



JEWELRY  
AND HOROLOGICAL REVIEW

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VOLUME XVI.

NEW YORK, FEBRUARY, 1885.

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## THE JEWELERS' CIRCULAR AND HOROLOGICAL REVIEW

*The recognized organ of the Trade, and the official representative of the  
Jewelers' League.*

A Monthly Journal devoted to the interests of Watchmakers, Jewelers, Silversmiths, Electro-plate Manufacturers, and those engaged in the kindred branches of art industry.

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To All Parts of the United States and Canada,  
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*All communications should be addressed to SETH W. HALE, President, THE  
JEWELERS' CIRCULAR PUBLISHING CO., 42 Nassau Street, New York.*

*Advertising rates made known on application.*

### Our Sixteenth Volume.

WITH THE present issue begins the sixteenth volume of THE JEWELERS' CIRCULAR. For fifteen years this journal has earnestly and conscientiously sought to advance the best interests of the jewelry trade in all its branches and in all its departments. Many of its present readers will remember it in its infancy, when it was a small little sheet, unpretending, weak and struggling; it entered upon an unworked field, filled with doubt and misgivings; but the high tone it assumed and maintained won the confidence of the trade gradually, till now the number of its friends is legion. It has aimed to be a teacher as well as a chronicler of passing events, and to this end has had the services, from time to time, of the most accomplished writers on technical subjects that the country affords, while its translations of the writings of European technologists have been numerous and important. We can point with pride to a galaxy of contributors to our columns such as no other trade journal ever had; their contributions embrace essays upon all the phases of horology, optics and optical material, treatises upon precious stones, their cutting, setting, etc., upon engraving, case making, the manufacture of jewelry in all its branches, and upon kindred subjects too numerous to mention. It has been the bringing together of these technical subjects, and giving place to their discussion, that has gained for THE CIRCULAR its wide popularity, and made it a welcome monthly visitor to every jeweler.

In entering upon our sixteenth volume we make no definite promises as to what we shall do, but simply that it will be our purpose to maintain the high standard achieved in the past, and to make each number worthy of its predecessors. Perhaps more space will be given than heretofore to discussing the mercantile phases of the

jewelry business, but we shall not lose sight of the educational features of THE CIRCULAR, but will continue to present the technology of the trade as heretofore, with the assistance of our able corps of contributors. THE CIRCULAR is a free, untrammelled, independent representative of the jewelry trade interests, being the organ of no clique and the partisan of no individual. It may sometimes be wrong, but it will be always conscientious and outspoken, combating the evil it sees and advocating the best business methods and practices.

We respectfully urge intending subscribers to send in their names at once, and let their subscriptions begin with the first number of the present volume. It happens that subscribers later in the year frequently desire to have their subscriptions entered from the beginning of the volume, and we are unable to supply back numbers. It occurs almost invariably after a number is issued that somebody finds some article of especial value in his department of trade, and he wants a number of extra copies. In this way we run short of back numbers and are unable to supply late orders. To insure complete volumes of THE CIRCULAR, subscriptions should be sent in promptly with the beginning of each volume.

### The Margin of Profit.

WHEN we hear dealers complaining that "there is no money in the business," we are strongly tempted to tell them that they are themselves to blame. As a general rule, dealers do not charge enough profit on their goods. The jewelry business is peculiar; it is subjected to unusual expenses and to extraordinary hazards; it is peculiarly sensitive to outside influences, and those that would not be felt in ordinary enterprises fall like a wet blanket on dealers in jewelry. A dealer is obliged to carry a more valuable stock of goods than most other merchants, tying up capital that might otherwise be earning something; he must provide unusual protection for his goods because of their exceptional value, and still he is liable to be robbed or defrauded, for the very nature of his stock is a temptation to criminals of all kinds. He is entitled to liberal compensation upon his investment because of the special hazards of his business, as well as for his own services. This can only come to him from the profit he makes on his sales, and if he is not careful in this respect he will find at the end of the year that he has run behind. Competition, when viciously prosecuted, has a most demoralizing effect on prices, and it may be said to be the rule that the retail dealers in any given place are such bitter rivals that they will sell their goods even at a sacrifice rather than take the chance of the customers going to the rival store. Doing business for either love or spite is an unprofitable occupation at any time, and in a dull season especially is suicidal. It is little enough trade the jeweler gets under the most favorable circumstances, and he cannot afford to throw away his profit on any customer.

Let us suppose that in a good-sized city there are half a dozen

jewelers carrying \$25,000 or \$30,000 worth of stock each; their sales average about \$30,000 a year each. Owing to jealousies and bitter rivalry they have undersold each other at every opportunity, so that the margin of profit has been reduced to, say, 20 per cent., or \$6,000 a year each. Out of this has to come interest on investment, rent, salaries, pay for personal services, and the thousand and one expenses incidental to the retail business. No wonder the dealer complains at the end of the year that "there is no money in the business." Now suppose these six dealers, instead of trying to cut each others' throats continually, were good friends, each recognizing the right of the other to make a living; that they were in the habit of meeting together sociably, and had cultivated mutual confidence and respect; suppose that out of this fraternal feeling there had grown a determination to get better prices for their goods, and that as a result ten per cent. more had been realized on their sales. Instead of \$6,000 apiece they would have \$9,000 each, and the additional \$3,000 would be clear profit, for expenses were provided for out of the \$6,000. But suppose the not unreasonable profit of 40 per cent. had been charged, and the gross result had been \$12,000 and the expenses still confined to their original limitation; under such conditions we should hear less frequently the complaint that "there is no money in the business." Right here is one of the evils that afflicts the trade; undue competition has destroyed legitimate profits and made dealers content to drag along year after year without bettering their condition; always owing for their stock, always worrying over maturing obligations, advancing in years, and still plodding away in the old treadmill of daily grind for board and clothes. Dry goods merchants and dealers in other mercantile lines do things better; they may be jealous of rivals, but they are careful to keep up prices. When they get new styles of goods they put on a profit of 50 or 60 per cent., and make their harvest when the goods are novel and popular, reducing the price as the public gets satiated with them. But a jeweler will send to New York, for instance, for a pair of diamonds on approval for which he is charged \$1,000; tremblingly he presents them to his customer, fearful lest he should not be pleased but would run off to a rival, and instead of praising the gems for all they are worth, he seeks to impress the would-be purchaser with them by offering them at, say, \$1,100. If he sells them he has barely got cost and the expense of conducting this particular transaction; he has not made out of it a dollar to apply towards general annual expenses, personal service, etc., and is no better off than before he ordered the goods. But suppose they had been lost or stolen while in his possession, how would the transaction have appeared on his books then? Instead of hesitating and dallying with his customer, he should boldly have charged him \$1,500 for the gems, and spent his best energies in convincing him that they were just what he wanted and cheap at the price. It is on large sales that dealers are apt to cut prices most, when these are precisely their opportunities for swelling their profit account. But fear of what a rival may do prevents them from doing themselves justice. What the dealers absolutely need is a wider margin of profit, and to this end they should cooperate. Lay aside petty jealousies and act in harmony for the best interests of the trade in general and yourselves in particular. For all the risks, the worry, the labor expended in conducting your business, you are entitled to more than ordinary profits, and it is your own fault if you do not get them. This is a subject in which the entire trade is interested, and we shall take occasion to refer to it in future issues.

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### Supply and Demand.

THE LAWS of supply and demand control the commerce of the world. When these are violated or ignored there will as surely come a period of commercial distress, as physical ailments are certain to follow any transgression of the natural laws. Financial panics, hard times and individual reverses are brought about by a

disregard of the conditions which regulate traffic among the people. The general business depression that has prevailed for the past two years is attributable to over-production. Speculation ran wild, resulting in the flooding of the market with fictitious values in excess of what the trading public could handle. Speculators traded upon the credulity of the people, and offered them all sorts of "wild cat" enterprises in addition to those of a legitimate character, till the load became too great to be borne, and when the collapse came there was a depreciation in values of all kinds, real as well as fictitious. The supply had simply outrun the demand. Owing to the speculative tendencies of our people there is always a market for a certain amount of visionary projects, but there is always danger of overdoing the "wild cat" business. But when speculation is wild—the appearances of the national prosperity are greatest and most deceptive. Money appears to be plentiful, and there is a feverish activity in commercial circles that is calculated to mislead and tempt business men to imprudence. They are apt to mistake a spasm of demand for permanent prosperity, and to make their calculations accordingly. The result is over-production, and the markets soon become glutted with products for which there is but a limited sale. Experience teaches that the reaction from this unhealthy condition comes about once in ten years, the period of depression lasting about two years, by the end of which time the country has passed through a period of liquidation—has sloughed off its speculative excesses—and is once more prepared to resume business on the legitimate basis of supply and demand. But the speculative fever comes again, and the same experience of unhealthy prosperity and extreme depreciation have to be gone through with periodic regularity. The bane of business is over-production, resulting from an imperfect knowledge of the conditions which create demand, or from a reckless disregard of the laws which should govern the supply. That appearances are at times well calculated to deceive the most sagacious must be admitted, but one who has past experience for a guide, and who observes the movements in kindred trades, should be able to hold a check rein over his own business, and so avoid falling a victim to over-production.

The jewelry trade is a periodical sufferer from over-production. Competition in the business is so pronounced that it is almost inevitable that more goods should be manufactured than there is a market for. The capacity of the productive machinery in the trade is sufficient to supply the whole world, while the markets are substantially confined to our own country. The constant cry goes up that we need new markets for our products—that new worlds should be conquered that our manufacturers might have more outlets for their manufactured goods. Suppose the whole world were open to them, how long would it be before every market would be over-stocked? If Stanley's newly developed African fields were thrown open to American manufacturers of jewelry they would have it over-stocked inside of a year, and be clamoring for new outlets for their products. The simple fact is that the manufacturing facilities are capable of producing more goods than there is a demand for, and until manufacturing is curtailed there will always be danger of over-production. Every manufacturer is ambitious to keep his factory going incessantly; not satisfied with running ten hours a day, he will keep his force working nights if there is even the faintest hope of disposing of his products; he will recklessly over-stock the market even at the probable cost of half a year's enforced idleness in consequence, sacrificing future prospects to present seeming requirements.

A remedy for over-production lies in limiting the working of the productive agencies. There is real good business sense—as opposed to individual rights—in the proposition to legally declare eight hours a day's work; it would be more to the general good if more than eight hours work a day could be prohibited by law; but, of course, neither of those propositions can ever be enforced, because they are at war with the individual interests of both employer and employed. Manufacturers will run their factories for all they are worth when it

will pay to do so, and workmen will work as many hours a day as they can get paid for. Nevertheless, owing to the surplus of manufacturing facilities, it would be better for all if the hours of production could be limited. In many factories it has become the custom to shut down a half or a full day on Saturdays, a practice which might be widely extended to advantage. Indeed, we believe the day is not far distant when Saturday will be kept as a holiday to a very general extent. At present, workmen have too few holidays—Sunday being more of a day of rest than recreation—and if they could have one day a week for social enjoyment it would be better for them, and, at the same time, reduce the possibilities of over-production by one-sixth. It would be better for the workman to have steady employment five days a week throughout the year than six days a week for six or eight months, and enforced idleness the remainder of the time. But this is a matter that can never be regulated by law, for the different productive industries are liable to varying exigencies and each must regulate itself. It has become a common thing for paper makers, manufacturers of cotton and woolen goods, etc., to agree to a limitation of their production, according to the stock in the market and the demand for it. Whether the manufacturing jewelers or any branch of them will ever come to a similar agreement is doubtful; their products are so varied that their interests are not identical, and cannot be regulated by cast iron rules. The fact is indisputable, that the capacity of the productive machinery in the trade exceeds the demand for its products; by what means it shall be limited in its operations remains to be determined. But one thing may be accepted as true; whenever a manufacturer creates a demand for a certain article, he is going to supply that demand if he has to work forty-eight hours a day.

We maintain that the over-production of values of every description was the cause of the hard times for the past two years. The jewelry trade had its fair share of responsibility in the matter, and if less goods were sold last year than was expected, it was largely due to the fact that the retail trade had been previously over-stocked. The country has been consuming this old stock during the past year, and has absorbed the greater part of it. Retail dealers generally are in a better condition now than they have been in three years, their indebtedness having decreased as their stock has run out. They need new goods, and, just as soon as they feel the coming demand for them, they will supply themselves. We hope they will not do it before. It is better to wait till they are morally certain of being able to dispose of goods than lumber up their shelves and show cases with stock that will not sell but which must be paid for. Wait till the flood comes and then swim with it. A short supply is always preferable to a surplus stock, and that condition is better for all concerned. Let the demand regulate the supply, and prosperity and profit are inevitable.

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#### Retail Dealers as Watch Repairers.

IT SEEMS to be a tradition in the trade that every dealer in watches and jewelry should be a repairer of watches also. This tradition dates back to the earliest manufacture of watches, but there seems to be no more real necessity for joining in wedlock these two distinct callings than there is for uniting the boot and shoe dealer and the cobbler, or the school teacher and the preacher. It is also a matter of tradition that doctors formerly united the business of the apothecary with their professional functions, and later, when the doctors grew out of the drug business, the apothecary became the blood-letting and the bone-setter. But these callings have been divorced and each remanded to its appropriate practitioner. There are many reasons why the repairing of watches should be conducted in connection with a jewelry business, but none why the dealer himself should be the repairer. The selling of watches seems naturally to fall into the hands of jewelers, and the repairing of watches brings

them custom; but the work of repairing is incompatible with the duties of a good merchant. We do not agree with a dealer whom we encountered recently, who declared with much emphasis that "horology is the curse of the jewelry business." On the contrary, we deem it a most essential part of the business, but believe the buying and selling of watches, jewelry, etc., should be kept distinct from the work of repairing watches. The watch repairer, who takes an interest in every job that falls into his hands, becomes so engrossed in his work that he makes an indifferent merchant, and the man whose mind inclines to the buying and selling of goods is not likely to prove equal to the skillful manipulation of the delicate mechanism of a watch. Where the attempt is made to combine the merchant and the repairer in one and the same person, one or other branch of the business is sure to be neglected, and it is usually the selling department that suffers, from which follows pecuniary embarrassment and probable insolvency. Look into the store of the average dealer in a country place. There he sits at his bench with a glass screwed into his eye, intent upon repairing the watch he has dissected and whose numerous pieces lie before him. He reaches a difficult point in his work, when a lady enters and desires to look at goods; the merchant is lost in the repairer, and he wishes his customer in Halifax till his job is done; ungraciously he waits upon the lady, and, his mind being upon his repairing, he fails to satisfy her, and she departs with the conviction that he is a most uninteresting salesman, while he mentally resolves that she only came in to bother him. Customers soon learn the habits and peculiarities of the tradesmen and merchants who serve them, and will avoid those who are gruff and unaccommodating or inattentive to their wants. If, however, the dealer prefers selling goods to repairing watches, he is not likely to make much of a reputation as a repairer, for his mind will be more occupied with his stock and his maturing obligations than the mechanism of watches.

Of course, in small places, where the sales of the jeweler are extremely limited, he must do his own repairing, but where his trade is moderately fair he will find it more profitable to attend to the mercantile part of his business and hire a watchmaker to do the repairing. By attending personally to his sales he can increase his business more than enough to pay the workman, and his mind will be less exercised with the cares of business. But watch repairing should never be done in the salesroom if it can possibly be avoided. The entrance of customers disturbs the workmen, and they lose much time gossiping with and watching those who pass in and out. Besides, customers get in the habit of going direct to the workman with their jobs, and there is danger that they will get to control the patronage in this line and eventually set up a rival establishment. The salesroom is not the place for the workman, but is the identical spot where the dealer personally should spend his time, receiving and serving his customers himself so far as is in his power. Let the merchant look after his patrons and the workman attend to the repairing; these branches of the business being entirely distinct should be kept separate.

Especially is the work of repairing incompatible with the duties of a merchant, now that retail dealers are forced into active competition with so many outsiders. If they expect to command patronage they must deserve and work for it. There can be no success without pushing enterprise and personal effort. It will not do for a dealer to simply buy a stock of goods, put them in his show case and then sit down and wait for the people to come and buy them. They will not do it. The dealer will require all his ingenuity to prevent trade drifting past him and lodging in the stores of his neighbors. He must make his place of business attractive, and to this end should exhibit goods that will catch the eye readily and excite curiosity. The fly once allured into your net, it is your fault if he does not become your meat. To this end show windows and show cases should present a tempting array of artistic goods in great variety, set out with such display of taste as will make conspicuous their respective merits. Cleanliness, neatness and careful arrangement should

characterize every inch of space, and no work bench should be permitted to destroy the general effect. Then the true merchant, having got a good thing, will let the public know it by advertising in the local papers. A little tact employed with the editor will secure frequent notice in the columns of local news. But editors are human; they believe in reciprocity, and in the "you tickle me and I'll tickle you" principle. They are the best natured men in the world, and constantly doing favors to others; but they will do far more for the man who advertises than for the one who does not. The successful merchant is alive to this fact, and he knows that a condition of success is undivided personal attention to business, using every endeavor to make friends, attract customers and to hold them in the face of competition. The man who expects to do this has no time to fool away repairing watches, losing a fifty dollar sale for the sake of a fifty cent job of tinkering. The line of demarkation between the merchant and repairer should be so well defined that there will be no danger of either trespassing upon the preserves of the other.

Therefore we hold, that while it is desirable and even necessary that retail jewelers should be prepared to repair watches, they should personally give their attention to the mercantile part of their business, employing competent workmen to do the repairing. Keep the store and the shop separate and distinct; attend to your customers yourself and do not give others an opportunity to win them away from you; make your stores attractive, invite custom, be always polite and attentive; in short, be a merchant, performing a merchant's duties, at the same time looking personally after your own business; do the brain work yourself and hire some one to do the mechanical part.

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#### Immature Business Men.

THE GREAT race for sudden wealth which all the inhabitants of the country are engaged in, from the time they leave the cradle till they return to Mother Earth, gives birth to a most prolific crop of immature business men, or ambitious youths who aspire to be classed in that category. There are thousands of callow youths to be met with every day who, having scorned to learn a trade, whose business education consists in having been office boys or clerks in somebody's business house, feel that they are entirely competent to manage a business enterprise of their own if they can only get the opportunity. Frequently some indulgent relative furnishes one of these with a small amount of capital as a basis of credit, and forthwith he launches out as a full-fledged business man, duly established in mercantile pursuits. His name is inscribed in large gilt letters on signs, doors and windows, his store fixtures are costly and attractive, his stock is abundant and his liabilities proportionate. This ambitious youth is apt to think that it devolves upon him to revolutionize the particular line of business in which he is engaged; that all his competitors are old fogies and do not know their business. In short, he is so inflated with his own importance that he proposes to carry the world by storm, to do business according to new methods, and to acquire a fortune in short order. Lacking experience, untrained in careful business methods, he expects show and splurge to compensate for the judgment and discretion that come with age and experience, and that bluster and "cheek" will win the confidence of the public. He is a living illustration of the saying that "fools rush in where angels fear to tread." His folly and his ignorance soon bring him to grief, and in a remarkably short time the name of this ambitious youth figures in that column of the daily paper wherein is recorded the "business embarrassments," in connection with the name of the individual whom he has designated as his assignee. And so this young man, before he has mastered the rudiments of business, finds that his ambitious schemes have resulted in failure, and that instead of having conquered fortune in a few

months, he has assumed the role of a bankrupt and must go through life with this cloud hanging over him.

The jewelry trade could point to numerous examples of this kind, and has abundant cause to grieve over the confidence it has placed in these immature business men. They come from the bench, from the sales counter, from the book-keeper's desk, from the ranks of the commercial travelers; from any station, in fact, that gives them a superficial insight into the business without affording them an opportunity to grasp that comprehensive knowledge of details that is essential to success. Frequently these over-smart young men rely upon the knowledge they have acquired while in the employ of another of that employer's customers for their success; they are apt to think that because they have sold goods for Smith & Brown, and made the acquaintance of their patrons while so doing, that these patrons will follow them when they set up for themselves. They forget that, as salesmen, they had behind them the capital and reputation of Smith & Brown; that these are what brought custom to that firm, and are the qualifications that will retain it. When a customer goes to Smith & Brown to buy goods, he does so because of his confidence in the integrity of those gentlemen, and it is immaterial to him what salesman is assigned to the task of showing him goods; he knows that the salesman is acting under instructions from Smith & Brown, and if he happens to be an agreeable fellow, they are credited with good sense in surrounding themselves with desirable assistants. It is the height of presumption in these subordinates to think that because they make a favorable impression on a customer, he will transfer his patronage from an old established house to him the moment he starts in business. How many men we have heard boast that they controlled the business of their employers, and what lamentable failures they have made when thrown upon their own resources. An instance of this kind occurred with an old house in Maiden Lane. A young man was taken into their employ more as an act of charity than because they needed him; he made himself useful, became popular in the trade, was promoted by degrees and was eventually in receipt of a handsome salary; he became inflated with his own conceit, and finally demanded as a condition of remaining that he should be admitted to the firm. His request was treated as presumptuous, whereupon he left, confident of his ability to find another place immediately and so take away his old employer's patrons. He has been looking for a situation for two years and has not found it yet; he sees his mistake, but his old place has been filled and he would be glad of any employment. Self-conceit is a common fault with young men, and one that leads so many of them to branch out for themselves when they should be receiving careful business training in some established house.

We allege no objection against either youth or reasonable ambition; it is not a crime to be young, and it is highly commendable in youth to aspire to fill the positions wherein their elders have been successful. It is simply against bumptious presumption that we protest; those unwarranted and unreasonable ambitions that result in giving us so many immature business men. The great evil hanging over the rising generation is a lack of thoroughness. Young men are too readily content with superficial knowledge and mediocrity; too prone to trust to luck rather than their own industry; without sufficient education to admit them to the learned professions, knowing no trade, yet dependent upon their own exertions for a livelihood, they take up chance employment from time to time, changing their occupation according to circumstances, but half the time doing service in the great army of the unemployed. One reason for this is the obstacles thrown in the way of boys learning trades by the trades unions; another is the lack of technical training schools. There are many boys employed as messengers, office boys, etc., who are obliged to work, who would be glad to learn trades if they had the opportunity, but who, lacking this, struggle along with such employment as they can get, being neither mechanics nor business men, but involuntary incompetents.

These are some of the causes that tend to give the country such

an abundant crop of immature business men, leading to so many failures and embarrassments. The abuse of the credit system must share in this responsibility, holding out, as it does, temptations to this class of incompetents to set up for themselves. Apparently the only remedy for this lies in the better instruction of boys and young men. They should be taught to be thorough and competent in some one thing, and that by industry and perseverance alone can they hope to win success; also, that success cannot be expected in a day or a year, but that continued pertinacity is necessary to its accomplishment. Every parent or employer who has any control over young men or boys, should use his influence to induce them to accept a thorough technical training for something useful, and not leave them to fight the battle of life in that hap-hazard way that has brought so many to grief.

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### Russian Reproductions

At the Metropolitan Museum of Art.

[BY JOHN W. MILES.]

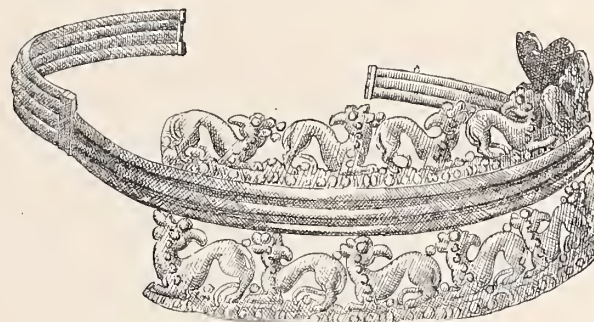
Continued from Page 383.



Dress Ornament,  
Gold, Scythian.

WE PASS now to objects of early Russian work in which our expectations of rude and barbaric handling will not be disappointed. Yet the first crude beginnings of a people—feeling that universal craving for tangible representations of visible or imaginary objects but without the skill to correctly portray them—is by no means uninteresting. In fact, the early art of every nation is in some respects an index of its future achievements, for though by some there may be produced examples showing elaboration of detail and delicacy of finish without the true artistic feeling, so also by others, the most coarse and uncouth workmanship may reveal germs of expression that, like a mustard seed, eventually terminated in a deeply-rooted, widely-spread growth, strong in purpose and exuberant with vitality. The former may be seen in the ideal of an angel from a psalter of the 8th century in the library of St. John's College, Cambridge, and the latter in a representation of the serpent beguiling Eve from the marble pulpit of the church of St. Ambrogia at Milan.\* In studying the early efforts of Russian art in the precious metals I have sought, therefore, to discover, not alone the actual art in them, but also the indications of art life and the marks or promises of future progress, but I am compelled to admit meeting with little success in either direction. Remembering, however, that the Republic of Novgorod, which was the commencement of the Russian Empire, was not founded until A. D. 862, and in the very midst of a period designated in history as the "Dark Ages"—when the old civilization, checked and overthrown, lay apparently lifeless beneath the rule of the victorious barbarians—the crude productions of the early Russian artists are perhaps characterized by more of art than we have a right to anticipate or even ask for. Of the specimens exhibited at the Museum nearly all are massive, but bearing that character less as an attribute of grandeur than as an indication of weakness in both conception and skill. This is perhaps most plainly seen in a collar of gold belonging to the treasure of Novo-Tcherkask, figure 17. It is formed of three solid united rings, and ornamented above and below for about one-half the circumference with massive open-work delineations of griffins or fabulous animals with birds' heads. These are cast and in some portions also chased. The decoration of these animals suggest a knowledge or tradition, in the mind of the artist, of Byzantine art, for he has employed settings of oval-shaped turquoises to enhance the richness of his work. These gems are placed in a very singular manner, two upon the body and one upon the head, and this disposition of them appears to have been in

accordance with some canon of their art, since the gems adorning other pieces of about the same period are similarly placed. For the eyes stones of a pale ruby color are used. The workmanship is



Collar, Gold, Early Russian, Figure 17.

extremely rude and barbaric although evidently intended to be of regal magnificence. The collar has a diameter of 6 inches, with about one-fifth part opening upon a hinge and fastened by means of a staple with a pin secured by a short chain.

In the same class I include three or four objects of gold cast work which, the original uses being unknown, are supposed to have been simply ornaments. These are also massive, and, in the case of two of them, represent a fabulous monster fighting a lion or a serpent. A third piece, however, betrays a more extended ambition, being an attempt to delineate an entire scene in open-work relief, figure 18. The design depicts a tree in full foliage, beneath which lies a warrior with his head upon the lap of an attendant. On the tree hangs a bow and arrow case, and a second attendant holds by the bridle a mule with eight legs and two heads.† There is no apparent attempt at re-finishing or re-touching, and the back of the piece shows the impress of a woven fabric upon which the design was originally modeled before casting. This is the most interesting, and, from an art standpoint, the finest object among all the specimens of early Russian work. As an effort to portray nature naturally it merits notice, and, although wrought with an entire absence of ideality, it is not wholly devoid of sentiment. On the route to or from the battle the warrior lays aside his weapons seeking rest beneath the welcome shade. His attendants, awake and alert, watch by him in readiness against surprise or prepared for immediate departure, for the delay is but temporary. This much is told plainly enough. If there was anything more than this in the mind of the artist he was unable to reveal it. In the most favorable judgment, therefore, regarding the conception we can only say that it does not apparently controvert natural facts, even though the crude and barbaric handling plays sad havoc with the laws of proportion.



Ornament, Gold, Early Russian, Figure 18.

These two pieces will suffice to illustrate early Russian work, and will clearly exhibit the poverty of a true artistic feeling among the primitive inhabitants of that nation. In fact, there is little in any of the specimens of pure Russian work to warrant an extended notice, for among the later and more creditable designs one traces, sometimes slightly but more often entirely, the well known styles of

† This is really two mules, but I use this form of description as best expressing the manner of representation.

\* Both figured in *The Two Paths*, by Mr. John Ruskin.

other countries which served as models for the Russian artist. This is seen notably in two cups, one of English and the other of German conception, and so strongly characteristic of the goldsmith work of those countries as to inspire a doubt of their being produced elsewhere.

During the long period which elapsed after the sweeping inroads of the barbarian tribes and until the 14th century, we do not look for many productions in gold and silver. Art, together with learning, though not dead, had followed the cowl and crosier into the seclusion of the monasteries, leaving few articles in the precious metals except those in the possession of the great feudal lords. Specimens of goldsmith work (other than ecclesiastical) belonging to this epoch of darkness are indeed very, very rare, but from the time of the Revival until the present day there has been preserved far more than enough to represent the different styles which gratified alike the taste and vanity of the nobles. Even a casual inspection of the collection under review shows a large preponderance of pieces covering these later periods, and bearing in form and decoration such unmistakable patterns that to a connoisseur the age of each can be very closely approximated unaided by marks.

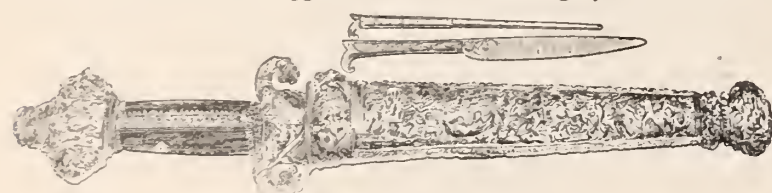
It would be singular if in a collection of this extent there were not one or more objects attributed to the great master of the 16th century—Benvenuto Cellini. Here we find two of them. The first is



Cup, Chalcedony, mounted in gold, Italian, 16th Century, Figure 19.

a miniature cup, figure 19, but though very beautiful its workmanship does not commend it as the product of any hand especially celebrated in a century of celebrities. It is of tazza shape with a bowl of chalcedony mounted in gold. The ornamentation of the foot and stem is very elaborately and delicately wrought. The cover is surmounted with little Cupids, and the entire height does not exceed 6 inches. It is from the Golitzin collection in the Troitsa Monastery at Moscow.

The other beautiful piece which is claimed to be the production of Cellini will be found illustrated in figure 20. Although not included in the late exhaustive treatise upon the subject by Eugene Plon\* the attribution is quite reasonable in view of the workmanship, which is in the favorite style of Cellini, and finished with that perfection which characterized all his works. But whether it is his production or not it is certainly Italian, and as certainly belongs to the period of the Renaissance. The ornamentation of both the dagger and its sheath is highly elaborate even



Dagger and Sheath, Silver-gilt, Italian, 16th Century, (attributed to Cellini), Figure 20.

for an age that exercised its purest art in the fabrication of resplendent armour and magnificent arms, and with them is a curious evidence of a well known domestic custom of that epoch. The blade of the dagger is of steel ornamented upon its upper part with damascening of arabesque work. The guard is of scroll foliage design with terminations of monsters' heads curving inwards towards the blade. The handle is of agate having a fanciful metal band (with settings of turquoises) upon each side, and surmounted with a massive knob matching the guard in decoration and bearing a representation of the Judgment of Paris. Above this are two Cupids embracing each other. The most beautiful and artistic portion of the piece is the sheath, and here the artist has displayed exquisite skill. The minute figures in high relief which almost entirely cover one side are executed with that delicate strength which characterized the work of

the great Italian artist and supplies the strongest evidence in favor of the attribution. The reverse side of the sheath is filled with ornaments consisting of fruit, flowers, carytides, chimæra, masks, figures and arabesques combined with great profusion and in excellent taste. The subjects, taken from the Iliad of Homer, are selected and displayed with rare judgment. The two little Cupids surmounting the hilt very appropriately symbolize the underlying cause of the following scenes, and the Judgment of Paris, immediately below, aptly represents the first act which led to the famous siege of Troy.

The story of Paris is too familiar to warrant more than a very brief synopsis here. Although the legitimate son of Priam, king of Troy, by Hecuba, the queen, his death was decreed before his birth owing to a dream of his mother that she had brought forth a fire-brand to destroy both the palace and the city. As soon as he saw the light, therefore, a slave took him to Mount Ida for the purpose of putting him out of the world, but, afterwards relenting, left him there, where he was subsequently found by some shepherds and reared by them as one of their own children. As he grew up in the vocation of his companions he exhibited so much nobility and daring, and guarded his flocks so bravely from wild beasts and robbers, that he was given the name of Alexandros (The Defender). Then occurred the marriage of Péléus and Thetis, when the goddess of Discord, enraged at her omission from the list of invited guests, entered the nuptial hall and threw down a golden apple inscribed, "The Prize of the Fairest." Hereupon all the females claimed it as their own, and the contention thus aroused was but partially appeased by the appointment of an umpire and the selection of Pallas-Athéné (Minerva), Héra (Juno), and Aphrodité (Venus), as candidates. Paris was unanimously chosen as judge, and with the apple in his hand commanded the three beauties to appear before him with all their charms unveiled that he might decide between them. Aphrodité won the prize by bribing the judge with a promise to bestow upon him the most beautiful woman in the world, and the two other goddesses, enraged at this settlement, vowed eternal vengeance against both Paris and his family. Soon after Paris was acknowledged by his father, Priam, and sent upon a political mission to Greece, but by changing his course he visited the court of Menelâos, king of Sparta and husband of Helené. He was very cordially received and entertained, but during an absence of the king managed to persuade Helené to an elopement and carried her to Troy, when Menelâos, securing the coöperation of all the kings and heroes of Greece, organized an expedition to recover his consort and thus inaugurated the Trojan war.

In proper sequence to the scene upon the hilt of our dagger is the ones immediately below upon the sheath. Here we first see the home of Helené, and she herself in the company of two men about to embark in a small boat for the larger vessel of Paris in the offing. Following this is a line of Greek and Trojan warriors actively engaged in the combat, while the knob at the tip matches the one upon the handle. Fitting into the sheath by the side of the dagger blade is a knife and single-pronged fork, having handles ornamented with damascening of gold. This is in accordance with the custom of the times which made it obligatory upon traveling gentlemen either to carry their own table utensils or adopt the habits of the ordinary people and eat with their fingers, and although forks with more than one tine were in use for especial purposes they were far from common, and considered more as valuable oddities than as a necessary implement of the dining hall.

One is forcibly impressed with the perfect appropriateness of this piece to the era of knighthood and chivalrous customs. The knight was a gentleman, but he was also a lover and devoted his arms to the fair lady of his choice. For her he fought, and upon her name he called when with lowered lance he dashed upon the foe. Whatever fealty he might owe his king a deeper homage claimed him at the shrine of feminine charms. The decoration of our dagger and sheath convey the sentiments of warfare, but a warfare in the cause of woman and prompted by a love of female beauty. The selection

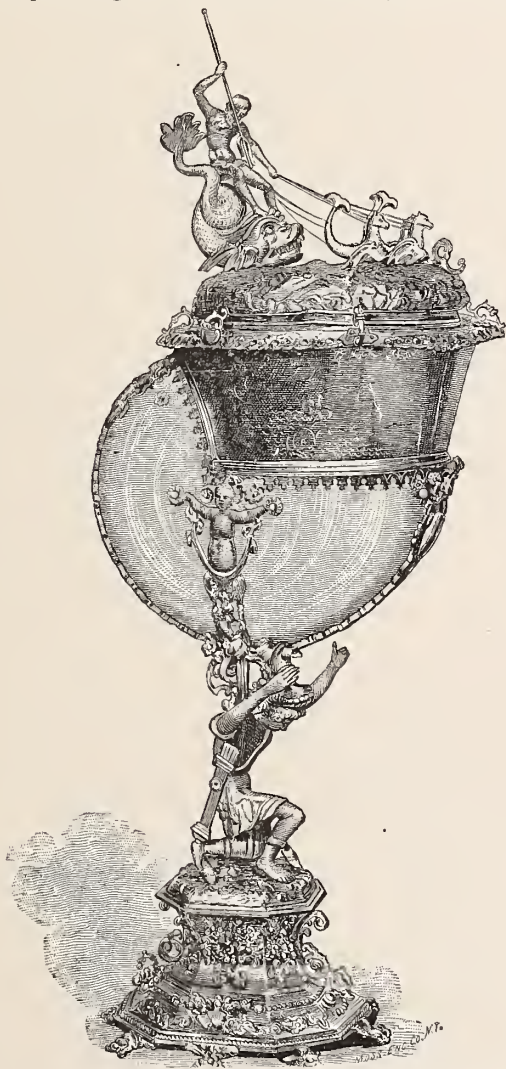
\* Benvenuto Cellini, Orfèvre, Medailleur, Sculpteur—Paris, 1533.



of the subjects were, therefore, peculiarly felicitous, for in that grandiloquent age however much a knight might prove fickle in deed he was nevertheless faithful to the sentiments of chivalry.

The piece is from the Imperial Arsenal of Tsarskoë-Selò, and measures 15 inches in length.

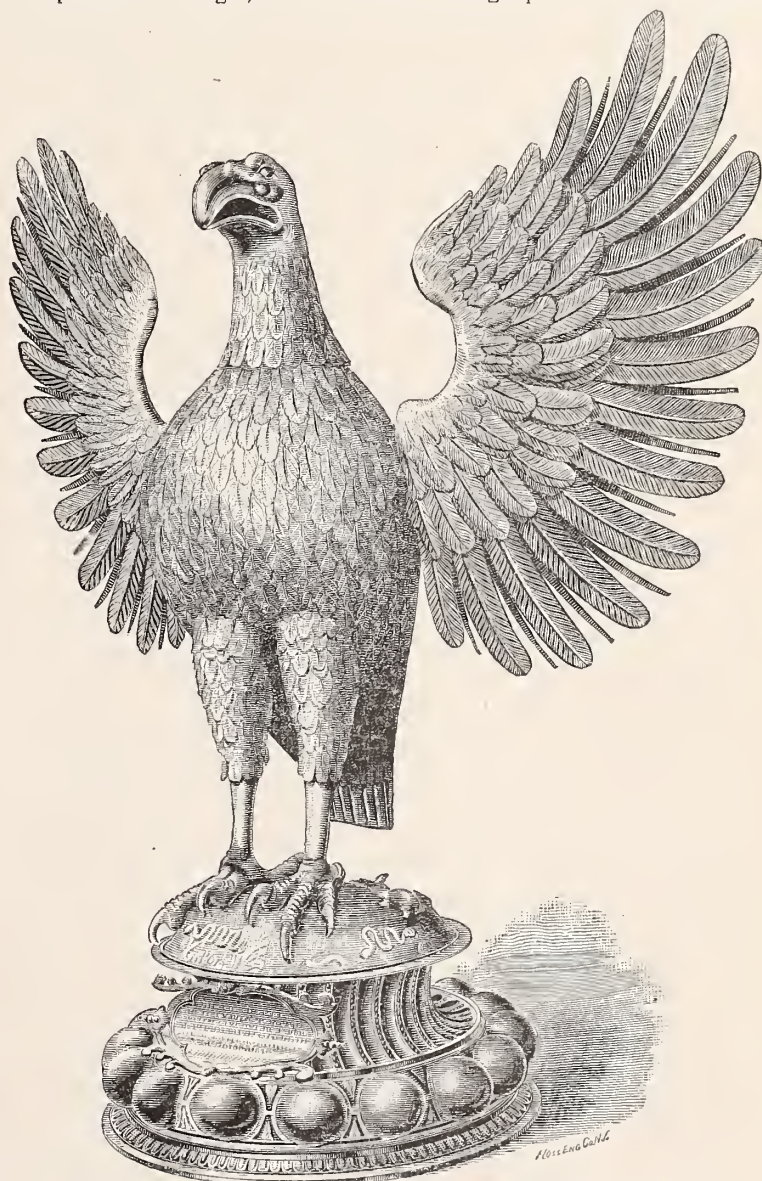
German work of the same century is represented by several objects, of which not the least beautiful is a Nautilus cup mounted in silver-gilt from the Chéréméteff collection, St. Petersburg. Figure 21 is an illustration of it. It is a standing cup of considerable height (20 inches), the bowl formed of a shell of the Pearly Nautilus (*Nautilus Pompilius*) and supplied with a somewhat broad band which serves as a lip. It has a cover representative of the sea, in which fishes and monsters are sporting, and surmounted with a figure of Neptune upon a dolphin driving three marine monsters. The broad band around the lip is engraved with marine subjects, while the shell is



Cup, Nautilus, Silver-gilt, German, 16th Century, Figure 21.

held in place by three bands of posing caryatides enriched with loose pearls. The stem is formed of an African warrior kneeling and in armour, with a quiver suspended at his side and a bow on the ground at his feet. Near him the ground is strewn with shells, frogs, etc. The base, resting upon tortoises and claw feet, alternating, is decorated with bracket scrolls embellished with loose pearls. This piece is by no means as beautiful as a similar cup in the possession of Queen Victoria, but it is an ambitious endeavor and worthy to be classed with many other relics of German skill during the 16th century. The artistic spirit of the Revival permeated all the countries of Western Europe, but no country except Italy produced more or finer specimens of gold and silver work than Germany. Their leading artist, Jamitzer, was no mean rival of the great Cellini himself, and many of the objects fabricated in the German workshops might easily be confused with those emanating from Florence. The goldsmith guilds of Augsburg and Nuremberg were fully as powerful as those of England or France, and as fully alive to the requirements of an age

excited by newly discovered learning and the dazzling display of knighthood. Every accessory, therefore, which could add to the splendor of tournament or table were eagerly grasped by the artist and made to serve as a foundation around which might be woven those teeming fancies begotten of universal enthusiasm. Coccanut shell (a rare shell in those days), rock crystal and even the eggs of the ostrich were utilized as cups and mounted with the most beautiful conceptions possible to the artist. Cups in the form of birds or animals were also quite popular, as may be seen by the set of "Cockayne" cups at Skinners Hall, London, and by two examples in the Museum collection, one of which is illustrated in figure 22. This is in silver-gilt, and an excellent example of Nuremberg work. It represents an eagle, life-size and standing upon a circular mound



Cup, Eagle, Silver-gilt, Nuremberg, 16th Century, Figure 22.

which forms the base. The wings are spread in a very life-like manner, the head and neck taking off to form the cup. Numerous small figures of insects, reptiles and shells are scattered over the mound, and the sides of the base are beaten up in bosses and gadrooned. On the front is a placque on which is engraved the following inscription: "Der. Kön. May, zu Danemarcke und Norwege Christiano dem 4 etc. Ihrem allernedstigsten König und Herrn hat die Landschafft aut Ozel dis Trinkgeschir aus schuldigen Treuen unterthenigst verchret in dem 1595 jare und wunchem Ihrem Kön Mayt langes gesundes Lebe und gluckseligs Regi."\* And beneath, in Slavonic: "An eagle sent by the King of Denmark, Christian."

\* "To her Majesty, Christian the IV., King of Denmark and Norway, our exalted Lord and Master, this province of Ozel has most humbly dedicated this drinking cup in the year 1595, with the best wishes for her Majesty's long and healthy life and happy reign." (This translation is almost *verbatim*, retaining the queer phraseology of the 16th century),

Although both of these two last pieces show the influence of the Renaissance upon the German goldsmith, the artists of Augsburg and Nuremberg were not mere copyists. In fact, before the incitement of the Italian Revival could reach them they had established a style of their own, national in its character and of sufficient grace to be adopted by other countries. The prominently raised bosses which we have seen upon the eagle cup was a purely German conception, and the custom of inlaying, as ornamentations, antique cameos and coins also originated in that country, and both ideas were afterwards used in England and France. Cups made with lobed bowls and cusped lips, bearing *repoussé* work of fruits, flowers and strap-work cartouches enclosing masks and figures, are far from uncommon among the examples of German work at the beginning of the 16th century, and even at a much later period the traditions of earlier beaten work of narrow leaves and vines cling around the covers of their beautiful hanaps and tankards in graceful distribution.

But the goldsmith of this period was something more than the name implies to-day. He was a jeweler, a worker in metals of all kinds, a sculptor, a painter, a thorough artist and the father of artists.\* Hence we find, in such specimens of their work as have been preserved, opportunities for study beyond anything a bare description can give. The prevailing taste leaves its impress upon the design, but without interrupting the thought of which it is the embodiment, so that these pieces come to us like a charming poem by Chaucer—quaintly expressed, perhaps, but with the true ring of those noble and natural sentiments which have been and ever will be indigenous to mankind. It is this materialization of the mind into form and substance that brings us into closer relations with these ancient worthies, and enables us to reach across the dividing centuries and call them brothers. The person who admires a work of art, therefore, merely because it is pretty, loses all that might make it a constant source of instruction and pleasure, for the true criterion is not the extent of labor or material, but the proportion of the artist's own heart and life which has gone into his conception. In this regard the work of the true artist is a child of his brain, and breathes the spirit of his highest ideals bounded only by the ruling culture and development of his epoch. Once understood, his production becomes to us a vitalized soul, with thought answering to our thought, and emotions that seem mirrored reflections of our own, demonstrating that universal truism which belongs to all time and to all peoples: *Homo sum; humani hihil a me alienum puto.* ("I am a man and deem nothing that relates to man foreign to my feelings.")

(To be Continued.)

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## Gossip of the Month.

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IN THE January issue of THE CIRCULAR we alluded to some of the difficulties in the way of forming a Board of Trade in the jewelry interests, pointing out certain incongruous elements that have heretofore defeated every effort made towards securing such an organization. These incongruities are the natural result of interests so diverse as are found in the jewelry trade, embracing, as it does, manufacturers, importers, jobbers and retail dealers, and including manufacturers and dealers in horological goods, gold and silverware, fine goods and cheap goods, importers of foreign manufactures, precious stones of all kinds, etc. The theory of a Board of Trade is

\* For instance: Among the famous men who learned their first lessons in art in the studios of the goldsmith may be mentioned Luca della Robia; Filippo Brunelleschi, architect and sculptor; Donatello, sculptor; Lorenzo Ghiberti, sculptor; Francesco Francia, a Bologna goldsmith, praised by Visari for excellence in enameling, but only remembered now as a great painter; Domenico Ghirlandajo, goldsmith and son of a goldsmith (Tommaso), famous as a painter; Andrea del Verrocchio, sculptor and the teacher in painting of Leonardo da Vinci; the father of Albert Durer who was a goldsmith at Cula, in Hungary, and afterwards in Nuremberg, and many others too numerous to recapitulate.

that it shall exercise a certain control over all its members, and those who have heretofore interested themselves in the attempts to form such an organization have found an unwillingness on the part of many to surrender in any degree their individual rights to secure the general welfare of the business. THE CIRCULAR has always favored the formation of a Board of Trade, and we have hoped to see such an organization, enjoying the confidence of the trade, centrally located, in commodious quarters, where ample accommodations could be provided for members and for buyers who visit the city, being, in fact, the headquarters of the trade. In pointing out the difficulties in the way, we did so in the hope that objectors to the project might see that they were standing in the way of the general good, and be induced to yield their objections. We are glad to learn that the effort to organize a Board of Trade to which we alluded is meeting with most encouraging success, a large number of houses in the trade having agreed to become members. There is hope of its being a success, provided it does not attempt too much at the outset. The greatest evil from which the trade is suffering is the abuse of the credit system, and if a Board of Trade will take cognizance of this, and endeavor to secure certain reforms—reforms easy of attainment if the trade acts as a unit—it will not only do a vast amount of good, but will pave the way for a more extended sphere of usefulness for itself. We rejoice that there is a prospect of effecting such an organization, and we hope that it will, as it certainly should, receive the hearty support of every man in the trade, regardless of any special interests he may have in hand. Nearly every other branch of commercial and mercantile business has its trade organization, and these have been found of great value and importance; it is time the jewelry trade perfected an organization of this character. Had it followed the suggestions of THE CIRCULAR a Board of Trade would have been formed years ago, and many of the abuses now complained of would unquestionably have been remedied.

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IN OUR issue for January we noted the fact that a dealer in London had been forced to print an apology over his own signature, for having sold an imitation Waltham watch; we now find in *The Watchmaker, Jeweler and Silversmith*, of London, an even more abject apology made by F. Narborough, and addressed to "The Guardians of the Standard of Wrought Plate in Birmingham." Mr. Narborough confesses that he has been in the habit of putting base metal linings in the mountings of whips, canes and umbrellas after such wares had been assayed and marked by the Guardians. He therefore humbly apologizes for these offenses, and promises, in consideration of their abandoning the prosecution begun against him, to surrender all such deteriorated goods, and to pay a penalty of £10 and all costs. It must be exceedingly humiliating for a dealer of supposed respectability to be obliged to publicly confess that it is his habit to swindle his customers, but it appears to be only a question, in such cases, whether the individual will make confession of his shortcomings or be exposed by those having jurisdiction in such matters, in addition to paying heavy fines and costs. These and other instances demonstrate that English tradesmen are not averse to practicing what they delight to allude to as "Yankee tricks," and indicate that they possess a fruitfulness in resources that renders it unnecessary for them to borrow any "tricks and devices" from their American cousins. They show, also, that in England some measures are taken to protect the public from being swindled by goods of depreciated quality, especially against the depreciation of goods after they have been stamped in accordance with law. Unfortunately, there is no standard of quality in this country, and the sole reliance of purchasers is upon the integrity of manufacturers and the dealers of whom they buy goods. There would be no objection to this species of "free trade in jewelry," provided the degraded goods were

sold for what they are, but when 12 karat goods are marked 14 or 16 karat, there is a premeditated swindle involved in the transaction that should be punishable by law. So it might be if a purchaser of such goods would take the trouble of prosecuting the seller or manufacturer for obtaining money by false pretenses, but this involves so much trouble and loss of time that it is never done. Consequently there is a certain class of manufacturers that keeps the market well supplied with goods of debased quality, that carry with them *prima facie* evidence of fraud. It is a reproach to the trade at large, and an injury to manufacturers of and dealers in fine goods, that such practices can be indulged in, but there seems to be no way of reaching the evil.

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THE distinction should be very clearly made between cheap goods and fraudulent goods. The former are made to supply a legitimate demand, and their manufacture and sale is an honest and honorable calling; but the latter are made to deceive by pretending to be what they are not, viz., gold goods of a degree of fineness corresponding to the stamp on their face. A great amount of public indignation has lately been excited over the confiscation by the health officers, of a large quantity of confectionary that was found to be made of adulterated sugar and colored with poisonous dyes. The so-called sugar is mixed with a certain kind of earth known as *terra alba*, while the dyes are made from mineral instead of vegetable substances. Where is the difference in moral turpitude between selling for sugar a substance that is compounded of glucose and dirt, and selling as 18 karat goods a compound of gold and base metal that will not assay above 16 karats? A manufacturer recently got out a new design for a scarf pin, which he made in a good quality of gold and sold to the trade at \$42 a dozen. There was quite a run on them, but his travelers soon reported that pins identical in appearance with his, were being sold by a rival manufacturer at \$36 a dozen. The original maker bought a sample of his rival's pins, and, as he suspected, found by assaying that it was two karats below the quality indicated by the stamp on its face. He, and every other purchaser had been defrauded by just the value of two karats. Yet, when this fact was made known to dealers, many of them said they preferred the cheaper goods because they gave them a wider margin for profit. Of course, by knowingly selling the fraudulent goods, they became *particeps criminis* in the robbery of the public as planned by the manufacturer, but that extra profit of half a dollar on each pin sold prevented them from seeing the iniquity of the transaction. Yet, if any one of those dealers had been swindled with bogus confectionary, how indignant he would have been. This is only an illustration of what is being done constantly in the trade to the injury and prejudice of those who are desirous of maintaining the standard of quality and the reputation of jewelers. Degradation of quality is one of the lamentable results of too much competition, but it does not speak well for the integrity of those who are willing to rely for their profit on misrepresentation and falsehood. Protest as much as it may, the public has no redress; the unscrupulous manufacturers and dealers continue their speculations, and, in the language of that noted financier, Boss Tweed, ask "what are you going to do about it?" In the absence of special statutes fixing a standard for wrought gold and silver, the manufacturer of bogus goods places the finger of contempt on the nose of audacity, and, with impudent digital gyrations, defies alike public opinion and private prosecution. But the jewelry trade is not alone in suffering from the baleful influences of debased quality. Adulteration is the order of the day, and stock of all kinds is "watered" to an extent that leaves but little semblance to the original material; almost everything we eat, drink or buy has gone through the watering process, till the dilution has resulted in such a degree of liquefaction that general liquidation is necessary to commercial purification—otherwise we shall continue to have stag-

nation and demoralization, resulting in repudiation and national degradation. From such a conglomeration of disastrous "ations," may we find safe and speedy delivery.

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THERE was great delay in bringing the New Orleans exhibition into presentable condition, and exhibitors were subjected to great annoyance and much expense in consequence. For two or three weeks after the opening there were many vacant spaces, while the goods that should have filled them were in the freight depots of the steamship and railroad companies. To add to the discomforts of the situation it rained steadily for the first week, and the grounds around the exhibition buildings became such a sea of mud as the Army of the Potomac used to encounter, when it moved out to meet the southern people with very different intentions from those entertained by the visitors to New Orleans at present. Then, too, the street car drivers went on a strike, and everyone was left to paddle his own canoe through the mud. All reports concur in representing that the exhibition was opened at least a month before it should have been, and that the consequent disappointment will seriously injure its prospects. However, it is to be hoped that the early spring months, which bring such delightful weather in that climate, will fully compensate for the inauspicious opening weeks. While it seems a long distance away to hold such an exhibition of the products of our nation's wealth and industry, yet the location is the great distributing center of an extensive section of the country, that is far behind the north and west in industrial and commercial development, and that offers a rich field for cultivation by the enterprising business men of the other sections. The south has had a hard struggle since the war to reconcile itself to the changed social and business conditions; it had much to learn and still more to unlearn; twenty years have done much to improve it, and the times and the people seem ripe for a greater prosperity than they have ever known. Such an exhibition as that at New Orleans is an intimation that they are ready to receive men, ideas, products and capital from other sections, and to open wide their arms to receive the spirit of enterprise and progress in whatever form it may come to them, or from whatever direction it may appear. It is a good thing for the jewelry trade that some of its representatives are numbered among the exhibitors, and that visitors, many of them strangers to such exhibitions, will have an opportunity of seeing what progress has been made in this country in the science of horology and in the gold and silversmiths' art.

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THE business men of the country have very generally expressed themselves in favor of a national bankruptcy law, and have, through their business exchanges, united in urging upon Congress the necessity of passing such a law at the present session. Yet some objections are raised to it, and these come mostly from some of the southern and western States. It is noticeable that the objectors are residents of those States where the debtor class predominates very largely, and where the State laws discriminate in their favor as against creditors residing in other States. It is precisely because some States do thus favor their own citizens that a national bankruptcy law, that shall apply to all States alike, is a necessity. Unless such a law is enacted, the creditor class will themselves find a remedy for existing abuses, by refusing to extend credit to residents of those States that have such unjust laws. No honorable man, who expects to pay his debts dollar for dollar, can object to an equitable law that places his creditor on an equal footing with himself, wherever he may be. There may be faults in the law now before Congress, but as it has been approved by the commercial exchanges of

all the principal cities of the country, and has already passed the Senate, it is but fair to give it a trial. If it is found oppressive in its operations it can be easily remedied at any time, but to reject the good there is in it because of some possible defect, would be unwise and prejudicial to business interests. The business men of the country have very generally expressed themselves in favor of the pending bill, while the objections to it come from a limited number of persons, and from States where it is most needed for the protection of honest creditors against the wiles of fraudulent debtors, who are now favored by discriminating laws. Congress cannot afford to ignore this almost universal demand for a bankruptcy law.

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"BLESSED are they who expect nothing," says the prophet. If they don't expect anything they are not disappointed when they don't get it; if they do, they have done better than they expected, and should rejoice thereat. But the blessing referred to as coming to those whose expectations are below zero, we presume comes in the form of a contented mind whatever may occur. The jewelry trade ought, according to this maxim, to be in a blessed frame of mind at this time, for it expected nothing of the month of January, and it got it. There wasn't trade enough to keep an office boy busy in each establishment, while proprietors and clerks had ample leisure for putting stock in order, and getting ready for the "business boom" all are looking forward to. What a pity it is that business men cannot take their summer vacations in January and February—they would seldom be missed in those months, while in July and August when they do go away, they might possibly find profitable employment if they staid at home. The little spasm of business activity that comes with the holidays followed the old year out, leaving only stagnation to usher in the new year, but, as everybody expected this, there was no disappointment; but whether the blessing of a contented mind is enjoyed by everybody is problematical. People like to be disappointed, and we are sure members of the jewelry trade would have been better satisfied if business had been so lively as to completely clean out their stocks. There were a good many buyers at holiday time, as is always the case, but it was clear that they felt the influence of hard times, for they all sought to make five dollars do duty for ten, investing in goods of moderate price rather than in the rich and costly varieties. The public is generally inclined to cut its coat according to its cloth, and if it is economical in dull times it makes compensation by being extravagant in seasons of prosperity. If it would only strike an average and let expenditures be equalized through a series of years, it would be better for all but contrary to human nature. The best way is to take things as they come, trust to the general law of averages, and enjoy that blessing which a contented mind always brings to its possessor.

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WE alluded last month to the order recently enforced by several western railroads, prohibiting the carrying of jewelry trunks as baggage. The order is more sweeping than we at first supposed, and extends to the trunks of all commercial travelers who carry goods of unusual value. Efforts have been made to have this order repealed, but thus far without success, the railroad managers claiming that the carrying of baggage involves them in heavy expenses at best, and when they have to pay for the loss of a valuable trunk occasionally it becomes more than they can stand. They point to the European roads where baggage has to be paid for extra, and the railroads do not assume responsibility for it. Under our system they have to provide baggage cars, and attach one or more to each train without compensation. All of which is specious pleading. The fact cannot be overlooked that the passenger traffic is one of great profit to our

railroads, even while carrying baggage without extra charge, which shows that the cost of doing so is included in the passenger fare; all the time they have been doing this, they have paid liberal dividends to stockholders and increased their assets largely. They introduced the system of carrying baggage free, and it has become so interwoven with business methods and calculations that it cannot be abolished without great injury to commercial interests. To require that all valuable trunks of commercial travelers must be sent by express is to subject the mercantile interests to great cost, delay and annoyance, with no benefit to anyone but the express companies. Various propositions have been made to the railroad companies to have the order rescinded, and it is hoped some amicable arrangement will be reached; if not, the question as to the right of common carriers to make such discriminating rules is likely to be taken to the courts. That the companies have a right to regulate the carrying of baggage is unquestioned, but we do not believe they have the right to make one rule for one part of the community and another for another part. Under present conditions, commercial travelers are virtually prohibited from traveling on those roads that have united in issuing the order referred to.

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IT is reported that the English nobleman who recently paid \$200,000 for the diadem of the late Empress Eugenie, has made the discovery that some of the emeralds composing it were bogus. The *Paris Figaro* is responsible for the statement that the ex-Empress was aware of the bogus nature of the stones, which is very probable, as her jewels were frequently sent to "her uncle," and it is not surprising that she should have disposed of some of the gems as emergencies required. But the joke was not relished by the Englishman who objected to being swindled either by an ex-Empress or the French government.

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WE observe by our English exchanges that there is universal complaint of dull times in the jewelry trade all over the Continent. There has been a lack of activity for a long time, and the outlook for the immediate future is not promising. The exports fell off nearly 12 per cent. during November, from those of the corresponding month of last year, while the total exports for the year as far as reported were far behind those of 1883. The statistics given show some interesting things; for instance, the number of watches imported in November was 41,546, valued at £50,023, while in the previous November the number imported was 31,051, valued at £38,059; for eleven months of 1884 there were 476,475 watches imported, valued at £556,009, while for eleven months of 1883 the number was 381,237, valued at £446,371. Where do all the watches come from and who buys them? The total value of imports in November fell from £36,526,437 in 1883, to £30,752,453, a falling off that accounts in some measure our loss of trade; the falling off of imports for eleven months of 1884 amounted to nearly \$175,000,000, a considerable loss of trade to the rest of the world. It is singular that the importation of watches into England should increase in the face of such a shrinkage of imports in general. At the same time there were 25,000 less clocks imported in eleven months of 1884 than in the corresponding months of 1883, a loss of about \$150,000 in value. If those who complain of dull times in this country can draw consolation from these figures, on the theory that misery loves company, they are welcome to them.

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A PROMINENT dealer recently said that he considers the practice which many assignees now have of giving out the names of the cred-

itors of a firm that has failed to be pernicious. The publication of these names, in many instances, brings the creditors into tight places, financially speaking. When it becomes known that these firms have heavy outstanding debts which they cannot realize on except in part, distrust is created and pressure for the payment of debts is immediately made. Such publications are liable to destroy confidence in those who are unfortunate enough to be creditors of insolvent houses. For the same reason insurance companies and banks dislike to see their names coupled with heavy losses. There is no good reason why the names of creditors of bankrupts should be made public; it is of no general interest, does no good, but is liable to do harm. It is a custom better honored in the breach than the observance.

## A Review of the Experiments of the Old Masters of Horology.

*Continued from page 369.*

### 3. DISPENSING WITH THE FUSEE.

THE FUSEE, as we have seen, is a very excellent part of the train for regulating the rate of a watch. Experience has demonstrated, however, that it is not by any means necessary to make use of a fusee in order to make the rate of a chronometer regular, and that it can be made as regular as desired by the introduction of a going barrel, which is made to actuate upon the first pinion of the train. This disposition, by its simplicity, offers great advantages, and the various evils well-nigh inseparable from the compound mechanism of the fusee and maintaining power are entirely obviated, as well as the danger of breaking the chain.

An almost perfect equality can be produced by employing a going barrel of a large diameter; because a very long spring can thereby be made use of. Only a few of its coils will be necessary to sustain the going of the watch, and it is therefore obvious that the difference in the motive power between the extremes, when the watch is wound and when it is run down, can never be very large, and that this difference will diminish with the length of the spring imparting this motive power. Beside this, such long and flexible springs will more completely retain their elasticity, and are less apt to break than the strong and short springs generally employed in watches with fusee. The last named virtue of a spring is of great value, more especially in a marine chronometer, because it stands to reason that the ship captain will be deprived of its use in case its spring should break.

By the means indicated, the watchmaker will be enabled to diminish the inequality of the motive power to a very minute quantity; he will not entirely overcome it, however. It is plain that the spring must necessarily possess a slightly greater energy when recently wound, and that it will become proportionally feebler as it unwinds with the going of the watch. This trifling inequality, however, is of no influence upon the rate of a chronometer—provided that the balance spring has been made thoroughly isochronous, because in this case the larger and smaller vibrations of the balance will be accomplished in the same time, and produce no change in the rate of the watch.

### 4. SEVERAL PROBLEMS FOR CALCULATING THE POWER NECESSARY FOR SUSTAINING THE MOTION OF A PENDULUM.

PROBLEM.—We are required to calculate the power necessary for sustaining the motion of a seconds pendulum, the bob of which weighs  $21\frac{1}{4}$  pounds and describes arcs of 10 degrees.

SOLUTION.—It has been ascertained by experiments that a pendulum which oscillates in arcs of 10 degrees, decreases to 9 degrees, 45 minutes, in 9 minutes; in order, therefore, to sustain its motion, it is necessary to increase the velocity of the bob every 9 minutes from 9 degrees, 45 minutes, to 10 degrees.

In order to find the additional quantity between the two extremes:

When the bob describes an arc of 10 degrees, and when it describes one of only 9 degrees, 45 minutes, it is necessary to deduct the versed sine of 9 degrees, 45 minutes, from the versed sine of 10 degrees; the remainder will then show by how much less the bob is raised when it describes an arc of 9 degrees, 45 minutes. In order to ascertain the versed sine of 10 degrees, we must deduct from the radius the sine of 80 degrees; this same operation must also be performed for the versed sine of 9 degrees, 45 minutes, in which case is to be deducted the sine of 80 degrees, 15 minutes, from the radius.

For example: The sine of 80 degrees (as complement of 10 degrees) is 98,480, deducted from the total sine 100,000, leaves 1,520 as versed sine of 10 degrees. The versed sine of 80 degrees, 15 minutes, or the cosine of 9 degrees, 45 minutes, is 98,555, deducted from the total sine or the radius, leaves for the versed sine of 9 degrees, 45 minutes, 1,445, from 1,520, or the versed sine of 10 degrees deducted from 1,445, being the versed sine of 9 degrees, 15 minutes, leaves 75. The required quantity is therefore  $\frac{75}{100,000}$  of the length of the pendulum, that is, if the pendulum were divided into 100,000 parts, then the bob must be raised by 75 such parts each 9 minutes. Now, a seconds pendulum is long, 3 feet  $8\frac{5}{100}$  lines, or 44,057 hundredths lines, and in order, therefore, to find by how many hundredths parts of lines the bob would have to be raised it becomes necessary to enter into the following proportions:

$$100,000 : 75 = 44,057 : X, \text{ whence}$$

$$X = \frac{75 \times 44,057}{100,000} = 33.$$

We thereby receive as quotient 33, which amounts to  $\frac{33}{100}$  lines or about  $\frac{1}{3}$  of a line, the quantity required to raise the bob from 9 degrees, 45 minutes, to 10 degrees.

It is necessary, therefore, to employ a weight of 21 with  $\frac{1}{3}$  of a line drop for each 9 minutes.

If, therefore, 9 minutes' time are reduced into seconds, we obtain  $9 \times 60$  or 540, and we also reduce the pounds into grains; by dividing the 540 seconds into 193,536 grains, we obtain as quotient  $358\frac{2}{3}$  grains.

Therefore,  $358\frac{2}{3}$  grains are required for a drop of one-third of a line, which must be imparted to the pendulum each second in order to describe an arc of 10 degrees.

If together with this pendulum a train with an escapement of 30 teeth were introduced, then this wheel would make one revolution in one minute. If the circumference of the wheel were made equal to 20 lines, then it would, with each vibration of the pendulum, pass through one-third of one line; it would be necessary, therefore, to introduce on the circumference of this wheel an energy of a trifle more than  $358\frac{1}{2}$  grains, without counting the loss of energy of the wheel upon the escapement. If the circumference of the wheel were made equal to 40 lines, it would have to pass through twice as large a space, and consequently the energy need be twice as small.

PROBLEM 2.—We are required to calculate the power necessary for sustaining the motion of a seconds pendulum, the bob of which weighs  $21\frac{1}{4}$  pounds and describes arcs of one degree.

SOLUTION.—The same process, specified in the preceding problem, must also be used here by remembering the fact that arcs of 1 degree decrease to 45 minutes within 142 minutes' time, which result must each time be ascertained by previously instituting experiments.

After this calculation it will be found that a weight of about 23 grains will be required, which has a drop of three one-hundredths part of one line, that is, about one-third of a line drop with a weight of  $2\frac{3}{10}$  grains.

DEDUCTIONS.—It will be seen by this what a great difference exists between different kinds of energy required to sustain the motion of the same kind of pendulum, when it describes larger or smaller arcs; since in the one case for arcs of 10 degrees  $358\frac{2}{3}$  grains and a drop of one-third of a line are necessary, while for arcs of 1 degree it requires only  $2\frac{3}{10}$  with the same quantity of drop, that is,

$157\frac{2}{3}$  times more energy is required to maintain the motion of a pendulum that describes an arc of 10 degrees, than is necessary for the same kind of pendulum oscillating in an arc of 1 degree.

. If, therefore, a pendulum describing only one degree, were to be moved by the same quantity of power necessary for one that oscillates through an arc of 10 degrees, it would become necessary to increase the weight of the bob by exactly the excess of energy, that is, it would have to be made  $157\frac{2}{3}$  grains as heavy.

It also follows from this that not alone the weight of the bob is to be increased in the inverse ratio of the square of the arcs, which is described, but in a still greater proportion; because, according to this law, in order that a bob that describes arcs of one degree exert the same energy to maintain the motion as when it describes arcs of 10 degrees, it would be necessary that the weight of the bob describing one degree be proportioned to that which it has when it describes 10 degrees, as 100 : 1.

The weight, now, in tenor with the calculation which I have given according to experience, must be as  $157\frac{2}{3}$  is to 1, without which proportion the pendulum would no longer be the regulator of a train, because it will be seen that such a pendulum, by describing small arcs, drops from an infinitely small plane, and that its motion is extremely small; it must not be imagined, therefore, that it be enough to affix to a timepiece a long and heavy pendulum; it is also necessary that its motive power be adequate to the loss of motion the pendulum experiences at each oscillation when left to itself, and whose oscillations occur only from the impulse imparted to it; it is also essentially necessary that after a train has been connected with it, this does not disturb the isochronism of the oscillations.

From the preceding remarks may be deduced the following general rule for the comparison of two pendulums under the like circumstances, but with different arcs of oscillations.

The energy of motion of a body employed for vanquishing obstacles, is the product of the mass through the square of velocity or of the distance accomplished. In order, therefore, to compare the energy of the motion of the same kind of pendulum it suffices to compare the squares of the arcs, because the products are multiplied with the same factor, that is, the bob. The energy of the motion of a pendulum which describes arcs of 10 degrees is, therefore, proportioned to the energy of motion of the same kind of pendulum describing arcs of one degree, as the square of 10 to 1, or as 100 : 1, whence follows that the pendulum which describes arcs of 10 degrees requires 100 as much strength to vanquish the obstacles which oppose its motion than a pendulum which describes arcs of 1 degree requires to vanquish the same kind of obstacles. But the necessary energy to sustain the motion of a pendulum describing arcs of 10 degrees must be  $157\frac{2}{3}$  times as large as the one describing 1 degree. The varying changes of so great an energy must necessarily occasion far greater irregularities than those whose products are of a smaller power. Alone for this reason, independent of other considerations, is a pendulum that describes smaller arcs always to be preferred to one with large arcs.

PROBLEM 3.—We have to ascertain the power necessary to sustain the motion of a pendulum which describes arcs of 15 minutes of one-fourth of a degree, and whose weight and length are like the preceding ones.

SOLUTION.—It will be found by calculation that a pendulum which describes arcs of 15 minutes after it has reduced to 7 minutes, raises with 7 minutes by 0.003 lines less high than it did by 15 minutes. It will also be found by experiments that such a pendulum requires 8 hours, or 28,800 seconds, until its energy decreases so far that it only describes arcs of 7 minutes. When, now, we divide the weight of the bob by the number of seconds, we obtain as quotient 6.72 grains with 0.003 lines drop.

Now we have found, by reason of the first problem, that in order to sustain the motion of a pendulum which describes arcs of 10 degrees, it requires 0.33 of a line drop and  $358\frac{2}{3}$  grains, that is,

$5,875\frac{2}{3}$  times more power to sustain the motion of a pendulum which describes arcs of 10 degrees than one which describes arcs of  $\frac{1}{4}$  degree.

CONCLUSIONS.—From these great differences it is obvious how important it is to establish definite magnitudes for the motive power for arcs through which a pendulum has to pass for the weight of the bob, etc. For this reason it is very difficult, in fact, almost impossible, to gauge this proportion precisely for clocks with springs, in which the energy of the spring cannot easily be increased or diminished; in clocks with weight, however, the pendulum is first made to oscillate, by giving it the necessary quantity of impulse, after which energy is added just sufficient to sustain the amplitude, without exceeding it. It need not be feared that an error might be committed, because if too much weight is added the oscillations of the pendulum will increase; but if too little power, then the arcs will gradually decrease and the pendulum finally come to a standstill.

Although we are not able to give unalterable rules about the power required for the different bobs and the different arcs to be passed through, still it will at least be seen by the preceding data in what manner the motive power must be proportioned.

It is not necessary to ascertain by calculation the power required to sustain the motion of a pendulum, if experiments were not instituted on the decrease of arcs in certain periods of time. Because this decrease of the arcs is changeable, and does not alone depend upon the greater or smaller weight of the bob and its shape, but also, as we have seen previously, upon its manner of suspension, so that definite rules cannot be given. Even if it could, it is a deplorable fact that a very small number of the watchmakers of the present day are able to enter into such calculations. It is better, therefore, to state conclusions drawn by experience, as we have done in the preceding.

We must finally state a fact that was given already as the conclusion of the first problem, viz., if the energy of the same pendulum were to stand in an inverse ratio to the squares of the arcs, as other authors have stated, we then would have the following proportion for a pendulum which oscillates in arcs of 10 degrees or  $\frac{1}{4}$  of a degree:

The energy necessary for sustaining the motion of a pendulum oscillating in arcs of 15 minutes, is proportioned to the energy necessary for sustaining arcs of 10 degrees, as the square of 15 minutes is to the square of 10 degrees=600 minutes—that is, 1 : 1,600; but we have found, by computation based on experiments, that this energy must be as 1 :  $5,875\frac{2}{3}$ . So that, therefore, if a pendulum could be moved by the same quantity of energy, be it either for describing arcs of 15 minutes or 600 minutes, it would be necessary that the weight of the bob, when it describes arcs of 15 minutes, be proportioned to the weight of the bob when it describes arcs of 600 as  $5,875$  : 1. In this way it would have the same proportion in the one and the other case, instead of being proportioned according to the fundamental law of energy, as 1,600 : 1.

(To be Continued.)

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## Recent Patents.

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The following list of patents relating to the jewelry interests, granted during the past month, is specially reported to THE JEWELERS' CIRCULAR by FRANKLIN H. HOUGH, Solicitor of American and Foreign Patents, 925 F Street, N. W., near U. S. Patent Office, Washington, D. C.

Issue of December 16th, 1884.

- 309,257—Clock, Calendar. J. K. Seem, Peoria, Ill.
- 309,269—Clock Pendulums. W. F. Weisgerber, New York, N. Y.
- 309,354—Watch Case. D. O'Hara, Waltham, Mass.

Issue of December 23d, 1884.

- 399,809—Clock, Secondary Electric. G. & F. Trippen, Philadelphia, Pa.

15,638—Breast Pin. E. C. O'Connell, Cincinnati, O. Design Patent.

*Issue of December 30th, 1884.*

310,011—Bracelet. G. E. Adams, Providence, R. I.

309,909—Watches and Clocks. Applying colors to enamel dials for. H. Abbott, assignor of three-fourths to W. C. Garrison, Newark, N. J., and Elgin National Watch Co., Chicago, Ill.

*Issue of January, 6th, 1885.*

310,293—Button or Stud, Detachable. J. J. Lindauer, New York, N. Y.

310,313.—Watch Dials, Apparatus, for Figuring. T. F. Proctor, Waltham, Mass.

### The Jewelers' League.

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AT THE meeting of the Executive Committee held January 2d, 1885, there were present Vice-Presidents Kimball and Hayes, and Messrs. C. G. Lewis, George Howe, R. A. Johnson and W. L. Sexton.

One application was rejected.

Three applications were referred for investigation.

The following eight applicants were accepted:

E. L. Bentley, C. A. Cromwell, J. Eichler, J. C. Nordt, J. Rothschild, H. Ruyter, New York City, N. Y.; G. W. Ferris, Chicago, Ill.; C. R. Streiff, St. Louis, Mo.

Five changes of beneficiaries were granted.

### The Earth a Great Magnet.—Its Effects on Watches.

AS SHOWN by the very interesting investigations and experiments of Prof. Alfred Marshall Mayer, of Stevens' Institute, the earth is a great magnet and a powerful one too. Everything on the earth and in the air above is permeated with this magnetic force—it goes through your clothes, it penetrates your bodies, it saturates your brains—it is a part of life itself. Gaus, the illustrious German astronomer, has computed (taking as a unit of his measure a magnet, 14 inches long, one inch wide, one-fourth inch thick, weighing one pound, made of the hardest steel and of the strongest magnetic force possible), the earth's magnetic force as equal to 8,464,000,000,000,000,000,000 such magnets. The attracting or lifting power of such a magnet is about ten pounds, which would make the attractive power of the earth 42,310,000,000,000,000,000 tons. If this magnetism were equally distributed throughout the mass of the earth, the magnetic intensity of each cubic yard would be equal to six of these magnets, or about sixty pounds attractive force. Prof. Mayer has shown that this magnetic influence, this invisible force, is a power filling space to an unknown distance (radiating in the lines of mag-

netic force very much as the rays of the sunlight, the lines of the earth's magnetic force being from south to north, as indicated by the compass needle).

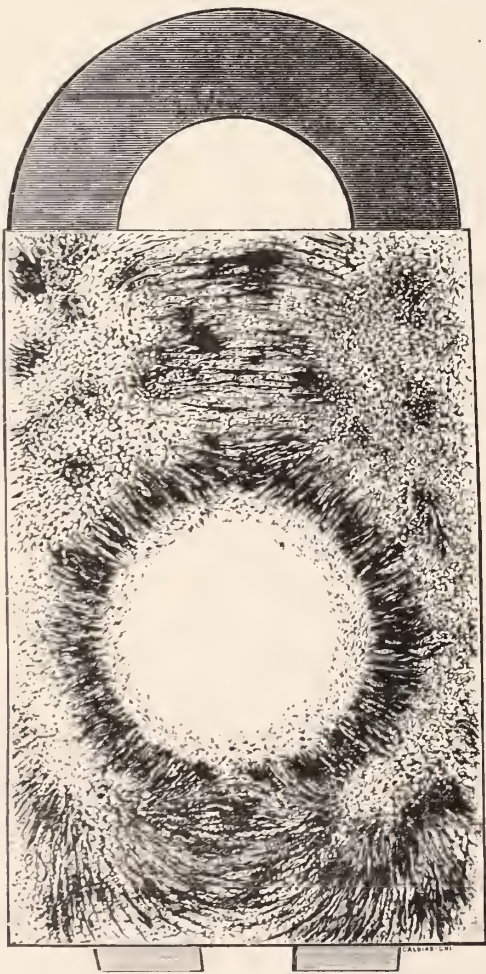
We move and live in this mysterious influence—the legs of the pedestrian cut the lines of force—the street cars and vehicles drive through it, and every time these lines or rays of force are cut, especially by a metallic body, an induced electric current is produced, a condition is disturbed, a power is set in motion, for an electrical current is a power. This is shown by the Professor in this simple experiment. Take a piece of copper wire, bend it into a circle 18 inches in diameter, and attach the ends to conducting wires connected with a galvanometer, and move or vibrate the ring so that it will cut the lines of the earth's magnetic force, and an electric current will be induced sufficiently strong to deflect the needle 15 to 30 degrees. A small piece of iron or steel free from magnetism when laying flat, if placed perpendicularly or inclined, will receive an induced charge of the earth's magnetism sufficient to deflect or rotate an ordinary compass needle, the lower end always taking the south pole, and the upper end the north pole of the needle. This disappears when the piece is laid level again, but if the piece of iron or steel is held so as to point in the line of magnetic force and vibrated as with a sudden blow sufficient to agitate the molecular atoms of which it is composed, it will become "magnetized" or a permanent magnet. Two metals placed together like brass and steel induces a mild electric current, especially when the temperature is raised. A metal ring when revolved over or in proximity to another, produces a current, and encounters a resistance from the disturbed electric or magnetic conditions. A cube of copper, say of one inch, if made to revolve between the two poles of an electro-magnet by means of a twisted thread, will instantly stop when an electric current is turned on. A copper disc swinging freely over an electro-magnet will rapidly revolve when an electric current is applied to the magnet, and requiring considerable force to rotate it in the opposite direction, and if force is used to revolve it in the opposite direction it will become quite hot from the resistance of the magnetic force. "The earth being a great magnet, currents of electricity must be induced in all conducting materials in which motion takes place at its surface."

Now, if we apply these facts, discovered by the investigations and experiments of our most noted scientists to the watches we carry in our pockets, shall we not have the cause of their variations and unaccountable behavior which have puzzled watchmakers and horologists for many years. Many fine watches have been discarded as worthless within a few years, no one being able to "find out what ailed them." Now, have we not the key to all this trouble? If we know the cause we can apply the preventive. If we let the balance wheel of the watch represent the wire ring used by Prof. Mayer, its motion is retarded or accelerated as it crosses the lines of magnetic force. The combination of brass and steel of which it is composed, swinging rapidly over and in close proximity to other pieces of metal, must encounter a certain electric or magnetic resistance—a sort of brake as it were—and all these influences are intensified or aggravated by the thermal currents induced by the heat of the body, electricity and magnetism produced by the motion of the body, the friction of the clothing, etc. If the experimental ring of Prof. Mayer, in making the rotation, cutting the lines of magnetic force, moving the galvanometer 30 degrees, encountered a "brake" resistance equal to  $\frac{1}{1000}$  part of a grain, then the balance of a watch making its vibrations at much greater speed, (the very liberal allowance being made that these conditions offset difference in size, viz.: the balance, composed of a combination of metals, revolving in proximity to other metals, greater speed and longer vibrations), would encounter the same resistance when under the same lines of magnetic force, and the balance revolving 18,000 times per hour, we should have a resistance of eighteen grains per hour to overcome (the application of one grain to the balance at once would vitiate the timekeeping of the watch) and if this resistance were equal during the twenty-four hours it would be 432 grains, but could be easily overcome, and the watch regulated

if the influence were regular during the 24 hours; but the influence on the watch is constantly varied as the wearer moves about, crossing the lines of the earth's magnetic force, or passing through the different mechanical magnetic influences at the present time so numerous.

A watch is the most delicate piece of mechanism known. It is the culmination of mechanical skill in delicate adjustments, and is of necessity made of metals the most susceptible of magnetic and electric forces. The operation of turning, polishing and finishing steel, leaves in it a "residual" force of magnetism; its molecular atoms are in a "tonic state," ready to be acted upon or affected by the slightest outside force. Watchmakers and horologists have given their skill to the adjustment of a watch to "position," which is to equalize the effects of gravity on the balance, "temperature," or variations in heat and cold, and to "isochronism," which is to equalize the force of recoil in the hair spring. All this has been accomplished to perfection, as these forces are definite. But they have overlooked the greater power of magnetic and electric force—the subtle influence, which is the strongest when the other adjustments are the most perfect—for it is a law of magnetism to seek fine points, and a nicely poised balance is more easily affected, and a closely coiled hair spring is a fine pathway or repository for these forces.

In order to protect a watch from these magnetic and electric forces, we must control or conduct them, and so arrange that they meet and neutralize each other, and an equal power exerted on all sides—in other words, we must make a neutral center—a sort of "charmed circle," which the lines of magnetic force cannot cross.



This cut represents an Anti-Magnetic Shield, which is made of size and form to surround a watch movement, placed on a horseshoe magnet about six inches long, and quite powerful. A piece of cardboard two or three inches square (a large size jewelry card is convenient for this experiment) is placed on the Shield, some fine, soft iron filings are scattered over the card outside the Shield, and if the card is gently tapped with a pencil the filings immediately move and arrange themselves in the lines of magnetic force. This cut was

made from a photograph, and is a correct representation. If the Shield is removed and the card held in the same position as before, and jarred a little, the filings will move in a line between the poles of the magnet, which is in the line of greatest force.

The application of Anti-Magnetic Shields to pocket timepieces promises to be of very great importance to horologists and watchmakers; it will render operative the fine adjustments and mechanisms which hitherto have been made almost *nil* and inoperative on account of their susceptibility to the all-pervading magnetic influence.

### Celebrated Goldsmiths and Horologists.

AFTER HAVING tarried on the Continent and given a short biographical sketch of its most noteworthy goldsmiths and horologists, we cross into England, where, among its celebrated goldsmiths of a remote period—who, it will be remembered, were frequently artists and designers of architecture, as well as sculptors, painters and workers in the precious metals, and in excelling in one or more of the fine arts—we meet with several of foreign extraction.

"Honor to whom honor is due," says an ancient and well known adage; and when we meet with a watchmaker or goldsmith who did not sell a gold watch case loaded down with steel springs for all gold at so much per pennyweight, or an 8 karat ring for 12 or 14 karat, what is more just than to get him canonized and made a saint of? The best known, perhaps, is the patron of English goldsmiths whose life we take from *Gilda Aurifabrorum* (The Guild of the Goldsmiths).

#### SAINT DUNSTAN,

who lived in the tenth century. Dunstan of Glastonbury, where he was born A. D. 925. His father's name was Herstan; his mother's, Cynedrida. He entered a monastery when young, and probably there learned the goldsmith's art as well as devoting himself to a religious life. When he left, he erected a cell in which was a forge as well as an oratory, adjacent to the church of Glastonbury; employing his time partly in devotional austerities and partly in the exercise of making ecclesiastical vessels and ornaments for the church, such as crosses, censers and chalices, as well as goldsmith's work in general, both for the clergy and laity. He instituted the Order of Benedictine Friars, one of its rules being the prohibition of marriage, which, it is said, originated from a disappointment in love he met in early life.

While working at his forge and anvil on one occasion, a mysterious person entered his cell to give an extensive order for plate, but Dunstan discovered that his visitor was no less a person than the devil himself in disguise, on which he immediately took the red hot tongs from the fire and seized his infernal majesty by the nose; the unexpected application made him roar and bellow so as to disturb the whole neighborhood.

So runs the tradition which has been carried down to this day, and implicitly believed by the faithful through many ages. Dunstan, however, at length attracted the notice of the Saxon king, Athelstan, and he was made Abbott of Glastonbury in the year 942 by his successor, King Edmund, who supplied him with money to restore the Abbey. He continued in favor with Edred and Edwy, and was raised by them to the dignities of Bishop of Worcester, subsequently Bishop of London, and in 959 he became Archbishop of Canterbury. On the succession of Ethelred II., in 979, his influence with that monarch declined, and he was deposed; but although shortly reinstated, he was so mortified that he died of grief and vexation in A. D. 988, and was buried in Canterbury Cathedral.

He was canonized as Saint, and from his high appointments in the State, combined with his previous employment as goldsmith and worker in the precious metals, he was chosen patron of the goldsmiths of England, and especially by the Goldsmiths' Company of London, who paid to his memory honors without end. Their records abound



with notices of ceremonials and observances to their patron saint on special occasions. Their gorgeous hall was adorned with his image of silver-gilt set with gems and precious stones of fabulous price. Much of their plate bore his effigy. They had "St. Dunstan's Light" kept constantly burning in St. John Zachary's Church, the cost of maintaining which formed an annual account in their Warden's accounts. They had a chapel also in St. Paul's Cathedral.

In 1460, "On St. Dunstan's Eve all the hoole companye of the Lyverye shall assemble at the Hall in their second Lyverye, and shall have iiij chapeleynes to wayte and goo before them to Pawls" (St. Paul's). On its being debated whether St. Dunstan's Day should be observed by shutting up their shops and keep holiday, the Company agreed to do so. He is designated in their books "Seynt Dunstan, our blessed Patron, Protector and Founder," and on their feast days they drank to his memory from a great and costly cup, surmounted by a statuette of the saint, called "St. Dunstan's Cup." He was considered as having been a brother of the craft; indeed, some of his handicraft was extant in 1280, for in the wardrobe account of Edward I. is noted, "a gold ring with a sapphire of the workmanship of St. Dunstan." All these observances ceased at the Reformation, however. Under date 1550, the Company change their election day, and discard the religious ceremonies from St. Dunstan's day to that of the Holy Trinity; but still their festivities were continued. A few years earlier (October 4, 1547), we read: "At the assembly on this day, Mr. Warden desired to know the pleasure of the assistants for the ymage of Seynt Dunstan, because of the Injunctions," and they agreed that "Mr. Alderman Bowes (Sir Martin), with iiij other, soche as they sholde appoynte, sholde take the same ymage and break yt, and turn yt to the moste profete of the house. Also that the great standyng cuppe with Seynt Dunstan on the topp sholde be lykewyse by them be broken and turned into other plate."

To Dunstan has been attributed the placing of pegs in tankards. Finding that quarrels very frequently arose in taverns from disputes about the proper share of the liquor when they drank out of the same cup, he advised Edgar to order gold or silver pegs to be fastened at regulated distances in the pots, that every man should know his just allowance. The space between each peg contained half a pint.

We must not leave unnoticed the splendid tapestry used for the decoration of Goldsmiths' Hall, made at great expense in Flanders, illustrating events in the history of St. Dunstan, the entire expense of which work was £550. The Wardens' accounts contain some interesting items: "Paid Mr. Gerard Hughes for the rich arras for the hanging of the Hall; for devising the story; for making the stories in black and white; to four masters, every one of them sixteen days at a shilling a day; for a boy to sharpen their colors (chalks); for the translation of the story out of English into Dutch that the foreign workmen might understand it; to Mr. Hughes for costs and charges, lying in Flanders and for canvas, etc."

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## The History of Goldsmithing.

*Continued from page 386.*

### CHAPTER IV.

ROMANTIC PERIOD (ELEVENTH AND TWELFTH CENTURY).

#### 1.—Germany.

The year 1000! This dreaded date, which superstitious belief, based on misunderstood prophecies, had assigned as the end of the world, and which for years previous completely paralyzed Europe. With some, apprehension turned into stupor, with others, into religious exaltation and frenzy—with nearly all, into abject fear. It suffices when we say that the progress of art was completely arrested. Near the end of the tenth century neither buildings nor churches were erected, but those that existed were richly endowed. The thought of the Last Day of Judgment caused the sinners, both great

and small, to tremble with fear and apprehension, and what was more natural for them than to try and be deserving of glory everlasting, which could comparatively be acquired at so cheap a rate, viz., by donating to the churches their present perishable "filthy lucre," and in return receive the assurance that they would thereby become joint possessors of an undivided interest in the future joys imperishable? Most assuredly the church stood in an enviable position; receiver of property not accumulated with an over-strained scrupularity, and dispenser of assurances that Heaven would be the reward of those who endowed it with goods thus accumulated. But it is not the province of the compiler to enter into hair-splitting disquisitions.

In the preceding pages we have shown that German art, and German goldsmithing in particular, was still in its swaddling clothes at the time of the decline of the Carolingian race; but it was destined to develop wonderfully by an unexpected event. In the year 973, Emperor Otho II. espoused a Greek princess, Theophania, a granddaughter of Constantine Porphyrogenetus, and this union exerted a powerful influence on the state of arts in Germany. Theophania, who had been raised in a court sparkling with genius of the first rank, both in arts and in science, had brought with her a large body of chosen Greek artisans, several specimens of whose workmanship have descended to us. Both by their individual work and their teachings, entirely new to western Europe, they soon surrounded themselves with a body of anxious learners, and thereby gave a mighty impetus to German art and science.

The Empress at once became the leader of this artistic movement, and at the death of her husband Otho, or Otto, which occurred in 982, she was called to the regency of the empire; and at the solicitation of the men most renowned in the country, she placed herself at the head of the movement.

Chief among the Germans by birth, who aided mightily in this enterprise, we must mention Monk Bernward, a man of great talents, to whom the Empress had confided the education of her son. If we can place credence in the chroniclers of his time, Bernward, who subsequently became Bishop of Hildesheim (992 to 1022), and was canonized as such, excelled in all manners of arts, besides goldsmithing. The treasure vault of the Cathedral of Hildesheim incloses several pieces which are attributed to him, especially the bindings of an evangel, a crucifix and the model of a crozier. His biographer, Tangmar, also attributes to him a hanging chandelier of gold and silver, several chalices and censers of a great value. Did the sainted bishop work these articles with his own hand, as St. Elias had done of yore, or were they simply wrought under his supervision by able workmen whom he lodged and fed in his palace? One thing is certain, however, St. Bernward exerted a powerful influence on the artistic movement in Germany.

Willigis, Archbishop of Mayence, who died in 1011, also appears to have contributed powerfully, both by word and deed. Mr. Labarte, on the faith of an ancient local chronicler, attributes to him particularly a gold chalice, ornamented with jewels, of so great a weight that a man of ordinary strength was barely able to lift it; also a gold crucifix, weighing twelve hundred marks—with a peculiar feature—all the single pieces could be taken off at pleasure—a singular idea, and one which speedily led to the despoliation of the object; the less scrupulous successors of Willigis did not long stand on ceremonies, but turned the single members of the body of Christ into money. In the twelfth century, Archbishop Arnold took off one of the feet to complete the payment of his troops, and Archbishop Rodolphus bartered away an arm to defray the traveling expenses of his journey to Rome. A precedent once established, the remainder of the crucifix soon vanished like "dew before the morning sun."

During the reign of Henry II., from 1002 to 1023, the state of the art of goldsmithing steadily advanced and attained the splendor with which it was destined to shine during the course of this and the next century. Both this emperor and his spouse St. Kunigunde, made a great many gifts of goldsmiths' work to the churches, and Mr.

Labarte, who made exhaustive researches on the state of the German industries during the early ages, says: Three gospels with rich bindings, the one with a bas-relief of ivory surrounded with gold, the second, also of ivory, inclosed in a border of gold and embellished with precious stones, and the third, of gold and studded with jewels and enamels; three crosses of brass and two of silver, besides several chalices and various vessels for sacerdotal use. Henry also had an altar facing made for the altar of the Cathedral of Basel, which is at present preserved in the museum of Cluny, where it is one of the handsomest ornaments. We borrow the following description from the catalogue of the museum, in order to give an adequate idea of the beauty and style of workmanship:

"The façade, entirely of gold, carries five figures in alto-relievo arranged in full center arches, which are supported on pillars with friezes with human figures. Each of these arches bears in large and well-shaped chased letters, the name of the figure. The Redeemer occupies the central arch, which is higher than the rest, and He is in the act of blessing. His left hand grasps the globe, and His naked feet are placed upon an elevation upon which are, in kneeling attitudes, the figures of St. Henry and Empress Kunigunde. To the right of Christ is the archangel, St. Michael, next St. Benedict, the founder and first abbot of Monte Cassino; at the left are the archangels Gabriel and Raphael, represented in garments and with wings spread. Their heads are surrounded with the saints' halo, ornamented with jewels. Above the vaulting upon the frontispiece, are personified the four virtues, the source of all the others: Prudence, Justice, Temperance and Force. Along the superior frieze and basement is contained an inscription, intermixed with Greek and Hebrew letters, recording the date of erection and vow made by St. Henry, in consequence of his miraculous cure at Monte Cassino.

"The entire anterior face of the altar (37½ inches high and 70 inches long), consists of fine gold; the figures, architectural ornaments, and other details, as well as the inscriptions, are chased in relievo; the main inscription alone is engraven in the empty spaces, and the letters are filled in with a colored paste. The façade reposes on a wood foundation. It is difficult to estimate the weight of gold employed in its construction, but chroniclers say that at least twenty-five marks were used for it."

But Emperor Henry did not remain satisfied with this gift of the altar facing which he made to the Cathedral at Basel, and its records contain a list of various other pieces of goldsmiths' work presented by him. The holy emperor made also many donations to other churches throughout the empire: Bamberg, Aix-la-Chapelle, Hildesheim, Ratisbon, etc., and to the celebrated abbey of Monte Cassino, where, it is said, he was cured of the gravel by the miraculous intervention of St. Benedict.

Saint Kunigunde, as already said, is also famous for having made many gifts to religious institutions. Her crown, which is at present in the possession of the King of Bavaria, is one of the most precious specimens of goldsmithing of that age.

The Abbey of Essen possesses a superb cross of the same period, presented by an abbess, Matilda, who, it is believed, was a princess of Bavaria.

This period is also celebrated for the sumptuous style of binding with goldsmith's work of the holy books, which gradually multiplied in number. These bindings were at first generally two simple sheets of ivory, more or less embellished, but soon glittered with jewels and gold, adorned with figures and arabesques, chased in alto-relievo or set with camcos, pearls, bezels of enamel, filigree most exquisitely wrought, etc. In default of ivory, the boards of the cover consisted of sheets of wood plated with sheets of the precious metals ornamented as aforesaid.

In Italy, beside the Lombard Book of the Gospels of Theodolinde, and the one at Monza, known by the name of *Tagliacore*, the most celebrated are those of the Vatican, St. Mark of Venice, Novara, Siena, the Gospels of St. Eusebius at Vercelli, the copy of Modena of the eleventh century, and the one of about the same period pre-

sented by the Archbishop Aripert to the Cathedral of Milan. This last copy possesses a great interest to antiquarians by being ornamented with mosaic.

In Germany, we must mention, as among the most noteworthy, the Gospels of Treves of the ninth century; of Hildesheim, Brunswick, Munich, Bamberg, Aix-la-Chapelle, of St. Emeran of Ratisbon, etc. In France, beside the copies already mentioned, we have the magnificent Gospels of St. Nene and that of the Holy Chapel, at the National Library. It is useless to enumerate the different copies still preserved throughout Europe, all of which are highly prized as invaluable specimens of the goldsmiths' art of the early ages.

Toward the end of the eleventh century, more especially in the following two, the manufacture of large reliquaries or shrines come in vogue, principally in Germany, of which quite a large number have been preserved. The diocese of Cologne possesses at least thirty, the greater part of which were years ago described by Canon Bopp. Several of them are veritable imposing structures. Those of the three wise kings, for instance, measure each 3 feet, 7½ inches in length, by 2 feet in width. It is true that Cologne and the borders of the Rhine were at that time the center of the artistic movement in Germany, and the industrial arts, under the influence of the masters from the Orient, began first to flourish here; we are therefore accustomed at the present day to speak of the "Cologne school" or the "Rhenish school."

Among the most important of the old German shrines we must mention those preserved in Aix-la-Chapelle, of St. Gervais, of Maëstricht, and of St. Sebald, of Nuremberg.

These shrines are valuable because they are made of the precious metals; many of them are simply wrought of copper, a metal which by its rigidity is much better suited for such works than gold or silver, but by reason of this decoration, consisting not only of engraving and chasing, but also to the skill and taste with which the various other embellishing material, such as jewels, ivory, niellos and brilliant enamels are introduced.

"At this epoch," says the Abbé Texier, "art centupled the value of the vulgar metals; enamel replaced the jewels, and by its beauty enhanced the value of the workmanship, and lent an additional charm to the beauty of the piece."

But this enamel is no longer that of the Byzantine—the enamel *cloisonné*; which was introduced with such a wondrous skill in the *Pala d'oro* of Venice, or the altar covering of the altar in the Church of St. Ambrosius, of Milan. The enamel employed in France and Germany in the eleventh, twelfth and thirteenth centuries is that known as *taille d'épargne*, fastened by fusion in the cut-in lines of the metal (almost exclusively copper), which forms the body of the piece, formerly employed by the Celts, but which appeared to have completely been forgotten since the fourth or the fifth century of our era.

As specimen of the German art of this epoch we know perhaps of nothing better or more perfect than the beautiful shrine once belonging to the collection of Prince Soltykoff, and to-day preserved in the South Kensington Museum; we give it in the following cut taken from a photograph, fig. 23.

The monument is about 18 inches high, and in form of an equal branched cross, each face is ornamented with a portico, with a *bas-relief* of ivory and columns, between which are placed several statuettes also of ivory. Twelve figures of the same material (those of the apostles) are grouped in a circle around the central portion, over which rises a cupola of twelve lobes. This cupola, the ridge piece, and the columns of the portico are entirely covered with enamel; no jewels have been introduced, nor precious metals, nothing besides gilt copper, enamel and ivory, but they have been employed with an exquisite skill, while the chasings of the friezes, chapters and basement plainly speak of having been made by a finished workman; the general details of this little structure are of an unsurpassable beauty.

Its form at once proclaims it to be of western workmanship, but at

the same time it is not difficult to detect in it the influence of Byzantine style. We do not remember to have seen an antique piece of work that betrays this influence as plainly as the piece under examination.

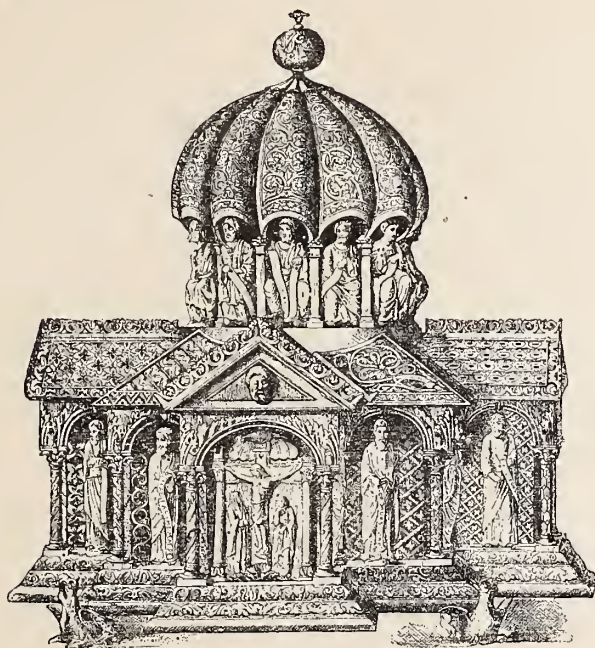


FIG. 23.

The emperors of Germany continued to protect the arts, and particularly goldsmithing, up to the reign of Frederick Barbarossa. He was reduced to sad straits, owing to his squabbles with the See of Rome. Far from enlarging the treasure of goldsmithing of his empire, he could not even preserve what he had in the treasury, and he was forced to turn it to account by melting it to pay the ruinous expenses of his frequent expeditions. He did not even hesitate, as we already stated, to rob the tomb of Charlemagne, and take therefrom the greater part of the pieces of jewelry buried with the great monarch by his own order.

#### 2.—France.

While German goldsmithing was developing so rapidly and assuming such large proportions, the other states of Europe, particularly France, did not remain behind. A new dynasty had in France succeeded to that of the Carolingians, and although its founder did not possess the talent of Charlemagne, still it fostered the industrial arts, particularly goldsmithing.

Thus we see that in the reign of Hugh Capet, his wife, Adelaide, made large presents of goldsmithing to the churches, and gave to that of Orleans a magnificent gold crucifix; next, his son, King Robert, whose reign inaugurated the eleventh century, caused to have made a large number of articles from the precious metals as a gift to the churches which he had founded.

About the same time there was a famous goldsmith by the name of Theudon, living at Chartres. Theudon, among other things, wrought a shrine for the most renowned of the relics preserved in that city, to wit, the chemise of the Holy Virgin.

But the principal centers of manufacture of the goldsmiths' industry were Paris and Limoges, and we will, at some future time, speak of the special nature of Limousine goldsmithing.

According to the historian, Jean de Garlande, the goldsmiths of Paris were divided into four classes: coiners, coat-of-mail workers, makers of drinking vessels and workers of gold or jewelers.

Beside this industrial classification, religious goldsmithing continued to be cultivated in many of the convents. As we have already seen, during the preceding centuries, certain abbeys were veritable nurseries of artists. Thus St. Abbon, the abbot of Saint Benedict-sur-Loire, toward the end of the tenth century raised a number of pupils among his monks. One of them especially, named Hausbert, passes for having been a very skillful workman. In the eleventh century, Odorain, monk of Dreux, enjoyed a great reputation. In the

twelfth, William, abbot of Andernès, excelled in goldsmiths' work, and many others might be quoted.

Theophilus, a monk of the middle of the 11th century, was a practical goldsmith, or he could not have described so minutely the technical details of the goldsmiths' trade. His work, entitled "*Diversarum Artium Schedula*" (Essay on Various Arts), treats of miniature painting, glass making, enamel and the goldsmiths' art so accurately that his instructions can be followed at the present day. His nationality is disputed; he has been claimed by Germany, Italy and France as a native or denizen, but it is a moot question. He describes the methods of working gold and silver—the necessary tools, the ingredients of the alloy, etc. He was, at the same time, *aurifabrum mirabilem, pictorem doctum et vitrearium sagacem*, or three artists in one.

The cup, fig. 24, known as St. Remy's Chalice, is believed to have been wrought by him, and the student will acknowledge that nothing can exceed the elegance of its shape. The jewels, skillfully intro-

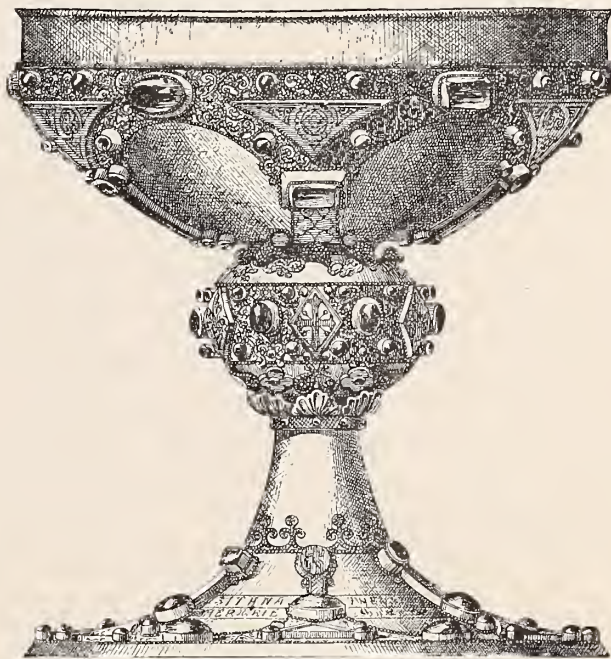


FIG. 24.

duced in the filigree ornamentation, are surrounded by seed pearls and bezels of enamel. The chalice, after having been kept for a long time at the Cabinet of Antiquities, Paris, was in 1861 finally restored to the Cathedral at Rheims.

The collection of the Louvre possesses a specimen of French goldsmithing of this epoch—a very beautiful pyx (in which the Blessed Wafer was kept), made by Master Alpais, of Limoges.

The native country of St. Elias has, in fact, remained celebrated as a center of goldsmithing. In the eleventh and twelfth centuries it enjoyed a great renown for its enamel *à taille épargnée*, which was once practised by the Celts. In nearly all the enameling of this kind the body of the piece was of copper, and thus the beauty of the enamel had to constitute the richness of the work.

(To be Continued.)

## Fashions in Jewelry.

### A Lady's Rambles Among the Jewelers.

THE class of patrons who buy their jewelry, silverware and bric-à-brac at dry goods and fancy stores is a large and important one. True they may not spend much money on any one article, but their purchases are frequent, and at the end of twelve months amount to no inconsiderable sum. This patronage is influenced by two powerful motives: first, the belief that prices are less at the dry goods

stores; second, unexpected temptations to buy jewelry when in search of other things. These temptations, by the by, occur in attractive show cases sandwiched in between counters and tables devoted to dress fabrics and staple dry goods. The inroads made on the sales of the jewelers are serious ones, especially in silver jewelry, cheaper grades of gold jewelry and silver plate ware. The shrewd merchants who have brought about this state of affairs, began by introducing the more practical articles from the jewelers' stock, and such as could be marked at extremely low prices. Attention was then called to the innovation by running, as an advertisement, one or two articles at cost price, depending upon the remainder of the stock marked in remunerative figures, but resting under the reputation of cheap goods, to make up the profits. The remedy lies in meeting the enemy on his own ground by a diversity of stock, which will transform jewelers' stores into bazaars embracing a sufficient number of departments to insure a wide range in selections and in prices. Among dry goods stores there remains not one without its so-called "cheap counters." Even houses devoted to the sale of exclusive fine goods have come to it. In the latter the popular prices are found in goods of excellent quality, but marked down on account of old style and to make way for new importations. Does it not occur to any jeweler that several shelves and show cases in his establishment long devoted to old-fashioned tea sets, trays and the like might be profitably disposed of at cost price, and their places supplied with fresh stock? Another source of cheap-priced goods with the dry goods merchants are stocks bought in times of depression at extremely low figures, and introduced in their own stores ticketed with but little advance on the prices paid. In this connection it may be well to add, that for twenty odd years there has been no season more advantageous than the present for picking up, at mere nominal price, choice specimens of bric-à-brac in glass, porcelain, metal wares, and Chinese and Japanese goods. The city stores are full of articles in these lines worth a place in the "house beautiful," and waiting to be sold at the cost of their importation or manufacture. Genuine Japanese and Chinese goods, in fact all bric-à-brac from the far East, can be bought to-day at figures which a few years ago was asked for their imitations.

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NUMBERED with new things attracting attention and promising to gain a widespread popularity, is selamite ware, of Massachusetts origin, but similar in effect and finish to the more expensive French faience. This ware, which is extremely decorative, appears in form of vases, umbrella stands, trays, lamps and other objects, and is sold at relatively small cost. Lamps, it ought to be explained in this connection, are having a big run in New York city, where it is considered the correct style to burn lamps and candles to the almost exclusion of gas in fashionable houses. Lamps in drawing rooms and parlors emit their light through beautifully colored shades, while lanterns hang suspended by chains in halls and vestibules. These lanterns are made with beautifully wrought brass, iron or oxidized silver frames set with colored glass. A novel fancy for dining rooms consists of regular table lamps mounted on slender standards, three, and sometimes more, feet high. A popular pattern simulates in brass a crane's leg terminating with a decorative lamp, over which is spread a colored Japanese umbrella to throw the rays of light down upon the table. The bowls of lamps, which come largely in urn and vase shapes, afford the silversmith and engraver opportunity to exhibit their handiwork, for many of these are of metal, silver, brass and copper all being employed. Oxidized silver lamp bowls are exceedingly fashionable, as are also copper ones. A new finish on white metal, by the by, which is attracting attention, is the copper finish, which presents sometimes a hammered surface and sometimes an engraved one. This finish comes not only on lamp bowls, but every article that is now produced in copper, such as card receivers, smoking sets, small tables and the like. In regular copper ware,

what is known as royal copper is newest; this shows a peculiar and attractive finish that must be seen to be understood. On much of this metal work appears applied decoration in form of insects or coins in silver.

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FINE umbrellas and canes mounted with gold and silver handles, have proven remunerative articles by jewelers who have introduced these in their stocks. The silver handles this season are the more fashionable ones; oxidized silver, of course, taking the lead. Favorite patterns are those known to the trade as the "horn" and "wild rose." The first imitates a crook of buck horn, while the latter consists of a thickly chased surface of wild roses. Hawthorn blossoms sometimes take the place of the rose pattern; again the head of a greyhound appears, or maybe a pelican's beak. Sometimes the handle becomes a silver ball, or a sword blade, or merely a plain silver cap. The most popular form, however, is the crook, for both umbrellas and canes.

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FINE stationery represents another line of goods for which there exists a steady demand. Various colors appear in note and letter paper, but exclusive styles admit only white, cream and gray hues. The paper may be rough or smooth as best suits the writer. The very newest, however, is the home spun linen. This paper is equally attractive in appearance with the Irish linen stationery, and much more pleasant to write upon, being less rough and offering but slight resistance to the pen. As regards size and form, paper and envelopes have not changed in style; the paper folds once to fit a square envelope. While sealing wax stamped with a seal is the more fashionable mode of closing the envelope, monograms remain in use. These appear usually in the center of the sheets, either in colors or bronze. There is also a fancy for using the initials instead of the monogram. Of course, crests and coat-of-arms, by those who display the same, appear in place of the monogram or in the seal.

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FOR opera glasses there is always a demand. Not only in cities where opera houses and theatres are numerous, but in every town large enough to boast of a concert hall these glasses find a market. There is probably no one article in general use so little understood, however, by the salesman who retails it and the patron who purchases it, as the opera glass. The average buyer possessed with the idea that all opera glasses magnify and bring objects close, is guided in the selection of a glass mainly by the size and appearance of the case, and is intent on gaining for the least amount of money the opera glass which is most pleasing in effect. The average salesman who is ignorant of the merits of achromatic glasses over non-achromatic ones, and of aluminum over more cumbersome material, will naturally permit his patron to carry away a second grade opera glass in a pearl case with gilt bars, when, if this patron had only been cognizant of their relative merits, the finest glasses would have been cheerfully paid for, though exhibiting, perhaps, a less elaborate cover. The ordinary opera glass containing four glasses, and representing what opticians class a second grade article, is sold in greater numbers, doubtless, than any other style, and furnishes at moderate cost a fairly good article. But the inveterate theatre-goer who is content only with the best, uses an opera glass with at least six glasses, which, according to some of our leading opticians, is as strong as any made. The old idea that more power is obtained with

twelve glasses is now disputed, although everybody versed in such matters understands that with twelve glasses is gained a perfect achromatic glass. In a word, their arrangement is such as to dispense with all prismatic rays, consequently the colored fringe, which in the average opera glass surrounds the object and diminishes its distinctness, is entirely overcome. The most perfect, and at the same time expensive opera glass, is the achromatic one, of sufficient size to give a wide field, in an aluminum case. So popular, by the by, are these aluminum cases, that in the very expensive goods they are being produced with fine decorative effect. In illustration may be cited opera glasses in which the tubes are made of aluminum and covered with fine Limoges enamel. The opera glass containing six glasses, though not achromatic, is an excellent glass. Opera glasses are sized according to the diameter of the largest glasses, expressed in French lignes, which correspond with English inches as follows: 12 lignes=1.00 inch; 17 lignes=1.55 inch; 19 lignes=1.75 inch; and so on. The larger the opera glasses of course the wider the field embraced, but very strong magnifying effects are obtained in small sizes. The little pocket opera glass of 12 ligne that can be conveniently carried in one's vest pocket is an instance at hand. For covers are used a variety of material such as white pearl, Oriental pearl, black pearl, Limoges enamel or copper, shells, ivory, celluloid and morocco. Morocco cases represent a standard style and aluminum the lightest ones made, being only about one-fourth the weight of silver.

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OPTICIANS complain, and not without cause, that jewelers in small towns who carry a stock of eye-glasses, spectacles, etc., as a rule sell only the cheaper grades of goods, although they number with their patrons people able and willing to buy the best. This state of affairs is due largely to the fact that few dealers take the trouble to inform themselves on the subject of optical goods. They do not know how to test the eyes or adapt lenses to correct defective vision. They do not recognize a good quality of lenses from an inferior quality, or understand the importance of light frames with comfortable adjustment. Their ignorance begets an uncertain, doubtful manner which is quickly recognized and shared by the customer, who naturally selects the cheapest grade to tide over the time until a city optician can be consulted, when he is paid a good price for a first-class article. The fact that there is a steadily increasing demand for optical goods, especially eye-glasses, it would seem as if all dealers ought to understand the importance of being able to handle such goods intelligently. Every jeweler located in a town where there is no resident optician has an opportunity of doing a lucrative trade in spectacles and eye-glasses there, provided he devotes a sufficient length of time with a trustworthy optician to learn the relative merits of the various grades of goods and the art of testing the eyes. So soon as he can inspire his customers with as much confidence in his ability to adjust glasses as he long ago gained in the matter of regulating a watch or placing its mainspring, he will begin to discover what city jewelers several years since found out, viz., the golden harvest comes to the jeweler in profits made on articles sold, not in tinkering with fifty cent jobs at the work bench.

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WHILE lenses quite colorless, free from polarization of light and accurately ground are a first desideratum in eye-glasses and spectacles, the frames and their adjustment are important features. Many persons, especially those of nervous temperament, experience serious inconvenience and not a little pain in wearing the ordinary steel and plated frames. A number of cases have come under the writer's observation where heavy frames of clumsy construction occasioned severe neuralgic attacks. The lenses were in each case changed two or three times by an ignorant dealer to correct a trouble due

entirely to the weight and pressure of the ill-made frames, as was eventually proven by wearing with comfort the first lenses in tortoise shell frames. For beauty, lightness and ease tortoise shell has long held a first place, and is still largely employed. Tortoise shell frames, however, are quite expensive, owing to their liability to break in cold weather. Of late, celluloid frames to simulate tortoise shell, also amber, have been introduced. These are not only attractive in appearance and of light weight, but exceedingly durable, it being almost impossible to break them. These frames are set with lenses equally as fine as those found in tortoise shell, and, as neither the celluloid nor the springs are affected by heat or frost, they promise to become speedily popular. In a general way it may be said that gold eye-glasses are most worn by middle-aged and elderly people, while the skeleton or frameless eye-glasses and the tortoise shell ones are adopted by younger folk. The celluloid, with its enduring quality, recommends itself to all ages. In cheaper goods steel and rubber frames contend for favor.

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APROPOS of celluloid frames and illustrating the value of acquainting patrons with the meritorious characteristics of one's stock, is the following true story: A customer entered a country jeweler's store and asked for a cheap pair of eye-glasses. The dealer, without comment, selected from the tray devoted to glasses a steel-framed pair with inferior lenses, this being the type representing the lowest figure. A looker-on, interested in the introduction of celluloid frames with treble adjustment, asked the dealer, in an aside, why he did not show these. "It will do no good," was the reply, "he asked for the cheapest and will pay for no new-fangled notions." Looker-on, intent on seeing fair play for the celluloid frames, picked up a pair and threw them down violently on the counter. As soon as the customer recovered from the surprise of seeing the glasses so roughly treated uninjured, he placed them astride his nose, smiled benignly to find how softly it was pinched, paid double the price of the inferior sort and went on his way rejoicing.

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THE rage for oxidized silver jewelry continues. The more ancient and dingy the articles appear the better they are liked, no matter what the design chances to be. Ancient coins and other antique subjects remain in vogue, though a variety of objects in everyday life are also represented. A lace pin which is selling remarkably well simulates, in oxidized silver, an artist's brushes, with a pallet set with colored stones suspended as a pendant. Colored stones, by the by, are much employed in silver as well as gold jewelry, the more usual mode being to incrust those of small size and varying colors in a rough surface. Imported filigree work, the finest of which comes from Italy, is also fashionable. Flower and insect patterns appear in the filigree work, as do also musical instruments, such as violins, banjos, guitars and the like. Silver bracelets are having a popular run, the bangle bracelets being favorites. Narrow silver bands, from two to twelve of which are worn according to the taste of the wearer, are very popular. Chain bracelets terminating with one or more old coins, a cube or a ball represent another favorite style. The serpent bracelet, with jeweled eyes, which coils about and adjusts itself with readiness, whether the arm it clasps be large or small, is yet another salable pattern. Silver pencils attached to silver chains are much worn by ladies while shopping, and silver watches and chains are substituted for gold ones in traveling.

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IT IS too early to speak definitely of new designs in gold jewelry. It is quite safe, however, to assert that manufacturers generally will

bring out unusual lines of novelties in graceful and attractive patterns, for a greatly improved trade is confidently expected during the season of 1885-86. At the present date gold jewelry set with small stones represents the best selling articles in the market. Bracelets, especially bangles, are all the while increasing in demand, and the Queen chain remains a favorite. Gentlemen are patronizing both link and single sleeve buttons; the nugget finish being a popular one for these buttons. With full dress are worn studs and sleeve buttons enameled to represent a white linen finish.

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OF THE making of clocks there is no end. These timepieces are now manufactured with a prodigality which insures their being found in every household, for the infinite variety of shapes, styles, grades and sizes affords a range of prices starting at seventy-five cents and terminating with as many hundreds of dollars as the most extravagant millionaire chooses to offer. French clocks represent the highest perfection in way of decorative clock cases. From France come the finest specimens of art work in bronze, onyx, marble and brass clocks, hand painted porcelain clocks and clocks decorated with Limoges enamel and gold trimmings. English clock makers claim and deserve the reputation of producing the most accurate timekeepers, and their admirable chronometers, cased in handsome substantial manner, appeal to a large and wealthy class of patrons. To the American manufacturers belongs the credit of making the best timekeepers at the least possible cost. The fame of their moderate-priced clocks has literally gone abroad over the land. The export trade in American clocks consumes nearly or quite one-third of all the clocks made. Leading manufacturers have their branch houses abroad, and hold direct relations with all the principal trade centers. In a word, time's progress is marked by American clocks in Europe, China, Japan, Australia, India and South America.

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THERE exists in New York City at the present time, by people who can afford luxuries, quite a fancy for English clocks. The calendar clocks, the musical clocks and other complicated sorts being more or less sought after. Hall clocks of large size, in antique style, with cathedral chimes and musical gong, are counted with desirable high-priced clocks; so are the large English mantel clocks that run three weeks without winding and strike on a gong. In French clocks the present fancy runs to those in antique brass cases. Marble and onyx clocks are standard styles, always in fashion.

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AMERICAN manufacturers, whose original aim was to meet the demand for moderate-priced clocks, have successfully accomplished that aim, there being in the market to-day one-day clocks that keep fairly good time, for which the retail buyer pays only seventy-five cents or one dollar, while \$5 to \$10 will purchase a trustworthy timekeeper in an attractive case with a gong strike. The immense trade done in American clocks is suggested in the fact that leading firms are producing two and three hundred styles of clocks each, embracing all grades, from tower clocks and fine regulators with compensating pendulum to tiny clocks two inches in diameter. The most popular style of clock ever made in this or any other country is the lever in nickeled case. The nickel cased carriage clocks have an almost unlimited demand. Cabinet clocks in walnut, ash, cherry and other carved wood cases are good selling clocks, and especially adapted to libraries and sitting rooms. Cases in mantel clocks attracting attention are, black hard rubber ones showing elaborate finish and ornamentation, solid wood cases with brass trimmings, brass cases

after desirable French models, American bronze cases and enameled iron cases simulating marble. In many American clocks have been introduced the cathedral chimes and gong strike. American manufacturers have also borrowed the English idea of a musical strike clock, and produced timekeepers which mark every hour with a tune differing from the one that proclaimed the previous hour. There are also American clocks with eight-day carriage movement and visible escapement, for which is claimed style and finish equal to European productions. Musical alarm clocks, which at any required time play a tune loud enough to waken the sleeper, are counted with remarkable achievements in clock mechanism. Clocks with visible pendulum, fitted with cathedral gong and having the half-hour strike movement, are out in black walnut cases of attractive finish and at prices so reasonable as to render them popular timekeepers with patrons of average means. Mantel clocks with weight strike, in polished veneer cases, represent an old-time fashion which still finds favor in the southwest and in foreign countries.

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It is generally conceded that the most accurate timekeepers are gained in weight clocks. The popular demand, however, is for clocks of smaller size than can be made with weights, hence the largely increased number of clocks with spring movements. Among the many improvements developed in clock making is an attachment for regulating to the utmost accuracy without touching the pendulum or stopping the clock, a decided convenience over the old plan of regulating by screwing the pendulum ball up and down. Clocks in which one spring, and consequently one winding, is made to serve for the alarm, music or strike, are numbered with improvements, as are also fine regulators with mercurial compensated pendulums. A comparatively recent novelty in clock escapement, introduced under name of Flying Pendulum Clock, in which a flying ball takes the place of the pendulum, is said to be a good timekeeper. It is certainly an excellent show window attraction, drawing a crowd wherever exhibited.

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NOVELTIES in one-day timekeepers exhibit a bewildering variety as regards size, pattern and cost. There are tiny little round clocks with dial measuring only 2 inches in diameter, wooden and metal owls, padlocks, barrels, lanterns and other queer conceits, showing somewhere a dial. Plaque clocks still find a trade. Some of the plaques are of plush and porcelain, but the greater number are of metal. Royal copper scrolls with solid silver ornaments are favorite clock frames. Brass plaques and scrolls in antique finish and exhibiting porcelain dials are fashionable, as are also oxidized silver clock frames.

ELSIE BEE.

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## The League.

PROCEEDINGS OF THE EIGHTH ANNUAL MEETING.

THE ANNUAL meeting of the Jewelers' League, of the city of New York, was held at the Masonic Temple, on the evening of January 20. The President called the meeting to order and announced the order of business. The minutes of the last meeting having been printed and furnished the members, their reading was dispensed with. The President read his annual address as follows:

PRESIDENT'S ADDRESS.

The eighth annual meeting is now convened to listen to the reports by your officers of the work accomplished during the past year, and to direct as to the furtherance during the ensuing year.

A history of the past will be so succinctly given in the reports of the Executive Committee, and of our honored Secretary and Treasurer, that but little remains to be said.

The work of the past year has been well done; the Executive Committee has executed our will, as provided in our Constitution and By-Laws, with faithfulness and diligence; the purposes of our organization have been more effectually accomplished than in any former year. We have paid during the year mortuary benefits to a greater amount than during any year of our existence, and at a small ratio of expense, viz., 7½ per centum.

We have now a body of members who doubtless better realize the good to be done and bad, than those experimental members who have dropped out during the year.

We have nothing to regret in the past in the working of our institution, and would that we had nothing to apprehend from any specious or unwise legislation at this meeting.

Let me repeat the quotation given in the President's remarks last year:

"From an Annual Report of the Chief Registrar of Friendly Societies in Great Britain, I quote:

"As the future prospects of the Societies rest in a great measure on the amount of knowledge which the persons most active in their management possess of the real nature of the business they have under their control, it is essential they should realize that they are engaged in the administration of funds, depending for their successful progress on contingencies, similar indeed to those on which are based the contracts of ordinary life assurance societies, but of a far more complex character." \* \* \* \* \*

Notice that this is with reference to persons active in the management, and now with reference to the members he says:

"The greater the number of persons found in the societies possessing sound views on these points, the more marked in its effects on the steady growth of the funds will be the sense of moral responsibility brought to the consideration of all questions affecting the finances."

Fellow members, let not the question of immediate convenience cause you to forego future security; ponder well before you strike out one of the strongest elements in the perpetuity of our beloved League; heed well the warning of those who have your interests and our sodality interests thoroughly studied and cared for; remember that you are morally responsible for your action here to-night to 2,500 other members who cannot be present. And now pardon a personal reference:

Since May 6th, 1877, a period of seven and a half years, I have been an official worker in our Jewelers' League. I uttered the words which caused it to be born, was present at its birth in the office of the firm of which I am a member, had the honor of naming it the Jewelers' League, and, at the first meeting of the Executive Committee, was considered by it entitled to number one of the membership numbers. May I not ask as modestly as the importance of the event will permit, although the father of nothing else, that I may be the father of the Jewelers' League?

Having continued in its active service up to the present hour, it cannot but be patent, therefore, that one who has lived with it in the years, and witnessed its growth from the solitary, helpless infant, to the stalwart youth of 3,000, must have for it an affection which a mere separation from it as an officer cannot possibly efface, and as evident must it be that I can not resign my deep interest in it to others, without pangs of regret that my earnest efforts in its behalf in its early life have been the cause of separating me from it now.

I have for two years past felt that the watchful care which my position necessitated over our League and its interests in various directions, was, with the attention necessary to private interests, a severe strain upon my system, however hardy and enduring I may have been. My physician has peremptorily counseled me that as I valued my future health I must be relieved.

Pray do not consider me immodest in declining a nomination before it is offered to me, but so many friends have urged my acceptance, that I feel called upon to thus make my position known,

Not the least, by any means, of the clouds of regret which overhang, upon severing my official connection with the League, is the memory of the warm friendships made, and the genial associations with so many of you gentlemen, members, ex-officers and officers.

The silver lining to the cloud, however, will consist in the fact that after my term of service has now expired, I shall still have that pleasurable memory of you all, and the satisfaction of having attempted my whole duty to you.

Long live the Jewelers' League!

The Examining Finance Committee submitted its report, which was adopted.

The following report of the Secretary and Treasurer was then submitted and accepted:

ANNUAL REPORT OF THE SECRETARY AND TREASURER.

Membership of League, January 15th, 1884.....		3,003
Members <i>died</i> during year 1884.....	23	
Members <i>dropped</i> , (for non-payment of assessments).....	433	
Members <i>resigned</i> .....	12	
	<hr/>	468
Members <i>reinstated</i> , (who had been dropped in former years)	6	
	<hr/>	
Decrease for year.....		462
Applications <i>received</i> during year 1884.....	458	
Applications <i>rejected</i> .....	27	
Applications <i>referred</i> for investigation, (not yet accepted).....	10	37
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Members <i>accepted</i> during year 1884.....		421
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Net Decrease during year 1884.....		41
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Total Membership at date.....		2,962
Members <i>died</i> since organization, June, 1877.....	48	
Members <i>resigned</i> " " June, 1877.....	15	
Members <i>expelled</i> " " June, 1877.....	1	
Members <i>dropped</i> " " June, 1877.....	484	548
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Last Membership number.....		3,510

	GENERAL FUND.	BENEFIT FUND.
Amount on hand January 15th, 1884.....	\$3,611.44	\$6,160.30

RECEIPTS.

421 Members' Initiation Fees, at \$3.00.....	1,263.00	
421 Members' First Assessments, at \$2.00.....		842.00
Amount from Reinstatements.....	1,196.00	
Interest on Deposits at Union Trust Co., 1 ½ %.....	118.16	
Interest on Contingent Fund (4 % Reg. Gov. Bonds).....	190.00	
Interest on Permanent Fund (6 % City & County Bds.).....	210.00	
Interest on Permanent Fund, \$50, 4 % Coupon Bond.....	2.00	
Assessments Numbers 24 and 25.....		11,328.00
" " 26, 27 and 28.....		17,810.00
" " 29, 30 and 31.....		17,802.00
" " 32 and 33.....		12,168.00
" " 34 and 35.....		12,676.00
" " 36 to 40.....		30,338.00
" " 41 to 45.....		28,500.00
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Total Amounts to the Credit of the Treasury....	\$6,590.60	\$137,624.30

DISBURSEMENTS.

Beneficiary of F. Blauer, Chicago, Ill. ....	\$5,000.00	
" E. Linz, St. Louis, Mo.....	5,000.00	
" J. B. Goldey, B'klyn, N. Y.....	5,000.00	
" G. C. F. Wright, New York, N.Y.....	5,000.00	
" D. S. Barry, Philadelphia, Pa.....	5,000.00	
" J. A. Clancy, Selma, Ala.....	5,000.00	
" W. H. Davis, York, Pa.....	5,000.00	
" W. S. Cook, New Lenox, Ill.....	5,000.00	
" J. W. King, Jacksonville, Ill.....	5,000.00	
" H. H. Eaton, Nashua, N. H. ....	5,000.00	
" H. W. Hurlburt, Hartford, Conn.....	5,000.00	
" Geo. Frantz, New Orleans, La.....	5,000.00	
" E. D. Rhodes, No. Attleboro, Mass.....	5,000.00	
" D. H. Hopkinson, Brooklyn, N.Y.....	5,000.00	
" Monroe Marx, New York, N. Y.....	5,000.00	
" P. J. Elmquist, Morris, Minn.....	5,000.00	
" F. A. Cady, Charleston, S. C.....	5,000.00	
" Philip Nast, New York, N. Y.....	5,000.00	
" L. A. Hoffman, Freehold, N. J.....	5,000.00	
" G. J. Heinrich, New Orleans, La.....	5,000.00	
" E. L. Peck, Providence, R. I.....	5,000.00	
" J. A. Doar, Charleston, S. C.....	5,000.00	
" J. S. Wood, Providence, R. I.....	5,000.00	
Commissions of Secretary and Treasurer....	6,573.20	\$121,573.20
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Amounts carried forward.....	\$6,590.60	\$16,051.10

	GENERAL FUND.	BENEFIT FUND.
Amount brought forward.....	\$6,590.60	\$16,051.10
Paid to Board of Trustees of Jewelers' League.....		15,528.90
Amount in the Benefit Fund .....		\$522.20
MISCELLANEOUS DISBURSEMENTS.		
Books, Stationery and Printing.....	\$1,121.04	
Postage and Rent of P. O. Box 3,444.....	347.53	
Rent of Office.....	300.00	
Exchange of Iron Safe.....	250.00	
Expense of Moving and Furnishing Office..	146.27	
Hire of Hall for Annual Meeting, 1885....	40.00	
Fuel, Gas and Ice.....	28.26	
Expenses of Office.....	23.75	
Services of Attorney.....	20.00	
Rent of Box in Nassau Bank Safe Dep. Co..	12.50	
Subscription to "Guardian".....	2.00	
Commission of Secretary and Treasurer....	122.95	
Paid to Board of Trustees of Jew. League...	1,471.72	\$3,886.07

Amount in General Fund.....		\$2,704.53
Total Amount in Treasury.....		\$3,226.73
Deposit in Chatham National Bank.....	\$1,762.89	
Cash on hand.....	72.38	
Interest on Deposits at Union Trust Co....	461.26	
" " \$50.4 % Gov. Bond in Union Trust Co .....	8.00	
" " \$3,500 4 % Bond of Permanent Fund in Union Trust Co....	210.00	
" " \$9,000 Bond Contingent Fund in Union Trust Co.....	192.00	
Deposited at Union Trust Co.....	522.20	\$3,226.73

	Permanent Fund.	Contingent Fund.
Chicago Fire Fund.....	\$4,938.53	
Bond Donated to Fund.....	50.00	
Surplus from General Fund.....		\$1,471.72
" " Benefit Fund.....		15,528.90
	\$4,988.53	\$17,000.62
<i>Invested as follows:</i>		
\$50.00 4 % Gov. Coupon Bond.....	\$50.00	
3,500.00 6 % N. Y. City and Co. Bonds.	4,733.82	
\$3,550.00 (Par Value.)	4,783.82 (Market Value.)	
\$1,000.00 4 % Reg'd Gov. Bonds.....		\$17,000.62 (Market Value.)
Balance in Union Trust Co.....	\$204.71	

WM. L. SEXTON,  
*Secretary and Treasurer.*

The undersigned have examined the Accounts and Assets of the Jewelers' League, and find them correctly set forth in the Annual Report herewith submitted by the Secretary and Treasurer.

A. A. JEANNOT, HENRY UNTERMAYER, GEO. H. HODENPYL,  
*Examining Finance Committee.*

Mr. Robert A. Johnson, Chairman of the Executive Committee, then read the following report:

REPORT OF EXECUTIVE COMMITTEE.

*Mr. President and Members of the Jewelers' League:*

"Your Executive Committee congratulates you on the prosperity of the League." These words have constituted the opening sentence of each of the seven annual reports of your seven Executive Committees.

Stereotyped though they are by repetition, every good reason exists why they should again fulfill their annual mission.

Your Committee in this, the Eighth Annual Report, greet you with congratulations.

It congratulates you on the organization of the League; on the grand, good mission it has accomplished, and on its bright prospects for a long, useful future.

The most sanguine anticipation of its incorporators and early members have been exceeded, and its wonderful prosperity attests the fact that the Jewelers' League, with its careful, economical administration, has been thoroughly appreciated.

Your Committee has held, during the year, eighteen regular and special meetings, a quorum being present at each. The Surgeon of the League, Dr. Wilbur, has been with us at our regular meetings, and the League is again indebted to him for his valuable professional advice.

The labors of the Committee are not as generally known as are their duties.

The regular meetings of the Committee last from three to five hours. In addition to the routine business, which is always considerable, every question and answer of every applicant for membership, with every detail in his medical examination, is carefully considered, and whenever a doubt exists in the minds of the Committee, the League is given the benefit of the doubt and the applicant is rejected.

It ought to be needless to say again that the Committee has no control over the dates of the deaths of members; but it seems to be necessary to say that whenever properly attested proofs of death are presented to them, the Constitution makes it imperative with them to order the assessments, be they few or many.

Months may pass without a proof of death being presented, and then five may be presented together. Your Committee have no discretion in the matter; you have defined their duties.

The average age of the membership is 37<sup>3</sup>/<sub>100</sub> years, just what it was in 1880.

The death rate of the past year, although greater than before, has not been large, while the average death rate since the organization of the League has not only been small, but is, as far as we have been able to learn, without a parallel in the history of similar associations.

From the tables of mortality we could have reasonably expected at the average age of our members, a total death loss, since our organization, of 97; we have had 48. Twenty-three have joined the "silent majority" during the year that is past, for three of whom an assessment was ordered at the final meeting of the Executive Committee. Beneficiaries have been paid the sum of \$115,000, making a total of \$188,670.00 paid to beneficiaries since the organization of the League.

To those who have been members for the past year, there has been a cost of \$44 for \$5,000 of insurance.

To those who have been members for two years, there has been a cost of \$25 per year for \$5,000 per year of insurance, while those who have been members since the organization of the League, have had an average insurance of \$4,060 per year at an annual cost of \$11.88, about 1/8 of what would have been the cost to the youngest member of our association in the regular Life Insurance Companies.

The funds of the League, invested as required by our Constitution, are bearing interest in the Safe Deposit Vaults of the Nassau Bank of our city.

They are in the keeping of three appointed Trustees who are members of this Committee. The names of these Trustees, their personal description and family history are recorded on the books of the Company.

The large vault of the bank cannot be entered except upon the recognition of the Custodian in charge, and the small vault containing our securities cannot be opened except by the three Trustees acting in unison with their three separate keys.

The Contingent Fund now amounts to \$17,000.62, invested in 14 \$1,000 Registered Bonds of the U. S. This fund belongs to the members of the League, and will be used to pay for all deaths in excess of 1 1/4 per cent. of the membership as provided by the Constitution.

This fund is already an element of strength, and with its constantly increasing value, will, in time, become one of the greatest elements in the stability and permanence of the League.

More than that, for organized on our present system it is the greatest, it is the only guarantee of safe and cheap insurance in the future; it is our only safety in times of disaster or epidemic, and on it depends the perpetuity of the Jewelers' League.

In the lapse of time it may be well to limit its amount, but at present it should not be tampered with or hampered by any constitutional amendments.

Your Committee unanimously, earnestly hope that your vote this evening against such amendments may be as nearly unanimous as was the vote that called the fund into being one year ago.



Your Committees of the past three years have recognized the fact that many of our members would in time find it inconvenient or impossible to carry \$5,000 insurance, even on our mutual plan of insurance at cost. You will bear them witness that they have as often as they have had opportunity, called the attention of these members to the fact that the low death rate had been phenomenal, and that assessments would be greater than they had been.

With the last two assessments these members have dropped, and while we regret the fact that some of them, perhaps, have been obliged to do so, yet we feel that it is for the good of the League that this should happen just at this time.

The League is stronger without them than with them, and the amount of our insurance more reliable. They will be replaced with new risks, with men who will count the cost and come to stay. Then we will all know just where we stand.

Amendments to the Constitution have been presented to your Committee, and will be offered for your consideration at the proper time during the meeting.

In the printed call for this meeting, your Committee have expressed their approval or disapproval of these amendments. This they have done after long and careful consideration, having in view but one purpose, the welfare of the League.

We miss to-night the kindly face of one who has always been with us on occasions like the present. In the death of Mr. D. H. Hopkinson, of THE JEWELERS' CIRCULAR, in July last, the League lost one of the earliest of its members and one of the warmest of its friends. Taking an active interest in our association from its organization, his voice and his pen were ready in its behalf and did faithful service.

To the gentlemen who have succeeded him in the management of THE JEWELERS' CIRCULAR, the thanks of the League are due, as they are likewise due to the various trade journals who have shown kindly interest.

No less a meed of praise is due to the careful and valued employés of our Secretary. The records and accounts of the League have been kept by them with a neatness and accuracy worthy of your especial commendation.

There is little more to be said. The comprehensive report of the Secretary and Treasurer puts you in possession of all necessary facts and figures.

The past of the League at least is sure and satisfactory, and if it were dissolved to-night, every man of us, whether he has been a member one week or seven years and a half, has had more than the worth of his money.

If there has been any dissatisfaction, it has been among those who have expected something for nothing, or those who have failed to realize a large profit on their investment, because they have failed to die.

It remains for you, the membership, the constituency of the League, who control its affairs, to shape its future. Let every member take an active personal interest in its affairs, and induce worthy friends to take membership with us.

Let all to whom it is possible attend these annual meetings. Exercise your power, your privileges, your duty in changing the administration when you think it necessary. Select for its officers, cautious, conservative, honest men. Accumulate your Contingent Fund for a time of need, and then there is no reason why the future should not be as secure as the past, then there is no reason why the League should not exist long after the claims of its present membership shall have matured and have been paid in full.

With this report the labors of the present Executive Committee cease and end.

Through your confidence the honor of the League and its interests have been in their keeping.

They have realized their responsibility. Without fear, or favor, or reward, they have labored as best as they knew for the general good.

The work, whatever sort it is, is done; it cannot be recalled, or

repaired, or changed. The history of the year is ended; the record is written, and signed, and delivered. Will you affix to it the seal of your approval?

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|---------------------------------|-------------------------------|
| GILBERT T. WOGLOM, President,   | } <i>Ex-officio.</i>          |
| WM. C. KIMBALL, Vice-President, |                               |
| AUGUST KURTZEBORN, "            |                               |
| JAMES P. SNOW, "                |                               |
| HENRY HAYES, "                  | } <i>Executive Committee.</i> |
| SAMUEL W. SEXTON,               |                               |
| CLEMENT B. BISHOP,              |                               |
| JOSEPH B. BOWDEN,               |                               |
| GEORGE R. HOWE,                 |                               |
| CHARLES G. LEWIS,               |                               |
| ROBERT A. JOHNSON, Chairman.    |                               |

THE PRESIDENT—Gentlemen, you have heard the report of your Executive Committee, and the beautiful sentiment expressed with reference to our late friend and fellow member. I ask you to rise in your places as a token of respect to our deceased friend and fellow member, D. H. Hopkinson. (The members here rose *en masse*).

THE PRESIDENT—What shall be done with the report of your Committee?

MR. T. L. PARKER—I move, you, Mr. President, that the report be received, and that the thanks of this League are due and are hereby extended to our Executive Committee for their able report, and for the onerous duties they have so well discharged.

The motion was seconded and carried unanimously.

The President announced the next business to be the election of officers, and, resigning the Chair, he called upon W. C. Kimball to preside.

MR. SEXTON—Mr. President, gentlemen and fellow members of the Jewelers' League: We are called upon this evening to part, in an official way, with the one who may truly be called the founder, or, if he prefers it, the father of the Jewelers' League. In losing Mr. Woglom as the presiding officer, the League loses one whose motives have been pure and unselfish, and whose labors in its behalf have been unceasing. In suggesting the organization of the League, he had only in view a movement for the benefit of the members of the trade, and in accepting an official position he honored the League more than it honored him. In every position which he has filled he has been systematic, thorough and faithful. The Permanent Fund of almost five thousand dollars, is ours because of his untiring exertions for its possession. In fine, the proud position, gentlemen, of the League to-day is, in a great measure, owing to the thought that he has bestowed and the labor he has performed. Therefore, I ask your indulgence while I submit for your consideration the following resolution:

*Whereas*, Mr. Woglom declines a re-nomination to the office as President, and thus severs his official connection with the League; and,

*Whereas*, the members sincerely regret that the League is obliged to lose him as its presiding officer.

*Resolved*, That we, the members, hereby give expression to our appreciation of all of his labors, and to our regret that he finds it necessary to decline a re-nomination. We hereby acknowledge his sincerity, his unselfishness and his faithfulness in his entire connection with the League, and we regret that we are to be deprived of his counsel and good judgment as our presiding officer. We heartily wish that as a fellow member he may live for many years to witness the successful and beneficial working of our organization, which he has striven so hard to establish and to perpetuate (Applause).

The resolutions were then adopted and referred to a committee of three to engross.

The election of officers was the next order of business, and Mr. Henry Hayes having been nominated, the Secretary was directed to cast one ballot for him for President, which was done and Mr. Hayes declared duly elected.

Mr. Hayes having been escorted to the Chair by a committee appointed for that purpose, addressed the meeting as follows:

## REMARKS OF PRESIDENT HAYES.

THE PRESIDENT—Gentlemen, I am glad that I have been introduced to you. I am a stranger to all of you. (Laughter). I assure you it is with no ordinary emotion that I say that I fully appreciate this expression of your confidence in placing me in the Chair to preside over you, and I also presume to say from the bottom of my heart that I don't thank you for making me President of this League. (Laughter). I appreciate the responsibilities belonging to this office, but I have enough responsibilities. I don't dare to add to them. It is contrary to my wish and my taste, and then you place me in strong contrast, and very unfavorably for me, in making me a successor to the gentleman who has so ably, indefatigably and courteously presided over you, and devoted his best hours and labors to the interests of this League. You will have to bear with me in my ignorance. I will have to ask your forbearance. I will aid you all I can in your consultations, and if I err it will be honestly done, and I would say to you that this occasion on which we are assembled is one of no ordinary moment. It is not the ordinary avocations of your daily life visiting the Astor House to get some western man in your clutches (Laughter), or going to Tiffany's and asking them if they don't think your goods are nice, or going to Maiden Lane to induce them into buying a few paltry goods. The object of your League and the object of your meeting to-night to advance the interests of the League, are those that spring up from the very innermost recesses of your hearts. It is because of your affection for those who are nearest and dearest to you, and, therefore, your consultations should be such as will advance the permanence and welfare of this League. In all our deliberations to-night let us be prudent and cautious, only endeavoring to accomplish that which will strengthen and conserve our interests. The Executive Committee have placed before you important matters which are worthy of your attention, and have covered all the ground necessary for your consideration, I therefore propose to commence business. (Applause). Gentlemen, the office of First Vice-President expires to-night. The Third Vice-President is Mr. James P. Snow, who now becomes the first Vice-President. The Fourth Vice-Presidency is vacant; we will now proceed to elect a person to fill the vacancy in the Second Vice-Presidency for the coming year. We will have to ballot for them separately. Nominations are in order.

Mr. Robert A. Johnson, who has served seven and a half years as a member of the Executive Committee, was then unanimously chosen Second Vice-President. William C. Kimball was chosen Third Vice-President, and August Kurtzeborn, of St. Louis, elected Fourth Vice-President.

Wm. L. Sexton was re-elected Secretary and Treasurer unanimously, and in a few pleasant remarks returned thanks for the confidence reposed in him.

The following named gentlemen were unanimously elected members of the Executive Committee to fill the places of those whose terms have expired: S. H. Hale, with Robbins & Appleton; J. R. Greason, of J. R. Greason & Co.; and E. S. Smith, of Smith & Knapp.

The President appointed, as the Examining Finance Committee, Messrs. J. C. Downing, H. S. Cousins, and Jacob Marx.

Under the head of miscellaneous business various amendments to the Constitution were proposed, and a lengthy debate ensued, resulting in the rejection of all except the following, which were approved by the Executive Committee:

*Submitted by Mr. George R. Howe.*

In Article II, Section 2, substitute the word "and" for "or," so that the clause shall read: "Who is now *and* has been for one year immediately prior to the date of his application, engaged in the Jewellery or kindred trades, etc."

In Article V, Section 2, add the words "or less," so that the clause shall read: "except when the Executive Committee shall, by virtue of this provision, have extended the time for the payment of an assessment for the further space of one month *or less*."

*Submitted by Mr. Isaac Cole.*

Add Section 2 to Article XIII, as follows:

All proposed amendments to the Constitution shall be published in full and sent to each member of the League, not less than fifteen days before the Annual Meeting.

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## The Jewelers' Security Alliance.

*President, DAVID C. DODD, JR.*

*Vice-President, AUGUSTUS K. SLOAN*.....Of Carter, Sloan & Co.  
*Treasurer, W. C. KIMBALL*.....Of H. F. Barrows & Co.  
*Secretary, C. C. Champenois*.....Of Champenois & Co.

### EXECUTIVE COMMITTEE.

C. G. ALFORD, *Chairman*.....Of C. G. Alford & Co.  
C. B. BISHOP.....Of Carrow, Bishop & Co.  
HENRY HAYES.....Of Wheeler, Parsons & Hayes.  
J. B. BOWDEN.....Of J. B. Bowden & Co.  
DAVID UNTERMAYER.....Of Keller & Untermeyer.  
E. F. DORRANCE.....Of Dorrance & Brother.  
P. O. Box 3277. Room 2, 170 Broadway, New York.  
HON. ALGERNON S. SULLIVAN, *Counsel.*

THE REGULAR meeting of the Executive Committee was held at the office of the Alliance on the 8th inst. The resignation of Mr. C. B. Bishop, as a member of the Executive Committee, was received and accepted, and Mr. N. H. White was elected as his successor.

The following applicants were admitted to membership in the Alliance, viz.:

Chas. Armsheimer, New York City; Jas. O. Bailey, Boston, Mass.; Jos. Felrath, Mobile, Ala.; Kattelle Bros., Boston, Mass.; J. C. Meyers, New Orleans, La.; E. Nichols, Southington, Conn.; G. E. Smith, Parkersburg, W. Va.; Eugene Schripff, Scranton, Penn.

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## Proceedings of the Horological Club.

### A DISTINGUISHED BODY OF WATCH AND CLOCK MAKERS.

*One hundred and twenty-seventh discussion.—Communicated by the Secretary.*

[NOTICE.—Correspondents should write all letters intended for the Club separate from any other business matters, and headed "Secretary of the Horological Club." Direct the envelope to The Jewelers' Circular Publishing Company, Seth W. Hale, President. Write only on one side of the paper, state the points briefly, mail as early as possible, as it must be received here *not later than* the eighth day of the month, in order to be discussed and reported in the CIRCULAR for the next month.

### BENZINE AND SOAP FOR CLEANING WATCHES.—THE LAW GOVERNING WATCH REPAIRERS.

*Secretary of Horological Club:*

I am glad "X. Q. Z." looked over his file of THE JEWELERS' CIRCULAR and answered my question. I wish to thank him for doing so. I had been informed by one who claimed to have worked in a western factory, that a solution of cyanide was used to clean the movements. His description was substantially the same as Mr. Z's. Having read such severe condemnation of its use from members of your distinguished body, I was anxious to know the truth of the matter. Will he kindly answer one or two more questions? Is the ordinary benzine used by him, and what kind of soap? Castile?

I am never more pleased with THE CIRCULAR than when it contains considerable correspondence and good workshop notes. I am greatly indebted to correspondents as well as to your Club for valuable suggestions. I was set to thinking, and working, too, by "Echoes from the Bench" about a year ago. The writer's workbench, system, reminiscences and suggestions particularly remain with me, I trust for good. He promised us more, but I have looked in vain for the fulfillment. The wants and watch-rack are wanted.

I hope some of your readers who may have learned the law governing watch repairers will favor us with the information in reply to my inquiries in July number, 1884.

L.

Mr. Uhrmacher said the Club had not condemned the use of cyanide, but had said that its use must be attended with great caution, and if the workmen are careless it had better not be used at all. Many people eat arsenic regularly, but those who do not know how to do it safely had better let it alone. So it is with cyanide. We do not condemn its use, for it is valuable in its place, but we have tried to point out its dangers and the precautions that should be taken. Any one who should get the trade to using cyanide for cleaning watches, and give no information except to dissolve the cyanide in water and dip the plates, etc., in it, would be justly execrated by the thousands of workmen who would incur loss from not knowing the dangers attending its use. This information we have endeavored to supply, as will be seen in our Proceedings in the past.

As regards the law question, the only safe way in law matters is to go to a good lawyer, state *fully* the circumstances of *that particular case* and get his opinion. Some little fact that seems to the workman of no importance may alter the whole legal aspect of the case. It will be much cheaper to pay a dollar or two for a few words of trustworthy advice, than to take the say-so of some non-professional and get himself into a mess which may cost him fifty times that amount, besides time, annoyance and disgrace. The law may be different in every State, and even in every city. One way to learn what the law is in his case is to ask a lawyer, the other is to get into a law-suit and find out by experience. Our advice is to take the former.

#### CLEANING WATCHES.

##### *Secretary of Horological Club:*

The following is a process for cleaning watches by the use of cyanide of potassium. A small piece of the cyanide is dissolved in a common drinking glass filled with water, or, what is better, a wide mouthed bottle with a ground stopper. The movement to be cleaned is taken apart, and the balance, the lever and other steel parts are placed in benzine. If the balance jewels are in settings they are removed and also placed in the benzine. The plates and wheels are strung on a small brass or copper wire, bent so as to form a catch, similar to a safety pin with the pin part extended to hold it by, and dipped into the cyanide, then well rinsed in clean water (warm water is best), and then in alcohol and placed in sawdust to dry. When dry brush only enough to remove the sawdust. The parts in the benzine are cleaned in the usual way. E. M.

Mr. Clerkenwell said the foregoing was the usual process followed by those who use cyanide for cleaning, but he would repeat his cautions expressed at our December meeting. While useful in its place, cyanide is dangerous and must be used with great care—dangerous to the person using it, to the gilding of the parts put into it, if allowed to remain too long—and dangerous to all steel articles around which can be reached by its vapors. If not thoroughly cleaned off, the trace of it remaining on the pieces will vaporize on the watch when put together, and rust the steel works of the movement.

#### MORE ABOUT DIAMOND WEIGHTS.—MR. WINDBAG CLEARS THE HALL.

##### *Secretary of Horological Club:*

Having read the comments on Troy weight in the November and December numbers of THE CIRCULAR, I referred to a book in which I had seen a table called diamond weight, and it may be interesting to your readers.

It is a pocket edition of Worcester's dictionary, published by J. B. Lippincott & Co., Philadelphia, and copyrighted 1872. This is a copy of the table.

##### *Diamond Weight.*

16 parts=1 grain.
4 grains=1 karat.
1 karat=3 $\frac{1}{8}$ grains Troy (nearly).
15 $\frac{1}{2}$ karats=1 oz. Troy.

According to the above the karat exactly equals 3 $\frac{1}{8}$  grains Troy. I obtained a copy of Orton's book, the edition of 1871, which states on the title page that it is a revised edition. I looked up some points on the subject and give the facts stated.

Encyclopædia Britannica gives 4 grains=1 karat in weighing diamonds; and 5 grains Diamond Weight=4 grains Troy; and 150

grains Diamond Weight=1 oz. Troy; and says this weight is not very different over the globe.

Chambers' Encyclopædia gives 1 karat Diamond Weight=3 $\frac{1}{8}$  grains Troy. American Encyclopædia says 74 $\frac{1}{8}$  grains Diamond Weight=72 grains Troy. All agree that the diamond grain is lighter than the Troy.

Worcester's dictionary defines Troy Weight, and gives a division of the Troy grain which I state below, viz.:

##### *Troy Weight, Grain.*

24 blanks=1 periot.

20 periotics=1 doit.

24 doits=1 mite.

20 mites=1 grain.

G. S. C.

Mr. Ruby Pin, who had this subject in charge, was absent, but Mr. Windbag volunteered to speak for him.

"I always stand ready," he observed, "to speak for the absent, to kiss his sweetheart for him, smoke his cigars, and, in fact, to do anything within the bounds of reason to prove my self-sacrificing friendship. If need be, I would spend a whole day in cutting off coupons for him, and then collect them myself to save him all trouble in the matter. In the case of our highly esteemed friend, Mr. Ruby Pin, I feel under special obligation to lay myself out in his behalf. You are all aware of the unfortunate little disagreement between us at the last meeting of this honorable body, which happily ended in a reconciliation. I desire now to show the sincerity of my forgiveness and the holy friendliness of my present feelings toward him—and to do that I am willing to talk till my breath utterly fails me." (The tumult which arose at this point was understood by Mr. Windbag to be applause, and, laying his hand upon his heart, he continued bowing till silence was restored).

"Mr. Chairman and gentlemen of horological and similar predictions, let us plunge '*in medias res*,' as Jupiter used to remark when a fresh vessel of nectar was placed before him. The letter just read is very interesting, and the gentleman is evidently well read upon the subject. Unfortunately, I am not so, but must speak in general terms, and from my own knowledge only. As regards diamond weights, I do not know the size of them, but my experience convinces me that they are very small. This gorgeous and effulgent stone which I wear upon my broad and manly breast, and whose brilliancy makes these electric lights look green with envy and disgust, the last relic of my departed wealth (I refer more particularly to my latest assignment, when I nobly and honorably settled with my creditors dollar for dollar, 5 per cent. in cash and the balance in notes), this glorious diamond which links me with my former proud position in the business and financial world (and I devoutly trust and hope ere long to regain the same, and even to soar far higher in the confidence and esteem of my countrymen), this beautiful gem, as I was saying, cost me a pile of money. If diamonds are sold exclusively by the karat, it must have weighed at least a thousand karats. (I may remark that, although I paid for it by note, I was solemnly assured that I had it at a very slight advance upon the cash price). I should say, from long and anxious cogitation over this point, that instead of there being 3 $\frac{1}{8}$  grains to the karat, there are more than 50 karats to the grain. To be sure, the books cited by Mr. C. have it the other way, but books are often out of date and behind the times, while I speak from experience and actual knowledge of the practice of the trade up to a very recent date—in fact, just previous to my late assignment. I therefore feel inclined to rely more upon my actual knowledge than upon books, written probably by persons who never had a diamond or a karat in their lives, and must, consequently, have compiled their data from hearsay. (I wish to say right here, that I have owned a good many diamonds in my time, my first wife being a scion of nobility, and she inherited all the heirlooms of her family for several generations back, consisting of gold and precious stones *galore*). I think, therefore, that on the ground of experience and actual knowledge, I may claim that the books are wrong, and that there cannot be more than one grain to a karat according to the most modern practice among diamond dealers (I refer to respectable dealers, of course, for a person of my standing

would not deal with any second rate fellows), and that, in all probability there are at least two karats to the grain. If anybody doubts that, I recommend that he try it and find out for himself.

"Mr. C. also gives a table of Troy Weight which is very interesting. He first gives us a weight called 'blanks.' That must be a very light weight. When one says 'All is a blank,' it is equivalent to declaring that there is nothing there. Still there may be different kinds of blanks. During my recent financial complications, I frequently heard the term 'law blanks,' but had no idea that they were a species of weights. Then there are blank checks, which are decidedly no good—wouldn't give a penny a pound for them; and blanks in a lottery are worth still less.

"Whatever they are, the table says 24 of them make one 'periot.' That is probably French for 'period.' Those blarsted Frenchers never can learn to spell properly. I recollect when I was a boy, I saw a French book one day, and you may think I am exaggerating, but I could hardly find a single word spelled rightly, and there were whole pages of it so badly spelled that I could not make head nor tail of it. I have been disgusted with everything French ever since. A nation so illiterate that its writers cannot spell one word in fifty properly, cannot expect educated and intelligent people to read their books. For my own part I never shall. I scorn to notice such wholesale ignorance.

"Then the table says '20 periotics=1 doit.' That is probably a French blunder for 'do it.' Do what? That is left unexplained. Perhaps it is the French way of giving good moral advice, meaning 'Do something, no matter what—only *do it.*' Or perhaps it is misspelled for 'dot.' A dot equal to 20 periods would be of pretty good size—equal to a fly speck in August. But how did they find out how much it weighed? These Frenchers are queer people. As for the 'mite,' everybody knows it is a mighty small bit, but it seems these Frenchers have calculated that it weighs just  $\frac{1}{20}$  part of a grain. It may be so, but I would rather weigh some for myself before I freeze to that. And while I was about it I would like to weigh up a few 'periotics' and fly specks—I mean 'dots.' I think it is rather suspicious that I never heard of such weights before. It rather looks as if it was all a trick of these blarsted Frenchers putting on learned airs to hide their illiteracy in the way of spelling.

"Why just think of this: We all know that a grain is an awfully small weight, yet there are in a single grain no less than 230,400 'blanks,' according to this table! Who could weigh the 200,000th part of a grain? The idea is absurd, and that book ought to be suppressed. Who is this Mr. Worcester? He is not in the list of my acquaintances. Still he may be a very respectable sort of person, possibly, but he has evidently been imposed upon, and has published this table without first consulting the mercantile agency to find whether it was good. Unless he corrects the error and makes ample apology in his next edition, I shall feel under the painful necessity of withholding my patronage and countenance hereafter. I like to encourage struggling merit, give it a helping hand to lift it up and all that sort of thing, but—"

"Moved and seconded that the Club do now adjourn," said the Chairman. While he was putting the question to vote, Mr. Windbag glanced around, and was astonished to see that his audience had dwindled down to the Chairman and the Secretary. "Carried," said the Chairman, and the audience had "skipped by the light of the moon" before Mr. Windbag could vote "No."

"Who are you?" asked Mr. Windbag, of a burly person who was inserting a key in the door of the Council Chamber.

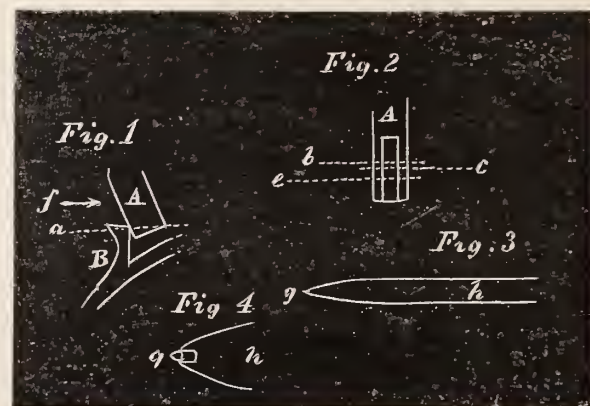
"I'm the janitor, be gob, appointed by Mr. Hale, the Prisdint, be gob, an' I'm solid wid the old man, be gob, an' mister, av ye're not out of here afore this door shuts, ye'll freeze afore mornin'."

As Mr. Windbag sadly plodded down the four flights of winding stairs, he thought of the mutability of human affairs, the ingratitude of republics and of Clubs, of his friendly intentions thrown away, and resolved never, no, never, to do a favor again to anybody but himself.

## Problems in the Detached Lever Escapement.

BY DETENT.

WE LEFT the problem last considered, of incorrect impulse faces, at the point of correcting the angles. How to do this will be next taken up. At fig. 1 is shown an entrance pallet. The manner of correcting this will apply equally as well to the exit pallet, consequently we will consider the entrance pallet only. As we demonstrated in our last communication, we had too much lock and too little impulse, hence we will proceed to grind off the pallet on the dotted line *a*, fig. 1. We have described the necessary grinding and polishing laps in former articles, so, of course, we need not speak here of these, but will proceed at once to determine how much is to be removed. In our problem the banking was examined and found correct; so now for the pallet. We take a little castile soap, and with a small pencil brush paint the locking faces. The addition of a little white lead ground in will make the effect more certain, but the simple soap will answer well enough. We now put the pallets in the watch and wind it up a little, and move the lever back and forth until the scape wheel makes a full revolution. Now, let down the mainspring and take out the pallets, and the locking face of the pallet will be found marked by the teeth scraping off the soap as far up as the lock extends. At fig. 2 is shown a face view of the pallet as seen in the direction of the arrow *f*, fig. 1. We now mark pallet at the point we wish to remove the angle to; as, for instance, the pallet is marked by the teeth up to the dotted line *b*, consequently we should grind off the angle up to the line *c*, which corresponds to the line *a*, fig. 1. There is no especial rule which can be applied to the extent of the space between the lines *c* and *b*, except it should represent the locking face or about 2 degrees. If the eye is well disciplined with the model it will judge very closely. On judging closely I would beg to make a few remarks; it is quite easy for the disciplined eye to judge of space or size when it has a standard to go by—I don't mean by this a standard of inches or parts of an inch,



but relative sizes, *i. e.*, in the present instance the old lock (a great deal too much) extends from the lines *b* to *c*. Now, when we were trying the lever we found the lock was twice and one-half too much. Now, we carry this proportion to the locking face in hand, and grind away one-half or  $\frac{3}{8}$  of the space from *b* to *c*; this is easy enough to judge. But in judging of sizes without a comparison the eye ever so well educated is liable to err; as, for instance, we are turning a pivot to match a jewel and measuring with a gauge indicating  $\frac{1}{25000}$  of an inch (a very good standard); our jewel hole measures  $\frac{1}{25000}$ ; for such a hole the pivot should measure  $\frac{1}{25000}$ , allowing  $\frac{1}{25000}$  for oil space. Now, the human eye, educated and practiced to this, will err 3 or 4 one twenty-five hundredths of an inch; as, suppose we are turning the above pivot, we turn until the eye says you are quite small enough, and on measuring we will find on such extreme fine measurements that nothing beats the tool to measure with, and that the eye cannot be depended on. But in this case we have a comparison; but in the pivot case we had no pivot alongside to compare with. To enable us to judge just how much we are to remove, we will grind a round file to an extreme fine sharp point, and scratch the steel on each side of the pallet stone to correspond to the line *c*.

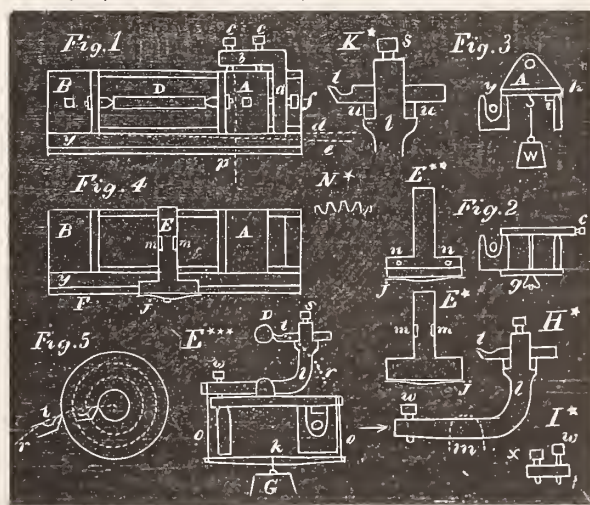
A useful little tool is a diamond point set in a piece of steel wire at figs. 3 and 4. In *bort*, such as one buys for jewel grinding, one will find small splinters of diamond, which, by careful setting, will form a point by which the pallet stone itself can be marked with a fine scratch. But in grinding the scratch must be cut away, as it (if left) would be constantly cutting the teeth of the scape wheel. In breaking up old diamond cap jewels it is quite easy to select a fragment which can be set up. For such a tool take a bit of steel wire about  $\frac{1}{16}$  of an inch in diameter and turn it up to a conical point as shown enlarged at fig. 4, and drill a hole in the end to match the size of your diamond splinter; into this the fragment of diamond can be burnished in, and, if necessary, can be still further secured by brazing. That is, if brass filings and borax be applied at and around the diamond splinter, the brass can be fused without injury to the bit of diamond. Such a diamond splinter can be used to reduce the size of hole jewels, but this is not under consideration at present. The corrections which a skillful workman can make to an escapement would make the ordinary "practical watchmaker" open his eyes—nine-tenths of the trouble with old watches lies in the escapement. Most of the train troubles are soon discovered and corrected, but the mystery of the escapement—the *angles*, and the *lock* and the *drop*—"O, glory," said a watch *destroyer* to me, "that's what gets me." His idea was a *practical man* did not need any such nonsense as to understand the principles of the machine he was called upon to clean and repair. When the fact is, the practical man is precisely the one who should understand all this nonsense, and the "Model" I've preached and sung about so often in these papers is precisely the thing by which such knowledge is to be obtained—not the *only* way but the best way. In correcting lever escapements which have too much drop, we must put in new pallet stones; although generally in club tooth escapements if one pallet is corrected it will answer—but don't understand this will do if both are equally faulty, for this is not what I mean. What I mean is generally one pallet is very bad and the other one will answer after the first one is corrected. For if we sought to remedy all the faults of many of our cheap watches, the melting pot would be the first thing to use. In testing a watch for a thin pallet which can be considered as causing too much drop (although the fault may be in the tooth, if a club tooth, but as it can be remedied by correcting the pallet we call it all the fault of the pallet), we proceed as follows: We put a slight friction under the balance and revolve it so as to unlock the escapement and see if the tooth falls too far after being released from the pallet, and also notice from which pallet the most drop takes place, so as to be able to select which one is most in need of correction. Here, again, we must in a great measure depend on the judgment; but we know the drop should not be more than  $1\frac{1}{2}$  degrees, and here again the eye has a comparative standard, *i. e.*, the drop should not be much more than  $\frac{1}{4}$  of the angular motion of the tooth when acting on the impulse face of the pallet, or about  $\frac{1}{2}$  of the angular motion (12 degrees) from locking face to locking face. Some years ago (1876, I think), a reward was offered in England for an instrument to practically measure such angles, but as far as the writer's knowledge goes the prize was not awarded, or at least nothing has come into use. The way to correct the thin pallet is to put in a new pallet stone which will hold the scape wheel longer, and, of course, convey more train power to the balance; but we shall have to leave this to our next communication.

## Lathes and Lathe Work.

BY THE MODEL WATCHMAKER.

BY HAVING both of the heads provided with a spring as described in last article, we can move either head in the direction of the axis of the lathe readily. It is only very seldom, however, one wants to turn any work but such as is perfectly cylindrical, but by having

the heads loose a slight taper can be given with great facility. By having an L-shaped piece placed as shown at *a b*, fig. 1, the head *A* can be moved either to advance in the direction of the axis of the lathe, or to set the head to turn taper. If the latter is to be done a straight edge should be used to line up the front of their heads so as to change from the position shown by the dotted line *d* to *e*. The L-shaped piece just mentioned is secured to the ways by a screw and thumb nut, as shown in fig. 2 at *g*. At *c c* and *f*, fig. 1, are screws which serve to hold the head *A* in any position desired. In lathe work it is frequently desirable to hold a head in place with a weight. And the same is true of the slide rest. We will first consider how steadiness is to be obtained with, say, the head *A*. At fig. 3 is shown a cross section of the ways of the lathe on the line *p*, fig. 1. At *h* is shown the spring for holding the guide *i* firm against the rear way. This spring should be quite strong so as to represent a pressure of 15 or 20 pounds. If we now suspend a weight from the head *A* as shown at *W*, fig. 3, we will have the head *A* held securely in place, first by the spring *h* and then by the weight *W*. Now, if the L-shaped piece shown at *a b* is applied as described, we can, by means of the screw *f*, force the head *A* with its center against the cylindrical piece *D* we are supposed to be turning. Now, this arrangement may seem insecure to those who have had no experience with similar lathes, but it will be found perfectly steady against any chip which should be taken. Now, with this arrangement, a slight taper can be made by moving the head with the screws *c c* (understand please); this arrangement does not do away with the clamping of the head *A* to the ways as before described, but shows how the head *A* can be moved and manipulated. We will next describe the simplest form of slide rest known to the writer. The principal piece of the slide rest is T-shaped, with the top of the T sliding on the front way (*F*) of the lathe bed as shown at *E*, fig. 4. The slide, as we shall term it, is planed or filed flat on the lower side, and has a guide *n* screwed to this lower side which runs against the inner edge of the front way *F*. To keep this guide pressed firmly against the way *F* is provided a spring *j*, acting on the same principle as the spring shown at *h*, fig. 3. This spring *j* is not absolutely necessary as two guides could be attached to *E* so as only to permit the way *F* to slide between, but it would require extremely nice fitting to so



make and fit the parts that there would be no side shake. But by means of the spring *j* the guide *n* is kept firmly pressed against the way *F* and all shake avoided. The manner of holding the tool is very simple and is fully illustrated in diagrams *E*. In fig. 4, the T-shaped slide is shown in position as seen from above. At *m m* are two lugs protruding upwards, shown in fig. 4 and also in diagrams *E\** *E\*\*\**; these lugs support the piece *l* which carries the turning tool. The lugs *m m* are directly under the axis of the lathe and are pierced for a taper pin on which the tool carrier *l* turns, or swings back and forth at right angles to the axis of the lathe. It will be seen that the tool shown in diagram *E\*\*\** at *t* will swing on the circle shown at the dotted line *r*, and be presented to the piece to be turned at nearly right angles to a radial line. This will be

better understood by inspecting fig. 5, which is an enlarged diagram of the position of the work and tool. The several dotted circles showing the position of the tool in cutting when applied to cylinders of different sizes. A weight of about 20 pounds will keep the slide in position and also keep the tool pressed in to its work; the weight is suspended so that half the pressure is on the tool and half on the slide—although really *all* is on the slide—but one-half the weight presses the tool forward. If the axis of the pin on which the piece *l* turns is parallel to the axis of the lathe, the end of a cylinder in the lathe can be faced off perfectly square, and by turning the guide *n*, diagram *E\*\**, a little of the ends can be undercut, but the undercutting will be slightly concave, but not enough to be of any disadvantage where undercutting is necessary. The advance of the tool is made by means of the screws shown at *w x*, diagrams *H\** and *I\**. Diagram *H\**, showing *l* (except being detached) precisely as diagram *E\*\*\**. Diagram *I\** is a view of *l* seen in the direction of the arrow in diagram *H\**. The use of two screws, *w x*, is in cutting screws; we will suppose the regular advance is made by unscrewing the screw *x*, and that the tool *l* is permitted by the screw *x* to cut a chip of a sufficient depth in the job *D*. We now turn the screw *w* so that *x* does not touch, and consequently the tool *l* is thrown out. Now, if the lathe is reversed the tool will go back without touching. If the screw *w* is turned back the tool *l* will not cut until *x* is turned, and so on the screw *w* serving to lift out the tool *l*. Now we get to moving the slide *E* by means of a screw shown at *y* figs. 3 and 1. This screw has been mentioned in former articles, and we will leave it rest until we arrange our wheels for turning it. These wheels can be bought at comparative small cost or they can be made. I will first tell how to make them, and then tell where to buy and how much they ought to cost. The feed screw *y*, is to have 10 threads to the inch, and the advance of the tool in ordinary turning should be about  $\frac{1}{10}$  of this speed or 100 to the inch, *i. e.*, the job in the lathe should turn ten times to the feed screw once; consequently we must arrange our gear in this proportion. We must dispose our wheels so we can readily reverse and also cut screws of different pitch. The writer feels half disposed to apologize for the seeming length to which this description of an entirely accessory lathe—for it is evident for the ordinary watchmaker directly to have use for such a lathe is nonsense, but he can use it indirectly in a hundred ways. Again, some workmen would say—"I can buy a good screw cutting lathe for 50 or 60 dollars, and why bother and spend time to make one." To such a remark I would beg to say, you cannot buy an *accurate* screw cutting lathe for less than \$250, and then you can not do the range of work on it you can on this simple and comparative inexpensive lathe. Wheels for the feed can be made of zinc very easily, first casting them in round buttons or discs and then cutting teeth in them. In cutting teeth in zinc or even brass wheels it is not necessary to have a revolving cutter; teeth can be cut by the same motion as a metal planer or shaping tool, *i. e.*, a cutter shaped like the tooth but acting as a graver, cuts teeth very rapidly and accurately. In gear in this manner it is better to adopt a tooth shaped as shown in diagram *N\**, than to use teeth shaped like the teeth of clocks and watches, and in the present instance this form of tooth is quite as good. The manner of cutting and spacing will be in our next.

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## Foreign Gossip.

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**GOLD FROM ALASKA.**—South-bound steamers from Alaska take each trip, during the summer months, from \$10,000 to \$50,000 worth of gold dust.

**FOR AGUE-STRICKEN WATCHMAKERS.**—A European exchange says that honey is the best vehicle for administering quinine, where the flavor of that alkaloid tends to produce nausea.

**HOROLOGICAL.**—Forty-eight patents were issued in France for improvements in watches during the year 1881, and still our gold hunting case timekeeper varies five minutes per 24 hours. "There's something emphatically wrong."

**DEATH OF AN EMINENT MAN.**—The death is announced from Paris of M. Barral, the well known chemist, a friend and fellow-worker of Arago and A. von Humboldt. He was also known as an enthusiastic and daring balloonist.

**HE WENT HOME.**—Prof. Chandler Roberts, who has been paying visits to the mining districts of Colorado and Nevada, as well as the mints and assay offices of the United States, has commenced his metallurgical lectures at the Royal School of Mines of Birmingham.

**GOLD IDOL EXCAVATED.**—A gold idol, weighing thirty-two pounds, was recently excavated in Calistiahuaoa, a State of the Mexican Confederation, by some Indians. The idol was composed of a group of figures, but it was broken up by the Indians and divided equally.

**ANOTHER CENTENNIAL.**—Dr. Carlos Faremba, of Mexico, has addressed a circular letter to all the representatives of foreign governments now in Washington, advocating the celebration of the discovery of America on its four hundredth anniversary, October 12th, 1892, and the erection of a monument on the spot where the first landing was made.

**OPENING OF A NEW TUNNEL.**—The Arlberg Tunnel was opened in September, and affords a direct railway communication between Paris and Vienna, via the Tyrol and the Vorarlberg. The first-class return ticket costs £10 17s 6d. The tunnel is 6.8 miles long, and now that it is completed, engineers are reviving the scheme for driving another tunnel through the Splügen.

**INFINITISSEMAL.**—An illustration of the way in which a coefficient like 0.000006, the coefficient of expansion of steel, may become a big thing with a few degrees and long lengths, has been demonstrated on a new line of track, laid last winter on the continent. The rails were laid during winter time, and insufficient room was left for expansion; consequently, last summer's heat lately expanded the rails to such an extent that the road bursted out of line.

**"THE CONNECTING LINK."**—At a course of lectures on Biology, delivered last month at the Mason College, Birmingham, Professor Hilhouse discoursed on the physical basis of life, illustrated by the "flowers of tan," a creamy slime which creeps over the surface of decaying tan heaps, and exhibits the power of motility, internal and external, by means of which it avoids strong light, and moves in the direction of the source of water, while it climbs up stems and leaves, in defiance of the laws of gravity.

**THE FIRST CLOCK.**—The first clock which appeared in Europe was probably that which Eginhard (the secretary of Charlemagne) describes as sent to his royal master by Abdallah, King of Persia. "A horologe of brass, wonderfully constructed for the course of twelve hours, answered to the hour-glass with as many little brazen balls, which drop down on a sort of balls underneath, and sounded each other." The Venetians had clocks in 872, and sent a specimen of them that year to Constantinople.

**CASTELLANI COLLECTION.**—The recent sale, in Rome, of the Castellani collection, calls to mind an incident showing the value of a name, sometimes, especially if the name be that of an expert, such as this distinguished Italian goldsmith. About the year 1870, Photiadis Pasha picked up for £16, in Constantinople, the wonderful bronze head, variously called Artemus Niké, or Venus Victrix, and offered it to the British Museum for £500. The offer was declined. Castellani bought it, and a year or two later sold it to the British Museum for £8,000. The head is of heroic size, and is evidently of the best period of Greek art. It stands in the Bronze Room in the Museum, and is worthy of careful study. Hollow spaces are found in place of the eyes, and yet the sculptor has given them a decided expression.

## Workshop Notes.

**FICTITIOUS SILVER.**—No. 1. Silver, 1 ounce; nickel, 1 ounce, 11 dwts.; copper, 2 ounces, 9 dwts.; or, No. 2. Silver, 3 ounces; nickel, 1 ounce, 11 dwts.; copper, 2 ounces, 9 dwts.; spelter, 10 dwts.

**MEM.**—Nothing proclaims the skillful workman as well as the finish of a new article. Always make the best finish possible; nothing succeeds as well as a good shine. Your customers demand it in everything and it is a good sign. Encourage it all you can; condemn the botch that sends out work without finish. A well arranged set of polishing tools saves much time; keep them always in good order, and remember to exclude dust and dirt.

**BALANCE SPRING.**—The study of the balance must ever be of the greatest importance to the watchmaker; because with it chiefly is he able to control the rate of the watch. Debating the different kinds of springs, Mr. Britten says that the great advantage of an over-coil spring is that it distends in action on both sides, and the balance pivots are thereby relieved of the side pressure given with the ordinary flat spring. The Breguet spring, in common with the helical and all other forms in which the outer coil returns toward the center, offers opportunities of obtaining isochronism by slightly varying the character of the curve described by the outer coil, and thereby altering its power of resistance.

**RELATION OF MAINSPRING TO BARREL.**—If we wish to have a mainspring theoretically adjusted, there is no better method than simply to allow one-third empty space, one-third for the barrel arbor and the remainder for the spring. When a spring is at rest on the barrel, at either side of the arbor it should occupy one-sixth of the barrel's inside diameter. If we divide a barrel into sixty equal parts, we should always see that the barrel arbor is just twenty of these parts. It is a great mistake to have a barrel arbor too small, for when such is the case it is almost sure to break the mainspring if the center is at all stubborn, as is very often the case with the cheap class of mainsprings in market.

**CUTTING SCREW THREADS.**—It is quite a knack to make a nice screw, and beginners are generally apt to use too much force when cutting the thread. If the spindle has been turned too large for the hole in the screw plate there is danger of breaking the screw plate, which is very hard, and pieces will chip off; again, the piece to be tapped is apt to break and stop up the hole in the plate, thereby entailing the tedious job of drilling the piece out and cleaning the thread. It is better to begin with a hole much too large and working down gradually. It is natural that a certain amount of force must be employed, and a little practice will soon teach the beginner how much to insure a full good thread. Now, put the screw back in the lathe, and turn the head a little more than the required thickness, and cut the screw off by turning a groove above.

**CLEANSING SOILED CHAMOIS LEATHER.**—Every workshop contains at least one dirty wash leather, which is generally thrown away for want of knowing how to cleanse it. Make a solution of weak soda and warm water, rub plenty of soft soap into the leather and allow it to remain in soak for two hours; then rub it well until quite clean. Afterward rinse it well in a weak solution composed of warm water, soda and yellow soap. It must not be rinsed in water only, for then it would be so hard when dry as to be unfit for use. It is the small quantity of soap left in the leather that allows the finer particles of the leather to separate and become soft like silk. After rinsing, wring it well in a rough towel and dry quickly, then pull it about and brush it well, and it will become softer and better than most new leather. In using a rough leather to touch up highly polished surfaces, it is frequently observed to scratch the work; this is caused by particles of dust, and even hard rouge, that are left in the leather, and if removed with a clean brush containing rouge, it will then give the brightest and best finish, which all good workmen like to see on their work.

**CLOCK REPAIRING.**—Another essential point to be attended to, says Chauncey Jerome, in his directions for keeping clocks in order, is that the rod should hang in the center or very near the center of the loop in the crutch wire which is connected with the verge, and for this reason if it rubs the front or back end of the loop, the friction will cause it to stop. To prevent this, set the clock case so that it will lean back a little or forward as it requires. It sometimes happens that the dial (if it is made of zinc) gets bent in, and the loop of the crutch wire rubs as it passes back and forth. This should be attended to. It should be noticed, also, whether the crutch wire gets misplaced so that it rubs any kind of a dial; the least impediment here will stop a clock. The center of the dial should next be noticed. It sometimes happens that the warping moves it from its place so that the sockets of the pointers rub, and many times it is the cause of the clock's stopping; this can be remedied by paring out the center of the side required.

**PUTTING IN TEETH INTO WHEELS.**—To put in teeth in watch or clock wheels without dovetailing or soldering them, drill a hole somewhat wider than the tooth square through the plate, a little below the base of the tooth; cut from the edge of the wheel square down to the hole already drilled; then flatten a piece of wire so as to fit snugly into the cut of the saw, and with a light hammer form a head on it like the head of a pin. When thus prepared, press the wire or pin in the empty space of the wheel, the head filling the hole drilled through the plate, and then projecting out so as to form the tooth; then with a sharp pointed graver cut a small groove each side of the pin from the edge of the wheel down to the hole, and with a blow of your hammer spread the face of the pin so as to fill the groove just cut. Repeat the same operation on the other side of the wheel and finish off in the usual way. The tooth will be found perfectly riveted in on every side and as strong as the original one, while in appearance it will be equal to the best dovetailing.

**HOW TO FILL A TUBE WITH MERCURY.**—Having got the tube which is open at one end (narrow end), heat the bulb in a flame; in doing this the air in the bulb expands, but the other end of the fine tube being open the expanded air gets out through this end. Next, before the air has had time to cool, plunge the open end of the tube below the surface of a vessel containing mercury. As this air cools it shrinks into less bulk, and the pressure of the air from without drives the mercury to occupy the vacant space. Part of this mercury will therefore be driven into the bulb. We next take the bulb with the mercury in it, and heat it well above the flame of a lamp, bulb, tube and all. The mercury will soon begin to boil, and its vapor will be driven out and the air before it, until bulb and tube will both be filled with vapor of mercury. When this is done we plunge the open end of the tube once more into a vessel of mercury. As there is only vapor of mercury in the tube, when this cools it will condense, and the mercury in which the instrument is plunged will go into the bulb and tube and it will be filled.

**GOLDLIKE VARNISH.**—An excellent gold varnish which gives bronze the color of gold is prepared in the following manner: Three ounces of bright gum-lac is dissolved in 2 pounds best alcohol, and tintured either with annatto or gamboge; the first gives it a handsome dark gold, the latter a lemon-yellow color. The bronze to be treated is slowly heated over a charcoal fire, left to cool a little, and then dipped into a mixture of 3 parts water and 1 part nitric acid, and left in it until entirely black, which requires about one or one and a half hours. Then take it out, brush it with a stiff brush and dip into strong nitric acid; seize it with copper tongs, as those of iron or steel are very injurious. When the black coating of the first immersion has entirely disappeared, take out the bronze, rinse it off clean in lukewarm water and dry in sawdust. The operator must be cautioned that the smallest piece of iron in the bronze will ruin the whole piece, by showing itself in the shape of a large black spot which cannot be removed or covered. When the piece has been thus treated, it is laid upon a red hot iron plate until so hot that it would burn the hand. Apply the varnish in one or several coats.

## Trade Gossip.

A. D. Linsley, of Lena, Ill., has recently sold his business.

George F. Gleason has retired from the firm of Field & Co.

John F. Luther, manufacturer of emblems, pins, etc., has removed to No. 89 Nassau street.

J. J. Fisher will remove on February 1st, from 695 and 697 Broadway to No. 1 Maiden Lane.

M. D. Rothschild, of L. & M. Kahn & Co., sailed for Europe in the *Werra* January 25, in the interests of his firm.

E. W. Reed, of the firm of E. W. Reed & Co., of Fort Collins, Colorado, was in New York recently making purchases.

Mr. "Joe" Doty, well and favorably known in the jewelry trade, entered the noble band of Benedicts Wednesday evening, Jan. 21st.

Henry Durlach, formerly with H. Hahn & Co., is now located with Isaac Durlach, his father, in importing diamonds at 49 Maiden Lane.

In the celebrated Muzo emerald mines at Boyaca, an emerald has been found weighing in the rough over one pound, the largest ever discovered.

Albert Lorsch announces that he has admitted to partnership in his business Alfred Krower, who has been many years associated with his house.

Jacob W. Grubb, of Wheeling, W. V., a member of the jewelry trade, was recently elected mayor of that city, being the first Republican who has held that office for twenty years.

Julius King, M. D., manufacturer of optical goods, of Cleveland, Ohio, has opened a branch office in this city at No. 4 Maiden Lane, which is in charge of Leo Wormser as manager.

Justus Heilbrun, importer of diamonds and precious stones, sailed for Europe in the *Gallia* January 14. His trip abroad is for the purpose of buying diamonds, etc. for this market.

E. E. Kipling, the well known importer of precious and imitation stones, has admitted his brother, Arthur W., to an interest in the firm, which will be hereafter known as E. E. & A. W. Kipling.

Joseph B. Mayer, importer of diamonds, of Buffalo, N. Y., has just returned from Europe, where he has spent some time selecting diamonds for his home trade. He returns with a choice line of gems.

Mr. John O. Slemmons, of Pittsburgh, Pa., of the firm of Hodge, Slemmons & Co., was married January 20th to Miss Spaulding, daughter of Rev. Dr. Spaulding, Rector of Christ Church, Jersey City.

A pearl weighing ninety-three karats and valued at \$17,000 was shipped to London from Mexico recently. It is believed to be the largest in the world. It was purchased from an Indian, who found it at Mulleje, Lower California, for \$90.

H. G. Thresher, for many years traveler for Waite, Smith & Co., of Providence, has been admitted to a partnership in the firm. His place on the road will be supplied by L. W. Sweet, who has long been identified with W. S. Hough, Jr., & Co.

The firm of Hüger & Heitlinger have dissolved. Mr. Heitlinger has formed a co-partnership with Wm. Keer under the firm name of Keer & Heitlinger. Mr. Hüger will succeed the old firm and continue business at 23 Marshall street, Newark.

A large new clock has been erected in the church of St. Michael's, near Ashford, Kent, England. It has two dials 4½ feet in diameter, and is fitted with Dennison's Gravity Escapement, and other modern improvements. The church has also been enriched with a new bell.

At a recent meeting of the Newark Board of Trade, a vote of thanks to the President, James W. Miller, of Miller Bros., was unanimously passed. The resolution complimented Mr. Miller highly on the wisdom and ability he had displayed in conducting the affairs of the Board.

The jobbing trade have been represented during the past month in New York by Messrs. Otto Young, Theodore Kearney, Samuel Swartchild, Adolf Shakman, of Chicago, A. Herman, A. Schwab, I. Amberg, L. Strauss and A. Plaut, of Cincinnati, Aug. Kurtzeborn, of St. Louis, Mo.

Messrs. Thayer & Ellis, of Toronto, Canada, have been in town during the past month. These gentlemen have for many years been identified with the jewelry business in Canada, and have now formed a co-partnership for the purpose of doing a general jobbing business in watches, jewelry, etc.

Stern Bros. & Co. have just introduced some novelties in the way of electrical jewelry, which are both attractive and surprising, among which is an electrical scarf pin which works perfectly. They are having a ready sale. The headquarters of the electrical branch of their business is 61 Nassau street.

Wm. Butt & Co., of Providence, have opened a New York office at No. 176 Broadway, which will be under the supervision of Wm. D. Carrow, late of the firm of Carrow, Bishop & Co. Butt & Co. have recently largely increased their manufacturing facilities, and offer an extensive line of jewelry of all kinds.

The firm of Herzog Bros. have retired from the jobbing trade and have formed a co-partnership with V. Nivois (successor to A. Guinand, established 1842,) under the firm name of The New York Gold Watch Case Co., and will continue to make a very large and attractive line of gold watch cases for the jobbing trade only.

Charles Dunsler, a blacksmith, of Leesville, Ohio, has made a clock, mostly with blacksmith's tools, which has excited considerable comment in his neighborhood. It is principally of steel and in a glass case so the movement can be seen, and gives the time in eleven cities, striking the hours and quarters, and is seven feet high.

We learn that Mr. Julius King, of Cleveland, has secured the services of Mr. Ed. L. Creveling, who will call on his eastern trade, representing the New York office lately established at No. 4 Maiden Lane. Mr. Creveling has been for the past years associated with the optical trade. His many friends wish him the success he deserves.

Samuel Swartchild, formerly of the firm of Kearney & Swartchild, has opened a wholesale watch, material, tool and optical goods store at 71 Washington street, Chicago. Mr. Swartchild has been identified with this branch of the trade for so many years that he is well known and knows what the trade requires, and will make a success of his undertaking.

George W. Ludwig, of Chambersburg, Pa., keeps a well selected stock of goods, and knows how to let the public know. He is a liberal advertiser in the local papers, and, as a consequence, receives many editorial notices. What doth it avail a man to have a good thing unless he lets people know? Ludwig is a good example of an enterprising local dealer, and we hope he is making money.

R. N. Peterson and G. W. Royce have recently entered into co-partnership, and taken offices at No. 189 Broadway, where they will engage in business as importers of and dealers in diamonds. Mr. Peterson was connected with the firm of Baldwin, Sexton & Peterson for over thirty years. Mr. Royce was also connected with the same firm for several years in the capacity of bookkeeper and salesman, but for the past year has represented the firm of E. Aug. Neresheimer & Co.

L. A. Cuppia, whose fine silver jewelry, cane heads and umbrella handles are favorably known to the trade, has a choice collection of silver bracelets of his own manufacture, and embracing the popular bangle bracelet in a diversity of styles. These goods are noticeable because they combine original designs with artistic finish. The same may truly be said of a full line of lace pins and hair pins. Recent importations of Italian silver filigree jewelry affords unusual range for selection, the patterns being unique and the workmanship very fine. Silver watch chains, for which there exists at present a demand, show all the desirable designs produced in gold chains.



Charles Knapp, of 41 Maiden Lane, has secured the property Nos. 41 and 43, and the lots in the rear of them, and will convert it into a six-story building, covering all the ground, designed especially for stores, offices and workshops for jewelers. It will be so arranged as to give each room abundance of light and ventilation, while elevators will afford convenient access to them. Such a building is much needed in the Lane.

The Khedive of Egypt is always hard up; but a few weeks ago he became a little harder up than usual, and sent a chest of jewels to Paris to be sold for the highest price in cash. In the meanwhile a debtor came in unexpectedly and paid up every cent of his indebtedness, although the Khedive had for a long time mentally marked "n. g." opposite his name. The Khedive being now "flush" sent post-haste after his jewels, and they are now on their way back to Egypt.

The annual banquet of the Chicago Jewelers' Association was held at the Grand Pacific Hotel on the evening of January 8. It was largely attended by members of the Association and invited guests, and a pleasant evening was spent in the enjoyments of the table and listening to the eloquence of the gentlemen selected to respond to the numerous toasts. The banquet hall and tables were elegantly decorated, and music and flowers added zest to the occasion, which was a thoroughly enjoyable one throughout.

A Paris jeweler has been prosecuted for illegally practising surgery. He had pierced the ears of a child two years old for ear rings, for which he charged half a franc. The ear became inflamed, the inflammation spread to the neck, and the child died, the doctor attributing death to the ear having been pierced too high up. The defense was that all jewelers pierced ears, and that the mother must have used some injurious lotion. The jeweler was fined 50 francs for homicide through imprudence, with 150 francs damages to the parents.

The cutting of the Cleveland gem is completed. It was begun on the day following election and was completed on Saturday, January 24th, making continuous work for eighty-one days. The wearing away and polishing of one facet took from four hours to a day, and the stone was cut with 128 facets, which accounts for the long time required. It weighs  $42\frac{1}{4}$  karats. The Koh-i-noor weighs about 136 karats, but is not of perfect shape. The local gem will be shown to Gov. Cleveland and then goes to the New Orleans Exposition. We congratulate Mr. S. Dessau, the owner of the diamond, upon the success he has met with in cutting this stone, as it was all done in his own shop.

H. Muhr's Sons, of Philadelphia, have issued their fifth annual greeting to the trade, in the form of an elegant lithographic calendar. It is composed of twelve cards, each containing an appropriate illustration of the season and the calendar for the month. It is handsomely printed in lithographic colors, and, besides forming a convenient calendar for reference, embraces quite a catalogue of goods sold by them. This firm has at the New Orleans Exposition a very complete and attractive exhibit, embracing, besides an elegant display of desirable goods, a complete workshop, with workmen at their benches turning our work. The exhibit attracts much attention, as it deserves to.

The New York Jewelers' Club held its annual meeting and election, Tuesday, January 13th, at which time Mr. B. W. Ellison was, for the third time, elected President. Messrs. Jacob Marx and T. L. Parker were elected respectively 1st and 2d Vice-Presidents, M. J. Lichtenberg, Secretary, and E. Untermeyer, Treasurer. The following named gentlemen will compose the Executive Committee for the ensuing year: Robert A. Johnson, J. W. J. Pierson, Wm. Bardel, J. W. Senior and J. C. Rising. A committee was appointed to take into consideration the question of having a benefit society in connection with the Club, and present the results of their labors at the next meeting.

The annual meeting of the Jewelers' Safety Fund Society was held on January 14, at which time the following officers were elected: Henry Hayes, President; S. W. Saxton, Vice-President; Ira Goddard, Secretary and Treasurer. Directors—Enos Richardson, Chas. G. Alford, Henry Randel, Ira Goddard, Henry Hayes, Samuel C. Scott, S. W. Saxton, Jas. C. Aikin, Wm. R. Alling, F. S. Douglas, S. Oppenheimer. The Society was reported in very good condition.

A Nashville paper says, that "not in all the South, not excepting New Orleans, Louisville or St. Louis, is there a jewelry house that can surpass, if equal, the taste, elegance and general attractiveness of the house of F. L. Davies & Bro., corner Union and Cherry streets, dealers in jewelry, diamonds and fine art goods, and their patrons are among the wealthiest, most aristocratic and discriminating ladies and gentlemen of the South." A lengthy description follows of the attractive goods exhibited by this firm.

A. C. Smith, manager of the New York office of Robbins & Appleton, agents for the American Watch Company, has been promoted to be general superintendent of the gold and silver case manufacturing department of the American Watch Company. S. H. Hale, who has had charge of the western business of Robbins & Appleton for many years, with headquarters at Chicago, will succeed Mr. Smith as manager of the New York office. These gentlemen are men of energy, capacity and thorough familiarity with the requirements of the business.

The ophthalmoscopic test lense, manufactured by the Spencer Optical Company, is giving great satisfaction. This instrument not only measures each eye separately—an important feature—but it is so simple in its construction that any one with average intelligence after a little study, can detect optical defects and select the lenses required for their correction. Another useful article to jewelers is the new pebble tester that works instantaneously, and is warranted correct. Celluloid spectacle and eye-glasses, which gain speedy popularity wherever introduced, are largely manufactured by this firm. A specialty is the celluloid eye-glass frame with triple adjustment. The Spencer Optical Company will be represented this year in the different sections of the country by E. T. Badoux, W. W. Smith, H. H. Cushman, H. Vincent, J. H. Gale, A. Marscheutz and G. H. Briscoe.

Of an iron egg in the Berlin Museum, the following story is told: Many years ago a prince became affianced to a lovely princess, to whom he promised to send a magnificent gift as a testimonial of his affection. In due time the messenger arrived, bringing the promised gift, which proved to be an iron egg. The princess was so angry to think that the prince should send her so valueless a present that she threw it upon the floor, when the iron egg opened, disclosing a silver lining. Surprised at such a discovery, she took the egg in her hand, and, while examining it closely, discovered a secret spring which she touched, and the silver lining opened, disclosing a golden yolk. Examining it closely, she found another spring, which, when opened, disclosed within the golden yolk a ruby crown. Subjecting that to an examination, she touched a spring, and forth came the diamond ring with which he affianced her to himself.

One of the features of the banquet given at Young's Hotel, Boston, by the foremen of the American Watch Company, of Waltham, was the circulation of a neatly printed four-page burlesque paper called "The Foremen's Evening Bladder." It was full of jocular hits at the managers and employees of the company, written in a good natured vein which none of the victims could possibly construe into an affront. Even the two large pages of advertisements were in the nature of jokes, representing the factory foremen, agents, etc., as engaged in keeping billiard saloons, concert halls, junk shops and such other occupations as one finds conspicuously advertised in country papers generally, all wittily worded and fitted to the individual advertisers respectively. It was received in the same good natured spirit in which it was conceived. The description of the examination of "The First Class in Theology, Horology and Taffy-ology" was particularly well done and exceedingly laughable.

The second annual dinner of the Foremen's Association of the American Watch Company, of Waltham, was given at Young's Hotel, Boston, on the evening of January 3. Among the invited guests were the following named gentlemen, representing the management of the Company: R. E. Robbins and C. H. Tausey, Boston; E. C. Fitch, S. H. Hale, Chicago; A. C. Smith, New York; and Alfred Bedford, London. The *menu* was an excellent one, and all did justice to the good things provided. With the advent of cigars came the speeches, which sparkled with wit and good natured hits of a local nature. Music and singing were pleasant features of the entertainment. Besides the ordinary *menu* cards used at the supper, at each plate was found what appeared to be a fine watch in composition case. It had a dial, and the hands indicated the time at which the company sat down to supper, so that many thought they had been presented with a nice watch. Soon the discovery was made that the watch did not "go," and an investigation of its interior showed that its "movements" consisted of the *menu* printed on silk—which made one of the most appropriate features of the occasion.

H. M. Longhead, of Marinette, Wis., writes as follows: "I have a clock which cannot help but be a great curiosity to your readers. It is an old grandfather clock and was brought from the old country. It is a musical clock, or, you might say, it has a hand organ in the top. It is 235 years old, will keep good time, and it is the only one of its kind in America. The movement is made of wood, lead, iron, etc. The weight that runs the musical part weighs 50 pounds. It plays a piece every hour, but it is rather hoarse at present from old age, or perhaps this cold country has some effect on its lungs. The dial is large and has the paintings of William Penn describing his history, etc. At the top are five wooden musicians dressed in uniforms, who raise their instruments to their lips as they begin to play. It is novel and curious; the case is 7 feet high, 2 feet square, made of maple and mahogany, and a very ancient looking piece of work. It was made in the year 1649, and was brought to this country in 1847 by a party of immigrants, being the only timepiece brought with them. I have it at present at Lapp & Flershem's, 81 State street, Chicago, where anyone in the city can call and see it. It will well repay them, for there is no white elephant about it."

The following is the apology referred to in "Monthly Gossip," which is printed in the London trade journals. We print it as a trade curiosity: "To the Guardians of the Standard of Wrought Plate in Birmingham: Whereas I, the undersigned Frederick Narborough, of 53 Green street, Deritend, Birmingham, manufacturer of mounts for whips, walking sticks and umbrellas, as I hereby admit, have caused additions to be made to certain articles of silverwares—namely, mounts, collars or ferrules, for walking sticks and umbrellas, after such wares had been assayed and marked by you, by placing linings of base metal inside such wares, such additions being contrary to the statute in force with reference to the assay of gold and silverware. Now, I beg to say that such additions were made by me in ignorance of the law on the subject, and not with the intention of breaking such law. I therefore humbly apologize to you for the offences so committed. And if you will discontinue the action you have commenced against me in the Chancery Division of the High Court of Justice, claiming an injunction and to recover penalties in respect of such additions, I undertake to hand you the whole of such articles now in my possession to be broken up, to pay you a penalty of £10 and to pay all the costs, charges and expenses you have incurred with reference to the said action. And I also undertake that I will not hereafter make any additions by adding metal linings to any silver mounts, collars or ferrules made by me after they have been assayed and marked at your office. I further agree that you may publish this apology in such way as you may think desirable. Dated the 26th day of November, 1884. F. Narborough. Witness, Thomas Martineau, Law Clerk to the Assay Office, 7 Cannon street, Birmingham."

A very poorly dressed young man, carrying a basket on his left arm, and a short heavy piece of plank in his right hand, stepped up to the show window of Kirchberg's jewelry store, Chicago, recently, while the street was yet crowded with pedestrians. The store was in charge of Miss Annie Marrow. Suddenly the young man raised the plank and brought it down on the big plate glass show window. He then coolly filled his basket with the jewelry displayed in the window. The audacity which characterized the robbery bid fair to assist the thief to escape with his plunder. A gentleman who from the opposite side of the street had witnessed the youth's action rushed after him, and seizing the fellow held him until in a moment afterward an officer came up. When the basket was emptied of its contents, it was found to contain thirty-two gold watches, two trays of gold watch chains, two trays of watch charms and a number of diamond rings. The property is worth \$3,000. The prisoner gives the name of Oscar Hall.

The Providence Board of Trade is working successfully and satisfactorily. The efforts to form such organizations in trade circles are always subject to criticism when first put forth, and many who are likely to be benefitted hold aloof until they can see "how the thing works." This was the case in Providence, but the necessities of the situation demanded such an organization for the protection of trade interests, and now that it has been formed and has entered upon the good work proposed, it meets with the approval of the best houses in the trade in Providence and vicinity, and these constitute a majority of the whole. There is every reason to believe that the Providence Board of Trade will do a good and much needed work in the field it has marked out for itself. The officers selected have the confidence of the members to the fullest extent, which is a necessary factor in making the Board a success. We congratulate the trade on this important movement having been so auspiciously inaugurated.

The efforts to which we have heretofore alluded as being made for the formation of a Board of Trade in the jewelry interests, has taken practical shape and are meeting with substantial success. On January 15, a meeting of those who have taken a special interest in perfecting the organization, was held at 205 Broadway. There were about fifty gentlemen present, representing nearly as many different houses. Mr. S. Oppenheimer, of Oppenheimer Bros. & Veith, called the meeting to order, and briefly stated the object of the call. Mr. J. W. J. Pierson, of the E. Howard Watch & Clock Co., nominated Joseph Fahys for President, and, the vote being taken, he was unanimously elected. Mr. Fahys accepted the office and at once assumed the duties of presiding officer. Mr. S. Oppenheimer, of Oppenheimer Bros. & Veith, was then chosen First Vice-President, and Frank Richardson, of Enos Richardson & Co., was chosen Second Vice-President; Mr. William Smith was elected Treasurer. A ballot was then taken for Directors, resulting in the election of the following gentlemen, who will constitute the Board of Directors for one year: L. Strasburger, of L. Strasburger & Co.; J. W. J. Pierson, of the E. Howard Watch & Clock Co.; Wm. Bardel, of Heller & Bardel; W. F. Wilson, of John Wilson's Sons; E. August Neresheimer, of E. A. Neresheimer & Co.; L. Stern, of Stern Bros. & Co.; S. Lorsch, of Sussfeld, Lorsch & Co.; D. Untermeyer, of Keller & Untermeyer; L. Kahn, of L. & M. Kahn & Co. The organization having thus been perfected, an adjournment was taken to permit the Board of Directors to mature other matters connected with the work. Headquarters will be selected immediately in a convenient locality. James R. D. Graham has been chosen as Secretary, and will devote his time to the duties of the Board. With such an auspicious beginning, the New York Jewelers' Board of Trade should command the confidence of all firms in the city interested in the jewelry business, and it is to be hoped that the membership will be rapidly and largely increased.



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## THE JEWELERS' CIRCULAR AND HOROLOGICAL REVIEW

*The recognized organ of the Trade, and the official representative of the  
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A Monthly Journal devoted to the interests of Watchmakers, Jewelers, Silver-  
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### The Signs of the Times.

THE TIME is close at hand when, according to very general prediction, an improvement in the business conditions of the country is to be looked for. There can be no doubt but the anticipated change in the political control of the government has had a tendency to suspend enterprise temporarily to a great extent, and to foster that general lack of confidence that was begot of the financial failures of last spring. Everybody has been anxiously looking for some intimation from the President-elect as to what would be the policy of his administration. Capitalists and business men have been deterred from entering new enterprises, and millions of money that should be employed in productive industry now lies idle in the banks, simply because there is a lack of confidence in the future, engendered of the recent financial overturnings. Thus far Mr. Cleveland, President-elect, has conducted himself in such manner as to win the commendation of even those who were opposed to him politically; all his utterances and his acts indicate that he proposes to pursue a conservative policy, and to be President of a nation and not of a party. The public looked anxiously forward to the formation of his Cabinet, feeling that some conjecture relative to the future might be predicted on the character and standing of those whom the President selected as his personal advisers. By the time this issue reaches many of its readers, the President will have been inaugurated and the new administration fairly installed. Nothing of a revolutionary or startling nature has characterized the conduct of the Democratic party since its success in November, and the probability is that the government will be quite as stable and trustworthy under its auspices as it ever has been. From a political standpoint, there is nothing whatever in the way of a speedy resumption of business activity.

Already there are many indications leading to the belief that business will be quite active at an early day. Many great manufacturing industries that were suspended in whole or in part in the fall, have resumed operations; among these are iron, woolen and cotton industries, the demand for their products being reported as large and encouraging. In certain mercantile lines the trade reports a promising outlook, and the general belief is that the present year will see a revival of industry that cannot fail to bring prosperity. The jewelry trade will undoubtedly feel the effects of returning business confidence as soon as any other branch of business. The trade is in a condition to bear a very large amount of prosperity, for it has been a great sufferer during the depressed period. Notwithstanding all it has suffered, it is to be congratulated on having pulled through with so little disaster. There have been some failures, but the number is not so great as might reasonably have been expected under the circumstances. The trade is in most excellent condition to meet a prosperous "boom," for it is at present more nearly established on a cash basis than it has been in many years. Dealers have been buying few goods, have been liquidating their liabilities and are ready to stock up with new goods whenever they perceive any indication of a demand for them. A little patience exhibited now will, we believe, be amply rewarded at an early day.

### A Railroad Outrage.

THERE seems to be little prospect of a harmonious adjustment of the difficulty that has arisen between the western railroads and the travelers for jewelry houses, to which we have heretofore referred. The roads refuse to carry as baggage the trunks of travelers for jewelry houses—indeed, they refuse the trunks of any travelers where the contents are ordinarily of unusual value. Orders have been issued to all station agents not to check such trunks, nor receive or harbor them under any conditions. If a traveler wants his sample trunk forwarded he must send it by express, by express trains, and pay express charges from station to station. The objection to this is not so much the matter of extra expense occasioned by the express charges, as it is the loss of time to which the traveler is subjected. Under the old plan of checking baggage, a traveler could visit several towns on a given line of road in one day, availing himself of all kinds of trains to cover the distance, but now he is dependent upon the one or two express trains daily for the transportation of his baggage. This new order of things acts as a virtual prohibition on commercial travelers, and deprives the roads of a large amount of patronage they have heretofore enjoyed from this class of persons. The jewelers of Chicago have made every effort possible to induce the railroads to rescind this order, but without avail. They offered to waive all claims for damages in case of the loss of a trunk, but this was rejected; then they offered to insure their trunks, so that loss could not fall upon the railroad companies, but this was

rejected; in short, they have offered to relieve the railroads of all accountability for lost trunks if they would only continue to carry them as baggage. But the companies are obdurate, and refuse to make any concessions whatever. As a consequence, travelers have been compelled to resort to various subterfuges to get their baggage on the same trains with themselves, sometimes filling them with cheap clothing, as though they were traveling for a clothing house, or smuggling their sample cases into the passenger cars with them. But these subterfuges were sure to be detected sooner or later, and, besides, the trade does not like to be compelled to do things in an underhand way. The result will probably be that suit will have to be brought against some railroad company to test its right, as common carriers, to make such discrimination between the different classes of their patrons. John Smith, as a private individual, traveling for either business or pleasure, may be accompanied by a trunk as big as a barn, and have it checked as baggage to any place he desires; but John Smith, the traveler for a jewelry house, cannot carry a trunk of any size and have it checked as baggage; he must consign it to the care of an express company and pay extra for its transportation. We have said before that we do not believe the railroad companies have the right to make such discrimination. They are chartered as common carriers, and because they are expected to serve the public fairly and without favor or partiality they are given certain privileges. They also incur certain obligations which the courts have affirmed repeatedly. We trust the jewelry trade will not submit to this imposition, but will make a test case and bring it before the courts as speedily as possible. We understand that the western houses have been obliged to take their travelers off the road because they find it impossible to visit their customers, except at unusual cost, on account of this regulation. It is a matter of serious importance to them, and is an outrage to which they should not submit. If necessary, it should be brought to the attention of Congress, that a law may be passed, making it a misdemeanor for any railroad company to make arbitrary and unjust discriminations between the different classes of the traveling public.

#### Uniform Commercial Paper.

A BILL HAS been presented to Congress, and is now in the hands of the Judiciary Committee of the House, that is of so much importance that it should command the attention of every business man, as well as his influence to secure its enactment into a law. The purpose of the bill is to secure uniformity in all the States regarding commercial paper of all kinds, including promissory notes, drafts, bills of exchange, bank checks, bills of lading, and all similar paper used in commerce between the States. On the 27th of January Mr. C. C. Bonney, a prominent Chicago lawyer, presented to the Judiciary Committee an argument in favor of the proposed measure. The history of the measure shows that it has received the endorsement of prominent financiers and business men. In 1882 the attention of the American Bankers' Association was called to the fact that great inconvenience and loss result from negotiable instruments being governed by the laws of the State in which they are made, and that a single note or bill of exchange may be made in one State, endorsed in one or more other States, guaranteed in still another, and thus be subject to the laws and decisions of as many different States. The matter so commended itself to the Bankers' Association, that a resolution was passed asking its favorable consideration by Congress. In view of the fact that the Bankers' Association is composed of all the leading banks of the Union, and that those banks bring together nearly all the great commercial, manufacturing and monetary interests of the country, the approval of the subject by that body at once attracted the attention of the business portion of the people, and secured for it more thoughtful consideration than it would have received in years if it had emanated from any other source.

But the Bankers' Association did not content itself with simply recommending the measure; it directed the employment of counsel to prepare a bill to be submitted to Congress, and put the matter in charge of its Executive Committee, which employed Mr. Bonney to prepare a report and draft a bill. These were submitted at the annual meeting of the Bankers' Association in 1883. The report consisted of an elaborate examination of the whole subject, with the conclusion that Congress possesses the power to enact a general law requiring uniformity of commercial paper in all transactions between citizens in different States, and where made in one State and payable in another. The bill prepared by Mr. Bonney was made to conform as closely as practicable to the recent act of the British Parliament, consolidating and codifying into one statute the law of negotiable instruments as existing in Great Britain. This was done for the purpose of securing, as far as possible, international as well as national uniformity of commercial obligations. The bill so prepared and endorsed by the Bankers' Association, was introduced by Judge Poland at the first session of the present Congress, and was referred to the Judiciary Committee. As originally drawn, it contained a clause discriminating against the local paper of the different States. This provision met with some opposition before the Committee, and it was suggested that if it was omitted the bill would meet with more cordial support, and that when uniformity of commercial paper was once obtained, the self-interest of the several States would cause such legislation to be adopted as is necessary to give full force to the national law. Mr. Bonney, acting on this suggestion, prepared an amendment restricting the compulsory provisions of the bill to paper made in one State and payable in another. As the bill now stands, it applies to all transactions of an inter-State character, which constitutes the great bulk of all our commerce, and covers most of the paper received by our merchants and manufacturers, and by them deposited in the banks for collection. The Judiciary Committee regards the bill favorably, and has appointed a sub-Committee to take charge of it.

This is briefly the history of this important measure for the relief of business men. It is not possible for the present Congress to take action upon it, but the purpose is to get it in such shape that it can be passed early in the next session. It is regarded as one of the most important measures in the interests of commerce that Congress has had before it in several years. It would be far better for the country if that body would pay more attention to the necessities of our business interests and less to the politicians. Congress derives its authority to act in this matter—as it does upon all business topics—from that clause of the Constitution that confers upon it the power to regulate commerce between the States. At the time the Constitution was adopted, the several States were exceedingly jealous of their rights, and fearful of centralizing too much power in a national legislative or executive body, but insisted that each State should have full authority over its internal affairs. But since those days the country has developed to a wonderful extent; railroads and telegraphs have given such an impetus to commerce, that no business man, manufacturer or merchant, attempts to limit his transactions to the State wherein he is located. It has become imperative that Congress, legislating for the entire nation, should ignore State limitations, and pass such laws for the regulation of inter-State commerce as will place it on a basis of uniformity in all the States. Commercial paper of the kind referred to in the bill cannot be considered as commerce; but it is a factor of commerce, and, as the greater includes the less, the power to regulate commerce must include the power to regulate those factors which, taken together, make up what is known as commerce. This must include the buying and selling of goods, the transportation of the same, the evidences of indebtedness given in exchange for them, the insurance required for their protection, and the methods governing the collection of such evidences. In short, as commerce is based on a system of credits, the evidences of credit become an essential factor of commerce, and as much subject to regulation by national legislation as commerce in

the concrete. This view of the Constitution is one that we have asserted with persistency for many years, and we rejoice to see that Congress is at last beginning to entertain it. Already it has passed laws to regulate transportation between the States, and in other measures has given evidence that it is less afraid of the old bugbear of States' rights than formerly. In time we hope to see national interference to prohibit State and local taxation of commercial travelers and merchants of other States seeking to do business in a given State; also to prevent deception and fraud in all articles of commerce, providing penalties for those who adulterate their goods or misrepresent them as to quality. Through the medium of uniform laws regulating all factors of commerce and all commercial transactions, the standard of commercial honor may eventually be raised very considerably, and to the great advantage of all honorable men.

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### Eleventh Hour Men.

SOME MEN appear to have been born behind time, and their business methods impress one with the idea that they have never been able to catch up. They are always just a little behind their neighbors, and come to be known among their business associates as eleventh hour men. If they want goods, instead of buying promptly at the appropriate season, they put it off from week to week until their competitors have secured the cream of the markets, and they must take what is left or go without; if they have engagements they are always late; if they have a note coming due, they fail to take proper measures to protect it in time, and their paper goes to protest simply because they put off till the eleventh hour their efforts to protect it. Their motto appears to be "never do to-day what can be put off till to-morrow." This habit of procrastination brings many a man to grief; with some it is constitutional, due to the fact of their having been born behind time, but with others it is the outgrowth of a spirit of indifference or carelessness. We often hear it said of a man that he is peculiar, that he has not acquired business habits, and excuse must be made for him. No man has a right to be peculiar at the expense of his neighbors, or to expect them to excuse his laches because he chooses to be different from other men. The fact of living in a civilized age and community imposes obligations upon every individual enjoying that blessing, the chief of which is to conform to the customs and usages approved by the majority. Peculiar men are a nuisance, and should be relegated *en masse* to the lunatic asylums, where so many others similarly afflicted already enjoy the hospitality of the State.

The eleventh hour men are, of all peculiar persons, the most aggravating, and their lack of promptness is made all the more inexcusable by the knowledge that it is unnecessary. There was Brown, of Michigan, who had business with Jones, of New York, and telegraphed "meet me at the Astor House 10 A. M. to-morrow." At great inconvenience and possible pecuniary loss, Jones postponed a trip to the east, and was at the hotel promptly at the hour designated. But there was no Brown; he had not arrived nor had he sent any message. Jones fumed and fretted all day, and in the evening went off on his proposed trip, having lost a whole day waiting for Brown. Next day Brown came along leisurely, and was greatly disappointed at not finding Jones. His excuse for the delay was that he got engaged in some business and thought twenty-four hours wouldn't make any difference to Jones. But it did, and to Brown, too, for he had to telegraph to him to meet him in Boston, and incur the expense of going there. Jones ought, also, to have charged him for his lost time, but, of course, he did not. We met Robinson in the street a day or two since, looking troubled; he said he had just had a draft on one of his customers returned dishonored, and he had got to make it good at the bank. "Why do you do business with men who do not honor your drafts when they are due?" we asked. "Oh, this fellow is good," he replied, "but he is infernally

slow; always putting me in a hole, but he pays eventually." The next time Robinson had an opportunity to make that customer pay for the trouble he caused, it is very certain he availed himself of it. This man, although notified that the draft was made, failed to provide for it in time; probably the money was ready next day, but the banks do not wait two or three days to give a man an opportunity to get his wits together. Time and tide are said to wait for no man; neither do the tides and currents of business; the business man who expects to be successful must get in the swim and keep up with his fellows; if he dallies and dawdles, or demands special consideration for his peculiarities of temperament or habit, he will be very apt to find himself stranded, with prospects for very little salvage.

The eleventh hour man is most trying to the manufacturers and jobbers in the jewelry trade, at the busy season in the spring and fall of the year. These enterprising gentlemen spend much thought, time and money in preparing attractive stocks of goods for their customers; they advise the trade regarding their preparations by circulars and advertisements, soliciting early orders that they may gauge their production accordingly. The prompt business men respond according to their requirements, obtain their supplies and have them on the market as early as possible; then the eleventh hour man wakes up, goes over his stock to ascertain what is wanted, and finally forwards his order. But the early birds have captured the attractive worms, and the order is filled, minus the seasonable novelties that would have aided so much the sale of his standard goods. Frequently an order for goods calls for certain things that the manufacturer does not carry in stock; he must send to the factory and have them made, and this takes time; as a consequence, the entire order must be delayed, or two packages made and the cost of transportation thereby doubled. Such a transaction makes all parties to it dissatisfied. All trouble and annoyance of this kind could be avoided by sending the orders promptly when the manufacturer is stocked up with his full line, thus giving him time and opportunity to fill them properly. The advertising pages of THE CIRCULAR contain the announcements of all the prominent houses in the trade; these are changed from time to time to suit the conditions of their business; here will be found a complete enumeration of the novelties and choice goods that each has to offer, and by keeping watch of these, buyers will have a full and trustworthy guide as to what goods are desirable and available, with full directions as to where they can be obtained. Following these as a guide, there is no excuse for any dealer being "left out in the cold" when novelties are introduced, or when his stock needs replenishing in any line. Promptness in everything that pertains to business is an absolute essential to success; the eleventh hour man, who is always dilatory and procrastinating, may drag out a precarious and even a prolonged existence, but he will never achieve eminence in his calling, or be anything more than an incubus, clinging, like a veritable old man of the sea, to the shoulders of his more enterprising neighbors and business associates. Procrastination is the thief of time, but a prompt business man is the noblest work of God.

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### A Word to Employees.

IN TIMES of business depression, such as we have been going through for the past two or three years, the greatest forbearance between employers and their employees becomes a necessity of the situation. When there is but a small demand for goods, those engaged in making or selling them have a serious struggle to maintain themselves. Their production must be cut down, and their expenses be reduced to correspond. Take, for instance, a firm in the jewelry trade that manufactures a portion, at least, of the goods they handle; this necessarily involves a large investment for a factory and adequate machinery, and the expense of a force of workmen sufficient to produce the goods required; there are, also,

the salesrooms in the city requiring a force of bookkeepers, salesmen, etc. In a busy season this force is all actively employed, and the employees as a rule have no complaints to make regarding their compensation. But a dull season comes, there are few sales and no profits, but the expenses run on all the same. There must be a curtailment, however, for necessity knows no law, and the first suggestion is to close the factory. But that involves the dispersment of a force of trained workmen, whose experience has been valuable to their employer, and the throwing out of employment of many who are dependent upon their daily earnings for the maintenance of their families; idleness means to them deprivation if not positive want and suffering. Few employers care to inflict such hardships upon men who have served them faithfully, but the necessity for a reduction of expenses is imperative. So the factory is closed for two or three days a week, or wages are reduced. This latter course is more objectionable to the workmen than a reduction of the working hours, for they are always apprehensive that if wages are once cut down they will never be restored, and they would rather lose fifty per cent. of their time than twenty per cent. of their wages. Here is where there should be the utmost frankness and consideration shown on both sides, and generally a plain statement of the case will result in an amicable adjustment of the difficulty. Workmen are noted for their lack of comprehension of business propositions; it is natural that they should be wanting in business knowledge, for their training lies in another direction. But their common sense will tell them that the same expense cannot be maintained for the production of \$50,000 worth of goods that is required to produce \$100,000 worth. The manufacturer and the merchant are subject to certain expenses that they cannot escape from, such as rent, maintenance of the property in which their capital is invested, etc. Having dealt fairly and honorably with their employees in prosperous times, they cannot be expected to carry all the burdens imposed by general business stagnation; employer and employees have cast their lines in the same pool, and must abide by the result.

A manufacturer told us recently that for two years he had not been able to draw enough money from the firm to pay his living expenses; that their factory was kept running solely for the purpose of keeping the men employed, and giving them an opportunity to support their families. It would have been better for the firm, he said, if they had closed their factory two years ago, for they had positively been running it at a loss. This is not an isolated case, but serves as an illustration of what has been quite general in the business. Manufacturers very much prefer to run their works to their full capacity, and to employ as many workmen as possible, for they count that the greater amount of goods produced and sold the greater the amount of their profit. They are always reluctant to make reductions of any kind, but when the inevitable demands that they shall be made their employees should meet them in a spirit of fairness and forbearance. The past two years have been full of hardships for all business men, and the fortunate persons have been those who were working for fixed salaries for a responsible employer who came forward with the requisite means to meet his pay-roll at the stipulated times.

There are indications that there will soon come some improvement in the business situation, but how soon or to what extent are problems the future alone can solve. The jewelry business is peculiarly sensitive to fluctuations in business, being almost the first industry to feel any depressing influence and about the last to recover from it. This makes it all the more necessary for those employed in it to exercise the greatest forbearance and consideration for those whose capital and credit are exposed to such unusual vicissitudes and perils. In this industry the interests of the employed and the employer are peculiarly blended, and the inducements for standing firmly together are stronger than in almost any other calling. Mutual confidence, forbearance and good faith should characterize the relations that must necessarily exist between them. If the past few months have imposed hardships upon the employees

in the trade, we trust they will not forget that their employers have had still greater ones to contend with, for they have had more at risk and their responsibilities have corresponded.

### Who Shall Maintain Technical Schools?

TECHNICAL instruction, with a view to facilitating and improving industrial methods, thereby maintaining that superiority in manufactures which alone commands the world's markets, continues to grow in favor in Britain as well as on the Continent. But with this characteristic difference, that while the latter are largely and in some instances exclusively under the patronage of the State, the former are left to private or associated enterprise. Thus far the experiment under both systems has worked out satisfactory results; but as the voluntary system has to contend with serious odds, to competition with the paternal governments of the Continent, the question of how to maintain and increase the efficiency of this system of instruction is engaging the attention of thoughtful minds to an extent rarely known before. While it is true that the Government is not a contributor to their support, it is to be observed that Parliament is by no means indifferent to their success; in evidence of which we may refer to a Royal Commission on Technical Instruction, which was recently authorized to make an inquiry into the subject in all its bearings, and to whose recently submitted report we have heretofore alluded. The report presents evidence of a conclusive character as to the efforts which are being made by other nations to fit themselves to compete with Britain in every branch of industrial activity. Governments are vying with municipal authorities and private individuals in establishing and endowing institutions of the most varied character; all of which, however, has the same end in view, viz, that of fitting their populations to meet the constantly increasing demands made upon them by the growing necessities of the time. Technical instruction, it is admitted, could not teach a trade; it could not supersede workshop experience; but while valuing that experience, the Commission do not shut their eyes to the fact that it often resulted in mere mechanical routine knowledge. What was wanted was not mere experience, but intelligent experience, and that could only, or at any rate could best, be gained by systematic training in the scientific and artistic principles which underlie every industry. To insure that training the discipline and opportunity afforded by a school were essential. Continental nations were certainly doing more of this kind of systematic training of their industrial workers of all classes than England had hitherto been in the habit of doing. The success which had attended these efforts was shown not only in the existence of gigantic manufacturing establishments, but also, and perhaps especially, in the great perfection of manufacture to which many of these had attained and in the keen competition they were able to maintain with English products. It was the universal opinion in these countries that without these technical schools for high and low, results of this character could not have been arrived at, and the greatest apprehension for the future welfare of their industries, expressed by intelligent foreigners, was that England should some day or other awaken to the necessity of placing her industrial instruction on a similar footing. Thus, admitting that France, Germany, etc., had done more for systematic technical instruction than had been done in Britain, the question was, what were the best means of remedying the evil? The Technical Commissioners by no means approved of the wholesale introduction of Continental methods. They felt that each country must work on its own lines, and the only way to secure permanent progress was to expand and extend the system under which they had been accustomed to work. Abroad, as already stated, almost all the technical schools were State supported, and, hence, to recommend the adoption of principle that in England would be only to court defeat. Nor did the Commissioners find wanting

among English institutions examples of technical schools which might be placed on a footing of equality with any of a similar character elsewhere, both as regarded efficiency and the influence they were exerting in the improvement of the industries they were designed to advance. What was chiefly needed was the multiplication of such schools, and the attainment of that object could only be effected by a general consensus of opinion as to the importance, or rather the necessity, of the kind of instruction which such institutions afforded. And as this can only be obtained by exciting a widespread public interest in the subject among the people themselves, if labor and capital will join hands in the work the result would not be doubtful.

About all that is said in favor of the experiment in England is not less applicable to the present state of the question in the United States. There is a general recognition of the importance of multiplying and maintaining these technical schools; but, unfortunately, the disposition is to fall in line with the Continental plan of throwing the burthen of their support upon the State, rather than to make them self-sustaining by private enterprise. Hence we have schemes for incorporating technical instruction with the curriculum of the public schools, in addition to music and painting, and the languages, for which, in the aggregate, the taxpayers of this city alone have to pay about \$4,000,000 per annum. The Free Academy, or University of the City of New York, we believe, is at this moment making some experiment of the kind, but with what results we have yet to learn. It is scarcely in accordance with the fitness of things that the hand-saw and jack-plane should be mixed up under the same roof with Greek and Latin, though it would doubtless make no inconsiderable addition to the army of ten thousand placemen who are now drawing salaries from the municipal exchequer. By all means let us encourage technical instruction in every possible way—none need it more urgently than the present generation of American youth; but let us avoid the temptation of adding to the functions of the State in a matter of this kind, lest while seeking to enlarge the area of American skilled industry and the market for its products we add to the burthens already imposed upon it for the support of an already overgrown Government machine, which needs to have those functions restrained rather than enlarged. There is nothing in this way that private enterprise cannot accomplish infinitely better and infinitely more economically than the State.

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### Russian Reproductions

At the Metropolitan Museum of Art.

[BY JOHN W. MILES.]

Continued from Page 8.



Dress Ornament, Gold,  
Seythian, Dancing  
Girl.

THE INVENTION of printing and consequent revelation of ancient lore opened a rich field for the artists of the 16th century. The numerous legends of both Greece and Rome furnished an abundance of themes abounding in variety and having all the delights of a recent discovery. The austerity of the old cloister-bred art gave place to the new and free ideals of ancient mythology, and in the classical Olympos the artist found materials for the expression of his thoughts suitable to every circumstance and symbolic of every vice or virtue of humanity. The age was ripe for such an awakening; the glowing, polytheistic fables of Hellas were undeniably pertinent to such an age. We find, therefore, a large proportion of the productions of this period delineating scenes derived from the ancient legends, and indeed such representations are often found blending with subjects from the scriptures—a strange commingling of paganism and christianity. The historical incidents of holy writ furnished subjects for cups and

tankards as well as for objects destined for more sacred purposes, and they were wrought with skillful and expressive force. Among such scenes (upon the collection under review) may be mentioned Abraham setting out upon his journey accompanied by his flocks and herds, David carrying the head of Goliath, Joseph with Potipher's wife, etc., which, although upon pieces belonging to a later period, are of the style prevailing during the Renaissance. A prominent example of this adoption of the mythic tales of Greece and Rome is seen in the dagger and sheath already described, and also in the small placque illustrated in figure 23. This last beautiful specimen of German work is from the Goltz collection, Moscow. It is in silver-gilt, and measures eight inches in circumference. The scene depicted is from the legend of Æneas and Dido, and with the exception of a narrow border, covers the entire placque.

The story of Æneas and Dido, although a glaring anachronism has been preserved, not only by Ovidius, but also by Virgilius, whose description of the unfortunate love of the queen is exquisitely beautiful. Æneas, the son of Anchises by the goddess Aphrodite, displayed great valor at the siege of Troy, and, when compelled to leave the burning city, carried his father from the flames upon his shoulders. According to Virgilius he was afterwards sailing from Sicily



Plaque, Silver-gilt, German, 16th Century, Figure 23.

to Italy when he was driven upon the coast of Africa and received by Dido queen of Carthage. The life of the queen before this meeting was one of vicissitude. She was the daughter of Belus, king of Tyre, and reputed to be of great beauty. Pygmalion, who succeeded Belus upon the throne, assassinated the husband of Dido (Sichæus) in order to gain possession of his great wealth, but she herself escaped, together with the treasure, and, accompanied by a number of Tyrians, flying from the tyranny of Pygmalion, founded the city of Carthage. In securing the land for this purpose she bargained with the natives for as much as a bull's hide would cover, and cutting the skin into narrow strips claimed all the territory which these, placed together, would encompass. In memory of this device the citadel of Carthage was called *Byrsa*, which is the Greek for "a bull's hide." Dido, in faithful remembrance of her husband, remained a widow in spite of the persistent attentions of numerous noble suitors until the god-like mein and manly beauty of Æneas caused her to fall desperately in love with him. In vain she sought to quell the burning passion within her breast, in vain she struggled against the shame of yielding a love unsought. His presence was to her as that of a god, his speech, oft relating the incidents of his life, Othello-like, fanned into brighter flame the love which filled her heart. This did not escape the notice of the gods, and Hera (Juno) appealed to Aphrodite, the mother of Æneas, to join the couple in marriage by the following plan:—That when Dido and Æneas should engage in the hunt upon the following day a violent storm should darken the heavens, and when, flying from the rain and hail, the retinues of the royal pair should be scattered, the queen and Trojans

prince should seek shelter in the same cave. There the consort of Zeus proposed to join them in wedlock. Fully comprehending the irregularity of such a union, Aphrodite consented. In the morning, therefore, Dido issued from the palace gate in all the charms of her natural beauty, heightened by the splendor of her raiment, and the magnificence of her followers. Æneas, distinguished above all the rest, joins the procession with his train, and the hunt begins. In the midst of the sport the storm arises. The lightning's vivid flashes shoot across the darkened sky, while peal on peal of loud-voiced thunder break crashing through the air in quick succession. In the solitude of the cave the unceremonious marriage of Dido and Æneas is consummated, after which, as expressed by the poet, "Dido is neither influenced by appearance or character, nor is she now studious to carry on clandestine love. She calls it marriage. She weaves over her fault with this title." Like all illicit loves, the happiness of Dido was of short duration. King Iarbus, a rejected suitor of Dido, appealed to Zeus, who, in answer to his prayers, sends Hermes (Mercury), the messenger of the gods, with orders for Æneas to continue his voyage, and Dido, rising from her couch, beholds the morning sun glistening upon the sails of her lover far out upon the sea. In despair she orders the Trojan relics to be burned in a sacrifice of expiation, and herself, mounting the lofty pile, draws a sword, the gift of Æneas, and plunges it into her bosom. "On the marble tablet of her tomb," says Ovidius, "was this brief epitaph, which she herself left when dying:—'Æneas furnished both the cause of death and the weapon. Dido fell by her own hand.'"

Such in brief is the story embalmed in the poem of Virgilius and selected by the artist as a subject for representation upon our plaque. The numerous figures in *repoussé* which are here given probably depict the union of the two retinues upon the morning of the hunt, and are placed with consummate skill. The battlemented walls of Carthage, the men in armour and the gayly caparisoned horses are produced with a remarkable minuteness of detail and with strict adherence to the laws of perspective. Dido herself, sitting her horse in the manner customary with the women of the 16th century, occupies the most prominent position in the scene, surrounded by the Tyrian and Trojan nobles. The piece is bordered with a narrow

band of conventional ornament punctured at equal distances for attachment to some article of probably more perishable nature.

Among the many elegant objects in this remarkable exhibit perhaps the gem of all is the silver-gilt cup and cover made in Nuremberg during the 16th century and illustrated in figure 24. It is from the Chérémeteff\* collection—the same from which the Nautilus cup was taken—and stands 10 inches high. This piece is worthy of the most careful study, and indeed is so full of elegant goldsmiths' work that fresh beauties can be discovered with every examination. Any description, however vivid, would fail to express all the delicate details with which the artist has enriched this cup, and I opine that nothing but the Nuremberg mark prevents its attribution to Cellini. Beginning at the foot, which is trefoil-shaped, we find each of the three

elaborate *repoussé* work of fruits, flowers and wreaths, minutely developed, and crowned with loose pearls. Between these are three sphinxes. Immediately above and forming the commencement of the stem is a band engraved with scroll work, from which rises the stem, profusely decorated with embossing and chasing in the most rich and varied styles possible in goldsmithing. Upon this rests the bowl of the cup, shaped somewhat like a chalice, and with the lips cusped in six lobes, partly engraved in delicate arabesque patterns. Beneath the engraving and springing out of the narrow interstices between the lobes are Cupid's heads, forming the upper terminations of six strap-work cartouches, which fill the contracted portion of the bowl and contain masks differing each from the other and matchless in beauty. The lower part, swelling out into a flattened sphere, is covered with strap-work and minute *repoussé*, surrounding six plain bosses directly below the six cusps of the lip. In the center of each boss is set a ruby. The cover, although profusely embossed, is nearly flat. From its center rises a band, similar to that upon the stem, and supporting a structure composed of three arched niches holding caryatid figures. This is crowned with a flat pearl. Below the band are six sphinxes lying out in the interstices formed by the six divisions of the cover. Upon each of these divisions is a cartouche beaten up and chased in most exquisite and elaborate designs. Between these and the edge is a hexafoil border with the following motto in Latin:—" *Laudem operosa ferunt sed moderata valenti semina mens mortalis habet virtutis et artis.*" (Great industry is an object of praise, but a well-regulated mind possesses for a vigorous man the seeds of mortal virtue and skill. The edge is embossed with a beautiful design of Cupid's heads and minute groups of fruit and flowers alternating. When first executed this charming cup was enameled, and, from slight traces upon the original, we may infer that the plain bands upon the cover and foot, as well as the cusps of the lip, were once enriched with translucent enamel through which shone the engraving with great richness of effect. The shape of this cup and its embellishments leave nothing to be desired, and it certainly excels any piece of 16th century German work that ever came to the attention of the writer.

Hastening forward with our review of the pieces of this epoch, we pause for a moment before an object that recalls the luxurious furnishings which set forth the tables of the noble lords and gave them that splendor which has been so fully described in the chronicles of the time. It is true that they ate with their fingers and in large halls filled with a mixed company, but there was an elegance of manners then as now, regulated quite as much by fashion and by established rules of polite breeding. Frequent washings before, after and also during a meal preserved a scrupulous cleanliness, and if the fingers were sometimes stained a saffron hue, owing to the nature of the popular condiment, they were at least free from dirt, for the etiquette of the higher classes demanded the most delicate management in the handling of food and the greatest possible avoidance of soiling the fingers with it. Even the custom of washing was surrounded by that elegance which belonged to all their habits of life, and we shall soon see an example among these reproductions of the elegant ewers and basins that were provided for that purpose. The present illustration, however, figure 25, is that of a Table Fountain which was probably used for perfumed water, although others are mentioned in history as flowing with spiced wine. This is in silver-gilt, of Augsburg work, and is 20 inches high. The bowl is lobed, curling inwards at the junctions. From the center rises a structure holding the fountain jet and surmounted by a figure in the round, armed, and resting the right hand upon a lyre. The bowl is filled with *repoussé* work of scrolls forming panels in which are figures of marine boys. The entire piece is supported upon a stand with a round base. It is from the famous treasures of the Kremlin in Moscow.

If the history of this single piece could be known and written it would undoubtedly prove a romance more fascinating than anything of which we could conceive. What tables may it not have graced, and in what goodly company of high-bred knights and fair-faced



Cup and Cover, Silver-gilt, German, 16th Century, Figure 24.

\* Count Chérémeteff, aid-de-camp to Alexander III., and head of one of the most wealthy and distinguished families of the Empire.



maids? Perchance the trickling music of its waters may have been often lost in the wild revelries of boasting men-at-arms, perchance its voice mingled full as often with the sweeter tones of knightly love. Fair rosy fingers may have dallied with its perfume or dipped the kerchief in its fragrant basin. There is not only poetry and song in the design but also in the possible, nay, probable, memory of its past. Unfortunately the records of nearly all these Russian treasures have not been kept. In some cases an inscription gives the clue by which we may trace the sources and destination of an object, but in the majority of them no chronicle, however slight, remains to testify of the causes which carried these precious examples of goldsmiths' art into the treasure-houses of Russia.



Table Fountain, Silver-gilt, Augsburg, Figure 25.

One more specimen of German skill claims our attention in the tankard illustrated in figure 26. This is only one of many pieces that have been preserved that were made for the same purpose. The national beverage of Germany demanded a larger receptacle than the more delicate or stronger drinks of other countries, and the tankard became not only a very popular but a very necessary form. Some of the most tasteful work of the German goldsmith was expended upon these objects, and from them we gather much of our information regarding the state of art in that country at the different historical periods. The tankard of our figure is in silver-gilt. It is from the Museum of the Hermitage in St. Petersburg. The cover, nearly flat, has an ornamental edge of laurel surrounding a circular medallion which occupies the center, and contains in *repoussé* a representation of Aphrodite and Eros. The scene is a landscape with a town in the mountains of the background. The drum is beaten up into designs of scroll and strap work, groups of flowers, festoons, etc., completely filling the spaces around four oval cartouches. The scenes within these cartouches are mythologic and symbolize the sentiments of love, from which we may infer that the piece was originally in some sense a loving cup. The smaller cartouches upon the front and under the handle bear representations of Aphrodite and Eros in distinctly different posings. The scenes upon each side are larger. Of these one represents two nude figures, male and female, embracing. At the foot of the couch upon which

they recline is a bearded man with a robe which he is about to throw over them. In the sky above and seated upon his eagle is Zeus holding the thunderbolt, and with an angry expression upon his face. Around him are other gods of Olympus—Hermes bearing the caduceus, etc. The scene upon the other side is the one figured in our illustration. Hephaestus (Vulcan) is forging an arrow, while Eros and his mother Aphrodite, posing in graceful attitudes, watch the skillful manipulations of the artist god with evident pleasure and interest. The purchase, or attachment over the handle for lifting the cup, terminates in a delicate female head which may have been intended also for that of Aphrodite.



Tankard, Silver-gilt, German, 16th Century, Figure 26.

The word tankard, as applied to a drinking vessel, was unknown previous to about A.D. 1575. Before that date it was used to designate large wooden tubs, bound with iron, in which could be carried about three gallons of water, and the men who conveyed them were called "tanckerd-bearers." There has been considerable discussion among the etymologists regarding the derivation of the word, some pretending to trace it to *tin-quart* and others to the *twang* or sound made by the cover in closing it, but the most probable source is from the French word *estang*—a pond or pool. Whatever may have been the origin of the name, the shape and liberal dimensions of the article itself commended it to other nations than Germany; and in the numerous objects extant of old English plate many of the drinking cups may be found of this form decorated with the various styles of ornamentation which were in vogue at the time of their production. Indeed it is difficult to find a collection of antique plate of any pretensions that does not contain one or more tankards, and the one which has been described has many companions closely resembling it in shape, although differing widely in the artistic character of their decoration.

The pieces of Spanish work are very few. A small bowl (diameter 8 inches), silver-gilt and enameled, is perhaps the most noticeable, figure 27. The interior has a wide frieze around the outer circumference, with a narrower one within. Both of these are chased and *repoussé* with fabulous animals and wild men surrounded by vines and tendril work. In the center is a shield upon which, in painted enamel, is a device showing a tree growing from waves and bearing fruit. It has the following inscription:—"In the year 7137\* this bowl was given to be placed, filled with rice, on the tomb of the Boyar Prince Dmitri Timophevitch Troubetzkoi." The Boyar in Russian nobility ranked correspondingly to the modern English peer. They came next after the princes of the blood, and had the privi-

\* A. D. 1629.

lege of choosing for themselves and their dependents the prince they would serve, transferring their allegiance at will and without notice. Peter the Great abolished this order in Russia proper, although they still exist in Moldavia and Wallachia, where they form the council of Hospodars and exercise a predominating influence over the people. The inscription in all probability was engraved some years after the production of the piece, neither was the bowl originally designed for the purpose of following that Chinese custom which supplies the departed soul with food. A raised edge around the center, immediately within the narrow frieze, would seem to indicate that it served as a plate for an ewer or other object now lost and which it matched in design and decoration. Its value lies chiefly in its nationality and antiquity. The original is in the Troitsa Monastery.



Bowl, Silver-gilt, Enameled, Spanish, 16th Century, Figure 27.

The relics of the 16th century include also a number of Italian pieces in iron work, such as door knockers, helmets and armour of all kinds, but though many of them are richly ornamented with gold, and were the productions of goldsmiths, only a very brief notice of them can be given here. Among the most prominent is an iron shield, with a surface almost entirely covered in *repoussé* with a representation of the battle of Saul with the Ammonites. The figures of warriors, priests and war-horses are massed upon the convex face in the greatest possible profusion. On the left of the battle scene is a walled city with a river running through its center. In the background, upon both the right and left, are the two camps of the opposing forces, while overhead an angel is descending from the sky, symbolic of the heavenly assistance which we are told was given to Saul. In the band around the edge of the shield occur numerous objects of arms and armour of all descriptions from the Roman *fasces* to the Mediæval coat of mail. Between these in oval cartouches are embossed figures of Grecian gods and goddesses—Zeus, Hermes, Aphrodite, etc. The clothing and armour of all the figures as well as the caparisons of the horses are damascened with gold. The helmet matching the shield is also damascened with gold and *repoussé* with biblical subjects—David and Goliath, Judith and Holofernes, etc. Both pieces are from the Imperial arsenal of Tsarskoe-Selo.

Still another helmet of Milanese work is in the shape known as *bourguignot*. This is of one piece of metal. The crest is a sphinx, the ornament flower work, masks and figures in black on a gold ground. It is celebrated as the helmet of the Chevalier Bayard, but without authentic proof.

A round shield, *repoussé* and gilded similar to the one described, has five medallions containing representations of Prudentia (Prudence), Fortitudo (Fortitude), Fama (Fame), and Invidia (Envy), with Mars in the center. The rest ornamented with fruit, flowers, trophies, birds, grotesque figures and the bird-emblem of the Grand Duke of Tuscany, Cosmo I. It is known as the shield of the Medici.

The door-knockers are of bronze. The most noticeable among

these is the one in company with a door ornament from the Castel del Piove, Padua. It is formed of a female figure, crowned and seated upon a lion. A winged female figure flanks each side. The ornament for the other door is a head of a boy, laughing, very finely executed. The work is attributed to Sansovino.

Six pieces of marble statuary have been copied in plaster, four of antique Grecian and two of Italian. Of the latter one is especially noticeable. The original is of Carrara marble, and represents, slightly under life-size, a dolphin, carrying upon its back a dead child. In the breast of the child is the fatal wound accidentally made by the fish. The dolphin holds the child by the hair and is swimming quickly for the land. The work is attributed to Raphael.

(To be Continued.)

### The Identification of Minerals.\*

A PERSON'S first thought on picking up some unknown mineral or rock from the roadside, the quarry, or the field, is, What is this? What is the name of this object? and, if he has no more knowledge of the mineral world than the majority of people, he will be unable to answer his query, unless the specimen should chance to be quartz, mica, or some such very common mineral.

After the student of mineralogy has advanced far enough in his studies to become somewhat familiar with the subject, he begins to ask himself, when examining some fragment of the mineral kingdom, Of what is this object made? What is its composition? and lastly occurs the question, How was it made? This article concerns itself only with the first of these three questions. It is well, perhaps, to say here that, in order to acquire a knowledge of the physical peculiarities of minerals sufficient for their identification, the student should familiarize himself, by frequent inspection, with the general appearance of all minerals that come under his observation, and especially the more common species, as quartz, feldspar, mica, hornblende, limestone, etc. It is very desirable for the amateur geologist to have a collection of his own, of typical specimens of fifty or a hundred of the more common minerals and rocks, which, by the way, costs very little. If this is not convenient, he should not fail to visit the mineralogical collection in the rooms of some natural history society, which contains, in addition to all the common minerals, many rare and beautiful specimens from all parts of the world. It is only by careful study of the specimens themselves, object lessons, as it were, that any substantial knowledge of them can be gained.

Minerals are identified, or determined, as mineralogists say, by first noting their physical peculiarities, and afterwards ascertaining their chemical composition.

We will now consider the physical characters of minerals:

1. About the first characteristic of a mineral to engage our attention, is its color. Colors, as relating to minerals, are of two kinds, essential and non-essential. The essential color of a mineral is its color when in a pure state. The non-essential is mainly the color of the impurities contained in the mineral. The essential color is found by powdering the mineral or rubbing it on any hard surface, as unglazed porcelain. The powder thus obtained is called the streak, and although the non-essential color may vary greatly, its streak is always nearly uniform. A mineral shows its true color when powdered, for the same reason that muddy water becomes white when beaten into foam and made opaque.

The essential color or streak of limestone is white or grayish white; its non-essential colors range from red, green and yellow to blue, brown and black. Common feldspar (orthoclase) may be white, gray, flesh red, or even green, as in Amazon stone, but its streak is uncolored.

Metallic minerals, those in which metallic elements predominate, are always opaque, and generally have essential colors, while vitreous

\* W. H. L., in *Kansas City Review of Science*.

or glassy minerals, which are more or less transparent, often have non-essential colors, because we can see into them and discern the impurities. Magnetite (an ore of iron) is a metallic mineral, and its color and streak are both black.

2. Closely related to color is the property termed luster, by which is meant the quality of the light reflected by a mineral as determined by the character of its surface. The two principal kinds of luster are the metallic and vitreous. The former is the luster of all true metals, and of nearly all minerals which are chiefly composed of metallic elements. An example may be seen in galena. The vitreous luster is the luster of minerals in which the non-metallic elements preponderate, as in vitreous quartz. There are various other kinds of luster, as adamantine, the luster of the diamond; resinous, the luster of resin; pearly, like pearl, as talc, pearl spar; and silky, as satin spar. When luster is entirely wanting, a mineral is said to be dull, as chalk and kaolin.

3. After the color, streak and luster have been determined, the hardness is the next property that commands attention. In minerals there are all grades of hardness, from talc, which is impressible by the finger nail, to the diamond, the hardest of all known substances. To facilitate the determination of this characteristic, a scale of hardness has been devised, as follows, beginning with the softest :

- |              |                    |
|--------------|--------------------|
| 1. Talc.     | 6. Orthoclase.     |
| 2. Gypsum.   | 7. Quartz.         |
| 3. Calcite.  | 8. Beryl or Topaz. |
| 4. Fluorite. | 9. Corundum.       |
| 5. Apatite.  | 10. Diamond.       |

Of any two minerals, that which scratches the other is the harder, and by testing an unknown mineral by those given in this scale its degree of hardness can be ascertained. For instance, if we have a specimen that scratches calcite, but is scratched by apatite, we estimate its hardness at 4, but if it should also be scratched by fluorite, we would place it at 3.5. The hardness of all common minerals, however, as nearly as we need to get it in order to identify them, can generally be determined without recourse to the scale. The hardness of common window glass is about 6.5, and any mineral that will scratch it must be at least as hard as quartz; and any mineral that can be scratched by a knife cannot be much harder than 5.5. By the judicious use of the point of a knife and a piece of glass one can soon learn to estimate hardness well enough for practical purposes. In general, different specimens of the same mineral vary but little in hardness. There are exceptions to this rule, however, and some mineral species, as serpentine and calcite, vary greatly in this respect, the former ranging from 2.5 to 5.5, and the latter from 1 to 3.5.

4. The specific gravity or weight of minerals is one of their most constant characteristics. It is more difficult to discover, however, than hardness, and is therefore of less practical value as an aid in determining species. If the specimen is not too small, its weight can generally be estimated with sufficient accuracy for practical purposes by lifting it in the hand. Barytes or heavy spar can be readily distinguished from all minerals which it otherwise resembles by its much greater weight.

5. Most minerals occur more or less commonly in crystals, that is, in figures bounded by plane surfaces arranged regularly about a center. Minerals of the same species always crystallize in similar or allied shapes, and therefore the determination of the crystalline form is an important aid in identification. For instance, iron pyrites commonly crystallizes in cubes, thus rendering it easy to distinguish it from copper pyrites, which it sometimes resembles. Tourmaline and hornblende, when occurring in small fragments in rocks, are very similar in appearance, but the tourmaline can usually be distinguished by its long, slender, triangular crystals. In order to recognize any but the simpler forms of crystals a knowledge of crystallography, the science "which treats of the forms resulting from crystallization," is necessary, but as most minerals commonly occur uncrystallized, we are often obliged to depend upon other

characteristics, and the determination of the crystalline form is seldom absolutely necessary.

6. Cleavage, or the tendency of a mineral to break along certain planes, is a property closely allied to the crystalline form, and is frequently useful in the identification of minerals. Common feldspar (orthoclase) can be distinguished from similar minerals by its peculiarity of breaking or cleaving in certain directions with a bright, even surface.

7. When a mineral does not occur, as is commonly the case, in distinct crystals, its general structure should be noted, whether it consists of an aggregate of fine grains like granular quartz, or forms a compact mass like flint or chalcedony. Notice if it is made up of a number of slender columns like some tourmaline, or of fine fibers like asbestos or satin spar. Sometimes a mineral has a lamellar structure, consisting of a succession of plates or leaves, like common mica. Again, it may be found in globular forms like marcasite (white iron pyrites), or in a shape resembling a bunch of grapes, termed botryoidal, like limonite or chalcedony. Minerals also occur coralloidal (coral-like) forms, as aragonite, or dendritic (tree-like) shapes, as magnetite (magnetic iron ore). Other species occur in stalactites or stalagmites, as limestone.

There are also many other imitative shapes in which minerals are found, such as amygdaloidal (almond-shaped), reniform (kidney shaped), capillary (resembling a thread or hair), reticulated (net-like), acicular (resembling a needle), etc. In short, a careful examination of the general structure and imitative shape, if any, of a mineral will often lead to its identification without further trouble.

8. There are various other physical characters of minerals, such as magnetism, taste, odor, feel, tenacity, and phosphorescence, that are often useful in their determination. For instance, magnetite can be distinguished from minerals which it otherwise resembles by its property of being attractable by a magnet or magnetized knife blade; native alum by its astringent taste; kaolin or clay by its peculiar odor; and the hydrous silicates—talc, serpentine and chlorite—by their smooth or greasy feel. When two pieces of quartz are rubbed against each other they will emit light, or are phosphorescent. This is best seen in the dark.

The determination of the physical characters of minerals is, generally speaking, sufficient for the identification of all common, and also many uncommon, species, but there are many others that need to be tested chemically before their identification is rendered certain. This treatment is also necessary when the chemical composition of the mineral is to be ascertained, or the exact proportion of metal in an ore of silver, lead, copper, etc., determined. This latter process is called assaying.

We will now speak of the chemical characters of minerals.

Treating the mineral with acid is usually the first step. Calcite or common limestone can be readily recognized by its lively effervescence when touched with hydrochloric (muriatic) acid, while in the mass, but dolomite or magnesian limestone will only effervesce when powdered. Other minerals require the use of strong or hot acid. In addition to hydrochloric, sulphuric and nitric acids are often used. By the employment of acids the degree of solubility is determined, the presence of carbonic acid detected, and various other results obtained. After treatment with acids come the blowpipe tests. The mineral is placed upon charcoal, and submitted to the action of the flame of an alcohol lamp or gas jet directed upon it by the blowpipe. The degree of fusibility is noticed, the color of the flame noted, and also the character of the sublimes and the odor of the escaping gases. The mineral is heated in open and closed glass tubes, and then mixed with the fluxes—soda, borax and salt of phosphorus. By these and other methods of treatment, and reference to a set of tables on the determination of mineral species, the exact status of the specimen in hand is finally decided.

The quantitative analysis of minerals, by which the precise proportion of each of their chemical constituents is found, requires a still more careful examination and additional treatment. A few

words on the identification of rocks will not, perhaps, be out of place. To ascertain the peculiar species to which a rock belongs, it is only necessary to identify its constituent minerals, as, if we find a rock to consist of an aggregate of the minerals, quartz and orthoclase promiscuously intermingled, we know it to be a binary granite; if it contains hornblende in addition, it is hornblende granite. If a rock is composed of quartz and mica, it is mica schist; if a combination of hornblende and quartz, it is hornblende schist, and if it is simply a mass of grains of quartz firmly cemented together, we call it quartzite.

Many rocks, however, are so fine grained that it is impossible to distinguish the minerals of which they are made up, with the unaided eye. In such cases recourse is had to the microscope, which generally reveals the character of the constituent minerals without further trouble, but quite often we are obliged to go still further, and cut off a thin section or slice of the rock. This slice is mounted on a slide and carefully examined with the microscope, notice being taken of the reflected, transmitted and polarized light, change of color and various other peculiarities. The object is to ascertain the crystalline form, if any, of the minute particles of the minerals constituting the rock, the color, luster and any other character possible. The science which treats of the determination of rocks by this method is termed microscopic lithology. Most specimens, however, can be identified without the aid of the microscope, so that a knowledge of this branch of the science of rocks is not indispensable to the amateur geologist.

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## Gossip of the Month.

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EVERY journal receives, with more or less frequency, letters for publication from various persons who have an idea, a statement or a grievance they desire to make public. It has come to be well understood that the editor of a journal is not responsible for the opinions of his correspondents. This fact used to be very generally stated by the editor at the head of his correspondence columns, but the public so well understands the difference between correspondence and editorial writing, that the cautionary words are now very generally omitted. Our daily papers are loaded down with communications on various topics—several of them make special features of these "Letters from the People," and solicit contributions on all topics—but no one thinks of holding the editor or the journal responsible for the utterances of these multitudinous writers. Indeed, it is the ambition of many editors to make their journals mediums of communication between the people, giving every one opportunity to air his grievances or to "trot out his hobby." THE CIRCULAR has always solicited contributions from persons either in the trade or familiar with it, and we have repeatedly given space to them when the opinions expressed were diametrically opposed to our editorial utterances. If a correspondent is mistaken as to facts, corrections are always solicited and given the same publicity that the original letter had. While an editor thus allows the widest latitude to voluntary contributors, and cannot reasonably be held responsible for what they say, a distinction must be made between them and the regular correspondents of a paper, who make it a matter of business to furnish acceptable letters for publication at stated intervals. In such cases the editor is bound to take reasonable precautions to ascertain that his correspondent is a person of respectability and character, one who is not likely to mislead him or abuse his position to ventilate private grievances, or in any way betray the confidence reposed in him. When he has satisfied himself upon this point, he is warranted in printing what such a correspondent writes, and when such contributions are clearly and distinctly published in a department by themselves, are dated at the place where written, and are signed by either a full name or a *nom de plume*, the distinction is so clearly made that no reasonable person will hold the journal to

accountability for what the correspondent may write, provided he keeps within the bounds of legitimate news or criticism. For instance, "G. W. S." (George W. Smalley), has been for years the London correspondent of the *New York Tribune*; he says what he pleases over his own signature, writes with a free hand and caustic pen when necessary, yet no one would think of holding the *Tribune* or its editor responsible for what Mr. Smalley says. We are led to make these reflections because one or two persons have criticised us for having published recently a communication from Providence that gave offence to some members of the trade in that city. Our correspondent was well known to the local trade as a gentleman of character and held a responsible position; he had furnished us a number of letters that were bright, newsy and free from offence. His letters were printed with such distinctive marks, that whoever read them knew that the opinions expressed were simply those of the writer, not those of THE CIRCULAR. If what he wrote had been literally true, and we had every reason to believe him, we were justified in printing his letter; if he was deceived or misled by interested parties, the error would have been corrected by the correspondent or ourselves, upon proper explanation, with the utmost cheerfulness. Indeed, the correction was made as soon as the error was pointed out to us, but before this was done, one or two persons had attempted to magnify a molehill into a mountain to our prejudice. We have sins enough of our own to answer for without being saddled with those of either our regular correspondents or occasional contributors. What THE CIRCULAR says it will maintain until convinced that it is wrong, and then it will yield with as good grace as the circumstances will permit; what our correspondents say is another matter, and those who do not agree with their expressed opinions should deal with them. That is the way we do when we differ with them. So much for the distinction between editorial opinions and those expressed by correspondents.

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THE American Watch Company recently applied to the Massachusetts Legislature for permission to increase its capital stock to \$2,500,000. Had the application been made to the New York Legislature, the probability is that it would have been "hung up" till some lobbyist had "struck" the Company for a "boodle." The Massachusetts Legislature, however, sent a committee of eleven members to inspect this great industry, of which the State is so justly proud, and Messrs. Robbins and Fitch showed them through the factory. The members studied with great interest the machinery and methods in use, and were astonished with the magnitude of the business, full details of which were given to them. They were shown that fully one-third of the product of the Company went to foreign countries, and that the sales for the month of October amounted to \$3,540,000. A statement of the financial condition of the Company was also presented to them. At the conclusion of the visit the committee was unanimously of the opinion that men who had built up this business to its present magnificent proportions, to the honor and glory of the State and nation, had carried it through periods of war, pestilence and financial panics, were fully competent to handle any amount of capital they might be entrusted with. Accompanying the committee was Lieutenant-Governor Ames, who has long been a stockholder in the Company, but had never before seen the factory. He expressed himself as highly delighted with all he saw, and became more in love with his stock than ever.

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IT is but a few years since the Empire of Japan and the heart of Africa were equally unknown to the world, and the unsealing of the Japanese ports by Perry was one of the greatest achievements of

American diplomacy, and one of the most prominent events of the century. Now comes Stanley with his international project for opening up the interior of Africa. At the present time Japan sends us \$14,000,000 of goods annually, while we send to her a very considerable amount, and it is a noticeable feature of the Japanese trade that those who engage therein are almost uniformly successful, Japan being a cheap market to buy in and the United States a dear one to sell in. A very large proportion of our importations from that country consists of bric-à-brac and fancy goods. How long will it be before our commercial transactions with Africa will equal in volume our Japanese trade? As Africa produces few articles for export she is more likely to be for many years to come a consumer of our products than a competitor in the markets of the world. What we want is an increased export demand for our products to serve as a stimulant to those who grow or make them. Mr. Gladstone recently quoted some famous statistician as authority for the statement that in a hundred years from now, the English speaking population in the world will number at least one thousand millions. If our manufacturers will only have patience to wait that length of time, they will find a ready market for all the goods they can make. We wonder if there will be much change in styles in those days of excessive population? As we expect to be there to see, we shall faithfully chronicle all the novelties and keep the trade posted as to the requirements of the masses.

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THAT Americans are the most inventive people on the face of the globe has long been claimed by them and conceded by the rest of humanity. Our principal rival in this matter is John Bull, and he is constantly offering opportunities for testing his claim to inventive equality. The triumphs won by American ingenuity in every great international exhibition since 1850 have been solid and substantial, redounding to our glory and profit. This year comes another opportunity for our inventors to win renown, in the shape of an International Inventor's Exhibition to be held in London. It is to be a great mechanical world's fair in fact, where everything pertaining to the industrial arts will find a place. It is unfortunate that a commission has not been appointed to look after the interests of American inventors, but intending exhibitors from this side of the ocean will not be neglected by the British authorities. Many have secured space for their inventions, and the American pilgrims who chance to visit London this season can obtain a flavor of their native land by dropping into the Inventors' Exhibition.

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CONGRESS has spent considerable time discussing the bill which provides that no more silver currency shall be coined. If more of the members of that body were practical business men, engaged in either the manufacture or sale of those goods that go to make up our immense commerce, they would more fully realize the importance of retiring the silver coins and making gold the standard of our currency. It is a disgrace to the nation that it should put its imprint upon a piece of metal worth eighty-five cents and call it worth a hundred, or to palm off as a dollar anything the intrinsic value of which is less than that sum. Gold is the standard of value adopted by nearly all civilized nations, and it is high time our government placed itself on an equality with them. Millions of dollars in silver coin are now stored in the vaults of the Treasury—so great has been the accumulation, which is being constantly increased by the requirements of the law—that new vaults are being constructed to hold it. That the public does not want silver is proven by the fact of this enormous accumulation of the despised currency. The jewelry business is conducted essentially on a gold basis so far as investments

are concerned; diamonds are paid for in gold, and the metal used in jewelry represents an outlay in gold. It is rather hard, therefore, that the trade is required to recognize depreciated silver when they come to sell their goods. Some of the diamond importers now make out their bills "payable in gold," thus protesting against a fraudulent silver currency. Should anything occur to create a foreign demand for our gold, there would immediately occur a hoarding of all the gold currency left in the country, and it would at once command a premium, thus depreciating silver still more, and causing additional loss to mercantile and manufacturing interests. What the welfare of the country demands is a gold basis for our currency, and an immediate stop put to the further coining of silver. Congress will be forced to take this bull by the horns sooner or later, and the sooner it does so the better it will be for the country.

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THERE is a great deal of hopefulness in the trade for the business of the coming season. Manufacturers have been, and still are, busy getting ready their goods, expending much labor and time upon new designs and attractive novelties, and when buyers come to look over the market they will find a bountiful supply of attractive goods. Other lines of business show signs of increasing activity also, and the almost unanimous prediction is that there will be a good amount of business transacted this year. The hard times have worked a radical cure of the evil of over-production with which the country has been afflicted for several years, and when the demand for new goods finally does come it is likely to be very lively. Patience is a virtue that has been largely exercised by the jewelry trade of late, and it is to be hoped that its reward is near at hand.

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THE advertising pages of THE CIRCULAR should be carefully studied by every dealer. They abound with illustrations and descriptions of desirable goods, including those which are new and novel as well as those which are standard in character, with definite instructions where they are to be obtained. Indeed, we often find the advertisements the most readable part of the magazine, because they contain the greatest variety of information regarding trade matters. In our various editorial departments we can discuss matters of interest to the trade, tell what is going on in a general way, print articles of technical importance, etc., but are necessarily precluded from saying much regarding the special goods made by different manufacturers. But in the advertising columns each one tells his own story in his own way, and in a concise and pointed manner invites attention to his specialties. There is a great deal of skill required in properly constructing an advertisement; a fault with most advertisers is that they say too much, filling up their spaces with long strung out sentences when they could better accomplish their purpose with a few crisp, telling words. Illustrations of specialties convey a better idea of style and construction than any long-winded description; accompanied by a few words of necessary explanation, they constitute the most attractive advertisement. In this respect our advertisers generally have struck the right note. It is a matter of common notoriety in newspaper circles, that THE JEWELERS' CIRCULAR is the handsomest trade journal in the world, and that its advertisers show better taste than is exhibited by any other class. Their advertisements are, as a rule, very attractive, and we commend them to the careful perusal of the trade.

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THE New Orleans Exhibition has fallen far short of the great success that was anticipated for it, a fact much to be regretted. A great

variety of causes has led to this disappointment, but the principal one, as far as we can learn, lies in the fact that New Orleans is too far south of the main routes of commercial travel. It is a long distance for business men of the North and West to go, and the trip involves an expenditure of time and money that comparatively few can afford. Philadelphia was on the direct line of commercial travel as well as being in the route of pleasure tourists. Business men coming to the great marts of trade, and tourists *en route* to the seaside or mountain resorts, could visit the Centennial Exposition with little divergence from their natural lines of travel and with little loss of time, so that the Centennial Exposition was visited by tens of thousands where thousands go to New Orleans. Another drawback comes in the shape of reports that in New Orleans the most extortionate prices are charged for everything. We do not know whether or not this is true, but certain it is that the report has tended to keep many away, for the American people do not like to be imposed upon even in small things. We regret the lack of success that has attended this exhibition thus far, and sincerely hope it may be made up before the close. New Orleans is deserving of the greatest consideration, for it is an important city, and its residents should be encouraged in every great enterprise they undertake.

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WE sincerely hope retail dealers have carefully pondered our suggestions of last month relative to sinking personal animosities and agreeing among themselves to charge a fair and reasonable profit for their goods hereafter. The very best way to overcome excessive competition and the evils of undercutting is for dealers to cultivate closer social relations. If the dealers in each town or city would come together occasionally for a good dinner, they would ascertain, before the wine and cigars were finished, that they are all pretty good fellows and inclined to do about what is right in the way of business. But where there is a lack of social intercourse, each is apt to regard every competitor as an inveterate enemy and to use every method to get the best of him. This leads to undercutting prices, until goods are sold at an actual sacrifice. Dealers are too apt, in figuring the cost of their goods, to omit to take into calculation the items of rent, cost of living, value of personal services, etc. They seem to think that if certain goods cost them \$36 a dozen and they sell them for \$42, they have made \$6; but if they charge to these goods a fair proportion of their expenses, they will find that the actual cost comes much nearer to the selling price. Dealers in jewelry are entitled, by reason of the precarious nature of their business, to a greater margin of profit than most other merchants, and if they will but come to an arrangement among themselves they may just as well get prices that will leave them with a clear profit as to sell goods at starvation rates. A difference of even ten per cent. in the selling price will often make the difference between profit and loss on a stock of jewelry. The dealers may just as well secure all the profit there is in their goods as to scrub along on starvation prices. Mark your goods so as to bring you a fair profit, stop underselling your neighbors, and conduct your business on fair business principles. Try to find the warm spot in the social natures of your competitors, and through it cultivate good fellowship with them and a better business understanding. Above all, make your goods pay you enough profit to make life worth living.

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### Jewelry Repairing.

PROBABLY there is not anything upon which the reputation of a keeper of a jewelry store is more easily built up than the neat and substantial repairing of the jewelry of his patrons. The intrinsic

value of a filled ring may be almost nothing, but to the owner it is surrounded by a halo of associations which give it priceless worth, and if broken by accident, its neat repairing is very highly appreciated. So also the cleaning of jewelry, which, through discoloration has lost its beauty, is often looked upon with delight as marvellous.

Perhaps a few hints on this subject may be of use to some who have met with difficulty in making repairs to their satisfaction.

It is of first importance that the use of soft solder be avoided as far as possible in repairing articles made of gold or silver, and even filled and plated jewelry may be repaired with hard solder.

To repair a ring, the shank of which requires soldering, bury the head in a crucible full of wet sand, place a small piece of charcoal against one side, coat the break, previously cleaned by filing or scraping, with borax, and charge with solder; blow a flame against the ring and charcoal until the solder runs in. For articles which require to be protected from discoloring in the process of soldering, coat them with a mixture of burnt yellow ochre and borax, adding a little dissolved gum tragacanth to make it lay all over, allow it to dry, then charge with borax and solder and heat sufficiently; boil out in weak pickle made of nitric or sulphuric acid. One important point is to wash the piece well in hot water with a little ammonia in it before attempting any repairs; this removes all dirt and grease, which, if burned on, cannot be removed.

If the article be of colored gold, boil out in pickle made of muriatic acid, and never coat with any protecting mixture. The solder must vary in regard to fusibility according to the quality of the article. For repairing most filled work, very easily melted solder is required, which may be made of 1 ounce fine silver, 10 pennyweights hard brass wire, adding 2 pennyweights zinc just before pouring; or, to make it more fusible, use bar tin instead of zinc; or, for strong silver solder, use only the silver and brass. For repairing most bright gold work, use gold coin, 3 pennyweights; fine silver, 3 pennyweights; fine copper, 2 pennyweights. For colored work, fine gold, 1 pennyweight; silver, 17 grains; copper, 12 grains; hard brass wire, 2 grains.

A good solder for repairing spectacles or other steel work is made by melting together equal parts of silver and copper. In soldering steel, plenty of borax should be used.

Very often the want of a rolling mill is a great obstacle to the making of solder, but it may be flattened very thin, although not with great regularity, by pouring onto a flat piece of wood, and putting the flat surface of a piece of iron, while it is still in a melted condition; a piece of cigar box is good to pour it on, as the odor emitted is not very disagreeable, and the solder may be melted in the hollow of a piece of charcoal, by using gas and a blowpipe.

For cleaning colored gold, a mixture of 1 pound sal soda, 1 pound chloride of lime and 1 quart of water will be found useful; it should be placed outside the building after mixing, and when settled, the liquor poured off and the sediment thrown away; with great care this may be used for cleaning gilt bronzes, and cheap gold, and plated jewelry, but caution is necessary, as it will corrode brass very rapidly.

To remove lead solder from badly repaired jewelry, place the piece in muriatic acid and leave till the lead is eaten away. It is best always to heat the piece gently and brush off the lead, while melted, before subjecting the piece to the action of the acid, as too long a steeping is not desirable.

Set pearls, which have become discolored by wear, may often be improved by placing in a covered vessel with a mixture of whiting, ammonia and water, and permitting them to remain for a few hours.

A good powder for cleaning jewelry, silver watch cases, etc., is made by mixing about four parts of whiting with one of rouge, using with alcohol or water; this, it will be found, is easily brushed out of crevices, engravings, etc.

Many are not aware of the fact that the gold and jet jewelry, which has been worn so much for years, can be hard-soldered with easy running solder without removing the jets, but it is easily accomplished

by coating the gold with ochre, and laying the piece with the jets up while soldering, care being taken not to smoke the jets; an alcohol lamp is perhaps preferable to gas for this purpose, but in most cases gas answers best for soldering.—[H. G. M., in *Goldschmiedekunst*.

### The Tempering of Small Drills.

MUCH HAS been written on this subject, and still it is never exhausted; new methods for hardening this small tool, so useful to the watchmaker, are recommended every little while.

Small drills for drilling holes in arbors, staffs, etc., which are frequently very hard and difficult to be perforated, are tempered in the following manner: After the drill has been filed to its proper size (the cutting-face must not be flattened with the hammer), it is only moderately warmed, avoiding that it does not become red, when it is run into borax. The drill is thereby coated over with a crust of borax and secluded from the air. It may now be hardened by heating it only cherry red, after which it is inserted into a piece of borax, or, what is still better, plunged into mercury; care is to be taken in the latter case, however, not to breathe the mercury fumes. The borax accommodates itself to the heat of the drill, melts and cools it off. Various experiments, made by cooling in water, petroleum, etc., after the drill had been coated with borax, were not followed by results as favorable as when the drill was plunged into borax or mercury; it becomes exceedingly hard, without being brittle, and the watchmaker is able to drill articles which cannot be perforated with a drill tempered in the ordinary manner.

Many watchmakers make use of broken broaches for these small drills, in the belief that they are made of the best steel, which is not always the case, however, because the steel used for them is frequently burned, and, of course, the steel is thereby rendered unfit for such small tools. In order to be certain of the quality of their drill, let them take a new piece of round steel.—[G. L., in *Schweiz. Uhrm.*

### Brass in Horology.

THE SPECIFIC gravity of brass is 8.39, co-efficient of expansion  $\frac{1}{533}$  or 0.001875; it is an alloy of copper and zinc, to which is generally added a trace of lead, for the sake of rendering it more pliable for working. The brass used in horology consists of 66 parts copper, 33 zinc, 1 lead, and occasionally a trifle of tin is also found in it. Its color, tenacity, ductility and hardness vary much, according to its composition, wherefore it is necessary for the watchmaker to be very circumspect when purchasing the raw material.

One kind of brass may be hammered for a long time before it is reduced to the firmness and hardness necessary for the purposes of the watchmaker, while another kind cracks after a few blows. A gold colored brass contains less zinc; it increases in paleness of color with the percentage of the latter; melts more readily in fire or in soldering, and more prone to crack when hammered.

It is but seldom that a sheet of brass is uniform in its metallic composition throughout the entire sheet; the variance is occasioned by the different degrees at which the principal metals cool after casting; it also happens that by overheating the lighter metal will separate from the heavier, the mass crystallizes in places, and it is but natural that its firmness and tenacity result unequal. The difference of consistency of this alloy can be noticed frequently in the same sheet, if ordinary lubricating oil is distributed in drops at regular intervals over both sides. The metal is of the same composition at the places where the decolorization of the oil progresses in the same manner, and *vice versa*. Another way of testing is to slightly heat the sheet, and then to pour dilute *aqua regia* over it; the surface is ren-

dered bright thereby, and a tolerably fair judgment of the homogeneity of the alloy can be arrived at.

#### WORKING THE BRASS.

The brass, as it is purchased, cannot be used for the purposes of the watchmaker; it is too soft and porous, and possesses no powers of resistance. German brass may be taken twice or three times as thick as the ready article is to be, while twice the thickness is sufficient for English brass. For striking or hammering it is above all things necessary that both anvil and hammer have good, smooth and polished surfaces (it is not injurious to rub the anvil with a little tallow); inequalities upon the surfaces easily produce spots and unevenness in the brass, which will gradually enlarge into cracks. The surface of the anvil as well as of the hammer should be very slightly rounded; the edge of the hammer must not be sharp, but broad and nicely rounded. Small pieces are hammered upon the bick-iron, laid upon the knees, larger ones upon the ordinary anvil, which is fastened in a block placed upon a straw mat, so as to break the force of the blows.

If there is but little choice in the quality of brass, so that it is necessary to take a thicker piece, commence hammering toward the side toward which the brass is to extend, striking with the edge of the hammer with uniform blows, parallel to each other, after having filed the cut sides flat and rounded off the edges with a fine file. When the metal has been treated in this manner upon the two sides, and the work has been carefully done so that no blows penetrated deeper than others, and the metal is then found to be only about one-third thicker than is required, the faces of the hammer are reversed. With the broad side of the hammer strike medium strong blows, in rows and with regularity, at the same time moving the brass to and fro, until all traces of the hammer's edge are obliterated, the brass has become nicely flat and has been reduced to its necessary thickness. With small, steady blows, so that no heating is produced, a brass can be manufactured that may be worked as nicely as steel, and leaves nothing to be desired. Heating is also prevented (and this is often done), by frequently cooling the brass, hammer and anvil with cold water during the operation of hammering.

Irregular, violent or unduly strong blows, struck in rapid succession, heat the metal, destroy its molecular cohesion, produce cracked places and give rise to fissures, which are often revealed only after the piece is ready, so that it has to be thrown away and the entire manipulation must be commenced again. If cracked edges begin to show themselves, they must at once be filed out before proceeding with the hammering; if others are seen immediately afterward it is better to cease hammering. It is advisable to hammer the brass as thin as it is to be used, so that in working it only the outer layer, and even of this as little as possible, is to be taken off; it stands to reason that its greatest density is mainly upon the surface; the farther we penetrate into the interior the softer will the metal be, and, consequently, the less suitable for our purposes.

Should the brass be entirely too thick, heat it very carefully, but without bringing it to a red heat, and while it is still hot rub it with a little tallow. A little extra heat is apt to render it perfectly useless; before continuing to hammer let it become thoroughly cold, because brass is very brittle when warm. Overheating generally causes the grey spots that are frequently revealed when working the brass, and cause that an otherwise acceptable piece must be thrown aside, much to the chagrin of the watch repairer.

Long, round or square pieces are best hardened in the draw bench; if such a one is not on hand, strike them very small blows upon only two sides, otherwise such pieces are very prone to crack. Plates can also be nicely and uniformly hardened by passing them through a pair of goldsmith's rollers.

#### CAST BRASS.

Cast brass is generally brittle, nor can it be bent without breaking, nor hammered without breaking or cracking. It is only seldom that an entirely faultless piece of cast brass is found that can be worked

like ordinary brass, wherefore it is generally used only in large pieces for tools or steeple clocks. Before attempting to work a crude cast with file or graver, it is well to first cleanse it with dilute sulphuric acid or *aqua regia*, in order to remove any adhering impurities, hard crust, etc., which would ruin the tools.

### Advice to Watchmakers' Apprentices.

BY A MAN WHO HAS SPENT TWENTY YEARS AT THE BENCH.

AN ALLOY of tin and lead, if maintained at a pale cherry red heat, rapidly oxidizes and forms what is known to enamellers as *calcine*. This oxide forms the base of some of the most useful frits of the enameler. The preparation of this *calcine* is as follows: A shallow cast iron ladle is used for melting the alloy and maintaining it at the proper temperature. As fast as the oxide forms it is scraped to one side and removed, care being taken *not to let any particles of unoxidized metal be gathered with the calcine*. Care must also be taken to not let the temperature run much above a pale cherry red, as it will cause the calcine to *frit* (melt into glass). The proportions of lead and tin are varied, some writers saying equal parts of tin and lead, others directing 15 parts of tin to 100 of lead; but 1 part tin to 2 parts of lead is about the right percentage. This calcine, after cooling, is to be ground either in a mill or in a porcelain mortar, then elutriated, *i. e.*, ground fine in water—using a considerable water in the mortar, and while the fine small particles are still suspended in the water, pour the mixture into another vessel to settle. The fine sediment dried is *calcine*. This, mixed with other ingredients, forms the basis of many of the enamels. The substances usually mixed with *calcine* are silicious sand and sea salt. The sand can be substituted by ground flint (the substance on so-called sand paper), and the sea salt, by table salt, or soda (washing soda), carbonate of potash (*sal tartar*), or pure potash. Each of these ingredients give different results, and all desirable for certain objects. The following formula will serve as a standard, but can be varied to suit wants:

#### *Frit No. 1.*

Silicious sand.....4 parts.  
Calcine.....4 “  
Sea salt.....1 “

By varying the proportions of the above ingredients we can change the frit to our wants; if we want it more fusible, add more sand; if we want it more opaque or whiter, add more tin. We next melt the substances in the proportions we desire (say, as given above), into a vitreous mass. Enamels are not melted into a really fluid state like melted metals, but into a sort of plastic condition which enables it to take on a glossy surface and adapt itself to the form of the metal sink cut to receive it. The composition can be fused in a clay crucible, or it can be fused on a fire tile by spreading some substance on the tile which will prevent its adhering. Spread an even layer of air slacked lime, wood ashes or fine sand on the fire tile, say  $\frac{1}{8}$  of an inch deep, packing it smooth; and on this spread a layer of the mixture (Frit No. 1), and put it in your enameling furnace and heat until the frit melts into a mass. Of course, it is understood that the substances are to be ground and thoroughly mixed together before fusing, and also the sand used is to be perfectly free of any metallic oxide, and should be calcined, before using, with one-fourth its weight in sea salt.

#### *Frit No. 2.*

Broken crystal goblets.....3 parts.  
Calcined borax.....1 “  
Saltpeter..... $\frac{1}{4}$  “  
Diaphoretic antimony.....1 “

The last named substance is an antimoniate of potash from metallic antimony and nitre deflagrated together. This frit is melted together, then broken up and re-melted several times, as re-melting

improves it. Frit No. 2 is very useful for blues, purples and delicate shades. The two frits given above are the foundation of all the frits. Receipts are given for the use of flint glass instead of crystal goblets; there is no difference, however, in the composition of the two kinds of glass, except that flint glass contains a trifle more lead. For black enamels a little lime or chalk (carbonate of lime) is added. White enamel is composed of the purest materials, and for this reason it is best to substitute for the silicious sand, rock or quartz crystals ground fine. Heating and throwing into water facilitates the grinding. The *calcine* for white enamel should consist of 2 parts of tin to 1 of lead, reversing the proportions given above for general use. So for white enamel we give the following formula:

#### *White Enamel.*

Calcine (2 parts tin to 1 of lead).....1 part.  
Fine rock crystal.....2 “  
A very little manganese.

These substances are ground well together and melted in a clay crucible, and when melted turned into water; this melting can profitably be repeated 3 or 4 times.

#### *Black Enamel.*

Silicious sand.....12 parts.  
Calcined borax.....12 “  
Diaphoretic antimony.....4 “  
Saltpeter.....1 “  
Lime.....2 “  
Grind and re-melt the above 3 or 4 times, then take of the above  
Frit.....5 parts.  
Oxide of manganese.....2 “  
Saxony cobalt.....1 “

The above will generally stand the coloring pot, but if it blooms use less borax. For such enameling as is done on a coal at the lamp, more borax can be used if not to be colored.

#### *Blue Enamel.*

Frit No. 2 and oxide of cobalt is an intense color, only a very little is needed. Experience is the best guide. Sometimes when a blue enamel is not exactly satisfactory, a re-melting and the addition of a trifle more of nitre (saltpeter) will correct it.

#### *Yellow Enamel.*

The finest is made from silver, the sulphate or phosphate; try it with Frit No. 2, leaving out the nitre. Another yellow, but pale, like Naples yellow:

White oxide of antimony.....1 part.  
White lead.....2 “  
Sal ammoniac.....1 “  
Alum.....1 “

The white lead can be substituted by any oxide of lead and the proportion varied. The addition of the red oxide of iron changes to an orange. As a rule, yellow enamels succeed best with metallic fluxes, and those used sparingly.

#### *Green Enamel.*

This enamel requires a strong lead frit as follows:

Red lead.....10 parts.  
Flint glass.....6 “  
Borax.....2 “  
Saltpeter.....2 “

Melt and throw into water. Grind and mix as follows:

Above frit.....36 parts.  
Dentoxide of copper.....2 “  
Red oxide of iron..... $\frac{1}{10}$  “

The green oxide of chromium, added to Frit No. 2, forms a good green, melts well and stands a high heat. Blue enamel added to the above darkens the green, but the lead Frit, as above, injures the clearness. Strange as it may seem, both red and green enamels are colored by oxide of copper, *i. e.*, copper in different degrees of oxidation.



*Red Enamel.*

Frit No. 2.....8 parts.  
 Red (protoxide) of copper.....1 "

Purple of Cassius gives a pale pink enamel. The proportion is the same as above. The red produced by the protoxide of copper is superb, but in firing it is difficult to manage as it readily takes up more oxygen. If the color is lost in this way, cover the surface with fine charcoal when in the furnace, and generally the color comes back. The firing can be managed so with this oxide of copper as to produce a bronzed look by particles of fine copper in the enamel, now of a pale red color. The red oxide of copper can be made by boiling equal parts of sugar and sulphate, or rather, acetate of copper in four parts of water. After two hours of very moderate boiling the vessel should be set aside to settle. The watery solution should be poured off and the red precipitate washed. This is the protoxide of copper. The green oxide of chromium is made as follows :

Perfectly dry chromate of potash.....240 parts.  
 Sal ammoniac.....35 "  
 Gunpowder .....45 "

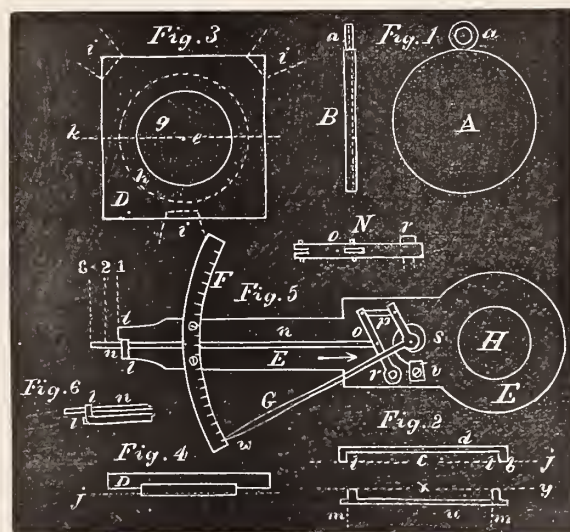
These substances are reduced to fine powder, intimately mixed by passing several times through a fine sieve. Next take a small funnel and stop up the outlet hole, and pack the ingredients into it to form a solid cone. Remove it from the funnel and set the base of the cone on a fire tile and light the top (of the cone) with a match ; it will burn beautifully. Wash and elutriate as directed for the calcine, and you have green oxide of chromium.

How to Make and Engrave Silver Bangles.

BY EXPERT.

A NOVELTY in bangles is in having them to open and admit a highly varnished photo, or the picture protected by a very thin disc of Russian Isinglass (mica). Or a motto is engraved on the inside as "Ever Thine," "In Friendship." Of course, the making of such bangles involves the destruction of two coins, as a portion of each is turned away in order to let the two halves snap on to each other. It is not necessary to have a joint, although it can be done, but it requires nice close workmanship. The usual way is to turn the two halves so they will comparatively be easy to separate by inserting the nail or a knife at the juncture and forcing them apart. If it seems desirable, both halves can be provided with a ring for attaching, but the rings so made as to represent halves, as shown in fig. 1, where *a* represents the rings. At *A* is shown a side view of the dime or quarter, and *B* an edge view. The manner of making such bangles is simple enough if you have a universal lathe or step chuck American. If you have the former, the first thing is much like the plan given for facing off dimes early in these articles, only for a commencing specimen it would be best to use a quarter dollar, as you will have a chance to work on a larger scale ; although after a little practice it is easy enough to work with dimes or even half dimes ; or, as an extra specimen, a gold dollar. We commence by taking a piece of thick short brass (No. 14) one and one-half inches square, and turn a recess into it of the size of the coin you intend to use, centering by the hole drilled at *c*. This hole should be quite small, say  $\frac{1}{32}$  of an inch in diameter—only large enough to catch and hold the centering point of the lathe, both for the recessing just mentioned and for the turning out of the coin. The recess should not exceed in depth more than one-fourth the thickness of the coin. For all the measurements, I will describe a little tool (very easily made) at the close of this article. After the brass plate *D*, fig. 3, is recessed as described, a coin should be cemented in with shellac, being careful to press the coin down well into the recess so as to press out any excess of shellac ; this is important, as we will take our measurements from the face of our brass plate. And to make our measurements more certain it is well to face off the plate a little

back from the recess as shown in fig. 3, where *g* represents the sink or recess for the coin, and the dotted line *n* shows the extent of the facing off. It is well to mark the plate *D* where the jaws of the universal lathe go as shown at *iii*, fig. 3 ; this ensures the same results over and over again. After the coin is in the recess *g* it is to be faced off, removing about one-fourth of the coin corresponding to the dotted line *j*, fig. 4, which is a transverse section of *D*, fig. 3, on the line *k*. We must now turn it out as shown at *c*, fig. 2, making the angles at *l* slightly undercut ; the recess should be as deep as is consistent with strength—say, hardly  $\frac{3}{4}$  the thickness of the coin. The dotted line *j* corresponds to the same line in fig. 4. The face left on the line *j* at *b*, should be about  $\frac{1}{16}$  of an inch wide. We should now take another coin and face it off precisely as we did the one just described, except we should recess it as shown at fig. 2. Now, the idea is the flange at *b* is intended to snap on to the flange corresponding to the dotted lines *m m*. The picture to go into the recess at *x*. If a motto is to be engraved inside, the recess or sink at *x* is omitted, and the surface is left flat on the line *y*, fig. 2, and polished for the engraving. The rings for attaching the box coin to the bracelet are attached (hard soldered) to the edge of each half, and filed away until the two halves of coin come to a close joint. In practice the halves can be left so that on joining the made up coin will be a trifle thicker than either coin was originally. The greatest difficulty in doing such a job is in judging of the depth to which the turning is to be carried ; all this is readily determined by a little



gauge which we will now describe. The tool will be found eminently useful for other measurements as the reader will see. The principal part of the gauge consists of a piece of sheet brass or German silver (about No. 24), shaped as shown at *E E*, fig. 5, and about  $2\frac{1}{4}$  inches long. The piece *E* is perfectly flat except at the end *l*, where a lip is turned up to allow the needle *n* to pass through. The needle *n* is an ordinary sewing needle (No. 3 or 4) with the extreme sharp point broken or ground off. The only precaution with the needle is to get a long one with a drilled or round eye. The cut at fig. 5 is full sized, and measurements, if desired, can be taken direct from it. The needle *n* is attached by its eye to a short lever *o*, by a pin passing through the lever and the needle eye; an enlarged view of the lever *o* is shown at *N*, as seen if looked at in the direction of the arrow seen below the needle in fig. 5. This lever turns on a screw at *r*, and is attached to the hand or indicator *G* by a short connecting rod *p*. The indicator is bent at right angles at *s*, or rather, it is cut of the shape shown out of No. 24 brass, and the piece at right angles and connecting with *p* is bent downward so as to enable the hand *G* to extend over the lever *o*. The circular index *F* should be of thicker brass (No. 14), and shaped as shown, and divided into about 50 parts. The needle should extend about the  $\frac{1}{8}$  of an inch beyond *l*, and when it is pushed in this distance it will cause the hand *G* to traverse the whole length of the circular index *F*. The circle at *H* is only a hole to give steadiness in holding the gauge between the

thumb and finger when using it. In using the gauge we will suppose we wish to measure the distance between say, the dotted lines at 2 and 3. When the point of the needle *n* first touches the line 3, the shoulder on the end of *E* will be on the line 1. If, now, some part extends above the line at 3 (say at 2), *E* can be pushed forward until it strikes something on line 2. To apply the thing practically we will suppose we wish to measure the depth we are turning, the recess at *c*, fig. 2; we let the point of *n* strike on *c*, and press *E* forward until the shoulder *t* strikes *b*. And so all through the entire process we can make our measurements—say we first measure the depth of the recess *g*, then the entire thickness of the coin, and go on turning and measuring until complete. It is best to turn the half shown at *d*, fig. 2, first, then turn the half at *u* so *d* will snap tight on to it. The rings at *a* will prevent the loss of either half, if by any accident they should come apart. A thin ferrotype will go into the recess *x* even of a dime; and a paper photo will admit of a thin mat going inside of *x*. This little tool is very useful in many jobs of watch work, and for that reason it is well to take some care in graduating the index *F*. The process of etching can be applied to silver bangles with very nice effect, and will be treated on in our next. The stud and spring at *v*, fig. 5, is to keep the hand *G* pressed against a pin in the index *F* at *w*, except when the needle *n* is pressed in.

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## Proceedings of the Horological Club.

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### A DISTINGUISHED BODY OF WATCH AND CLOCK MAKERS.

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*One hundred and twenty-eighth discussion.—Communicated by the Secretary.*

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[NOTICE.—Correspondents should write all letters intended for the Club separate from any other business matters, and headed "Secretary of the Horological Club." Direct the envelope to The Jewelers' Circular Publishing Company, Seth W. Hale, President. Write only on one side of the paper, state the points briefly, mail as early as possible, as it must be received here not later than the eighth day of the month, in order to be discussed and reported in the CIRCULAR for the next month.

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### FACTORY METHODS OF CLEANING WATCHES AND SELECTING HAIR SPRINGS.

*Secretary of Horological Club:*

In reply to the inquiry of "L" in the February Proceedings, I would say that I use common benzine, or what is called 72 naphtha. I also use Castile soap and warm water; dip each part separately, allowing it to remain in the cyanide but a second, then wash thoroughly. I will also give my method of hair springing.

We have what is called in the "shop" vibrators, one each for quick and slow trains, made thus: Take a balance of an old watch which is all right, with a good hair spring, etc., and attach a long stud like the old series, 10 size Waltham movement, and pin the hair spring into the stud at the correct time point. We then have an old dial with a pillar fastened in the second hand hole, the stud to be fastened into the end of the pillar, so as to allow the lower balance pivot to touch the dial. We are now ready to pick out a new spring for a balance. First put into the staff a small piece of putty powder mixed in oil to about the thickness of ordinary putty, or else a small piece of beeswax, then fasten the inside end of the spring into the putty. Then by taking hold of the outside end with tweezers, we can tell in a second whether it will run the watch or not, by placing it on the dial near the vibrator, and starting both by a twist of the tweezers holding the spring. If it runs slower than the vibrator, take up more spring (in the tweezers) until both vibrate exactly alike; if too fast, *vice versa*. The vibrator, of course, must have the same number of vibrations as the watch to which we are to fit the spring. By a little practice with the vibrator we can pick a spring out for any watch in a very few minutes, and bring to time so that it will require little, if any, alteration when in the watch.

I will try to explain in my next the method of pinning and truing a hair spring. With kind regards to "L," I remain,

Very truly,  
X. Q. Z.

### CLEANING FINE WATCHES.

*Secretary of Horological Club:*

I would like to know the best possible way of cleaning very fine watches, also what to use for the same; if you will please answer the above through your columns I will be exceedingly obliged.

E. D. H.

Mr. H. will find this matter fully discussed in our Proceedings for a few months past.

### RESTORING THE COLOR OF GOLD AFTER HARD SOLDERING.

*Secretary of Horological Club:*

What is the best way to restore gold to its color after hard soldering?

P. E.

Mr. Clerkenwell replied that there are different ways, according to the effect desired, as for plain or mat gold, Roman or Etruscan, etc. To describe all would make quite a good sized book. The simplest and easiest way is to expose all parts of the article to a uniform heat, allow it to cool, then boil it until bright in a pickle made with about  $\frac{3}{8}$  ounce of sulphuric acid to one ounce of rain water. Another way is to first pickle, then color. Anneal and boil in a pickle made of nitric acid and water, then again anneal black and dip in a coloring mixture made as follows: Put into the coloring pot or a No. 10 black-lead crucible 9 oz. 12 dwts. of saltpeter, and 4 oz. 15 dwts. of table salt. Heat it up without water, then add hot water enough to make a thick paste; let it boil, add  $6\frac{1}{2}$  oz. of muriatic acid and stir it up well. In using keep up a quick and lively fire, and the mixture should boil up till it fills the crucible—which should have been previously well annealed to avoid breaking. The mixture removes more or less of the gold, and the operation should therefore be performed as quickly as possible. With good gold  $1\frac{1}{2}$  to 2 minutes will be long enough to expose it to the mixture. The article should be constantly stirred about, taking care not to let any of the surface get out of the color, as the vapors will affect the work. Then rinse it in a pickle, dip in hot water, wash well in ammonia, again dip in hot water and dry thoroughly in hot sawdust. This color may be used with gold ranging between 12 and 20 karats fine, but the finest coloring can be got with about 15 karat gold. If not thoroughly dried the work is liable to become spotted. Much practice is needed to be successful, and Mr. E. would do well to buy some book giving all the minutiae for different kinds and qualities of gold, and study the subject carefully before trying his hand on any very valuable or difficult article. Coloring is almost an art of itself, and there are many different ways employed by different jewelers, so that he must not expect to learn it in a moment. "Gee's Gold Worker" is a good book, and there are also others. A cheap work called "Collins' Private Book of Useful Alloys, etc.," can be got for 50 cents from Van Nostrand the bookseller, of this city. As for saying which is the *best* way, every workman thinks his way is best.

### WATCH REPAIRS BOOK WANTED.

*Secretary of Horological Club:*

Can any member of your Club tell me where I can get a suitable book for recording the watches which we repair.

D. B. G.

Mr. Uhrmacher said that the Club was frequently asked about books for watch repairs, and if none are now in the market it ought to pay somebody to print a good one, and keep the trade advised of his address, with the price of the book, etc. A short standing advertisement would not cost much, and he would secure a reasonable and steady income from it, besides accommodating the trade.

### IMPROVED BEZEL FOR WATCH CASES.

*Secretary of Horological Club:*

I would consider it quite a favor if you would tell me what you think of my improved bezel for O. F. watch cases. A drawing is enclosed. It will hold a number of sizes of glass. No danger chipping the edge in putting in, as they are put in from the back and the rim screwed down on it, making it dust and water tight. I have applied for patent. You can answer through THE CIRCULAR or otherwise.

J. W. M.

Mr. O'Lever said the idea was a good one, but it seemed to be

somewhat like one of the patents of the Waltham Watch Co. If he could secure a good patent on it he would doubtless find it valuable.

LOOSE JEWELS MOVING IN A DIRECTION CONTRARY TO THAT OF THE PIVOT.

Secretary of Horological Club:

As Mr. Ruby Pin has given up the question asked by Mr. S. at the January meeting in regard to a jewel running in the opposite way to the wheel, and has left it to some one else to explain, with your permission I will try and do so. It is an occurrence that has come under my notice a few times in forty years, and though seeming strange, it cannot possibly do otherwise if conditions are favorable; and if Mr. S. had stated the circumstances fairly, I am sure some of the Club would have had no trouble in explaining it. Mr. S. unwittingly left one of the elements out of the question altogether, and the Club has not thought of it.

We will put it in this way: If a jewel is loose in its setting, and is dry and dirty, and the wheel running in it is forcibly made to run or revolve, it follows that the jewel must either remain stationary or go with or in the same direction as the wheel. We will now oil the jewel, giving it more than the usual quantity. (This is the element that has been overlooked). What is the result? The jewel goes in the *opposite* direction to the wheel, of course, and must. To explain: the train is set in motion, the pivot running in the loose jewel throws the oil from the center of the jewel in curved radii, which, if there was no obstruction, would fly off the edge of the jewel; but these oblique jets of oil strike against the setting, and, of course, forces the jewel in the opposite way to that in which the wheel is going. The oil, after expending the force given to it by the revolving pivot, finds its way over the top side of the jewel by capillary attraction, and keeps up a continual supply of oil to the pivot, and so the thing goes on.

Yours truly, M. Moss.

Mr. McFuzee thought that Mr. Moss probably meant that the oil was thrown outward, not by the pivot, but by the shoulder of the pinion arbor or by the center of the scape wheel, which reached up near to the jewel. If thrown out by the pivot, it would be thrown on the upper as well as the lower surface of the jewel, and could not return to the pivot as described. The explanation is certainly ingenious, and could easily be tested by anyone who has such a movement, by varying the quantity of oil. If the jewel ran in the direction opposite to that of the scape wheel, and, after removing the superfluous oil, without changing any other condition, it then ran in the *same* direction as the wheel, it would show that the action was due *certainly* to the presence of the oil, and probably to the action described. Has Mr. Moss tested the question in that way? If so, we may consider it settled. We hope to hear from him often, as his communications are always valuable and highly appreciated.

BACK NUMBERS OF THE CIRCULAR, WITH EXCELSIOR'S "PRACTICAL HINTS ON WATCH REPAIRING," FOR SALE.

The Secretary wished to call the attention of our friends to the fact that Mr. A. J. Green, of Grafton, Neb., has offered for sale bound volumes of THE CIRCULAR, embracing Vols. 7 to 14, inclusive, and containing the whole of Excelsior's famous "Practical Hints on Watch Repairing," for which we have received literally hundreds of inquiries since the exhaustion of the stock of back numbers at the publication office. The first series of those articles was re-published in book form and is now for sale at the office. The second series has never been re-published, for the reason that the author has found it impossible to get the necessary time to revise them. We are therefore unable to state when they are likely to appear, and can only repeat what we have said so often, that the only way to obtain them, at present, is to purchase the back volumes of THE CIRCULAR from some subscriber who is willing to part with them. Thus far we have known of but one, and we give all our friends the benefit of that opportunity by inserting the full address. What his price is we do not know. It is probably a good round sum—and they are worth it.

### A New Annual Clock.

MR. T. A. L. de Gruyter, of Amsterdam, has obtained a German patent for a clock which requires winding only once in

nearly two years, or, more correctly speaking, after the lapse of 600 days, which lays the Harder's annual clock completely in the shade.

The *Allg. Journal d. Uhrmacherkunst* describes the mechanism as follows: The going train in the accompanying fig. 1 is composed of the barrel *a*, with 110 teeth, the first intermediate wheel *b*, with 66 teeth, which sits up the 16-leaf pinion *c*; the second intermediate wheel *d*, with 64 teeth, which is fastened upon the 12-leaf pinion *e*; the third intermediate wheel *f*, with 60 teeth, which sits upon the

10-leaf pinion *g*; and of the center wheel *h*, with 96 teeth, sitting upon the 8-leaf pinion *i*, and gearing into the 8-leaf pinion *m*, of the scape wheel *e* with 20 teeth, which alternately actuate upon the anchor *k*. According to this arrangement, the barrel *a* makes one revolution in 75.75 days, or, with 8 revolutions, goes for 607.56 days.

The striking train connected with the going train is arranged in such a manner that the barrel *a*<sup>1</sup>, with 110 teeth, depths into the 12-leaf pinion *c*<sup>1</sup>, which carries the first intermediate wheel *b*<sup>1</sup>, with 100 teeth; this again gears into the 12-leaf pinion *e*<sup>1</sup>, of the second intermediate wheel *d*<sup>1</sup>, with 90 teeth, which, by means of the 8-leaf pinion *g*<sup>1</sup>, sets into motion the pin wheel *f*<sup>1</sup> with 64 teeth. This pin wheel *f*<sup>1</sup>, with 16 pins, moves through

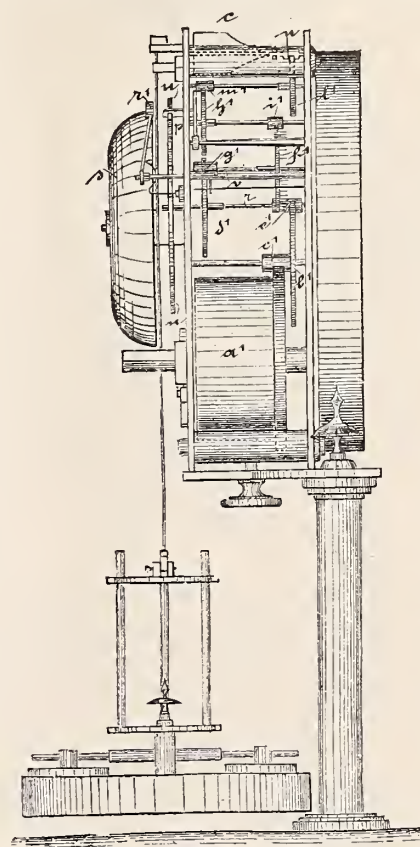


Fig. 1.

the 8-leaf pinion *i*<sup>1</sup>, the pallet wheel *h*<sup>1</sup>, with 48 teeth, which finally depths into the 8-leaf pinion *m*<sup>1</sup> of the warning wheel *l*<sup>1</sup>, with 56 teeth, and then through the fly pinion *n*, with 7 leaves, sets the fly *o* into motion.

Upon the arbor *r* of the second intermediate wheel *d*<sup>1</sup> of the striking train sits, as will be seen in fig. 1, the count wheel *u*. This count wheel *u* constitutes in its arrangement the most essential part of the invention; it is not, as was usual hitherto, provided with 12 notches for the dropping in of the rack hook *p* for 90 strokes, but with 2 x 12 notches, for 180 strokes. This rack hook *p* drops into the notches of the count wheel *u*, and is each hour unlocked twice by the center wheel. As soon as the lifting-piece drops from the pin situated on the warning wheel *l*, the striking part is set into motion. The center wheel, therefore, relieves the striking part 48 times in 24 hours; and since the count wheel *u* is calculated thus that the rack hook *p* drops in 48 times, the count wheel *u* will revolve only once in 24 hours; and by the addition of the second intermediate wheel, together with the increase of teeth in the other wheels, it becomes possible to continue the striking train in activity for 600 days with one winding.

The second intermediate wheel *d*<sup>1</sup>, as previously mentioned, has 90 teeth, and depths into the 8-leaf pinion *g*<sup>1</sup>, of the pin wheel *f*<sup>1</sup>, whose 16 pins actuate the hammer arbor *v* with the hammer *r*<sup>1</sup> affixed thereto, and effect the striking of the hammer *r*<sup>1</sup> upon the gong *s*. (Fig. 2). Therefore, two strokes come to each tooth of the second intermediate wheel *d*, or to 90 teeth 180 strokes, which the clock must make in 24 hours.

The pin wheel *f*<sup>1</sup>, as stated, has 16 pins, and the pinion belonging thereto 8 leaves, consequently two pins come to each leaf; and since the 64 teeth of the pin wheel *f*<sup>1</sup> depth into the 8-leaf pinion *i*<sup>1</sup> of the pallet wheel *h*<sup>1</sup>, 4 teeth cause one stroke ( $\frac{64}{8 \times 2}$ ). The pallet

wheel  $h^1$ , with 48 teeth, is provided with two relieving pins, so that to one-half revolution a pin braces upon the rack hook  $p$  and stops the striking part as soon as the rack hook  $p$  drops into a notch of the locking plate  $u$ . The 8-leaf pinion  $m^1$  of the warning wheel  $l^1$  makes 3 revolutions to each stroke, while the warning wheel  $l^1$ , with 56 teeth, actuates the fly pinion  $n$  with the fly  $o$ , which makes 24 revolutions to each stroke.

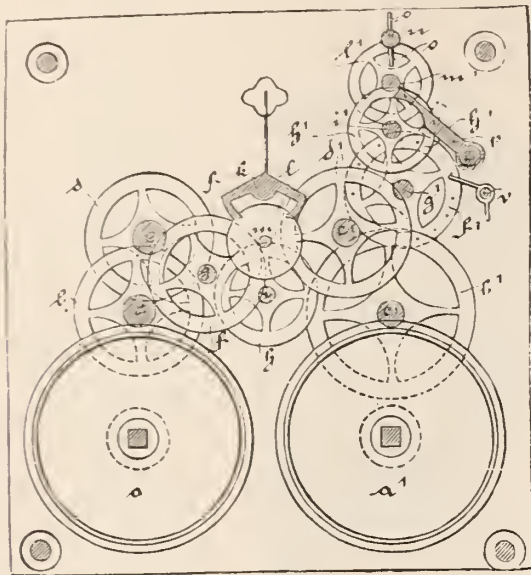


Fig. 2.

According to the above indicated dispositions of the intermediate wheel  $d^1$ , pin wheel  $f^1$ , pallet wheel  $h^1$ , rack hook  $p$  and locking plate  $u$ , in connection with the warning  $l^1$  and fly  $o$ , the barrel  $a^1$  of the striking train makes one revolution in 76.18 days, so that the clock strikes 609.44 days with 8 revolutions.

### Jewels of the Orient.

THE history of gems in the East is the history of the governing princes, for so often has the course of history in the Orient been affected by intrigues about precious stones that they assume a State importance. The traditional diamond in the East is the Great Mogul. The original weight of this stone was 787 karats, but by cutting it was reduced to 297 karats. The stone disappeared at the last Tartar invasion, when treasures to the value of \$350,000,000 were captured by Nadir Shah. It is believed to be at present hidden away in some obscure fortress in Asia Minor, and it may be recovered at some future time.

Some idea of the abundance of precious stones in the East may be gained from the fact that when Mahmoud, in the eleventh century, captured Sumnat, an idol statue was broken open and found to contain three bushels of diamonds, rubies and emeralds. Ala-uddeen obtained from the Rajah of Mahrattas fifty pounds of diamonds and rubies and 175 pounds of pearls. Shah Jehan, the greatest of the Mogul sovereigns, left a treasure of incalculable value at his death—a throne valued at \$30,000,000 and a crown worth \$12,000,000. The throne was the celebrated peacock throne, so called from the images of two peacocks which stood before it, each made of precious stones so matched in color and position as to resemble the natural color of the bird. The throne was six feet long and four feet wide, of solid gold and crusted with diamonds, rubies and emeralds. Steps of silver led up to it, while a canopy of gold, fringed with pearls, supported by twelve pillars, emblazoned with gems, surmounted the whole. On each side was a sacred umbrella made of velvet, embroidered with pearls, the handle being of gold inlaid with diamonds. It was the most costly work of art ever made. Its only rival was the cerulean throne of the house of Bahmenee, in the Nizam. This was built in the seventeenth century, was nine feet long by three feet

wide, was made of ebony, covered with plates of gold crusted with gems, and was valued at \$20,000,000.

A late traveler gives an account of the magnificence of the Persian crown jewels. In the jewel room he found treasures valued at \$35,000,000, among them the crown, a mass of diamonds surmounted by a ruby as big as a hen's egg. The king's belt is a wonder of barbaric magnificence, weighing about twenty pounds and composed of a solid mass of diamonds, rubies and emeralds. As Persia is the native land of the turquoise, it is but natural that the finest stone of this description is to be found in its collection. This royal specimen is four inches long, perfect in color, and without a flaw. When the Shah was in Europe, some years ago, he wore a variety of diamonds and other precious stones that kept the detectives in a constant fever of fear lest he should be robbed of some of them, for one, even of the smallest, would have been a fortune for a half-dozen thieves. The buttons of his coat were five in number, and each button was a diamond larger than the Koh-i-noor, while every part of his clothing seemed to be useful, not as a covering for his body, but as places to hang diamonds on.

### How to Color Brass.

CORRESPONDENTS have at different times desired to know how to color brass, and in answer to them we have looked up the following reliable recipes:

If brass be covered with moistened sand for some time, a beautiful brown coloration is developed upon the surface, which remains bright when polished with a dry brush. In order to render the color more light or green, it is colored with a film of verdigris obtained by evaporation of dilute acid applied to the surface. The antique appearance of the article thus treated is quite beautiful, and more or less lasting. An objectionable feature of the process is the extent of time necessary for its execution, and it has for this reason been substituted by another process. The brass being heated, is immersed in old or dilute nitric acid, and left therein till the surface is covered with scales; it is then cleansed with sand, washed and bronzed. The term "bronze" embraces in commerce all possible colorations. Brown is obtained by immersion in a solution of nitrate or chloride of iron, the intensity of the color being dependent on the strength of the liquid; for violet colors, antimony chloride is used, while a chocolate color is obtained when the surface is covered with a layer of humid iron oxide, and highly heated and polished with graphite. By moistening the brass with a solution containing iron and arsenic chloride, an olive green is imparted to it. The liquid is prepared by dissolving the respective metals in muriatic acid. The surface is polished with a brush and black lead and coated with a lacquer composed of 100 parts varnish, 4 parts tumeric, and 1 part gamboge.

A steel color is developed by using a boiling solution of arsenic chloride, while a careful application of a concentrated solution of sodium sulphide causes a blue coloration.

Black, being generally used for optical instruments, is obtained from a solution of platinum chloride, to which tin nitrate is added. In Japan, the brass is bronzed by using a boiling solution of copper sulphate, alum and verdigris.

Success in bronzing depends in a great measure upon the temperature of the alloy and solution, the quality and proportion of the metals used in preparing the alloy, length of immersion, drying and many other peculiarities—as regards care of the manipulations—which demand a dexterity only acquired by practice.

When it is not the object to impart to the surface an artificial color, but to protect it against the formation of rust or oxidation, a coating of the surface with a varnish called "lacquer" will then suffice. The metal is heated, steeped in acid and washed with water; it is again immersed in pure nitric acid, washed and dried in sawdust. Or the brass is placed in dilute nitric acid—1 part of acid to 1 part

of water—until the surface appears quite white, being then washed and dried as before.

The first method produces a bright, the latter a dull surface; by polishing the projecting parts this imperfection is partly overcome. The articles are again immersed in acid, washed with water containing some crude potassium bitarbate, and dried in hot sawdust. The so prepared articles are heated on a hot plate and then varnished. The varnish used is prepared by dissolving 1 ounce shellac in 1 pint alcohol. Pigments, sandal wood, dragon's blood and annato are introduced to increase the color and gloss; also tumeric, saffron, gamboge, etc. The former produces a yellow, these a red, and a mixture of both a beautiful orange colored varnish.

An excellent light colored lacquer consists of 3 parts aloes, 1 part tumeric and 100 parts plain varnish. A yellow lacquer is composed of 1 part tumeric, 4 parts dragon's blood, and 100 parts of the spirit varnish. A red lacquer can be made by mixing 32 parts of annato, 8 parts dragon's blood, and 100 parts varnish. Lacquers fade and are chemically altered by the combined action of light and heat, and should be kept in vessels of glass or earthenware; they are also affected by metals.

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AT THE regular monthly meeting of the Executive Committee held Feb. 6th, 1885, there were present President Hayes, Vice-President R. A. Johnson, and Messrs. J. B. Bowden, C. G. Lewis, S. H. Hale, J. R. Greason and W. L. Sexton; also Dr. Wilbur.

Meeting called to order by the Secretary. Mr. J. B. Bowden was unanimously chosen Chairman of the Committee. 10 changes of beneficiary were granted, 43 members re-instated and resignations of 4 honorably accepted.

One application rejected.

Six were referred.

The following 12 were accepted.

H. T. Cook, F. E. Davis, H. G. Eilshemius, Jr., D. F. Foley, P. L. V. Thiery, N. Y. City; F. Leventhal, Hartford, Conn.; A. E. Elbe, W. P. Garretson, Bloomington, Ill.; S. C. Dustin, Detroit, Mich.; F. A. Upham, St. Paul, Minn.; J. H. Crosby, Jr., Jacksonville, Fla.; W. W. Welch, Nevada City, Cal.

## Fashions in Jewelry.

### A Lady's Rambles Among the Jewelers.

DECOLETTE ball dresses with no sleeves at all, and Worth's promise of flowing sleeves next summer, explains in part, at least, the

increased favor with which necklaces and bracelets have been received in the world of fashion this winter. Single stone necklaces and pearl necklaces are the sort most worn by milady on full dress occasions, while gold and silver beads form a necklace to her liking for afternoon and reception wear. In the single stone necklaces those composed of small, but fine diamonds, are much sought after, the stones being mounted so that no gold is visible. Often a pendant containing a flawless colored gem of great value is suspended from a diamond or pearl necklace, or it may be fashionably worn pending from a simple gold chain.

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PEARL necklaces are composed of pierced pearls strung on silk threads. Sometimes the pearls are graded in size and color, the more decorative specimens finding a place in the front of the strand. In this connection may be told a fact sounding strangely like fiction, but substantiated by responsible importers and dealers. It is that many ladies of society who possess and wear fortunes in precious gems, do also adorn themselves with Roman pearls which cleverly imitate the real article. These fair deceivers do this without fear of detection, knowing full well that the genuineness of any jewelry worn by them will never be questioned.

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PLINY placed the pearl next to the diamond in value, and supposed the former proceeded from drops of dew swallowed by the oyster. Importers and dealers of the present day, while they may not adopt the dew drop origin theory, concur in giving great value to drop pearls of large size that possess the wonderful polish and luster characteristic of the gem. Black pearls, when perfect, rank exceedingly high, as do also pink pearls of good form. Of small pearls and such as are more or less defective in form and luster, it may be said, as of inferior grades of diamonds, ruling prices are considerably less than before for some years.

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PEARLS deteriorate by age, contact with acids, gas and noxious vapors of all sorts. This is especially true of pierced pearls. Various means for restoring them have been tried, but experience shows them to be useless. The best way to preserve pearls is to wipe them with a clean linen cloth after being worn and deposit them, wrapped in linen, in a closed box or casket. A leading importer of pearls advises that pearl necklaces, which are liable to deteriorate by coming in contact with the skin, be re-strung once a year, as drawing the silk thread out and in through the pierced parts tends to cleanse the pearls. In Ceylon, we are assured on fairly good authority, that, when it is desired to restore the luster to Oriental pearls, the pearls are allowed to be swallowed by chickens; the fowls, with this precious diet, are then killed, and the pearls regained in a white and lustrous state.

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WITH the present tendency to a more decorative style of dress, and to Oriental effects in jewelry, colored stones, including gems and what are termed semi-precious stones, such as the spinels, tourmalines, chrysolites and the like, remain fashionable as ever. Among precious gems the sapphire is the most popular stone as well as the cheapest in price, owing to a plentiful supply. The emerald, without flaw, especially if of good size, is rarest of all, though not so much of a favorite as the ruby of perfect tint. Ladies in selecting and wearing

gems should remember, by the way, that there are what jewelers call "night" and "day" gems. For instance, the diamond, ruby and emerald are night stones; that is, they appear beautiful by transmitted light as well as by daylight, while the sapphire is a day stone, being less attractive in color by gaslight.

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AMONG pretty surprise articles for the "house beautiful," are music boxes and albums in boudoir or drawing-room, which, on being opened, play melodies from the latest opera, popular ballad, or dance music. There are chairs, too, and foot stools, that on being sat upon send forth harmonious sounds. In the dining-room, guests converse to the time of subdued music by an orchestra, through the medium of a musical box with bells, drums, castinet and flute attachments, hid away in the recesses of a rich inlaid side-board; or their ears are greeted, on raising a decanter of choice wine, with a familiar air coming from a musical box concealed in the bottom of the decanter. These and various other musical surprises indicate the perfection to which the musical boxes of the patient, ingenious Swiss artisans have been carried. From St. Croix, Switzerland, come some of the most wonderful musical boxes in the world. The styles are many and range of prices such as to bring them within the reach of a very large patronage. A leading Swiss manufacturer, at his New York sales-rooms, exhibits musical boxes in prices all the way from one tune ones at 90 cents, to large orchestras playing from forty-eight to one hundred tunes, and vary in cost from \$1,000 to \$3,500. One of the most popular musical boxes is the zither-harmonique piccolo, which imitates the piccolo and produces a very pleasing effect. The musical boxes attaining to greatest perfection and concentrating the effects of the most complete orchestra into the music box are the sublime harmonies. The higher priced musical boxes are in handsomely inlaid cases, affording a pleasing ornament as well as diversion.

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THE revival of gold jewelry is a noticeable feature in the fashions for the season of 1884-5. The nugget finish is a popular one, and it is especially effective in sleeve buttons, lace pins and flat-link bracelets, in which colored gems are imbedded. Popular combinations in jewelry are gold and platinum and gold and silver.

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THE "Queen" remains the newest form of watch chain for ladies' wear, and, as it is susceptible of an infinite variety of pattern and material, it is likely to please for a long time to come. Numbered with attractive patterns are chains finished with three small balls set with gems, and chains on which a solitary ball opens in half disclosing a locket or viniagrette. Again, the finish is fanciful as a viniagrette in form of a jug, a teapot or a rose. Counted with fancies rather than fashions, are enameled chains incrustated with colored gems to wear with watches similarly decorated. Ladies' watches, by the by, remain small in size.

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SILVER jewelry was never more popular than it is now. The rage for oxidized silver continues, and antique designs which so well suit this finish remain fashionable. But the fashion is not restricted to oxidized jewelry. Filigree work is also in favor, and affords a pretty change in one's assortment of silver jewelry. The most popular filigree jewelry, and at the same time the least expensive, is that which comes from Italy. In the Italian filigree, flower and insect

patterns and musical instruments are favorite designs. The patient Chinese sends us some beautiful and artistic filigree work, remarkable for minute detail in workmanship and unique patterns. The Spanish filigree is also highly prized by connoisseurs in such matters, being exceedingly delicate and airy in effect. Comparatively little American filigree work is in the market, owing to the cost of producing it. That sent out by the best manufacturers is, however, preferred by many owing to its more enduring qualities and the fact that it blends utility with beauty. Articles in silver jewelry having the greatest run are bangle and chain bracelets, lace pins, hair pins and beads. Silver beads are worn in from one to five and six strands. Colored stones, by the by, are employed in silver jewelry, the usual plan being to incrust small stones in either a rough or smooth surface.

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MANY ladies who greatly admire the delicate and artistic filigree silver jewelry, are deterred from wearing it because it so quickly tarnishes. Probably if these ladies knew that this jewelry can not only be thoroughly cleaned, but made to appear quite new by any silversmith at small cost, this objection would be removed. Silver filigree is the one class of work above all others that bears repeated cleanings by a silversmith without injury, always returning from the renovation good as new.

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AMONG recent novelties in Vanity Fair are cloak clasps, also clasps and brooches for the waist and throat of new spring dresses, of oxidized silver or Roman gold, studded with colored gems. Little eight-day clocks only two inches high, and decorated in gold and enamel, note the progress of time on milady's writing desk. Escriptoire sets, showing artistic work in silver, brass or copper, and consisting of a tiny lamp of classic shape, a seal, sticks of colored wax, etc., in a tray, have been introduced to meet the requirements of the present fashion for sealing letters. Fine watches for ladies are now made with calendars that recall appointments made for certain days. An innovation that marks the rapid change from more quiet styles in jewelry, are large seal rings worn by ladies.

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BRACELETS, which are enjoying a greater popularity than before for years, embrace several desirable styles. Bangle bracelets are perhaps the most popular kind, though the chain, flat-link and other flexible bracelets are in great demand. There are also combination lock bracelets which open on the word "love," "hope" or "faith," and designed for engagement tokens.

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THE idea of practicing rigid economy, we are told, is the one uppermost now in the popular mind, and yet luxuries in the way of toilet articles were never manufactured in greater profusion than that of the present. Manicure sets, with handles of solid silver, artistically etched; brushes with solid silver backs, chased and oxidized; shoe lifts and button hooks of sterling silver, on which are traced floral patterns and marine views, silver scent bottles, powder boxes and the like, seem a travesty on the so-called hard times. When the above named articles appear in gold, as they occasionally do, the paradox is complete.

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DURING the fever heat period of the rage for decorative lamps that pervaded fashionable New York homes last season, there existed

a prejudice among the more fastidious dwellers in Gotham against the association of kerosene and dainty dishes, which rendered lamps, however classic in form and artistic in ornamentation, decidedly objectionable in the dining-room. That objection has this season been obviated by the introduction of candelsticks and candelabra, consequently the illumination furor now pervading fashionable dining-rooms, springs from the subdued flames of many wax candles in candelabra that revive styles in existence centuries ago.

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IMPORTERS and manufacturers lost no time in encouraging this fancy for waxen tapers, but are fanning the soft flames with a prodigality of styles in candelabra, that promises to outvie the numerous lamp family and follow it to the four corners of the globe. All classes of artistic metal work are being employed in the making of the required candlesticks, and every conceit of the past, as well as original designs of the present, are being wrought in brass, silver and iron. An exclusive style is one represented in old English candelabra, handed down from father to son for the past three hundred years, without the slightest variance in outline or decoration from the original models. Comparatively few of these candelabra are made, and heretofore they have been confined to English homes.

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THE candelabra most sought after are medium in height and come in three, five, seven and ten lights. The correct style calls for two of these candelabra, one at either end, on a table of small dimensions, and three or five on one of more ample proportions. A style likely to gain widespread popularity, and a revival of the early colonial fashions, are brass candlesticks and candelabra, surrounded with glass drops and pendants that quiver and send out reflected lights with the slightest movement.

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WHILE the craze for decorative lamps is on the wane in New York city, the demand continues in a modified way. Very many of the vestibules of city houses are lighted through colored lanterns of peculiar workmanship, swung from the ceiling with chains, while drawing-rooms and libraries are illumined with lights mellowed by passing through rich tinted shades. Many of the lamps are veritable works of art, and will be treasured as desirable ornaments long after the fashion that introduced them is forgotten.

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MRS. HITT, Mrs. Adams, Miss Frelinghuysen and other fair brewers of tea in Washington are responsible for the present cosy fashion of sipping tea in the afternoon, and introducing not a few English and Russian styles. In some houses the Russian samovar finds a place on the tea table, but the preference is in favor of the less troublesome tea pot of silver, brass or copper, showing artistic form and workmanship. This kettle is swung over an alcohol flame and provided with the fragrant herb from decorative little caddies. The Japanese tea ball is also a familiar object at the Washington tea drinkings. This perforated silver ball, suspended from a chain, is filled with English breakfast tea and dropped into boiling water, where it remains until the leaves are "steeped," when it is removed, leaving the beverage clear as amber.

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but employ in their manufacture art work in various metals. Low forms prevail in tea sets, and, indeed, among most articles of silver-ware for the table.

ELSIE BEE.

## The History of Goldsmithing.

*Continued from page 17.*

THE ENAMELS of Limoges were in great demand in the twelfth century. They were applied to all kinds of work—on metallic tombstones, for instance, those of the Counts of Champagne, the designs of which have been preserved by Gaignières, or for commemorative tablets, like that of Geoffrey Plantagenet, in the Cathedral of the Mans, on church furniture, such as candlesticks, tabernacles, boxes for the holy oil, etc.

The tabernacles were, in allusion to the Holy Ghost, constructed in the shape of doves, with enameled wings, standing upon a circular plate, in such a manner that they could either be placed in a standing position or suspended by chains, as occasion required. Fig. 25 is the representation of one of these doves. Nearly all those we saw

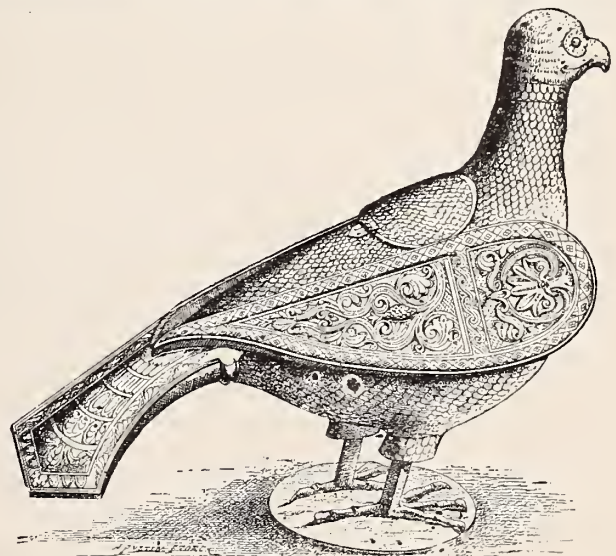


FIG. 25.

are of substantially the same shape. They have a small receptacle that can be closed with a lid with joints in their back in which the Blessed Wafer was kept. During the twelfth and thirteenth centuries, the enameled goldsmiths' ware of Limoges was so common that it was known everywhere by the name of Limoges work (*opus Limovicense*).

The greater number of the rich cathedrals and mighty abbeys of this epoch—Rheims, Rouen, Saint Riquier, Saint Germain-des-Prés, Saint Denis and others, hoarded vast treasures of goldsmithing. But Saint Denis, of Paris, especially, was eventually destined to eclipse all the other churches by the riches which its splendor-loving and renowned Abbé Suger managed to collect. It would be useless to give the list of this magnificent collection, and we only mention the three greatest pieces of work which he caused to have constructed, viz., the covering of the main altar, the monumental shrine by him erected over the graves of the Saints, Denis, Eleutherius and Rustique, and the large golden crucifix that stood upon a pillar in the sanctuary.

Charles the Bald had already overlaid the front of the great altar with a covering. Suger completed the work by overlaying the two extremities and posterior surface with similar coverings, containing numerous figures of saints arranged under arcades richly ornamented with all kinds of jewels.

The sepulchre of the holy martyrs, the patrons of the church, whose bodies had until then been inclosed in three silver coffins, was surmounted with a black marble tomb of broken work, and upon it Suger had erected an enormous and magnificent shrine of enameled

copper, which, similar to the one of the Three Wise Kings, at Cologne, was constructed in the form of a church with three aisles, the central one of which was much higher than those of the sides.

In the construction of this shrine and the finishing of the great altar, Suger exhausted his whole stock of jewels and precious metals, hitherto stored in the rich treasure vaults of his abbey, together with all the gifts which he had been able to beg from contemporaneous kings and princes; and he had still a third pet object to accomplish. He intended to erect in his church a crucifix of the most magnificent work. For this purpose he devised all manners of ways and means, and soon after he was able to purchase, at the price of four hundred livres, an enormous sum at that time, a very large quantity of jewels belonging to the inheritance of King Stephen of England; and beside this sum he set apart eighty marcs of gold for the construction of the crucifix.

It was about three feet high, and stood upon a superb pillar nine feet high. The body of the cross was of wood, covered with enamel; the figure of the Savior was wrought entirely of fine gold, and to give an idea of the lavish profusion of jewels, we simply state that the drapery which covered His body, from the waist to the knees, was studded with eighty precious stones and one hundred and fifteen pearls.

The pillar was a marvel of art and elegance. The gilt-bronze figures of the four evangelists were grouped around the foot, and above them were those of the four greater prophets. The shaft was covered with medallions of saints, and borders and ornaments of enamel interspersed with jewels.

Suger had entrusted the construction of the crucifix to artists from Verdun. Pope Eugene III., in person, celebrated the dedication service, and in order to better insure the preservation of so precious an object, he fulminated the sentence of excommunication against the sacrilegious person who should dare to divert the sanctified object from its proper uses, and this threat sufficed for many years to stay the hand of the ruthless despoiler of ecclesiastical edifices. Even during the frenzy and excitement of religious wars it had the power of arresting the arm of the heretic, and it was reserved for Catholics to tear it down. The Allied forces in 1590, under the leadership of the Duke of Nemours, carried off the crucifix, together with many other objects less worthy of veneration.

Suger prosecuted the lavish display of riches in the decoration of his church so far, that he drew upon himself the severe censure of his contemporary, St. Bernhard. "You cover with gold the walls of your church," wrote to him this austere reformer, "and meanwhile your poor go naked." But the remonstrances of St. Bernhard were idly wasted; the precedent established, Suger's example was quickly followed. Soon afterward, Maurice de Sully, Bishop of Paris, presented his church with a magnificent gold pavement for the altar. Gervais, Abbott of Saint Germain d'Auxerres, had one wrought of silver, and the churches of Periqueux, Troyes, Saint Omer and many others, were enriched similarly.

### 3.—Switzerland, England, Spain, Italy, etc.

It must not be presumed, however, that this senseless decoration of the holy places was confined alone to France—endless would be our labor were we to enumerate the many objects wrought in other countries of Europe for a similar purpose.

In Switzerland, excluding Basle and Saint Maurice d'Agaune, the cathedrals of Sion and Coire preserve very handsome pieces of the eleventh and twelfth centuries.

England, we believe, has preserved no specimen of its national goldsmithing of so remote an age except one—the vessel for the holy ointment kept with the royal regalia in the Tower of London. Several abbeys, however, possessed at this time very rich treasures. For instance, the church of Walsingham, in the county of Norfolk, hoarded in its vaults a treasure of gold, silver and jewels, valued, according to our money, at six million dollars. Another very powerful abbey, that of Saint Albans, counted many goldsmiths among its monks. One of them, Anketil, had acquired such a reputation for

his works in the precious metals that he was invited by the King of Denmark to superintend his goldsmiths' works, and be his banker and money changer. A pair of candlesticks made by him, of silver and gold, and presented by Robert, Abbott of St. Albans, to Pope Adrian, were so much esteemed for their exquisite workmanship that they were consecrated to the basilica of St. Peter at Rome. In the time of Henry II. the demand for highly finished trinkets was so great, that many additional artists resorted to England from Germany and Italy.

The Abbot of St. Albans, Robert, is noticed by Matthew Paris as being a skillful goldsmith. He made two remarkable reliquaries, covered with golden images, and other choice works in gold and silver. He was a great promoter of the goldsmiths' art, and under his supervision many artistic and imposing objects were wrought.

Ireland, also, this old Catholic stroughold, so fertile in confessors, abounded in relics of its saints, and its goldsmiths wrought shrines of a unique pattern, several of which are still preserved; for instance, that of St. Monaghan, the reliquary of St. Lachteen, as well as a number of gospels and pastoral staffs all of the same style, whose characteristic appears to be the knot.

Among the Irish reliquaries of this remote period, are found several which we believe to be without equal in any other country. They are the bell mountings. Many of the Irish saints were hermits, and the bells of their hermitages have become objects of veneration, and are to-day treasured as relics. Several of those preserved are ornamented with goldsmithing, after the style indicated in fig. 26.

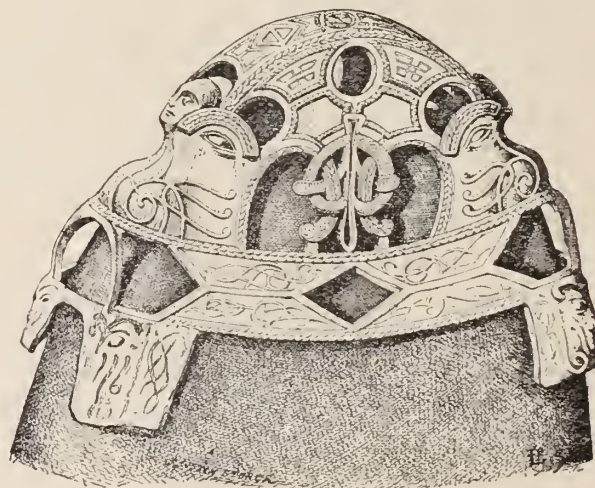


FIG. 26.

This mounting, which can to-day be seen in the collection of the British Museum, is of silver, very finely worked. A part of the ornaments is nielloed and traces of enamel are found on it.

Russia, also, possesses several precious objects of goldsmithing of this period, among which we may mention the large gold neck chains of the Muscovite sovereigns of the tenth and eleventh centuries, the cup of Prince Wladimir Davidowitch de Tchernigov (1138-1151), and various other pieces kept in the cathedral of the Anunciation at Moscow.

In Pesth, the Hungarians treasure in their national museum the silver scepter and various trinkets of King Biella, who lived in the twelfth century.

Spain has no early distinct art and civilization, but rather a blending of Christian and Moorish styles, although the culture of its national industry was never completely lost sight of. Two Spanish goldsmiths, named Aparisio and Rodolfo, who lived in the eleventh century, are mentioned as the authors of the handsome shrine of St. Milano, which contained twenty-two bas-reliefs of gold and ivory.

Belonging to the same time or a little later, is the gold chalice still kept in the Abbey of St. Dominico de Silos. We reproduce it in fig. 27; while it may be said to be rather heavy in style, it is remarkable for the excellence of the filigree work of the arches decorating the cup. A very ancient inscription, engraven on the foot, informs us



that it was made in honor of St. Sebastian by an abbot of the name of Dominico.

Of about the same date, we find in Portugal another chalice, none the less interesting, due, as the inscription on it informs us, to the munificence of Queen Dulce, wife of Don Sanchez I. This precious object is at present kept in the collection of the Academy of Arts and Sciences at Lisbon.

Italy was at this time in a state of transition—of transformation; two styles were striving for the mastery; one aimed to retain the style of the country, as modified and influenced by Byzantine art, and we mentioned at the proper time that the Doge Oreolo invited Byzantine goldsmiths to construct the admirable altar piece in the Cathedral of St. Mark, in Venice, known by the name of *Pala d'oro*, while at Milan, Archbishop Angilbert charged an Italian artist with constructing an altar pavement for the Church of St. Ambrosius. Leon d'Ostie furnishes us with several proofs, in his precious chronicle of Monte Cassino, of this tendency of the arts in Italy at this epoch



FIG. 27.

It is well known that Monte Cassino was the seat of one of the most powerful and wealthy abbeys ever known. Toward the middle of the century, Abbot Didier, elected in 1058, undertook to entirely rebuild the principal church of his monastery, placed under the invocation of St. Benedict. Didier desired to make his church matchless in beauty, and he engaged the most celebrated artists both of the Orient and of Italy.

He ordered of the Byzantine goldsmiths a gold altar piece, decorated with jewels and enamels, representing various passages from the Gospels and legends of St. Benedict; also silver platings for six columns that were to surround the choir, and many other ornaments of silver and bronze.

At the same time, he established in his monastery of Monte Cassino art studios and workshops in which he gathered many artists, and where he caused them to make a large number of pieces of goldsmithing, original as well as copies from Byzantine models. Thus, of thirteen silver bas-reliefs representing Christ and His apostles, ten were brought from Constantinople while three were wrought at Monte Cassino; he received as a present a superb medallion of silver-gilt, and had it copied in his workshop, using it as a decoration of the ciborium of the large altar.

It would be useless to repeat the long list left us by Leon d'Ostie of the various ecclesiastical furniture and vessels, chalices, crosses, censers, reliquaries, candelabras, etc., wrought for Abbot Didier; it simply proves that our industry enjoyed a well-merited prosperity in Italy, inferior to none in the rest of Europe.

CHAPTER V.

THE PERIOD OF THE POINTED ARCH.

(THIRTEENTH, FOURTEENTH AND FIFTEENTH CENTURIES.

I.—France (thirteenth century).

From the thirteenth century forward, a new style of architecture began to prevail in Europe. It sprang suddenly into existence, and we find its first beginnings barely outlined in the latter years of the twelfth century; this was the pointed arch style, improperly called Gothic, and it caused a complete revolution in all the various branches of art and industry. The powerful, but somewhat heavy outlines of the Roman style, and the rather overcharged sumptuousness of Byzantine art was rapidly supplanted by bold, daring shapes, at the same time of a grace and an elegance that made the value of the object consist rather in the finish of the work and gracefulness of the style than in the intrinsic value of the material employed.

France is considered to have been the cradle, as it possesses the earliest and at the same time purest specimens, dating to the first half of the thirteenth century. One of them, especially the Holy Chapel at Paris, with its painted windows and almost aerial style of architecture appears to have been chosen as type by the goldsmiths of that and succeeding age, to judge by the various objects preserved, the contours of which are plainly traceable to this structure.

Sculptures of stone, wood and metal, all very quickly conformed themselves to this style of the pointed arch.

(To be Continued.)

The Jewelers' Security Alliance.

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Vice-President, AUGUSTUS K. SLOAN.....Of Carter, Sloan & Co.

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P. O. Box 3277.

Room 2, 170 Broadway, New York.

HON. ALGERNON S. SULLIVAN, Counsel.

At a meeting of the Executive Committee of the Alliance, held on the 19th inst., the following applicants were admitted to membership, viz:

E. E. & A. W. Kipling, New York City; A. Poetz & Co., Mobile, Ala.; W. C. Wright, Tarrytown, N. Y.; Welch & Butler, Potsdam, N. Y.; J. H. Zetsche, Sodus, N. Y.; S. Preston, Jr., New York City.

Rules Governing Compensation Pendulums.

THE compensation pendulum is to the astronomical clock exactly what the compensation balance is to the chronometer, and whatever facilitates the narrowing of the margin that borders the central line of absolute accuracy, reduces the space demanded by final adjustment. It may never become possible to produce, by mechanical means, either a balance or a pendulum absolutely correct and requiring no adjustment. There are means of closely approximating to that condition, and these I propose to impart.

In the first place, the conditions of the manufacture of Graham's mercurial pendulum, the one adopted by both the artist and the astronomer, require careful consideration. The rod and the stirrup should, after all mechanical work is completed, be annealed down to the simplest softness, and all subsequent bending avoided, as well as any large amount of friction, for the sake of polish; and no part of the stirrup should be left on the strain, but should fit without shake, but still without bind. Here we arrive at the point where the closest approximation to the proportion nearest mechanically achievable—perfect compensation for temperature. The ordinary glass jar and mercury being the simplest, is amongst, if not absolutely, the best; and the result of a great number of experiments has proved that a glass jar of exactly two inches internal diameter, containing eleven pounds eight ounces (avoirdupois) of mercury will be so near to absolute compensation as seldom to require any correction when tested in heat and cold. The mercury should be carefully relieved from all admixture of atmospheric air, and this is by no means an easy task. In addition to the careful removing of any visible air bubbles, time and the application of heat should be given in order to facilitate the decomposition of such remaining portions of air as cling with great tenacity to mercury that has been recently shaken. For this purpose a piece of bladder neatly tied over the top of the jar will enable the maker to aid this decomposition by keeping the jar for a week or so in a temperature of (say) from a hundred to a hundred and five, and the jar should not be put into the stirrup until all the manipulations of the clock and its pendulum suspension are completed.

During the opening of the pendulum, the addition or subtraction of mercury from the jar should be effected by a dipping-tube. The most convenient form of this latter tool is a piece of glass tube half an inch in diameter, drawn out at one end for a couple of inches to a nose about two inches long, and of about a quarter of an inch in diameter. The top end of the dipper should also be drawn out a little, and the end of the drawn-out part rounded where the orifice is about one-tenth of an inch in diameter. The plane in which the pendulum swings should be east and west, and the suspension should always be of such a form as will enable the pendulum, by its own weight, bringing the suspension of itself from all restraint of friction.

The fulfilment of the foregoing conditions will give in all cases good practical results.

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### The Adjustment of a Four-Jewel Cylinder Watch.

[By G. VOGET, in *Allg. Journal d. Uhrmacherkunst.*]

[Our readers will remember our having mentioned at the proper time that our very enterprising exchange, the *Allgemeine Journal der Uhrmacherkunst*, offered, in 1880, a prize of 500 marks for the best treatise on the adjustment of a four-jewel cylinder watch. A number of essays were handed into the prize committee, the best three of which were accepted, and the best, from the pen of Mr. Hermann Horrmann, was duly honored with the first prize. We laid this excellent work before our readers last year. The second best we published two years ago, and with the present number we commence the publication of the third and last of the series. Our readers are too well aware of the fact that the intrinsically best piece of work does not always receive the first prize, and the second and third may contain processes and working methods fully as good as the first, and hoping that our readers may find in the following something of interest to them, we begin with the third of the series].

#### PRELIMINARY INVESTIGATIONS.

The case and parts intimately connected with it receive our first attention. The case snap and the fastening at the pendant may be defective. The snap, which generally moves too hard, is afterward

corrected with a small mallet when the movement has been taken out, the blows of which are directed upon the bottom bezels near the joints. When opening the bottom, it will often be seen that the winding post and hand square, as well as the cups, project. They must be level with the dust cap, because a pressure by the bottom of the case on these parts might cause the watch to stop, or at least give rise to an irregular rate. But as these defects cannot be corrected at once, it is advisable to either note them upon a slip of paper or to impress them upon memory, to be set aright in regular order at the time when engaged on these parts.

We then open the dust cap to see whether the barrel and balance have free shake in the case, whether the closing of the dust cap is interfered with by a bridge or screw, or the reverse. This is easily ascertained by putting a little rouge on the suspected parts, and closing the cover they will betray their presence.

When opening the crystal bezel, we must observe the position of the hands to each other. It is necessary sometimes to raise or lower the hour hand; the center-staff must not touch the crystal.

When such defects cannot be remedied at once, they either are to be borne in mind or noted upon a paper, so that they will not be forgotten.

When the dial has been taken off, observe whether anything stands higher than the plate. Screws, barrel arbor and stop work of inferior watches are invariably higher than they should be, and the touching of the movable parts, such as the minute pinion and stop work on the dial often causes the watch to stop. The pressure of the screw heads, screw ends and barrel arbor against the dial is apt to cause the bursting of the latter.

The movement is now to be taken from the case and the case snap set in order, if it should be defective.

Before we take down the movement, a general inspection is necessary. Various questions prompt themselves upon the adjuster. How does the barrel and balance stand to the center wheel? How does the cylinder stand to the scape wheel? Has the balance spring free shake? Does the fourth pinion, as its arbor, approach very closely to the balance? The questions can all be answered by this inspection, which saves him much time, since he can be guided by what he has seen.

We have now progressed sufficiently far to take down the movement and commence the actual work.

The succession of the parts to be examined and treated varies much among workmen. The majority begin with the train, then place in the escapement and end with the barrel and its parts. This method is good enough. But it would be incorrect to commence with the escapement, because both the center and scape wheel frequently stand out of true, and exert an untoward influence on the position of the cylinder together with balance.

I am accustomed to work according to the following method, which I think is the best, although I am compelled sometimes to adopt the first mentioned, in tenor with the quality of the watch.

The labors required for bushing and uprighting the center wheel and barrel being about the same, I perform them one after the other, next the small wheel work and finally the escapement.

After all parts, up to the center wheel, have been taken down, examine whether this stands truly upright to the plate. This is generally not the case in cheap watches, and is a great defect, which, if not thoroughly corrected, will finally end in vexations, when the watch is about to be delivered as "ready." The hands would barely move with sufficient freedom, especially if the watch has a seconds hand.

The hole in the plate is frequently taken as standard, and the hole in the bridge is thereby centered. This is not correct, because a new error is easily invited thereby.

It is most assuredly advisable, before commencing the bushing, to be satisfied of the condition of the barrel depthing, which can, at this time, be corrected with facility, and according to need placed deeper or shallower, although the dial hole must never be left

entirely out of view. (With an 8-jewel watch regard must be paid to the center depthing). We now know what hole is to be centered in favor of the barrel depthing. The wheel is then taken down and the quality of the pinion scrutinized—that is, care is taken whether, when placed upon a tapering turning arbor, it will run true, whether the pinion leaves have the correct shape, whether they are not too thick, and in what condition the pivots and shoulders are. These pivots, which are subject to a strong friction, must be treated with care. Pivots without polish are ruined in a short time, and spoil the jewel holes and the oil.

Nicely polished pivots are produced with a composition file and rouge, or in a depthing tool specially prepared for this purpose.

This finished, the bushing of the holes is next in order.

THE BUSHING OF THE LARGE PIVOT HOLES.

Well-hammered sheet brass will be the most appropriate for this job. I assume the case that both center wheel holes require bushing and the hole in the plate shall remain where it is. This hole must be carefully opened by broaching, and to effect this it is necessary that both the plate and the broach always stand at right angles to each other, and both parts are sufficiently twisted in the hands.

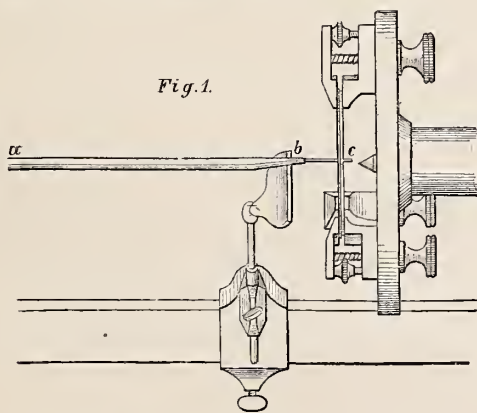
A well fitting bouchon is then turned in, with hole that is almost large enough for the pivot.

A bouchon must always be turned in such a manner that it is, as it were, retained by suction; it is then easily riveted by a few taps with the hammer. The customary notching, to offer a better hold to the bouchon, is useless.

When the hole has been sufficiently broached to receive the pivot, the plate is clamped in the universal head, in order to center the hole truly round.

If reliance alone were to be placed in the centering center, even if the lathe is very exact, a truly vertical wheel would be obtained only in exceptional cases, because when a hole has been bushed it is customary to remove the burr from the hole with a chamfer, graver or similar tool. Now, it is questionable whether this chamfering is confined to the true center of the hole, and it might happen that the small sink, as shown in fig. 2, has become one-sided as the centering center would brace in this sinking. The work, therefore, becomes untrue.

The centering with the centering tool which I employ very successfully, can barely be surpassed by means of any other tool, if the watchmaker has not an uprighting tool on hand.



When the plate is fastened in the lathe (fig. 1), a piece of silk paper with a hole in the center is laid over the plate, so as not to injure the gilding, and the clamps are only slightly drawn on. The centering center is drawn back, and instead of this, a long pegwood, in which is fastened a thin pin, is inserted into the hole. The wood must be flat below so that it can rest upon the support at point *b*. Now, as soon as the pulley is revolved, the sides of the hole will turn around the pin *c*. The most trifling deviation caused by the hole must also be participated in by the small lever *b c*, and since lever *a b* is 10 times as long, it will at point *a* make the 10-fold motion.

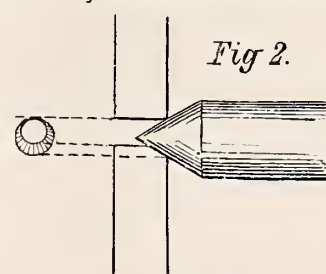
The least deviation can be corrected by slight hammer taps upon

the plate, because the smallest motion of this wood will be noticeable to the eye when the point *a* is brought into close connection with some object. The clamps are then tightened, and another close inspection will convince us of the steady position of the centering tool.

It is next in order to obtain the bridge hole vertical to the hole in the plate; to do this we screw the bridge upon the plate, and open this hole by turning to accommodate a bouchon. A well-fitted in-turned bouchon concludes this job, and the adjuster will be pleased with having a straight center wheel.

But when the hole in the bridge is to be considered as the true one, we screw the bridge upon the plate, fasten the whole in the lathe and proceed in the same manner; we insert the centering hole in the hole in the bridge.

It may also be mentioned that the hole which is to be uprighted, can either be filled in close or else provided with a finely perforated bouchon, after which it is turned nearly to suit for the pivot either with a hand or small lathe graver. This process is really still more exact, although it requires very small tapering gravers and great attention. The first-described method, however, has the advantage that if years afterward the hole has to be bushed again, the old bushing is extracted, and it needs then simply be replaced by a turned bouchon, while in the other case, the centering tool must be used again.



Both the center wheel pivots must protrude sufficiently so that neither the canon pinion nor the dust cap can cause a cramping, nor that the oil draws off into the canon of the pinion.

The center wheel is in this manner set in order, and work with the barrel can be begun.

THE WORK ON THE BARREL.

a.—The Barrel Arbor.

It is impossible to demand a uniform rate of a watch in which the barrel has not been carefully treated, whereby consequently the energy is transported unequally.

We have in first line the barrel arbor, to which great attention must be paid, and especially to that kind which is fastened only in one bridge. How often do we not find watches in which the barrel winding has a trembling motion: This is invariably caused by an untrue barrel arbor whose lower pivot is generally turned untrue (fig. 3\*). It also happens that both pivots are not in the center. An untrue barrel arbor daily assumes a different position of the barrel.

This error is easily corrected by cementing the offending barrel arbor upon the spindle of the chuck lathe, and the pivot can, at the same time, be nicely polished. It must also be observed that the square for the male stop is, after this treatment, placed in the center. A square standing out of the center can be the cause of stop errors.

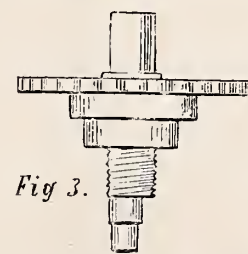
The screws of the dust cap which hold the barrel arbor, and, consequently, the entire barrel, must work with the utmost exactness. It is advisable to round off their ends so that the short taps in the bridge are not injured. When the dust cap has been screwed on, the barrel arbor must apparently be immovable, in such a manner, however, that it can easily be turned with the key.

I have noticed no obliquely turned on pivots on barrel arbors placed between two bridges. This, according to my opinion, is due to the cutting on of the thread. The pivots of the barrel arbor moving between two bridges in watches, are generally badly polished, which should invariably be improved.

b.—The Clickwork.

Defective clickworks, as well as those that after a short time refuse

\* In order to show the defect more plainly, it has been magnified.



to act, can invariably be ascribed to the carelessness of the adjuster.

An insecure clickwork, if treated with understanding, can in the majority of instances be made useful without the necessity of replacing it. The defect, however, shown in fig. 4, is removed only by substituting a new spring.

In a correctly constructed clickwork, the click tooth must stand about the length of a tooth behind the right angle  $c s t$ , fig. 4, which can be formed by means of the long side of the bridge and a line through the center of the ratchet.

A clickwork intended to be useful for a length of time, must, when at rest, be conditioned thus that click tooth completely fills the space between two teeth, and at the same time the notch in the bridge, and

the spring must lay flat against the bridge. Such a spring is supported everywhere and will last as long as the watch, provided it has the requisite elasticity and temper.

The click spring must be fastened securely to the bridge, so that it cannot move in any manner, whereby a scraping of the spring upon the barrel is prevented. This is best effected by introducing a foot-pin. The clickwork must have a gentle and pure sound; when this is not the case it is unreliable.

(To be Continued.)

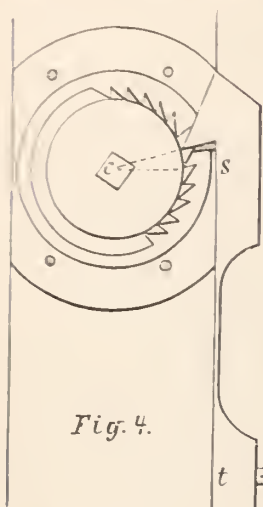


Fig. 4.

## Recent Patents.

The following list of patents relating to the jewelry interests, granted during the past month, is specially reported to THE JEWELERS' CIRCULAR by FRANKLIN H. HOUGH, Solicitor of American and Foreign Patents, 925 F Street, N. W., near U. S. Patent Office, Washington, D. C.

### Issue of January 13th, 1885.

310,795—Bracelet. D. E. Codding and O. H. Atwood, North Attleboro, Mass.

10,552—Re-issue. Bracelet clasp. S. Wallach, New York, N. Y.

310,737—Watch Key. H. G. Skidmore, Cincinnati, O.

310,865—Watch Stem Winding and Setting Attachment. H. A. T. Reineicke, Thomaston, Conn.

### Issue of January 20th, 1885.

311,107—Collar Button. S. Cottle, Shubael, N. Y.

311,048—Collar or Sleeve Button. J. Wall, Greenville, Miss.

310,937—Watch Movement Box. F. Fitt, Chaux-de-Fonds, Neuchatel, Switzerland.

310,936—Watch Stop. F. Fitt, Chaux-de-Fonds, Neuchatel, Switzerland.

310,910—Lathe, Watch Case Graving. C. Piquerez, Saint Ursanne, Switzerland.

### Issue of January 27th, 1885.

311,194—Button or Stud. N. F. Mathewson, Providence, R. I.

311,429—Chain Bar, Watch. J. Hoagland, Providence, R. I.

311,297—Watch Plates, Enlargement Ring for. W. E. Doolittle, West Haven, Assignor to New Haven Watch Co., New Haven, Conn.

311,270—Watch Repeating Attachment. F. Tergtgen, Elizabeth, N. J.

10,554—Watch, Stem Winding. H. R. Smith & R. Folsom, Boston, Mass., assignors to Elgin National Watch Co., Elgin, Ill. Re-issue.

### Issue of February 3d, 1885.

311,722—Bracelet. S. Cottle, New York, N. Y.

311,744—Button or Stud. H. C. Cooke, Providence, R. I.

311,640—Napkin Pin or Holder. A. L. Burlingame, Willett, N. Y.

311,566—Watch. A. Chopard, Moutier Grandval, Switzerland.

311,594—Watch, Alarm. C. Masmajan, Arogno, Tessin, Switzerland.

311,797—Watch Balance. J. E. A. Uhrig, London, England.

10,556—Watch Case. C. W. Harman and H. G. Skidmore, Cincinnati, O. Re-issue.

311,563—Watch Case Spring. T. L. Bear, Camden, N. J.

311,609—Watch Regulator. G. P. Reed, Melrose, Mass.

## Gold Leaf.

IF A SHEET of gold leaf is held up against the light, it appears to be of a vivid dark green color; this means that the light is transmitted through the leaf. When it is considered that this leaf is a piece of solid metal, a better idea of the extreme tenuity of thickness of the leaf can be comprehended than by any comparison by figures; nothing made by the hand of man equals it in thinness. This extreme thinness is produced by patient hammering, the hammers weighing from seven to twenty pounds, the lighter hammers being first used. When the true method of this beating is understood, the wonder expressed sometimes that gold leaf beating should not be relegated to machinery ceases; the art belongs to the highest department of human skill and judgment. Apprentices have served a term, and have been compelled to abandon the business, because they never could acquire the requisite skill and judgment combined necessary to become successful workmen.

The only pure gold leaf is that used by dentists for filling carious teeth, and it is called foil. It is left much thicker than the gold leaf for gilding—indeed, it could not be beaten so thin; for thin or leaf gold an alloy of silver and copper is required to impart the requisite tenacity. Dentists' foil weighs six grains, five, four and three grains per sheet, or leaf, according to its thickness. The last operation on the leaf is annealing. This is done over a charcoal fire, the leaf being laid singly in a sort of corn hopper—a square receptacle with wire bottom at the end of a handle—over which is held a similar cover to prevent the flame from carrying the leaf away. An instant's exposure to the flame induces a red heat, when the leaf is laid on a sheet of a book.

The material for gold leaf and dentists' foil is coin gold. The gold is precipitated by muriatic and nitric acids over a fire to separate the gold and silver, the copper of the alloy passing off in the heat. The silver from gold coin amounts to about seven penny-weights to \$800 worth of coin—the amount usually treated at a time. This reduction and separation of the metals is the usual method, and does not require special description.

The pure gold is then melted in sand crucibles with the proper proportions of silver and copper to produce the color of leaf desired, very fine ornamental effects being produced in gilding with leaf of different shades. The fluid metal is poured into iron molds, making bars seven inches long, one and an eighth inches wide, and one-fourth of an inch thick. These bars are forged, like iron, between anvil and hammer, to even the edges, and then rolled in powerfully geared rolls to a ribbon not thicker than writing-paper, and one inch wide. Of course, in the rolling as in all the processes, there must be occasional annealings.

Now comes the first of the beating processes. These squares of gold (one inch square) are placed in a pile alternating with larger squares (four inches or more) of "kutch" paper, a material made from a pulp of animal membrane—rawhide, intestines, etc.—and the outside of the pile receives a square of parchment. The hammering then begins with a seven-pound hammer on a block of marble that rests on a solid foundation. After one hour's beating the pile is warmed at a fire to anneal the gold, a process requiring care, so that the kutch paper be not burned. Four hours of beating suffices for this preliminary process, 180 squares of gold being treated in one pile. The final process requires great skill. The partially beaten squares are packed as before, but with alternates of gold beater's

skin, until the pile contains 900 sheets. The beating is continued with increasingly heavier hammers until the final finish with the twenty-pound hammer. The gold beater's skin comes from England, and the best of it—and the most of it—is made by one family—Frederick Perkins. The skin is so thin as to be almost transparent, and yet it is double, two thicknesses. It is prepared from the larger intestine of the ox. Each sheet of the skin is rubbed on each side before the pack is made and whenever the pack is re-arranged (placing the outer gold in the center and *vice versa*), with a powder made from calcined gypsum, of a very pure sort, imported from Germany. This is to prevent the gold from sticking to the skin.

In beating, the work of spreading the gold is from the center of each square of gold out toward the edges, and the finished squares are thicker at the edges than in the center. A contrary spreading would split the edges and ruin the squares. In re-arranging the squares in the process of beating they are sometimes torn, but another piece laid on as a patch, lapping over the torn place, will be firmly welded in after the beating.

The finished squares are cut to a size of three and three-eighths inches, and packed in a "book" holding twenty-five sheets, the paper leaves being rubbed with red ocher to prevent sticking. These books of twenty-five sheets are sold at from thirty to forty cents each. The cutting of the leaf is done by knives, which are simply chips of the outer shiny shell or skin of the Malacca cane, such as is used for walking sticks. The outer rind contains siliceous or flint in minute, invisible particles, forming a peculiar edge. Steel will not answer the purpose.

#### A Sad Memento of the Past.

AMONG the many objects of curiosity preserved at Queen Victoria's Windsor Castle is a clock with a sad historical memento attached to it. This is no other than the actual timepiece presented by King Henry VIII., the amorous, the lustful, to the fair, but unfortunate, Anne Boleyn, on their marriage in November, 1532. As far as the appearance of the case and dial go, it certainly is the most artistically built article of the kind that can be well imagined. It is an upright, square timepiece, standing on a bracket having a sloping, triangular support in front, resting against the wall. The top of the case is surmounted by a carved dome of highly-wrought ornamentation. What might be termed the platform of this dome is made prominent by pinnacles terminating the four pillars supporting the sides, these pillars, too, being quite in keeping with the other work. On the left-hand side is the door to the interior, having carved upon it the royal arms and crown. The dome is open-work, and at the summit is the royal shield, held in place by the forepaws of the heraldic lion, whilst the head of the kingly animal itself is keeping "watch and ward" high over all. There is only one weight, apparently lead-cased in brass, and even that is engraved. Around it at the upper end is the royal motto, "Dieu et mon droit." Below that is a circle enclosing on the upper part a true lover's knot; the letters, H. A. (Henry, Anne), and another true lover's knot below in the same circle; down to the end of the weight is more ornamentation. The front of the bracket has medallions of both male and female heads let into sunken panels. There is only one hand, and that for the hours, the pointer end being of the *fleur-de-lis* pattern. The hour circle is in Roman numerals, such as are used now, and enclose some elaborate flower engraving. The circle rests on a square plate, which is also elaborately wrought at the four corners.

Such is that famous clock; and it is lamentable to think that, in four years, the doomed queen, who was crowned with great pomp and public manifestations, was led to the block and beheaded by the order of the cruel, lustful and savage man who had made her such a right royal present. Her Majesty, Queen Victoria, must feel melancholy and heart-stricken when she looks at that mournful memento of such an unjustly ruined sister in dignity—a sister whose eyes often

gazed with loving fondness upon that same hand and dial. The size of this clock is, from the base to the cornice above the face, five and one-half inches, and from thence to the lion's head five inches more; the sides are each four inches square.

It is a pity that the name of the maker of the clock is not known. It has been modernized by the application of a pendulum, and may now, for many years to come, show the beautiful workmanship of the period in which it was made; but the case remains unaltered in all its splendid originality, to show us what that class of workmen could turn out in the sixteenth century. Many of those old clocks, down to the beginning of the last century, have been adapted to modern requirements.

#### Oddity in Designs.

THE DEMAND for bric-à-brac and novelties in household decoration apparently does not abate, and there is such a pressure for novelties that designers in all parts of the world, from Boston to Yokohama, are kept busy pushing their inventiveness to the last degree to turn out new combinations. Every manufacturer who caters to this taste in any way keeps a designer, whose ears are burdened with the demand for something new. An old shoe or an old hat gives an idea for a bon bon case. Every animal in the menagerie is employed by various artisans. Botany as well as zoology is ransacked for designs, and all the combinations apparently possible are made. Nevertheless, there seems to be no limit to the fertility of the designers. In referring to this subject, a bric-à-brac dealer, with an idle quarter of an hour on his hands, conducted a reporter through his collection, and as he went along his counters he said:

"There is a lamp that has the form of a white owl, from whose head rises the stem of an immense rose with closely folded leaves, which entirely conceal the globe. There is a stork in flight, with its wings spread out and its legs extended. It is ornamented, and is to be suspended from the chandelier by invisible threads. There is a candlestick, with a gold grape leaf for its base, and with a light receiver of crystal painted in gold. There is a work basket in the form of a skiff, and another with a moss-covered top full of artificial plants, is in the shape of a flower pot. There is a big elephant of porcelain, with an opening in its back for begonias, and there is a porcelain vase representing a tree trunk overgrown with climbing plants. There is a mirror to be bordered with cut flowers, and to represent a miniature lake in the center of a dinner-table. That crystal ball, mounted upon a spiral pedestal, is for a center table ornament, to catch and reflect the light. That glass screen has, you observe, pond lilies painted upon it, so that they seem to be floating in water. The curiously twisted horns in that smoking set come from Eagle Pass, Texas, and are lambs' horns. The other horns are from the heads of buffalo. They are mounted in Paris and sent back here. That dagger is a paper-cutter, and its sheath forms a thermometer. That cat is an inkstand. The head in a flaring bonnet is the same; lift the face and there is the ink well. That gold-umbered ship, with silver sails and a cargo encased in Austrian glass, is a liquor set. Here is a baby carriage that represents a slipper lined with plush, and here is another shaped like a canoe. That tree of gold, with a nest for eggs, is for next Easter. This paper weight contains a Geneva timepiece, and this one has a clock on one side, a barometer on the other, a thermometer between, and a geographical globe above. That stork, raising itself within a lotus thicket to seize a frog, supports a thermometer; and that setter dog, with a bird in his mouth, holds up a barometer. This gilded key, with a pair of brazen dragons in the ring, is a common and popular fancy for a thermometer now. Those three Turkish pipes form a newspaper rack. Here are designs for open fireplaces; for, after all, there is no bric-à-brac to compare to a bright open fire. And so the variety increases. There is no end to the designs. The designers are chiefly Europeans, who are worked at high pressure all the time."

## Foreign Gossip.

**THE WORLD MOVES.**—The progress of the Japanese is simply marvellous, and it is impossible to say when or where they intend to "check up with a short turn." A bill will, at an early day, be offered, making it legal for any citizen of the realm to appropriate—to pirate—the invention of any foreigner, and patent it in Japan.

**EXTERMINATION OF WOLVES.**—Thirteen hundred and eight wolves were killed last year in France, mainly on the border lands of Belgium and Germany. The rewards paid by the French Government for these animals vary from \$40 for a wolf who has attacked a human being, to \$8 for a cub, and amounted to \$20,750. France is making vigorous efforts to keep the wolf from its doors.

**PATERNAL.**—We see by our late Russian exchanges that the Czar has promulgated a ukase forbidding the circulating libraries from issuing the works of Darwin, and a more recent imperial decree puts those of Agassiz, Huxley, Lubbock, Adam Smith, Lewes and Spencer on the same list. (The latter is, perhaps, ostracised for his uncomfortable opinions expressed of us—the U. S.) The new list is not confined to English and American authors, for Moleschott, Büchner, Vogt, Reclus and others are considered unsuitable for Russian readers.

**CURIOUS WATCH.**—The museum of Lord Londesborough contains a curious watch, formed after the semblance of a duck. It is of fancy silver, with feathers chased, and is of the time of Queen Elizabeth. The lower part opens, and the dial plate, which is also of silver, is encircled with a gilt ornamental design of floriated scrolls and angels' heads. It has no maker's name. It is preserved in the original case of thin brass, covered with black leather, and ornamented with silver studs, forming, altogether, a very unique specimen of the early ingenuity of the watchmaker.

**FRENCH PATENT LAWS.**—Article 6, of the Law of July 5, 1844, concerning patents, requires that the designs accompanying applications for patents, shall be traced with ink and according to the metric system. In place of these designs, inventors have generally accompanied their applications with photographs, or designs produced by photographic means. These photographs or designs are liable to become indistinct with age, and the Minister calls attention to several clauses of the law, one of which says that a patent shall be refused to any applicant not complying with the provisions of the law.

**POPULATION OF PARIS.**—The Prefect of the Seine has just published the returns of the last census, from which it appears that Paris then had 2,239,928 inhabitants, of whom 1,113,826 were males, and 1,126,602 females. When the previous census was taken, in 1876, the total was 1,988,806, so that there has been an increase of 251,122. There were 68,126 inhabited houses, and 2,075,800 of the inhabitants were French by birth, the foreigners numbering 91,872 males and 75,542 females, consisting of 45,281 Belgians, 31,190 Germans, 21,547 Italians, 20,810 Swiss, 10,789 English, 5,987 Americans, and 65 Chinese.

**PRECIOUS STONES AND METALS IN INDIA.**—A learned professor stated in his lecture that for quite 3,000 years India has been known as the source of precious stones and metals, but scarcely 200 years have elapsed since other countries yielding precious stones have entered into competition with her; and it is only within the present century that she has ceased to hold a pre-eminent position as a supplier of the markets of the world. In order to arrive at a full and satisfactory elucidation of this subject, two branches of inquiry must be undertaken—one based upon what has been actually ascertained by careful geological exploration of the country, and the other upon such historical records as are available of the former production of the minerals in question, which embrace: Diamond, ruby, sapphire, spinel, beryl, emerald, lapis lazuli, gold, silver. The steel of India, or wootz, might be included here, since at least 2,000 years ago it was one of the most precious productions of India.

**MAGNIFICENT VIEW.**—The translator of this "Gossip" sees an item floating around in the European press that might be unknown to many of our home readers. It says that the Grand Cañon of the Colorado, 160 miles east of the Needles, on the Atlantic and Pacific Railroad, was recently visited by Professor Davidson, who says that he saw vertical walls 2,700 feet high, and 6,200 feet above sea level, where the Colorado River was 190 feet deep, and cannot imagine anything grander than the effect of sunset shining on these walls only ten degrees from vertical, composed of different colored rocks, red sandstones and the black overhanging rocks. The temperature was 136° F.

**PERPLEXITIES OF THE CLOCK WINDER.**—The principal of a college had charged an old man with the care of the steeple clock of the seat of learning. In a short time afterward, the latter presented himself before the principal with a woe-begone face. "Well, my man, why do you complain—is it too much work to wind up the weights?" "No, not that," he replied; "if the clock don't go fast enough, especially at noon, I have all the students of the college swearing at me, and, in order to content them, I move the hands forward; but the townspeople, on the other hand, complain that the clock goes too fast, and I set the hands back to satisfy them; so between the two I am always in hot water, and I would prefer some other job." The principal, in trying to console him, said: "I will give you one piece of sound advice. Let the clock go of its own accord, as the watchmaker has regulated it; do not try to suit everybody and you will live in peace."

**BRONZE POWDERS.**—"It is, perhaps, little known," says the *Chemische Zentral Anzeiger*, "that the celebrated inventor of the Bessemer steel preparing process, Sir Henry Bessemer, invented in early youth a method of manufacture, and the most remarkable fact is that he kept the process a secret for more than 40 years. The different bronze powders were in the first third of this century sold at enormously high prices, in spite of the cheapness of the material from which they were manufactured. The process, according to which it was manufactured in Germany, was unknown in England, and Bessemer, after two years' work, built machinery for manufacturing it, of which five produced as much as 60 skillful workmen could. The machines were built in pieces in various shops, and by Bessemer himself put together in nine months. No one beside the inventor himself and five trusted workmen has ever entered the working-room, so that even to-day, after 40 years, no one has yet witnessed how the bronze powders are manufactured. Three of his assistants have died, and Bessemer, a few years ago, presented the factory with all its business to the two survivors as a reward for their fidelity.

**EAR DISEASES.**—In a recent number of the *Archive fur Ohrenheilkunde*, Dr. Buskner gives an interesting result of inquiries made by himself and other aural surgeons, as to the statistics of ear diseases. They may be summed up as follows: One out of every three persons in middle life does not hear so well with one ear as with the other. An examination was made of 5,905 school children, of whom 23 per cent. presented objective pathological symptoms of ear disease, and 23 per cent. a diminution of hearing power. The liability to disease in the ear increases from birth to the fortieth year of age, and decreases from thence to old age. Men are more subject to ear affections than women, in the proportion of three to two. The external ear is affected in 25 per cent. of sufferers, the middle ear in 67 per cent., and the inner ear in 8 per cent. of total diseases. The left ear is more frequently affected than the right, in proportion of five to four. Acute affections of the middle ear occur less frequently in summer and autumn than in spring and winter, and of the total number of cases in the ear clinics, 53 per cent. are cured, 30 per cent. are improved, 7 per cent. are unimproved, and three-tenths of 1 per cent. end fatally.

## Workshop Notes.

**TO WRITE IN SILVER.**—Mix 1 ounce of the finest pewter or block tin and 2 ounces of mercury together till both become fluid, then grind it with mucilage water, and write with it. The writing will then look as if done with silver.

**TO TIGHTEN A CANON PINION.**—The canon pinion is sometimes too loose upon the center arbor. Grasp the arbor lightly with a pair of cutting nippers, and by a single turn of the nippers around the arbor, cut or raise a small thread thereon.

**TO REMEDY WORN PINIONS.**—Turn the leaves or rollers so that the worn places upon them will be toward the arbor or shaft and fasten them in that position. If they are "rolling pinions," and cannot be secured otherwise, it will be better to do it with a little soft solder.

**ARTIFICIAL DIAMANTINE.**—Diamantine consists of crystalized boron—the basis of borax. The *Techniker* says, that by melting 100 parts boric acid and 80 parts aluminum, crystals are obtained—the so-called bort, which even attacks diamond. Diamantine bought in commerce is less hard.

**TO ENGRAVE ON STEEL.**—Slightly heat the piece to be engraved; then rub it with beeswax, so as to obtain a thin layer when cold; engrave on the wax so as to reach the metal; soak in strong vinegar; then sprinkle corrosive sublimate over the engraving; wet it with vinegar, and in five minutes wash and melt off the wax.

**COMPOSITION FILES.**—These files, which are frequently used by watchmakers and other metal workers, for grinding and polishing, and the color of which resembles silver, are composed of 8 parts copper, 2 parts tin, 1 part zinc, 1 part lead. They are cast in forms and treated upon the grindstone; the metal is very hard, and therefore worked with difficulty with the file.

**CEMENT FOR RUBBER AND METAL.**—For cementing rubber or gutta percha to metal, Mr. Grossmann says to take pulverized shellac, dissolved in ten times its weight of pure ammonia. In this way the mixture will be of the required consistency. The ammonia penetrates the rubber, and enables the shellac to take a firm hold; but as it all evaporates in time, the rubber is immovably fastened to the metal, and neither gas nor water will remove it.

**SHARPENING TOOLS.**—The *Tischler Zeitung* states that a razor recovers its edge if left for half an hour in water which contains sulphuric or muriatic acid in the proportion of one part by weight of acid to nineteen parts by weight of water. The razor is carefully wiped on being taken out of the acidulated bath, and passed over an oil stone. The acid bath is not said to hurt the blade; on the contrary, the quality of the metal, in some cases, improves by immersion.

**POISING TOOL.**—A very good poising tool can be made by adapting to one end of the ordinary depthing tool two new centers of steel wire, about one-half inch of the inner end of each of which is filed away somewhat beyond the diametrical line. Harden and polish these ends, and they will present, when properly fastened in the tool by the set screws, a very nice sharp angle on which to poise the balance; the adjustment for the length of staff is of course made by the screws, which open the tool.

**TO FUSE GOLD DUST.**—Use such a crucible as is generally used for melting brass; heat very hot, then pour in your gold dust, mixed with powdered borax. After a while, a scum or slag will rise to the surface, which may be thickened by the addition of a little lime or bone ash. If the dust contains any of the more oxidizable metals, add a little saltpeter; skim off the slag or scum very carefully. When melted, grasp the crucible with a strong iron tongs and pour immediately into cast-iron molds slightly oiled. The slag and crucible may be afterward pulverized, and the auriferous matter recovered from the mass by cupelling with lead.

**WASHABLE COATING FOR GYPSUM FIGURES.**—According to C. Pusher, 3 parts caustic potash are dissolved in 36 parts hot water, 9 parts stearic acid are added, and the obtained soap paste is diluted with the same quantity of water and 95 per cent. alcohol. The warm solution is applied upon the warm gypsum cast, and this, after a few hours, is repeated with a wet sponge. The casting becomes still handsomer if, in place of potash, a corresponding quantity of ammonia is used. Old casts are first cleaned with a 3 per cent. caustic potash solution.

**HARDENING GOLD SPRINGS.**—To gold detent, thermometer, suspension and balance springs can be imparted a high degree of elasticity. Rolling hardens them, but they are rendered very brittle thereby. They can be made pliable and elastic, not by hardening, as in the case of steel, but by annealing, care being taken not to exceed a certain degree of heat. The spring may be coiled on a block and placed in a tube, with a smooth steel lid; then heat the tube in the flame of a spirit lamp, and as soon as the steel is of a blue temper, remove the flame and allow the whole to cool.

**FLATTENING AN ORDINARY BALANCE-SPRING.**—Remove the collet and stud, and clamp the spring by a central screw between two plates, which are then placed on a blueing tray and gently heated. A small piece of whitened steel is laid on the plate in order to see that the heat does not exceed what is needed to give a blue temper. Allow the plates to cool and separate them. Ordinary springs being made of rolled steel and subsequently coiled, always open out on heating; it is therefore necessary, before resorting to the above method, to coil up the spring, as otherwise the outer turn will be found to have opened beyond the stud.

**TO FIT A BOUCHON.**—After repairing the pivot, a bouchon is selected as small as the pivot will admit. Open the hole of the plate or cock so that the bouchon, which previously should be lightly draw-filed at the end, will stand with a slight pressure upright in the opened hole of the plate or cock; then, with a knife, cut it across at the part where it is to be broken off so that it may break very readily when required to do so. Press it in the plate on the side the pivot works, break off, and then drive it home with a small center punch. In every repair of this nature, notice should be taken of the amount of end shake of the pinion, and allowance made by leaving the bouchon so that any excess may be corrected. To finish off the shoulder end, a small chamfering tool should be used. It has a hole smaller than the pivot one to receive a fine brass wire, serving as a center to prevent the tool from changing its position while being used; or the wire may be put through the bouchon holes, and then the hole of the tool may be left open. The above is a far more expeditious way than using the turning lathe.

**TO RESTORE THE COLOR OF NICKEL MOVEMENTS.**—A correspondent of the journal *Suisse d'horlogerie* recommends the following method: Take 50 parts of rectified spirits of wine, 1 part of sulphuric acid, and 1 part nitric acid. Dip the pieces for about 10 to 15 seconds in this composition, then dip them in cold water, and afterwards in rectified spirits of wine. Dry them with a piece of fine linen, or in sawdust. Nickel and the greater part of those metals liable to tarnish, may be restored to their primitive color by dipping in the following bath: Dissolve in a half a glass of water, 6 or 7 grains of cyanide of potassium; plunge the pieces in this solution and withdraw them immediately. As the cyanide mixes well with water, it is sufficient to rinse them once in the latter to destroy any trace of the cyanide. After this, dip the pieces in spirits of wine, and dry them in boxwood dust, in order to keep them from rusting. The balance, even together with its spring, can be subjected to this operation without any danger. If the pieces to be restored are greasy, they must be cleaned with benzine before being dipped in the cyanide, because it will not touch grease. Cyanide of potassium, being a violent poison, great care has to be exercised, and the operation should be performed in a well ventilated place. The same bath can be preserved in a bottle, and serves for a long time.

## The New Orleans Exposition.

To the Editor of the Jewelers' Circular:

This New Orleans Exposition is so vast an enterprise, so full of interest, with exhibits from all parts of the world, that I do not suppose THE CIRCULAR, as a trade journal, can attempt to describe in detail its many attractions, except those relating to the trade, whose interest it is always its aim to promote, protect and encourage. The trade is very well represented. Watches, jewelry, silverware and articles of ornament naturally form a handsome display, and attract marked attention. It is singular how visitors will pass with a hasty glance fine exhibits, which, to arrange and tastefully place in position, cost thousands of dollars, and linger bewitched and enraptured by the wares of the jewelers who work the precious metals into artistic form for personal adornment. There is a charm in the little trinkets which holds the attention, particularly of womenkind. The spell has lasted for ages, and it will always exist.

But you want to know about the exhibits. By far the most attractive display in the Main Building is that made by the Meriden Britannia Co., a fact universally conceded by the management, visitors and exhibitors. It is awarded the palm for finest collective exhibit. They use the same cases they had at the Centennial, and you know it is really a magnificent structure. There are four separate cases, joined at the top, and under a grand dome or canopy. The location is on the main aisle, just to the left as you approach Music Hall from the main entrance. The center of their pavilion is occupied by a magnificent epergne, the largest ever made (95 inches at the base), valued at \$1,250. The four cases contain examples of the newest productions in hollow ware, in every conceivable style of ornamentation and finish; full dinner and tea service, in both nickel, silver and white metal, showing stylish goods in fish, game and entre dishes; beautiful combinations of richly cut-glass, silver and plate may be seen in fruit, ice-cream and dessert sets; and the "Cleopatra" orange dish is especially new in design; water sets—the pitchers, open-shape, so popular now, are shown in great variety of form and finish; punch bowls, in Moorish pattern and brilliant, iridescent finish; prize cups and trophies for yachting, horse-racing, rowing, bicycling, football, etc., etc.; cigar boxes, smoking sets, mirrors, sconces, fans and art work, in bronze and copper, adorn the cases, and are arranged prettily on a panel in the background. An ice urn, made specially for the exposition, shows the cotton plant in bloom in *repoussé*, and a picture of the famous Mississippi steamer, *R. E. Lee*; it stands in a prominent place, and is very much admired. The celebrated 1847 Rogers Bros. Art brand of flat ware, manufactured by this company, is arranged on a frame plush or panel 10 x 10. These goods, in pattern, finish and quality, are too well known by the trade to need description here, but the public who are interested are shown the raw material—for instance, a fork requiring 26 different handlings—in process of manufacture, from the original cut, out to the burnished article ready for market, is shown at each separate stage, and the practical work greatly interests visitors. The XII, or sectional plating, is exhibited, and its advantages, plainly in sight, are acknowledged by all. No goods are sold at retail by the company here. Frank E. Knight represents the Meriden Company, and has shown his usual good taste in arranging the exhibit.

To the left of Music Hall entrance is seen the magnificent display of the Waltham Watch Company. Most conspicuous of all the many objects of beauty and interest to be seen in this display is a model of their factory, exact in every particular, representing an expenditure of \$1,500. In their display of elegant gold cases of every conceivable design and quality, diamond studded, French enameled and richly engraved, are seen their unsurpassed skill and exquisite taste. Their show cases, filled with the beautiful in watches, both gold and silver, are presided over and arranged in splendid taste by Mr. C. J. Horton, agent, and Mr. J. W. Forsinger, assistant, than whom there are none more courteous in answering the numerous questions propounded by an admiring and

inquisitive public. This display, so comprehensive, so elaborate and rich, surpassing anything ever before seen at expositions, marks an epoch in the history of this company. It shows the wonderful progress of thirty years, and proves beyond disputation that they take the initiative in the industry of watch and case making.

Fronting Music Hall, the Elgin (National) Watch Co. has a very striking Gothic pavilion, presided over by Mr. J. H. Weber, who is kept busy in showing the excellencies of the movements styles of finish, improvements, etc., of the Elgin watches.

H. Muhr's Sons, the enterprising Philadelphians, are here, with a full working model jewelry factory. Motive power electricity. They are making, in plain sight before the crowds of visitors, a beautiful solid gold ring, souvenir of the Exposition. It is certainly a novel feature, and reflects great credit upon the firm. In cases they display the specialties for which they are famous—Improved Crown filled watch cases, Crown 18 karat Lion filled rings, solid gold, fine rings and lockets, etc., etc. Their space is in charge of Mr. W. R. Bennett, whose ready off-hand way of showing up the fine points of Improved Crown filled cases certainly is very entertaining and instructive to the public, which seem to go away with the idea that there's nothing like 'em.

Adjoining the Waltham exhibit is the display of C. N. Thorpe & Co., Philadelphia, makers of the "Jas. Boss" gold filled and Keystone brand coin silver watch cases. They claim great strength in manufacture, and apparently the claim is well founded, for we see a watch movement, encased in a Keystone case, running, while resting squarely upon its flat surface is a 200-pound weight. They show medals received at Atlanta, Cincinnati, Chicago and Paris. Their exhibit is in charge of Mr. W. H. Riley.

Jas. W. Tufts, of Boston, shows a case of silverware which, considering the short time the firm have been engaged in the manufacture of electro plate, illustrates how much can be done by energy and push.

The Seth Thomas Clock Co. is located just to the right of Music Hall. They put in position one of their No. 17 tower clocks—quarter-strike—an admirable timepiece—as is shown by a variation of only one second between Dec. 16th and Feb. 3d. Their new No. 20 regulator, in a very handsome carved mahogany case, is exhibited, and in addition, a full line of mantel clocks, hanging clocks and regulators. They receive the time each day from the Washington Observatory, St. Louis, and also from the Government Observatory at Washington. Mr. Baird looks after the interest of the company here.

The New Haven Clock Co. has a very handsome and tastefully arranged exhibit of their goods near the left of the entrance to Music Hall. They show a great variety of form and style in show-cases, on shelves, and against wall space; a very attractive assortment of office regulators and family clocks in wood, and almost innumerable shapes and kinds of metal-cased clocks and timepieces.

Leroy W. Fairchild, whose gold pens, pencil cases, match boxes, cigar cutters and novelties are so well known to the trade, is here with a very beautiful display. His space is a little gem, so neatly is it arranged, the goods they need only to be seen, to be admired and appreciated. Leroy W. Fairchild is a genius in his line, and whatever is new, striking and possible, is here. Mr. Chas. E. Jenkins is in charge of this exhibit.

Aikin, Lambert & Co. display a case of gold pens, pencil cases, penholders, etc., etc.

In the Government Building, C. W. Little, the enterprising Denver jeweler, has a very large and attractive pavilion, showing his extensive stock of Colorado topaz and agate jewelry, together with a handsome line of Rocky Mountain curios, jewel caskets and clocks made of from 20 to 50 specimens of Colorado minerals and ores are much admired and readily bought. Mr. Little gives away photos of mountain scenery as souvenirs.

In the Government Building, Rhode Island State exhibit is a case of jewelry made by the following Providence firms: Atwood & Colwell, Chas. Downs, J. C. Harrington, Nichols, Black & Co., Pearce & Hoagland, J. B. Richardson & Co.

I must not close without saying a word for Koch & Dreyfus, who show to all the trade visiting here and to exhibitors every courtesy and polite attention. During the past two weeks, hundreds of jewelers from all parts of the country have been here, and to all Messrs. K. & D. have extended every kind of business hospitality. They have prepared a neat card of introduction, showing location, etc., of each trade exhibit, and every day the exhibitors are pleased to show their wares to those who come to them so introduced.



## Trade Gossip.

Sigmund Veit has removed to numbers 65 and 67 Nassau street.

The firm of W. H. Payne & Co. will hereafter be known as Payne, Steck & Co.

Messrs. Fowler Bros. have been awarded English patents for crape stone jewelry.

Mr. P. Hecht, of Levy, Dreyfus & Co., will visit the Pacific coast during the coming spring.

Isaac Herman, well known in the diamond business, has made an engagement with Taylor & Brother.

Mr. Henry May will remove on or about May 1st to the commodious rooms 21 and 23 Maiden Lane.

L. Hammel & Co. will remove during this month from No. 9 Maiden Lane to No. 35 Maiden Lane.

C. A. Boynton, formerly traveling for W. H. Payne & Co., has made an engagement to travel for Alling & Co.

Max Freund & Co. have just added a complete line of American watches to their large stock of jewelry, Swiss watches, etc.

The firm of Grinberg, Goodman & Pollock has been dissolved by mutual consent, Mr. A. J. Grinberg continuing the business.

Mr. T. C. Faxon has assumed the management of the business of L. A. Cuppia, manufacturing jeweler and importer of silver filigree jewelry.

Mr. Hermann Oppenheimer, of Stirn, Oppenheimer & Co., has sailed for Europe on the steamer *Werra*, to establish a branch office in Paris.

The firm of Lyon & Hardy has been dissolved by mutual consent, J. D. Lyon retiring. The business will be continued by Mr. H. C. Hardy.

Ingomar Goldsmith & Co., have admitted to the firm Ad. Pforzheimer, lately with the old house of Hirsh Bros., whom he represented in the West.

E. A. Thrall, will remove May 1st from No. 1 to No. 3 Maiden Lane, where he will have much larger quarters to transact his increasing business.

H. S. Bedell, for many years representing McIntyre & Bedell, will hereafter represent the firms of Bryant & Bentley, and Shoemaker, Pickering & Co.

Mr. Albert Crouze has been admitted as a partner in the firm of Saunders Ives & Co., importers of diamonds, diamond jewelry and precious stones in general.

Rogers & Brother have, in connection with their New York office, No. 690 Broadway, a repair and re-plating shop on their premises, and will attend promptly to all work sent them.

We notice that our exchanges, home and foreign, make free use of the items of our "Fashions in Jewelry" columns. They are welcome to them, and the more of them they appropriate the better we like it.

There will be an unusually elegant and choice variety of Easter cards offered this year, and retail dealers can advantageously use them to diversify their stock, make their stores attractive, and tempt patrons to liberal purchases.

Messrs. Wm. B. Kerr and S. S. Battin, Jr., have formed a co-partnership for manufacturing fine jewelry. Both these men have long been associated with Messrs. Alling & Co., and are extensively and favorably known to the trade.

The firm of McNaught & Lowe has been dissolved by mutual consent, Mr. McNaught retiring. Mr. W. G. H. Lowe will continue the business. Mr. McNaught leaves this firm to take the management of the new watch case company that has just been formed in Toronto, with a capital of \$75,000.

Mr. Henry Fink, of Pforzheimer, Keller & Co., was married Feb. 10 to Miss Estella Kann, of Chicago. The trade was well represented at the ceremony, and the presents received by the happy couple were numerous and elegant.

Mr. H. C. Wilcox, President, and Mr. George R. Curtis, Treasurer, of the Meriden Britannia Co., have gone to Florida on a pleasure trip. Mr. Curtis will meet at St. Augustine Mr. J. G. Bacon, the New York manager, and with him visit Havana.

The copartnership heretofore existing between E. Aug. Neresheimer, Wm. M. Weil and Louis Neresheimer, under the firm name of E. Aug. Neresheimer & Co., has expired by limitation, Mr. Wm. M. Weil retiring. Mr. Weil will continue to travel for the firm as heretofore.

James J. Fisher, the well-known importer, dealer, and manufacturer of watchmakers' and jewelers' materials and tools, has admitted his two sons, E. & E. J., to an interest in the firm, which will be hereafter known as Fisher & Sons. They are now comfortably situated in their new quarters, No. 1 Maiden Lane.

A. W. Sexton & Son succeed to the business of Baldwin, Sexton & Peterson, diamond importers and manufacturers of diamond jewelry, Mr. Baldwin retiring from business. The senior Mr. Sexton has been identified with the firm over forty years, and the son has been reared in the business in connection with that firm.

E. H. Lovell, formerly with Duhme and Co., of Cincinnati, and Theodore Evans, have made engagements with J. T. Scott and Co., and will represent that firm on the road. Frank Townely, who has heretofore traveled for J. T. Scott & Co., will hereafter be found in the office by all his old friends and customers.

Messrs. A. Westen and F. H. La Pierre, recently connected with L. A. Cuppia, the former as manager and the latter as salesman, have formed a co-partnership, under the firm name of Westen & Co., for the manufacture of silver and gold jewelry, cane heads, etc. Their office and factory is located at No. 18 East 14th street.

At a recent meeting of the Directors of the Jewelers' Board of Trade, of Providence, the following officers were elected for the ensuing year: President, Dutee Wilcox; First Vice-President, F. I. Marcy; Second Vice-President, J. L. Sweet; Treasurer, J. A. McCloy; Secretary, George H. Slade; Finance Committee, R. S. Hamilton, Jr.; H. G. Mackinney and E. S. Horton.

The firm of Colby & Johnson has been dissolved by mutual consent. The business will be continued by Mr. C. K. Colby. Mr. Johnson, who is President of the Celluloid Show Case and Molding Company, will hereafter devote his entire time to the interests of that company. He is so well known to the trade that he needs no word of introduction from us. We wish the gallant "Colonel" every success, and are sure that his enterprise and ability are deserving of it.

The "Mary Anderson" is the designation of a new bracelet, recently patented by Charles S. Pine & Co. In recognition of the genius of the lady whose name has been employed in christening this bracelet, the firm has made a very beautiful pair of them, encrusted with diamonds, and bearing the initial "A," which have been sent to Miss Anderson as a present. In C. S. Pine & Co.'s advertisement in this number of THE CIRCULAR will be found an illustration of these bracelets. From this can be gathered an idea of the method by which they are made adjustable to any size.

Much has been said about the wonderful catch of whales and black fish on the New England coast during the winter, and the almost unequalled quantity of oil secured from them. Mr. Wm. F. Nye, the enterprising manufacturer of watch oil, was promptly on hand, and secured the greater part of the black-fish oil. Taking it to his refinery at New Bedford, he at once submitted it to his special processes, and now has on hand the finest lot of watch oil ever held in stock in this country. This oil, taken at midwinter, has peculiar advantages, and, in refining it, Mr. Nye produces a superior article for the use of watchmakers.

A general press despatch from Chicago, dated Feb. 17, says that the President and Directors of the Aurora Watch Company, which has been in trouble for some time, filed a bill in the Circuit Court to-day, in which they allege that Maurice Wendell, Secretary and Treasurer and chief stockholder, has spent \$206,000 of the company's funds in the space of a little more than one year since the company was organized; they ask for an accounting.

"Practical Instruction in the Art of Letter Engraving" is the title of a handsomely printed book, written by G. F. Whelpley, and published by John Wiley & Sons, of New York. It gives full instructions for engraving on metal, and is accompanied by numerous illustrations. It is a complete treatise on the subject, beginning with the rudimentary requirements of a pupil and carrying him through the various progressive stages until he is an adept. The author says in his preface, that "this business being but light menial labor, and of a sedentary character, opens the door of a new industry to women, which will lead them to lucrative positions. Let all who consider the pecuniary returns of this art, and its promising future, enter into it with a true love for its fascinating influence, and thus achieve that success which always crowns an earnest effort."

The death of one of Europe's greatest horologists, Moritz Grossmann, of Glashütte, occurred suddenly at Leipzig, Saxony, on Friday evening at 10 o'clock, Jan. 23d. He died of paralysis of the brain, after having delivered an erudite discourse on the subject of "Universal Time and its Introduction into Civil Life," before the Polytechnic Society of Leipzig. The gentleman was so well known in the horological world that a lengthy notice would at the present time be out of place, and we shall reserve it for some future occasion. The horological fraternity throughout the world will concur with us in saying that the departed was a luminous star in the horological firmament, who, by his intellectual capacities, his keen and untiring diligence, as well as by his willingness to devote his energies to the best interests of the art, had earned for himself an imperishable fame.

We are frequently asked when "Excelsior" will conclude his series of articles on watch repairing, the first of which have already appeared in our columns. It is with much regret that we announce that it is exceedingly doubtful if "Excelsior" will be able to resume them at present. He has been sick considerably of late, and in addition has become so much engrossed in some important electrical inventions, that his mind and his time are too fully occupied to permit of his writing on any subject requiring so much thought and care as that of watch repairing. We have hope, however, that at no distant period "Excelsior" will once more come to the front to discuss a subject of which he is master, and regarding which he has the faculty of imparting to others what he knows himself. When circumstances will admit of his continuing these articles, it will give him as much pleasure to prepare as it will us to print them.

An article that has lately grown into fashion for decorative purposes, is fine tissue paper of various colors. It is surprising the number of beautiful effects that can be produced by different colored tissue paper. Beautiful lamp shades, fancy fans, artificial flowers, and the thousand and one things which ladies of taste and ingenuity invent for the decoration of their rooms. The Dennison Manufacturing Company import this paper in large quantities, and sell thousands of reams monthly. It is an attractive feature for a retail store, and will attract lady customers without number. Another exceedingly useful article introduced by this company is the escreteoir for ladies' use. It contains sticks of perfumed sealing-wax, wax tapers and an initial seal. These are put up in paper boxes, or in elaborate plush cases, with the initial stamp, to suit customers. As the use of sealing-wax for sealing letters is once more demanded by the decree of fashion, no lady can afford to be without these conveniences, and no lady who has once seen them will consent to be without them. Every retail dealer should carry them in stock as a means of attracting custom.

Unger Bros. offer to the trade a novel line of jewelry. They have been at great trouble and expense to obtain *fac similes* of ancient coins, some of them dating as far back as the year 500 B. C., and from these have made unique charms in silver. There is the greatest variety imaginable, the *fac similes* having been obtained from one of the most complete collections of coins that there is in existence. The reproductions are perfect representations of the different coins, and cannot fail to be popular with the public.

The enthusiasm which has been infused into the American people, resulting in the wide-spread interest now taken in all matters pertaining to art, must be most gratifying to our advocates for "higher education." This interest is shown not only in the increased number of art schools, museums, etc., but to a still greater degree in the eagerness with which the papers are scanned to glean every art note; in fact, it has become almost a necessity for every local paper to have its "Special Art Correspondent." A recent publication is a striking example of the development both of the fine and the industrial arts, or we might say the perfection of the fine art of wood-engraving practically applied to illustrate the highest products of industrial art. Issued by Messrs. Reed & Barton, of Taunton, Mass., and 37 Union Square, New York, as a trade catalogue, this superb volume, of some four hundred pages, is embellished with nearly four thousand woodcuts of the highest order, illustrating their unrivaled variety of art designs in gold and silver electro-plate. The work also contains several fine lithograph pages. The binding is in the finest silk cloth, the covers embellished with elaborate designs in gold and silver. The cuts are printed on heavy plate paper, manufactured to order, and is of a finer grade than ever before used in any book. The edges are full gilt, and, as a whole, this catalogue stands without a rival as an art publication and as an example of American book-making. Distributed, as it will be, all over this country, and in all the principal cities of the world, it is destined to exert a widespread influence, and reflects the highest credit on Messrs. Reed & Barton.

The New York Jewelers' Board of Trade has met with the highest success thus far, and seems to fill a long-felt want. Rooms have been taken in the Benedict Building, corner of Broadway and Courtlandt street, where the Secretary is to be found at all times. A fortunate selection of officers was made; for these, including the members of the Board of Directors, have entered upon their duties with surprising energy. Great progress has already been made in perfecting a system of inquiry for obtaining desired information, and it is the determination to make this the most systematic and useful organization of its kind known to any branch of business. Its resources are available to any member of the trade in any part of the United States who desires to associate himself with it, and the larger its membership the more useful it will be. There is a large field for it to work in, which has never been cultivated before, and the indications now are that it will be the means of bringing about greater harmony in the trade than has existed for many years. There are many abuses to correct, and it will be the object of the Board of Trade to apply the remedy as fast as circumstances will permit. The following named gentlemen are the officers for the present year: Joseph Fahys, President; S. Oppenheimer, of Oppenheimer Bros. & Veith, First Vice-President; Frank H. Richardson, of Enos Richardson & Co., Second Vice-President; James R. D. Graham, Secretary; William Smith, Treasurer. Board of Directors: L. Strasburger, of L. Strasburger & Co.; J. W. J. Pierson, of the E. Howard Watch & Clock Co.; William Bardel, of Heller & Bardel; W. F. Wilson, of John Wilson's Sons; E. August Neresheimer, of E. A. Neresheimer & Co.; L. Stern, of Stern Bros. & Co.; S. Lorsch, of Sussfeld, Lorsch & Co.; D. Untermeyer, of Keller & Untermeyer; L. Kahn, of L. & M. Kahn & Co. All these gentlemen have shown great interest and earnestness in perfecting the organization, and have placed it on such a solid foundation that success is assured.



## THE JEWELERS' CIRCULAR AND HOROLOGICAL REVIEW

*The recognized organ of the Trade, and the official representative of the  
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### The Outlook Improving.

THERE WAS A noticeable improvement in business during the month of March, and members of the trade feel quite encouraged. There was no "boom" in business, nor was anything of the kind expected, but there was a steady increase in the amount of goods sold, and a better and more hopeful feeling expressed by buyers. It is a satisfaction to see an increase over the business of March of last year, for it indicates that confidence in the future of the business is increasing, and that still better things may be looked for as the season advances. It is far better to see business improving gradually in this manner, than it would be to have it come with a spasmodic spurt, that would keep everybody busy for a week or two, and then fall away and leave them idle for months to come. That trade is the more satisfactory that comes with such regularity that the merchant or manufacturer can count upon doing about so much each month. It is not probable that the jewelry trade will get into this condition for some time to come, but it is approaching it more and more as the facilities afforded retail dealers for purchasing goods as they want them are increased. In former years the rush of business came in the spring and fall, while the intermediate seasons were inactive. During the past few years orders have been more scattered throughout the entire year to the greater satisfaction of all concerned. There is no reason why the retail dealers should feel under the necessity of rushing in new goods at particular seasons; the jobbers keep them informed regarding all new goods, and afford them facilities for ordering as their necessities require. They will find it to their advantage to keep their lines full at all times, rather than make special efforts at particular seasons of the year and then let their stocks run down in the intervals.

There has been a general improvement in all lines of business during the past thirty days. Transactions at the stock and produce exchanges of the large cities have been more active with an upward tendency in prices. These marts of trade may be considered the pulse of the business world, beating in response to the requirements of the people. Depression in business manifests itself first in the fluctuations of stocks, and prices become firmer with returning confidence. It looks, at the present writing, as though the business of the country was on the up grade to a prosperous condition. There is every reason to predict for the jewelry trade a good year's business. Owing to the hard times of the past three years, the retail dealers have not been liberal buyers, and their stocks, in consequence, need replenishing; they have, during the same time, reduced their liabilities very materially, so that they come nearer to being on a cash basis than they have been in several years. But they are likely to be cautious in buying, lest they accumulate a stock of goods before the demand warrants them in doing so, and will only place their orders as they perceive indications that the public they cater to is ready to buy. This spirit is to be commended by all who have the permanent welfare of the trade at heart. There may be a few who would be glad to sell goods to any amount at any time, but the conservative man, who looks to the future as well as the present, would prefer that demand should precede supply. Manufacturers are in readiness to fill orders as they come in, and have many new and attractive goods to offer, but they are pursuing a wise course, preparing to meet any demand that may arise rather than producing large quantities of goods to be forced on the market. They are fearful of over-production, and will cautiously feel their way to steady sales in preference to piling up goods to be worked off at a sacrifice later in the season. The present outlook may be summarized by saying that it is improving slowly, and is permeated with a degree of hopefulness and confidence in the future that are of themselves a good foundation to build upon.

### Look at the Bright Side.

WE HAVE heard it said of gamblers that they will bear with patience a continued run of ill fortune, but the moment luck begins to turn in their favor, they become bold and venturesome in their play, determined to win all they can while fortune smiles upon them. There is an old and venerable saying that it is best to "meet your luck half way," and not to be exacting lest it grow discouraged and turn in another direction. In the jewelry trade there is too great a tendency to constantly look upon the dark side of the picture; no matter how prosperous may be the general condition of the business, one never hears a member of the trade admit that he is satisfied; they always have something to complain about. Latterly they have had just cause for dissatisfaction because of the dull times, but since the first of the year the outlook has been more hopeful, and the quantity

of goods sold considerably in excess of the transactions during the corresponding months of last year; yet we doubt if a single member of the trade will voluntarily make this admission. Ask one of them how his business is, and he is sure to reply that it is frightfully dull; press him with a few inquiries and he will admit that his January sales were fully up to last year; that February was considerably better, and as far as he can judge of the March business, it has been better than during either of the preceding months—in fact he has been busy making goods and filling orders. Yet he will not voluntarily make this admission, and it requires a reportorial inquisition to induce him to concede the fact. He has fallen so into the habit of talking on the bear side of the question that he is unwilling to grant that there is an upward tendency in business matters or any prospect of an improvement. He is unwilling to “meet his luck half way,” but insists that it shall come the whole distance, swarm over him, bury him over head and ears before he will admit even to himself that “business is fair.” This constant croaking of evil has a most injurious effect upon trade, tending to propagate a feeling of depression, of doubt as to the future, and to keep alive that lack of confidence that is so much to be regretted. If instead of always wearing a woe-begone look, and repeating in a parrot-like manner the set phrases indicating dissatisfaction with the existing state of things, each one would speak encouragingly to his neighbor, and so use his influence towards securing a restoration of business confidence, the burdens of the times would be much lessened, and the dawn of a better era be sooner brought about. It was General Grant, we believe, who said, regarding specie payments, that the best way to resume was to resume; we say that the best way to restore confidence is to confide—cultivate it yourself, set the example, and you will soon have a good following.

It is especially incumbent upon manufacturers and jobbers that they should at all times put their best foot foremost, and take as cheerful a view of the situation as circumstances will permit. If they constantly indulge in lugubrious predictions as to the future of the business, how can they expect the retail dealers to take a more hopeful view? If the wholesale dealers persist in promulgating discouraging views, it cannot be expected that the retail dealers will be able to get up such a degree of confidence as will warrant them in becoming liberal buyers. These latter have sufficient discouragements to encounter in the ordinary course of business without being weighed down by the ominous croakings of others to whom they look for encouragement. The business this spring has unquestionably been an improvement upon that of last spring, and all the indications point to a good year's business, why not admit the fact, banish long faces and evil predictions, and “meet the good time coming” half way? It is better to be too sanguine than too despondent; the one is encouragement to others and the other breeds discontent and dissatisfaction. We do not believe in exaggerating the situation in any direction, but as all signs point to an improvement in business conditions, we believe it to be for the good of the trade and of business in general to recognize the fact.

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### The Channels of Trade.

WE CONTINUE to receive complaints from retail dealers to the effect that many jobbers and some manufacturers sell goods directly to outsiders who are the competitors of the retailers. This is a subject that has been much talked and written about in years past, and, as the evil continues to increase, it seems superfluous to say much more about it. The simple fact is that the methods of doing business have materially changed of late years and retail dealers are brought face to face with the fact that they can no longer control the sale of goods in their line. For this fact they are largely to blame themselves, in not having taken possession of the market and so forestalled outsiders. If they had supplied the public with such goods as it wanted—had been as energetic and pushing in intro-

ducing new goods and keeping up with the progress made in the trade as their competitors have—they would have supplied the demand and there would have been no room for the outsiders. Manufacturers and jobbers would prefer that the retail dealers should handle their goods, but if they do not sell them and outsiders can, they will certainly supply the outsiders. The very fact that the complaint of the retail dealers is well founded, is evidence that they do not cover the field they attempt to work. As an instance in point: a hardware dealer from an interior town, some time ago applied to a manufacturer of silver plated ware to purchase a line of his goods, the manufacturer objected on the ground that there was a jeweler in that place who bought their goods in limited quantities; he caused inquiries to be made, and ascertained that the retail dealer was the reverse of an enterprising merchant; being more devoted to watch tinkering than to selling goods, and as a result, a bill of goods was sold to the hardware merchant. These were speedily disposed of and fresh ones ordered, and this trade has increased from year to year, the hardware dealer now taking twenty times the amount of goods that the retail dealer formerly did. Of course the latter grumbled, but the manufacturer argued that he ought not to be deprived of his sales simply because the dealer was too indifferent or too incapable to work up the demand which another was ready to do. It would, no doubt, be better for the retail dealers if the trade could all go through their hands, but how about the manufacturers and jobbers? They have their capital invested in their business, and their success depends upon selling goods at a profit; the more they can sell the greater their profit. It cannot be expected that they will be content to wait for retail dealers to take a limited quantity of their goods on credit when outsiders are willing to buy in liberal quantities and pay cash on delivery. A liberal order accompanied by the cash is such an irresistible argument that the merchant who would ignore it should be at once canonized as a saint. Business is business, and when that is under consideration all sentimentality is put in the background.

We confess that we would greatly prefer to see the trade confined to the legitimate channels, but at the same time we recognize the many changes that have occurred in business methods of late years which render this simply impossible. Whoever has goods to sell will sell them wherever he can to the best advantage, and this applies as well to the retail dealer as to the manufacturer or jobber. The only remedy for the trouble complained of is one advocated for several years in these columns, viz.: the adaptation of the retail business to the changed conditions that have come over trade in general. The dealers must make up their minds to become merchants in the fullest sense of the word, supplying the public with what it wants, and thus becoming active competitors of those outsiders of whom they now complain. A diversified stock of attractive goods is sure to bring custom. This is what the bazaar merchants rely upon, and it is why the hardware men, furnishing goods dealers and others mix jewelry with their legitimate lines of goods. The retail dealers who have followed our advice in this matter uniformly report good results. It is by no means necessary for a dealer to carry a line of hardware or furnishing goods in order to diversify his stock, but he can find plenty of articles that harmonize with a stock of jewelry, the handling of which will prove of advantage to him. In these days, when decorative art is all the rage, and every lady in the land is impelled to do work of this kind, the jeweler might make his place the headquarters for the sale of art material of all kinds without introducing any incongruous elements. Fashion, too, is fanciful regarding stationery, which involves much engraving, and this might be introduced. Artistic articles in glass and various chinaware are novel and attractive, and have the advantage that a few dollars judiciously invested will purchase a liberal display. There are thousands of fanciful articles of bric-à-brac or in the artistic line that one sees in the Broadway stores that command the attention of passers and prove a temptation to purchasers. A comparatively small sum may be made to go a long way in thus embellishing the store of a retail

dealer and adding to the attractiveness of his stock of jewelry. The days of specialties in mercantile transactions have passed, and diversity now rules the roost. Retail dealers should take the hint in time, and, by introducing such goods as harmonize with their calling, maintain their prestige as merchants, and seek to win back that patronage that should be theirs but now goes to the much complained of outsider.

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### The Margin of Profit.

WHILE THE trade has been complaining for the past two years of the dullness in business, and blaming the hard times for all the evils from which it suffers, it has seemingly lost sight of the many bad practices prevailing that have had a decided influence in reducing the margin of profit. It would naturally seem that when business conditions clearly indicate that there is to be a decrease in the amount of sales, and that, consequently, a reduced income to meet expenses is to be apprehended, there would be an advance made in the prices of such goods as are sold. Expenses run on whether sales are heavy or light; if they are light, the profit on the few sold must be increased or there will be a deficit when expenses are charged up against them. For instance, if the profit derived from the sale of \$100,000 worth of goods is ordinarily required to pay the expenses incident to conducting the business, when the sales drop off to \$50,000 either as much profit must be derived from the smaller amount sold as from the larger, or expenses will swamp the business. But the practice in all lines of trade in dull seasons is the reverse of this. Competition becomes greater between manufacturers, and they, in their anxiety to get rid of their goods, reduce their prices, while the extraordinary efforts made to sell them necessarily increases the cost of selling. They are, in fact, burning the candle at both ends, and the margin of profit is consumed as the two flames approach each other. The demoralization that thus attacks the manufacturer soon spreads to the jobber and the retail dealer, and we have presented to us such a spectacle as has been before us during the past two years—a great productive and mercantile industry employing vast capital and much costly skilled labor conducted without adequate compensation. This is bad for the trade and bad for the country at large. It is also wholly unnecessary and demoralizing; unnecessary, because the cutting of prices does not stimulate a healthy demand; demoralizing, because it tempts to overstocking, also because when prices have once been reduced they can never be restored, and also for the reason that reduced prices is sure to result in degradation of quality. The fundamental principle to secure success in trade is to maintain such relation between cost and selling price as to secure an adequate margin of profit. The fact that this principle has been lost sight of to a great extent during the hard times now happily past has been a fruitful source of demoralization, and has had a more depressing effect upon the trade than has the falling off in the volume of business. The margin of profit should have been increased as sales decreased in amount. So long as manufacturers or merchants are content to grub along, slaving day and night to turn over their stock without making any profit, satisfied if the expenditure of an old dollar will bring in a new one, so long will they complain of a lack of prosperity. Prosperity does not depend so much upon the quantity of goods sold as it does upon the prices obtained for them. This applies to retail dealers as well as to every other branch of the trade.

The very nature of the jewelry trade demands that a liberal profit should be exacted upon the goods sold, for those sold have to compensate for many that, for various reasons, remain unsold. The cost of production of goods in this trade is unusually large, involving a liberal investment of capital, the employment of costly skilled labor, and extraordinary expenses in selling. Fashion, too, has much to do with enhancing the cost, as the changes of style dictated by

this fickle goddess make large quantities of goods unsalable. Every branch of the trade is affected by these conditions, and hence is warranted in demanding a fair margin of profit. The fact should never be lost sight of, that the goods sold must pay for those that are not sold. If a retail dealer sells an article at ten per cent. advance over its cost, he may think that he is making a profit, but if he charges against that article a fair proportion of his expenses, interest on capital invested, deterioration of stock, compensation for personal services, etc., he will find that he is out of pocket by the transaction. Ten per cent. will scarcely pay for the constantly decreasing value of stock on hand, much of which will eventually have to be sold below actual cost. In order to keep these points conspicuously before him, the dealer, in marking his goods, should include in the cost of each article its proportion of all other expenses, a matter very easily computed; he thus has before him a constant reminder of the contingent cost of doing business added to the actual cost of each article; he then sees at a glance that if he does not get more than the price named in the marked cost of the article he will make no profit, and if he sells for less he does so at a loss. If it costs him \$10,000 a year to sell \$100,000 worth of goods, that \$10,000 must be figured into the cost of the goods, and absolutely insisted upon, or disaster must inevitably follow. A dealer may, of course, be content to throw away his profit and work for nothing; his creditors cannot complain so long as he pays his bills promptly; but of what advantage is it to him? Wherein is his condition or that of his family improved? The remark is frequently heard: "Mr. Smith charges a little more for goods than some others, but he keeps an excellent stock and his goods are all trustworthy." Mr. Smith is the true merchant, who has made his reputation by selling only the best in his line, making his store attractive, and seeking to please his customers. They prefer to pay him a little more than to take the chance of being deceived by others. We could name jewelers in this city and elsewhere who can get considerably more for their goods than their neighbors, for the reason that they have built up such a reputation, and the fact that they are counted among the prospered merchants is proof that they not only get full cost for all they sell but a liberal profit in addition. As we have said before, it is necessary to success in the jewelry business that the margin of profit should be a wide one; contingent expenses must be provided for as well as actual cost. The indications now are that the volume of trade this year will be large, and if every owner of stock would at once mark up his goods ten or fifteen per cent., we do not believe it would make any perceptible difference in the year's sales, but it would be a wonderful net gain to the sellers. With a liberal amount of sales, it will be the fault of the trade if better results are not reported at the close of the year than last year showed.

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### The History of Goldsmithing.

*Continued from page 55.*

HENCEFORTH, every piece of handicraft conformed to this style, and the works of gold and silver that have survived the shock of time clearly betray the model after which they were fashioned, by their better-defined outlines and more pronounced style of chasing, engraving or other ornamenting.

History has preserved us the description of many pieces of goldsmithing wrought by Parisian goldsmiths; contemporary writers speak of a large gold basin, with allegorical figures, representing the four elements and various other subjects, which the city of Paris presented to King Louis VIII., in 1223, on the occasion of his entry into the city; next, the silver-gilt sarcophagus, adorned with numerous figures, which this prince caused to be erected in honor of Philipp Augustus, his father, in the abbatial church of St. Denis.

A few years afterward his widow, Blanche of Castile, paid her deceased husband, Louis VIII., the same honor.

Nearly all the goldsmiths of Paris lived upon the Pont-au-Change (Exchange Bridge) and the Grand Pont (Great Bridge), which at that time belonged to the freehold of the bishop; they always were a rich and powerful corporation, although as late as under the reign of King St. Louis do we find for the first time that they were governed by statutes and by-laws, recorded in the writings of *Des métiers* (of the trades) by Etienne Boileau.

The affairs of the corporation were conducted by elected syndics, whose duty it was to superintend the manufacture of gold and silver ware and punish fraud. The standard of gold was fixed, what amount of alloy it should contain, etc. The gold of the city of Paris was considered the finest.

One of the most celebrated pieces of goldsmithing of the commencement of the thirteenth century was the shrine of St. Genevieve, finished in 1212, after two years' work, by the goldsmith Bonnard, of Paris, who used in its manufacture ninety-three marks of silver and seven and one-half of gold, beside many jewels.

It was in the Ogival (pointed-arch) style, in form of a church, ornamented with statues of saints and bas-reliefs. It is a pity that this work, in common with everything else valuable that ever fell as booty into the hands of the ignorant, was destroyed during the French revolution. We still have a few specimens of the same kind, however, which convey an excellent idea of the ability of the French goldsmiths of the thirteenth century. Among them the shrine of St. Julia, at Jouarre, one of Nivelles, represented in fig. 28, and another of St. Taurin, at Evreux. All three are designed in the same ogival style.

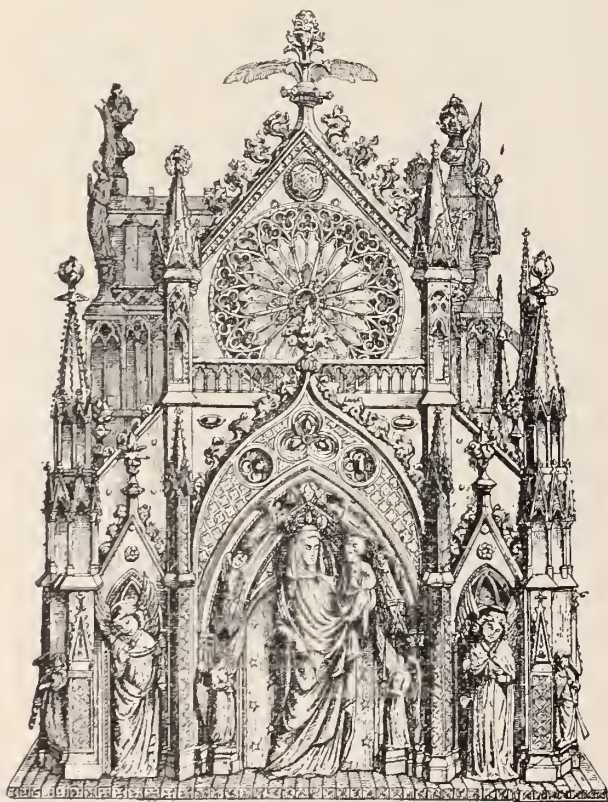


FIG. 28.

The shrine of Nivelles has been several times "restored," or, rather, "botched;" it is the costliest and most elaborately chased. It is the work of two goldsmiths, Colard, of Donai, and Jacquemon, of Nivelles, to whom the chapter delivered three hundred and fifty marks of silver and a great number of jewels. The order was issued to them in 1272; but the relics of the saint were not inclosed in the shrine until in the course of 1292.

The shrine of the saint Taurin, of Evreux, is of the same kind. It represents an oratory with a steeple. Each of its long sides is ornamented with three arcades, in form of pointed arches, separated between them by four counterforts. Two similar arcades decorate the two ends; the total length of the shrine is thirty-one and one-half inches. It stands upon a large pedestal nearly eight inches

high. The height of the shrine above this pedestal is twenty-two and two-thirds inches up to the comb of the roof, and about thirty-nine and one-third inches up to the spire of the graceful steeple. The figure of the saint, in high relief, fills a niche on each of the two long sides; several other niches contain representations taken from his life. Each arcade is supported upon elegant columns with Doric capitals. The shrine is ornamented with eighteen large and one hundred and seventeen small jewels, as well as many bezels of enamel.

An inscription on the plinthe informs us that the name of the person who ordered it was Abbot Gilebert or Gilbert, who died in 1255. According to the *Gallia Christiana*, the shrine was finished in the same year.

The next person of eminence in the course of our history is the pious Louis IX., or St. Louis, whose mother, Blanche of Castile (be it recorded to her honor), was one of the most exemplary queens that ever graced the throne of France; a good mother invariably raises dutiful children, and her son Louis loved her with such devotion that he frequently entwined the French coat-of-arms with those of Castile; various pieces of goldsmithing wrought by his orders bear the joint emblems; even the brother of St. Louis, Alphonse de Poitiers, venerated the virtues of his sister-in-law so highly that he frequently linked her coat-of-arms with his.

It might naturally be supposed that a potentate of so exemplary a character as to make him deserving of being canonized would have donated everything he possessed to the church—the truth is that he was not as liberal as many of his predecessors had been. The state of the royal exchequer was chronically drained by his many expeditions beyond seas, and he was bound to observe a rigid economy.

Among the several relics by him presented to the church was a thorn from the true holy crown of thorns, which he donated to the abbey of St. Maurice d'Againe, which is still treasured in the church of St. Maurice. The thorn is simply enclosed between two oval sheets of glass, the edges of which are bound around with a gold bezel, without any other ornament than a few engraved flourishes. The oval stands on end, the strips of gold are joined below into a stem, supported upon a foot, the severe simplicity of which is relieved by a few pearls.

St. Louis, however, knew to be prodigal at times in his gifts to the church. Contemporaneous historians make mention of the superb mountings of the crown of thorns, the splinter from the holy cross, the nail, the fragment of sponge, and other mementoes of the Passions, all of which he redeemed from the Venetians, into whose hands Emperor Baudouin had deposited them as gage for a large loan. Guillaume de Nangis estimates the gold, silver and jewels employed in making the mountings at more than one hundred thousand livres—which was an enormous sum for that age.

St. Louis and his wife, Marguerite de Provence, made other rich presents of goldsmithing to the Abbey St. Denis. Their return from Palestine had been one continued succession of disasters and fatal accidents; at one time, when they were in very imminent danger of perishing at sea, Joinville tells us, the queen promised, if God would see fit to preserve them, that she would have made and presented to the church a faithful copy, of silver, of the bark, with its masts, cordages, rudder, even its sailors. This votive offering cost them one hundred livres.

The favorite goldsmith of St. Louis was named Raoul. Philipp the Bold ennobled him in 1270.

Divers pieces of goldsmithing pertaining to the thirteenth century are still preserved, for instance, the reliquary of St. Peter and St. Paul, at Rheims; the beautiful croziers at the museums of Angers, Poitiers, Soissons and Saint-Omer; that of Bishop Hervé, as well as his chalice, at Troyes, etc. Fig. 29 is a copy of one of them.

After the death of St. Louis, goldsmithing appears not to have received great encouragement. The greatest piece of work wrought before the end of the century is perhaps the magnificent bust-reliquary containing a part of the head of St. Louis, which Philipp the

Handsome presented to the holy chapel of the Palais, after the canonization of the monarch. In the construction of this bust, of natural size, sustained by four angels, sixty-three marks of gold were used. It was surmounted with a gold crown, of four flourishes, ornamented each by a large sapphire, six rubies, four pearls, and

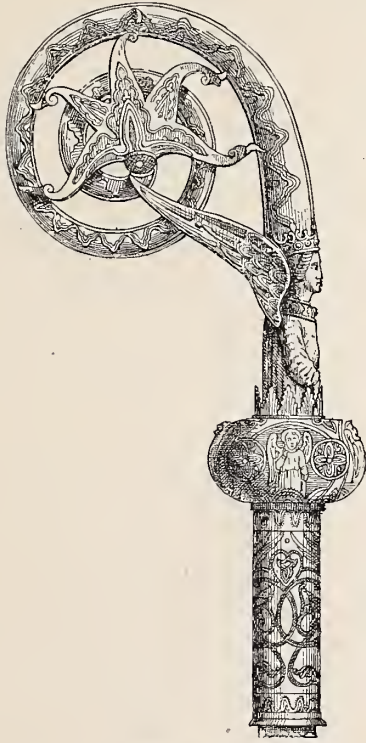


FIG. 29.

sixteen emeralds; to which must be added forty rubies, forty emeralds, four sapphires, a large chrysoprase surrounded by garnets, and four bezels of rock crystal disposed over the other parts of the bust. This was supported upon a foot of silver gilt of the weight of one hundred and seventy-nine and one-half marks, carried by four lions, and around it were disposed the figures of thirty kings and princes with their names and a long dedicatory inscription.

Various other parts of the body of St. Louis equally became the objects of pious care on the part of his grandson.

The corporation of goldsmiths of Paris about this time experienced a grave accident. The Grand Pont, which had been, as we said, one of the principal centers of this industry, went into pieces in 1281; a large number of goldsmiths lost heavily thereby, and were forced to seek other quarters. Their numbers had constantly been increasing, and the census of 1292 of the city of Paris shows that there were one hundred and twenty alone in the city.

When we consider that Paris was not the only city in France thus distinguished, we are forced to the conclusion that the art of goldsmithing was quite a favored branch of industry. Limoges supported a flourishing school of goldsmithing, and several other places, Toulouse, Montpellier, etc., successfully cultivated the same industry. History has preserved us the names of many of these goldsmiths, but it would be irrelevant to mention them. The silver-smiths of Montpellier were formed into a guild, and the standard of the metal they worked was also fixed by stringent rules.

The goldsmith-enamellers of Limoges had always been celebrated for their artistic skill. Their works were in demand everywhere, even in foreign countries. St. Louis, in 1247, ordered them to enamel the joint tomb of his two children in the Abbey of Royaumont; and toward 1275 John of Limoges was called to Rochester, England, to there enamel a tomb in honor of Bishop Gauthier de Merton. He was paid twenty livres for the material, and forty livres five sous six deniers as sum total for his journey and the work of enameling.

## 2.—France (fourteenth century).

The ostentation of the sovereigns and nearly all the princes of the house of Valois is well known, and the art of goldsmithing had never

been developed so highly as under their reign, and, singular to state, that the fourteenth century—the century, *par excellence*, which eclipsed all the previous ones in sumptuousness—commenced with a series of sumptuary laws for the purpose of checking it.

Toward the end of the preceding century, Philipp the Handsome, rather for the sake of gain than for the purpose of improving public morals, prohibited every one not having six thousand livres income to possess vessels of gold or silver, and every such person was commanded to take to the royal mint whatever he should possess of such vessels.

A few years afterward Philipp went so far as to ordain that even those persons possessing such an income should surrender one-half of above-said dishes to the crown; he at the same time forbade the goldsmiths from manufacturing anything whatever.

These orders shared the lot common to all such excessive measures: they simply remained a dead letter upon the statute book, and only served to provoke a senseless reaction under the following reigns. Philipp of Valois vainly tried to maintain them, and after him King John re-enacted them, although making them less rigorous, limiting to one mark gold or silver the weight of trinkets or pieces of vessels which the goldsmiths were authorized to manufacture. And, strange to say, that no one ever was more lavish in the use of domestic silverware than the princes, his sons. All four, Charles V. and his three brothers, Louis d'Anjou, Charles de Berry, and Philipp de Bourgogne, possessed, each one, vast treasures, according to the inventories of their households.

Mr. Labarte, from whom above data are borrowed, opines that these sumptuary laws were less hurtful to arts and trades in France than the many misfortunes that befell the country in the course of the fourteenth century. This would, generally speaking, be correct enough, but, in this case, we beg to differ with him. During the war of one hundred years, during the madness of Charles VI.—this period of desolation, when princely rivalry drove France to the verge of destruction, civil goldsmithing assumed proportions hitherto unknown, due to the unbridled luxury, rapacity and ostentation of the several rival princes.

Civil wars had become the normal state of the society of this epoch, and the goldsmiths took an active part in them; one of them became famous as a brawler—a certain Etienne Marcel, who belonged to the guild. In this turbulent state of society goldsmithing thrived prodigiously.

The large shrines, in form of a church, become rarer from this period forward, and there is a tendency to displace them with busts, frequently of natural size, full length figures, or groups, in which both the modeler and the worker displayed their skill. In 1368, Charles V. presented to the Abbey of St. Denis a group, of gilt silver, consisting of himself, his wife and son kneeling at the feet of Magdalene; a few years before this, Marguerite of France, Countess of Flanders, also presented to the same church a silver figure of St. Denis, holding his head between his hands. Other statuettes of goldsmithing—a holy virgin, St. Nicholas, St. Catharine—were given by Abbot Guy de Monceau.

Not many of these figures have come down to us; a few of them are preserved in the Louvre of Paris and the Museum of Cluny. The most perfect one is the virgin, of gilt silver, offered, in 1344, by Queen Jeanne d'Evreux to the Abbey of St. Denis. It is barely possible to imagine a more elegant piece of workmanship. The principal figure, twenty-one and one-half inches high, of a charming attitude and draped with much grace, stands upon a sort of a pedestal, enameled and adorned with small, very finely chased, figures. Mary carries her well-beloved son upon her left arm. In the other hand she holds a *fleur-de-lys*, which, it is said, formerly inclosed hair of the Holy Virgin's head.

Although this charming statuette is well known by everybody, we reproduce it in fig. 30.

As far as regards the busts, we mention that of St. Philipp, entirely of gold, presented to the church of Notre Dame of Paris by the Duke

of Berry; that of St. John the Baptist, which the same duke gave to the holy chapel of Bourges, and the beautiful bust of St. Bernard, wrought in 1334, to receive the head of the celebrated Abbot of Clairveaux. This last reliquary was, it appears, a remarkable object of art. It was supported upon six lions, and its base ornamented with twenty-four pieces of enamel.

Many relics were also preserved in receptacles of rock crystal, often of a cylindrical shape, mounted upon gold or silver feet. A goodly number of these are still in existence, and generally known by the name of monstrances.

Our readers would be astonished when studying the inventories of the churches, particularly those of St. Denis, the Holy Chapel, St. Germain-des-Prés, the cathedrals of Paris, Troyes, Reims, Chartres, etc., at the number and value of the different pieces of goldsmithing treasured by them, and more especially the number donated to them under the reign of the house of Valois.



FIG. 30.

But not alone the list of the possession by the churches is worthy of study, those of the kings and princes is equally so, and the morals of the century are perhaps nowhere better illustrated than in the list of the vessels possessed by them.

Among the documents of this kind pertaining to the fourteenth century the two most interesting are: the inventory of the treasures of King Charles V., taken in 1379, and that of the Duke of Anjou, his brother, who was his lieutenant for a long time.

Charles V. loved ostentation, bordering on prodigality. When the Emperor Charles IV. visited Paris, in 1378, the former overloaded him with presents, consisting chiefly of a large number of precious objects manufactured by his goldsmith Hannequin Duvivier. After the bestowal of these many gifts his treasury still was estimated at nineteen million dollars.

Such a luxury on the part of a sovereign on whom history has deigned to bestow the *soubriquet* of "the Wise," appears almost an anomaly, if we did not remember that banks or the business of loaning money at interest was little known or practiced—except in case

of war; when the ready cash had been disposed of, the sovereign pawned his silver and gold vessels. This was the custom of the times. In accordance with this custom we see the Duke d'Anjou, using (or abusing) his position, one fine day seize the greater part of the royal treasure and to pawn it for prosecuting the conquest of his kingdom of Naples, and evil-minded persons have recorded that the duke forgot to render an exact account of the vessels he seized, and they furthermore say that whatever he left his widow managed to do away with. There is one consolation, however, that art alone suffered the greatest loss. Strange to say that this same Duke d'Anjou possessed a treasure barely ever surpassed by that of any modern Western potentate. A minute inventory, said to have been drawn up by his august hand, in 1360, mentions a number of articles of goldsmiths' work so large as to almost surpass belief. For instance, a portable altar, tabernacles, custodiæ, reliquaries, busts and full-length figures of saints, tablets or bas-reliefs of gold and silver, crosses, holy-water pots, chalices, burettes, incense-boats, censers, altar candlesticks, little bells to announce "when Our Lord is raised," etc.

Next comes the table silverware, which comprises all imaginable kinds of dishes, vessels, basins and pots, groups, figures of men and animals, fountains, large gold plates for the viands, others for fruit, gold basins, spoons, plates, flacons, jugs, pitchers for water and wine, large cups, small cups—indeed, almost endless is the list. Even many pieces of kitchen utensils are of goldsmiths' work, plates of all styles, pots, kettles of silver, etc. The inventory closes with the enumeration of a number of articles of furniture and fancy objects, also of goldsmiths' work: tripods, high stands, chandeliers, mirrors, baskets, clasps for mantillas and children's silver dolls.

The total weight of the vessels of Louis d'Anjou is estimated at one thousand three hundred and eight marks of gold and eight thousand and thirty-six marks of silver; at the foot of the inventory the writer states that the goldsmith, Henry, had still in his hands two hundred and forty-eight marks of gold for making a safe (*nef*) for the duke's use.

The safe (French, *nef*.) was one of the principal pieces of table service of the princes of this period. By this name was called a vessel of large capacity, in which were inclosed the wine and spices, goblets, spoons, etc., for the personal use of the prince; the safe stood upon the table near him, and remained carefully closed up to the time that it was to be used; this was done to guard against poison.

Some of these safes were objects of art, embellished with men and animals. For instance, we find in the treasury of Louis d'Anjou "one large safe of rock crystal mounted in silver; at its two longer ends raise up two turrets, each guarded by a sergent-at-arms, having behind him an angel enveloped in leaves. Upon the lateral parts are seen two wild men kneeling before two women, one of which is a daughter and the other a widow; the whole is supported upon a chased pillar standing on a base, in the shape of a terrace, resting upon six lions. The pillar and the terrace are enameled, the first azure blue, the second green; upon the terrace grow bushes and flowers, among which butterflies fly from flower to flower; finally the figures of two soldiers, with halberd in hand, stand there to guard the pillar."

Many other pieces used for ornamenting the table, such as fountains, large cups, salt-cellars, etc., were equally very elaborate pieces of work.

It is evident that the goldsmiths of this period had become very skillful in the art of modeling and grouping the figures.

(To be Continued.)

### Something About Fans.

IT IS CURIOUS to see how the historical development of our civilization has been epitomized in fan-painting. The relation between history and this branch of art is closer than has been the



case with some objects of far greater importance. Mythology furnished the first subjects to the painters of fans; the Bible then took the place of mythology; the achievements of the cavaliers of the Middle Ages, both true and imaginary, the courts of love and all the chief features of that long and wonderful period next embellished the face of the costly trinket. Every episode in the "Jerusalem Delivered" was treated in a masterly manner. In the seventeenth century fans showed a striking tendency to increase in size. The *Mercury*, a French paper of fashions, in a number of January, 1678, states that their size should be in keeping with the volume of the dresses worn; at that time, as is known, the *guardinfante* gave ladies the shape of immense demijohns—no wonder, then, that fans were two feet square. But the re-action came; this style of fans were replaced by the "Lilliputian," or "imperceptible" ones. These suggested to Mme. DeGenlis her saying: "When women were timid and blushed they used to carry large fans, and they hid their faces behind them. Now that they blush no longer and are intimidated by nothing, they do not care to hide their faces, and consequently they carry but microscopic fans."

The two most beautiful fans ever seen are one of lace that belonged to Mme. de Pompadour, now in the possession of Mme. A. Jubinal, and one of ivory, presented by the city of Dieppe to the unfortunate Marie Antoinette on the birth of her son, the Dauphin, in May, 1785. The former, probably of Italian origin, is made of the finest embroidered lace; it took nine years to finish it, and the cost was about \$30,000. A row of miniatures almost indistinguishable to the naked eye, but of infinite precision and finish, forms its border, it is divided into five sections, each one decorated with a painted medallion, and all fine masterpieces of miniature painting. The central medallion was suggested by a historical anecdote known by the designation of "The Flea of Miss Desroches." In 1579, Etienne Pasquier was one evening at the salon of the Misses Desroches, who gathered around them the greatest literateurs and wits of their time. Perceiving a flea on Miss Desroches' shoulder, Pasquier cried that he would give anything to be that flea, and that he would willingly celebrate it in a poem. The suggestion was enthusiastically received by the company; every one offered to join in singing the praises of the "happy insect," and the result was that a volume of poems in Greek, Latin, French, Italian, and Spanish were soon published under the title, "The Flea of Miss Desroches." According to LaMonnoye, the best of all these poems was written by the young lady herself.

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## Gossip of the Month.

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WE OBSERVE that city retail dealers are making a display of new goods, showing that the manufacturers have already put out some of the novelties they have been preparing for the past few months. We know of one manufacturer who prepared to bring out something new last fall, a design that he was confident would become immediately popular, but before he had made up many he became convinced that the trade was going to be light, so he locked up all he had made and declined to show them. He said he was not going to throw a new and a good thing on to a dead market, and let it become old and stale before there was any demand for it. Therein he showed his good sense. But now he is preparing to launch these new goods this season, being confident that they will be popular, and that the demand for jewelry will warrant him in pushing them for all they are worth. In other words, he has his seed all ready and expects to reap a large harvest, but was not willing to risk losing his seed by sowing it in barren soil. He has, so to speak, bottled up his ideas, and when he draws the cork he expects them to go off with a fizz.

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THE faces we encounter daily in Maiden Lane and John street

have shortened up considerably under the exhilarating influence of numerous orders and increasing business. For some time past they have looked like mourners at a funeral, and it is refreshing to see once more an occasional smile on the countenances of members of the trade. We hope to see it widen out into one universal broad grin before the season is over, under the influence of a business boom.

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WE NOTE the fact that the fire insurance companies have lately been advancing their rates very materially on all classes of property, including jewelers' risks, factories, stock on hand, etc. They give as a reason the annually increasing fire losses, which have left them without a profit for several years. This is an attempt to make the good risks pay for the bad ones. Insurance companies have entered into such a reckless competition for business that they have paid little regard to safety, accepting dangerous risks at about as low a rate as they take the best. Of course, their losses have been heavy, and naturally they will continue to be so as long as they insure property indiscriminately and for more than it is worth. Over insurance is a direct premium offered for successful incendiarism, and then when these bad risks burn, up go the rates to make the good risks that never burn pay for the bad ones that do. This excessive competition has induced the companies to bid against each other for business controlled by brokers, so that the commissions paid to these unnecessary middlemen range anywhere from fifteen to forty per cent. of the premium receipts, thus running up expenses very greatly. Twenty years ago the entire business was conducted for a sum less than what is now paid for expenses alone. Fire losses consume about sixty per cent. of the aggregate premiums received by the companies, and expenses use up from thirty-five to forty-five per cent., so that the profits of the companies are microscopical in their proportions. Indeed the companies have generally drawn from their surplus accumulations to make up the deficit in the expense account. To bring the business back to a paying basis it is not necessary to raise the rates; let them cut off the brokers and reduce their other expenses in reason, and they will find a profit at present rates. Instead of trying to reform their methods, however, they squeeze their patrons still more so that they can continue in their reckless and extravagant practices. Over in New England they have organized some mutual insurance companies for the purpose of insuring cotton and woolen factories, and manufacturing property of a similar character. They collect a premium about the same as the stock companies charge, but at the end of the year return to the insured all of the amount not actually used to pay losses. For several years the dividends declared have averaged sixty-five per cent. of the premiums collected, making the cost of insurance to the members about one-third the rates charged by the stock companies.

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ALL the risks assumed by these mutual companies are of a similar character, and a condition precedent to insuring them is that all reasonable precautions against fire shall be adopted and maintained, and to this end frequent inspections of the property are made by the companies. It occurs to us that a similar company might be organized among the manufacturing jewelers for the insurance of their factories. Where the factories are detached from other buildings and not exposed to the hazards of contiguous risks, they could be insured on the mutual plan, but the mutual principle of insurance has not yet been adopted to insuring the general run of commercial risks. A company in New York, organized for this purpose, is now going through a baptism of fire in making the experiment, and there is hope that it will be successful. As the trade is now suffering from the advanced rates of the stock companies, it will pay to study up

the operations of these mutual companies. The mutual plan of insurance, distributing the losses of the few among many, is the correct one, whether applied to life or fire insurance, but in either case the members must be placed as nearly on an equality at the outset as is possible; if it is in life insurance, the members should all be nearly of an age and in good health, paying rates sufficient to compensate for any discrepancy as to age; in fire insurance, the property insured should be equally protected from the danger of fire and the risks made equal as to fire hazards. Mutuality in insurance implies equality of hazards as well as mutual responsibility.

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THE twenty-four hour dials for clocks and watches do not meet with much favor in this country, although there has been some effort made to introduce them here as well as in England. Our people are too much engrossed in the pursuit of the almighty dollar to waste their energies picking out the correct time from a complication of figures on a watch dial that tend to confuse them. What they want is a dial so distinct that the time can be told at a furtive glance, for the pushing business man seldom pulls out his watch squarely and looks it full in the face, but catches a glimpse on the sly without more than half removing it from his pocket. A double set of figures would puzzle him too much; and besides, he doesn't care much what the time is except in business hours, say from 9 A. M. to 3 P. M., when the banks close. Outside of those hours time may wag along fast or slow to suit its own convenience, but during those hours he wants to keep trace of every second as it flies. Twenty-four hour dials may serve to satisfy the curiosity or fine perceptions of scientists, but several generations of business men will come and go before they will usurp the places of the old twelve-hour indicators, with the minutes and seconds thrown in.

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THE sixty year old proprietor of a large manufacturing establishment, recently said that he was surprised every day when he compared what was done in his factory with what used to be done thirty-five or forty years ago when he worked at the bench, and at the capability of modern machinery. Old-country workmen, when employed in American factories, are surprised at the numerous kinds of work done by machinery here that they were in the habit of doing by hand at home. Our manufacturers have a special tool for almost everything, and for old-country workmen to learn the use of these is almost like learning their trade over again. All this tends to lighten labor and to cheapen products; it also tends to give employment to more workmen, for as the cost of goods is reduced the demand for them is increased, so that a much larger quantity is required. The drawback to this is that the increased facilities for making goods tempts to over-production, which is always bad for trade. However, these matters regulate themselves eventually, and it is the average of years that tells when the results of business enterprises are summed up. When sewing machines were first introduced there was a great hue and cry against them on the ground that they would rob workmen of their employment, but, instead, with the increased facilities for sewing, the demand has increased a thousand fold. Forty years ago, as we have heard venerable ladies remark, eight or ten yards of calico was a pattern for a dress, but all married men know now that it takes twenty-five or thirty yards—the surplus goes into overskirts, tucking, gores, gussets, hemstitching, ruffles, etc., whereby more sewing machines are employed than women were formerly. This is a fair example of the effects wrought by the introduction of labor-saving machinery—it lightens the labor of the workman, cheapens the product of his skill and creates an increased demand.

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THE silver bill was overwhelmingly defeated in the Congress so

recently adjourned, but it is a live question that will not yield to opposition that is confined to a limited section of the country. It is a noticeable fact that those who so strongly urge the continued coinage of silver, come from those sections of the country that have always clamored for an inflation of the currency, largely from the South. They seem to think that if there is plenty of money in the country it will become more plentiful in the hands of the people, but forget that the people must have something of a money value to exchange before they can obtain money. It will always be a difficult matter for a man who has nothing to sell to get money, but the one who has an abundance of valuable commodities can always obtain money. The same is true of localities, and it is those that are the least productive that want an inflated currency. There are now stored in the treasury millions of silver dollars for which there is no demand, yet Congress insists that the mints shall continue grinding them out and storing them in their vaults. Let there come a sudden demand for gold that should remove a large amount from circulation and at once it will go to a premium, and then those who can get hold of it will hoard it till the price is forced up to war rates. The purchasing power of silver will be reduced to correspond with the advanced price of gold, and a financial panic will be precipitated. Already some of the banks have caught the alarm, and made large investments in gold to be prepared for the emergency that is threatened. A combination of speculators is liable to be formed at any time to run gold up to a premium, and should this occur there will be widespread disaster. The attempt of Congress to degrade our money standard should be sternly rebuked by the people. The actual value of the silver dollar is only about eighty-five cents, and it is an outrage that the people should be forced to pay one hundred cents for it simply to satisfy the requirements of the owners of a few silver mines who want a convenient market for their products. The question is bound to come up again at the next session of Congress, and whoever has influence with a member should use it to compel him to vote for any measure that will stop the further coining of silver. There is enough already on hand to outlast the present generation, and the succeeding one will, no doubt, desire to be heard on the question of the kind of money it will be required to use. If the currency is kept on a gold basis there can be little trouble now or in the future.

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AS CONFIRMING our opinion that the action of those western railroads in refusing to carry as baggage the trunks of travelers for jewelry, silk and lace houses, is unlawful, is a recent decision of the Supreme Court of Nebraska. A telephone company in Lincoln refused to place one of their instruments in the office of a business man of that place; he brought suit to compel them to do so, and the case was carried to the Supreme Court. That tribunal has just rendered a decision to the effect that telephone companies have grown to be commercial necessities, and must be regarded as common carriers; that all citizens have a right to employ them on equal terms; and that where no good reason is assigned for a refusal by a telephone company to furnish a telephone instrument to a person desiring to become a subscriber, and tendering a full compliance with all the rules established for other subscribers, a writ of mandamus should be issued to compel such company to furnish such person with the necessary instruments. If it is unlawful for a telephone company, as a common carrier, to refuse to an individual any of the privileges it grants to others, it must certainly be unlawful for those other common carriers, the railroad companies, to refuse to one class of patrons the privileges it accords to all other classes. If the dealers, who are subjected to loss and inconvenience by the action of the western roads, will make a test case and get it before the courts, there is no doubt but the railroads will be compelled to receive the baggage of jewelry travelers on the same terms they do

the baggage of other passengers. The subject should receive prompt action, for the restriction is becoming more and more burdensome each day.

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A JOBBER remarked the other day, "It is the manufacturers of cheap goods who will catch the boom of better business in a short time, and the fine goods men will have to wait." We do not agree with this view of the case. In times of business depression, all classes of citizens avoid indulgence in luxuries, curtail their expenses and decline to gratify their artistic tastes. When times improve, their old instincts and habits return, and they indulge their fancies according to their means and prospects. It is only those possessing wealth and artistic instincts who can indulge in the purchase of the finer examples of the gold and silversmiths' arts, and it is well known that this class of persons are less likely to deny themselves the gratification of their refined tastes than is the class to whom careful economy is a matter of everyday necessity. A work of art, a rare gem, a curious book, are things which haunt the connoisseur and give him no peace of mind until he has accomplished its purchase. With the masses, if they cannot afford what they desire, they dismiss the subject from their minds and there is an end of it. If the business reaction sets in as indicated, we predict that the manufacturers of fine goods will be among the first to feel its effects, for the tastes of our people are becoming more cultivated and luxurious every year, and the means to gratify them more abundant.

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A CORRESPONDENT asks why we no longer print illustrated descriptions of patents issued covering articles used in the jewelry trade. We formerly made it a rule to print the record of patents, and to give illustrations of the new features embodied in them, but we found it created considerable dissatisfaction among those interested in patents, and occupied space with matter of little or no interest to general readers, for comparatively few persons who read THE CIRCULAR are inventors or patentees. It created dissatisfaction in this way: John Smith, for instance, obtained a patent for a bracelet clasp, and it was described and illustrated in our patent columns, giving the idea that it was the latest, and, consequently, the best thing in its line; along came Jones, Robinson and half a dozen others, who hold patents on bracelet clasps, some of which possess so much merit that they have become popular, and say: "It is unjust for you to give so much prominence to an idea that has never been practically tested and may be good for nothing, while our patents have become standard in the trade. Such publication is calculated to injure us." In two instances we printed such notices of new patents that were clearly infringements of patents previously issued, and the original patentees felt greatly aggrieved, holding that such publication, although innocently made, was calculated to aid the infringers in pirating what belonged to another. After careful consideration of the subject, we came to the conclusion that a simple record of patents issued was all our readers in general required, and if the few who might be specially interested in any particular thing desired further information, the record we print would serve as a guide by means of which they could refer to the patent itself. By enclosing twenty-five cents to the Commissioner of Patents they can obtain a printed copy of any new patent issued. While a brief record of patents issued may be regarded in the light of news, anything beyond that is so clearly a matter of individual interest that its publication is not warranted from a news standpoint. It becomes a mere matter of business and should be relegated to the advertising columns.

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Russian Reproductions

At the Metropolitan Museum of Art.

[BY JOHN W. MILES.]

Continued from Page 40.



Dress Ornament, Gold, Scythian Dancing Girl.

THE NEARER we approach our own times the more plentiful becomes the relics of goldsmiths' work, and the more rare do we find originality in design. The early part of the 17th century could still boast of many famous goldsmiths, but the enthusiasm of the Renaissance was fast fading away. The artists no longer sought inspiration from nature, its true source, but studied instead the styles of the previous century, building imitation upon imitation, and losing gradually the power of personal expression. The efforts that were made to create new styles were directed into channels of eccentricity and in very many instances the apparent aim of the designer was mainly to produce not something artistic but something odd. The result of such an ambition has filled our museums with pieces mainly valuable as curiosities, which, if not to be classed with such objects as the Totem poles of the American Indian, are only saved from such companionship by the firm hold of past traditions. There was no lack of mechanical skill but a demoralized tendency to graft upon previous types queer and unworthy fancies. Fortunately this does not apply to all the objects of this period, else an examination of them for the purpose of instruction would be useless; but of this class we will notice one article, a tankard in silver-gilt of Dantzic work, figure 28. This is from the Chérémeteff collection, and measures 10 inches in height. The ornament is a flower pattern in diagonal bands and leaf-shaped divisions. The form is very rare and peculiar. Four tubes expanding at the center and bent outward in an oval form furnish the receptacle of the cup. A small lobed bowl terminates the upper apertures of the tubes, and forms a vessel into which the liquid pours when one is drinking. A cover of the same pattern as the bowl has a purchase similar to a tankard, and is the only attribute of the piece that entitles it to that name. In the space formed by the curvature of the tubes is a small figure of Cupid bending his bow. The piece has no especial artistic value, but is merely one of those odd conceits which some of the goldsmiths adopted in lieu of a better style, and is introduced here solely to show the abortive attempts that were made by the artist goldsmiths of the 17th century to originate new shapes.



Tankard, Silver-gilt, Dantzic, 17th Century, Figure 28.

Of the curious pieces produced by the Dantzic guild, we may also notice an Indian mounted upon a camel, and which was designed solely for ornament, figure 29. It is of silver-gilt, with a height of 25 inches and a length of 15 inches. The Indian is dressed in a short skirt of feathers and wears upon his head a tall cap of the same material. The camel stands upon a ground strewn with lizards, etc., and a representation of a tree stump. This object, and the one immediately preceding, in all probability belongs to the latter part of the century.

The history of an art is the history of a people, and no epigram could apply to the art of the goldsmith with greater truth. It ever

has, and ever must, vary with the prevailing taste, culture and means of the purchaser, and regulate itself upon the condition of society, so that, in those antique examples which have survived the cupidity or the wars of mankind, we may find plainly chronicled the character and sentiments of those who first used them. We find, therefore, in the latter half of this century a new race of artists producing less of the delicate and refined work which belonged to the 16th century, and descending to more coarse and bulky styles such as those that have been last illustrated. But the entire spirit of the times had been undergoing a change. The order of chivalry with all its ostentation of display did not long survive the reigns of Francis I. and Henry VIII. Feudalism no longer thrived, religion had become converted, or, to use a more common term, reformed, wars had impoverished the plate of the rulers in the payment of mercenaries, the world made obeisance less to honorable valor of the person and

we value in both man and beast, and in none more highly than in that most intelligent servant of mankind, the horse. But if the animal is worthy of our esteem the rider is equally so, as with skillful hand he curbs with ease the impatience that would be free. In armour, with his sword at his left side and his right hand holding out a staff as if issuing a command, he sits his horse "every inch a king," and so he is, for the artist has made of him a portrait statue of



Figure, Silver-gilt, Dantzig, 17th Century, Figure 29.

more to the intrinsic wealth of property. We do not need printed histories to inform us of these changes when the indications of them are so plainly shown in the art productions of the period, neither do we need unusual perspicacity to detect the wide difference in this regard between the earlier and later halves of this century. The character of each is sharply defined, as we may see by comparing the two objects of Dantzig work with the equestrian piece from Augsburg, illustrated in figure 30. This beautiful statuette is something more than a curiosity, it is a study. It required no great skill, perhaps, to design a prancing horse, but it was a bold artist that dared give such a figure the support only of its hind feet with such material as silver. But here there is such perfect equipoise, such an apparent abundance of graceful vitality and strength that one forgets the frailty of its attachment to the pedestal, in admiration of the life-like mettle of the noble charger himself. The powerful muscles playing beneath the skin, the massive neck swelling with restraint and general appearance of latent energy are qualities that



Statuette, Silver-gilt, Augsburg, 17th Century, Figure 30.

Charles I. of England. Criticise as we may that unfortunate monarch, whose greatest error lay in his stubborn adherence to the "divine right," we must still admit the sublime nobility of his character under adversities. Besides, a Charles I. made possible an Oliver Cromwell.

The details of this statuette are worked out in a very careful and skillful manner, and the workmanship of the entire piece indicates the hand of a master. It is from the treasure of the Romanoff House, Moscow, and stands 17½ inches high.

Heretofore nothing has been written in this description regarding English and French work, although examples of both are under review. They do not, however, form so large a proportion of them as those of Germany. England followed the awakening of the Renaissance in a similar manner to that of other countries, with the exception that the influence of Italian and French enthusiasm began later and ended somewhat earlier. The importance of the new ideas springing to life in the south was strongly felt by the artists of Britain, and men were not only sent to acquire the skill and training requisite for a higher art, but they were also imported that the national plate should not suffer by comparison with that produced elsewhere. The styles of decoration which became the most popular were taken from sea life in combination with bunches of flowers, festoons, strap work and—for border ornamentation—the familiar "egg and tongue" designs. The shapes were modeled for the most part upon those originating elsewhere but selected generally with excellent taste. Only three pieces of English work of this period will be noticed—a

flask or costrel, in silver-gilt and 28 inches high, figure 31. Its exact date—ascertained by the admirable system of Hall marking—is A. D. 1619, or during the reign of James I. It is shaped like a vase, with a round foot and stem, and has a chain suspended at its widest part from two small handles. The graceful neck is closed by a stopper. Its decoration is of the style described, viz., flower work with strap work cartouches inclosing the usual sea monsters in *repoussé*. The Slavonic inscription reads: "Sent to the Czar Alexis Michailovich by the King of England, Charles II., in 1664," forty-five years after its creation. The piece is one of a kind known as "pilgrims' bottles," and which are very rare. The Reformation was fatal to almost all the church plate that bore any indication whatever of popery, and in that universal destruction of valuable church utensils the most rich and beautiful articles were sacrificed. The writer knows of but two similar flasks of this period, which are those in All Soul's College, Oxford, of French workmanship. To this day these latter are used to hold the wine for consecration at the Sacrament. The original of our illustration is among the treasures of the Kremlin, Moscow.



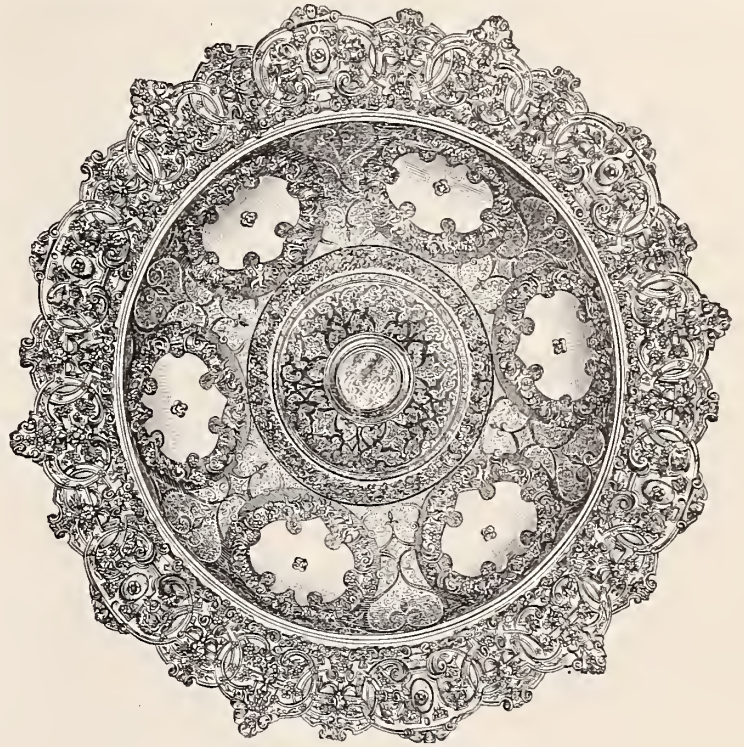
Flask or Costrel, Silver-gilt, English, 17th Century, Figure 31.

With the cups of English work is one almost identical in shape with that presented in 1628 to the Broderers' Company, London, by Edmund Harrison, imbroderer to the kings James I. and Charles I. It is of the gourd shape—a shape very common in Germany and somewhat so in England. From a circular foot roughly embossed rises the stem, representative of a tree trunk. The bowl, contracted at the center, is engraved upon its upper part with scroll leaf work, below a leaf ornament cut from a plain sheet of metal. It is inscribed underneath, "From the treasure of the patriarch Ioaassof."

Of nearly the same date (1604-15), are two great jugs in silver-gilt not widely differing. One of them may be described as standing 24 inches high, having a handle formed like a serpent with its tail coiled around its neck. The spout is dragon-shaped, the wings lying upon the shoulder of the jug, and the mouth holding the opening of the spout. A dog resting its fore paws upon the lip of the jug, furnishes a support or brace for the spout by curling a long tail around the neck of the dragon. The base is open-worked. Above it the whole surface is ornamented with leaf work in *repoussé*. Standing up from the shoulders are two female heads having large spreading wings embossed on the surface of the jug. The neck has two demi-figures also winged. The hemispherical cover is worked in the same manner as the rest of the piece, with three demi-figures standing out from the surface and with wings embossed on the cover. The purchase is a winged figure. It is from the Kremlin, Moscow.

Returning again to Nuremberg and the exquisite styles that originated there, we give an illustration of one of the most beautiful objects in figure 32. The free city of Nuremberg was a place of great importance at this period. Here some of the most famous Diets of the church of Rome were held, and here flourished the greatest prosperity in commerce and manufactures of any German city. The guild of goldsmiths, encouraged by the patronage of the wealthy burghers and stimulated by the closer proximity of the art-loving Italian, became a powerful organization in both art and material prosperity, establishing a reputation throughout all western Europe for the magnificence of their plate and jewelry. We have seen some instances where the kings of other realms commissioned the artists of Nuremberg, and her sister city Augsburg, to produce articles of plate intended as gifts to other monarchs, and in all probability most of the articles preserved in Russia emanating from these

cities were the gifts of other rulers than those of Germany. We are prepared, therefore, for evidences of the highest skill in the works of these artists, and in the round salver before us we can find nothing to disappoint us. This also is of the material so universally popular, silver-gilt. It measures 18 inches in diameter. The outer border is flat, and covered with the greatest possible amount of rich *repoussé* of flowers and strap-work, jeweled at equal distances with six rubies.



Salver, Silver-gilt, Nuremberg, Figure 32.

The central portion is a somewhat shallow bowl delicately figured with lustrous arabesques upon a matted ground. Around the inner edge or curve of the bowl are six cartouches, applied and made up of work matching the border. Enclosed within them are plaques of mother-of-pearl (in the reproduction ivory is substituted), holding in the center a ruby. This also is preserved in the Kremlin, Moscow.



Rose-water Dish, Silver, Parcel-gilt, Augsburg, 17th Century, Figure 33.

No other piece in the collection, except the cup and cover previously described (figure 24), is more full of fine goldsmiths' work than this salver. It may be said to be jeweled with ornament in view of the taste with which the artist has contrasted the lustrous with

the matted surfaces of the metal, massing the decorative work of the border with the richest effect, while, by the addition of the mother-of-pearl plaques in the center, relieving the flat arabesque work and maintaining the luxurious character of the design. We have yet to learn the history of this salver. That it was the creation of some artist with whose name we are already familiar is most probable; that other work by the same hand and equally magnificent followed the majority of the gold and silver work belonging to the period into the crucible is also probable. The very few examples of plate preserved, while winning our admiration, serve also to increase our regrets for richer treasures that have been destroyed.

Among the larger objects illustrative of art and custom is an oval plateau or rose-water dish of silver, parcel-gilt, figure 33. It measures 41 by 36 inches and was made in Augsburg. In the center is a representation in *repoussé* of a triumphal march. The principal person is intended for that of the youthful David holding in his hand the head of Goliath. Before him, accompanied by a dog, is a boy carrying his shield. Upon the right is a mounted warrior, probably Saul, and on the left a group of warriors, women and children. The wide border has a plain wavy edge and is embossed with trophies held by Cupids. Between these, in oval medallions surrounded by wreaths, are allegorical representations of the four seasons, winter by old age, autumn by a woman passing fruit from a basket to a little Cupid, etc. The trophies include coats of mail, helmets, quiver, shields and ensigns.

The rose-water dishes were objects of the most careful workmanship. The very nature of the purpose for which they were designed pre-supposes their destination to be among the higher classes and those demanding and appreciating the greatest skill. Few of them are as large as the one illustrated or as elaborately wrought. The Museum is fortunate in securing *replicas* of two of them. The second one, also of Augsburg work and silver-gilt, is slightly larger than the one figured (42 inches), but it has the same wavy edge and a center filled with *repoussé* work with a battle scene for a subject. Here there is much less detail but more spirit. The artist has chosen the time of attack, and given his representation of warriors and horses a semblance of fire and dash in an admirable manner. It is a stirring scene, and one that attracts our active interest.

(To be Continued.)

### The Adjustment of a Four-Jewel Cylinder Watch.

[By G. VOGET, in *Allg. Journal d. Uhrmacherkunst.*]

*Continued from page 58.*

THE CLICKWORK in fig 4 is thoroughly reliable. But the hook stands already one full tooth length beyond said right angle, and this quantity is the extreme limit which the hook can assume. If it were to be placed only a trifle beyond this point, then the clickwork would have the defect represented in fig. 5.

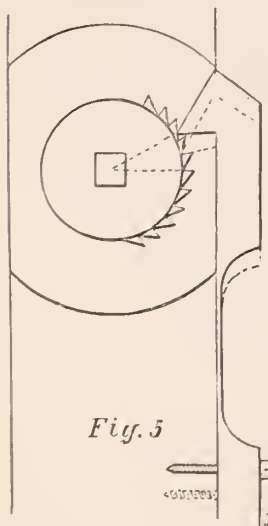


Fig. 5 shows a clickwork frequently seen in watches of an inferior grade. The hook stands two tooth lengths beyond the right angle. Such a click would, in a very short time, ruin both barrel ratchet and click spring. If the spring were to be retained and brought into the direction of the dotted line, it would be necessary to file a large piece out from the bridge and also move the screw hole in the bridge. This, however, would after all produce no satisfactory results, because, first, the bridge would become uncomely in appearance, and, second, the head of the click spring would stand free. A new spring filed in the shape shown in fig. 6 corrects the two evils more speedily and better.

The like error occurs with ratchets of too small a number of teeth, because the lifting faces of the latter are too long, although the click hook stands at the correct place. Remedy can in this case be applied by the filing of the click hook.

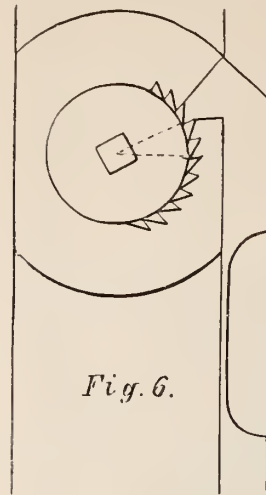


Fig. 6.

Fig. 7 shows an unduly large ratchet. It would be best to turn down the wheel and to file the teeth. But if not much time is to be spent on the work, and the wheel is otherwise faultless, a corrective may be applied by a few strokes of the file, as is shown by the accompanying click hook.

A click spring that stands free (as is shown in fig. 7), is more easily subject to breaking.

The clickwork, fig. 8, is employed with fixed barrel arbors that move between two bridges. It is based upon the same principle as the just described one, and the several defects and their corrections mentioned also apply to it. It is the main purpose here to leave the click as strong as possible,

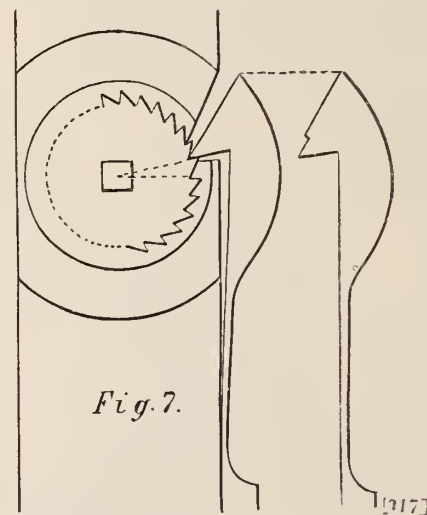


Fig. 7.

and not to retain one with a defect like that shown by the dotted line *i*.

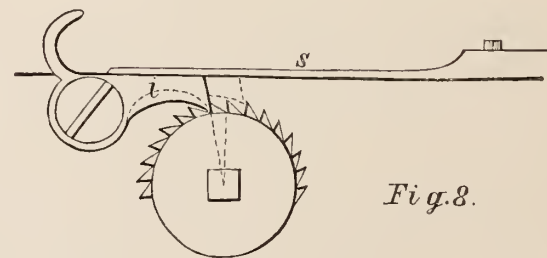


Fig. 8.

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Too strong a click spring *s* must be filed weaker; it is then less exposed to breaking, and the wear of the working parts is essentially reduced.

#### *c.—The Barrel.*

The condition of the mainspring has been ascertained at the time of the opening of the barrel. It is well known that the spring in a run-down condition must occupy the one-third part of the interior barrel diameter, or one-sixth of the space upon one side; that the core must also be one-third of the inner diameter, and therefore one-third space remains for the activity of the spring.

If with an unduly strong spring a sufficient number of coils of the spring is to be obtained, then the proportion will be incorrect. A spring must, in its wound-up condition, have from 13 to 14 coils and the number of revolutions of a barrel are to be at least  $5\frac{1}{2}$ .

Large spring hooks and unduly thick sides of the barrel both lessen the number of revolutions.

Too small a core and too large a hook in a barrel produce the breaking of the mainspring. At one time I was working in a shop where in every adjustment the core was filed snail-shaped in order to avoid the abrupt bendings caused by the inner hook.

The mainspring must not be too broad, and especial attention is to be devoted to the innermost coil, so that it will not produce friction either above or below. The two hooks must stand as near the middle of the inner height of the barrel as possible.

In order to produce a uniform depthing, the barrel is to be exactly round, and must not wobble upon the barrel arbor. If the barrel is untrue around the tooth points, and the depthing will not permit their being rounded, the following method is to be followed, whereby neither the circumference of the barrel is made smaller, and is made round at the same time :

The barrel hole is opened by broaching, and a fine-drilled bouchon is riveted in. If the barrel cover is to be bushed at the same time, both jobs are done together. A piece of hard wood is then fastened in the turning lathe, which is turned out sufficiently deep and large so that the tooth rim of the barrel can be pressed in tightly and firmly. The hole is next turned almost suitable for the pivot, and the barrel will then be found to run true. The cover is at the same time sprung in according to the mark and its hole is also opened. Should either the barrel or cover, if the latter, either within or without, require a turning down, it is to be done at the same time.

If, on the other hand, the barrel is round, and only the hole in the cover is out of center, the method adopted for centering it is the same as that for centering the center wheel.

The end shake of the barrel regulates the spring core, and this is to be taken into consideration when bushing the holes. The core, which is screwed on, is to be smooth upon the side turned to the barrel, because a large friction takes place here.

#### d.—*The Stopwork.*

This small contrivance, which is for the purpose of permitting only the central coils of the spring to enter into action, is of a great importance, because the moving force is thereby transmitted as uniformly as possible to the train and escapement. With all its great importance, however, its functions are frequently ignored.

The stopwork, if executed faultlessly, and not abused by the wearer of the watch, will perform good services for a number of years.

Both parts of the stopwork are to be of the same size ; they are to be as heavy as is consistent with their functions, and be of a blue, hard temper. The parts are tempered correctly by permitting them to burn off after hardening. But the flame must be quenched at the moment when the oil begins to burn, otherwise the parts would become too soft.

The female stop must freely revolve upon its shoulder, and has to have only a trifling side and end shake. The points of the star are slightly rounded to prevent their bracing against the male stop. The screw head must cover the surface of the female stop ; the screw end must not protrude below.

The male stop must sit securely upon its square, nor must the notch for the pin touch the exterior of the male. The turning out for the male stop must lie so deep that it does not scrape upon the cover, or, still worse, pinch the barrel. Each male stop is to be turned off. In the same manner the notches of the male stop are to be smoothed with a round file, otherwise the wheel tooth points would brace against them. Both parts are to be of the same thickness and located at the same height.

A faulty stopwork is apt to invite various defects.

#### CONCLUDING WORK OF THE BARREL.

Only after the barrel has been thoroughly set in order is it possible to form a correct judgment of the depthing. By filing a small "lantern" into the plate the depthing can be observed ocularly, because it is rather risky to alone depend upon the touch in the

examination of the depthing. Should it still be too shallow, nothing else remains than to drive the bridge a little toward it.

A small piece of bone, specially contrived for the purpose, of the shape of a broad punch, is used for this. It is held against the bridge, and, by giving a short tap upon it, the corresponding foot pin will draw a little, while the side of the bridge suffers no injury whatever.

If, however, the depthing is still much too shallow, cut off the footpin with the nippers, file down the stump still standing and then tighten the depthing, which can now be regulated according to desire.

In the uprighting tool drill a new hole through the plate and more than half into the bridge, for which use a drill with a shoulder or a pulley fastened upon it. Such a drill leaves no room to fear for the injury of the bridge, as it is possible only to penetrate to a certain depth into the bridge. A good footpin is made next and the depthing will be in order.

The depthing of the barrel moving between two bridges is most advantageously placed deeper by moving the upper bridge closer to the center wheel in the above described manner, and centering its hole with the centering tool in order to next upright the lower hole. The bushing of the upper hole is most justly avoided, because alterations in the clickwork are provoked thereby. But if the bushing will increase the good performance of the clickwork, then it is to be preferred.

But by the alteration of the upper bridge the dust pipe is thrown slightly out of bearing, and it will no longer stand true to the hole in the dust case. If the hole is enlarged only by the quantity necessary, it does no injury to the closing. Afterward, when the movement has been mounted again, care is to be taken that none of the caps are forced out of place.

The barrel must be mounted another time, not alone for the purpose of making sure of the good performance of the depthing, but also to examine the quality of the motion work.

#### THE MOTION WORK.

The depthings of the motion work may be faulty ; the minute wheel and barrel can scrape, also the hour wheel ; the latter may even butt with the female stop.

In order to place these depthings deeper, it is best to move the minute wheel stud (minute wheel pinion) ; the same may be done when the minute wheel butts with the barrel. If the distance is of any amount, to which the pivot is to be changed, then the hole in the plate is to be bushed, and the correct distance is to be determined with the depthing tool. If the difference is small, it is sufficient to drive the hole for the pivot with a sharp punch to the corresponding direction ; of course, this is to be done in such a manner that when the pivot has been screwed in the alteration effected cannot be seen. In order to remove this pivot, it would be necessary to again remove the barrel and minute wheel.

I must state here that in order to save the gilding, the repeated mounting and taking down is to be avoided as much as possible. The intelligent adjuster will long ago have examined the depthings, and not have left unimproved the occasion to remove the pivot. But for the purposes of a pamphlet detailing the labors necessary to be performed in succession, it would not do to jump from job to job as is frequently necessary in practice.

The minute wheel must not rest with its entire face upon the plate, but only upon the steel shoulder of the pin.

The meeting of the hour wheel with the barrel is corrected by turning off the former from below, whereby a shoulder is formed in the center, or, if the wheel is too thin, the canon pinion is replaced by one with a higher pinion.

The center staff must revolve with easy friction, run mathematically true and be securely fastened. It is evident that an arbor which inclines any way to be conical, cannot possess these qualities ; should the center-staff move too easily, it can be corrected by raising burr on it. Finally the hand square must be somewhat

smaller than the winding square, so that when setting the hands the key can easily be drawn off from the square.

After having examined, and, if necessary, corrected any occurring defects, the barrel must stand at the proper height to the center wheel, and likewise the motion work to the barrel. By revolving the barrel, these several wheels must move with freedom and ease, and fully discharge their functions.

#### THE CAUSES OF STOPPAGE.

Too small a barrel sink, especially when the barrel is not truly round, the grazing of the tooth rim upon the plate, as well as at the foot of the click spring and at the center bridge, and grazing of the star wheel or of the screw on the lower bridge; too broad or too small a barrel tooth, or one with burr—all these defects will produce a stoppage of the watch.

An untrue or too large a dust cap, which grazes in the dust pipe, or a plate with too large a hole, which passes beyond the projecting center wheel pivot, whereby this wheel would be pinched; too small a recess for the minute wheel; pinching of this wheel upon its pivot (minute wheel stud); a canon pinion with burr; too small an hour canon, will also induce stoppage.

#### THE TRAIN.

Before attempting to examine the depths, satisfy yourself of the condition of the wheels and pinions. The wheels must not be too thick, because by reason of their weight they would move more slowly and transmit the power more slowly; they should not be made too thin, however, as both they and the pinions would wear out too quickly. The wheels must be mounted firmly upon the pinions, and any burr is to be removed by grinding with the bluestone.

If the pinions run true, the pivots are polished, if necessary. It is not alone necessary that the pivots be well polished, but also that their size be appropriate to the size of the wheels, since this corresponds to the progressive decrease of the motive power. Pivots unduly thick render timing difficult.

The upper pivot of the third wheel and the lower one of the fourth wheel are subject to a greater wear, for which reason both have to be made thicker. In an 18-line watch, the upper third wheel pivot can be left 2 degrees thicker than the lower one, and the lower fourth wheel pivot can likewise be 1 degree thicker than the upper.

The lower fourth wheel pivot generally carries the seconds hand, and is therefore a great deal thicker. It would be well, however, to reduce the thickness of this pivot to the smallest possible quantity, which can be done without injuring its strength, by simply making it as long as it should be. Its end, however, may also be a little below the surface of the dial.

All the pivots must be nicely rounded off. Bezels are to be turned at the ends of the arbors, whereby friction is lessened, and the oil will adhere better, on account of its capillarity.

*(To be continued.)*

#### The Destruction of the Armeria Real, of Madrid, Spain.

THE STUDENT of history will concur with us in saying that there is no country on the globe with as incomparable a history as Spain, and the terrible fire which last July consumed one of the most precious monuments illustrative of its history, the Armeria Real, which was invariably the first building visited by the tourist and student of history, devoured not alone a treasure belonging to Spain but to the entire world. The long list of articles lost lies before us, and we simply mention: The coats-of-mail of the Cid (Cid el Campeador), Guzmán the Good, Hernando Cortez, D. John of Austria, Christopher Columbus, both white and black, with silver medallions; the coat-of-mail worn by Isabella the Catholic during the siege of Granada, with the monogram of "Isabel" worked in the vizier; the one which the city of Pamplona presented to Philip II., of Spain, with incrustations of silver, and the collection of 35 coats-

of-mail of Charles V., with images of the Virgin on the breastplate and of Saint Clara or Barbara on the back; one of them he wore at the battle of Muhlberg, and another one at his entrance into Tunis. Also the coat-of-mail of the Elector of Saxony, taken prisoner at Muhlberg by Charles V., etc.

If the collection of coats-of-mail was extensive, that of swords was more so. Among the number we find: La Celada of the Cid, of Bernardo del Carpio, the Durindana or Durandal of Roland, the formidable sword of Garcia de Paredes, of Pelayo, San Fernando, Isabella the Catholic, of Ferdinand the Catholic, of Charles V., Philipp II., Ferdinand Cortez, Pizarro, Boabdil el Chico, and the Duke of Conde, Duke of Alba, etc.

It is useless to copy a list of objects that belonged to men forever famous in history; the report winds up with mentioning the battle flags taken from the Turks, the Visigothic crowns, and the spurs and part of the cloak of San Fernando. The loss is irreparable.

## Recent Patents.

The following list of patents relating to the jewelry interests, granted by the U. S. Patent Office during the past month, is specially reported to THE JEWELERS' CIRCULAR by FRANKLIN H. HOUGH, Solicitor of American and Foreign Patents, 925 F Street, N. W., near U. S. Patent Office, Washington, D. C.

#### Issue of February 10, 1885.

- 312,102—Scarf Shield and Pin. L. Eschner, Philadelphia, Pa.  
 311,894—Watch Case Spring. A. Grandjean, Cincinnati, Ohio.  
 312,198—Watch Cases, Machine for Turning. J. Frossard, assignor to Dubail, Mounin, Frossard Et Cie., Porentruy, Switzerland.  
 312,221—Watchmaker's Tool. H. P. Pruim, Grand Haven, Mich.

#### Issue of February 17, 1885.

- 312,479—Timepiece. C. S. Lewis, assignor to Waterbury Clock Company, Waterbury, Conn.  
 312,458—Watch Case, Anti-Magnetic. C. K. Giles, Chicago, Ill.  
 312,253—Watch Regulator. D. H. Church, Waltham, Mass.

#### Issue of February 24, 1885.

- 313,036—Bracelet. A. Vester, Providence, R. I.  
 312,994—Bracelet, Chain. F. F. Heilborn, assignor to Lincoln, Bacon & Co., Plainville, Mass.  
 312,766—Jewel Box. W. Schott, assignor to Wiggers & Froelick, New York, N. Y.  
 312,833—Jewelry Manufacture. T. W. Foster, Providence, R. I.  
 312,848—Watch. H. W. Hayden, Waterbury, Conn.  
 312,856—Watch, Stem-Winding and Hand-Setting Attachment. G. Hunter, Elgin, Ill., assignor to R. E. Robbins, Boston, Mass., and T. M. Avery, Chicago, Ill.  
 312,907—Watch Case. C. Schuetz, Newark, N. J.

#### Issue of March 3, 1885.

- 313,085—Finger Ring. R. A. Kullmann, Jersey City, N. J.  
 313,360—Watch Case. D. O'Harra, Waltham, Mass.  
 313,326—Watch Case. C. W. Harman, New York, N. Y.  
 10,566—Watch Case Center, Re-issue. J. C. Dueber, Newport, Conn.  
 313,448 and 313,449—Watch Case Center. F. Rapp, Chicago, Ill.

#### Ferguson's Paradox.

WE HAD the pleasure, a few days ago, of examining a very interesting piece of mechanism known as "Ferguson's Paradox," constructed according to directions contained in the European horological press, by Mr. Hermann Horends, with the firm of Strassburger & Co. The mechanism, carefully studied, renders wonderful



performances, and utterly defies the known laws that a set of wheels depthing into each other must turn in the same direction. Before we enter into a description of the apparatus itself, it may, perhaps, not be uninteresting to enquire into its origin, which Mr. Ferguson himself explains in a letter to his friend, Rev. E. Cooper. He says : " I herewith send you an account of my *mechanical paradox* and my three letters to Parson Kennedy, who is now very quiet. He has been most sadly trimmed by all the monthly reviewers. My interview with the watchmaker was as follows : One evening I went to a weekly club with a friend, and on entering the room (or very soon after), the watchmaker began to hold forth violently against a trinity of persons in the Godhead, wondering at the impudence of the person who taught such an absurd doctrine, and at the weakness and folly of everyone who believed it. I happened to sit just opposite him with the table between us, and (you may believe) with plenty of wine and punch upon it. I gave him a severe frowning look, on which he asked my opinion concerning the Trinity. I told him that all my belief thereof depended upon the opinion I had of the sure knowledge and veracity of the revealer, but that I did not think it was a proper subject to be talked of over our bottles, bowls and glasses, and should, therefore, be rather desirous of talking to him about his own business.

" 'Very well,' said he, 'let us talk about it.'  
 " 'Sir,' said I, 'I believe you know very well how one wheel must turn another, or how a pinion must turn a wheel, or a wheel a pinion.'

" 'I hope I do,' said he.  
 " 'Then,' said I, 'suppose you now make me a set of four wheels, one wheel as thick as the other three, and cut teeth in them all, and then put the three thin wheels all loose upon one axis, and set the thick wheel to them, so that its teeth may take into those of the three thin ones. Now turn the thick wheel ; how must it turn the others ?'

" Says he : 'Your question is almost an affront to common sense, for everyone who knows anything of the matter must know that, turn the thick wheel which way you will, all the other three must be turned the contrary way by it.'

" 'Sir,' says I, 'I believe you think so.'  
 " 'Think !' says he, 'it is beyond a thought ; it is demonstrated that they must.'

" 'Sir,' says I, 'I would not have you be too sure, lest you possibly be mistaken ; and now, what would say, that, turn the thick wheel whichever way you will, it will turn *one* of the thin wheels *the same way*, the other *the contrary way*, and the third *no way at all* !'

" Says he : 'I should say that there was never anything proposed that could be more absurd, as being not only above reason, but contrary thereto, and also to plain fact.'

" 'Very well,' says I ; 'now, sir, is there anything in your ideas more absurd about the received doctrine of the Trinity than in this proposition of mine ?'

" 'There is not,' said he ; 'and if I could believe the one I should believe the other, too.'

" 'Gentlemen,' said I, (looking at the company), 'you hear this ; bear witness to it.'

" The watchmaker asked me whether I had ever seen such a machine. I told him I had not, but I believed I could make it, although I had never thought of it until that instant.

" 'My God,' said he, 'your head must be wrong, for no man on earth could do such a thing.'

" 'Sir,' said I, 'be my head wrong or right, I believe I can not only do it, but even be able to show the machine if I may be admitted into this company on this se'nnight.'

" The company, who, with serious faces, were very attentive to all this, requested that I would come. So I made my machine, all of wood, and carried it (under my coat) to the same room on the day appointed ; and there was the watchmaker.

" 'Well, old friend,' says he, 'have you made your machine ?'

" 'Yes, sir,' says I ; 'there it is ; let us take it to pieces. Are those wheels fairly toothed and fairly pitched into the thick wheel ?'

" 'Yes, they are,' said he.

" I turned round the great wheel whose teeth took into those of the three thin wheels, and asked him whether the uppermost thin wheel did not turn the same way as the one that did turn it ; whether the next below did not turn the *contrary way*, and the lowermost thin wheel no way at all ?

" 'They do,' says, he 'but there's a fallacy in the machine.'

" 'Sir,' said I, 'do you detect the fallacy and expose it to the company.'

" He looked a long while at it, took it several times in pieces, and put it together again.

" 'Sir,' said I, 'is there any fallacy in the machine ?'

" 'I confess,' said he, 'I see none.'

" 'There is none,' said I.

" 'How the devil, then, is it,' said he, 'that the three thin wheels should be so differently affected ? The thing is not only above all reason, but it is even contrary to all mechanical principles !'

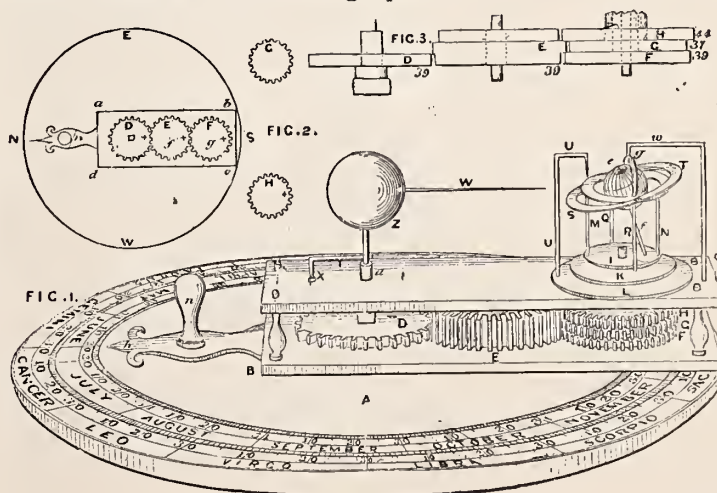
" 'For shame, sir,' said I, 'ask me not how it is, for it is a simpler machine than any clock or watch you ever made or mended ; and if you may be so easily nonplussed by so simple a thing in your own way of business, no wonder you should be so about the Trinity. But learn from this not for the future to reckon *every* thing absurd and impossible that you cannot comprehend. But now, I hope you remember what you said at our last meeting here—namely, that if you could believe such a thing as this, you could then believe the doctrine of the Trinity. You own the truth of the machine ; what do you say to the promise ?'

" He humm'd and ha'd, and asked me whether I would let him take it home to consider it. I told him he might ; but desired he would bring it to me to-morrow morning. He promised he would and did so ; but gave it to me with some hearty curses, telling me he saw it was true but did not understand it, and wanted me to explain it to him, which I refused. I kept it for six years without finding any person who could explain the principles on which it acted, and then put the sun and earth with the ecliptic and the moon's orbit to it, seeing it would then be a kind of arrery, and published the description which I send you, in order to save myself the trouble of explaining it any longer. As it is now finished, it makes a good arrery for showing the causes of the different seasons, time of eclipses, etc."

4 Bolt Court, Fleet Street, London, April 10, 1776.

The above letter sufficiently explains the *raison d'etre* of the paradox which has been a puzzler to many a student of mechanics, and in explanation of the mechanism we quote Mr. Ferguson himself.

The mechanism is (or may be) composed of a slip of wood, upon which is placed in a line three wheels, equal in diameter, the number of teeth in each wheel also being equal.



The axis of one of the outside wheels passes through the slip of

wood—say the platform—friction tight—and upon it the platform turns; the other two wheels rotate upon pins fixed in the platform. The outside pin serves as the axis for two other wheels. The middle wheel is composed of three wheels differing in diameter, pinned together; each of these wheels is paired with one of the three outside wheels, making three pairs of wheels. Each of the outer wheels carries a hand.

By the diagram the mechanism will be readily understood, the letters and numbers correspond with those in Ferguson's diagram.

Of the motions of this machine Ferguson has given the following explanation:\*

"The teeth of the thick wheel *E* take equally deep into the teeth of the three wheels *F G H*; but operate on those wheels in such a manner that whilst the platform is turned round, the wheel *H* turns the same way that the wheel *E* does; the wheel *G* turns the contrary way and the wheel *F* turns no way at all."

And before explaining the principles on which the paradox depends, he thought expedient to fix some certain criteria for bodies turning or not turning round their own axis or centers.

*The First Criterion.*—"If a body shows all its sides progressively round toward a fixed point in the heavens, the body turns round its own axis or center, whether it remains in the same place or has a progressive motion in any orbit whatever. For unless it does not turn round its own center, it cannot possibly have one of its sides toward the west at one time, toward the south at another, toward the east at a third time and toward the north at a fourth. This is the case with the moon, which always keeps on one side toward the earth, but shows the same side to every fixed point of the starry heavens in the plane of her orbit, in the time she goes round her orbit, because in the time that she goes round her orbit she turns once round her own axis or center.

*Example.*—"Take away the thick wheel *E*, and leave the wheel *F* where it lies on the platform. Then turn the platform round the axis of *D*, and it will carry the wheel *F* round with it. In doing this, *F* will still keep one and the same side toward the fixed central wheel *D*, as the moon still keeps the same side toward the earth; and although *F* will have no relative motion with respect to the moving platform, it will be absolutely turned round its own center *G*.

"But if we would keep the wheel *F* from turning round its own center, and so cause a cross mark upon it to keep always toward one side of the room; or, like the magnetic needle, to keep the same point still toward one fixed point in the horizon, we must produce an effect upon *F* resembling \* \* \* \* \* This is done by making the numbers of the teeth equal in the wheels *D* and *F*, and putting the thick wheel *E* between them so as to take into the teeth of them both. For then, as the platform is turned round the axis of the fixed wheel *D*, the wheel *E* is turned round its axis by the wheel *D*, and for every space of a tooth that the platform would turn the wheel *F* in direction of the motion of the platform, the wheel *E* will counteract that motion by turning the wheel *F* just as far backward with respect to the motion of the platform, and so will keep *F* from turning any way round its own center.

"If *F* had one tooth less in number than *D* has, the effect produced on *F* by the turning of the platform would be as much more than counteracted by the intermediate wheel *E*, as is equal to the space of one tooth in *F*; and, therefore, whilst the platform was turned once round, the wheel *F* would be turned the contrary way, as much as is equal to the space taken up by one of its teeth. But if *F* had one tooth more in number than *D* has, the effect of the motion of the platform (which is to turn *F* round in the same direction with it) would not be fully counteracted by means of the intermediate wheel *E*; for as much of that effect would remain as is equal to the space of one tooth in *F*; and, therefore, in the time that the platform was turned once round, the wheel *F* would turn on its own center in the

direction of the platform, as much as is equal to the space taken up by one of its teeth."

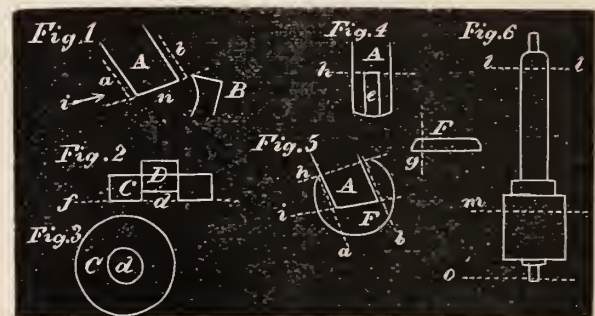
The above is the description by Mr. Ferguson himself, and it will be seen that it is rather vague. The designer has sought to render it more plain in fig. 3. Wheel *D*, of 39 teeth, is keyed to the platform; the thick wheel *E*, also of 39 teeth, gears into *D*; of the three thin wheels, *F*, *G*, *H*, gearing into *E*, *F* has 39, *G* 37, and *H* 44 teeth. Ferguson made wheel *E* of one piece, and sought to correct the inequality of size and teeth of the three wheels, *F*, *G*, *H*, by deeper or shallower depthing. The designer makes the central thick wheel *E*, of three wheels of corresponding unequal sizes riveted together, so as to enter into perfect depthing with *F*, *G*, *H*, which are also of unequal size.

The entire arrangement is a piece of ingenious reasoning to explain, and it were well worth the trouble for some of our readers to construct a "paradox" and send us the result of their cogitations.

## Problems in the Detached Lever Escapement.

BY DETENT.

PALLETS which are too thin is a fault quite often met with, both in open and close pallets. In open, or, as they are frequently called, exposed pallets, the best way is to change the stones. In close pallets the stone will generally have to be sacrificed. It is well enough, however, to save them in a small box kept for the purpose, as perhaps one chance in a hundred you will find a pallet stone taken from some watch that will answer for another if ground a little. We will suppose in the present instance we have a set of pallets, with which we have too much drop from the ingress pallet, or in other words, the entrance pallet is too thin. In some cases both pallets are faulty; if so, both must be corrected. But in the present instance it is supposed only the entrance pallet is wrong. This is told in testing our escapement, as follows: Put some slight friction under the rim of the balance and revolve it slowly, and notice the amount of drop. If, after the tooth resting on the entrance or ingress pallet drops, it falls too far (that is, more than 2°), we should put in a new pallet stone in the place of the one too thin. At fig. 1 is shown



the entrance pallet and tooth, *A* representing the pallet and *B* the tooth—the full outline representing the form of the pallet as it is, and the dotted line at *b* showing the width the pallet should be. In testing for the drop, as described above, while the friction is under the balance, we can easily determine the drop on both pallets. We test as above described for the entrance; after this is found, try the egress pallet, and see if the tooth again falls too far before the next tooth strikes the entrance pallet. Now, this can be corrected, to a great extent, by letting the new stone we are putting in extend forward to the line *a*, thus making the pallet *A* thicker, as we might say, on both sides, and correcting, in a measure, the fault of both pallets in one. To put in a new stone, we take a large, thick, cap jewel, and place it in our steel recess disc, shown at figs. 2 and 3. This tool has been described in former article, but it may be well to say that *C* is a disc of soft steel,  $\frac{1}{2}$  an inch in diameter and  $\frac{1}{8}$  of an inch thick, fitted with a fine threaded screw plug, shown at *D*. If the

\* *Horological Journal*, Vol. I., Ferguson's second letter.

plug *D* is screwed fully in, and the end of the plug faced off, on turning the plug *D* backward a recess at *d* is formed, in which we place our cap jewel. We now apply the disc to our diamond lap, and face it to the line *f*. The thickness of the cap jewel we are grinding off is determined by the screw *D*. At fig. 4 is shown an edge view of the pallet *A*, run in the direction of the arrow *i*, in fig. 1. In this fig. the slot *e* represents the recess where the pallet stone is to go. We grind off the cap jewel until it will just go into the slot at *e*, fig. 4. We next grind off our edge square, as shown at dotted line *g*, at diagram *F*, which is an edge view of the cap jewel after being ground down on one side. This square edge goes to the bottom of the recess *e*, to the dotted line *h*, fig. 4. A side view of the stone, as inserted in fig. 4, is given in fig. 5. This view is the same as fig. 1, except it shows at the dotted circle the form of the cap jewel we just ground and put in. The dotted line *h* is the same as fig. 4, and the dotted line *i* represents the line of the impulse face, and is also shown in fig. 1. A care must be exercised in grinding the angle where the lines *b* and *i* cross—that is, the new inner angle of the entrance pallet—or it will not escape. It should be ground so it will cut the steel a little at the point shown at *n*, fig. 1. Of course, it is understood that the lock is all right, and in accordance with the rules given in former articles. We grind with our diamond lap the inserted stone, to the lines *a*, *b* and *i*, and establish the form of the new pallet. There is no tool we can well use to measure the extent of the stone we wish to add to thicken our pallet—only an educated eye and good judgment. It is well to grind off with the diamond lap, and leave a little in excess on the lines *a* and *b*, to be removed after a trial; but the face (on the line *i*) can be determined at first. The pallets can be put in the watch and tried direct from the diamond lap, leaving the polish for a subsequent operation, after the correct form is obtained. It may not be amiss to say here, that one should charge quite as much for putting in a pallet stone as above described as for a set of new pallets because if well done you will get a better action than you would, without you should happen to strike an exceptionally well adapted pair of pallets. One's customers do not generally object to pay a good price if the work is only done well. What the customer objects to is to pay and get *beat*, and he will "kick" if it is only ten cents, if he feels he did not get value for it. Some persons might object to setting a pallet stone so it protrudes, as shown in fig. 1. To such persons I would say, you never have to do it to very fine watches, as in such the escapement is all right as it is, and in cheaper ones the best plan is to get them to go with the least possible labor. And in most cases the stone will only project a very little; indeed, it would hardly be noticed, and still make a vast deal of difference in the action of the watch. If one becomes proficient in such work, twenty minutes is ample time to put in a pallet stone. The details of grinding and polishing have been fully described in a former article. It is only intended in this communication to give the method of correction. The fault of too thin pallets is commoner than most persons would believe, if they have not noticed particularly. We have another class of trouble in pallet action, in the way of scape wheels which are not round. Frequently this is so much, that part of the teeth of the scape wheel hardly pass the pallets, while the other side will trip; that is, the teeth will not securely catch on the locking face. Usually, in such cases, the scape wheel has been badly set on the pinion. This can generally be told by inspection of the pinion at the point where the scape wheel is set. Sometimes it arises from the scape wheel pinion having been pivoted. If the last cause is the one, a new pivot will cure the trouble; but if the pinion is all right we must seek for the cause somewhere else. We will first find out where the fault is, and then tell how to correct it. If we put the scape wheel and pinion into the double callipers and revolve it, we can readily determine which is at fault—the scape wheel or the pinion. If a pivot is the fault, we answered this above; if it seems to be in the wheel, knock the pinion out, and test the wheel if it is round. The method of doing this, together with a simple tool for magnifying the error, will be given in a subsequent

communication. Usually, in such cases, the trouble is in the manner in which the scape wheel has been set on the pinion. The seat or place where the scape wheel goes on the pinion was turned too small, and when the wheel was riveted on, the riveting was done in such a way as to throw the shake or play all to one side. Such a condition is quite serious, as we cannot well put the pinion again in the lathe and true up the seat, as it is already too small; and it is impracticable to bush or close the hole in the scape wheel. The correct way to proceed is to test the scape wheel for round, and see if it is true; if not, it is easy to open the hole in the center to one side, so that the wheel will be true if the pinion is true. Now, there are two ways to go about correcting the trouble: First, and best, put in a new pinion; next, use the old pinion if it is long enough. How to do the latter will be explained in the next article.

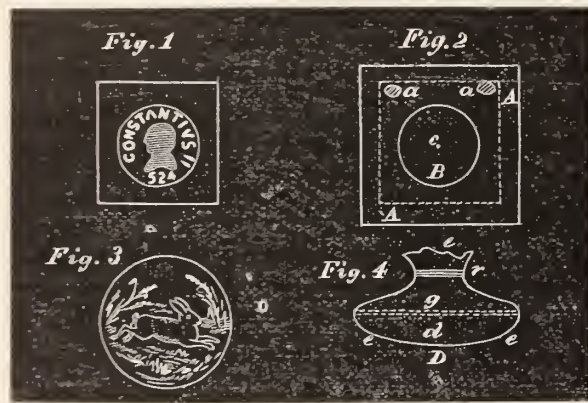
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## How to Make and Engrave Silver Bangles.

BY EXPERT.

**A** LOW RELIEF, like in appearance to a well-worn coin, can be imitated quite easily by etching. The method to be pursued is to coat the part to be left raised and bright with some substance which will resist acid; as, for instance, asphaltum varnish, such as is used to blacken hardware, or gum shellac dissolved in alcohol. If the latter is used it should be well dried by gentle heat and then raised to 450° F. If asphaltum varnish is used, it must have time to dry well before it is subjected to the action of the acid. A very good and rapid way to work is to heat the job, and apply with a pencil brush a mixture of asphaltum, 1 part; white wax, 2 parts; gum mastic, 2 parts. The asphaltum should be reduced to fine powder and added to the white wax after it is melted, afterward adding the mastic. Gum mastic comes in small drops called mastic tears; these should be selected, choosing such as is free of specks and dirt. The mixture above is to be melted, and while warm (near 212° F.) used as a paint on the job already warmed. We will describe the method of working with asphaltum varnish (asphaltum dissolved in spirits of turpentine), as it will give the idea of how to deal with the melted mixture—in fact both are worked alike except one is worked hot. To illustrate the mode of working, we will suppose we are to reproduce the appearance of an old worn coin, as shown at fig. 1. The design is first made on rather thin paper where it can be transferred to the face of the coin—or rather the piece of silver to represent a coin. The transfer is easily done by transfer paper as has been described in this paper; but as engravers are well known people of make shift and ready to adopt any plan by which time and labor can be economized, we would say a mixture of tallow and Indian red or tallow and lampblack mixed to the consistence of a pomade (it can be kept in an old movement box), if smeared on a small piece of tissue paper with the end of the finger makes a piece of fresh transfer paper of splendid quality. In working it is well to have the coin in a recess in a piece of heavy sheet brass about 2½ inches square, as shown in fig. 2; this enables one to have the transfer paper flat without any disagreeable inequalities underlying the design. The design can be attached to the brass plate by one edge with two or three little bits of adhesive wax as shown at *a a*, fig. 2. In fig. 2, *A* represents the brass plate, *B* the coin and recess, and the dotted outline the design, with the location of the little bits of attaching wax at *a a*. By attaching the design in this way we are enabled to turn it up and see if we have followed every detail of the outline. The method of locating the design so as to have it exactly over the coin, is to have a center mark as at *c*, fig. 2. We put the coin in the recess, and with a very fine needle pierce the design through *c*, and insert the point of the needle in a fine dot in the exact center of the coin; we now let the paper slide down the needle until it lays flat on the brass plate; we next turn the paper so it lies square with the brass plate *A*, and press the little bits of adhesive

wax down firm on the brass plate (the bits of wax being already attached to the back of the design). The reader will see, of course, that this way of proceeding will cause the center of the design and the center of the coin to exactly correspond. The attaching wax is made of white wax, 2 parts; rosin, 1 part; Canada balsam,  $\frac{1}{2}$  part; or, rosin, 4 parts; olive oil,  $\frac{1}{2}$  part. These are to be well melted together in both cases. After the design is attached as described a small piece of transfer paper is slipped under the design with the coated side down; the outline is next gone over with a piece of sharpened pegwood. If the unattached edge of the design is raised it can instantly be seen if the outline is perfect on the coin. When this is the case, remove the design, and with a fine pencil brush paint over the head and all such parts as are to be left bright with asphaltum varnish or the heated composition given above. The letters are the most readily formed with a quill pen, the point of which should not be too fine. A good method of blunting a pen for this purpose, is to burn the point at the extreme tip with a piece of red hot metal, or hold to a lamp blaze if you do not let the burning extend up too far. A rather broad style is the best even in the letters, also adopting the antique form. After all the parts to be left bright are gone over, the varnish should be left to dry for a day at least if the asphaltum varnish is used, but if the melted method is used it is ready as soon as cold. The back and sides should also be coated to protect them from the action of the acid; this coating is



done with the same material as we used for the face, only it is to present one unbroken surface to protect the coin. The best acid to use for etching in the unprotected parts is the common nitric acid (not the chemically pure acid), of the shops. The acid should be reduced by adding two or three parts of water. The time required will be in proportion to the depth we wish to reduce the etched parts. This reduction of the surface, of course, represents the raised work of the supposed worn coin. This very simple method can be made to produce a greater variety of effects than one would at first suppose, while the matted gray look of the etched parts gives a contrast to the bright portions. Too high a polish is not desirable for this work, but about as the rotten stone leaves it. The etching can be used for very fine effects for direct cutting in as a contrast to graver work as in fig. 3; here the coin is covered back and front with the composition to be melted and worked hot. In this case it is to be applied to the coin in a somewhat different manner and with more care, especially the face; the back and sides are all right if protected perfectly from the action of the acid. To apply the *etching wax*, as the composition is termed by the craft, put the coin in the recess in *A* and heat it up until it will just "hiss" (a little above the boiling point of water), and take some of the composition formed into a stick and rub it on until the entire face is coated. Now, take a dobber made from a piece of a fine kid glove tied over a bit of card board. The way to make a dobber is to take a piece of heavy card board 1 inch in diameter, and put a lock of cotton wool on one side; then get a piece of glove kid (from an old glove) which will have a nice smooth surface large enough for the face of the dobber, and tie the glove kid over the cotton and the card board so as to take the form shown in fig. 4; *g* representing the card board,

*d* the cotton, and *eee* the kid leather; the top is tied with a thread at *r*. The reader will see that the lower part will form a nice elastic cushion. After the etching wax has been applied to the coin and while still hot, the dobber is applied by gently patting the surface; this will equalize the coat of wax. Now smoke the surface of the waxed coin over a candle until quite black. After the coin is cool it is ready for the etching needle, which is simply a large needle set in a stick.

## Fashions in Jewelry.

### A Lady's Rambles Among the Jewelers.

THE furore for closing letters with sealing-wax and stamps is at its height in New York city, and must, in the nature of things, soon find its way to lesser cities and towns, for these fancies sweep over the country like great waves, touching, before they have expended all their force, remotest regions in all directions. Of course, our wide-awake manufacturers have taken advantage of this fancy to introduce any number of pretty conceits on which the required seal appears. There are some very beautiful watch charms of gold which disclose a stone seal ready to be cut, with the writer's monogram, initials, crest or fanciful device, as may be required. There are also desk seals of gold in attractive form, as well as seals in other and less expensive materials. Paper knives of brass, copper, nickel and silver are finished with a seal at the end of the handle. A popular form of paper knife, by the by, is one representing a feather rising out of a chicken's foot, which latter forms the handle. When placed on the impressionable wax, this foot leaves a sentimental "forget-me not."

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SEAL rings are naturally revived at this time, both for ladies' and gentlemen's wear. It is quite the correct thing for a lady to dash off her initials in her own peculiar chirography, and leave with a jeweler to insure a *fac-simile* of her autograph on her ring. This is a newer style than the monogram, and, at the present time, is taking very well. As seal rings are becoming to the hand—especially a large, well-formed one—it is believed that they will have quite a run.

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WHILE on the subject of seals it may be well to note a few new designs in way of trays for the escreteire which occur in decorative metal wares. These trays vary in form and ornamentation, but present for the most part elongated shapes, at one end of which appears a tiny lamp or candlestick; on the tray are grooves into which are fitted sticks of wax and a stamp. Less expensive than these, but decorative and convenient, are plush ones furnished with gilt or brass taper holders, wax stamps, etc. Cheapest of all, and consequently destined for extended circulation, are pretty little paper boxes in which are trays with compartments for tiny wax candles, sticks of wax in assorted colors and a stamp. These paper boxes furnish all the conveniences found in the solid silver trays, and range in prices from about 30 cents to 75 cents to the retail buyer.

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THERE is quite an art in sealing a letter, so the following directions, furnished by a leading manufacturer, may be found convenient: When the letter is ready to be closed, light the lamp or candle, lay

the seal on the desk at the right hand in such position that when used the impression may be square and right side up. Then hold the wax above the flame of the candle but not near enough to burn. A burnt wax makes a brittle, streaky seal, and is hard to manage. When the wax has gradually softened, apply it with a circular movement upon the place to be sealed; rub it well around and down until you have a circle of proper size and thickness. The wax has now cooled so that it will not take a clear impression. Hold, therefore, the envelope some little distance from the flame until the wax has again become soft, then moisten and apply the seal; the result will be a clear-cut impression.

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IN THE wake of decorative lamps and candlesticks have naturally followed all sorts of devices in form of shades and reflectors. Lamp shades are largely produced in colored glass, cut in facets and diamonds, and surmounted with pierced brass borders that present an exceedingly rich effect. There is also an infinite variety of colored shades in silk, trimmed with lace and fringe. Silver candlesticks are many of them furnished with reflectors of the same material; then there are tiny shades of silk and paper. Among the latter are attractive shades of tissue paper, some of which are exceedingly ingenious, and all are bright and pretty. Lamp shades of colored tissue paper are very decorative in appearance, showing sometimes landscapes and groups of figures, also wreaths of flowers, which last simulate nature's blooms in size, form and color.

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IN CONNECTION with candlesticks ought to be mentioned the reproduction of old-time models in trays and snuffers, which are brought out in brass, copper or silver, to correspond with the candlesticks.

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STATIONERS throughout eastern towns and cities are reporting large sales of imported tissue papers since the craze for making decorative articles of this inexpensive material began. This paper is produced in every conceivable shade and in gradation tints, and in the hands of ingenious persons of artistic tastes, undergoes wonderful transformations in plaques, flowers, fans, screens, dolls, bonbonieres, mats, picture frames, grate hangings and similar objects. Another demand on the tissue paper trade, are the paper balls and parties where guests appear attired in picturesque costumes composed of tissue paper. There seems no reason why jewelers in small towns with leisure time on their hands and space on their shelves, should not carry an assortment of this paper, with specimen articles showing what can be done. Importers of the tissue paper are in possession of a manual of directions for making all sorts and kinds of decorated articles in tissue paper. Copies of this manual are included in the sales of the paper, being designed for gratuitous distribution among retail buyers who are desirous of acquiring the art.

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TEA-WARE in silver, as seen in the best houses of the present date, includes all kinds of elaborately chased patterns, such as Indian, Japanese and old English. The old English *repoussé* work appears in many of the newer productions, and promises to be a leading style of ornamentation in tea-ware for the autumn trade of 1885. The fluted finish occurs on sets reproducing the low forms belonging to

Queen Anne's time, and is numbered with desirable styles; so is fine satin finish as produced by trustworthy manufacturers. Etching on silver has greatly increased in favor, and now appears on higher priced articles in solid silver in place of the less artistic and old-time engraving. Pierced and open work occurs on silver fruit dishes, and other odd pieces for the table. What is termed Cashmere finish affords an attractive change, and the same may be said for the Moorish decoration seen on plate ware. This last presents floral and other patterns in colors, and, applied to white metal, gives a very pleasing effect at comparatively small cost. It has been employed with desirable results on toilet articles, such as brushes, combs, hand-glasses and the like.

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IN MANY of the palatial homes of New York city, the solid silver dinner service is followed by a gilded dessert service, consisting of center and corner pieces and a dozen dessert plates. As a rule, these gold platters are wrought in different patterns, so that each guest has a picture all his own to contemplate. Occasionally the dessert service is of silver, in which case the correct style of decoration is etching.

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THE five o'clock tea sets, so important a feature now in every fashionable household, also the after-dinner coffees, show a remarkable prodigality as regards the number of styles, metals and modes of ornamentation employed. Unique effects, no matter how gained, providing always these be artistic, are in fashion. Each lady glories in possessing sets quite unlike her neighbor; "Patterns, you know, that cannot be duplicated." Silver cups and saucers, each differing from the other, are often used at five o'clock teas, and are of frequent occurrence in dessert sets.

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DESIGNERS assume free license when it comes to shapes in water pitchers and loving cups. The former are indispensable in every household of any pretension to style, and the other affords one of the most popular of gifts for gentlemen. Every country under the sun is called upon in one way or another for the forms, styles and decorations of these articles.

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LINEN cuffs and collars, which, according to present fashions, are necessary accessories to tailor-made suits, have created a fairly good trade in cuff and sleeve buttons among uptown retail dealers who attract the patronage of fashionable people. The cuff buttons most sold to ladies are single ones, from small to medium in size, often square or oblong in shape, and, when not containing gems, quite simple in finish. The use of the collar button is not confined to the wearers of expensive tailor dresses, but extends to all classes, and consequently this popular article appears in both gold and silver. A favorite collar button is one of gold, small in size, with a single colored stone or a small diamond set low in the center. The turquoise thus set affords an attractive button at a comparatively small cost.

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THE very *decollette* corsages that characterize the gowns worn by

milady at balls and parties, certainly encourage the wearing of necklaces, and New York dealers agree as to the increased demand for diamond, pearl and other single stone necklaces, and pendants worn with a single gold chain. As yet, however, all gold necklaces have failed to appear, the nearest approach being gold beads, which continue fashionable.

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THE popularity of the old style lace or bar pin has been sharply contested during the past twelve months by the enameled flower pins, the pendants worn as brooches and other shorter lengthed pins. The lace pin, however, is of such a convenient nature that it has held its ground well, and will find, doubtless, for some time to come, a generous patronage. A new self-locking pin introduced to the trade last autumn as the "Claustra," is attracting deserved attention from both dealers and city patrons. The "Claustra" is made in a variety of lengths, hence includes sizes suitable for brooch, shawl, lace and hair pins, and even bonnet ornaments. It is made both with and without pendants, and is susceptible of a great variety of designs and styles of ornamentation. Some of the designs are very unique, as, for instance, one in which the head of the pin is composed of gems simulating a great spider, while the cap that goes over the point of the pin and which is suspended from the head by means of a slender chain, represents a fly. The effect when the pin proper is concealed in lace or ribbon, is that of a cunning spider drawing by a golden cobweb an unwary fly into its trap. All the popular designs, such as enameled flower patterns, crescents and stars, swords, etc., are represented in the "Claustra."

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THE knife edge bracelet continues a popular style, especially where fine gems are to be mounted. Often a single diamond, ruby or other stone of desirable shade and grade, is the only one that appears, this being set on the edge at the top of the bracelet. In this position the gem sparkles for its full value, undiminished by the slender circlet of gold which appears just what it is, an apology for holding the gem on the arm. Again the stones extend a little way over the arm, and yet again they go quite around it, forming a blazing hoop of diamonds or colored gems. The double-jointed bracelet, by the way, is an exceedingly convenient form, and furthermore recommends itself on account of its enduring qualities.

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THE carved hoop finger ring with gems running around the finger, is a favorite ring with ladies, who find it not only decorative but easily worn under a glove, thus avoiding the annoyance of removal as is the case with some other styles. There has been some effort to introduce clusters in small stones, but the public has failed as yet to approve of this fashion. A very pretty effect is gained, by the way, when a fine colored gem is set in a ring, by covering all of the ring visible, when on the hand, with small diamonds. The apparent result is a colored gem set in a diamond circlet.

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COLORED gems, also diamonds and pearls, when of extraordinary beauty, size or brilliancy, are worth, and will be sold for, sums extravagant in proportion to the prices ruling medium stones. The reason is obvious, for so soon as any stone surpasses in any marked degree the ordinary quality of that particular gem, it is removed from the common category, and its price will depend more upon the fancy of pur-

chasers than on any system of valuation. In consequence of this fact, importers, as well as private individuals, feel very secure in the sustained value of their treasures, even, as now, during a period of depression in prices for average diamonds and other medium stones.

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AS SAPPHIRES are just now attracting an unusual number of buyers owing to their plentifulness and consequent cheapness, a word regarding color, methods of testing, etc., may not be amiss. The sapphire is found in all tints and shades of blue, but the color which approximates to blue velvet, of the shade formerly called *bleu du roi*, is most valuable; the color of the stone, therefore, is a matter of first importance. Indeed, its value depends upon its possessing the correct hue, and furthermore of being evenly colored. A rarely fine sapphire will appear blue by candle or gaslight as well as by day, whereas the majority of sapphires show a great difference in color by night. The blue of the sapphire, in a word, is seldom pure or spread over the whole substance of the stone. Sometimes it is mixed with black, sometimes with red, a fact not perceptible by daylight but obvious at night. When the color of a stone is partially dark, the lapidary has a method of cutting by which he takes away much of the dark-colored part, so that a stone lying on the table will appear to be of vivid blue hue like stones that are colored throughout. If the stone be held in a pair of forceps an inch beneath the surface of clear water, we are told on excellent authority, that the parts of the stone colored and uncolored will be apparent.

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HERMATITE jewelry grows in favor; indeed, it may be said to have made a place for itself in what is popularly styled standard goods. Black onyx jewelry, an old and enduring favorite among ladies in mourning, is always in more or less demand, and provides the most becoming of ornaments. It suits all complexions and affords an admirable background for pearls and diamonds. Onyx bracelets much "set off" the natural whiteness of the arm and hand. An attractive pattern, by the way, is one in which gold balls occur between each section of the onyx.

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THE manufacturers of fine rolled plate jewelry, or, as it is often termed by those outside of the trade, rolled gold jewelry, have kept pace with the times by reproducing the popular designs seen in fine gold jewelry, and bringing the finish of their work up to a high standard. The best class of rolled plate jewelry defies detection by the average buyer, and wears as long as the cheaper grades of gold jewelry. Of course, as in silver plate, there are grades of gold plate not worth the buying, and which bring discredit on everybody concerned in the making and selling of it. The best work, as has already been suggested, commands an immense trade and gives general satisfaction. Dealers who prize their reputations, handle, of course, only the best; in a word, they buy goods only of responsible manufacturers. These same dealers, when they carry a stock of gilt trinkets made by the electro-plate process, sell it as gilt jewelry, not as rolled plate, explaining the difference to their patrons as a matter of justice to everybody concerned. Colored stones and Rhine stones are largely employed in rolled plate jewelry. Popular stones for the purpose are Rhine stones, garnets and turquoises, amethyst, agates and blood stones.

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ARTICLES that have gained widespread popularity in rolled plate

jewelry are cuff buttons, lace pins, bracelets, vest chains and finger rings. In these articles the parts on which come the hardest wear is the heaviest plate; indeed, in many instances, notably in watch cases and finger rings, the exposed portions and trimmings are of solid gold, which insures prolonged endurance.

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COIN jewelry continues to attract a large patronage, and represents a favorite style in silver work. The preferred sorts are *fac-similes* of antique coins possessing well authenticated histories, and furthermore representing some of the rarest specimens of numismatic art the old world ever produced. There are, among the more valuable reproductions, exact copies of coins dating from 700 B. C., and illustrating the first rude attempts of artists to produce figures of persons or animals on metal. The copies of coins bearing date 400 B. C., show bas-reliefs representative of Greek art, which connoisseurs claim have never since been approached in coins. The most perfect copies have been obtained in silver, but there are also gold coins possessing great interest aside from the mere matter of decoration. These metallic archives of the past are worn in our modern drawing rooms, mounted on lace and scarf pins, in form of cuff buttons, as pendants from Queen and vest chains, and as bangles from bracelets. No lady's jewel case is considered complete without some of this coin jewelry, and gentlemen generally possess a coin or two in form of scarf pin or cuff buttons.

ELSIE BEE.

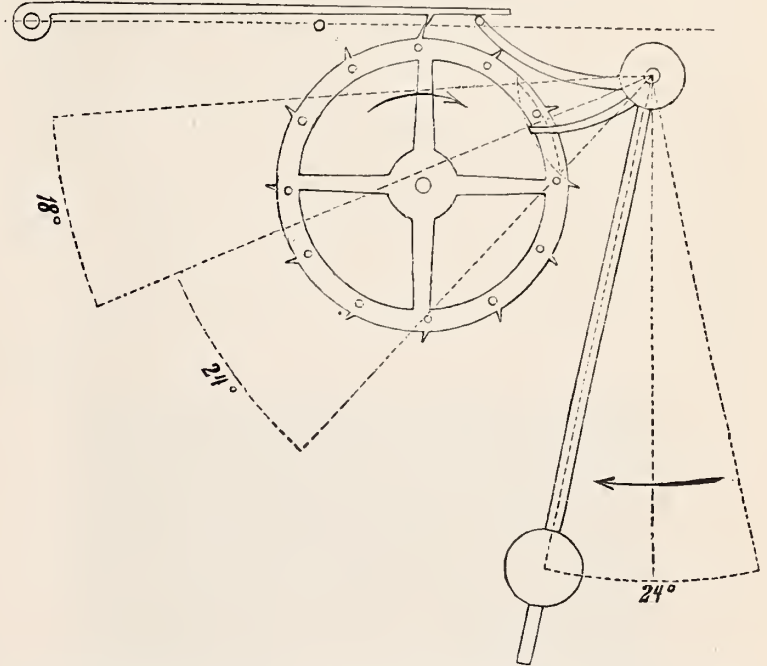
### Gallileo the Inventor of the Free Escapement.

"A PREVIOUS number of this journal," says F. W. Rüffert, in the *Deutsche Uhrmacher Ztg.*, "contains the representation of the clock constructed according to the directions of the blind astronomer Gallileo, by his son Vincentio, and the locksmith Ballestri, at the beginning of the year 1649. Said article was taken from the *Horological Journal*, and since the invention of the pendulum clock is a theme that should be of universal interest to all watchmakers, as it illustrates the manner in which the first escapement was constructed. We add the following by way of explanation:

"It is not very easy to recognize the performance and the characteristics of the escapement from said sketch, and I have therefore rendered them clearer by an enlarged drawing. First the horizontal detent lever, which is fastened above, has been represented as fastened too high. I have corrected it and modernized the escape wheel. This is provided with detent teeth around its circumference, and impulse pins on its side face, because we are dealing with a partly free escapement. This is represented at the moment when the upper detent tooth is unlocked. The upper and longer lever, situated on the pendulum axis, is the unlocking lever, the other is the impulse lever, upon which the escape wheel pin, standing above, will drop. The pendulum swinging to the left has passed through the arc of 24 degrees, and by continued oscillation in the complementary arc brings back the escape wheel. This escapement, therefore, is also a recoil. The detent lever hereby is still further lifted. The pendulum in its return to the right receives the impulse until the next tooth catches at the hook of the detent lever which braces itself upon the indicated support. If the motion center of the pendulum in the dotted line was situated a little more to the left, so that the impulse lever moved between the wheel pins situated further above, not alone the unlocking lever could be shortened, but also the revolution centers of the pendulum and detent lever, as well

as the place of detent and the place on which the unlocking takes place would lie in a straight line. Another advantage would already be, if the detent lever were to be prolonged farther to the right, whereby also the detent lever could be shortened. A certain drop of the pin upon the unlocking lever is necessary, so that the detent tooth of the wheel can pass free under the hook of the detent lever.

"When, therefore, the next detent tooth has become engaged, the pendulum oscillates freely in the complementary arc until it returns again and begins the play anew. The error in the laying out of the escapement which causes the recoil, therefore, consists in that the



unlocking takes place at the wrong time, during the oscillation of the pendulum to the left. The fundamental idea of the free escapement is there, however, and we are in duty bound to acknowledge the great Italian to have been the inventor of the free escapement.

"The matter of escapements is, or should be, so highly interesting to every watchmaker, that it would be well worth the trouble to write a separate history of all the escapements, and even if only a few of them are in use, nevertheless their study is not alone very instructive, but by reason of the general interest highly entertaining.

"I hope that watchmakers generally will interest themselves in this matter, and assist me by sending sketches, books, periodicals, etc., bearing on the subject matter, and leave this material for a certain time at my disposition. I flatter myself that the number of escapements can be raised to 200; I possess already over 150."

### Proceedings of the Horological Club.

#### A DISTINGUISHED BODY OF WATCH AND CLOCK MAKERS.

*One hundred and twenty-ninth discussion.—Communicated by the Secretary.*

[NOTICE.—Correspondents should write all letters intended for the Club separate from any other business matters, and headed "Secretary of the Horological Club." Direct the envelope to The Jewelers' Circular Publishing Company, Seth W. Hale, President. Write only on one side of the paper, state the points briefly, mail as early as possible, as it must be received here not later than the eighth day of the month, in order to be discussed and reported in the CIRCULAR for the next month.]

HARD SOLDERING.—PRESERVING THE SPRING IN WIRES DURING SOLDERING..

*Secretary of Horological Club:*

If you will please answer the following questions in the next CIRCULAR, you will confer a favor on one who is less qualified. Can

joints be hard soldered on watch cases with an alcohol lamp and blowpipe? If so, what kind should be used? How is it done at watch case factories?

How can I preserve the spring in wire (such as rolled plate) that is to be hard soldered—a pair of ear wires for example?

What should be used to restore the original color of hard soldered articles in low grade of gold? I have noticed that after the article has been cleaned and re-polished (using acids to cut the black off), that it had a whitish appearance.

I would like to know the correct meaning of rolled plate. What process does it go through to give the metal that name. F. H. B.

Mr. Clerkenwell said that any kind of hard soldering could be done with an alcohol lamp and a blowpipe, if the flame is large enough to heat the work properly. If it is not, you will only spoil the job, for the solder will never flow and make a good joint. Many workmen prefer a gas flame, but it cannot be used on all kinds of work, as it is liable to smoke the article. The size of the flame must, of course, be regulated to the work to be done.

There is no way to preserve the spring in wires which are heated enough for hard soldering. The heat may be confined to the vicinity of the solder to save the rest of the wire, then the soft part may be tempered by burnishing it, if not too much softened or burned.

The white color after pickling may be due either to heating the article too much or too long, or to keeping it too long in the pickle. In the former case, the alloy or copper is oxidized deeply into the article, and when removed by the pickle it leaves only the silver on the surface. In the latter case, keeping the article too long in the pickle has the same effect, by eating away the copper too deeply. The color may be restored by scouring and polishing till the silver coating is removed and the solid metal is brought to the surface. Then, if the natural color of the gold is too light, it must be colored either by plating with gold, or by the coloring process described in our Proceedings last month.

Rolled plate, correctly speaking, is a plate of gold united to thicker plate of poorer metal, and the composite plate rolled down to proper thickness for manufacturing into goods. Sometimes both surfaces are plated. The gold may be united by solder, by melting together or by powerful pressure and rolling. In some cases the entire body of baser metal is composed of a sort of hard solder. It is always a delicate matter to hard solder a rolled plate article without destroying it, and whenever attempted an easy flowing solder should be used. Even then nothing but experience and good judgment can secure the workman against frequent "accidents."

#### INSERTING A NEW BALANCE STAFF WITHOUT DISTURBING THE ADJUSTMENTS.

*Secretary of Horological Club:*

Will you please inform me through your column, if the replacing of a staff in an adjusted balance, where the poise is not disturbed, destroys the adjustment; or, in other words, is it possible to put in a new staff without affecting the adjustments. C. H. S.

Mr. Uhrmacher said that it was no doubt possible to insert a new balance without disturbing the adjustments, but the only way to be safe in the matter is to make a test after the job is done, to find out whether they have been affected or not. Even if the poise has not been perceptibly disturbed, the arms of the balance may be sprung up or down, or the metal part in a state of strain, which will cause the compensating segments of the rim to travel in a different course than before, and so affect their compensating action. Even riveting the staff in too tightly, and spreading or straining the center of the balance might affect. Or, if the old staff had been very tight and the new one was less tight, it would also affect it. The act of driving one staff out and the other in might do that. If the balance is heated during the repairs, it would very likely change its action, also too free handling with the warm fingers, or handling it a little too severely. In short, there are so many ways in which its action can be disturbed that a test can hardly be safely dispensed with, if the movement is a very fine one. If only common or cheap, a careful workman, by observing all precautions, could probably do the job

without injuring the movement. These remarks refer to the compensation for heat and cold, but the same ideas are equally applicable in the case of the other adjustments.

"IMPROVED BEZEL FOR WATCH CASES."—ADDRESS OF J. W. M. WANTED.

*Secretary of Horological Club:*

Will you kindly furnish me with the address or the Post Office of party who signs himself "J. W. M.," in "Proceedings of Horological Club," in article headed "Improved bezel for Watch Cases." I have made application for patent also, and wish to correspond with the party. Would also like copy of his drawings if you feel at liberty to give them. WM. BURNS, JR.

The Secretary replied that the letter mentioned, with the drawings, etc., were sent to the printers with the "copy" of the Proceedings, and may, by this time, be ground up into paper again. But even if we knew the address and had the drawings, we should not feel at liberty to give any information without permission of the party. All communications from correspondents are considered strictly confidential, except so far as they consent to publicity. It may be that they would be willing that information should be given, but that is for them to settle. We have nothing to do with that part.

In this case, as we do not know the party's address, there is only one way to reach him, and that is by inserting the inquiry of Mr. B. in the hope that it may be noticed by J. W. M., and lead to a correspondence between the two—which we accordingly do.

PRICE OF BACK NUMBERS OF "THE CIRCULAR" AND *American Horological Journal*.—EXCELSIOR'S "PRACTICAL HINTS ON WATCH REPAIRING."

*Secretary of Horological Club:*

In the last number of THE CIRCULAR I advertised copies of Vols. 7, 8, 9, 10 and 11 of THE CIRCULAR, and Vols. 1, 2, 3, 4 of Miller's *American Horological Journal* for sale, but I am at a stand to know what price to put on them. Will it be inconsistent with your duties to the Club and yourself for you to tell me what such books have sold for if you know? Or, if not, what, in your opinion, would be a fair price for them? I intend to leave watch work, and would, of course, like all I can get for them, and yet do not wish to ask too much. I see the Club mention another man who is willing to sell his copies of THE CIRCULAR, and say he ought to ask a good round price. If you will give me the desired information it will be considered strictly confidential.

Mr. Isochronal replied that it was hardly possible to get a specific price, under the circumstances. Ordinarily the price would be, for well bound volumes, from \$3 to \$5 a volume. But the special value of the back numbers of THE CIRCULAR, in this case, is that they contain the well-known articles by Excelsior, called "Practical Hints on Watch Repairing." The first series has been republished in book form under the title of "Practical Treatise on the Balance Spring, and the Adjustment of Watches and Chronometers for Isochronism, Positions, Heat and Cold, Rate, etc., and is now for sale at THE CIRCULAR office. The second series comprised several series of articles on the four principal escapements—the Chronometer, Detached Lever, Duplex and Cylinder, on examining, on gearings, wheels and pinions, and many other subjects of every day use to all practical workmen. His instructions were practical, right to the point, just what the workman most wants to know, and so clearly expressed that even the apprentice could understand and follow them. So great was the demand for back numbers from new subscribers who would want the whole series, that the extra editions which were thought large enough to supply all calls were rapidly exhausted, and there has been no way to get copies except to arrange with old subscribers willing to part with them, on account of relinquishing business, like Mr. Y., or for other reasons. We can only say to him that they are well worth a "good round price," but, for the sake of workmen who would be benefitted by having them, we trust he will not be too stiff. What he may conclude that he can afford to take, is, of course, a matter for himself to settle.



## GOLD DISCOLORING THE SKIN.—GRINDING SPECTACLE LENSES.

*Secretary of Horological Club:*

I have recently been much puzzled by the following circumstances and shall be very glad to have the opinions of some of the members of your learned body.

A lady brought me a pair of low grade eye-glasses that she had worn for four years, and complained that, recently, where the spring and frame touched the skin, a very distinct dark mark was left. The frame itself showed no discoloration. I suggested that another spring 14-k. fine be fitted, and the projecting points tipped with gold of the same quality. This was done, and, to my disgust, the result was even worse than before, a half hour's wear being sufficient to leave a mark visible at several feet distance. Another customer brought me an 18-k. plain ring, saying that it had been in use for five years, and that three weeks ago it had begun to blacken the finger of the wearer, and had continued to do so until that time. In both of these cases no preparation of sulphur had been used, internally or externally, and my only plausible explanation was that there must be some peculiar change in the excretions of the skin, and that as soon as the normal conditions were restored the disagreeable effect would be no longer apparent. This is not quite satisfactory to me, and any other explanation will be gladly read.

Kindly say what is the best kind of stone for grinding spectacle lenses, and describe the best mounting for it suited to the use of repairers.

J. S. B.

Mr. Ruby Pin said that the reason for the discoloration suggested by Mr. B. was the most likely to be correct. If the ring had been a filled ring, instead of solid gold, it might have been that it was worn through to the filling, and that that caused the discoloration. But the fact that the same ring had been worn for five years without blackening the finger, proves that there was some external cause for it. What that is is often hard to discover. It may be the exhalations or excretions of the skin, or something that has been handled. Even gas escaping in the air of the house, and the finger being moist and thereby attracting and absorbing the gas, and holding it in contact with the ring, might produce tarnish, etc. It often happens, too, that a slight tarnish exists for a long time unnoticed, until some one else talking about the thing calls the attention to it in this case, and what is then observed for the first time, may really have been there all the while. But the marking on the lady's nose is, of course, a recent thing. If it should continue, there would seem to be no remedy except to either use finer gold for the part which comes in contact with the skin, or else give it a good electro-plating with pure gold. Even the acids of perspiration, or of the water from the eyes, would not affect a *thick* plating. A thin coat would do no good whatever, as acid will act right through it upon the poorer metal beneath. In plating a gold spring, coat only the necessary parts.

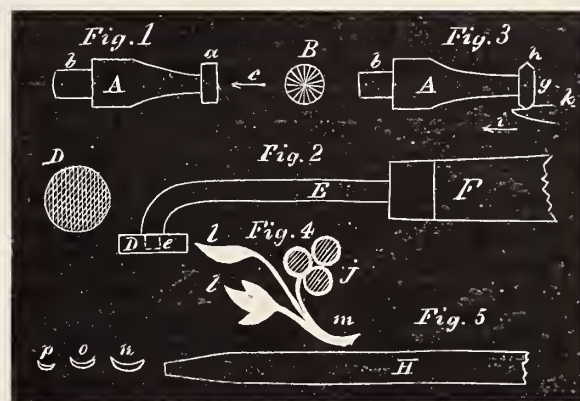
As regards grinding spectacle lenses, all sorts of stones and laps are recommended, but professionals generally use the ordinary "scotch gray" stone for the bulk of the grinding, keeping it plentifully supplied with water. The usual hand grindstone form is oftenest found, but it is more convenient to run it by treadle or mounted in a polishing lathe. Finish off with a small oil stone similarly mounted, being sure to first grind out cracks in the edges. Some finally polish the edges with crocus or rouge on a bell metal slip or even on a stick. The better the edge is finished, the less liable the glass is to crack under strain, pressure, falls, etc.

### Advice to Watchmakers' Apprentices.

BY A MAN WHO HAS SPENT TWENTY YEARS AT THE BENCH.

IN PREPARING work for enameling we can frequently make use of mills or rotary cutters in a lathe. These cutters can be of various forms and widths, but they are generally of two forms, *i. e.*, shaped as shown at fig. 1, where *A* represents the piece of large steel wire, with one end turned down as at *b* to screw into the lathe, and the other turned into a short cylinder as shown at *a*; this is cut into a mill with fine graver lines running parallel to the axis to make it a

sort of rotary file. Such mills should be hardened as hard as a file and used with oil. Another form of mill is shown at *B*; this is shaped like *A*, except it is cut on the end, and is a view as if seen in the direction of the arrow *c*. But it is to be remembered that nine-tenths of the cutting is to be done with a flat bottom graver, and these mills are more to bring the reduced surface to a comparative level than for actual cutting. Many writers insist on a roughened surface in the sinks into which the enamel is applied; this is not as necessary as some suppose; for if the enameling attaches itself to a metallic surface, there is an actual welding or fusion of the enamel and metal which will hold for all practical purposes. Using enamel on metal which is not rigid enough, like a thin, light watch case, is the cause of enamel flaking off in almost every instance, and in such cases no system of roughening will prevent it. Dealers should avoid such light, thin cases, as there is neither honor or profit in dealing in such goods. Another useful tool for smoothing the bottom of sinks is shown at fig. 2. They are made from pieces of files; to make such tools, take a file of any fineness and soften it in a charcoal box; cut it out round as shown at *D*, then smooth off the back and drill in a hole, and tap it as shown at *e*, fig. 2; into this is screwed a bent handle *E F*. The bent part *E* is a piece of steel wire with a screw cut on one end and then bent as shown; the other end goes into a wooden handle (partly) shown at *F*. These round pieces *D*



can be screwed on and off so as to use those of different sizes and fineness. Such tools are very useful around the bench for many other purposes, which will readily suggest themselves to the reader. While speaking of mills to use in one's lathe, the writer would beg leave to wander off a little from the text in hand. Most jobbing (I now mean those who repair jewelry) jewelers have no doubt been bothered with resetting stones in which it is desirable to set the stone lower. It is difficult to file the seat where the stone goes farther back, and to use some form of graver does not exactly meet the wants. Now, a mill shaped as shown in fig. 3 will exactly fill the bill. It is fitted with a screw *b* to go into the lathe as shown, but the mill part is V-shaped. The angle at *h* should be about  $60^\circ$ , and is cut up with a graver. In using this tool the work is held with the hand, and turned and pressed against the mill as desired. At *k* is shown what is intended to represent a clamp for a stone, and *g* shows the position of the mill. If the clamp is pushed forward in the direction of the arrow *i*, the stone can be set deeper. A few sizes and shapes will be quite sufficient for almost any job of this kind. In preparing work for enameling it is not necessary to cut away and leave fine lines and ornaments standing in relief—as, say, the rings at *j*, or the leaves at *l l*, or the stem *m*. These can be soldered on, using bits of sheet metal for *l l* and wire for *j m*. The writer regrets very much that such meagre information for such a beautiful art as enameling can only be given by words, but will assure the reader if he will persistently try and follow even the imperfect instructions given in these papers, he can learn to do creditable work. It is the writer's intention to next give a few hints and suggestions on clock work. The ordinary cheap Yankee clock is so very cheap now that the repair of such clocks is considered of no importance, yet it stands the *wary* watch and clock repairer in hand to look out even in this particular. We will suppose a customer has an old Yankee clock

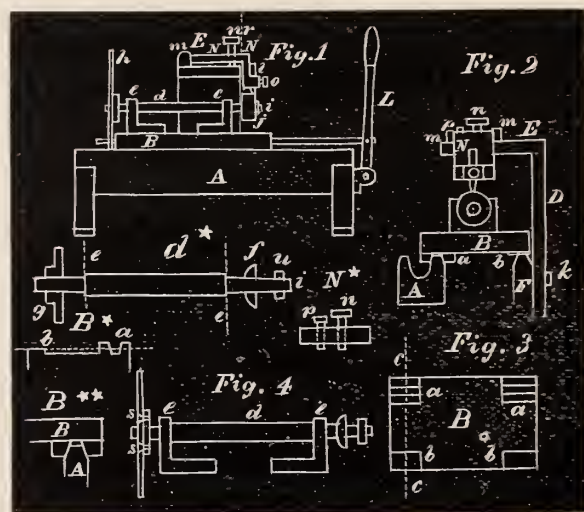
which has done service in the kitchen for years ; he brings it in to you and you see it is well worn and needs a considerable amount of repair ; now, sell him a new one if you can ; if not, do not let him take it away and get some other man perhaps not half as skillful as yourself to tinker it up for him, for if you do it will be more than probable that he will give him his watch to clean and repair, and you will not only lose a customer, but have a man saying : " Oh ! B.'s no good ; I took my clock to him to fix and he said it was all worn out, and C. took it and fixed it, and it runs as well as ever." In every case either sell a new one or fix up the old one. It is a very bad clock that one who knows how can not put into shape so it will run. Another thing to be looked to is the regulation ; be sure it is running right before you let it go out of the store, for not one in a hundred is fit to regulate a clock ; if it runs a minute or two in a day too fast, five or six turns of the nut below the ball is only a little, and, after they have turned the nut back, if the ball does not follow by its own weight, nine times out of ten they will not have sense enough to pull the ball down against the nut. All words aside, it is best to make sure of the regulation yourself while you have the clock in your possession. The great secret in clock work is to know exactly what you want to do and have the proper tools to do the work with. In three cases out of four it is not necessary to take a clock down to insure its running. Put on plenty of fresh oil and take off the verge and let it run down, wiping off the oil as it exudes from the pivot holes, leaving enough on finally to ensure its running for the next twelve months. When it comes to repairs, clocks need but two things (as a rule) done to them ; these are closing a hole or two and grinding out pits in the pallets. It needs no expensive punches to close a hole nicely, just a crescent-shaped punch of two or three sizes is all that is required. Such a punch is shown at fig. 5, and the shape and size of the points at *n o p*. The largest punch should be of No. 5 steel wire and the smallest of No. 14 steel wire. Holes are in every instance worn on one side ; close up from this side only, but be sure you do not overdo the matter and force the hole over too far—this, like most matters around a watchmaker's shop, is a matter of nice judgment. A few words to my old friends, the apprentices, for whom these articles are supposed to be written : Learn to take down and put together a clock quickly ; don't sit and dread a clock and be afraid you cannot get it to strike right again ; go at it manfully, and say, " I am going to get so I can put any striking clock together in 5 minutes " so it is all right, and stick to it until you can be as good as your word. When you find it is necessary to take a clock down, out with the pins or screws and down with it ; do your repairs and slap it together again. But for mercy sake don't sit and dread it. Get (when you have an idle half hour at your disposal) an old clock movement and take it down and mix up the wheels, and learn so you can put everything in place as quick as you could set the men on a checker board. When you have a hole to close mark the holes to be closed, and on the side where the wear is, so as to restore it to as near the original condition as possible. Judgment is essential in regard to the distance from the hole at which you should set the punch. This in a great measure depends on the thickness of the plate ; if the plate is quite thick the punch should be set back farther from the hole than in a thin plate. It should be our endeavor to close the hole the entire thickness of the plate, and this can generally be done from one side ; but in some cases it is necessary to close from both sides. A round broach should be used to smooth out the hole after it is closed, putting the wheel in place and the plates together, and trying if the wheel runs free and with the proper amount of side shake. A smooth faced stake of pretty good weight should be used for punching on.

### Lathes and Lathe Work.

BY THE MODEL WATCHMAKER.

**G**EAR WHEELS made from cast zinc, with the teeth cut in them with a tool working like a metal planer, are in every way adapted

for the change wheels necessary in a slide rest, screw cutting lathe. We propose to give the details of some modifications which will enable us to use our lathe, not only to cut such gear in zinc, but it will also work quite as well with brass, and even steel pinions such as are used in the larger size of music boxes. The writer is aware that most people imagine zinc is a very inferior metal, and so it is for many purposes ; but for gear wheels which are subject to only a moderate force, zinc does splendidly. Even in clock work a zinc wheel—say a main wheel— $\frac{1}{4}$  of an inch thick, will run as smooth and wear even longer than a brass wheel of the same dimensions ; and if the teeth are not disproportionally fine, the strength and rigidity of the teeth will be found ample. But the teeth in such wheels can not well be cut with a rotary cutter. It needs for cutting zinc wheels a cutter shaped and employed as is hereafter described to get good results. In the arrangement shown we dispense (for the time being) with the head and tail blocks, leaving the ways to be used as a guide to a sliding carriage or bed on which the wheels to be cut are mounted. Such a modification of our lathe is by no means expensive, and will be found to be eminently useful to any person who desires to fit up any rather large tools, as it can be used as a planer to make a slide rest, as will be explained further along. The principal feature in this arrangement is a heavy bed sliding back and forth on the lathe ways. This bed is of cast iron, grooved on the lower side to fit the ways, and moved back and forth with a lever or a rack and pinion. For the purpose of cutting wheels the lever is the simplest device, but for planing anything of any length the rack and pinion is preferable ; both plans will be described. Fig. 1 is a side view of the device, *A* representing the lathe ways, *B* the slide, *L* the lever for moving the bed *B* back and forth. Fig 2 is an end view of the ways in conjunction with slide *B* and the piece *D E* which supports the tool holder *N*. At fig. 3 is shown the slide *B* turned bottom side up to show how it is fitted to the ways. This slide should be about 12 inches long,  $1\frac{1}{2}$  inches thick, and wide enough to extend across the ways as shown at *B*, fig. 2. The manner of fitting the slide to the ways is quite simple ; four projections are cast on the lower side of *B*, as shown at *a a* and *b b*, fig. 3. The



two projections at *a a* are grooved as shown at diagram *B\**, which is a transverse section of *B*, fig. 3, on the line *c* ; these grooves are intended to slide on one of the ways of the lathe, as shown at *a*, fig. 2. The projections *b b* slide on top of the back way as shown at *b*, fig. 2. The manner of fitting up the slide *B* is as follows : The pieces *a a* are each about 2 inches long and cast fast to *B*. At diagram *B\*\** is shown a magnified section of the groove and way precisely as shown at *a*, fig. 2, except larger. The grooves in *a a* are filed and fitted by scraping until the way will slide nicely in it, but not go to the bottom of the groove in *a* ; this is shown in diagram *B\*\**. The object in not letting the way go entirely to the bottom of the groove is to ensure steadiness. After the pieces *a a* are fitted nicely to the way the projections *b b* are filed off until the plate or bed *B* lies flat and is entirely free of any rocking or tipping. The

manner of moving the slide back and forth by the lever *L* is obvious from inspection of the cut. The wheel or wheels (for 2 or 3 can be mounted on the arbor and cut at the same time), are put on the arbor *d*, as shown in figs. 1 and 4, fig. 4 showing the arbor enlarged from fig. 1. The L-shaped pieces *e e* are screwed fast to *B*, and serve as bearings for the arbor *d*. The arbor *d* is a piece of  $\frac{5}{8}$  round steel 7 inches long, with each end turned slightly taper as shown in diagram *d\**; the L-shaped pieces are fitted so they go to the dotted lines *e e*. At *g f* are two collars driven on *d*, *g* serving to hold the division or spacing wheel *h*, and the one at *f* serving to steady the wheel to be cut at *j*, fig. 1. The cutting tool is supported by the piece *D E* bolted to the rear way as shown at *k*, fig. 2. This piece (*D E*) should be quite heavy and strong, say 3 inches wide and 1 inch thick, and rigidly bolted to *F*. There can be two or three sets of holes in *D* for the bolts bolting *D* fast, so as to permit *E* to be adapted to different sizes of wheels to be cut. The piece *N* carrying the tool *l* is jointed at *m*, so as to lift and pass free of the cut when on the return stroke. At *m m*, fig. 2, are two projections attached to *E*, in which the tool holder *N* is hinged; this tool holder comes forward as shown in fig. 1 and extends downward, having a loop and set screw *o* which serves to hold the tool *l*. At *n* is a milled head screw which regulates the depth of the tool. This screw (*n*) passes through *N* and rests on *E*. And as the lever *L* is worked back and forth with one hand, the other hand turns the screw *n* so as to feed the tool *l* deeper and deeper into the cut, until the proper depth for the tooth is obtained. At diagram *N\** is shown a magnified vertical section of the tool holder *N* on the dotted line *r*, fig. 1; this shows the feed screw *n* and a stop screw *p*; this stop screw regulates the depth to which the cut is made. In using our tool we will suppose we keep unscrewing the screw *n* until we have cut in deep enough; we next turn in the screw *p* until it arrests the cut at this point—the screw *p* is turned with a screw driver so that it will not be mistaken for *n*. We next screw in the screw *n* and lift out the tool *l* free of the cut, and set our division wheel *h* one notch further along ready to cut another tooth with the cutter *l*. The spacing or division wheel *h* can be made of No. 14 sheet brass and should be about 7 inches in diameter. The divisions can be spaced off with a pair of fine pointed dividers. About the best way to go about the spacing is to first mount the wheel on a hub or collet as shown at *g*, diagram *d\**, attaching the wheel with two screws as shown at *s s*, fig. 4. If after the wheel *h* is mounted it is turned around by revolving the arbor *d*, and a keen point is held steadily against the wheel *h*, three or four circles can be swept on *h* which exactly correspond to the center of the wheel *n* and arbor *d*. These lines (circles) should be as fine and perfect as possible to ensure accuracy. We next make a starting point on one of these circles with a fine prick punch. Suppose, now, we wish to divide one of our circles into 100 equal parts; we first divide the circle into 10 equal divisions, and these, again, into 10 spaces. Any number of divisions can be made, and, if proper care is observed, a very good degree of accuracy can be obtained. After the spacing is laid out the points should be established definitely with a prick punch, and a hole drilled quite through the brass plate of which *h* is formed, as it is important that *h* should be held steadily while the tool *l* is cutting; and such a form of cutter exerts a much greater force on the arbor *d* and wheel *h*, than if a rotary cutter was used. If the wheel *h* is arranged so as to turn lying flat against *B*, a slightly taper pin can be put through *h* into *B* to hold *h* secure while a cut is made. The wheels to be cut go on the arbor against the collar *f*, diagram *d\**, and held in place by the nut *n*, turning on the screw *i*.

then the regulating power cannot actuate uniformly upon the regulator, and the timepiece will go irregularly; because a timepiece whose wheels and pinions form no good depthing, requires an unduly great motive force to overcome the injurious influence of friction and to restore the loss of energy caused by the faulty depthings.

Depthings may be faulty, either because the diameter of the pinions do not stand in correct proportion to that of the wheels, or because the wheels seize too deep or too shallow in the pinions, or else the shape of the wheel teeth or pinion leaves is not as it should be.

1. If the diameters of the pinions do not stand in correct proportion to the diameters of the wheels, then the teeth of the wheels or the leaves of the pinions either will butt with their ends against each other, or it will cause a blow with the depthing; in both cases, energy will be lost and the depthing become irregular.

2. If the pinions seize either too deep or too shallow into the wheels, either a drop will take place, or the teeth will grind against each other in so injurious a manner that energy is lost and irregularity of depthing is produced.

3. If the shape of the wheel teeth and pinion leaves is not correct then an irregular driving of the pinions will be the consequence, and an irregular actuation will also be imparted to the regulator by the motive power.

It is therefore of the greatest importance to make the diameter of the pinion in a correct proportion to that of the wheel, and to determine exactly how far the wheel is to seize into the pinion, and to make the wheel teeth and pinion leaves of a shape proper to make the depthings as uniform as possible.

The diameter or the radius of the pinion is proportioned to the diameter or the radius of the wheel as the number of the pinion leaves to the number of wheel teeth. If, therefore, a wheel with 50 teeth and a diameter of 20 lines seizes into a pinion of 10 leaves, then the diameter of the pinion will be 4 lines less, because

$$50 : 10 = 20 : x,$$

$$\text{therefore } x = \frac{20 \times 10}{50} = 4.$$

In practice, however, the diameter of the pinion, with regard to the smaller or larger number of teeth which they receive, deviate somewhat from this rule, as we will see farther below; for this purpose, there are easy ways for determining the diameters of the pinions.

The following rules must be observed for determining the size of pinions:

A pinion with 16 teeth must have a sufficiently large diameter as the opening of a pinion measure that can fully embrace 6 pinion leaves, counted from the outer side of the first leaf to the outer side of the sixth leaf.

A pinion with 15 teeth must have a somewhat smaller diameter than 6 full leaves, or a somewhat larger one than 5 teeth and the point of the sixth.

A pinion with 14 leaves must measure 6 leaf points.

A pinion with 22 leaves must measure 4 teeth and the point of the fifth, or, what is the same,  $4\frac{1}{2}$  leaves; for pendulum clocks 5 full teeth are taken.

A pinion with 10 leaves must have 4 full leaves.

A pinion with 8 leaves should embrace 4 leaf points, less  $\frac{1}{4}$  of the space between 2 leaves; for pendulum clocks 4 leaf points are taken.

A pinion with 6 leaves must measure largely 3 leaf points; for clocks 3 full leaves.

When the pinion drives the wheel, they must have a somewhat larger diameter.—[From MOINET's *Traité d'horlogerie*, etc.]

### The Depthing of Wheels, Pinions, Etc.

THE depthings of the wheels and pinions of a timepiece require the greatest exactness. If the depthings are badly constructed,

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Room 2, 170 Broadway, New York.

HON. ALGERNON S. SULLIVAN, *Counsel*.

At a meeting of the Executive Committee held on the 13th inst., the following applicants were admitted to membership in the Alliance, viz.:

A. Aron, Springfield, Ohio; Wm. Brenninger, Washington, D. C.;  
 T. G. Calvert, Lexington, Ky.; Jas. B. Keene, Ansonia, Conn.

## To Polish a Wheel.

EASY AS IT may seem, nevertheless the polishing of a wheel is quite a difficult matter—that is, to a workman who is not accustomed to polishing—to ensure success. It is like everything else in watch work, it requires a fair amount of practice, personal instruction and the greatest cleanliness. If the operator is unsuccessful, he may, in the majority of cases, trace his failure to a want of cleanliness. Put a cork, cut flat on top, in the vise, place the wheel on the cork as far as the pinion will allow; take a bluestone, which was previously reduced to an even face by having been rubbed on a stone, and water, and stone the wheels smooth and flat, at the same time keep turning the wheel round with the left hand; then wash it out and put in a box with some slaked powdered lime; the object of this is merely to dry it, and prevent the pinion from getting stained or rusty. Then brush it out nice and clean, put another cork, cut clean and flat, in a vise; then pound on a stake some fine red stuff. Some workmen add a little rouge, but that is according to fancy. Take a slip of tin, about the size of a watchmaker's file, only thicker; file the end of one side flat and smooth, charge it with a little of the red stuff and polish the wheel, keeping it turning all the time with the left hand, and do not leave off until the wheel and tin polisher are almost dry, so that you can see the polish; and, if to your satisfaction, clean it off with pieces of soft bread, and brush it out. If it has scratches on it bread them off, and clean off the tin and charge it again with the red stuff. As said, cleanliness is of great importance, for if there be any grit about the red stuff, polisher, or the fingers of the workman, the work will be full of scratches.

The above system applies to solid train wheels only.

Escape wheels are polished in the same way, but before they are put on the pinion. Solid wheels, such as fusee and movement wheels, are polished in the turns, using soft wood or burdock pith instead of tin. There is another way for polishing them, however, which is quite as often employed, by which they are fixed to a small brass block. The block is heated in a bluing pan, and a piece of resin passed lightly over it so as to leave a very thin varnish only, which is quite enough to make the wheel adhere; there should be circles marked on the face of the block as a guide for fixing the wheel as nearly central as possible, or else a small pin in the center of the block to go through the hole in the wheel with the same object. The wheel fixed to the block is first rubbed till quite flat on a piece of bluestone having a true surface, which is kept moistened with water; it is rubbed with a circular motion by means of a pointer (generally a drill stock), and pressed down on the middle of the back of the block which is hollow. The wheel is thoroughly cleaned and then polished on a block of grain tin with sharp red

stuff and oil well beaten up previously. The block of tin rests on a leather pad. When one side of the wheel is finished it is placed again in the bluing pan. The old resin is cleaned off, and the finished side of the wheel fixed to the block. After both sides are polished, the wheel is placed in spirits of wine to remove any resin adhering to it.

Pierced wheels are first rubbed flat on a cork with a bluestone. After cleansing they are polished with a soft tin polisher and moderately sharp red stuff, using a slightly circular stroke. Instead of a plain cork, some finishers use a half round cork resting in a notch cut in another cork. When quite smooth the wheels are washed in soap and water, and burnished on a clean hard cork with a burnisher well rubbed on a board with rotten stone or red stuff.

Another method for polishing wheels is also much employed: Grind the wheel well upon a cork, and pay strict attention to remove all the burr from the limbs. Then polish with a zinc file moistened with crocus and alcohol. After the wheel has been polished with it, take a sword file and finish polishing with it. Before using, the sword file is to be sharpened and rubbed with a little wax, after which the file is wiped off upon a piece of cloth, so that only a film of wax remains upon it. A brass wheel may also be polished in the following manner, viz.: by grinding it with slate stone and oil, and polishing with diamantine upon boxwood with a few short strokes. For sharpening the sword file emery paper is much employed, after which the file is in gradation sharpened upon decreasing by emery.

## The Manufacture of Artificial Jewels.

THE MANUFACTURE of the combinations for imitating our most important jewels has, at the present day, assumed the proportion of an industrial art, and much capital and skill are engaged in it. France, especially, defies rivalry in this branch, and the products of the districts of the Jura, Franche-Comté, the communities of St. Claude, Septmoncel la Meure, les Molunes, etc., go to all parts of the world.

The basis of all imitation products is a pure, fluid, lustrous, transparent and dense sort of glass, called strass, which is colored by the addition of metallic oxides. The proportions of weight of the ingredients of this strass are as follows: Pure pulverized silica, 45.7 parts; pure dry carbonate of soda, 22.8; calcined borax, 7.6; saltpeter, 3.4; pure minium, 11.8. Rock crystal is used as silica, because flint contains impurities. All ingredients are pulverized separately, then intimately mixed and heated in a Hessian crucible. The temperature of the charcoal fire must be gradually increased until it begins to fuse. This degree of heat is sustained for 20 or 30 hours, finally the crucible is cooled very slowly. The compactness and beauty of the product depends upon the regularity of the fusion, the intimate union of the ingredients and the careful cooling. The cold mass is without further treatment cut, polished, lined with foil, etc., to imitate the diamond. For imitating other gems other additions of colors are necessary. For instance, for topaz take 40 parts anti-mony glass, 1 part purple, and 1,000 parts strass. If one part of this mass is heated with 8 parts strass for 30 hours in a Hessian crucible (in a glass furnace), a yellow crystal is produced that imitates the finest ruby. Emerald is imitated with 1,000 parts strass, 8 oxide of copper, 0.2 chromic oxide, and 0.53 ferric oxide. For sapphire are taken 1,000 parts strass and 15 parts cobalt oxide; or, 0.106 per cent. cobalt carbonate.

Artificial emeralds of an entirely different composition have recently appeared in market, and are said to be prepared from beryl. Such imitations are easiest recognized by their specific gravity, if they do not betray themselves by their optical characteristics. The color of these new imitations resemble very closely the genuine, and their fracture is excellent.

Genuine stones are less often imitated by covering with a thin lamina a certain quantity of strass; these stones are called doublets.

There is another method for imitating jewels, generally called the synthetical method, which was first successfully employed by Messrs. Frémy and Feil, who employed for the artificial production of ruby and sapphire, taking differently colored and crystallized corundum for the purpose. Their recipe reads: Calcine, equal parts by weight, of alumina and minium in a crucible up to pale red heat. In this operation the lead salts attack the silica of the crucible. On cooling, two layers are visible; the one is vitreous and principally consists of lead silicate; the other is crystalline, and consists of aluminum or corundum. In order to imitate the ruby, mix with it 2 or 3 per cent. of bichromate of potash, for the (blue) sapphire, cobalt oxide and bichromate of potash. The jewels imitated in this manner possess the hardness of the natural.

More important than all this is, perhaps, the artificial manufacture of the diamond. The Englishman, J. B. Hannay, recently exhibited the following experiment before the London Royal Society: A serpentine iron pipe (20 inches in length) was filled three-fourths full, with a mixture of 90 per cent. bone oil, 10 per cent. paraffine alcohol (boiling point of 75°), and 4 grams lithium. The pipe was closed by smelting, and heated to red heat for 14 hours in a furnace, then slowly cooled. When the pipe was opened, a large quantity of gas issued out of it, and below was found a hard, adhering mass, which contained microscopic fragments of crystallized carbon, which differed from the natural diamond only by their feeble luster. But the exorbitant cost and the difficulty of executing this process precludes until now its practical adoption.

### A Metallic Alloy as Substitute for Silver Plating.

VILLERS specifies two alloys, one of which consists of 80 parts tin, 18 parts lead, and 2 parts silver; the other of 90 parts tin, 9 parts lead and 1 part silver, as a suitable substitute for the far costlier silvering. For these compositions, the peculiar method of preparing them must strictly be observed, according to which the tin is first to be fused, and when the fluid metal exhibits a perfectly white color, the lead, in a granulated condition, and after the silver is to be added, while constantly stirring with a fir rod. The fire is then increased, and the alloy, as soon as its surface exhibits a pale yellow color, is cast in bars. For using this alloy, articles, for instance, objects of steel, after they have been dipped in a dilute solution of muriatic and sulphuric acid, then rinsed, dried and heated for about 5 minutes to 70 or 80°, are immersed for about 1 or 2 minutes in the mixture kept fluid above a moderate fire, rinsed in cold water, if necessary, tempered, rubbed off and polished, while gently heating it. It is said that articles treated in this manner possess the white color as well as the ring of silver, and are quite remarkable for resisting oxidation; if they are to be still better protected against the influence of acid fluids, they are to be immersed in an amalgamating bath consisting of 60 parts mercury, 39 parts tin and 1 part silver, or coated galvanically with a feeble silver coating.—*Maschinenbauer.*

### Celebrated Goldsmiths.

IN THE history of celebrated goldsmiths, we next come to SIR THOMAS GRESHAM, who, says the *Gilda aurifabrorum*, was a merchant and goldsmith of great renown, son of Sir Richard Gresham, and was King's Exchanger in the reign of Henry VIII. He carried on business at the sign of the Grasshopper, No. 68 Lombard street, the site of Messrs. Martins' banking-house; the original sign was in

existence so late as 1795, but disappeared on the erection of the present building. He founded the Royal Exchange, opened by Queen Elizabeth, January 23, 1571. He also founded Gresham College, which he endowed with six professorships with £50 to each. This great goldsmith died in 1579, and was buried in St. Helen's Church, Bishopsgate. The bulk of his wealth was found to consist of gold chains.

Gresham was present at the first council held by Queen Elizabeth at Hatfield, and was received with marked favor; she promised him if he did her none other service than he had done to King Edward, her late brother, and Queen Mary, her late sister, she would give him as much land as ever they both did. The characteristic reply was an exposition of his financial views: "An it please your Majesty to restore this, your realm, into such estate as heretofore it hath been; first, Your Highness hath none other ways, but when time and opportunity serveth, to bring your base money into fine, of eleven ounces fine, and so gold after the rate; secondly, not to restore the Steelyard\* to their usurped privileges; thirdly, to grant as few licenses as you can; fourthly, to come into as small debt as you can beyond seas; fifthly, to keep your credit, and specially with your own merchants, for it is they who must stand by you, at all events, in your necessity." It is worth noting how implicitly the advice appears to have been followed, with the exception of the matter of licenses.

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AT THE regular monthly meeting of the Executive Committee of the Jewelers' League, held March 6th, 1885, there were present Vice-Presidents Johnson and Kimball, and Messrs. Bowden, Howe, Lewis, Greason, Smith and Sexton.

Requests from four (4) members for changes of beneficiaries were received and granted.

One (1) application was rejected.

Four (4) applications were referred.

The following nineteen (19) applicants were accepted:

F. L. Donaldson, G. L. Fox, G. Mutz, Z. A. Oppenheimer, J. H. Sillick, J. Wilson, W. F. Wilson, New York City, N. Y.; G. A. Zeidler, Niagara Falls, N. Y.; F. M. Hamilton, Newark, N. J.; Wm. Loeb, Philadelphia, Pa.; L. Luckhardt, Jr., Johnstown, Pa.; G. O. Munson, Hartford, Conn.; C. Becker, Baltimore, Md.; A. C. Freeman, Norfolk, Va.; C. Johnston, Memphis, Tenn.; W. W. McIntosh, Clinton, Ill.; L. Moynat, Elgin, Ill.; S. C. Scott, Bloomington, Ill.; W. B. Ragland, Waco, Texas.

\* A company of German traders.

# Foreign Gossip.

**EXQUISITE CALCULATION.**—We read in the *Comptes Rendus* that M. Poincaire asserts that the attraction of the moon exerts an influence upon the attraction of gravity. He has ascertained that the clock annually loses one-half a second at the equator, owing to the united attraction of the sun and moon, and loses one second at the poles in the same time.

**FICTITIOUS TURQUOISES.**—As is known, the artificial turquoises are produced by immersing bone or ivory in a concentrated oxide of copper and ammoniac solution in water. In from 8 to 14 days they are impregnated with hydrated oxide of copper, and after having been rinsed in water and dried, they possess the bluish green color of the genuine turquoises.

**GOLD.**—One cubic inch of gold is worth \$210; one cubic foot \$312,380, and one cubic yard \$9,777,762 (counting the ounce at \$18). At the commencement of the Christian era there were altogether \$427,000,000 worth of gold, but at the time of the discovery of America only \$57,000,000 remained. At present the value of all the gold in the world is counted \$6,000,000,000.

**FRENCH LAW ABROGATED.**—France has lately repealed the law governing the fineness of gold. Our readers will remember that formerly gold of a certain percentage only could be worked and lawfully sold, and the work below this standard was destroyed and the maker could thank his stars, if he was let off scott free. At present, gold cases of a so-called "fourth" lawful fineness, viz.,  $\frac{588}{1000}$ , can be manufactured, only for the export trade, however. In the same manner and for the same purpose goldsmith work and bijoutrie, and watch cases, of every grade fine, can be manufactured.

**THE OBSERVATORIES OF FRANCE.**—The French pride themselves on possessing the oldest observatory in the world, and they own at present, besides the several private institutions, seven public observatories, as follows: Paris (Director Mouchez), Marseilles (Stephan), Toulouse (Baillaud), Bordeaux (Rayet), Lyons (André), Algiers (Trépied), Besançon (Gruey). The Paris observatory is the most important, Marseilles follows next. The small institution at Besançon was principally used for regulating watches, to assist the declining watch manufactory. Of the private observatories, the one founded by Banker Bishoffsheim, at Paris, is the largest.

**AMERICAN APPRENTICES AT GLASHUTTE.**—The *Allg. Jour. d. Uhrm.* says that the horological school at Glashütte (M. Grossmann, superintendent) has for several months counted among its pupils from all nations, also an American, aged 35, and wife (no age stated), a Mr. Watts, who for about 10 years had his own business at Ashland, Neb. The gentleman, who does not yet speak German, informed Mr. Grossmann (who is a fine English scholar) that he desires to be taught from the very A B C of watchmaking. Possessing great applicability and the necessary intelligence, he is making rapid progress. Both the husband and wife take lessons in German, and when they have acquired this language, they intend to try their hand on French.

**CUSTOM-DUTY OF GREECE.**—A new custom tariff has entered into force since the 7th of June last in Greece. The following parts are of interest to our manufacturers:

	Francs,
Watches, gold or gilt.....piece,	5.00
"    silver or silver plated..... "	2.00
"    of other metals..... "	1.00
Watch Cases, gold or gilt.... "	3 50
"    silver or silver plated..... "	1.00
"    of other metals..... "	.50
Watch Movements, without cases..... "	1.50
Clocks, ordinary, in cases and single pieces....oka*	1.50
Other Clocks and single pieces of clocks for public edifices.....	exempt.

\* The oka=1.28 kilograms=2 lbs. 4 3/4 oz.

**SWISS MUSICAL BOXES.**—We take the following data from the report of the Vorort of commerce and industry of the Swiss Confederacy, on the importation of musical boxes. As this is increasing from year to year, we are forced to conclude that we, as a nation, are rapidly being educated in heaven-born music—in a great measure owing, doubtless, to the brawny muscle of the swarthy Italian with his organ and monkey.

1878 .....	francs	95,679
1879 .....	"	187,759
1880 .....	"	261,833
1881 .....	"	447,599
1882 .....	"	582,799
1883 .....	"	728,015

**TRANSPARENCY OF METALS.**—It is well known that gold may be reduced to so extremely thin a lamina that it transmits a greenish light; which peculiarity is made use of as a practical test of its purity by gold beaters, as the smallest percentage of alloy—silver, even—essentially modifies the transmitted light. The most attenuated gold film ever produced was several years ago exhibited in the New York Academy of Science, lying between two sheets of glass. Although the method of its production was very simple, still it must have required a high degree of dexterity in its manipulation. The gold film was precipitated by the operation of a galvanic battery upon a copper daguerrotype plate; the copper was then dissolved with nitric acid, and the film—doubtless the most difficult part of the entire operation—was then placed upon a plate of glass.

**FRENCH SELF-VANITY.**—It is true beyond cavil that the French possess eminent ability, but we are constrained to say, that at the same time they are gifted with an adequate share of self-vanity. The following anecdote makes at present the rounds of the French press: "It was in the drawing-room of a certain princess. The conversation was about the French workmen—their faults and virtues, principally their merits. They are remembered only when suffering. 'Nothing is impossible to French workmen,' said the princess. 'They can make something out of nothing, and of something they can make everything.' The diplomate interposed, 'There princess,' said he, drawing one of the few hairs from his bald cranium, 'I wager that your workmen, capable though they be, as you assert, will never be able to make anything out of that.' 'You are mistaken,' responded the princess, 'I will prove to you in a week's time how little you know French workmen.' The princess took the hair to her bijoutier, who in a week's time delivered to her the following suggestive bijou: A vulture holding in its beak the hair; to each of its extremities are affixed, respectively, Alsace and Lorraine, united by a scroll bearing the legend: 'You hold your conquest simply by a single hair!'" "Vanity, vanity, all is vanity, saith the preacher."

**TRIAL OF THE PYX.**—The final trial by weight and assay of the gold and silver coins of the United Kingdom, prior to their issue from the mint, is called the trial of the pyx, in which are deposited specimen coins. When the coins are weighed into bags at the English mint, two pieces are taken out of each bag, one for assay within the mint, the other for the pyx. The latter are sealed up by three officers and deposited in the chest or pyx. The trial takes place about once in three years by a jury of goldsmiths, summoned by the lord chancellor. The jury are charged by him at the exchequer office, Whitehall, London, in the presence of several privy-councilors, and of the officers of the mint. Being furnished with a piece of gold and silver from the trial plates deposited in the exchequer, they are required to declare to what degree the coin under examination deviates from them. The jury then proceed to Goldsmiths' hall, where assaying apparatus is in readiness, and the sealed packets of coins being delivered to them by the officers of the mint, are first tried by weight, after which a certain number of pieces taken from them are melted into a bar, from which the assay trials are taken. A favorable verdict relieves the officers of the mint from responsibility and constitutes a public attestation of the standard purity of the coin.

## Workshop Notes.

**MAGIC POLISH FOR BRASS.**—Add to sulphuric acid half its bulk of bichromate of potash; dilute with an equal weight of water and apply well to the brass; rinse it well immediately in water, wipe dry and polish with pulverized rotten stone.

**MALLEABLE BRASS.**—The *Metallarbeiter* says that a malleable brass is obtained by alloying 33 parts copper and 25 parts zinc; the copper is first thrown into the pot, which is covered slightly and fused. As soon as the copper is smelted, the zinc, to be free from sulphur, is added, and the alloy cast into ingots.

**TO PROTECT THE POLISH OF METALS.**—Melt one part by weight of best wax paraffine, and when sufficiently cooled, add three parts of petroleum. Mix well together, and apply to the polished article by means of a soft brush. The protecting film need only be very thin, wherefore not too much should be applied.

**TO PREVENT RUST.**—It is well known that the rusting of bright steel goods is due to the precipitation of the moisture in the air upon it. This may be obviated by keeping the air surrounding the goods dry, and a saucer of powdered quicklime placed in an ordinary show case will usually suffice to prevent the rusting of the cutlery exhibited therein.

**SOLDERING CAST STEEL.**—The material employed is pulverized white marble. The two pieces to be soldered are simply heated, rolled in the marble dust, then quickly placed one to the other and hammered. This recipe is due to Mr. A. Fiala, an eminent mechanic of Prague, and was communicated by Mons. G. Bertrand to the *Revue Chronométrique*.

**MARBLE STAINING.**—Marble can be stained different colors by the following substances: *Blue*, a solution of litmus; *green*, wax, colored with verdigris; *yellow*, tincture of gamboge or turmeric; *red*, tincture of alkanet or dragon's blood; *crimson*, alkanet in turpentine; *flesh*, wax, tinged with turpentine; *brown*, tincture of logwood; *gold*, equal parts of verdigris, sal ammoniac and sulphate of zinc in fine powder.

**PAPER FOR WRAPPING UP SILVER.**—Six parts of caustic soda are dissolved in water until the hydrometer shows 20° B. To this solution are added 4 parts of oxide of zinc and boiled until dissolved. Sufficient water must next be added to reduce the solution to 10° B. Next dip paper or calico into this solution and dry. This wrapping will very effectually preserve silver articles from being blackened by sulphuretted hydrogen, which, as is well known, is contained in the atmosphere of all large cities.

**TO WORK HARD STEEL.**—If steel is rather hard under the hammer, when heated to the proper cherry red, it may be covered with salt and hammered to about the shape desired. More softness can then be obtained, if required to give a further finish to the shape, by sprinkling it with a mixture of salt, blue vitriol, sal-ammoniac, salt-peter and alum, made cherry red again, sprinkled with this mixture, and hammered into shape. This process may be repeated until entirely finished. When ready, the steel is hardened in a solution of the same mixture. This method is recommended by prominent workers.

**GALVANIC GILDING.**—Phosphate of soda, 60 grains; bisulphate of soda, 10 grains; cyanide of potash, 1 grain; chloride of gold 2.5 grains; distilled water, 1,000 grains. The water must be divided in three equal parts: I. part, of 700 grains, in which the phosphate of soda is dissolved; II. part, of 150 grains, for dissolving the chloride of gold; III. part, of 150 grains, for dissolving the bisulphate solution and cyanide of potash. The first two solutions are gradually mixed together, and the third is finally added. For this gilding, which is to be used heated, ranging from 122° to 158° Fahr., a platinum anode is to be employed, and fresh portions of gold salt are added whenever the solution is exhausted.

**TO STAIN HORN BLACK.**—To stain horn black, immerse it in a cold prepared solution of 120 parts mercury, 120 parts nitric acid and 500 parts water; rinse it well after 12 hours, and put it for an hour or two into a solution of 15 parts sulphuret of potash and 500 parts water; next rinse. The color is unalterable, although simply upon the surface. To give horn a dark color, polish it with tin ashes and oil.

**DEAD-WHITE ON SILVER ARTICLES.**—Heat the article to a cherry red or a dull red heat, and allow it to cool; then place it in a pickle of 5 parts sulphuric acid to 100 parts water, and allow it to remain for an hour or two. If the surface is not right, rinse in cold water, and repeat the heating and pickling operation as before. This removes the copper from the surface of the article, leaving pure silver on the surface. When sufficiently whitened, remove from the pickle, well rinse in pure hot water, and place in warm boxwood sawdust.

**JEWELERS' SOLDER.**—To make platinum firmly adhere to gold by soldering, it is necessary that a small quantity of fine or 18 karat gold shall be sweated upon the surface of the platinum at nearly white heat, so that the gold soaks into the face of the platinum; ordinary solder will then adhere firmly to the face obtained in this manner. Hard solder acts by partly fusing and combining with the surfaces to be joined, and platinum alone will not fuse or combine with any solder at a temperature anything like the ordinary fusing point of ordinary gold solder.

**EASY WAY OF NICKEL-PLATING.**—It is said that a light coat of nickel can be obtained by heating to boiling a bath of pure granulated tin, arool (crude cream of tartar), and water, and adding a little red hot oxide of nickel. A brass or copper article immersed in the solution, is at once coated with a film of almost pure nickel. If a little carbonate or tartrate of cobalt is then added a bluish color is obtained, which varies in thickness according to the quantity of cobalt used. This method of nickelizing cannot be used for large quantities or vessels, although it is said that it gives satisfactory results for small lots.

**SOLDERING STONE-SET RINGS.**—There are various ways for doing this, but the following will be found to be as good as any: Take tissue paper and tear it into strips about three inches wide, twist them into ropes, and then make them very wet and wrap the stone with them, passing around the stone and through the ring until the center of the ring is a little more than half full of paper, always winding very close, and then fasten upon charcoal, allowing the stone to project over the edge of the charcoal, and solder very quickly. The paper will prevent oxidation upon the part of the ring it covers, as well as protect the stone.

**TO REMOVE RUST.**—The best way to remove rust from pinions is to scour them up with oil-stone dust and oil, till a smooth surface is obtained, then polish with crocus. Care must be taken not to grind the leaves off any more than is necessary, or the proper shape may be destroyed. Some workmen soak the rusted parts in a solution of cyanide of potassium or other solvent of oxide of iron, but the use of such means cannot be approved of. The way described is as good as any, and is safe. If the pinions are very badly rusted they should be rejected and others put in, as they will be out of shape when finished off smooth, and would not perform well in the watch.

**FOCAL DISTANCE OF SPECTACLE GLASSES.**—Place the end of a measure of 30 or 40 inches in length against a smooth wall or other suitable ground, in plain view of some well-defined object a few rods distant, as, for instance, a building or window on the opposite side of the street. Then place the edge of your lens on the measure, and move it backward or forward until a spectrum is formed, or, in other words, until a clear and distinct outline of the distant object is produced on the ground against which your measure rests. This point will represent sufficiently near for all practical purposes the exact focal distance of the lens, and will correspond in inches with the number on all properly marked convex spectacles.

## Trade Gossip.

L. Hammel & Co. have removed to No. 35 Maiden Lane.

E. A. Thrall will remove from No. 1 to No. 3 Maiden Lane.

John M. Goddard will remove from No. 3 to No. 1 Maiden Lane.

Henry May will remove from No. 19 John street to No. 23 Maiden Lane.

S. R. Parlin, of Norwich, Conn., has recently disposed of his business.

C. F. Church has removed from No. 9 Maiden Lane to No. 194 Broadway.

After May 1, S. F. Meyers & Co. will occupy offices at No. 50 Maiden Lane.

S. Dessau will remove on or about May 1 from No. 4 Maiden Lane to Nos. 4 and 6 John street.

Louis Griffith, a jeweler, of Philadelphia, was found dead in his store on the morning of March 24.

Mr. C. A. Fowler, of Fowler Bros., will leave for Europe in the *City of Chicago* April 9, in the interests of his firm.

Henry Fera has leased office and factory facilities at No. 10 Maiden Lane, and will occupy his new quarters about May 1.

C. E. Hastings has just returned from an extensive trip to the Pacific Coast, and reports a better outlook for business.

E. T. Baker, formerly traveling for the Derby Silver Company, has associated himself with the house of Baird & Dillon.

Mr. George R. Collis, well known in the jewelry trade, has formed a connection with the Whiting Manufacturing Company.

A. K. Sloan, of Carter, Sloan & Co., sailed with his wife and two daughters for Cuba on Thursday, 27th, on a pleasure trip.

A Jewelers' Relief Committee has been organized at Birmingham, England, to assist the many unemployed jewelers of that city.

While repairs are being made to the buildings Nos. 41 and 43 Maiden Lane, O. Schwencke will occupy No. 42 Maiden Lane.

L. Straus & Co. have introduced a new line of flowered goods which are exceedingly natural in appearance and very attractive.

Mr. George A. French, representing the diamond importing house of Wm. S. Hedges & Co., sailed for Europe per steamer *Oregon* March 18.

Jacob Strauss, of 25 John street, will remove May 1 to the front offices of the same building, which are more convenient and desirable for his business.

The firm of John A. Riley & Co. has been dissolved by mutual consent, Mr. Charles S. Freer retiring. The business will be continued by John A. Riley.

Messrs. Cox & Sedgwick, accompanied by their wives, are making an extended Southern trip, having been absent about two months. Their speedy return is looked for.

Mr. Albert Wittnauer, for many years associated with J. Eugene Robert, has been admitted to partnership, and the firm will hereafter be known as J. Eugene Robert & Co.

Col. J. M. Rutherford has recently sold at auction the stock of L. Luckhardt, Jr., of Johnstown, Pa. Mr. Luckhardt removes to Montana, where he will resume the jewelry business.

Scotch jewelry is gradually making its way in Paris and has become fashionable. Two shops have already been opened for the exclusive sale of this well known style of jewelry.

Oppenheimer Bros. & Veith have purchased the balance of the stock of the Lancaster Watch Company, consisting of the regular movements formerly manufactured by this Company.

The Gorham Manufacturing Co. and Le Boutillier & Co. have taken the store 9 Maiden Lane, and will open it about May 1 as a show room for the convenience of the down-town trade.

The Whiting Manufacturing Co. have removed their salesroom to the corner of Union Square and Sixteenth street, where they have refitted the store in a very handsome and tasteful manner.

The co-partnership of M. Fox & Co. has been dissolved, Mr. James Graves retiring. The business will be continued by Michael Fox, Charles J. Fox and G. Louis Fox, under the firm name of M. Fox & Co.

"Hammered silver is all the fashion now-a-days. Have you any?" "Why, yes. That is, my silver is hammered out of me every rent day, and what is left the butcher and baker take. Hammered silver is no novelty to me."

Mr. Samuel Joel, for fourteen years associated with Lissauer & Sondheim, died of consumption February 22, in the 39th year of his age. He was well known in the trade, and was highly respected by a large circle of acquaintances.

Tunis is becoming quite an important market for jewelry. From the 13th of November to the 12th of December last, that is, in the space of a single month, jewelry to the extent of 141,035 francs has been imported from France alone.

The firm of Leroy C. Fairchild & Co. has gone into liquidation, and Leroy C. and Harry P. Fairchild have been admitted to partnership with their father, and the new firm will be known in the future as Leroy W. Fairchild & Sons.

The co-partnership of Wm. Daue & Co. has been dissolved by mutual consent, William Daue assuming the liabilities and continuing the business. Thomas Wilkinson, who has long been identified with this house, will remain with Mr. Daue.

The prize of £50 so generously offered by Mr. A. Fischer, of London, for the best "Essay on the Going Barrel," has, by the unanimous vote of the judges, been awarded to Mr. J. Herrmann, and the publishing of the essay will soon commence.

Goodman Brothers have leased the premises No. 27 Maiden Lane, and will commence business April 1 as importers of diamonds and manufacturers of diamond jewelry; they were formerly associated with the firm of Grinberg, Goodman & Pollack.

Louis Strasburger & Co. are disposing of their entire stock of watches, intending in the future to devote their time and attention more especially to the diamond trade. Mr. Strasburger will sail for Europe in a few days in the interests of his firm.

Wilbur H. James, the great confidence operator and forger, was arrested in Boston this week, and taken to St. Paul, Minn., by Myers & Finch, whom he had swindled out of several thousand dollars. The Pinkertons have been on his track for some time.

Two companies for the importation and exportation of jewelry have recently been formed in Paris, each with a capital of £20,000. They trade under the following names: L. Lartigne & Co., Rue Richer, 22; and Levi, Lion & Co., Rue des Pettites-Ecuries, 13.

G. W. Smith, jeweler, of Rolla, Mo., has in his possession two old musical clocks; one with two cylinders playing 16 operatic airs. The other has 3 cylinders, playing 30 airs. Both clocks are good eight day timekeepers. Mr. Smith does not know the age of either.

From a sample of gold quartz made up into a locket by Levison Bros., of San Francisco, that we have seen, we are not surprised that tourists to California create a large demand for this class of goods. It makes a very handsome ornament, and one possessing much intrinsic value. The natural products of that auriferous State have made many desirable additions to the forms and styles of personal ornaments.

Since the introduction and development of the "Cleveland" diamond, there seems to have grown up a rage for large stones in the rough. H. Muhr's Sons, of Philadelphia, have obtained a stone that weighs 130 karats which they are preparing to have cut. D. L. Van Moppes, of this city, has lately received a stone from Europe weighing 190 karats. This is said to be the largest diamond ever brought to this country.



The E. Howard Watch and Clock Co., the Willemin Watch Case Co., and W. & S. Blackinton have, in combination, rented an office at No. 100 State street, Chicago, and Mr. Sol. Kaiser, well known to the Western trade, will have charge of their interests in that city.

After a man has settled for twenty-five cents on a dollar, it must be very aggravating to hear of his entering business again and selling goods which he paid one-quarter price for, at a price which competitors cannot meet. The manufacturers are not quite so free about credits as they were a year ago.

Valuable deposits of manganese are said to have been discovered near Batesville, Ark. The manganese was first discovered on a tract of 1,200 acres of land entered at \$1.25 per acre before the discovery. The manganese belt, or district, is estimated to be about twelve miles long. The ore occurs in pockets, and is an "oxide running from 40 to 65 per cent. of metallic manganese."

The "Claustra" pin introduced to the trade last fall by A. Luthy & Co., has met with decided approval and promises to have a successful run. Among new designs in this self-locking pin for the spring and summer trade, are the enameled flower pins, which, when worn, appear as though the stem of the flower ran through the fabric, after the fashion of a natural flower or *boutonniere*.

The *Marquette Mining Journal* says that the Michigan Land and Iron Company has given out over fifty options for leases during the past two weeks to parties who will explore for gold and silver, and still the demand is for more. Next spring, it is believed, will witness such a scene of activity in the way of exploration in Marquette and Baraga counties as was never before seen in the upper peninsula.

Attention is called to the interesting assortment of coin jewelry to be seen at Messrs. Unger Brothers, 9 Maiden Lane. The coins made by this company represent genuine antiques dating back to 700 B. C., and are well worth a visit of inspection. Artotypes taken from casts will give out of town dealers a fairly good idea of the extent and value of this collection, and are given as samples of the coins.

The French Consul General at Quito (Ecuador), writes to the *Moniteur* that there is a demand for the cheaper classes of jewelry in that country. The trade seems to be in the hands of Germans, who can sell cheaper than the French houses. He recommends Messrs. Albert Breille, and Gelvin et Granadas, at Quito; and Maulme et Fornot, at Guayaquil, as good houses dealing with jewelry.

The platinum mines of the Ural Mountains, in Russia, now supply the world with that metal. It is shipped first to dealers in France and England, where it brings about twenty-eight dollars per pound of pure metal. It is necessary to refine it carefully; in the crude state it consists, according to recent analysis, 75 of 1 platinum, 1 1 palladium, 3 5 rhodium, 2 6 iridium, 6 osmiridium, 2 3 osmium, 4 gold, 1 copper, 8 1 iron.

The *Illustrated London News* says that it is well known that the most splendid pearls in the world belong to Madame Gustave de Rothschild, and that the historic rubies of the house of Nassau are owned by Madame Nathaniel. Madame Euphaussi also has some magnificent rubies; and Mrs. Mackay has an enormous one, for which she paid £12,000 to Boucheron, of the Palais Royal. The Duchess of Edinburgh and the Prince de Bearn also have splendid sets of rubies.

All the Swiss papers report a most unsatisfactory state of affairs in the watch trade. The new year brought no improvement on the bad business of last autumn. Failures and compositions seem to attract all the attention for the present, and throughout the trade there is a most uneasy feeling. The *Pays* of Porrentrug says: "A large concern has just stopped payments in Chaux-de-Fonds, and it is feared that another large establishment in the Jura is seriously affected by this failure." The crisis seems to be as general as it is disastrous. At Bienne the situation is equally grave, and three establishments are reported to have reduced their prices by 25 per cent. The same cry comes from Lode.

According to late advices it is estimated that there were over 20,000 unemployed working men in Birmingham. It was also stated that the brass founding, gun and jewelry trades were the most distressed, thousands of working men in them being unable to obtain employment. The gun trade, both military and sporting, was said by some gunmakers to have entirely left the country, while the jewelry trade was described as never having been in a condition one-tenth as bad as at present.

It is well known that for some time past the silver case trade has been in a very unsatisfactory condition. A movement is on foot in this city among manufacturers and jobbers having for its object the securing of a better understanding among all parties in interest, and the establishment of a scale of prices for the different grades of cases that will leave a small margin of profit to at least some one engaged in handling this class of goods. The outlook at present promises well for the establishment of a harmonious understanding in the matter.

The American Watch Company petitioned the Massachusetts Legislature at the commencement of the session for a change of corporate name to that of the American Waltham Watch Company, and the latter asked permission to increase the capital stock of the Company, which is now \$1,500,000, to \$4,000,000. The Legislature, having by a special committee carefully investigated the business of the Company, passed the bills granting the petitions of the Company, so that the capital stock will immediately be increased in accordance with the privilege granted.

Ground will be broken in a short time at the southwest corner of Broad and Race streets, Philadelphia, for the erection of a large and imposing building for manufacturing purposes, as the property of Simon Muhr, of the firm of H. Muhr's Sons, diamond merchants and jewelry manufacturers of that city. The building, which is in the form of the letter L, will be six stories in height, with a basement. It will have a frontage of 100 feet on Broad street and 140 feet on Race street, with a width of 45 feet, and a wing at the west side of the lot of the same height, 54½ feet in length and 45 feet in width.

A watch, to obtain the highest possible certificate, class A, especially good, from the Kew Observatory, must satisfy the conditions of a very severe ordeal lasting 45 days, and during that time the hands must not be touched. The watch is hung up and laid down in every conceivable position, and placed in ovens at a temperature of 85° and in refrigerators at 40° Fahrenheit. Should the mean variation be more than two seconds in its daily rate during the period of the tests, the watch is either returned to its owner or an inferior certificate is awarded. Mr. G. M. Whipple, the Superintendent of Kew Observatory, has lately reported the noteworthy fact, as indicating the high degree of excellence to which the science of horology has arrived, that a watch not specially constructed for the purpose and of moderate price, carried off the highest honor, by not showing a mean variation of three-quarters of a second in the daily rate, though tested as just stated.

Probably the most wonderful timepiece ever heard of is a timepiece described by a Hindoo rajah as belonging to a native princess of Upper India. In front of the clock disk was a gong, swung upon poles, and near it was a pile of artificial limbs. The pile was made up of the full number of parts for twelve perfect bodies, but all lay heaped together in seeming confusion. Whenever the hands of the clock indicate the hour of 1, out from the pile crawled just the number of parts to form the frame of one man, part joining itself to part with quick metallic click; and, when completed, the figure sprang up, seized a small mallet, and walking up to the gong struck one, the first hour. When 2 o'clock, two men rose up and did likewise; and so through all the hours of the day, the number of figures being the same as the number of the hour, till at noon and midnight the entire heap sprang up, and, marching to the gong, struck one after another, each his blow, making twelve in all, and then fell to pieces again.

Perhaps this was the cause of the dull jewelry trade in 1884. Conversation in a jewelry store: "What are you buying now?" "I am looking for some present to give my wife on her birthday. I tell you, making presents costs a heap of money." "Why don't you do as I do? I have never failed to make my wife a present on her birthday every year for twenty-five years, and I am not out a cent thus far." "How do you manage it?" "It is very simple. After we were married, when her birthday came around I gave her a \$20 gold piece. When my birthday came around she gave me the \$20 piece back, and we have kept that up ever since, and neither of us is out a cent."

The annual report of the Leipsic Chamber of Commerce furnishes the following trade information: The watch business is unimportant. Orders come from abroad for cheap goods, but at prices which render business impossible. High class work is well sought after for local requirements, but the style does not suit foreign buyers. Clocks in unpolished oak cases and decorated with various antique coins in polished copper sell well, this article being a specialty of Leipsic. The prices are low and the work fair. The same report also states that Leipsic is gradually superseding Paris in the manufacture of gilt bronzes. A large number of clocks were sent from Leipsic during the year to England, Italy, Russia and Holland; Belgium is also commencing to draw supplies from there.

Says the Boston *Advertiser*: "A French traveler from Stamboul tells a wonderful story of the sights he saw. There were two thrones, one of enameled gold, with incrustations of pearls, rubies and emeralds. Also two caskets studded with rubies and diamonds, in which hairs from the Prophet's beard are jealously preserved. One room was hung with armor and scepters; caskets and escreteires lay on the table. In another room are the costumes of all the Sultans down to Mahmoud II. Each of the costumes has a silk scarf attached, together with a magnificently chased dagger and a diamond aigrette. Finally, the sacred treasure, consisting of the relics of Islam, the mantle and standard of the Prophet, his sword and bow; the swords of the first Caliphs, and the oldest manuscripts of the Koran.

Some time since Alfred Pettit and others were indicted in Newark, New Jersey, for larceny and receiving jewelry patterns from Miller Bros. Alfred Pettit has just been convicted of the crime as charged and sentenced to the penitentiary. According to the evidence in the case, Pettit was solicited to steal from Miller Bros., and did steal various original hubs and jewelry patterns of expensive, artistic and salable character, and took them to a rival firm of manufacturing jewelers. In this manner the stolen patterns found their way into the market in competition with the originals that had been honestly paid for. It is now a question to what extent dealers may be held responsible as receivers. It is a great satisfaction that this species of thievery has met the decided check of "Jersey Justice." We congratulate Miller Bros. and honest manufacturers generally upon this result.

At the last meeting of the League, complimentary resolutions were adopted recognizing the efficient manner in which the retiring President, Mr. Gilbert T. Woglom, had discharged the duties of his office during his incumbency. A committee, consisting of Wm. L. Sexton, Secretary and Treasurer of the League, T. L. Parker and B. W. Ellison, was appointed to have the resolutions properly engrossed and presented. A few days since the Committee invited Mr. Woglom to lunch, on which occasion Mr. Parker formally presented the resolutions in a pleasant speech, in which he especially commended the ability, unselfishness, sincerity and faithfulness with which Mr. Woglom had directed the affairs of the League. Mr. Woglom responded in a brief and becoming manner. The resolutions are handsomely engrossed in album form, and are unique as well as attractive in their arrangement.

The *Watchmaker, Jeweler and Silversmith* furnishes us several items of news this month. Among other things, it says, that Parisian gentlemen of taste wear now very little jewelry, but that little of good quality. For pins, a good stone, sapphire, pearl or turquoise, surrounded by small brilliants are the favorites. Rubies and emeralds are considered too showy, particularly for day wear. Two rings are worn on the small finger of the left hand. They are made rather heavy in mat gold, one of them plain, the other with a colored stone in the center and a brilliant on each side. Watch chains are worn short and without appendages. With evening dress no chain is worn at all, although a good gold watch or chronometer in the waistcoat pocket is *bon ton*. Two studs only are worn in the shirt, also in colored stones with small brilliants.

Insurance on jewelry, in and out of safes, has always been a favorite investment for the companies in this city, and has paid remarkably well thus far in the history of local underwriting. In the block on each side of Maiden Lane, between Broadway and Nassau street, there is an enormous concentration of valuable jewelry stocks, and the rates have been fairly maintained at thirty-five cents, although there is an occasional cut to thirty cents. The English as well as the large American offices have been in the habit of writing very freely on these risks, and we do not doubt that the aggregate writings of some of the larger companies have amounted to almost a third of a million dollars. It is not surprising, therefore, to learn that a movement originating in English offices is in progress to materially reduce the lines as well as to advance the rates.

The American Watch Company is to make an extensive exhibit at the coming International Inventions Exhibition, which is to be held in Horticultural Gardens, adjoining Kensington Gardens, in London, England, beginning the first week in May. Mr. Bedford, who represents the Company in London, has secured a liberal and desirable space for the exhibit, and no effort will be spared to make it the most interesting feature of the exhibition. The bench to be used is 26 feet in length, and is double, that is, it is just twice the width of those commonly in use at the factory, so that the hands can work on both sides and are to sit facing each other. The tools forwarded are nearly all automatic in their action, and embrace a number that have never been seen outside of the Waltham factory, having been invented, perfected and used there and nowhere else. Among them are the following: Automatic screw machine; automatic roughing out machine; automatic machine for making dial feet; automatic machine for drilling and tapping the screw holes in the rim of the balances; automatic staff lathe; automatic leaf polishing machine; automatic staff polisher; Marsh's automatic scape cutting machine; machine for cutting teeth in train wheels; automatic bevel wheel cutting machine; automatic pinion cutter; one jobbing lathe, with all of the modern appliances and improvements. There will also be a number of machines for sharpening cutters, all being thoroughly fitted up. The exhibit will be under the supervision of Mr. Charles S. Burnham, assisted by Mr. Fred Mann, who have already sailed, and will receive and place the machinery in position. The workmen and women to operate them will sail in the *Scythia* April 18. In addition to the practical exhibition of machinery at work, the Company will make an extensive display of the various kinds and grades of watches manufactured by it. The cases containing the tools were shipped from Boston a few days since by the Cunard steamer *Cepelonia*. This exhibit will be one well calculated to open the eyes of old world watchmakers to the magnitude of that industry in this country, and to the degree of perfection it has attained. It will also have a tendency to open up a more extended foreign demand for the products of the American Waltham Watch Company.



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## THE JEWELERS' CIRCULAR AND HOROLOGICAL REVIEW

*The recognized organ of the Trade, and the official representative of the Jewelers' League.*

A Monthly Journal devoted to the interests of Watchmakers, Jewelers, Silversmiths, Electro-plate Manufacturers, and those engaged in the kindred branches of art industry.

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### Business Quiet but Promising.

THE PERSISTENCY with which winter lingered in the lap of spring was well calculated to retard business enterprise, and such was the actual fact. March was the coldest and most disagreeable March that has been known for many years; it was characterized by prolonged storms of great severity, accompanied by heavy snow falls, that seriously obstructed many of the western railroads and rendered ordinary roads impassible. In the great cities great discomfort prevailed, and sickness was abundant. Such weather could not but prove discouraging to business men who were forced to defer their new enterprises till more fitting occasion. A month of business has, therefore, been lost, and whatever of improvement was promised by the conditions earlier in the year, was postponed. Notwithstanding the general dullness in most lines of business, there has been a most encouraging movement of breadstuffs from the localities of production to the seaboard, and something of an improvement in prices. The disturbed condition of affairs in England—a threatened outbreak with Russia, the war in the Soudan and the Irish troubles—tended to keep Europe in a ferment. England was forced to put many troops in the field, and to prepare to maintain them on a war footing. As a consequence an increased demand arose for American products, under the stimulus of which prices advanced slightly and became decidedly firmer.

A noticeable characteristic of transactions thus far this year has been the lack of speculative excitement. Ordinarily rumors of war-like disturbances in Europe would have been the signal for the wildest speculations in American staples and everything related thereto, but the reverse has been the fact in this instance. Speculators were probably not pleased with their recent experiences and

are satisfied to wait awhile before taking extraordinary risks. Then, too, many of those amateur speculators who, in times of excitement, take "a flyer" in the markets, were so badly burned during their late experience, that they have no stomach at present for further ventures of this kind. Many things have tended to keep speculation down to the minimum, which is always a good thing for legitimate business. With the advent of pleasant weather, following a long, dreary and trying winter, there was a quiet but steady improvement in general business; April showed an improvement over March, and May is expected to be still more favorable to business enterprises. The reaction from the exceeding depression of the past two years cannot be much longer delayed. The country never was richer in products of all kinds than it now is, and there is a plethora of money in the market to be had at low rates, with which to move these products and to establish new business enterprises. Nothing is wanted to secure a season of universal prosperity but general confidence in the condition of affairs and their stability. That is coming by degrees. After the bitter experience of past years, public confidence is a quality of slow growth; yet, as it is an essential to success, every business man is inclined to do all he can to promote it.

There is little to be said specially regarding the jewelry trade—it is waiting for its opportunity, and, like every other industry, is fully prepared to take advantage of the first symptom of returning prosperity. It must possess its soul in patience; it is simply one of the factors that go to make up the great volume of national commerce, and an integral part of a body cannot move faster than the whole. It cannot be forced out of its position, nor surround itself with conditions that do not apply to the entire commercial body. When all branches of business become prosperous the jewelry trade will share in that prosperity, but it cannot work up a special "boom" of its own. All branches of business are interdependent, but comparatively few recognize this fact; a more general study of the science of trade and commerce would enable business men to forecast the future with better results to themselves, and show them how dependent one class is upon another. In concluding this brief summary of the business outlook, we can not do better than to recall what we wrote months ago, which was, briefly, that the earlier months of the year would see some slight improvement in business, but it would not be until the last half of the year that any decided increase in the volume of sales would be noted; we anticipate a good fall trade, and a volume of business for the year that will greatly exceed that of last year. Patience and ready watchfulness, with thorough preparation for any emergency are the requisites of the hour.

### Cutting Prices.

IN TIMES of business depression there is always a tendency in the trade to cut prices. A manufacturer who has considerable sums of money tied up in his products becomes anxious to realize on

them, impelled thereto, possibly, by maturing obligations, and so he attempts to force his goods upon an inactive market by cutting the prices. The jobber, who finds his stock in excess of the demand, cuts prices down to cost in the hope of enticing buyers to take them off his hands. Retail dealers follow in the same line, regarding no sacrifice as too great that brings them in ready money. This is a most reprehensible practice, and is fraught with evils that reach far beyond the present. Some immediate returns may be gathered in this way at times, but it is always at the expense of future business. Any attempt to force a market is demoralizing. A cut of ten or fifteen per cent. is but little temptation to buyers and will not create a legitimate or responsive demand. No consumer will buy what he does not want simply because he can obtain it at one season a very little cheaper than he can at another, nor will a wise dealer load down his shelves with unsalable goods to oblige a jobber or manufacturer because the price has been cut a few cents on the dollar. He knows that the cut is made because the cutter needs money, and that however pertinacious he may have been in selling the goods, he will be equally so when the time for payment comes around.

But one of the most far-reaching evils of the price-cutting practice is found in the fact that when the price of standard goods is once reduced, it is almost impossible to re-establish it; on the contrary, having been once cut there is constant apprehension that a still further reduction may be made at any moment, and he who loaded up at the first reduction is liable to find his competitors underselling him with the same goods bought at lower figures than he paid. Standard prices for standard goods are the most satisfactory to dealers at all times. They then know precisely from month to month and year to year what they must pay for their goods, and have the further assurance that no one else is getting them for a less price. Dealers are jealous of their reputations for selling goods as cheaply as any one in their community can afford, but when they know that manufacturers and jobbers are constantly reducing their prices, they can never feel certain that a rival has not bought his goods for less than they and so be able to undersell them. Dealers much prefer standard prices that will yield them a fair chance for profit than constant fluctuations. They base their calculations upon a percentage of profit on each article sold, and if the cost price is small, of course their profit is small. In some recent notable cuts in prices, some prominent retail dealers vigorously protested against them, claiming it was cutting off a portion of their profits, and that they would prefer to pay more for the goods in order that they might charge more. It makes quite a difference to them whether they get ten per cent. on an article that costs \$10 or the same percentage on the same article when the cost price is \$15.

From every point from which it can be viewed, the frequent cutting of prices of standard goods is demoralizing to the trade. When a manufacturer reduces his prices the impression goes out immediately that he makes the sacrifice because he needs money badly, and that a further reduction may be looked for. Price cutting works injury to all classes interested in handling the goods, involves the sacrifice of a fair profit not only temporarily but continuously. It is invariably followed by special exertions to dispose of the goods, and when these efforts are attended with success, as they sometimes are, the result is an overstocking of dealers, causing them embarrassment and loss. There are times when a manufacturer is forced to cut his prices in order to compete with another who preceded him in the reduction, but it will be found on investigation that price cutting originates with pecuniary embarrassment or over-production, and when once the standard is broken there is no predicting to what extent competition may force prices down. We have had numerous illustrations during the past year of cut after cut being made in the prices of standard goods; one manufacturer commences with a reduction of ten per cent., another follows with a cut of fifteen, another with twenty, and so the rival manufacturers continue to slaughter each other and the trade in general till the margin of profit is all cut away. Then comes degradation of quality, reduction of wages to

workmen, and a long struggle to keep the cost of manufacture within the selling price. It would be far better for all parties interested if manufacturers would establish their prices at the outset on a basis that would afford a fair profit to all who handle their goods, and maintain those prices to the end, giving no rebates or special discounts to favored dealers, but permitting all to obtain them on equal terms.

### Sacrificing Quality to Price.

A LIBERAL buyer recently said to a manufacturer: "I cannot afford to buy your goods any more, for I can obtain the same articles from another manufacturer at considerably less price." "Hold on, my friend," said the manufacturer; "you are certainly mistaken. I can buy gold, silver and labor as cheaply as any one, and I know the goods I sell cannot be placed on the market for a less price than I charge. If you are getting similar goods at a lower figure, you certainly are not getting as good quality." "I don't know about that," said the buyer, "but your competitor says his goods are the same as yours." "Well, suppose we test the matter right now. Take an article of his and a similar one of mine and assay them; let me know the result and charge the cost of the experiment to me." The buyer accepted the offer, and the assay showed that while one make of goods assayed full 14 karats as warranted, the other, claiming to be the same quality, assayed but 11 karats. No wonder the latter could be sold for a less price. A simple calculation showed that the cheaper quality paid the manufacturer a larger profit than the manufacturer of the better quality of goods obtained from his. In short, one quality was what it pretended to be while the other was a fraud, made so with malice aforethought, and for the deliberate purpose of robbery. This seems like pretty hard language to apply to transactions of this nature, that are all too common in the trade, but we would like to know wherein lies the difference between selling 11 karat goods for 14 karats, and a paste diamond for a genuine gem. The man who would do the latter would be regarded as a swindler, and, if prosecuted and convicted, would be quite sure to find his way to State Prison. Fraud is fraud, and, no matter under what specious disguise it may be concealed, the essence of a criminal transaction is still there. The man who sells his goods by representing them to be of a better quality than they really are, is liable to a criminal prosecution for obtaining money by false pretences. But adulteration and degradation of quality is so general in all productive industries, and prosecutions are so seldom undertaken, that unscrupulous men have come to deal in adulterated articles exclusively, and to make a regular business of preparing the materials necessary to successfully adulterate their goods. There is a factory in Brooklyn that is devoted exclusively to grinding up cocoanut shells and the like to make a powder for the adulteration of all kinds of ground spices. Books are printed containing recipes for adulterating wines and liquors, and chemists devote their time to devising cheap compounds for reducing the quality of costly articles so that they can be sold at a low price. It is not at all surprising that the jewelry trade, which offers so many temptations for fraud, should be subjected to the wiles of designing men. But the worst of it is, the baleful influences of such deceptions are so widespread, and competition is so active, that some of the old established houses have fallen into the habit of shading the quality of their goods, and lowering the represented standard by a karat or two. Dealers encourage this sort of thing by their demands for low priced goods; quality is a secondary requirement to novelty, attractiveness and cheapness. Let two rival manufacturers offer to a dealer two samples of goods identical in design and appearance, the one being *warranted* 14 karats fine, and the other *said* to be of the same quality, but the price being ten or fifteen per cent. less, and nine times out of ten the dealer will take the cheaper article. At the same time he knows from the price that it cannot be what it is rep-

resented, but it looks as well as the other and will sell more readily. Yet the dealer is here working against his own interests, for he gets the same rate of profit on the cheap goods as he does on the more costly ones, and the latter would, of course, bring him more money than the other, and, consequently, more profit; if he makes ten per cent. profit on an article that cost him \$5 he makes fifty cents; on a \$10 article he would make twice as much; he would have little more difficulty in selling it, he and the buyer would be better pleased, and the dealer would have an easy conscience. There is scarcely anything that enters into a jeweler's stock that does not have to compete with similar goods of a degraded quality. Whatever is new and attractive will soon be copied in debased metal at a lower price, and the more the dealers buy of it the greater is the temptation held out to manufacturers to degrade their goods. We could cite many instances where the manufacture of certain articles of good quality has been broken up by the introduction of base imitations, claimed to be equally good, but sold at a price that precludes the possibility of their being up to the standard represented.

We have many complaints from retail dealers to the effect that they are the victims of the manufacturers in this respect; while there is some truth in this—the manufacturers of bogus goods are always the most active and persistent in selling them—we are inclined to believe that the responsibility for this evil is about equally divided between manufacturers and dealers. The latter are constantly holding out temptation to the former, and the former rather enjoy being tempted. "I was tempted to steal dem chickens an' I couldn't help it," said an ancient negro to the magistrate. "But you must not yield to temptation," replied the Judge. "What's der good ob the temptation if yer can't yield to it?" said the darkey, but he got sixty days all the same. So the constant clamor of the dealers for cheaper goods induces manufacturers to make them regardless of standard, and even deceptive in their representation of quality. Jobbers order goods of low grade made in quantities, but stipulate to have them marked to indicate a finer quality than they really are. It is not the retail dealer who is defrauded by transactions of this nature, for he knows what he is buying and can judge very nearly the quality by the price, but the one who buys it from him is the victim. True, he may pay but a 14 karat price for a ring stamped 18 karats, but he is none the less deceived, and would have a good cause of action against both the dealer and manufacturer.

"What are you going to do about it?" asks an anxious inquirer, in the language of Boss Tweed. Nothing can be done that we can see, except to educate the public and the business community up to the recognition of a higher standard of commercial honor. When a business man's guarantee, either verbally or by the marks upon the goods of his production, can be accepted as a positive warranty of quality, the evils of degraded standards will be overcome. But the millennium is not upon us yet, and commercial integrity is still considerably below par. If there could be a few criminal prosecutions for misrepresentations of quality, accompanied by the punishment it deserves, it is probable that they would act as a deterrent, but that honesty that is enforced simply through fear of punishment is not to be trusted, nor is it desirable to have in the community. Robbery done in secret, and that is winked at by all classes, is far more demoralizing than that which, with pistol in hand, cries "stand and deliver." It is insidious and corrupting in its influences, blunts the moral sense and degrades the man. More thorough enlightenment as to the ethics of commercial honor and business morality is calculated to work a cure of the evil referred to.

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#### Auction Goods.

THAT THE American people delight in being humbugged, not to say swindled, is a fact that was commented on by a great "moral showman," who has done his full share of business in that

line. But the method of humbuggery most fascinating to the average mind is that which is so thinly disguised under the title of auctions. Americans, in this respect, are a conglomeration of "Mrs. Toodles," to whom there is an excitement and temptation about an auction sale that is simply irresistible. They go to an auction for excitement and recreation, and buy things recklessly, not that they know their value or that they need them, but because there is an infection in the atmosphere that allures them into bidding. It is wonderful, too, the degree of credulity shown by the congregation in an auction room. Every word the auctioneer utters is accepted as Gospel truth, when, as a matter of fact, the auctioneer may be a perfect stranger, a liar by nature and inclination, and well paid for lying on this particular occasion. Men without reputation or character cater to this insane desire of the people to get "auction bargains," and in the large cities hundreds of auctions are progressing daily, the sales embracing every description of property that offers an opportunity for profit. Some of these, of course, are legitimate sales of valuable property, but nine out of ten are deceptive and fraudulent in their character, calculated to deceive the unwary and profit the promoters.

The jewelry trade is cursed with a number of peripatetic swindlers of this kind, who go about the country selling cheap jewelry, plated ware, etc., by misrepresentation and fraudulent deception. There is one gang that makes a specialty of silver plated ware of all descriptions. They go from place to place advertising a bankrupt stock for sale, announcing that the goods are the productions of the best makers, whose names are well known, and proclaiming "a great sacrifice." The auctioneer, a stranger, paid for lying, guarantees every article to be of the very best quality, gives the name of the maker, states a wholesale list price for each piece and then proceeds to sell at a "slaughter." Now, as a matter of fact, these goods are made expressly for this business; they are of the very lowest grade of plated goods that can be made; the names stamped on them are either bogus or are imitations of the names of reputable manufacturers, sufficient change being made in the spelling to avoid prosecution for fraud; they look bright and tempting, but a very short time will suffice to obliterate every vestige of plate and leave the base metal fully exposed. They are such goods as no reputable dealer will handle under any consideration, but if asked to duplicate any article in the stock would do so for a less price than the auctioneer usually gets for it. But the glib-tongued auctioneer is loaded up with persuasive language; long practice has made him familiar with audiences of this kind, and he knows just how to tickle their fancy and make a good profit on every article sold. Everything about such a sale is a fraud, from the quality of the goods to the statements of the auctioneer. That this is so is proved by the fact that factories are employed all the time making the goods, which would not be the case if "the sacrifices" were genuine; that there is a profit made on the goods is proof positive that the statements of the auctioneer are false and the goods fraudulent.

A sale of this kind in an ordinary country city or village, will serve to demoralize the silver plate trade for a year or more. Goods of intrinsic value in the hands of local dealers are compared with those of the auction "fakir," and, as the public cannot see the difference between the good plate and the bad, the dealer suffers in the comparison. Citizens load themselves down with the base material and have no money to spend for reliable goods for some time to come. This is a very great injustice to the local dealer, and he has abundant reason to complain of the treatment he receives at the hands of his fellow citizens. He is a resident among them; a property owner; pays his share of taxation, contributes to charities and all public improvements, and does all in his power to add to the prosperity of the community of which he is a member. The money he receives for his goods is largely spent among the merchants and tradesmen of the place, who are morally bound to reciprocate the obligation by buying of him such goods as he may have that they desire. The auctioneer, on the contrary, shares none of the obligations of citizenship; he is a strolling vagabond, seeking opportunities

to perpetrate fraud; his ambition is to get in all the money he can, spend as little as possible, and get away with as much as he can get hold of; he leaves behind nothing but a lot of bogus goods that the local dealer could duplicate for less money than the auction dupes paid for them. In no view of the case is the peripatetic auctioneer a benefit to any place he visits, and he should be spurned by every respectable citizen as an adventurer and a swindler. Years ago, in this city, the Mayor used to station a policeman in front of these mock auction places to warn strangers against them; this course would hardly be possible in country places, but local dealers can do much to break up the evil by advertising them in the local papers whenever they announce their coming, or by the distribution of handbills cautioning the public against them, and exposing the worthless character of their goods. Reputable manufacturers do not send out their goods to be disposed of at auction. In the first place they cannot afford to sell trustworthy goods at such prices as are obtainable in a motley auction room crowd, and then their relations with local dealers will not permit them to enter into competition with them even if remunerative prices could be obtained. Honestly made silver plate or jewelry is not found in auction sales of this character. Occasionally a bankrupt sale of legitimate stock is necessary, but these are always conducted in a manner and by individuals that guarantee the genuineness of the sale. Such sales are bad enough in the trade, and are always avoided if possible, but the traveling "fakir" and his gang have nothing whatever to commend them, and can only be classified among the frauds. We wish it were possible to bring these facts before every community in the land, but lacking this ability ourselves, we shall be glad to aid local dealers in exposing them. They can do the work better themselves if they will but co-operate to that end, and whenever an auction of this kind is announced, deluge your fellow citizens with circulars and handbills exposing the fraudulent character of the goods offered. They are cheap, worthless auction goods, like Hodge's razors, "made to sell," and the purchaser is the worst sold of all interested.

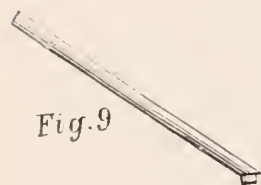
### The Adjustment of a Four-Jewel Cylinder Watch.

[By G. VOGET, in *Allg. Journal d. Uhrmacherkunst.*]

*Continued from page 78.*

THE FOURTH wheel depthing is the first one subjected to an examination. Before attempting this, however, it is necessary to know whether the scape wheel stands straight.

Ordinarily the scape wheel is uprighted by broaching the foot pin holes obliquely, and bending the foot pins over to the required side. A shaky bridge is generally the result of this operation. Nor would I advise the stretching of the bridge in case the wheel inclines over behind.



By the use of the punch shown in fig. 9, which I have made for my own use, it is possible to drive the bridge in any desirable direction without in the least jeopardizing its firm position.

Mount the bridge upon the plate, and place the latter upon the work bench against the projecting ledge. The short shoulder of the punch (which must not be longer than the thickness of the bridge), is set into the screw hole, and a tap upon the punch, according to the resistance of the foot pins, will force the bridge over in the desired direction.

When the scape wheel stands vertical to the plate, its free motion is looked into.

With perfectly mounted jewel holes, the pivots of the scape wheel, when measured with the pivot gauge, should be from  $1\frac{1}{2}$  to 2 degrees smaller than the size of the jewel hole. Obliquely mounted jewel holes render timing very difficult, although the defect is only

in rare instances so bad that it would become necessary to improve the setting or substituting another jewel. Recourse is had in this instance to making the wheel free, by making the pivot 2 degrees, either scant or full, smaller than is indicated as the width of the holes by the pivot gauge. Jewel holes that are either too wide, cracked or chipped, should unconditionally be substituted by better ones.

Still other defects may contract the freedom of motion of the scape wheel. Its teeth may scrape in the recess of the plate or in that of the scape wheel bridge. This is found out by placing a liberal quantity of rouge on a few teeth, whereby the unduly small recess is ascertained. The points of the pinion leaves may also rub in the funnel-shaped recess of the plate. Defects of this nature are apt to cause serious equivocation in the examination of the depthing. It is advisable, therefore, to first arrange the free motion of the scape wheel.

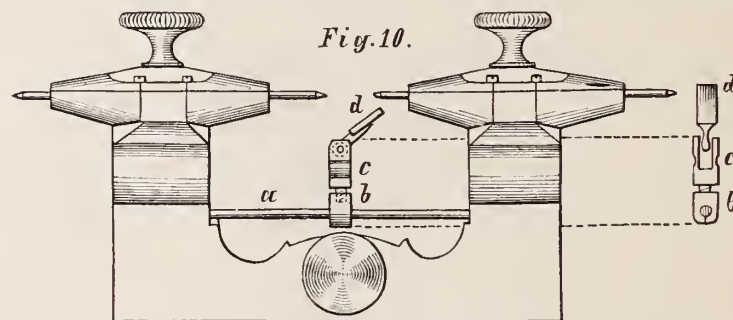
When both pivots and holes are well set in order, the wheel should continue in motion for a short space of time if the repairer blows his breath against it, and when finally it is about to come to a rest, it ought to move to and fro, similar to an unpoised balance.

If, however, the wheel stands still with a sudden jerk, there is still a defect to be remedied somewhere. When found and set in order, the examination of this depthing may be commenced.

If the depthing passes through smoothly on the plate, it may be presumed that it is good, although it is not by any means certain—except the wheel teeth and pinion leaves are well made. If, for instance, the wheel teeth are broad and the depthing stands shallow, it will pass through well, but it is no good durable depthing.

This depthing, which is entirely covered from view, should in the adjustment be invariably tried in the depthing tool, in order to ocularly observe its performance.

A depthing tool with the small mirror attachment (fig. 10), which



I made for my own use, renders excellent services when investigating this depthing. The usefulness of this mirror consists in that it renders the depthing visible and plain. The depthing is placed in in such a manner that it is turned toward a window, so that the light enters well into the tooth spaces. The picture is reflected in the mirror (which stands at 45 degrees), and the depthing can be examined with a glass.

Without a mirror, the depthing under investigation would be in the dark, since the pinion is always turned toward the person of the observer, and the point of engagement, where the pinion leaf is seized by the wheel tooth, can not be seen well.

The so-called prism magnifiers, which serve the same purpose, are also very good. But since the prism, which projects quite largely, is exposed to the danger of being injured, it is necessary to treat the magnifier with extreme care; because it is worthless whenever the sharp edge of the glass has been chipped off. Beside this its high price prevents it from being used extensively.

The arrangement shown in fig. 10 can be made in 1 or 2 hours and costs next to nothing. A round piece of steel *a* is braced between two uprights of the depthing tool; *b* is a perforated piece of brass with a springing action and slideable upon the rod *a*; *c*, the support of the mirror *d*, and made of hammered brass, has a springing action and is made with a ball and socket joint. A thread is cut on its lower end which is screwed into *b*. The ball with the mirror *d*, consisting of one piece, can be moved in all directions, and

is to be made no larger than shown in the cut, because, when inspecting the fourth wheel depthing of a 14 line watch, the mirror is to be placed so high that it enters between the two centers. The mirror is made of a hard piece of steel with a perfect polish. The ball and mirror may either be made of one piece, or, as shown in the cut, the mirror can be cemented upon the prolongation of the ball.

Special care must be taken in the examination of the fourth wheel pinion, because its action is of a great influence upon the timing. This pinion has generally only 6 leaves, whence follows that its point of attack occurs before the line of centers.

The engagement before the line of centers is called "entering friction," and is of a rough and wearing kind. The scape pinion is frequently found too small. It thereby approaches nearer to the point of engagement of the line of centers, but it causes an unequal depthing which has both sliding and drop. Although such a depthing, if arranged as it should be, is not apt to cause a stoppage or butting, still it will produce irregularities in timing.

Such a depthing with a small pinion is made as serviceable as possible by placing it a trifle shallower than it should be.

It is more dangerous, however, to obtain an unduly large pinion; this depthing has more entering friction. In order to prevent the butting of the teeth, it is necessary to set the depthing fairly deep. Since this places the points of the wheel teeth very near to the bottom of the pinion, a very small particle of dirt is sufficient to produce a stoppage.

In both cases, with too small and too large a pinion, there is loss of power and rapid wear of the movable parts. If the deviation from the correct size of the pitch diameters is of any amount, then a suitable new pinion must be substituted.

With the aid of a micrometer every watchmaker is able to find a suitable one quickly according to the "tables for wheel and pinion," prepared for the purpose.

In retired localities, where the watchmaker has not the convenience of a material store close at hand, and it should become necessary to take a smaller pinion, on account of the small choice on hand, he should, before turning, place both the fourth wheel and the pinion into the depthing tool.

A depthing standing too deep in the plate is quickest corrected in the rounding machine. Should the depthing stand too shallow, it has to be bushed deeper.

Many workmen think they effect results quickest by stretching the wheel and rounding it upon the machine, and they use as an argument in their favor that they thereby preserve the gilding of the pivot holes. Although it is true that oil will adhere better to gilt surfaces, I would never for this reason think of stretching the wheel. The toothing invariably becomes faulty by this operation—that is, it will produce broader and narrower teeth, and it will remain uneven if the wheel is rounded only in the Swiss rounding machine. The toothing can be made very uniform in a shop which possesses a set of the Ingold fraises. Again, both the polish and the gilding of the wheel will largely suffer by stretching. A defaced gilding can be restored only in an imperfect manner, and it is therefore customary not to attempt to improve the appearance of a hammered up wheel.

When holes are bushed, the bouchons must be made as small as possible in order to preserve the gilding in the sinks.

Cases may occur, however, when the watchmaker is forced to stretch the fourth wheel. In watches of certain constructions, the space is so scant that the fourth pinion cannot be placed nearer to the scape wheel, because the heels of the scape wheel teeth would come into contact with the fourth pinion. It is also possible that it provokes a scraping of the balance on the arbor of the fourth wheel. One is forced sometimes, when the pinion stands too close to the one or the other part, to replace the wheel by a larger one.

The fourth wheel must stand vertical to the plate, which is easily done by the use of a good uprighting tool.

We next will have to inspect the depthings of the third and center wheels. In case that the two depthings will have to be corrected,

it is best if the hole in the plate is closed by bushing; we then correct the third wheel depthing in the depthing tool, and with it strike an arc upon the plate, but we must be careful to hold the tool vertical. We next strike an intersecting arc with the tool for the center wheel depthing, and we drill at the point where the two arcs intersect. The bridge hole is bushed tight and uprighted.

So that my remarks about the pivot hole be not misunderstood, I would say that I always seek to preserve a gilt hole, but I never try to do it by round-about ways or manipulations that are not useful to the watch.

All the bars of the movement must be firmly held by their foot pins. All the work and trouble spent upon a depthing would be lost if the watchmaker forgot to pay the necessary attention to secure the firm position of the bridge. It is possible to locate a third foot pin somewhere in every bridge, if it be done in the manner already explained.

The repairer has sometimes great trouble in producing a good depthing, and not infrequently with the third wheel depthing. The fourth pinion is often very rough, and length strokes are visible at the place where the rounding and the flank of the pinion should melt into each other. It stands to reason that with such a condition it is next to impossible that the wheel tooth, which also labors with the same defect, should move quietly along, but it will rub against a rough face similar to a file.

I have succeeded in establishing a pretty easy depthing by the following method, which may be permitted to the repairer in isolated cases, when engaged with ordinary watches.

Fasten a pulley either to the arms of the wheel or upon the arbor of the pinion, fasten upon it a strong hair bow and place the wheel between two guard pins of the lathe. Upon the saddle of the turning lathe fasten a piece of mainspring, say, with a hand vise, which is effective for from 1 to 1½ centimeters. The end of this spring is filed sharp, and must stand parallel to the pinion and exactly before its center. The saddle is slid so far forward that its end seizes as deep as possible into the pinion. By putting powdered oilstone and oil on it and drawing the bow for some time rapidly up and down, the pinion will become pretty clean and the depthing is visibly improved. I obtain a polish with rouge and a piece of composition file, which has been riveted to a piece of spring and of an equal thickness. It is used in the same manner as explained for the first spring.

A rough friction is not found in center wheel depthings; nor with 10 leaf pinions.

With correct proportions of wheel and pinions, the depthing between 10 leaf pinions and a correct quantity of wheel teeth begins on the line of centers. The friction from this line forward is called "outgoing friction." It is very gentle, and the wear of the operating surfaces very trifling.

Having found and remedied all the defects of the depthing, we have quite a list of others which also may occasion stoppage and irregularities in the train.

The center wheel may rub in the recess of its bridge and at the point of the third wheel bridge.

The third wheel will rub, if it stands too high, on its own bridge, on the foot of the center wheel bridge, on the center wheel pinion and on the barrel teeth. The last two accidents are faults of construction and incorrect proportions of size. When this wheel stands too deep, and the recess in the plate has been turned so deep that a hole has fallen in, it may happen that the third wheel will come together with the minute wheel.

The fourth wheel will rub upon the plate if the lower shoulder of the pinion is very short. The pinion must be turned back in this case. If this wheel stands too high, however, it may come into contact with the scape wheel.

The most frequent rubbings of the scape wheel have been mentioned heretofore. If the upper shoulder of the pinion is very short and the jewel stands rather far back it is possible that the arms of

the wheel touch the lower side of the bridge. This contact will be removed by filing the under side of the bridge so far back that the jewel comes near to the file.

We finally have several other causes of stoppage. Scanty recesses, narrow pivot holes, badly shaped teeth.

These disturbances are apt to escape the scrutiny of the repairer, especially if the movement contains shaky wheels, and these have an undue amount of shake.

(To be Continued.)

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### Russian Reproductions

At the Metropolitan Museum of Art.

[BY JOHN W. MILES.]

Continued from Page 76.



Letter (with the exception of substituted Dress Ornaments), from the Bible of Charles the Bald. Dress Ornaments, Gold, Scythian, Pegasus and Medusa Head.

DESIGNS IN cups showing settings of rare coins were very common, particularly in Germany, where the style originated. Some of those extant are quite elaborate, while others are of more simple, though not less graceful, form. Our collection boasts but one object of this class, which we illustrate in figure 34. It is from the Chéréméteff treasures and measures 4 inches in diameter. The shape is semi-spherical with two handles of scroll work. The outer surface is roughened in file pattern, and has nine coins showing the obverse upon the exterior and the reverse upon the interior of the cup. Coins were also set in the bottom and upon the cover of tankards encompassed with vine and leaf work.

The attention that was given during the 16th and 17th centuries to ewers and basins was very great, and included many rich and fanciful patterns, such as the one presented to Marguerite of France, by her sister Eleanor, which was in the form of a large peacock enriched with settings of sapphires and other precious stones. The principal piece of this order in the collection is represented in figure 35. It is of silver, parcel-gilt. The ewer is of the graceful Persian shape, the body beaten up in ten lobes contracting upwards to the neck to meet a lobed ring, and expanding again slightly before terminating at the



Cup, Silver-gilt, German, 17th Century, Figure 34.

hinged cover, which has also ten lobes and is surmounted by a pineapple tip. The decoration of the cover, body and base is in *repoussé* rose and leaf work boldly executed. The balustered handle is delicately formed with leaves and the indication of a bird's head at the upper part. The spout terminates in the head of an eagle holding the opening in its mouth. Below this it bears leaf-like scales in *repoussé* nearly to the juncture with the body where it is changed to leaf and fruit work. The ring upon the neck is embossed with three rows of shells. The bowl is round, with ornamentation to match the ewer. Upon one of the lobes of the latter is a representation in *repoussé* of a double-headed eagle holding a sword and scepter and with a princely coronet upon its head. On the body of the eagle is a dove with a cross in its beak, and above the sun and moon. It is thought that these may be the arms of a Hospodar of Moldavia. The pieces are from the Museum of the Hermitage. The height of the ewer and diameter of the bowl are equal, 15½ inches. Although very graceful, it is not to be compared with a set in the possession of the corporation of Norwich, England, of a little earlier period, and there are other specimens extant representing more truthfully the splendid workmanship which was bestowed upon these objects,

Among them, perhaps, the most elegant are the magnificent pieces in silver preserved in the palace Coccapani and attributed to Cellini. They are the property of the Marquise Pontanelli *née* Coccapani of Modena, and until lately have never been figured but strictly guarded from the public. The work upon them is something marvelous, and more especially interesting since the scenes are historic, being representative of the following story:

In 1380 the citizens of Genoa maintained commercial relations with both Kaffa and Trebizond. Among the Genoese in the latter country was one Megollo Lercaro, who, because of his rare qualities, was especially favored by the emperor, and consequently exposed to the jealousy and hate of the principal courtiers, who sought all occasions for attempting his humiliation. One day, following the custom of the court, he joined in a game of chess, and his adversary proved to be a young man attached to the emperor by shameful ties. A violent dispute arising between the players, the young man spoke



Ewer and Basin, Silver, Parcel-gilt, German, 17th Century, Figure 35.

contemptuously of the name Genoese. Megollo retorted with a flat contradiction, and immediately received a slap in the face without being able to either avoid it or retaliate, being prevented by the hostility of the courtiers surrounding him. A remonstrance addressed to the emperor failed to obtain for him any satisfaction for his wounded honor. Burning with indignation he nevertheless chose to dissemble and soon afterwards availed himself of an opportunity for taking his leave of the emperor in a natural manner. Arriving at Genoa he no longer restrained his anger, but set about devising means for the execution of his vengeance. In this he enlisted not only the co-operation of his parents and intimate friends but also of his entire family, and in a little time succeeded in arming and equipping two galleys, which he gave out were to sail the Majeure sea. He then made it his duty to ravage all the shores and pillage all the ships of the Emperor of Trebizond, and also gave orders that all captives falling into his hands should be deprived of their nose and ears. In vain armed vessels opposed him. Nothing seemed to arrest the progress of his victories. One day four ships advanced upon him in



two lines, with the intention of surrounding him. He, however, feigned to avoid them, with the purpose of breaking the lines and separating them. In this he succeeded, when, in his turn attacking, he captured one of the enemy's ships and afterwards two others which had taken to flight. Upon one of the latter was an old man with his two young children. The father, fearing for himself and his little ones the terrible treatment inflicted upon the others, begged Megollo to put him to death but to spare the children. Megollo, moved to pity by his prayers and tears, yielded, and made him the bearer of a vase filled with ears and noses to the emperor, with the message that his vengeance was not so much for the offense as for his betrayal. In order to avoid further misfortune the emperor consented to descend to the shore bringing with him the young favorite weeping and with a cord around his neck. Very humbly the youth begged for his life. Megollo approached and gave him a kick in the face, and, remarking that it was not the custom in Genoa to show cruelty to women, granted him the boon of his miserable existence. For this generosity the emperor offered Megollo a large quantity of presents, which were refused. It was neither for cupidity nor booty that he had come but for his honor and that of the name Genoese. He exacted, however, one thing, which was that the emperor should cause to be displayed in the market place devoted to the commodities of Genoa a painting of all his adventures. The emperor observed fully the conditions, and from that time the Genoese sojourning in Trebizond were held in greater distinction than ever before. As for Megollo, he was received with great honor upon his return to Genoa, both by his family and all the Genoese.

This entire history, beginning with the game of chess, is represented in *repoussé* upon the ewer and basin with consummate skill, the basin alone having eleven scenes containing upwards of one hundred figures, besides other ornaments and figures of Cupids and females, nude and draped, symbolic of the virtues, etc., all within a diameter of 20 $\frac{1}{4}$  inches. Such pieces prove not only the magnificent luxury of the period but also the great importance of these objects as necessities. Our ewer and basin is but a simple example of those more richly beautiful.

A few additional words regarding the custom which demanded these things. They were necessary articles of every table and were handed around before and after a meal, the hands being held over the basin, while the water, hot, cold or scented, was poured upon them by the servant. Naturally the wealthy and noble classes demanded the most costly material and the most beautiful workmanship in articles so prominently connected with festive occasions, and with them were provided also the finest naperie. Social laws decreed certain ceremonies in this service, and the *Boke of Kervyng* is very explicit in directions to the attendants to see before meat "thyn ewery be arayed with basyns and ewers and water hote and colde, and se ye have napkyns." The *Babees Boke* also instructs:

"Thanne somme of yow for water owe to goo,  
Somme holde the clothe, some poure uppon his hande."

Sometimes more than one person ate from the same plate, and remembering the use of the fingers (in the absence of forks), we can readily agree with the remark of De Laborde, "*que l'absence de fourchette et l'habitude de manger à deux dans la meme écuelle et à plusieurs dans le meme plat, rendaient nécessaire la propreté des mains, pour les autres avant le dîner, pour soi meme après.*" (That the absence of the fork and the habit of two eating with the same bowl or many with the same dish rendered necessary the cleanliness of the hands, for the others before the dinner, for himself after). Forks for eating having been accepted shortly before by other countries of more fastidious elegance, were adopted in Great Britain during the reign of James I. (1603-1625), and the ewer and basin were dispensed with, the metal of many of them without doubt appearing again in the shape of forks.

We illustrate next three objects of Russian work, the first a bratina of silver, parcel-gilt, with a probable date of 1618, figure 36. There

are many of them in the collection (13), all of the globular form and all with band-like lips contracting inward. The Russian bratina was a health cup or toasting cup, and was passed around the table at the commencement of a feast. They rarely had handles, but the makers were not confined in the material, two of them in ivory being still extant in Moscow. The one chosen for illustration here is the finest of all in the collection. It is of the usual globular form, but around the base is a sort of open-worked construction, with figures of men who appear, with their hands reaching upwards, to be supporting the bowl above. The cover is arched up and surmounted with a rather tall stem crowned with a silver flower. The bowl is worked in *repoussé* with arabesque flower work between four applied plaques. On the plaques the ornamentation is similar, with the exception of the center, where there are shields, one supported by two eagles, one by two fishes, one by two pages, and the last by a lion and unicorn—the latter the arms of the Romanoffs. These plaques were probably an afterthought of the artist, since a similar design is engraved upon the cup itself underneath them. The shields bear Slavonic inscriptions. An inscription in the same



*Bratina, Silver, Parcel-gilt, Russian, 17th Century, Figure 36.*

language is worked in long interlaced letters around the lip, according to the usual rule with the bratina. That upon our illustration anglicised reads: "As arms are necessary to a warrior on the day of battle, as rain in time of drought, as drink to the thirsty, and as a sincere friend for a consoler in time of misfortune and sorrow, so concord and friendship are indispensable to all those who would drink from this cup, but if discord exists between those who would drink from it let them be driven forever from the house. Bratina of Peter Alexeivitch Tretiakoff."\* A boss at the bottom of the cup has an inscription: "Man, who art thou who lookest at me as if thou would'st swallow me?"

The bratina is a specimen of drinking utensil new to the western world, and the writer doubts if any Museum outside of Russia ever counted one among its treasures until the appearance of these reproductions. They are all very similar in shape, rarely have covers and vary little in decoration. The most interesting feature about them is the interlaced inscription—a method which enabled the artist to

\* Clerk of the Council under Michael Feodorovitch, first Czar of the Romanoff dynasty.

say a great deal in a very small space. The one illustrated is from the Kremlin and measures 11 inches in height.

The second Russian relic is depicted in figure 37. It is a panagia or locket-shaped pyx of about 1 inch in diameter used for carrying the host when traveling, or to the sick, and was worn suspended from the neck by a chain. It is of silver-gilt and enameled. The chain is missing. It is covered with inscriptions, for the most part of prayers, but one fortunately gives us its date: "Made in 7111,\* by Hermogenius, first Metropolitan of Kazan." The back is quite flat; the front beaten up in the center to almost a hemisphere is set with a topaz cut in facets and covering a painting on silk of the Virgin and Child. Upon the boss, which is plain silver overlaid with arabesque work, is enameling of dark green with the exception of a representation of two cherubs which are not enameled. Upon the center of the back of the panagia is engraved the emblems of the Passion within a circular inscription, which is again within an inscription of larger characters around the edge. Inside the case is entirely engraved and filled with inscriptions. On one side are the Virgin and Child; on the other the usual symbolic representation of the Trinity—three angels sitting at a table upon which are three chalices. The piece is known as the panagia of the patriarch† Hermogenius; the original preserved with the patriarchal treasures, Moscow.

The pyxes of an earlier period were often made in a round shape with a conical cover, or in the form of a dove hanging by chains over the altar. In the latter case they were enclosed by curtains. Sometimes they were kept in one of two apartments which were built on each side of the altar; sometimes the host was kept in an elaborate receptacle called a *ciborium*, and which was composed of rich architectural design. Following the pyx proper came the monstrance, an article of church plate that called forth the skill of the greatest artists of the 15th and 16th centuries. The most beautiful of these extant is perhaps the one of Sedletz Castle, Bohemia (15th century). But the elegant goldsmiths' work of other countries was almost unknown in Russia at these early dates. Even the order of knighthood and the code of knightly laws had not gained—and indeed never did gain—a foothold in Russia, and that blending of chivalry with the church in the famous Crusades stimulated no increase of pageantry in the churches of the Czar. Yet the pastoral staves, the elaborate censers and even our little pyx, overcrowded as it is with details, proves the existence of ecclesiastical splendor and the consecration of the richest metals to the service of the church.

The illustration, figure 38, carries us into the 18th century, as it was made in St. Petersburg, in 1736. It is an oval plateau of silver-gilt, measuring 39½ inches. This, in size and general arrangement of ornament, is similar to the Augsburg rose-water dish described under figure 33, but the subjects are distinctively Russian. In the center of the plaque is a battle scene elaborately worked in *repoussé* with some portions standing out entirely from the surface. The central figure is so treated, the body of the warriors from the waist up being worked "in the round," and in the figures on the right and left, the arm with a spear and the one with a mace are represented entirely free. The border, with a wavy edge, bears also scenes of battle in oval medallions with trophies intervening. Referring again to the strong similarity between this and the Augsburg dish the question arises, was this similarity simply a coincidence or did the Russian artist have before him the German design of the previous century? Certainly appearances would seem to indicate the latter, but whether or no original in sentiment the workmanship is of a very high character and worthy of praise.

The creation of an original art demands many and varied elements.

\* A. D. 1603.

† The relation of the Patriarch to the Greek church was similar to that of the Pope to the church of Rome, although in many things the creeds of the two churches differ widely. The Greek church in Russia is now governed by a Synod.

There must be time for its perfect development, a certain liberty of thought and action, and, above all, beautiful surroundings in nature. In neither of these is Russia favored, and for this reason she has never possessed, and does not to-day possess, an art of her own. The art which has reigned and which reigns to day is the art of the foreigner, either copied by the native artist or more likely produced within her dominions by alien hands, so that of the pieces last described we cannot be sure that they are the work of an artist "to the manor born," and it is quite possible that they were the products of imported skill. This feebleness of art is a cause of great regret among the Russian nobles, and many efforts have been made to stimulate an awakening. Of the late attempts in this direction the Count Stroganoff has taken a leading part, establishing in Moscow a school of design and a museum of art and industry. The two institutions are supported by the government, the school divided into five classes and the museum into three sections, viz., first, modeling in plaster; second, objects of Oriental art and that of Europe, ancient and modern; and, lastly, the monuments of Byzantine and ancient Russian art. It is doubtful, even with these advantages and the patriotic zeal of the nobles, if Russia is ever able to produce a



Plateau, Silver-gilt, Russian, 18th Century, Figure 38.

national art. Her people are not sufficiently apt and homogeneous to arrive at the degree of perfection required for the foundation of a unified originality in sentiment. The population is made up of seven distinct races, Slavs, Turks, Finns, Caucasians, Mongols, Germans and the yellow race, each having different aspirations and each clinging more or less to the ideas born of their own traditions. We may see very plainly the effect of these diverse elements upon architecture in the different sections of that vast country wherever any one of the races may have a predominating influence. But the art of Russia has ever been essentially foreign and based upon the genius of other countries. Previous to Peter the Great, the arts were encouraged by both Ivan III. and his son Vasili IV., but it was by the hands of the Germans, the Italians, the Turks, chiefly of Constantinople, and of the Swedes. Peter himself devoted his time less to this cultivation and more to the aggrandizement of his empire. Since Peter there has been the same dependence upon foreign art and the same importation of designers. Russian art, therefore, or that to which by courtesy we give the national name, is of a very diverse character. The northern and central portions of the empire is pregnant with the Finnish methods and conceptions, a preponderating influence of great strength, while the more southern sections still acknowledge the sway of the old Byzantine styles.

(To be Continued.)

## Gossip of the Month.

THE practice of exchanging presents among friends at Easter is being more generally observed each year. The event commemorated by the ceremonies observed at this season is one that appeals to the heart of every Christian, and it is not at all surprising that the religious portion of the community regard it as a festival only second to Christmas. Easter greetings have become exceedingly popular of late years, and manufacturers in most lines of productive industry vie with each other in devising new and attractive novelties for this season. These take largely the form of Easter cards and Easter eggs, remarkable for the ingenuity displayed in devising unique forms and combining them with artistic development. The jewelers are not behind their fellow manufacturers in preparing Easter novelties, and this season their offerings were more varied and elaborate than ever before. Good Friday occurred April 3 and Easter Sunday April 5, and for two or three weeks preceding these dates, the shop windows of retail dealers were decorated with suitable novelties for Easter presents. Some of the jewelry exhibited was rich and costly, designed for presents that should be carefully treasured among precious keepsakes, while cheaper forms of Easter greetings abounded. The sales of these goods gave a little impetus to trade that was most gratefully received, and accepted as a harbinger of better times coming. It is a good thing to encourage the observance of festivals and holidays, for our people have all too little relaxation, and, besides, they are good for trade, stimulating a demand for specialties commemorative of these occurrences. In some of the States Good Friday has been made a legal holiday, and it probably will not be many years before it will be made such in all the States.

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SOME of our correspondents evidently think that the special duty of a trade journal is to ventilate the personal grievances of individual members of the trade. If a dealer thinks he has been badly treated by a manufacturer or jobber, forthwith he writes us a long letter for publication, denouncing these persons in vigorous language. We have before us a letter of this kind wherein a well known firm is pleasantly alluded to as "swindlers," "robbers," "cut-throats," and by other terms of a similar endearing character. This individual expects us to fight his battle with these gentlemen, not as a matter of general interest to the trade, but because he feels that he has been aggrieved. In other words, instead of prosecuting these "swindlers," as he probably would do if he had a good case against them, he wants us to denounce them and have them sue us for libel, to which our only defense would be "we were told they were swindlers." The use of such language is actionable, and the person to whom it is applied does not have to prove special damages; to call a man a swindler in print entitles him to damages unless it be proved that he is a swindler. Such has been the decision of the courts in recent cases, and we have in mind an instance wherein a publisher enjoyed the privilege of paying \$5,000 for the luxury of calling a man a rascal. It is no part of the duty of a trade journal to fight the battles of an individual, or to attempt to right the fancied grievances of every one of its subscribers. It has to do with those matters that affect trade interests in general, with the common methods and practices that prevail, and with whatever is calculated to affect the trade in all its branches. He would be a veritable Don Quixote who would attempt to right the wrongs, real or imaginary, of every business man, and he would have nothing else to do but fight windmills. Suppose we, for instance, were to make a trade matter of every delinquent subscriber to THE CIRCULAR, or to expose every individual whose dealings with us did not conform to our standard of business promptness or morality. We should be laughed at by the trade and deservedly forfeit its support and confidence. Personal grievances

are not proper subjects for publication, and we must decline laying the ground work for libel suits to oblige disgruntled dealers who have been refused an extension on their notes by creditors who want their money, or because of any grievance that is entirely personal. Whatever is of interest to the trade in general we shall be glad to comment on even though it may originate in private transactions; in fact, all matters of interest have this origin, but their bearing upon the trade is a matter of nice discrimination.

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VISITORS to California are importuned at all points in that State to purchase specimens of the native productions of precious metals, decorative stones, etc. Some of the specimens of cornelian, agate, etc., partly polished, are very handsome, while match safes, seals and numerous other articles are manufactured from them in very attractive styles. Gold-bearing quartz may be obtained in specimens showing the gold in its native state and condition in a very pronounced manner. Every California tourist feels in duty bound to bring away something to remind him of his trip to the Golden Gate, and there is, consequently, quite a thriving trade in these specimens. California manufacturing jewelers have taken advantage of this demand for specimens of State products, and are working them up into various ornamental forms for personal decorations. Seal rings, carrying native stones, watch charms, scarf pins, cuff buttons, etc., are made up in numerous attractive forms and find a ready sale. The gold-bearing quartz is most sought for, as it takes a handsome polish and makes a very attractive ornament in whatever form it is displayed, and, moreover, there is no discount on the genuineness of the precious metal it contains. But California manufacturers are not limited in their productions to native specimens by any means, but their range of home-made goods is very wide, including pretty much the same lines and styles that are known in the East. They are enterprising and pushing, also, aiming to supply the entire Pacific Coast with jewelry made in San Francisco. As yet they have not been able to supply the entire demand coming from west of the Rocky Mountains, and much of that trade still comes to New York, but the San Franciscan manufacturers are reaching out for it with a degree of enterprise that is highly creditable to them.

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MANY removals are announced to occur about this time—the first of May being the universal moving day in New York—but the changes contemplated or already made do not involve any extended change of location. It is more in the nature of a swapping of quarters by members of the trade than removals. Maiden Lane, John and Nassau streets, with contiguous portions of Broadway, will continue to be the headquarters of the jewelry trade in the future, as this locality has been for so many years in the past. Buyers will find the manufacturers and jobbers "there or thereabouts" the same as usual; there may be a change in the street numbers, but when Maiden Lane is reached the particular jeweler wanted will be found close at hand.

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BRASS certainly cannot be defined as a precious metal. If it could some men we know of would be millionaires on the strength of their faces alone. Still it is a metal that affords artists and designers good opportunity for displaying their skill in the production of decorative work. Of late there has sprung up quite a rage for ornamental brass work, giving employment to many designers and workmen, and even amateurs have caught the fever and are dabbling in brass work to a

considerable extent. These ornaments take on all sorts of forms, both antique and modern as to style, and are mostly classed as bric-à-brac, for interior decoration. Many of the articles thus produced are highly ornamental, adding much to the attractiveness of a room. Numerous specimens are to be seen in the show windows of our retail dealers, and, while they cannot be classed as jewelry, they serve to set off other goods, to excite curiosity and tempt passers-by to stop and examine the stock. Anything that will entice customers into a store is legitimate—indeed, according to modern practices, it would be hard to say what is illegitimate—and if ornamental brass goods will serve that purpose, then dealers should put them on exhibition. The correct principle for a merchant to adopt is to make his place of business as attractive as possible, keep what the public wants and sell goods at reasonable prices. Every article of an artistic nature may well find a congenial place in the jewelers' stock, and a little diversity in the character of his goods is likely to catch the public eye quicker than a single line. This is the secret of the success of the modern bazaars, and those retail dealers who have followed our advice on this subject have found their profit in so doing.

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THERE are plenty of new goods in the market now. Every manufacturer has something new to show, and he would be a hard buyer to satisfy who could not select a desirable stock from the New York houses at the present time. During the month just passed there were a good many buyers in the city from various sections of the country, most of whom bought with quite as free a hand as could have been expected. Now is a good time to visit the city or to fill orders—the goods are ready, and were never better calculated to catch the public fancy.

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THE New Orleans Exposition has not met with as much success as was anticipated for it. The location was against it in the first place, the early days of its opening were stormy and the streets so muddy as to be almost impassible, while the management of the Exposition has, apparently, lacked capacity to handle an enterprise of such magnitude. But what has contributed as much as anything else to keep people away, is the reports of extortions practiced by residents upon strangers. From letters published or circulated privately, it is made to appear as though the residents of New Orleans sought to rival the hack drivers at Niagara, and, by a system of overcharges and exacting compensation for the slightest service, to disgust visitors with the city, the Exposition and everything connected with either. The various exhibits are said to be excellent in variety and quality, but their attraction is not sufficient to induce the majority of people to run the chances of being swindled by the petty exactions demanded at every turn. It is unfortunate for those exhibitors who have gone to so great an expense in sending their goods there that they do not have the crowds of sight seers that were expected; had they been given a voice in the management it is probable the success would have been greater. International exhibitions are becoming altogether too common; there are at present open, or preparing to open early in the season, four or five different ones in different countries. They are mainly devoted to some specialties, but are sufficiently general in their character to warrant invitations being sent to everybody to come and exhibit their wares. Manufacturers, inventors and producers find the tax altogether too great to be represented at all of them, and they might almost as well stay away from all as from one, for, if they have active competitors, they are accused of being afraid to exhibit if they miss any of them. That the interest in this kind of exhibitions is dying out was demonstrated two years ago when the effort to organize an international

show in New York failed ignominiously. After that it seemed rather presumptuous in New Orleans to take up the idea. What would be better than these so-called international exhibitions would be permanent exhibitions in the prominent cities of the world, but notably in New York, London and Paris. In these might be gathered examples of the productive industries of the several countries, to be changed according to circumstances. More people would visit one or more of these exhibitions in the course of a year than are ever brought together by an international affair, while the cost of maintaining them would not be nearly so great. We believe in industrial exhibitions, but think they can be made of far more practical service than they have been as yet.

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WE NOTICE that THE CIRCULAR is extensively quoted from of late by the daily and weekly papers all over the country, copious extracts from our notes on "Fashions in Jewelry" especially being re-printed. As this is good for the trade in general, we are glad to have extracts made from our columns, but should be more pleased if due credit was given us by our brother editors. The reading matter in our columns is expensive, because most of it is technical and prepared by experts, and we ought to have full credit for its publication. However, if some of our contemporaries were to give credit for all they steal, they would show an amazing lack of originality.

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THE largest diamond ever found in America has been found again recently, this time in Ohio. Every spring the first North River shad is caught in several different places, anywhere from New York to Albany, just as the largest diamond is in danger of being found anywhere. Every time it is found it "creates intense excitement in the neighborhood," during which the discoverer possibly sells his farm to advantage; but a singular thing about it is that the excitement soon dies out, and the big diamond is never heard of more. It is more than probable that diamond mines exist somewhere in this country, for the development of its natural resources is yet in its infancy, but geologists have not been able to find any satisfactory trace of them. That some isolated stones have been found from time to time is well known, but we are always skeptical when we see that biggest diamond story going the rounds of the press.

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IT is well known in the trade that for some time past there has been considerable demoralization in the silver case business, excessive competition having induced both manufacturers and jobbers to cut their prices from time to time, till finally the margin of profit was whittled down so exceeding fine that there was no money in cases for anyone engaged either in manufacturing or selling them. We have heretofore commented on this phase of the business, showing that it brings nothing but disaster to the retail dealers, and have suggested that the leading manufacturers and jobbers should, for their own protection as well as the protection of retail dealers, come together and perfect some arrangement whereby the parties interested should have some guarantee that the capital they have invested in cases should not be kept in constant peril through reckless and unbusinesslike competition. It gives us pleasure to announce that such a meeting of manufacturers and jobbers took place in this city last month, and an understanding was reached, in accordance with which standard prices for cases have been agreed upon, and from these there will be no deviation. Hereafter there will be no favored dealers to receive special discounts, or rebates of any description, but all legitimate members of the trade, whether jobbers or retail dealers, will be on an equality as

to their purchases of this class of goods in the future. Every purchaser will hereafter understand that he buys his cases as cheaply as anyone else can, and will not be under the constant apprehension that his competitor will take advantage of some new cut in prices and so be able to undersell him in his community. There is to be no more cutting of prices; there could not well be without bankrupting somebody, for cases have already been selling at prices that would not cover cost. The manufacturers of movements are in entire sympathy with the action taken by the case makers, and will give them their practical as well as moral support. Undoubtedly the protests entered by the retail trade against the demoralization brought about by undue competition has had great weight in bringing about the amicable arrangement referred to. It is no kindness to dealers to have prices cut all to pieces by manufacturers and jobbers; it unsettles their business and leaves them all at sea as to their purchases. If they buy goods one day they are not certain but prices will be so cut the next that they cannot escape a loss. What they want is standard prices for standard goods, and no special favors to anyone. We anticipate that the new arrangements regarding cases will result in promoting the best interests of every person interested in handling them, insuring against cutting prices and giving all a chance to make a reasonable profit from them.

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SILVER jewelry is being extensively made by the silver goods firms, and it is growing in popularity. Some of the newest goods introduced are inlaid with gold by a peculiar process. In the flower pieces the veining of the leaf is marked in gold as delicately as if it were penciled. Some of the jewelry, made by a combination of the two metals, is exceedingly beautiful. A dark globe of oxidized silver is thus set into a moon and star in burnished gold. The designs of lace-pins are too numerous to mention in detail, the head of a swan, the wing of a swallow, a shell painted with a landscape and a tiny plaque are all new designs. Pungents mounted in gold and made of cameo, glass and crystal, cut in many facets. There are tiny glove colognes which are carried inside the glove, and long crystal flasks in serpentine shape which serve as an ornamental piece on the toilet table. Among the toilet articles are many fancy boxes for jewelry and trinkets made in old English *repoussé* style, tiny trays and brushes. Easter eggs for *bonbonnières* are of oxidized silver etched with a Scriptural design and an appropriate Easter text. In fact, the attractions in silver goods are too numerous to mention, but are so artistic and tasteful as to satisfy the most æsthetic.

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### The Greenwich Observatory Clock.

CONTINUING the series of articles by Prof. Waldo, on "How Washington Time is Obtained," we lay before the readers of THE JEWELERS' CIRCULAR this month "How Greenwich Time is Obtained;" although it may not be new to many of our readers, still it may be interesting to them.

It must be understood that "true time," as the term is generally understood, is not obtained by observation of one instrument alone, but by comparative readings of a number; one acting as a check against another, although there is a principal clock to which the others are in a manner subservient. The real time makers at Greenwich are the transit instrument and the standard sidereal clock. The transit is a telescope 12 feet long, having an object glass of 8 inches. The tube is of cast iron, braced and strengthened, is conical in the center and rests by means of its trunnions upon firmly built solid piers. Upon one of the trunnion pivots there is fixed a finely graduated circular of degrees, minutes and seconds, with micrometers and vernier to read them off by. The instrument is pivoted due east

and west, thereby giving an axis due north and south. Near to each end of it is a horizontal line of mercury, by which to test the line of sight and ascertain if there are many errors—errors of collimation, as they are called. In taking observations, the moment that the clock star is on each wire the observer touches a telegraphic key which is on the tube of the telescope near the eye piece. That touch causes a magnet to be made upon the chronograph in another room, which mark is entered in the transit book when convenient. The chronograph is a timekeeper itself, and consists of a brass cylinder 20 inches long and 12 inches in diameter. It has a train of wheel work driven by a clock barrel weight, and regulated by a conical pendulum, the lower or bob end of the pendulum terminating in a kind of paddle float, and revolving in a flat basin filled with glycerine. The resistance of the glycerine to the motion of the paddle float performs the same functions as the ordinary pendulum bob. The chronograph cylinder revolves once in two minutes, and it is covered by a sheet of paper ruled in faint lines by itself. There are arrangements of magnets and prickers by which, when the observer touches the key at the transit instrument, a steel point pricks the paper. As the sidereal standard clock, by means of one of its wires, also makes punctures in the paper every second, the observer can tell, on examining these marks and the spaces between them on the revolving cylinder, at what particular fraction of a second each wire in the object glass of the transit instrument was crossed by the clock star. Six hours' observation work can be put upon each cylinder, and four observers can mark at the same time, provided that no two of them touch the telescope key of their several instruments at the same electric moment—a very unlikely occurrence indeed. The first time signal is sent out from Greenwich at ten o'clock every morning. The state of the sidereal standard clock has to be ascertained; it has to be compared with the mean solar clock, and that clock has to be brought to time. To effect these, the "transit" from the chronograph cylinder paper is read off; certain corrections are made, and the true time of the star passing the meridian ascertained. But the transit instrument itself requires correction occasionally, notwithstanding the ingenuity with which it has been built for strength and the foundations and the piers upon which it rests. Temperature acts upon it as it acts upon the balance spring of a watch, although it seems hardly feasible that two tons of cast iron, inclosed within thick walls and carefully tended, should sensibly feel the effects of heat and cold. But it is so; and the errors are small, still they are errors and have to be eliminated.

The standard sidereal clock is one of the marvels of mechanical horology. It is fixed to the north wall of that part of the observatory known as the "magnetic basement," the temperature there varying only a few degrees throughout the year. It was constructed by Messrs. E. Dent & Co. in 1871, and is somewhat peculiar in its action. As far back as 1826, the late Astronomer Royal read a paper before the Cambridge Philosophical Society on "The Disturbances of Pendulums and Balances, and on the Theory of Escapements." That of the clock under notice is of the same character. The escapement is a detached one, having an affinity to that of the chronometer. The pendulum impulse takes place at each double vibration, so that the seconds hand moves only once every two seconds, those seconds being the even ones. The pendulum is hung from a solid brass casting firmly attached to one of the basement walls. It has a zinc and steel compensation and a leaden bob, and the driving weight slides down a prepared "shoot," to avoid vibration did it move freely. The first zinc tube rests on the rating nut, then a steel one goes over that, resting at its upper end upon the zinc and carrying at its lower end the leaden bob. The weight of the bob is about twenty-six pounds. The rod is of steel. Upon the crutch axis, held by friction, are two straight brass and steel compensating bars, carrying at each end a small compensating weight, whilst along the crutch rod is a spindle, tapped and nutted at the upper end, and carrying a square weight at the lower end. This spindle is for enabling very small changes of rate to be made without stopping the

pendulum. The compensating tubes have holes and slots cut in them, the better to allow the temperature to circulate. The driving weight is only about  $5\frac{1}{4}$  pounds.

There is a magneto-barometric arrangement to counteract barometric error, so that as the mercury in the barometer rises and falls, its float produces magnetic action between it and the magnets of the pendulum. These are two bar magnets, each about six inches long, fixed vertically to the back and front of the pendulum bob. Below them is a horse shoe magnet attached to the end of a lever, the other end of which is joined by a rod to the float on the mercury in the siphon of the barometer. The lever rests on a knife edge. It will thus be understood that as the float on the mercury rises and falls it moves the lever, the magnet of which acts correspondingly on the magnets of the pendulum either to advance or retard it. The general work of the sidereal clock is to drive sidereal relay, which relay closes three pairs of springs, completing as many circuits. One circuit registers the clock seconds on the chronograph previously mentioned, another controls the half-seconds pendulum of a clock near to the hour circle of the great equatorial, driving the fifty-nine seconds clock and working a sounder to render audible anywhere in the dome the beats of the standard sidereal clock, whilst a third closes the circuit for controlling the balance of a chronometer attached to the eye piece of the equatorial telescope.

Upon the superintendent's desk in the principal computing room is a small electric dial, the hands of which are driven by a separate wire. Only fifty-nine seconds for each minute are sent by the sidereal clock through the "relay." The stoppage of the 60th second at the end of each minute is to prove whether or not the two clocks agree. It was shown "that if the seconds hand stops at what would have been one second after the minute, the dial is in correct sympathy with the parent standard sidereal." The error of the standard sidereal clock having at length been found and booked from the star observations of the previous night, and that the fifty-nine seconds clock is in sympathy with it, a small mean time solar clock only a few inches away has now to be compared, in order to ascertain and correct its error. Previous to this being done, an inspection is made of the mean solar standard clock, which is called "the parent of this system." Its home is across the court yard under the time ball. It is located in a small room about 5 feet square. Opposite to the "mean solar" is a companion of its toils, a relic in its way. This aged "shipmate" bears the following inscription upon its dial: "Geo. Graham, No 3." It is in an old mahogany case, and its rate is still so good that, like an old sentinel, it is kept there and consulted as a check upon the work and escapades of its younger companion against the opposite wall. The mean solar standard clock is entirely an electric one, with a pendulum. It was put up some thirty years ago by Messrs. Shepherd & Sons, of Leadenhall street, London. A small weighted lever keeps the pendulum in motion, worked by the armature of an electro-magnet. The electrical relay from this clock controls a clock at London Bridge station, one in a front window at the works of Messrs. De la Rue, Bunhill Row, and one in the Horological Institute, Northampton Square. This clock also gives the hourly time signals all over the country, and the public may see a sympathetic set of hands and dial worked by the same clock in the wall of the Observatory by the gate. That clock has no pendulum, the movement being kept going by the oscillation of two permanent magnets through positive and negative currents of electricity. The swinging of the pallets propels the scape wheel, and that sends round the motion wheels of the hands. That clock has hour, minute and seconds circles, the latter being below the center. The dial is figured up to 23 in the hours, the 24th, or noon, being 0; the minutes are ticked and dotted on a circle outside the hour figures, whilst the seconds are marked in the usual way as upon regulators.

The gentleman whose duty it is to ascertain the exact time, having by means of the wires brought together that of the standard sidereal clock and the mean solar standard, nothing remains but to compare

them by the method of coincidences. This can be easily effected within two or three tenths of a second by means of an instrument called a commutator, which is on the time superintendent's desk between the small sympathetic dials already spoken of.

(To be Continued.)

### Mother-of-Pearl.

THE PRINCIPAL production of Tahiti is mother-of-pearl. This is what stimulates her commerce, this is what gives rise to the relatively important exchanges that take place in these far-off lands of Oceanica, and this is what attracts those vessels which, for a century past, have been sailing among the desolate and wild islands that make up the archipelagoes of Tuamotu, Gambier and Tubuai.

On account of its rarity, mother-of-pearl has always been an object of luxury. Before navigators discovered that part of the world which is lost in the immensity of the Pacific, it was still rarer than it is now; it had more value, perhaps, but it was assuredly neither more sought for nor more prized. At present it is much employed in the manufacture of many objects. The mother-of-pearl employed in the industries is furnished by various species of shell-fishes, the most esteemed, most iridescent and also the most beautiful being that produced by the pearl oyster. Again, two sorts of pearl oysters are distinguished. One of these, known as the pintadine (*Meleagrina margaritifera*), is found in China, the Indies, in the Red Sea off the Comore Islands, to the northwest of Australia, in the Gulf of Mexico, and particularly off the Tuamotu and Gambier Islands.

The other, which is more commonly known as the pearl oyster (*Meleagrina radiata*), is found in the Indies, in the seas of China, in the sea of the Antilles, in the Red Sea and to the north of Australia.

The former of these has a harder, more azure and more transparent shell, and one that attains larger dimensions than that of the latter. Some have been found that measured as many as 12 inches in diameter and weighed more than twenty pounds. The *Meleagrina radiata* rarely exceeds 4 inches in its largest dimensions, and never reaches a weight of five ounces. The two species furnish pearls. According to the fashion or the prevailing taste, sometimes those of the one are preferred and sometimes those of the other; nevertheless, those of the pintadine have a brighter luster and more transparent and intense tones than those of its congener.

It is difficult to estimate the money value of the pearls collected in the French possessions of Oceanica. We cannot even fix upon an approximate figure as regards this, since this commerce escapes all control, and proceeds after a manner clandestinely. Some estimate that it reaches about \$20,000 per annum, and others that it amounts to \$100,000. According to what I have seen in the Tuamotu Islands, and, on another hand, considering the quite large number of persons who, at Papeete only, are concerned in this trade and live by it, I would give it as my opinion that it amounts to \$60,000. The most important markets for fine pearls are found in England.

The pintadine comes from the tropics. The archipelago of Tuamotu and Gambier is, as I have stated, the point where it is found in the greatest abundance. Here it finds surroundings that are congenial to it.

This archipelago, which was annexed at the same time as the Islands of Tahiti and Moovea, consists of eighty islands, almost all of which yield mother-of-pearl, and seventy-two of which are inhabited intermittingly by individuals of the Maori race. France has an excellent and devoted population there, which is very proud of its new nationality, and which remains indifferent to all attempts made against our influence. It loves France, proclaims the fact and manifests it loudly every time that occasion requires it. Industrious, docile, submissive, of mild and simple manners, observing with scrupulous fidelity the laws and regulations that have been given it, it is one of the poorest on the face of the globe. The narrow tongue of

land, or rather the crown of arid reefs that surround the lagoon of these coral islands, and which is destitute of vegetation, scarcely affords this people sufficient food for its miserable and precarious existence. While the neighboring happy population which dwells upon the fortunate shores of the Society Islands lead a life of ease and pleasure, where everything grows without labor and in abundance, the unfortunate Tuamotun is reduced to the necessity of feeding upon the cocoanut and a few rare and meagre seeds of Pandanus (nearly the only fruits on these sandy shores), fish and shell-fish, which, during several months in the year, are poisonous.

The Tuamotu people are essentially nomadic—through necessity as well as through taste. When one lagoon is exhausted, when diving no longer yields anything, the native, without sorrow or regret, or without caring even, places his family and his goods in his boat, abandons the hut that he had built and goes, somewhat at the will of the winds, to seek elsewhere, in another island, the wherewith to live. His only industry is diving. All take part in this—women as well as children. The women have a truly wonderful aptitude for this arduous and laborious occupation. At Anna there is a woman who explores depths of 25 fathoms, and sometimes remains under water for three minutes, and she is not an exception. And then, how dangerous are these investigations in the dark depths of the lagoon, where reigns as masters hungry sharks, which, when they cannot be avoided, must be fought. There does not pass a year in which some diver does not come out of the water mutilated. When an accident happens, terror reigns among the divers, and the fishing for mother-of-pearl ceases for some days. But this feeling of fear and of danger does not last, for it becomes necessary to give way to the imperious needs of life. To the Tuamotun, mother-of-pearl is current money. It is with this that he buys the scanty clothing that he wears, and the little bread, flour and provisions that he eats, and, finally, the alcohol for which, like all the inhabitants of Oceanica, he has a pronounced passion.

The picture which I have just sketched is exempt from all exaggeration. I cannot enumerate the sufferings of these brave people who are so attached to us, nor the vexations they have been subjected to on the part of trafficking strangers.

Twenty or thirty years ago the trade in mother-of-pearl in the Tuamotu Islands well paid those engaged in it. By means of a bit of valueless fabric, a few handfuls of flour or a few pints of rum, there was obtained a ton of mother-of-pearl, worth two hundred or four hundred dollars, or many beautiful pearls whose value the natives ignored.

The archipelagoes were frequented by boats of various nationalities. Mother-of-pearl was abundant, and pearls were not so rare as at present. Since then the number of trading vessels has increased.

The aborigines, enticed by the advantages of a commerce that was becoming more and more fruitful in measure as competition extended, betook themselves to fishing with improvident ardor, and now they find that the lagoons are less productive, that they are becoming depopulated, and that some of the most fertile of them are giving signs of exhaustion.

The interesting situation of the population of the Tuamotus, the danger by which it was menaced of being deprived of all resources and of all work, and also the fear of soon seeing one of the most productive sources of revenue of the Tahitian colony exhausted, and the principal element of its commerce disappear, attracted the enlightened attention of the colonial administration. With an eagerness that the Colonial Council of Tahiti has had to thank him for, the Under Secretary of State had the goodness to select me to go on a mission to Oceanica. The programme of studies he gave me was as follows:

(1). What is the real state of the oyster producing lagoons? Are they beginning to give out? If so, what is the cause of it, and how can it be remedied? (2). Would it not be possible to create an industry for the culture of the pearl oyster at the Tuamotu, Gambier, Tahiti and Moovea Islands analogous to that which exists in

France for the culture of the edible oyster? Would it not be possible by this means to procure remunerative work for the indigenes of Tuamotu, and one that should be sedentary and continuous, and that would render them independent and free them from the cupidity of dishonest traders whose dupes and victims they are? Would they not thus be preserved from the trouble and danger that result from the assiduous practice of diving? Would it not be a means of attaching them to their home, their family and native island, prepare a more peaceful life for them, and gradually lift them toward the social level of the peoples of ancient civilization? (3). Is there any way of regulating the fishing for mother-of-pearl in the archipelago? If so, what should be the basis thereof?

Although statistics do not show a great diminution in the production of mother-of-pearl, it results from the minute investigations that I made upon the very spot, that the lagoons are becoming poorer and poorer every day, and that in order to secure oysters of merchantable size, the divers are obliged to visit great depths. I estimate that if we do not take prompt and vigorous measures, the lagoons of Tuamotu will run the risk of being very much impoverished, if not ruined, in a few years. The arrangements applied by the administrators who have succeeded one another at Tahiti were assuredly excellent, but they were insufficient to avert their ruin.

The forbidding to fish in a certain number of islands for a few years, so as to favor their regeneration, could not produce such a result, since, contrary to what has been thought, the pintadine is not unisexual but hermaphrodite. The cause of the impoverishment of the lagoons is due to the abusive and improvident fishing that has been done in them.—*G. B. Brandley, in La Nature.*

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## Lives of Celebrated Goldsmiths.

BRUNELLESCHI.

IN READING about art we often find the word "Renaissance," and the art of that period bears the same name: the art of the Renaissance. This, as is well known, means "new birth" or a "re-awakening," and denotes the time when the darkness and ignorance of the mediæval age was passing away, and men were arousing themselves and endeavoring to restore literature and art to the high places they had once occupied. The artists who took the lead in this movement were a remarkable class of men, and merit remembrance and gratitude from all those of later times who have profited by their example.

Some authors call Filippo Brunelleschi, or Brunellesco, the "Father of the Art of the Renaissance." He was born in Florence in 1377, and died in 1446. His mother was of a noble family, and on his father's side he had learned notaries and physicians for his ancestors. Filippo's father desired that his son should be a physician, and directed his education with that end in view; but the boy had such a love of art, and was so fond of the study of mechanics, that his father at length allowed him to learn the trade of a goldsmith, which trade was, in that day, more closely connected with what we call the fine arts than it is now.

Filippo made rapid progress, now that he was doing something that pleased him, and soon learned to excel in the setting of precious stones, and this, too, in exquisite designs drawn by himself. He also made some beautiful figures in niello, the process of which is so well known to the readers of THE JEWELERS' CIRCULAR, that it is unnecessary to again describe it.

After Filippo had perfected himself as a goldsmith and niello worker, he studied sculpture and executed some designs in bas-relief, but he was always deeply interested in such mathematical and mechanical pursuits as fitted him to be the great architect which he finally became.

He went to Rome with his friend Donatello, and there Filippo was untiring in his study of architecture, and made innumerable drawings from the beautiful objects of ancient art which he saw. One day, when these two artists were digging among the ruins in the hope of finding some beautiful sculpture, they came upon a vase full of ancient coins, and from that time they were called "the treasure seekers." They lived very poorly and made the most of their small means, but even then they suffered many privations. Donatello returned to Florence, but Filippo Brunelleschi studied and struggled on, and there grew up in his heart a great desire to accomplish two things in his native city—to revive there a pure style of architecture and to raise the dome upon the then unfinished cathedral. He lived to see the realization of both these ambitious hopes.

The Cathedral of Florence is also called the Church of Santa Maria del Fiore, which means St. Mary of the Flower; this may also be rendered St. Mary of the Lily, which is more expressive, since the lily is the emblem of the Virgin Mary, the chief patron saint of Florence. St. Reparata is another favorite Florentine saint, who, in pictures, holds in her hand a banner on which is a lily. The same device was on the red shield of the Republic; indeed, the very name of Florence is popularly believed to have had its origin in the abundance of its flowers, especially the lily known as the *Iris Florentina*, which grows wild in the fields and in the clefts of old walls in various parts of the city.

In 1407 Brunelleschi returned to Florence, and soon after the superintendents of the works upon the cathedral listened to the plans of various architects for raising the dome. Filippo proposed his views, but they were considered far too bold. He made models in secret and convinced himself that he could accomplish the great work. After a time he wearied of the waiting and returned to Rome always thinking and planning about the dome, the erection of which had now become the one passionate wish of his heart. The struggle was long, and he suffered from the ignorance and indecision of the officials of Florence; at length, in 1420, a call was made for the architects of all countries to come with their plans, and, after many meetings and debates, the commission was finally given to Brunelleschi, thirteen wearisome years having passed since he had first asked for it.

At this meeting of architects, Filippo refused to show his models, and when he was criticised for this it is said that he proposed that, if any one present could make an egg stand upright on a smooth marble, he should be the builder of the dome. The eggs were brought, and the others all tried in vain to make one stand. At last Filippo took his egg, and, striking it a little blow upon the marble, left it standing there. Then the others exclaimed that they could have done the same. To this Filippo replied: "Yes, and you might also build a dome if you had seen my design!"\*

The story of the building of the dome is very interesting, but it is too long to be given here. There were endless difficulties placed in Filippo's way, but he overcame them all and lived to see his work almost completed; only the outer coating was wanting at the time of his death. It is the largest dome in the world. The cross on the top of St. Peter's at Rome is farther from the ground than is that above Santa Maria del Fiore, but the dome of the latter is larger than the dome of St. Peter's. It was also the first dome that was raised upon a drum, as the upright part of a dome or cupola is called, and this fact alone entitles Filippo Brunelleschi to the great fame which has been his for more than four centuries.

He designed many other fine architectural works in and about Florence, among which are the church of San Lorenzo, that of Santo Spirito, some beautiful chapels for Santa Croce and other churches, the Hospital of the Innocents, and the Badia at Tiesole. That he

had also a genius for secular architecture is proved by his having designed the famous Pitti Palace.

Its builder, Luca Pitti, was a very rich rival of the great Medici and Strozzi families, and he determined to erect a palace which should excel theirs in grandeur and magnificence. This palace stands in the midst of the Boboli gardens, and was for a long time the residence of the sovereigns of Tuscany and Italy.

Filippo's enthusiasm for art made him willing to endure any amount of fatigue for the sake of seeing beautiful things. One day he heard Donatello describe an ancient marble vase which he had seen in Cortona. As Filippo listened he was possessed with the desire to see it, and quietly walked away, saying nothing of his intentions. He went on foot to Cortona, a distance of seventy-two miles, saw the vase and made accurate drawings from it, and was again in Florence before he was really missed by his friends, who supposed him to be busy with his invention in his own room.

A very interesting story concerning himself and Donatello is that the latter received an order for a crucifix, carved from wood, for the church of Santa Croce, and when it was finished asked Brunelleschi's opinion of it. Relying on their long friendship, Filippo frankly said that the figure of Christ was like that of a day laborer, whereas that of the Saviour's should represent the greatest possible beauty. Donatello was angry, and replied: "It is easier to criticise than to execute; do you take a piece of wood and make a better crucifix."

Brunelleschi did this, and when he had completed his work invited Donatello to dine with him. He left the crucifix in a conspicuous place in his house while the two went to the market to buy the dinner. He gave the parcels to Donatello and asked him to precede him, saying that he would soon be at home. When Donatello entered and saw the crucifix, he was so overcome with admiration that he dropped eggs, cheese and all on the floor, and stood before the carving as motionless as if made of wood himself. When Brunelleschi came in he said: "What are we to do now? You have spoiled all the dinner!" "I have had dinner enough for to-day," replied Donatello. "You, perhaps, may dine with better appetite. To you, I confess, belongs the power to carve the figure of Christ, to me that of representing day laborers." This crucifix is now in the Chapel of the Candi, in the church of Santa Maria Novella, while that of Donatello is in the chapel of Saints Ludovica and Bartolommeo, in the church of Santa Croce.

On the south side of the square which surrounds the cathedral called the Piazza del Duomo, there is a modern statue of Brunelleschi. He is represented as sitting with a plan of the great dome spread upon his knee, while his head is raised and he looks at the realization of his design as it rises above the cathedral. He was buried beneath the dome. His monument is the first in the southern aisle, where he was interred at the expense of the city. A tablet in the wall bears his epitaph, and above it is his bust, made by his pupil Buggiani.

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## Proceedings of the Horological Club.

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### A DISTINGUISHED BODY OF WATCH AND CLOCK MAKERS.

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*One hundred and thirtieth discussion.—Communicated by the Secretary.*

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[NOTICE.—Correspondents should write all letters intended for the Club separate from any other business matters, and headed "Secretary of the Horological Club." Direct the envelope to The Jewelers' Circular Publishing Company, Seth W. Hale, President. Write only on one side of the paper, state the points briefly, mail as early as possible, as it must be received here *not later* than the eighth day of the month, in order to be discussed and reported in the CIRCULAR for the next month.

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### MODELS OF ESCAPEMENTS.—REMOVING SOFT SOLDER.

*Secretary of Horological Club:*

Please inform me where I can obtain large models of the different escapements, their cost and your opinion of same for the use of

\* This story of the egg is also told of Columbus, but it doubtless originated as given above, as many Italian writers thus tell it, and, if true of Brunelleschi, the incident must have happened some fourteen years before Columbus was born. The astronomer Toscanelli was a great admirer of Brunelleschi, and there is little doubt of his having told this story to Columbus.



apprentices. Also whether the receipt in THE JEWELERS' CIRCULAR, consisting of green copperas, saltpeter and muriatic acid, for removing soft solder, has ever been tried, and with what success?

"APPRENTICE."

Mr. Clerkenwell thought that such models were not made for sale in this country. In Europe, the horological schools often made them as a means of instruction to the students, and then sold them. Models could probably be obtained by addressing M. Grossmann, at Glashütte, Saxony. Such models are unquestionably very useful in enabling apprentices to understand the workings of the different escapements, but their cost would be too much for apprentices to incur out of their own pockets.

As for the recipe spoken of, our friend should have mentioned where it was published. "In THE JEWELERS' CIRCULAR" is altogether too indefinite. THE CIRCULAR is publishing recipes all the while, and we cannot give any opinion until we can examine the particular one which is referred to.

#### IMPROVED BEZEL FOR WATCH CASES.

*Secretary of Horological Club:*

Please give my address through THE CIRCULAR to Wm. Burns, Jr., who asked for it in your April Proceedings, and greatly oblige,  
JNO. W. MOORE, Box 902, Marion, Ind.

#### ACID ENGRAVING ON STEEL.

*Secretary of Horological Club:*

Will you please inform me in your next month's Proceedings what will be the most easy way of imprinting on steel, by the use of acids, on uneven surfaces? I wish a quick way, as I have a great many pieces to do.

W. P. S.

Mr. Expert knew of no way of accomplishing the object aimed at by Mr. S., even when the surfaces are perfectly smooth and flat; engraving by any acid process is slow and tedious work. It would be quicker, and probably easier, to cut with a graver. Perhaps the best way in this case would be to get a stamp made, fitting the uneven surfaces, and stamp or press the design on them. If a great number of pieces are to be stamped alike, this would not only be the cheapest and best, but the only quick way.

#### MAKING TRAINS FOR CLOCK MOVEMENTS.

*Secretary of Horological Club:*

Will you please inform me in what number of THE JEWELERS' CIRCULAR there is an article covering the principle of making trains for clock movements, the laws governing the same, etc.

H. S.

Mr. Uhrmacher said there was probably little use of giving the dates, as the back numbers which contained them were long since exhausted, but he thought there was a long series of articles on clock making in THE CIRCULAR for 1880 and 1881. Excelsior's "Practical Hints on Watch Repairing," during 1879 and 1880, also contained articles on wheels and pinions, gearings, principles of depths, etc., which were applicable to clocks as well as watches.

#### BACK NUMBERS OF "THE CIRCULAR."

The Secretary stated that he had been informed that the back volumes recently advertised for sale in THE CIRCULAR, and noticed in our Proceedings last month, had already been disposed of. The notice to that effect was received last month, but after our meeting for that month. Correspondence about their purchase is therefore useless. But we shall be pleased to receive notice from any other owner of the back volumes containing Excelsior's "Practical Hints on Watch Repairing," which he is willing to dispose of. We have had hundreds of inquiries for them, but only two persons have ever offered to part with their copies. This is a most striking evidence of the high estimation in which they are held by those who are so fortunate as to possess them. They very sensibly hold on to what they have until they are sure of getting something to replace it.

It has long been the intention of The Jewelers' Circular Publishing Co. to re-print the second series of "Practical Hints," uniformly with the volume already issued and for sale containing the first series, but their author has been unable thus far to find time to revise

them for re-publication, and we regret to say that it is at present uncertain when it can be done. When it is ready we shall most gladly give notice in our Proceedings.

#### LOOSE JEWEL MOVING IN A DIRECTION CONTRARY TO THAT OF THE PIVOT.

*Secretary of Horological Club:*

In your Proceedings for March, I notice an item on rotating loose hole jewels. I have seen several hole jewels loose in their settings or frames, and while the pivot was in motion they would turn very slowly in the opposite direction in the frame. I have seen boxes in machinery loose, and rotate in their seats and in a contrary direction to the shaft. These boxes are called thimbles or bushes. The reasons of which are probably as follows: All journals or pivots in their boxes or holes have a rolling motion on the inside of the hole or confine, and, in the case of the watch, the pivot rolls forward in the hole of the jewel just as it would if rolling on a flat or straight surface. This forward motion is carried to a point where the pivot can go no farther, and then a slight slip takes place—then another forward roll and slip takes place, and so on during the continuance of its motion. This irregular action is due to the lack of constancy in the force impelling—teeth and leaves and other irregularities. Now, when the jewel is loose in its frame, it also rolls in its hole or frame and with the pivot, but when the pivot slips back this action makes a new point of bearing for the pivot in its hole, and this action rolls the jewel back with a sudden impulse and with greater effect than the slower and forward action just preceding, and by the superior force of this back impulse, the jewel is slowly rotated in its setting in a contrary direction to that of the pivot. Of course, all these motions and impulses are very small, but they become manifest by the slow retrograde movement of the jewel. I think by looking at the diagram you will see the forces and action with a little study.

I. L. FINN.

Mr. McFuzee explained that the diagram represented a pivot loose in a jewel hole and the jewel loose in its setting. The pivot revolves to the left, and has rolled up the side of the hole till it only touches at the left side, half way up, leaving an open space between it and the jewel, above, below and at the right. In the same way the jewel itself has rolled up in its setting till they only touch at the left side, half way up, leaving an opening between them at all other places. Any one can easily draw it for himself by simply making four circles, two large and two small, each pair touching each other only at the left, at a point level with the center of the pivot.

So far we may agree with Mr. Finn, and suppose that the parts have reached those positions. He then holds that the pivot, not being able to mount any higher, suddenly slips down and rests on this bottom of the jewel hole, and that this new position of the pivot, by its weight or by the pressure of the train upon it, causes the jewel to roll down in its setting and take a similar position. He further supposes that when the jewel reaches its lowest position it does not stop its motion, but its momentum is sufficient to carry it around a little ways, in the same direction it had while rolling down, *i. e.*, contrary to that of the pivot. Now, is this belief tenable? If the jewel was free from restraint at the instant that it reaches its bottom position, it would be possible for it to be carried back by momentum. But, in fact, it is not free, for it is held down by the pivot and pressed against its setting, whose friction is great upon it; and it would seem unlikely that the jewel, while so gripped between the pivot and the setting, could be thrown around or backward in the setting. We may suppose the jewel to roll up and down with the corresponding motions of the pivot, but in that case it would not revolve at all. On the other hand, if we suppose it to slip a little at every up and down movement, then it would slowly revolve in the same direction as the pivot. There is nothing to account for a motion in the contrary direction, except the theory of a throwing back action, which hardly seems tenable under the circumstances. Even if it could be assumed in the case of light mechanism, like watches, it could hardly occur in heavy machinery, where the weight resting upon the journals would prevent any jumping around of the thimbles. We would like to hear further about this curious phenomenon from our philosophical friend.

The Jewelers' League.

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THE JEWELERS' CIRCULAR is the exclusive official paper of the Jewelers' League, and has been selected for the publication of all matters of interest pertaining thereto. Letters or inquiries pertinent to its business or purposes, and which might interest the trade or inquirers, will herein be answered. Address Jewelers' League, Box 3,444, P. O., New York, or the office of THE CIRCULAR.

THE REGULAR monthly meeting of the Executive Committee was held April 3d, 1885.

There were present Vice-President Snow, and Messrs. Bowden, Howe, Hale, Smith, Lewis, Greason and Sexton.

Five (5) applications were rejected.

Five (5) applications were referred.

Eleven (11) applications were accepted, as follows :

O. Muller, New York, N. Y.; J. Wennstrom, B. Schiemann, A. R. Hutton, M. J. Feinier, Brooklyn, N. Y.; A. T. Poltock, W. Hoboken, N. J.; E. A. Potter, Providence, R. I.; C. L. Post, Columbus, Ohio; A. V. Richards, Dubuque, Iowa; W. T. Smith, St. Louis, Mo.; F. Z. Sherwood, Faribault, Minn.

Nine (9) changes of beneficiary were granted.

The question of re-instatements of delinquent members was thoroughly discussed, and it was decided that hereafter members who have been delinquents as long as 60 days shall be required to present new medical certificates together with their requests for re-instatements.

The Jewelers' Security Alliance.

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P. O. Box 3277.

Room 2, 170 Broadway, New York.

HON. ALGERNON S. SULLIVAN, Counsel.

At a meeting of the Executive Committee, held on the 10th inst., the following firms were admitted to membership in the Alliance :

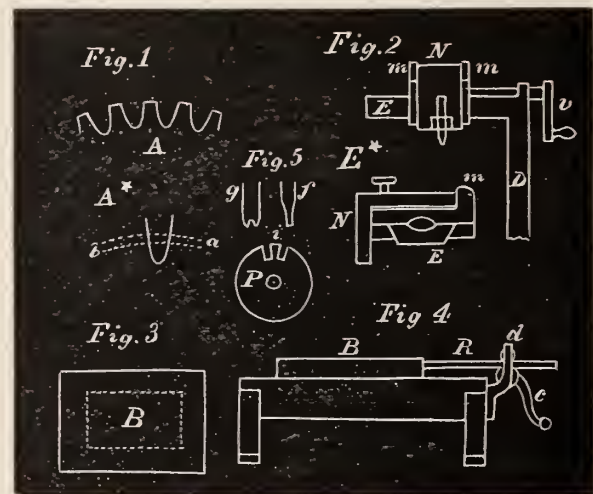
Hope Bros. & Co., Knoxville, Tenn.; Leonard Huber, Louisville, Ky.; Fritz Hofer, Aurora, Neb.; Wm. Platt, Troy, N. Y.; D. M. Weil, Wichita, Kan.; Geo. Wolf & Co., Louisville, Ky.

Lathes and Lathe Work.

BY THE MODEL WATCHMAKER.

THE BEST form of tooth for gear wheels cut in the manner described in April number, is shown at *A*, fig. 1, and the form of the cutter at diagram *A\**, the dotted line *a* representing the extreme diameter of the wheel, and the dotted line at *b* the pitch line. Pin-

ions to work well and smoothly of this kind of gear, should not have less than 20 leaves. In cutting the teeth in zinc wheels the cutter should be kept well oiled. A pinion, 1 inch in diameter, should have about 30 or 36 teeth. Pinions, when speaking of the teeth, are usually called leaves, but when above 20 divisions they are generally considered as small wheels, and the *ingrainings* are described as teeth. Steel wheels for pinions, if annealed in a charcoal box, are readily cut in this manner. A sliding bed as described in April number, can be used for a small planer and shaper, and is a very useful tool for such persons as have an "itch for making things," as I heard a Yankee express it. By making the arm *E* (fig. 2, April number), so it can be used as a slide to shift the tool carrier back and forth, we can plane off a flat surface. We will describe the changes which would have to be made in the arrangement shown, (in April) using the same letters of reference in the present cut. The principal change to be made is to fit the arm *E* so that a transverse section would be shaped as shown at diagram *E\**. In the new arrangement a slide is fitted on *E*, with beveled guides as shown in *E\**. To this slide are also attached the lugs *m m*, which carries the tool holder *N* precisely as in last arrangement. The slide on *E* is provided with a screw shown at *s*, to move the tool back and forth. This screw works precisely as the ordinary traverse screw does to a slide rest and will need no further description. The feed screws in *N* will govern the up and down to some extent, and a change in the height of *D* (April number) will do for anything required. A change should be made in the sliding bed *B* (April number), by having it cast with the part enclosed in the dotted outline, fig. 3, raised, say, 1/4 of an inch. This raised part is to be planed off in



the machine itself, so as to be perfectly parallel to the arm *E*. Let this raised part be, say, 6 inches long and 4 wide. Holes can be drilled in the sliding bed *B*, to which fastenings can be attached for holding any piece we want to plane. A rack and pinion can be substituted for the lever to move the bed *B* back and forth. There is no difficulty about making the change from the lever to the rack and pinion. The arrangement for holding the pinion is fastened at the same place as the one which holds the foot of the lever. The connecting bar from the lever to the bed *B* should be jointed to *B*, and the rack should also be jointed to *B*. A general plan of the arrangement is shown in side view at fig. 4, where *B* is the bed; *R*, the rack; *c*, the crank; *d*, a friction roller for holding the rack pressed into the pinion. The sliding bed could as well be fitted as shown in this number in the first place, as it is equally as well adapted for gear cutting. After the slide on *E* is fitted up, the surface of *B*, which is raised and shown enclosed in the dotted lines, can be planed off by a proper shaped tool in *N*, moving the screw *v* so as to take a slight chip or cutting off at each stroke. But what such a machine is best adapted for is brass, like the plates for a small clock—a plate 4x6 can be planed, which is quite large enough for a regulator. The teeth can be cut in the wheels and pinions also with such a planer, only remembering to use pinions of twenty teeth. Wheels can be cut in this way as fine as the teeth in watch wheels, only a

good deal of care must be exercised in making everything with the greatest exactness. But if the reader has complied with the directions given in regard to accurate measuring tools early in these papers, he will be able to manage it. Pinions should be turned and cut separate from the staff or arbor on which they are to run. Here is one place in which accuracy will particularly tell. If the pinion is turned perfectly true, and the arbor on which it is put to be cut is perfectly true, it must come out at the end of all the processes perfectly true. The hole through a pinion of this kind should be slightly taper, and the arbors exactly fit it. By this I mean first the arbor on which the pinion is to be cut, and also the arbor on which it is to be mounted. If you find any job that the work gets out of true, seek for the error and the place where it occurs and remedy it. The only source of error which can creep into a machine fitted up as described, is in the spacing of the teeth on the division wheel  $\frac{1}{2}$  (April number); but even this source of error can be corrected by making the wheel  $\frac{1}{2}$  double, joining the halves with the screws  $s s$  (April number). In doing this, teeth must be cut in the edges of both wheels at the same time. After the teeth are cut the wheels are turned half way round relative to each other, and again secured by the screws  $s s$ , which are opposite. But this system of correction is of too common use to require further description. Pinions with the leaves rounded, exactly as the usual clock and watch pinion, can be cut in this machine by making two operations of the cutting. The principle by which the cutting is done is shown in fig. 5. The first cutter is simply chisel-shaped, cutting a straight incision as shown at  $i i$ . This cutter is shown at  $f$ . The second cutter is shown at  $g$ , and is concave on the edge. At  $P$  is shown a blank pinion with two incisions forming a leaf. The pinion is first cut around with the chisel-shaped cutter, when all the leaves would be as the one shown. We next change the cutter and put in the one shown at  $g$ , and set the index wheel so the cutter with its concave edge comes astride the leaf, rounding both sides. Well formed cutters of this type and an accurate division wheel will cut beautiful pinions. Pinions with conical holes, when mounted on a taper arbor, can readily be driven on so as to need no other fastening. The zinc wheels for our lathe should be about  $\frac{1}{2}$  an inch thick, and a pinion 1 inch in diameter should have about 20 teeth of the form shown in fig. 1. A wheel should be made to run like a loose pulley around the centers of both head blocks. These wheels should be 4 inches in diameter and have 80 teeth. These wheels serve the double purpose of transmitting power for turning any piece put in the lathe, and also conveys the motion to the feed screw for working the slide rest. We will give in next article the size and positions of the change wheels for cutting screws of different pitch, and a change of feed for turning. As soon as we desire to turn a piece of steel of any considerable size, we must resort to some means by which we can make our work run slower and with greater power. To do this we connect our foot wheel to a countershaft, and from this countershaft, by means of gear wheels, bring the motion to our job in the latter at a lower speed. All this we will consider in our next.

## Fashions in Jewelry.

### A Lady's Rambles Among the Jewelers.

THE average fashion article is a delusion and a snare, and the man or woman who writes it nine times out of ten knows less about what people in polite society are wearing than does the average reader of said article. A New York daily, laying claim to an extended circulation, recently announced in its fashion notes that "bracelets are no longer worn by ladies of refinement," while a leading evening journal as emphatically proclaims in its fashion items that "it is considered vulgar to wear large diamonds." Now, the truth is, the bracelet rep-

resents one of the most salable articles to be found in the jeweler's show case at the present date, and ladies in high social circles are wearing bracelets, as well as other jewelry, with more freedom than before in many years. Readers doubting the first statement are referred to leading retail houses that cater to an exclusive fine trade, such as Tiffany's, Howard's and Starr's, also to the manufacturers of fine gold jewelry for statistics proving the largely increased sales in bracelets. Then the doubtful ones have only to follow fine ladies to the opera, the theatre, receptions and balls, to prove with their own eyes that the trinkets were bought to be worn, not hidden away in a casket. As regards the wearing of large gems: Well, the fashion writer of THE CIRCULAR defies the "oldest inhabitant" to prove there ever was a season when the fashions precluded the wearing of a large diamond of fine quality, by people refined or otherwise, whose circumstances admitted of their possessing such a jewel. It is high time that this and similar written nonsense had come to an end. The patient public has had "ancient history" in jewelry fashions *ad nauseum*. Because "once upon a time" jewelry was but little worn does not prevent the fact of its increased popularity now. Let us please have some fresh items, brother and sister fashion scribes. Believe me, the popular prejudice is in favor of a new order of things and against stale matter in fashions.

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THE bracelets worn to-day are in remarkable contrast with the old-fashioned chain manacles and stiff broad bands of former times. The latter was valued chiefly according to size and weight, while the present styles include only such as are delicate and dainty in construction, and of artistic pattern and finish. Numbered with new things attracting deserved attention, and promising to have a long run, are elastic reversible gold bracelets. These bracelets are composed of little box-shaped sections strung together on a gold wire spring, and so arranged that the bracelet can be slipped over the hand with perfect ease and yet adjust itself closely to the arm when in place. By this arrangement troublesome fastenings are entirely dispensed with, and there is not the slightest danger of losing the bracelet from the arm. In addition to the merits of flexibility, durability and elasticity, is the fact that these bracelets are reversible. They are equally well finished on both sides and show two distinct styles of finish, affording two bracelets in one. For instance, the block pattern sections, on one side, may present the "crackle" or "bark" finish, and on the other a plain or etched surface; or again, gems may appear on one side for evening wear, and a plain surface on the other for less ceremonious occasions. The bracelets are as readily turned as are a strand of beads on a rubber cord, with the advantage of a durable gold wire coil in place of destructible rubber.

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THE "crackle" finish which has appeared on some of the new jewelry, was doubtless suggested by the crackle glass and porcelain ware which has had quite a run, and which it certainly resembles. It affords an attractive change, and is deserving of the favor of a large patronage. The same may be said of the "bark" finish, which, by the by, is especially effective on lace pins and link buttons in form of long bits of bark. This rough rustic finish affords an admirable ground work in which to incrust small gems. Flat link bracelets with a gem in each link are effectively made with this finish. The "crackle" and "bark" finish appear in both gold and silver jewelry.

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THERE is one class of jewelry that claims all seasons for its own, and which finds a steady sale regardless of the going and coming of

fashions, and that is black onyx jewelry. Nothing has ever been introduced that fills its place satisfactorily. With elderly ladies and ladies in mourning onyx jewelry is indispensable, and these alone constitute a large patronage. Onyx jewelry, however, is by no means confined to any age or circumstance. In combination with diamonds, pearls and gold, it is suited to festive as well as mournful occasions. Being exceedingly becoming, it is needless to add that black onyx jewelry is much affected by young and pretty widows.



WATCHES for ladies' use continue small in size, the preferred sort being those with plain gold case on which the monogram is engraved or etched. Silver watch cases, by the by, some of them, represent a high class of art work in their decoration and finish. Especially artistic are the etched ones oxidized to gain the old silver finish so highly prized just now. Then there are some beautiful examples of enamel to be seen on silver watches.



THE Queen chain continues popular beyond the expectation of its most sanguine manufacturers. It combines the several merits of grace, beauty and cheapness. It is also susceptible of all degrees of ornateness, without losing its leading charm of simplicity.



THE Queen chain in black onyx and gold, is out this season in a diversity of patterns to meet a large demand. This style is preferred by many middle aged ladies and others just out of mourning. For deep mourning come onyx chains with the appropriate crape finish.



SILVER jewelry has attained a high prominence among connoisseurs and patrons of taste, with its graceful designs and artistic workmanship. Notable among new productions is silver jewelry in the decoration of which gold alloys are hammered into the silver, producing a harmonious gradation of colors and beauty of finish never before gained on silver. In illustration of this new finish may be mentioned flower pins, a pansy, for instance, which received the hues of the natural bloom through the alloys, and not only this, but that peculiar velvety appearance characteristic of the natural flower. Lace pins, simulating a cat in form, possess to a remarkable degree this velvety finish, while the spots that mark a cat's coat are clearly brought out by the use of various alloys. Exactly the same effects have been produced by this same process of hammering in alloys on gold, but application of the process to silver is a recent one. In much of this new jewelry the entire surface is covered with the gold; again some of the jewelry shows the combination of the two metals, as when the design is traced on a silver background in threads of gold.



THE steadily increasing demand for fine metal work for church use has developed many beautiful and interesting models in the way of ecclesiastical goods, and silversmiths are finding it to their interest to reproduce some of the old altar pieces of the past, as well as to originate new ones. A visit of inspection to one of the headquarters of this class of metal work disclosed the fact that ecclesiastical metal work for Episcopal and Catholic churches follows mostly old English styles, those prevailing during the fifteenth

century being most largely reproduced. The communion sets for the churches mentioned employs a combination of fine cut glass and richly engraved or etched silver. The collecting basons are made sometimes of silver and sometimes of brass. In both metals appear *repoussé* work in the center, with appropriate texts engraved upon the edges of the basons or receivers. For Presbyterian, Methodist and other denominations, the communion sets are less interesting to antiquarians, making little or no pretense to following models hallowed by ages. In mission and pocket sets, the great aim is to have a complete service in as compact and convenient form as possible, and it is really remarkable the ingenuity with which this has been perfected.



THE baptismal fount is another object upon which skillful workers in metal expend much time and thought. Many of these founts are made of silver, and represent on the outside of the bowl moving water. Occasionally a glad parent with a big cash account orders a special fount for the exclusive use of his own offspring. It is told on the authority of the superintendent of an ecclesiastical department where the work was done, that a New York gentleman has a fount made to order for each child born to him, the number at the present date having reached five. What is done with the fount after the christening was not satisfactorily explained, but the story is given for what it is worth, all the same.



IN CONNECTION with the revival of old models in church metal work naturally follows the reproduction of apostle spoons, a relic of a time-honored custom in England. A set of apostle spoons consists of thirteen pieces, one being the Master's spoon and the others the spoons of the twelve disciples. Each spoon has carved or engraven on its handle the figure of one of the apostles. It is claimed that there are only three perfect sets of the original apostle spoons in existence; one at Cambridge, another at South Kensington and a third in the possession of an English clergyman. But these are sufficient to furnish models for modern artisans, and high church folk are afforded an opportunity of adopting the old custom if they feel so disposed. The custom in question makes it incumbent on the sponsor in baptism to present the god-child with one or more of these spoons, a whole set being expected where economy is not a matter for consideration. Often only two spoons are presented, in which case these represent the patron saint of sponsor and child.



IT IS A well known fact that in fashionable New York houses the dinner caster no longer holds a place. It was some time ago banished to make way for pretty salad casters and individual peppers and salt shakers. Everybody does not know, however, that the caster thrives in spite of the disfavor of polite society in New York. In a word, outside of two or three large cities the caster is as popular as ever, and in evidence of this fact are the large lines of new patterns all the time being produced by our leading New York manufacturers, who count casters among their most salable articles.



THE baking dish, which is all the while growing in favor, is out in new shapes and designs to meet the requirements of the increased demand. Those of oblong form afford a pleasing contrast to the round dishes, and will be appreciated by people who welcome a

change. These convenient dishes are furnished in all the prevailing styles found in hollow ware. Their economy is appreciated fully only by the people who have once used them. With ordinary care, the triple plate baking dish will last for fifteen or twenty years, when it can be re-plated or replaced, and yet not cost half so much as the porcelain and china dishes usually bought and broken in a family during the same period of time.

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IN SILVERWARE, the old silver finish continues popular, but not to the exclusion of other styles. The fancy for tints on silver appears to be a growing one, for many beautiful effects have been produced on this season's ware by means of alloys and chemicals, one piece of silver often showing a gradation of colors from green to red. This finish is very decorative and is employed to fine advantage on fruit sets, berry spoons and odd pieces. A beautiful specimen, seen on a small tray, give the effect of an exquisite miniature inlaid in a frame work of finely wrought silver. Now and then the bowls of gold lined spoons are engraved or etched with pleasing effect, but this is too expensive a fancy to be of frequent occurrence, and is usually confined to ice cream spoons or after dinner coffee spoons.

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THE fluted finish, which appears on most of the silver table ware, and known as the "Queen Anne," also the "Elder Brewster" finish, was first seen in this country on a tea set of English manufacture belonging to Wm. Brewster, one of the pilgrims who landed at Plymouth, and who figures in American history as "Elder Brewster."

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MENTION has before been made in THE CIRCULAR of the excellence of American cut glass, also the wonders being accomplished in the Pittsburgh factories in way of pressed glass. It is conceded by authorities in such matters, that the best quality of American cut glass compares favorably with the English production, and is fast driving the latter out of this market. And now Pittsburgh pressed glass is coming to the front with recent productions that evince remarkable perfection in this line, and suggesting splendid possibilities for the future. Samples recently seen reproduced in pressed glass, the "strawberry cut" on some glass bottles with a fidelity certain to deceive the average observer, while the finish of the stopples occasionally misleads an adept. The excellence attained in pressed glass makes it possible to put on the market fruit dishes, casters, etc., of desirable patterns and fairly pleasing appearance at prices suited to a popular trade.

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THE fame of American watches is world-wide, and yet the application of automatic machinery to the watchmaking industry was not employed until 1848. Like many another experiment destined to bring about a wonderful revolution, the pioneers in watchmaking by machinery had a hard struggle which eventually resulted in financial failure; but out of this forlorn enterprise sprang the original American Watch Company, from which, in turn, many other companies have developed. According to a comparatively recent estimate by one of our foremost manufacturers, there are made, on an average, 3,650 watches per day by nine first-class factories in the United States. The value of the year's product of gold and silver watches in this country exceeds \$16,000,000, and the business directly and indirectly furnishes employment for 100,000 persons. The above

estimate does not include the production of cheap, inferior goods. The improvements in the general manufacture of American watches have been especially notable since the Centennial Exhibition, resulting not only in improvement in quality, but the reduction to nearly or quite one-half of the previous cost of producing a watch movement. The production during the interval stated has been quadrupled.

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SO RAPID and so systematic have the operations of the mechanical appliances in a watch factory become, it is possible to take the raw materials from stock in the morning and have a watch running from them by noon. A leading factory in which we are assured this feat can be done, makes every part of the works in the establishment excepting the mainsprings, which are French. In this same factory the share which mechanism has in the finished watch has been increased until there remains now for hand work only the preparation of the jewels and the cutting of the gold regulating screws. In the production of a single watch of good grade, the distinct operations required make a sum total of 3,500 and upwards.

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RECENT importations of French clocks include black marble ones without gilt lines or other form of ornamentation, the single decorative feature being a fancy face. The forms of these new clocks are decidedly pleasing, and the change from redundant styles of decoration to none at all, it must be confessed, is an agreeable one. Quite in contrast with these plain marble clocks, which depend upon their fine quality and artistic forms for favor, are the wonderfully ingenious mechanical contrivances in form of a lighthouse, a windmill or an old oaken bucket swinging in a well, and which display in their evolutions a clock face.

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THE demand for fanciful clocks is still unlimited, if one is to judge by the number of new patterns furnished this spring, both by manufacturers at home and abroad. Of the making of placque clocks there appears to be no end, and it must be said that there are some very pleasing designs among the new gilt ones. In competition with placque clocks are the newer tambourine timepieces, which, as the name indicates, consist of a clock set in a tambourine. Of course, the tambourine affords a wide field for a varying of decoration. A pretty conceit is that of a clock being carried in a sedan chair.

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JEWELERS located in towns where there is no resident optician have, as THE CIRCULAR has before suggested, splendid opportunities for building up a lucrative trade in optical goods. The obstacle to this lucrative trade has heretofore been the ignorance existing among retail dealers in regard to testing the eyes and adapting lenses. This ignorance has occasioned serious losses and injury to everybody concerned. The manufacturers, who are keenly alive to the detriment done the trade through lack of an intelligent handling of their stocks, are all the while introducing various contrivances and testers for the education and assistance of amateur dealers in optical goods. So zealous have they been and so practical the contrivances they have introduced, it would seem there remains little, if any, excuse for lack of knowledge on the part of dealers in regard to the proper selecting and adapting of lenses to their customers' needs. While the lenses are a first consideration in eye-glasses and spectacles, the adjustment of their frames is an important matter, and one often

overlooked to the serious inconvenience of the wearer. The center is the best part of the lenses, hence the pupil of the eye should be in direct line with the center of the lenses. Now, the distance between the pupils varies in different people, and unless the frame of each pair of glasses be fitted in every individual case to meet this requirement, the best effects from the lenses are lost. To assist dealers in this direction has just been introduced the pupilometer, a pupil measure of exceedingly simple contrivance, by which anybody can ascertain with perfect accuracy the space between the pupils, and readily adapt the frames of either spectacles or eye-glasses to eyes and face. This, it is believed, will add a very serviceable article to the list of assistants already known to the trade, and help to hasten on the time when a countryman or woman will feel as assured of a good pair of glasses, properly adjusted, at the hands of the smallest retail dealer, as they would experience if making their purchase of a regular optician.

ELSIE BEE.

### Advice to Watchmakers' Apprentices.

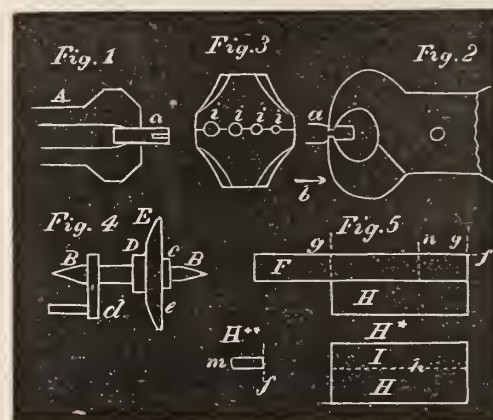
BY A MAN WHO HAS SPENT TWENTY YEARS AT THE BENCH.

WHEN HOLES are too badly worn in a clock plate bush them. For those who have an American lathe this is very easily done. Select a piece of hard brass wire a trifle larger than the bush you wish to make, and put it in a split chuck as shown at *a*, fig. 1; center and drill with a drill a little too small; turn off the outside of the wire to a convenient size. Next take an old pair of cutting pliers and soften the cutting edges. File the edges a little thick, and cut notches half in each as shown at *i i i*, in fig. 3, which is a view of fig. 2 seen in the direction of the arrow *b*; in these notches cut fine screws so as to grasp a bush as shown at *a*. The bush should be grasped near the base, and lathe turned backward so as to cut a screw on *a* as it is unscrewed. Such an arrangement, with four sizes of screws with taps to match makes bushing very easy. If you find your bush on one side and the wheels out of depth, remove the bush and file the hole over to one side and put in a larger bushing. Sometimes the ends of the teeth are pitted and worn. This usually occurs only when the depth is too shallow. Don't attempt (as a usual thing) to file up the teeth, but set up the wheel to the correct depth and reverse the wheel, *i. e.*, take it off the arbor or pinion, and turn it so the opposite side of the teeth will work against the pinion. Be sure and look if the wire of which the pinion is made is not rough; if so, put in new wires. Such cases of repair are exceptional, and are not found in one clock job in fifty, but one should know exactly how to do it. Old Yankee clock wheels and movements should be saved in a box kept for the purpose of repair stock. The pitting of pallets is very common. If the pallets are only a trifle pitted, they should be ground out with an emery wheel mounted on a spindle as shown at fig. 4. Emery wheels are something of importance around a workshop, but good ones are a little hard to come by; the tanite are about the best. A good emery wheel should cut rapidly and not glaze. For clock verges one about  $3\frac{1}{2}$  or 4 inches in diameter is right, and it should not be too fine. One thing in emery wheels should be kept in mind, that is, to run them at a very high velocity—a peripheral velocity of 2,000 feet in a minute is not too much—even double this velocity in some cases. A lap made of lead and tin with a small percentage of copper is useful for grinding off pallets and also for bright work in jewelry. The laps are made as follows: A wooden pattern is prepared 6 or 7 inches in diameter and molded in sand (a process which has been fully described in these papers). Such a lap should weigh about 5 pounds and be about  $\frac{3}{4}$  of an inch thick in the middle, and shaped as shown in fig. 4, which is an edge view. If we prepare 6 pounds of lap mixture, which we should need to cast a lap weighing 5 pounds, the proportion would be as follows:

4 pounds pure grain tin.

2 pounds pure lead.

Melt the lead and tin separate, and pour together into one ladle and stir well together. Add to this melted mixture of tin and lead 6 pennyweights of melted copper, stirring again well. Now, pour into the sand mold. The sand mold should be of the dry sand kind made by mixing a little dissolved rock candy with the sand to moisten it. After the pattern is taken out, the mold should be well dried and the composition poured while the mold is hot. The lap should be mounted on a spindle with a collar *D* and nut *c*. The ends of the spindle are cone pointed as shown, so as to go into a lathe when it is turned by the dog *d*. It is better to mount a lap or emery wheel on such a spindle than to run it on a chuck screwing into a lathe spindle. A lap something smaller will answer, and the copper can be dispensed with, but the copper makes the lap harder and more durable, especially for edge work. A lap made (cast) from old type will do pretty well, but is not as nice for gold work. After the face *e* is turned flat it should be filled with flour of emery, and if for gold work the emery should be washed by letting the coarser particles settle out. The emery should be rubbed well into the face of *E*, with some hard substance like a piece of agate, until the face of *E* is completely filled with particles of emery. Such a lap is used dry. For gold work a lap improves for some time, giving brighter and brighter surfaces. Laps are mostly used for colored work and



give beautiful contrasts. The gold goods should be protected by a coating of gum gamboge and gum Arabic, two parts of the latter to one of the former, dissolved in water until about as thick as thin mucilage; this painted on and dried will do it. The lap will soon cut away such parts as come direct in contact with it. Laps and emery wheels should not be used on your watch lathe but in your jewelry polishing lathe. The face of the lap *E* should be perfectly flat and true. For mere clock work a lead lap 4 inches in diameter and, say,  $\frac{1}{2}$  an inch thick in the middle and  $\frac{1}{4}$  at the edges, charged with No.  $\frac{1}{2}$  emery will answer every purpose. After the pit is out the surface of the pallet should be rubbed with an emery buff made by glueing 000 emery cloth on a stick 1 inch wide,  $\frac{1}{4}$  of an inch thick and a foot long. Everybody uses such buffs, but only few get the best service out of them. Mahogany buff sticks can be got for a few cents apiece, and will last for years with anything like care. It may not be amiss to tell how to make them; get, say, six mahogany sticks of the size given, cut 6 strips of emery cloth  $2\frac{1}{4}$  inches wide and shown at diagram *H\**. We next take one of our sticks, and with hot strong glue paint it from *g* to *g*, fig. 5. We now press this painted side on *H\**, so it occupies the emery cloth from the margin to the dotted line *h*. A weight of some kind is placed on *F* to hold it pressed down on the emery cloth until it dries. As soon as the glue is firmly dried the remaining portion of the emery cloth shown at dotted line *l* is painted with glue, when the rest of the emery cloth is wrapped around *F*, after which the buff is placed under weight to hold the cloth in place until dry. The advantage of making an emery buff in this way is that we get better edges, as will be seen by inspecting diagram *H\*\**, which is a transverse section of *F* on the line *n*, fig. 5. It will be seen that as we commence with a cut edge

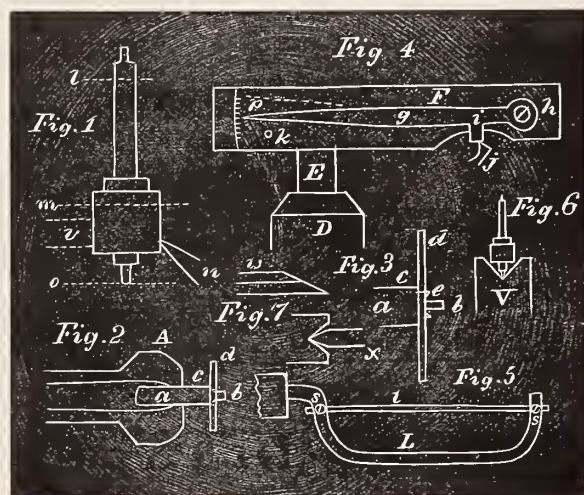
which corresponds to the dotted line *f*, diagram *H\*\**, and wrap the emery cloth around *F*, the edges at *m* must be somewhat rounded, a feature useful in many instances; it also gives us a narrow buff on the edge *m*, while the edges on the dotted line *f* are as near square as we can well get. After a buff is worn out throw the stick into water over night, and in the morning it will be soaked loose; dry it a few minutes and it is ready for another covering of emery paper. The advantage of using mahogany is it is very hard and does not warp like most other woods. After the scratches from the lap are removed, the pallet should be polished with Vienna lime or diamond-tine. English steel rouge does well but is too slow for such persons as desire to hurry. If the pallets are too wide or too close, heat them up to a deep blue and bend them, but don't soften the wearing faces of the pallets.

### Problems in the Detached Lever Escapement.

BY DETENT.

WE GAVE a cut in last article illustrative of the manner of correcting a pinion which was faulty; the cut to which we refer is fig. 6, April number; but we will repeat this figure for convenience sake. The first thing to be done to complete the problem unfinished in the last article, is to test our scape wheel and see if it is perfectly round, measuring or testing from the hole in its center. To do this we put a piece of steel wire in our lathe as shown at *a*, fig. 2; we turn down the end at *b* until the scape wheel will just go on up to the shoulder *c*. This will be better understood by inspection of fig. 3, which is an enlarged view of the wire in fig. 2. The dotted lines are supposed to represent the scape wheel; the part of the wire *a* at *e* is turned so the scape wheel will just go on, and an under cut part of *e* is left so as to be burnished back on the scape wheel and hold it flat and true. Such a piece of wire is turned in an instant almost, and the wheel fitted and fastened on it. We next fit a piece of large wire into the rest holder as shown at *E*, fig. 4, *D* representing the rest holder. Attached to *E* is a flat plate of brass *F*; this forms, with the wire *E*, a T-shaped piece, the end (*H*) of which extends over the axis of the lathe. There is an indicator finger *g* attached to *F* by a screw at *h*. The idea of the device is, the instrument is set over the scape wheel mounted as shown in fig. 2, in such a manner that the teeth of the scape wheel will touch a projection shown at *i*, which extends downward from the indicating finger *g*. At *k* is a pin inserted in *F* on which the finger *g* can rest. It is evident that if the scape wheel mounted in the lathe is turned, the teeth will one after another take the place of the one shown at *j*, and as they pass the projection *i*, the indicating finger *g* will be raised until the tooth passes *i*. If the teeth all raise the finger *g* to the same height the scape wheel must be true in the round. On the other hand, if the teeth raise *g* to different heights the scape wheel is out of round and should be corrected; if the teeth on one side all seem to be too short and the other side all too long, it indicates the wheel is round but the hole is not in the center, but should be filed or ground to one side. For grinding a hole to one side in a hardened steel scape wheel, the best instrument is a piece of soft steel or iron wire of near the size of the hole, charged with oil and oil stone dust. The frame for holding such a wire is shown in fig. 5, the bow *L* is bent as shown, and has two set screws shown at *s s* for holding the wire, the bow *L* having two holes into and through which the wire *t* is passed. This tool is used by putting the wire *t* through the center hole and smearing the wire *t* with oil and oil stone dust, and grinding the hole over to one side in correction. This tool is also very useful in grinding over the hole in hardened steel pallets for the purpose of setting them closer or farther away; and again, in roller tables it frequently happens the hole is to one side, which throws the roller out of round. In this case the hole for the staff is ground over to correct the error, and then with a round faced punch close

the hole so as to grasp the staff again. To resume our problem of an untrue scape wheel: If we conclude after testing that grinding the center hole to one side will remedy the inaccuracy, we shall have to remove the scape wheel from *a*, grind over the hole as described and then put the wheel back on *a*, after turning a new seat (on *a*) to fit the enlarged hole in the scape wheel. Generally one can hit the error at the first, but if it is found on trial again that we have not ground away enough (the safe side to err on), we can grind away a trifle more. It will now be safe to reset our scape wheel after trueing up the pinion. We will now go back to one shown at fig. 1, duplicate of fig. 6, in April, '85, number. What we want now is to turn up our pinion so it will be true, with a seat to fit our trued up scape wheel. We shall have to examine our pinion and see if it will answer. In the first place we shall have to raise the pinion, cutting off the top pivot and turn a new pivot with the shoulder coming on the dotted line at *l*. The wheel seat will come on the dotted line *m*. Now, this will leave the lower pivot too short, to remedy which we must pivot the pinion on the lower end. We put our pinion in the wax chuck with the lower pinion out, and true up by the outer edges of the pinion leaves with a piece of sharpened pegwood held as shown at *u*. We pivot so as to bring the shoulder on the line *o*. Of course, it is to be understood that we are not going to raise the pinion so much as to disengage it from the teeth of the fourth wheel.



After the lower pivot is formed we should reverse our pinion in the wax and turn the top pivot on it, and also turn for the new wheel seat on the line *m*. In doing such a job we should be positive the hollow cone in our wax chuck is absolutely true, and that the lower pivot goes completely to the bottom of the hollow cone as shown in fig. 6. The cautions are these: Be sure the hollow cone at *V*, fig. 6, is perfectly true—no little point protruding in the center, and that the hollow point is in the absolute center of the axis of the lathe, and also be sure the lower pivot goes in and rests in this center, and that the edges of the pinion leaves does not touch the sides of the hollow cone. With these precautions taken we can be certain of the truth of our work. It may be well for the benefit of the young reader to tell him how to turn in a hollow cone and have it true. Sharpen a graver with a long taper point as shown at *w*, fig. 7; with this turn your hollow cone as perfect as possible, with the angle as near  $60^\circ$  as you can judge. Next turn a steel point as shown at *x*; this point should be as hard as the graver will cut; turn it so it is a little more pointed than to exactly match the hollow cone, i. e., the angle of the steel cone point should be about  $55^\circ$ . After your hollow cone is as near perfect as you can judge, insert the steel pointed cone and press it forcibly inward. This will positively remove any little protuberance which might have been left in the turning. The reader must not imagine that this way of treatment will cure a badly turned up hollow cone; it is only to be used as a perfecting and finishing touch. After the top pivot is turned, the seat for scape wheel is turned on the line *m*. The whole of the idea is to raise the pinion enough to allow a new seat to be turned for the scape wheel, and to enable us to do this the lower pivot will have to be removed and the

pinion drilled with a drill of such size; the plug inserted will be large enough for not only for a pivot, but a shoulder. In my next communication the plan for grinding imperfect club teeth will be given.

### The History of Goldsmithing.

*Continued from page 70.*

THUS, IN THE inventory made in 1379 of the silverware of Charles V., mention is made of one of these fountains that served as a center ornament of the table, which, according to the figurative expression of a chronicler of the time, was "a history in gold and silver." The upper part was a large hanap (large cup), in form of a castellated tower, to which clung several turrets, sustained upon springing arches and standing upon a green hill. At the foot were six armed men assailing the castle, and behind the castellations stood ladies ready in its defense, while from its three gates issued three trumpeters with instruments on their lips. The piece was skillfully decorated with enamels of different colors. The composition was probably a gallant allusion to some feat of arms in the taste of the period.

Another very elaborate piece will more fully give an idea what bizarre compositions the goldsmiths of the epoch manufactured, and found at length described in the inventory of Louis d'Anjou. It is an allusion to the legend, at that time universally known as "The Feat of Arms (*pas d'armes*) of Saladin, and was one of those compositions in which the hanap was the principal piece. It was artistically chased and decorated with numerous moldings and figured arcades. On the bottom, inside, was the horseback figure of Saladin, accompanied by several Saracens, raised upon a blue enameled ground, entwined with chased leaf work. Eight other enamels grouped around, and representing, two by two, the chevaliers who assisted in the feat of arms, were surrounded with pearls, sapphires and garnets. The following inscription was traced around the border of the cup:

*Logaument heil estez demene; quar de loyante est on honnourez.  
Qui loyaus est toute sa vie honnourez est sans billenie.*

The cover was also richly decorated. The center was ornamented with scroll work surrounding a blue enameled button, upon which rabbits gamboled. Above the button, and as crown to the piece, was the seated figure of Charlemagne, with sword in hand, his feet resting upon a lion. Around him (upon the cover) were represented his twelve victories in a series of enamels upon blue ground surrounded with borders of pearls and jewels, similar to the cup. The interior of the cover was equally ornamented with chasings and enamels, which displayed the banners of the twelve victories.

The hanap and its lid weighed thirty-two marks and was only a part of the piece, the full description of which is irrelevant, and we would never end this "History of Goldsmithing" were we to attempt a description of every quaint piece of work dating to those times.

The silver service of the table was at this epoch very different from what it is to-day. Certain pieces, at present considered more "for ornament than use," were at that time held to be very important. Others, again, which to-day are in universal usage were hardly known then.

Salt cellars, for instance, which are almost no longer seen on our tables, were, during the middle ages, and even at the beginning of the Renaissance, held to be indispensable, and worthy the embellishment of the goldsmiths' highest art. They were often made of gold and artistically enameled or studded with pearls and jewels. The city of Paris presented a beautiful salt cellar set with pearls, sapphires and rubies to Charles VI.; the gold used in its manufacture weighed fifteen marks and six ounces. The Duke de Berry possessed another one, equally valuable, enameled and mounted upon a chariot of gold; it was valued at one thousand livres.

It is both amusing and instructive to study the changes of customs, especially during the middle age. One chronicler of an earlier age—Olivier de la Marche, in his *Estat du Duc de Bourgogne*, gravely informs us that salt was held to be indispensable at table, and it is served even at the tables of princes, at each cover, in a small piece of bread, the crumb of which has been dug out correspondingly. This is pastoral simplicity indeed.

These same princes, who needed jeweled salt cellars, took no offense at conveying the food to the mouth with their fingers, which, as the old saying goes, were "invented before knives and forks," and thereby closely imitated the ancient heroes of Homer. "Spoons," says M. Laborde, "are as old as soup;" and he might have added with equal propriety, that "the custom of eating with one's fingers is as old as the desire to eat." As far as forks are concerned, however, they were then only a late introduction and hardly ever used in the fourteenth century. We find the first mention of them in the inventory of Edward I., of England, under date of 1297, and this monarch could sport only *one*. *One* appears to have been the cabalistic number. Queen Clemence, of Hungary, in 1328, possessed thirty spoons and *one* fork. Jeanne d'Evreux had sixty-four spoons as companions to *one* fork—always *one* only. Forks at that age had not yet sunk to that plebianism they have attained at present, but were objects of a luxurious and over-refined dude-ism. They were not used for eating fish, flesh or fowl with, no indeed—this would have been a dire affront to the time-honored and hoary-headed vehicles, the five fingers, and a broad hint to them that humanity could henceforward, and forever thereafter, dispense with their further services—titled dudes used them exclusively for eating fruit (and we hope that the soul-absorbing present social conundrum, whether green peas ought to be eaten with fork or spoon, never came up for discussion before their debating societies). Thus we find in the inventory of Peter Galveston, the favorite of Edward II., that he owned three forks to eat pears with. This is overstrained nicety with a vengeance. A little later, Charles V. raised the number to six: three silver and three gold plated forks—for what? To toast cheese with. At the end of the century the fair sex commenced to use them; the Duchess of Orleans had one made to eat confectionary with when she was sipping her wine; and the Duke de Burgundy had one of crystal and gold with which to chase his strawberries around the plate. They gradually worked their way downward, like everything else fallen from high estate, and two centuries later we find them "in everybody's mouth."

The numerous inventories still preserved, attest that the Dukes of Burgundy, Berry, Normandie and Orleans (not to mention the French princes), had each one collected large wealth. Particularly the Duke of Orleans, the husband of the handsome Valentine de Milan, was a prodigal without qualifications. Simon Allais, his goldsmith at Paris, once received from him eighteen thousand nine hundred and ninety-seven livres for gold and silver furniture, trinkets, etc., to be given away as New Year's gifts.

#### 3.—France (*fifteenth century*).

In spite of the universal distress prevalent at this epoch, when the church and the kings and princes possessed all the wealth of the country, while the poor luxuriously reveled in starvation, misery and rags, this custom of New Year's gifts was driven to excess, at least among the princes. We still possess a curious proof of this fact.

There still exists at Altœting, in Bavaria, an exquisite piece of goldsmithing of French origin, the existence of which is due to this custom. M. Labarte, in his researches, discovered a minute description in a manuscript inventory of the treasure of Charles VI., which says that it was presented to this unfortunate king by his spouse, Queen Isabella, of Bavaria, on the 1st of January, 1404.

As will be seen by the accompanying cut, fig. 31, the superior part represents the holy Virgin with her Well-Beloved Son, seated under a grape arbor. At her feet kneel Charles VI., clad in his paraphernalia, and with the royal crown on his head; opposite him is his



equerry carrying the king's helmet. At the lower part, which forms a kind of lower story communicating with the upper part by two staircases, is seen the king's horse, held by a page. The whole is of silver, gilt and highly enameled. The trellice of the arbor is studded with pearls and jewels, and around the throne of the holy Virgin are gracefully grouped several little figures of kneeling saints and angels with folded wings.

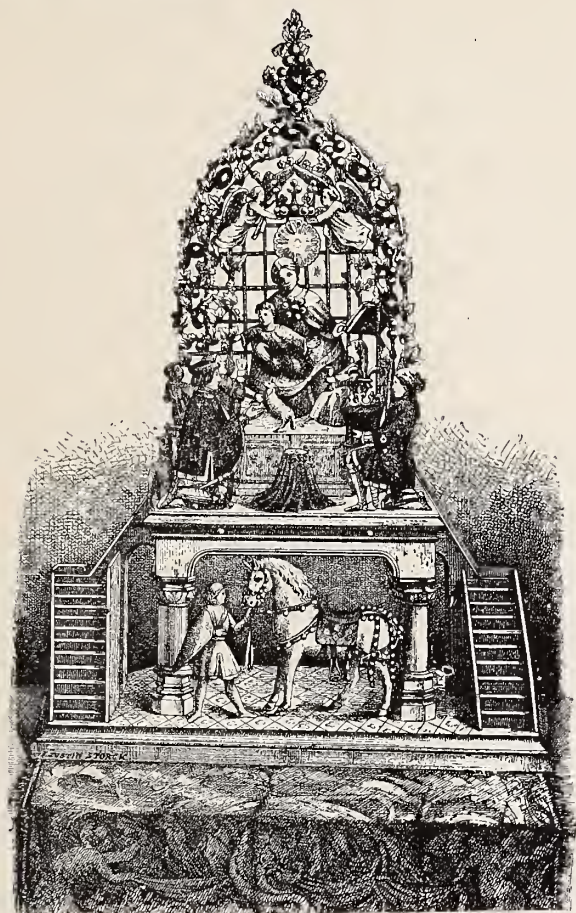


FIG. 31.

In the fifteenth century this little piece was known by the name of "The Gold Image of 'Nostre-Dame.'" "The Germans," (our French authority sneeringly adds), "attaching, doubtless, more importance to the figure of the horse than to those of the king or the holy Virgin, have named it 'The Little Gold Horse' (*Das golden Rassel*)."

Isabella, of Bavaria, who was not well liked by the French people, had a brother by the name of Louis, who got mixed up with many of her intrigues. He was charged for a short time with the care of the dauphin, who shortly afterward chose the Duke of Burgundy for his guardian, however. Public sentiment accused Louis of being the instigator of many of the disorders and acts of prodigality of Isabella, and of being the cause of her numerous pilferings from the public treasury. In 1413, Duke Louis fell into the hands of the discontented party, and was by them imprisoned in the large tower of the Louvre. But his captivity was of short duration, and as soon as liberated his sister appointed him to another important post—the command of the Bastille Saint Antoine, where she deposited the more precious jewels of the crown. The Duke of Bavaria, frightened, it is said, at the menacing attitude of the people of Paris, quitted France soon after. It is permissible to believe that when he went away he knew to pay himself for his services, and pretended that he had received the things as gifts from his brother-in-law, King Charles VI.

This is, according to M. Labarte, the reason why the piece is at present in Germany, and, he says, the Germans have always liked French goldsmithing. When we consider that this account was written shortly after the close of the Franco-Prussian war, it is easy to account for such flings of rancor.

With Isabella we arrive at the first years of the fifteenth century.

The situation of France presents nothing enviable. It is the time of its darkest hour. Its capital is in the hands of the invader, while the division, the many quarrels, rivalries and jealousies of the French princes add the misfortunes of civil war to those of the invading English. Only one thing has survived the general ruin: the senseless waste and lavishness of the princes.

The numerous inventories and accounts of this epoch, for instance, those of Charles VI., the Dukes of Burgundy, Normandy, Orleans, King René, etc., when compared with those of the preceding centuries, always show the same reckless waste, the same prodigality and ostentation, added to which are the vices of the century.

From the table of the magnates, goldsmithing passes over to their person. The prevailing fashion for gentlemen of that period were the so-called "hugue" robes, short plaited robes, heavily padded upon the shoulders, the sleeves of which are cut in a quaint style and reach down to the ground. It was the chief delight of these magnates to overload these long sleeves with trinkets of goldsmiths' work. Silk or felt hats were worn with this suit and adorned in the same manner.

Charles VII., in his early youth, and while he was only the regent of the kingdom, appears to have driven to the last limits this nonsensical custom. When he held his entry into Toulouse in 1420, he wore one of these robes with long sleeves, the gold garniture of which weighed ten marks; and in the following year we see him pay to Pierre Piettement, a goldsmith at Bourges, the fabulous sum of twenty thousand livres (which would be nearly twice as much to-day) for the chains and ornaments of goldsmithing of another robe.

The love of ostentation of this young prince was much greater than his love of arms. He was satisfied in the same year, 1421, with spending the sum of one thousand eight hundred livres for a sword-hilt and a parade helmet with gold dolphins and *fleurs-de-lis*.

His court followed his example of lavishness. History has preserved us the minute details of the luxuriousness of the lords who accompanied him in his solemn entry into Paris, after becoming of age, in 1435. The Bastard of Orleans was the most conspicuous of all; he was dressed with great splendor, and bestrode a horse, the housings of which, a gold cloth, dragged on the ground. Both horse and rider were overloaded with goldsmiths' work, according to the veracity of the chroniclers of the times. "Overloaded" is the proper word, because Dunois wore a gold necklace formed of large oak leaves, which, itself alone, could not have weighed less than fifty marks.

In the midst of all this unbridled licentiousness, it is pleasant at least to detect one man—Dunois—who loved war, and to whom arms were dearer than wanton display. In 1449, at his entry into Lyons, we see Dunois flourish a sword, the hilt of which was studded with rubies and diamonds, and valued at more than fifteen thousand crowns.

Ostentation and prodigality were the curse of the lords of this period, and one prince was no better than the rest—we may make *one* honorable exception: the Duke of Anjou, King of Sicily, better known in history as the good King René. From his recently published accounts we can see with what painstaking care he regulated his expenses, and that he did equal justice to all parts of his domains, preferably employing the artisans and artists of the locality where the work performed by his order was in progress.

As far as New Year's gifts were concerned, however, he participated in the vice common to the princes of the times, and bestowed goldsmiths' work with a lavish hand. Thus, in 1448, he sent to his sister, the Queen of France, a golden image of Magdalen (being a reliquary), which cost him twenty-four gold crowns. At another time he gave to the Senechal of Anjou a gold mirror, valued thirty-five florins; to his wife a gold tablet (reliquary), weighing four marks four ounces, twenty-three karats fine, and ornamented with sapphires, emeralds, rubies, etc. The queen, on her part, who was a woman with a domestic turn of mind, gladdened him with the present of two silver jars in which to put his sweetmeats. René appears to have

been delighted with this present, because we see in his accounts that he had them cased in leather, doubtless for the purpose of carrying them on his journeys.

It must not be presumed that because profane goldsmithing developed prodigiously, owing to the times, the religious branch was neglected. It is true the age when everything was dedicated to the service of God was passed. But the clergy were always powerful; certain churches and abbeys possessed immense riches; and the princes on their part had too much cause to sue for mercy and pardon, and therefore sought to ease their consciences and wipe out old scores of sin by the gifts of pious largesses.

In the beginning years of the fifteenth century, we find the goldsmiths of Paris engaged, by order of Guillaume III., Abbot of St. Germain des Prés, in the construction of a new shrine for the patron saint of his church, in place of the old one, dating to the time of King Eudes, which was, perhaps, not in the taste of the century. The new shrine, fig. 32, was in form of a church, surmounted by a

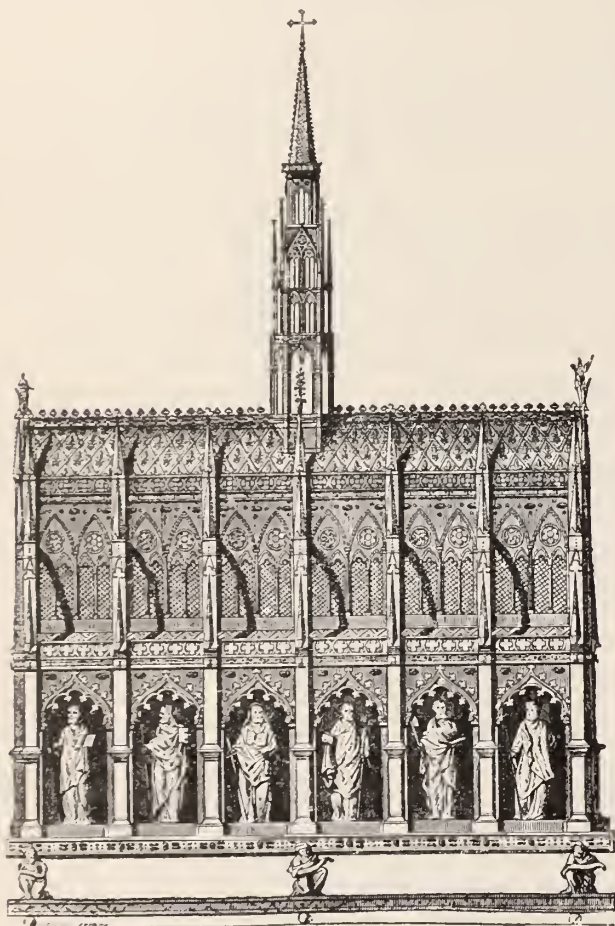


FIG. 32.

trelliced bell-tower, with six figures of apostles on each side, that of St. Germain at one end, and at the other the representation of Trinity between the two figures, one the King Eudes, the founder of the first shrine, and the other the pious abbot, who was about to found the second, for which were set apart twenty-six marks of gold, two hundred and fifty marks of silver, two hundred and sixty precious stones and one hundred and ninety-seven pearls.

Another handsome silver shrine with figures was that of St. Maclon, which Jean VI., Duke of Bretagne, donated to the Cathedral of St. Malo. It was manufactured by a goldsmith named Pierre de la Haye.

Occasionally, also, the English made rich presents of goldsmithing to the churches of the cities of France which belonged to their dominions. Thus, the Duke of Bedford, when he was appointed regent, in 1422, presented to the Cathedral of Paris a gold tablet with the picture of King Henry V. and Catherine of France.

The tender-hearted Agnes Sorel, even, was seized with the passion of tendering votive offerings to the church. In 1444 she gave to the Church of Loches a handsome gold cross containing a piece of wood

of the holy cross, together with a figure of Magdalen, inclosing a few of the beautiful blonde hairs that dried the feet of our Saviour. It is very edifying, indeed, to behold this festive royal sinner place herself under the patronage of her prototype, the sainted sinner, with whom she had nothing in common, not even the bitter pangs of repentance of the latter. It is not for us to assert that Magdalen interceded for her, but Charles VII. soon after experienced a great improvement in his fortunes, and he hastened to shower marked favors, in the way of rich presents, over his *chère amie*, who had remained faithful to him in his darkest hour of trouble. Heaven ever reserves its best rewards for the good.

We are sorry to say that gratitude was one of the lesser virtues of this brave monarch. History has for several centuries hung her head in shame when she was compelled to recount his ingratitude to Joan of Arc, and his conduct toward the eminent financier, Jacques Cœur, who had also rendered him invaluable service in his hour of need, was fully as shameful. Jacques Cœur was held to be the richest man of his time, and this was enough to condemn him. After having often relieved his most pressing wants, the king returned the favors by seizing his possessions in the name of the State, reserving the lion's share of the spoils for himself. Evil minded chroniclers assert that a portion of the latter went for having made another table service of silver, as he had been obliged to pawn his own at the time of his abasement and poverty.

It can readily be believed that a monarch who without further scruples confiscated the property of his subjects was also a spendthrift, because it cost him nothing. When, in 1458, a Hungarian embassy waited on him to demand the hand of his daughter in marriage with their King, Ladislas, Charles VII. would not suffer the ambassadors to return until they had accepted a mark of his royal favor. He sent them many rich presents, a rich silver-gilt table service and gold cups, each one filled with gold coin. The whole was valued at more than twenty thousand gold crowns.

Louis XI. was not a prodigal, although he frequently made costly vows. In moments of extreme embarrassment he was wont to become pious, and made a promise of a rich votive offering to some saint in whom he placed confidence, to assist him in his straits. As a payment of one vow, he presented to the Abbey of Saint Denis a large silver shrine, in form of a fortified town. It is said that this piece of work represented the town of La Guerche. In 1476, he turned over to his goldsmith, François Gimbert, one hundred marks of silver to manufacture a niche for the black Virgin of Puy, and on several other occasions he made rich presents to the Church of Notre-Dame-de-Clery, for which he felt a great devotion, and had a handsome silver inclosure made for the large shrines and principal reliquaries in the Church of St. Martin de Tours.

Apart from this, Louis was no lover of ostentation. If his father delighted to wear all manners of gold ornaments in the sleeves of his "hugue," the son was content with wearing simple lead figures on his hat.

Charles VIII. would have been the most frugal monarch who occupied the throne of France for several centuries, if his reign had been longer, and if the distant expeditions he was called on to make frequently had not consumed the resources of the country. The chronicles of his time have preserved only the description of a beautiful group of gold figures serving as foot to a cross, which he ordered from Lambert Haultemont, a goldsmith of Paris. This group represented the holy Virgin and Magdalen at the feet of Christ.

(To be Continued.)

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To Color Amber.

THE *Neueste Erfindungen und Erfahrungen* says that it is necessary, in order to color amber, to find a liquid in which it can be heated, and this liquid must comply with the following conditions,

says Prof. Ed. Hanausek : Its boiling point must lie above 302° F., and it is better if it boils above 392° F. The amber must not be attacked by the hot liquid, nor must its physical character be changed. The liquid must also be able to dissolve dye and not decompose them, or, at least, not rapidly. It is also necessary to mention that the dyestuffs employed must not decompose at the mentioned degrees of temperature. Many of the fatty or essential oils, and also solid fats and hydrocarbons which melt below 302° F., may fulfill these conditions. The attempts to impart different shades of color to amber were made in linseed oil. The following pigments dissolve in it without being entirely decomposed at 392° F., viz., dragon's blood, alizarine, purpurine and indigo. Of the aniline colors, fuchsine, aniline violet, methyl green and alkali blue, all refuse to dissolve in pure linseed oil. In carrying out the experiment, a weighed quantity was stirred into linseed oil, and the piece of amber to be colored suspended therein and slowly heated to 374° or 390° F. The liquid was then kept for some minutes at the temperature of 360° to 390° F., after which the source of heat was removed and the hot liquid allowed to cool gradually. After taking the amber out of the oil and cleansing it, it was found to be dyed.

Different colors can be obtained with the above mentioned dyes, and various shades can be produced according to the relative proportions of dye and oil.

A light or dark reddish brown can be made with dragon's blood, bright yellow with alizarine, an orange yellow with purpurine, light or dark green, dark blue and black from indigo. The proportions of indigo that must be taken to obtain the shades mentioned are given as follows : For light green, one-fourth part of indigo to a hundred parts of oil ; for dark green, half a part to a hundred ; for dark blue, one part to a hundred ; and finally, for black, four or five parts of indigo to a hundred of oil ; on heating the oil, the indigo dissolves in it and imparts to it a very beautiful reddish purple.

By frequently heating these mixtures to 392° F., both the indigo and the linseed oil suffer some change. The oil gets thicker and turns brown, and, when heated, it no longer assumes such a fine purple color. A mixture that has undergone this change from heating, colors amber brownish, hence it is necessary to frequently change the dye baths or renew them, when it is desired to obtain pure shades of green and blue. In dyeing black this is not so necessary, yet it has also been observed that in this case, too, the operation succeeds better by the use of fresh dye baths, or at least adding a little unused indigo to the bath after each heating. In dyeing black it is not necessary to suspend the amber in the liquid, for it is colored more quickly when it lies on the bottom in immediate contact with undissolved indigo.

If finely pulverized asphalt is put in linseed oil and the oil heated until it almost boils, a portion of the asphalt will dissolve, forming a brownish liquid with a distinct green fluorescence. Amber that has been heated in this liquid for a long time to 392° F., acquires a brownish color and has a slight greenish fluorescence, which characteristic, however, is much more distinct and striking if the amber is subsequently heated in a mixture of one part of indigo in a thousand of oil.

Asphalt is not the only substance that can be employed to impart this fluorescence to amber, as all hydrocarbons which are fluorescent themselves can impart this quality to amber.

Coloring amber is of practical interest in as far as it is a fact that this crude material can have the color changed in every way.

If it is found possible to give to any amber the color and shade of the finest quality, great results may be expected. Moreover, the method of dyeing low-priced amber is so simple that it can very easily be changed to black amber, for example, which is capable of being used for certain purposes.

Rendering amber fluorescent may be of considerable importance.

Gold From Exhausted Coloring Baths.

OUR EXCELLENT exchange, the *Journal der Goldschmiedekunst*, an authority on all subjects bearing on the precious metals, contains the following method for recovering the gold from exhausted color baths. Of course, by gold-coloring bath is understood a fluid containing table salt, saltpeter and alum, and used by goldsmiths to enhance the appearance of their productions, by dissolving the copper in the alloy with the gold, whereby a thin layer of pure gold is left on the surface. It occupies the same position of the pickle with silver.

It is obvious that this caustic fluid will not alone attack the copper, but must of necessity also dissolve more or less of the gold, it is advisable to not by any means consider it as useless and exhausted and to throw it away, but the gold must be parted from it, which is to be done as follows : First saturate the color with nitro-muriatic acid, in order to dissolve any free gold, and set it aside to operate for some time. Next dilute the mixture with a quantity of distilled water, filter in a glass funnel and blotting paper, having previously stirred it well. The residue left in the funnel throw into the sweepings, and from the clear fluid part the gold as follows : Throw into a wineglassful of distilled water as much sulphate of iron (iron vitriol) as the water will dissolve ; when the solution is saturated, slowly drop a few drops into the fluid, and the gold will at once precipitate in a brown metallic powder.

After having carefully decanted the fluid from the sediment, this is first washed with hot, and afterward with cold water, to "sweeten" it, and to remove all salt adhesions therefrom, then dried and next melted with a flux, such as potash and a little borax.

The gold may also be thrown down with sulphate of copper or copper clipping, but the preceding method is the most rational and sure.

French Exports to South America.

TO THE *Moniteur D. L. B.* we are indebted for the following particulars referring to the French exports of watches and jewelry to the various South American States :

ARGENTINE REPUBLIC.	
Gold plate.....	frcs. 2,437,300
Watches, etc.....	" 42,600
Imitation jewelry.....	" 1,391,600
MEXICO.	
Fine jewelry.....	" 304,458
Common jewelry.....	" 447,400
NEW GRANADA.	
Fine jewelry.....	" 448,067
Common jewelry.....	" 138,600
Watches, etc.....	" 82,050
VENEZUELA.	
Jewelry.....	" 152,934
BRAZIL.	
Fine jewelry.....	" 1,187,632
Common jewelry.....	" 856,800
Watches, etc.....	" 128,968
Plated ware.....	" 68,684
Optical and scientific instruments.....	" 488,302
URUGUAY.	
Fine jewelry.....	" 5,252
Common jewelry, 637 pieces.....	" 127,400
PERU.	
Rolled gold.....	" 217,600
Fine jewelry.....	" 227,581
SAINT THOMAS.	
Gold jewelry.....	" 66,391
CUBA AND PORTO RICO.	
Fine Jewelry.....	" 623,975

## Recent Patents.

The following list of patents relating to the jewelry interests, granted by the U. S. Patent Office during the past month, is specially reported to THE JEWELERS' CIRCULAR by FRANKLIN H. HOUGH, Solicitor of American and Foreign Patents, 925 F Street, N. W., rear U. S. Patent Office, Washington, D. C.

### *Issue of March 10, 1885.*

- 313,650—Jeweler's Press. L. P. Bosworth, Pawtucket, R. I.  
 313,726—Jewelry, Electric. A. Haid, Rahway, N. J.  
 313,656—Clock, Alarm. S. S. Colt, Orange, N. J.

### *Issue of March 17, 1885.*

- 314,014—Clock, Pneumatic. A. Hahl and O. Mergenthaler, Baltimore, Md.

### *Issue of March 24, 1885.*

- 314,502—Lace Pin and Flower Holder, Combined. W. W. Yonge, Chattanooga, Tenn.  
 314,471—Lace Pin. S. Pinover, New York, N. Y.  
 314,288—Watch, Stem Winder Mechanism. A. S. Galentine, Valpariso, Ind.

### *Issue of March 31, 1885.*

- 314,826—Button, Collar.—H. J. Geer, Attleboro, Mass.  
 314,634—Clock, Secondary Electric. W. F. Weisgerber, New York, N. Y.  
 314,834—Watch Arbors, Making Crowns for Winding. G. E. Hart, Assignor to Waterbury Watch Co., Waterbury, Conn.  
 314,672—Watch Regulator. C. M. Howard, Fredonia, N. Y.

### *Issue of April 7, 1885.*

- 315,418—Button, Collar. G. Kremetz, Newark, N. J.  
 315,328—Charm, Watch Chain. F. T. Pearce and J. Hoagland, Providence, R. I.

## Concerning Telescopes.

A CORRESPONDENT in Omaha, Nebraska, asks for information on three points: 1. What would be the cost of the largest telescope with unlimited means?

There are two kinds of telescopes, differing radically in construction, each possessing advantages peculiarly its own. One is known as the refracting telescope, because it depends on the refraction of light through glass lenses. The other is called the reflecting telescope, because it acts by reflecting the light from a concave mirror. Refractors are almost exclusively used in the United States, for they are easily managed, convenient, and have proved themselves to be the best working instruments, while the greater part of the astronomical observations of the present century have been made with them. We therefore infer that our correspondent refers to this kind of telescope. We have no means of estimating the cost of the largest telescope that can be constructed with unlimited means, but we can give the cost of some of the great telescopes now in use.

The telescope of the Naval Observatory in Washington, mounted and ready for use in 1873, cost \$50,000. It has an aperture of 26 inches, and was, until 1881, the largest refracting telescope in the world. The great Russian telescope at Pulkowa, a refractor of 30 inches aperture, finished in 1882, now enjoys the distinction of being the greatest refractor in the world. Messrs. Alvan Clark & Sons, of Cambridgeport, made the object-glass for this huge instrument, at a cost of about \$12,000, the mounting being the work of Messrs. Repsold & Sons, Hamburg, Germany.

The Russian telescope will not long enjoy the supremacy. The Messrs. Clark are now in process of making a refractor for the Lick Observatory on Mt. Hamilton, California, with an aperture of 36 inches, which will, when finished, take the first rank in size, and probably in cost.

The reflecting telescope of the Earl of Rosse, in Parsonstown, Ireland, takes the lead in size among reflectors. It cost \$250,000. The speculum, or mirror, is 6 feet in diameter, weighing 4 tons, and the focal length is about 54 feet.

M. Flammarion, a French astronomer of renown, was firm in the faith that the moon was inhabited. He determined to prove his position by the construction of a monster telescope, with such magnifying power as to reveal the men in the moon to terrestrial observers. He planned an immense refractor, far larger than any in existence, which was to cost \$200,000. He earnestly solicited contributions from the whole civilized world to help in his project. For some reason the plan fell through, and we have heard nothing of it since 1879.

The second question (2) is, How much larger could one probably be made than has ever been made, or now being made, to your knowledge?

In the case of refractors, it is almost certain that there is no advantage to be gained by increasing the diameter of the object-glass or aperture beyond a limit somewhere between 30 and 36 inches. As the aperture and magnifying power increase, the defects in the instrument become more apparent. The first difficulty telescope makers had to contend with was chromatic aberration. This was obviated by the use of two lenses instead of one—a concave lens of flint glass and a convex lens of crown glass, so arranged that their aberrations destroy each other. Telescopes are now made in this way, and are called achromatic telescopes.

A second difficulty now arose, known as the secondary spectrum. It is due to the fact that flint glass as compared with crown disperses the blue end of the spectrum more than the red, and the result is that the refracting telescope is not perfectly achromatic. The defect is scarcely noticeable in a small telescope, but becomes a serious obstacle in a great telescope, increasing with the diameter of the aperture. Since the trouble is inherent in the glass, there seems to be no possible method of overcoming it.

In the case of reflectors, the trouble lies in keeping the great mirrors in perfect figure in every position, the mirror being liable to bend on account of its own weight and elasticity. Such was the case with the reflector at the Paris Observatory. It has a mirror of silvered glass, the diameter being nearly four feet. It was mounted in 1874, but the glass bent under its own weight, and was rendered useless.

The greatest foe to the mammoth telescopes is, however, the atmosphere. The waving and trembling, the moisture, and the currents, so pervade the atmosphere at the sea-level, that the most powerful telescopes can be used to advantage during but a small portion of the nights of the year. The remedy or amelioration of this trouble is to establish observatories in elevated positions, where the air is dry, clear, and steady. These conditions prevail on the mountains and elevated lands of the western and southwestern portions of North America. When, therefore, the largest refractor in the world is mounted and ready for use in the Lick Observatory, under the serene sky that arches above Mount Hamilton, 4,000 feet above the level of the sea, it is reasonable to hope that important tidings from the star depths will be the result.

The third question (3) is, Would the largest and most powerful one that could be constructed create general interest to the scholars and to the country generally, and, in your opinion, would such a one add materially to our store of information and give us a better knowledge of the heavens?

The largest telescope that could be made cannot fail to awaken a deep interest among scholars and in the whole country, if, through its great eye, some important discovery were made; for the wonders astronomy reveals touch a sympathetic cord in the popular heart. But the largest telescopes are not as available to the ordinary observer as those of more moderate dimensions. They are valuable not so much for their magnifying power as for their light-gathering power.

We have seen Jupiter and Saturn through the great Russian tele-

scope of 30 inches aperture, and through a telescope of  $8\frac{1}{4}$  inches aperture. The difference in the two views was not so much in the size as in the brighter light thrown upon the objects in the larger telescope. The great telescope is used principally to bring out objects that are invisible in smaller ones. Thus the Washington telescope won renown by its discovery of the moons of Mars. Herschel discovered Uranus with his reflector of 2 feet aperture, Mr. Lassell discovered two moons of Uranus with his reflector of 2 feet aperture. Lord Rosse's reflector is used chiefly for making drawings of nebulae and lunar scenery. The reflector of the late Professor Henry Draper was used in photographing the Great Nebula of Orion, bringing out stars of the 14th magnitude. But it takes practiced eyes and the devotion of a lifetime to detect these minute and distant objects. The directors of the great observatories are absorbed in their work. They have little time or inclination to reveal celestial wonders to ordinary observers, who are untrained to see what they see, or to comprehend the abstruse calculations by which they reach results.

Astronomy is making its way to the heart of the people. A widespread interest is felt in all that pertains to the heavens. It is, however, popular astronomy that is demanded. The accounts of eclipses, comets, occultations, are eagerly read, and the movements of the bright planets are followed by thousands of observers all over the country.

It would be a noble work for a philanthropist to endow an observatory, furnish it with the best kind of instruments and efficient officers, and devote it, under certain restrictions, to the use of the people. The telescope is the only instrument that brings nearer to our eyes the mysterious creations of the firmament, and reveals the vastness of the material universe. Those who are familiar with its revelations must necessarily gain a better knowledge of the heavens, and by their influence increase the general interest in the ennobling science by relating what their own eyes have seen.

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### Etching.

**ETCHING** IS the art of cutting lines in any material by means of some corrosive agent. Thus, since nitric acid dissolves copper, if we confine the action of the acid to certain lines, we can cut grooves of considerable depth in the copper, and these grooves may be used either as lines from which we may print or as marks similar to writing. Iron, brass, steel, silver, ivory, glass, marble and many other materials may be cut in the same way, by the action of suitable acids. As a simple and easily learned method of forming engraved plates from which we print, the art of etching is one of the most practical which persons who intend to become engravers can acquire. The materials required are few and simple, great freedom of outline may be secured and the results are very pleasing.

Copper is the metal usually employed for etching drawings. It is furnished by the dealers in plates, perfectly smooth and flat, and of any desired size. The surface is first coated with a wax or varnish, for which there are many recipes, the following being probably the best: Take of beeswax and asphalt 2 parts each; Burgundy pitch and black pitch, 1 part each. Melt the wax and the pitch in an earthen vessel, and add the asphalt by degrees in fine powder. Expose to heat until a drop which has been cooled breaks by bending back and forth two or three times in the fingers.

A second, which is simpler and said to be very good, is composed of asphalt, 2 ounces; Burgundy pitch, 1 ounce; beeswax,  $\frac{1}{2}$  ounce.

A transparent varnish may be composed of resin, 1 ounce; beeswax, 2 ounces. Melt together.

The plate having been polished and burnished, is grasped by one corner in a hand-vice, and warmed over a spirit lamp until it will melt the varnish or etching ground, which is then spread over its surface thinly by means of a ball or pledget of cotton tied in a piece

of silk. Before the ground has quite cooled or solidified, it is blackened by the smoke of a lamp or candle. The blackening is necessary so that the design may be clearly seen as it is drawn in.

The design may be either drawn directly on the plate, or transferred by means of transfer paper. Or it may be first drawn on the etching by means of a very finely pointed camel hair pencil, using, of course, a white color dissolved in some medium which will adhere to the ground. Water is useless. Turpentine answers very well.

In whatever way the design is drawn on the surface of the ground it must be next cut in by means of a steel point, good sewing needles making excellent ones, and different sizes being used according to the strength of the lines required. The lines having been traced through the varnish so as to expose a bright copper surface, the next step is to make a border of wax around the plate so that the acid will not run off. The wax used for making the border is a mixture of beeswax, resin and tallow, of such a consistency that it will be easily moulded by the fingers. The border should be nearly half an inch high, thus converting the plate into a shallow dish. This dish is half filled with a mixture of one part of nitric acid and three parts of water. After this plate has been exposed for a few minutes to this liquid, the acid is poured off, the plate washed with pure water and allowed to dry. All the very delicate lines are then "stopped" out, as it is called, by being coated by means of a camel hair pencil with varnish dissolved in turpentine. When this has dried, the acid is poured back again and allowed to act on the coarser lines, and the more frequently this process is introduced, the more perfect will be the ultimate result.

When the lines have all been etched to the required depth, the varnish is removed by warming the plate and washing with turpentine. A copper plate press is used to take off the impressions.

The process of etching is very simple, and the results very satisfactory. As an artistic recreation, it is capable of affording a great deal of pleasure.

The art of cutting names, etc., on steel tools and other objects is very simple and useful. The following give good results:

*Etching Liquid for Steel.*—Mix 1 ounce sulphate of copper,  $\frac{1}{4}$  ounce of alum, and  $\frac{1}{2}$  a teaspoonful of salt reduced to powder, with 1 gill of vinegar and 20 drops of nitric acid. This liquid may be used either for eating deeply into the metal or for imparting a beautiful frosted appearance to the surface, according to the time it is allowed to act. Cover the part you wish to protect from its influence with beeswax, tallow or some similar substance.

*Etching on Glass.*—Fancy work, ornamental figuring, lettering and monograms, are most easily and neatly cut into glass by the sand blast process. Lines and figures on tubes, jars, etc., may be deeply etched by smearing the surface of the glass with beeswax, drawing the lines with a steel point and exposing the glass to the fumes of hydrofluoric acid. This acid is obtained by putting powdered fluor-spar into a tray made of sheet lead and pouring sulphuric acid on it, after which the tray is slightly warmed.

The proportions will, of course, vary with the purity of the materials used, fluor-spar (except when in crystals) being generally mixed with a large quantity of other matter, but this point need not affect the success of the operation. Enough acid to make a thin paste with the powdered spar will be about right. Where a lead tray is not at hand, the powdered spar may be poured on the glass, and the acid poured on it and left for some time. As a general rule, the marks are opaque, but sometimes they are transparent. In this case, cut them deeply, and fill up with black varnish, if they are required to be very plain, as in the case of graduated vessels.

Liquid hydrofluoric acid has been recommended for etching, but as it leaves the surface on which it acts transparent, it is not suitable.

The agent which corrodes the glass is a gas which does not remain in the mixture of fluor-spar and sulphuric acid, but passes off in the vapor. To mix fluor-spar and sulphuric acid, and store it in leaden bottles under the idea that the mixture is hydrofluoric acid, is a gross mistake.

## Foreign Gossip.

THE ART EXPOSITION AT TURIN.—One of the most attractive objects exhibited at Turin during the late exposition was a burgh of the mediæval age, together with its little town, constructed with the most painstaking fidelity; all the buildings and rooms were, down to the smallest details, constructed according to historical account, and exhibited domestic life and trades of the 15th century.

THE ITALIAN CORAL FISHERY.—The Italian coral fishery occupies at present 4,200 fishers, as we see by the last report of the proper department. These fishers procured 56,000 kilograms of coral of a value of \$840,000. The manufacture of this quantity of raw material into beads, crosses, etc., forms a flourishing industry, which sends its products to all parts of the world, and adds millions every year to the nation's wealth.

GOLD IDOLS.—A gold idol weighing thirty-two and a half pounds was recently excavated at Calistiahuaoa, a State of Mexico (we never thought that there could be anything more remarkable in the State than its name), by some Indians. The idol was composed of a group of figures, but it was broken up by the Indians and divided equally. When we found our idol it weighed considerably more—it "kicked the beam" at one hundred and twenty-five pounds, and it was us who were all broken up. There is a difference in idols.

STATISTICAL ITEMS ON HOROLOGY.—The Chamber of Commerce, of Besançon, has recently published its annual report, from which we cull the following figures bearing on the manufacture of watches at Besançon: In the year 1883, 499,265 watches were stamped with the sales' stamp; (491,403 in 1882); 2,337 pieces were stamped for export during 1883, against 2,520 in the preceding year. The other towns in France have, in 1883, manufactured 491 pieces; 74,119 watches were imported, so that the total number of watches in French commerce amounted to 573,875 watches; the industry of Besançon takes part in this sum with 87 per cent. The importation of foreign watches into France has diminished since 1881. In 1883 there passed through the custom houses of Pontarlier, 65,569; Bellegarde, 4,915; Besançon, 3,129; Paris, 2,489; Montbéliard, 862; Lyons, 498; Bordeaux, Marseilles, Nizza, Nancy, Chambéry, Nantes and Havre, 297 pieces; total, 74,119. In 1882, the total amounted to 76,922; and in 1881, to 92,710.

INDIAN PRINCES AND THEIR JEWELS.—The Indian princes and nobles grasp with greater avidity after diamonds than any other people, and there is only one country in the universe where this precious stone has no great value. This land is Burmah, the "house of the white elephant," from which the finest rubies found anywhere are brought, and are valued far higher than the diamond. The king of Burmah guards the rubies of his country with a most jealous care and regulates their export; it is but very seldom that permission is granted to take one out of the country, and these beautiful and costly jewels can be procured only by theft or favor. They are not surpassed by any jewel when worn at night by artificial illumination, and the diamond, with all its fire creates no such effect as the Burmese royal rubies. No European has as yet been fortunate enough to behold the admirable ruby of the size of a pigeon's egg, and of an extraordinary quality, belonging to King Thibau, and the sale of the beautiful stones which went to England in 1875, and were the finest lot ever seen in Europe, caused so great an excitement in the country that the officials charged with transporting the stones had to be escorted by military to the ship. The diggings of these "blood red buds" is five days' journey to the southeast of Ava—the precious country where, according to the opinion of the natives, the rubies grow and ripen. They are here found of all colors, yellow, blue, green, and as matchless crimson red jewel as well as colorless. Next in rank are those found in the Tartary (Badakshan), which, as the Tartars aver, are always found in pairs. For this reason the finder of one large ruby will keep it until he has found its mate.

—"Fame, the empty bauble," some poet exclaims somewhere, which is not quite true, however. Poor John Harrison, the English chronometer maker, after having been paraded around the English, French, Italian, Spanish and every other foreign press, is being done to death again in the German horological papers. We sincerely hope that the old gentleman will finally get a rest, after having, like a wandering Jew, traveled around the horological press of the world ever since the date of his death. *Requiescat in pace.* Give him a rest.

NEW QUICKSILVER MINE.—A new quicksilver mine has been found at Schuppiastena, near Belgrade. As is known, there are only a few quicksilver mines in the world, the two largest of which are in Almaden, in Spain, and California, which are owned by the house of Rothschild, who only permit the world's supply, but never a glut of the market to issue from their mines, and thus they control the biggest monopoly of the world. The yearly consumption of quicksilver is cut down to 100,000 bottles, the larger part of which comes from California, while Idria furnishes about 10,000 bottles.

"THE WORLD'S TIME."—The same Chaux-de-Fonds *Impartial*, who regards with a jaundiced eye every invention and improvement made beyond the boundary poles of Switzerland, feels very ill at ease because the Americans, as general, get ahead in the matter of the 24 hour division of the watch dial, and claims that a watchmaker of that city has made such things "time out of mind." It may be true; but there are many inventions that have been prompted and made by the wants of the times in countries far apart—among them we will mention the telescope, for which Galileo gets the credit; the invention of printing, claimed by three countries; the telephone, for which there are seven claimants; the telegraph, and many other inventions both useful and ornamental, and the inventor who succeeds in publishing his idea first, and convinces the world that the emanation of his study is a good thing, is very apt to be called the inventor and gets the credit. He who hides his light under a bushel is a fool and deserves oblivion.

—"Nothing new under the sun," said Solomon already, and he was right—(thus says the Chaux-de-Fonds *Impartial*). For some time past both the foreign and German-Swiss press have made a great fuss about the watches made by the English and Americans. By aid of the excessive bragging announcements of our trans-Atlantic competitors, ignorant people, the number of which is legion, believed these interesting reports. We have repeatedly stated that our watchmakers, a long while ago, made watches with dials divided from 12 to 24 hours, and others with 10 hours, each at 100 minutes. As far as the watches with 24 hour division is concerned, they have been manufactured in Chaux de-Fonds for the last nine years. But in order to entirely take the wind out of the sails of our trans-Atlantic watch manufacturers, we must tell them that we possess watches with three dials. They are old verge escapements, manufactured at Locle, near the close of the last century. The movements under debate were doubtless made at the moment when the French National Convention introduced the republican calendar (November 24, 1793), with the month divided into three decades, each at ten days. As is known, this style was abolished by a decree of Napoleon I., Sept. 9, 1805, who re-instated the Gregorian calendar. The following is the description of these three dials: The first is divided into 24 hours, of which the first 12 have red, the second black numbers; one has a division into 60 minutes, a second 100 degrees or minutes; and finally a third 10 hours. This watch required 4 hands. The second dial also had 24 hours and 10 hours, at 100 minutes. This watch apparently had only 3 hands. The third dial had 10 hours, each at 100 minutes, and 3 decades around the rim; it required a hand each, for hours and minutes, and a third for the days, etc.

## Workshop Notes.

**TRANSPARENT BLUE FOR STEEL.**—Damar varnish,  $\frac{1}{2}$  gallon; finely pulverized Prussian blue,  $\frac{1}{2}$  oz.; mix thoroughly. Makes a splendid appearance. Excellent for blueing hands.

**TO SOLDER BROKEN BROACHES.**—Steel broaches and other tools are soldered by cleaning well the parts broken, then dipping them into a solution of sulphate of copper, and soldering them with ordinary soft solder. The joint is a good one and will stand ordinary hard wear.

**ACID-PROOF CEMENT.**—A cement that resists acid is made by melting 1 part India rubber with 2 parts linseed oil; add sufficient white bolus for consistency. Neither muriatic nor nitric acid attack it; it softens a little in heat, and its surface does not dry easily; which is produced by adding  $\frac{1}{3}$  part litharge.

**TO SOLDER GERMAN SILVER.**—Dissolve granulated zinc in muriatic acid in an earthen vessel. Cleanse the parts to be soldered and apply the acid. Next put a piece of pewter solder on the joint and apply the blowpipe to it. Melt German silver 1 part, and zinc in thin sheets 4 parts; then powder it for solder.

**NON-CORROSIVE SOLDERING FLUID.**—Many years ago I used to add bicarbonate of soda to the soldering fluid, to neutralize the acid (or nearly so), and found that ordinarily it worked just as well, and did not rust steel but very little, if any. The best way to remove the fluid from the work is to boil it out two or three times in alcohol (fresh every time); this removes the acid much more surely than any other plan I have ever known. Soldering fluid should never be used in watch work or allowed about the bench.

**A NEW ALLOY.**—A new alloy, which is known as Nuremberg gold in Germany, is at present frequently employed for the manufacture of cheap gold ware, and is most excellently suited for the purpose; since, as far as its color is concerned, it is absolutely identical with that of pure gold, nor is it in any manner influenced by a continued exposure to air. The alloy will retain its color even after violent use, and the fracture will exhibit the pure gold color. Its composition is as follows: Copper, 18; gold,  $2\frac{1}{2}$ ; aluminum,  $7\frac{1}{2}$ .

**OXIDIZING SILVER.**—Dr. Ellsner says that there are two distinct shades in use; one is produced by chloride, which has a brownish tint, and the other by sulphur, which has a bluish black tint. To produce the former it is only necessary to work the article with a solution of sal-ammoniac; a much more beautiful tint, however, may be obtained by employing a solution composed of equal parts of sulphate of copper and sal ammoniac in vinegar. The fine black tint may be produced by a slightly warm solution of sulphate of potassium or sodium.

**TRANSPARENT CEMENT.**—Ordinary cements generally leave yellowish traces which look disagreeable, especially with transparent objects. The following recipe, according to the *Mon. des prod. Chim.*, makes a perfectly colorless varnish: Sixty grams chloroform are poured over 75 grams India rubber, cut into small pieces, and contained in a bottle which can be closed air tight. When the India rubber has been dissolved thoroughly, 15 gr. mastic are added and digested for about 8 days until dissolved. The cement prepared in this manner is used like any other.

**TO WRITE UPON STEEL.**—A good fluid with which to write upon steel is prepared by mixing one part of nitric acid with about one-sixth part of hydrochloric acid. Cleanse the part to be operated on with oil and cover it with a coating of beeswax. With a pointed tool write upon the wax, letting each stroke penetrate down to the metal; then with a fine brush, dipped into above said acid mixture, follow the strokes of the writing. When these strokes have been filled with this mixture, let the work stand for about five minutes, and then dip it into water to interrupt the further operation of the acid.

**PURE GOLD.**—The *Journal d. Pharmacie* specifies the following method for preparing pure gold: Commercial gold is dissolved in a mixture of 4 parts hydrochloric and 1 part nitric acid, of  $20^{\circ}$  B.; the obtained white-colored pasty chloride of silver is filtered off, and the filtrate is mixed with an aqueous solution of antimony chloruret, to which so much hydrochloric acid has been added, that no turbidity is produced at the mixing of the solution. The reduction is effected in a few hours, especially if a little heat is used. The gold is filtered off, washed with dilute hydrochloric acid, next with water and fused with a little saltpeter and borax. The mother liquors, which contain antimony chloride, can, boiling with metallic antimony, be again reduced to antimony chloruret and again used.

**CEMENT FOR FASTENING METAL UPON GLASS.**—In order to quickly and well fasten metallic objects upon glass, the use of the following cement is recommended: 100 grams of finely pulverized litharge and 50 grams dry white lead are intimately mixed together, and with boiled linseed oil and copal varnish worked into a half stiff paste. The proportion between boiled linseed oil and copal varnish hereby is as follows: 3 parts linseed oil and 1 part copal varnish. The quantity of the latter depends upon the quantity of the litharge and white lead used. In every case sufficient of the oil is added to the latter to make a suitable paste. The cementing is very simple: The lower face of a medallion, etc., is filled with the cement, pressed upon the glass and the exuding excess is removed. The cement dries very rapidly and becomes very hard.

**REMOVING BROKEN SCREWS FROM WATCH PLATES, ETC.**—A correspondent of THE JEWELERS' CIRCULAR complains that he has a bad case of broken screw in a watch plate, and asks for information how to extract it. Our columns have heretofore contained practical recipes, to which we refer him, adding another one. With a screw-head file cut a slit in the top of the broken screw deep enough for a screw driver to have a firm hold. Then pressing the screw driver firmly in the slit, turn it to the left, and in most cases the screw will give way. After turning it once or twice it is advisable to file off the top of the screw nearly level with the watch plate and re-cut the slit. If this method does not answer, place the plate with the top of the broken screw over one of the holes in the riveting stake corresponding to the size of the screw, and with a joint pusher placed on the bottom of the screw, give a sharp blow with a hammer or mallet, which generally breaks the thread and partly drives it through the plate, after which it can be pulled out with a pair of pliers. Re-tap the hole and fit in a new screw.

**RECOVERING SILVER.**—A correspondent inquires of the "Workshop Notes" editor how he can recover the silver from silver plated iron. We furnish him with two recipes: Pour some concentrated nitric acid on the electro-plated iron. It will dissolve the silver, leaving the iron intact. When the operation is finished, pour the liquid off and dilute with water; add a solution of common salt. Silver chloride will settle as a bulky precipitate, which must be filtered and well washed. Remove the silver chloride from the filter, put it in a porcelain dish, add a few cuttings of sheet zinc and a little water, and allow to stand for a week or two. The silver will then be reduced, forming a heavy gray powder. Remove what remains of the zinc, wash well and melt in a crucible, adding some sodium carbonate as a flux. Or, procure an earthenware pan (of course the size is determined by the quantity of material to be treated) and into it lay the pieces of iron until about three-quarters full. Cover them with concentrated nitric acid and gently warm. As soon as all effervescence is finished, the pieces are fished out and replaced by others. This is continued until the effervescence becomes slight; the pieces of iron being washed and the washings added to the main quantity of acid. Muriatic acid is now added until no further white precipitate is thrown down, at which point the whole is heated and allowed to stand for some time; the clear liquid is decanted off, and the precipitate thrown into a thick calico bag and well washed with hot water and dried. Mix the dried mass with carbonate of soda and fuse in an earthen crucible, when the silver will be found in a button at the bottom.

## Trade Gossip.

Wm. Fels has removed to 363 Canal street.

Wood Bros. succeed J. Packrel, Jr., Maquon, Ills.

Barnett Bros. have removed to No. 3 Maiden Lane.

D. De S. Mendes has moved to No. 4 Maiden Lane.

Balster & Biddle, Emporia, Kansas, have dissolved.

Ballou & Burpee succeed W. P. Ballou, Dekalb, Ills.

John M. Goddard has moved to No. 1 Maiden Lane.

G. Francesconi has removed to No. 25 Murray street.

Joseph A. Feinier has removed to No. 4 Maiden Lane.

Henry May has moved to Nos. 21 and 23 Maiden Lane.

Dattelbaum & Friedman have moved to 4 Maiden Lane.

E. B. Miner has moved from Newton to Starkville, Miss.

Wilkinson & Read succeed C. P. Probst, Englewood, Ills.

Myron A. Fuller succeeds Smith & Fuller, Gaylord, Mich.

Louis Strasburger sailed for Europe in the *Eider* on the 29th.

H. S. Hart, Brooklyn, Mich., is succeeded by Geo. W. Green.

Robert Ernst, of Vicksburg, Miss., was burned out April 22d.

J. E. Gray & Co., Calmar, Iowa, have sold out to Yagar Bros.

Friedenthal & Rypinski have removed to No. 52 Maiden Lane.

O. W. Parsons, Haverstraw, N. Y., has sold out to A. Themans.

John G. Tone, formerly of Chatsworth, Ills., has moved to Peoria.

Thos. J. Howe has moved from Sewanee, Tenn., to Princeton, Ky.

Chas. Rosefield has moved from Honesdale, Pa., to Hancock, N. Y.

Henry Fera will sail for Europe in the steamer *Hommonia* May 21st.

Otis Anderson, dealer in diamonds, has removed to No. 10 Maiden Lane.

Graham & Co. have moved from 80 Nassau street to 38 John street.

Jacob Allebach, formerly of Emlenton, Pa., has moved to Foxburgh.

M. L. Grimes has moved from Central City to Rapid City, Dakota.

M. Kahn, of L. & M. Kahn & Co., sailed in the steamer *Ems* on the 22d.

The firm of Maier & Delkin, Atlanta, Ga., is succeeded by Delkin & Kuhrt.

Sweeney & Coombes, of Houston, Texas, have bought out Daniel Kennedy.

The firm name of Bonner & Abramovitz has been changed to J. Bonner & Co.

Keller & Fry, manufacturing jewelers, have removed to 52 Maiden Lane.

The New York Optical Co. have moved their office to No. 52 Maiden Lane.

Koch & Gerlach, Columbus, O., have dissolved. Peter M. Koch will continue.

George J. Garman succeeds the firm of Garman & Stabler, Williamsport, Pa.

A. Wittnauer, of J. Eugene Robert & Co., sailed for Europe in the *Fulda* on the 15th.

George Uibel, manufacturer of sea bean jewelry, has moved from 142 to 207 Fulton street.

W. P. Morgan has been admitted a partner in the firm of Levison Bros., San Francisco, Cal.

The firm of G. W. Marquardt, Des Moines, Iowa, is changed to G. W. Marquardt & Sons.

In a recent fire at Martins Ferry, O., John A. Lash, jeweler, is reported to have lost \$2,500.

The firm of Fuller & Noble, of Olean, N. Y., have dissolved; they will each continue in business.

Greensfelder & Co., San Francisco, have dissolved. N. B. Greensfelder will continue the business.

A. J. Gandner has sold his business in Waterville, N. Y., to W. S. White, and will remove to Oneonta.

John Scheidig has removed temporarily to 39 Maiden Lane during the rebuilding of his present store, No. 43.

The main office of the Aurora Watch Company has been removed from Chicago to the factory at Aurora, Ills.

G. B. Tobey, formerly with Eisemann Bros., is now with M. Fox & Co., and will represent them on the road.

Adolph Marx, of Kossuth Marx & Co., will sail for Europe early in May for the purpose of purchasing diamonds.

Thomas B. Penton, Jr., has made an engagement with Reed & Barton, and will travel for them on the Southern circuit.

D. E. Oppenheimer, of Faulkenau, Oppenheimer & Co., will permanently reside in Europe as resident buyer for his firm.

S. Dessau, diamond importer and cutter, former owner of the "Cleveland Gem," has moved to Nos. 4 and 6 John street.

E. A. Thrall has moved from No. 1 to No. 3 Maiden Lane, where his facilities for doing business have been largely increased.

Henry Fera, diamond importer, has removed his office and cutting factory from Nos. 4 and 6 John street to No. 10 Maiden Lane.

W. C. Lippus, formerly with Pforzheimer, Keller & Co., is the New York agent for the Columbus Watch Co., with office at 24 John st.

Adolph and M. Hugo Keller, of L. H. Keller & Co., sailed for Europe in the steamer *Ems* on the 22d; they expect to be abroad a year.

B. I. Wehrle & Bro., of Indiana, Pa., have dissolved, B. I. Wehrle continuing the business. E. N. Wehrle opening a store in Punxsutawney.

B. J. Cooke, of the firm of B. J. Cooke's Sons, of Philadelphia, was married April 1. Nevertheless he will continue to travel for the firm.

Hight & Fairfield have removed from South Bend, Indiana, to Butte City, Montana, where they have established themselves in the jewelry business.

What is said to be the largest diamond in the world is about to be cut in Amsterdam. It was recently found in South Africa and weighs 475 karats.

A. S. Mermod, of Mermod, Jaccard & Co., of St. Louis, gave us a pleasant call during the past month. He visited New York on business for his house.

Farjeon & Co. have introduced a new mainspring called "The Jurgensen," which is claimed to possess many advantages over mainsprings now in use.

H. C. Haskell has introduced a choice line of society goods, class pins, class rings, and other emblematic goods. He is also prepared to make special designs to order.

Reports from Chili says that bracelets, necklaces, and ear rings enjoy the largest sale in that market. The quality required is low, and the favorite colors blue, red and green.

Place, Peterson & Co., Providence, R. I., have dissolved. O. E. Place, J. P. Peterson and Louis Vaughn have formed a new firm under the old style of Place, Peterson & Co.

A. K. Sloan, of Carter, Sloan & Co., has returned from Cuba; where he went for a pleasure trip with his family. He is much improved in health and is ready for business.



George Bonney, of the firm of George C. Shreve & Co., of San Francisco, has been spending considerable time in New York this spring, and has favored us with a pleasant call at the office.

Goddard, Hill & Co., of Pittsburg, have issued a very comprehensive catalogue of jewelry, watch material, cases, etc. It is abundantly illustrated and is a valuable reference book for dealers.

George H. Schumann, son of Charles W. Schumann, was married recently to Miss Emma Weilbacher, and Charles W. Schumann, Jr., was also married a few days later to Miss Henrietta Grace Marcus.

The New York Jewelers' Association have removed their headquarters to the corner of Liberty street and Broadway, in the old building of the Mutual Life Insurance Co., which has been elegantly fitted up for offices.

Attention is called to the new elastic reversible bracelet just introduced to the trade by S. Cottle & Co., 860 Broadway. This firm is also showing a new collar button for which are claimed beauty, durability and cheapness.

John T. Howard, Jr., and Herbert Cockshaw, for many years with Cox & Sedgwick, have formed a co-partnership under the firm name of Howard & Cockshaw for the manufacture of jewelry. They are located at Nos. 36 and 38 John street.

During the past year France has imported gold and platinum, laminated or drawn, valued at 4,197,978 francs against 3,520,752 francs in 1883; and rough platinum, ingots, etc., valued at 517,181 francs in 1883 against 282,420 francs in 1884.

In Paris, red neckties are supplanting white ones for dress occasions, which makes a greater demand for gems set as scarf pins. A pronounced contrast between the pin and the scarf is desirable. It probably will not be long before this fashion reaches this country.

S. F. Myers & Co. have removed to the spacious store No. 50 Maiden Lane. The store runs through from Maiden Lane to Liberty street, and has been fitted in a very attractive style. This move into larger quarters was made necessary by the increase of their business.

Gustave F. Veith, of Oppenheimer Bros. & Veith, was married March 25th, and sailed for Europe in the steamer *Fulda*, April 15th. The happy couple will be gone abroad about three months, during which time Mr. Veith will combine business with pleasure by making purchases for his firm.

A collar button has been patented by Mr. Henry J. Geer, of Attleboro, Mass. This invention consists in the combination, with a U-shaped plate, of a spring catch, a hinged plate, and a headed stud, designed to work so the button cannot drop out of a large button hole, and cannot work loose.

The firm of M. Fox & Co., has been dissolved, James Graves retiring. Mr. Fox has reorganized the firm, admitting his two sons, C. J. and G. L. Fox, to partnership, and the business will be continued under the firm name of M. Fox & Co. Mr. M. Fox sailed for Europe in the interests of the firm in the *Elbe* on the 8th of April.

James B. Rumrill, an old and prominent resident of Springfield, Mass., died in that city April 6. He was formerly engaged in the manufacture of gold chains, the firm being Arthur, Rumrill & Co. He was highly respected by all who knew him. He was born at Springfield in 1812, and retired from active business a number of years ago.

The clocks imported into Great Britain during February numbered 48,852, of the value of £32,644, against 59,096, valued at £35,617, in the same month of 1884, and 62,611, estimated at £33,395, in 1883. Of those the United States furnished 17,934, valued at \$30,100; of watches imported numbered 39,916, valued at \$952,875, or over \$40,000 in excess of the watch importations of February, 1883.

An alarm clock has been patented by Mr. Samuel S. Colt, of Orange, N. J. It is made with a cam wheel connected with the clock works and operating a bent lever, which is held down by a spring to engage with a stop hook attached to the shaft of the alarm escapement, whereby the alarm will be made to sound intermittingly at regular intervals.

Two swindlers (Germans), claiming to be father and son, are traveling along the Hudson river representing themselves to be watch-makers. Their game is to get possession of a number of watches for repair, and then to leave town, taking the watches with them. They met with some success in Ulster County. The older of the two is about 50 years of age.

The Gorham Manufacturing Company are making an important feature of their ecclesiastical department, which occupies considerable space on the second floor of their store on Broadway and Nineteenth street. In this department are on exhibition many interesting models in metal work designed for church use. Memorial tablets figure conspicuously in this department.

A Dansville man left an old watch at the jeweler's to be repaired, and a few weeks later he called for it and asked what the charges were. "Two dollars and a half," replied the tinker. "Did you say two dollars and a half?" "Yes, sir; twenty shillings." "Well," replied the customer, "you can take the watch towards it, for part pay, and when I get some change I'll come in and pay the balance."

At the meeting of the New York Academy of Sciences, held at their rooms in Columbia College, April 6, Mr. George F. Kunz delivered a lecture on "Gems and Gem Mining," illustrating his remarks with a series of lantern slides representing the methods, machinery and mines of India, Brazil and South Africa, also of many of the historical and famous diamonds, pearl and coral fisheries; also regarding the structure of the precious stones, and a variety of facts relating to gems.

A methodist presiding elder in Brooklyn has lost his confidence in tortoise shell watch chains. He carried a valuable gold watch with such a chain attached, apparently thinking that, while setting a good example, he would be less liable to robbery than if a gold chain flashed in his waistcoat. But as he walked along the street the other day, while Barnum's parade was passing, he became a victim of the wily pickpocket. He is now wondering how a simple and inexpensive chain suggested a costly watch.

J. T. Scott & Co. call the attention of the trade to their new chronograph movements, which are interchangeable, the same as American movements, fitting any style or quality of the regular 18 size open face American stem case. These movements are made under letters patent controlled by J. T. Scott & Co., who are the sole importers of them. This interchangeable feature for a chronograph movement will be appreciated by dealers who cannot afford to carry a large stock of fine movements at all times.

A traveling man who recently went to the New Orleans Exposition undertook to do some business incidentally while there, and was arrested for selling goods by sample without a license, exposing himself thus to a fine of \$50. After a delay of five hours he was brought before a magistrate, where he pleaded his case so effectively that he not only escaped with a warning, but in a quiet chat with the Judge a few moments later he succeeded in selling him and his clerk specimens of the very products of Yankee ingenuity which had just been the occasion of his arrest.

Charles S. Pine & Co. recently designed a new bracelet, which they named the "Mary Anderson." A pair of them were forwarded to the eminent actress, who acknowledged them as follows:

London, March 14th, 1885.

Dear Sirs—Miss Anderson instructs me to convey to you her very sincere thanks for the very pretty and artistic bracelets you so kindly sent. It is the first present Miss Anderson has ever accepted, but in this instance she does so with much pleasure. Again thanking you for your courtesy, I am, yours sincerely,  
G. GRIFFIN.

The Meriden Britannia Company has introduced something entirely new in the way of an ice pitcher, illustrations of which will be found in their advertisement in this issue of *THE CIRCULAR*. The top is arranged to fit the pitcher closely, making an air-tight reservoir of the body of the pitcher. An air valve passes through the cover, and the handle is arranged so as to hold the valve in place. By this arrangement the pressure of air causes the water to rise in the spout of the pitcher so that it is not necessary to tip it up when water is desired. It is very convenient and highly ornamental, being made in various styles and with a multiplicity of designs.

In this issue the American Waltham Watch Co. present to the trade an illustration of their new patent dust-proof hunting case. Dust-proof open-face watches have been furnished by them during the past six years, and have supplied the immediate wants of engineers and railroad men, whose calling demands a thoroughly dust-proof watch. The general public however using mostly hunters, demand a dust-proof hunting case. This has been the desideratum. It has taken some time to supply it, and it will prove a boon to all wearers of watches to acquire it. Practical men will appreciate the ingenuity of its construction, and the perfection of its workmanship.

A traveling salesman for a New York house was recently traveling in South Carolina, and with a fellow traveler purchased a one-thousand mile ticket. The conductor refused to allow but one of them to ride on the ticket, saying that while it could be issued to two or more parties only one person could ride on it at one time. The traveler was put off the train about four miles from Wadesborough and gave notice that he would sue the road for damages. He employed an attorney, but it was not long before the authorities offered to compromise. The offer was accepted and the traveler came off \$1,000 better off. His walk four miles to Wadesborough netted him just \$250 per mile.

A traveling salesman for Carter, Sloan & Co. had a sample case with \$10,000 worth of jewels in it stolen from him last January in Covington, Ky. The Pinkertons, who were put in charge of the case, succeeded in fastening the crime on two professional thieves, John Meaney and Partick Guerin, and in following them to Canada. The men were watched, but they were very wary, and did not cross into the States. As Robert A. Pinkerton was walking in Union Square, he saw Meaney and Guerin. The recognition was mutual, and the thieves started to run. Guerin got away, but the detective locked Meaney up. Careful search was made for his companion, but without avail. Meaney waived his right to a requisition, and was taken to Covington for trial last night. He is an adroit sneak-thief. Both men intended sailing for Europe.

Mr. George F. Kunz recently delivered a lecture on gems before the Woman's School of Technical Design, 112 5th ave., New York city. The specific gravity, hardness, optical properties, and chemical composition of the gems were treated of. A large series of lantern slides exhibiting a set of some of the finest gems of their kinds in America, as well as a suite of those in the matrix state that were loaned by Messrs. Tiffany & Co. Mr. Kunz stated that fully \$100,000,000 was invested in the mines and the diamond district, and gave a series of figures showing the output of many of these mines and the value of the diamonds. The average for the diamonds found in 1883 was 5.25 karats; 2,376,552 $\frac{3}{4}$  karats were found and were sold for \$13,070,166.24. Reference was made to the extensive pilfering that has taken place from time to time, £120,000 worth of stolen diamonds having been purchased by one firm during four months. Single instances of where one man held 2 $\frac{1}{2}$  pounds of diamonds have been known, although the detective system extended through all the walks of life, and only patented agents were allowed to buy or sell.

We take great pleasure in announcing that we have made arrangements with Professor Leonard Waldo, of the Yale Observatory, to contribute to our columns a series of papers upon horological topics. One or more articles from his pen will appear hereafter in each monthly issue of *THE CIRCULAR*. Professor Waldo is well known to horologists and scientists as a thoroughly practical, as well as scientific man, whose contributions are marked by rare ability and preserved for their importance. He has had charge of the Observatory for a number of years, and has, consequently, had supervision of the testing of all scientific instruments, including chronometers, watches, etc., submitted for that purpose. All persons interested in the science of horology will be glad to learn that Professor Waldo has consented to give them practical treatises on the subject. His first paper will appear in the June number of *THE CIRCULAR*.

A curiosity in the way of watches was shown by Mr. E. Sordet, Director of the Watchmakers' School at Geneva, before the horological section of the Society of Arts. This wonder is nothing less than a watch with one wheel, manufactured at Paris in the last century by a Mr. Gautrin. The watch was presented to the National Institute in 1790, being then in a deplorable state; but the teacher of the repairing section at the school, Mr. Emile James, has, after many hours of labor, succeeded in re-establishing harmony between the various organs, so that it is now in going order. The great wheel which gives the watch its name occupies the bottom of the case and the center of the plate; it has 60 teeth and is 33 mm. in diameter. Its axis carries two pinions, one of which receives the motive force from a barrel, and the other carries the minute work. The function of this great wheel is quadruple. First it acts on a lift, then on a lever operating on another destined to lower the axis of the watch, and lastly on a third lever, the latter serving to return power to the great wheel at the moment when the action relents by the rise of the axis.

It is pretty generally known that the Cleveland diamond that Mr. Dessau recently had cut, and which is remarkable for its size and brilliancy, was purchased by Miss Minnie Palmer, the well-known actress. After securing the gem, Miss Palmer was desirous of having it mounted in a becoming and also unique manner, and Mr. Dessau secured the services of Jeanne Brothers, who have won an enviable reputation for the artistic manner in which they mount precious stones. They hit upon a unique setting for the Cleveland diamond, which is almost as attractive as the gem itself. They have made a very close imitation of a full blown Jacqueminot rose, the petals of which are in colored gold, so delicately and artistically shaded as to produce a most natural appearance. Two little chains depend from the rose, ending in gold balls; by gently pulling one of these the center of the rose slowly turns, and there rises out of the very heart of the flower the brilliant diamond, which nestles among the petals of the rose like a mammoth dew drop. The effect of suddenly bringing to light the dazzling gem from the center of the dark background formed by the rose is startling at first, and then one is lost in amazement at the size and luster of the stone, and in admiration at the skill of the artists, who have produced an almost magical effect by the original and exceedingly happy setting they have given to it. To see the rich and varied tints of this popular rose suddenly illumined by a flood of light reflected from the central gem is something not to be forgotten, and when Miss Palmer wears it and exhibits the very clever mechanism contained in the rose, she will be envied by all her sex. The setting is so arranged that the diamond is detachable from the rose, and may be worn in any other article of ornamentation.



## THE JEWELERS' CIRCULAR AND HOROLOGICAL REVIEW

*The recognized organ of the Trade, and the official representative of the Jewelers' League.*

A Monthly Journal devoted to the interests of Watchmakers, Jewelers, Silver-smiths, Electro-plate Manufacturers, and those engaged in the kindred branches of art industry.

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### Business Prospects.

THAT the very late spring and accompanying cold and disagreeable weather has had the effect of discouraging business enterprise, is generally conceded by business men. There has, however, been some improvement during the past two months, and there is a confident belief prevalent that before the close of the year there will come a general revival of business that will last for several years. The prospects of war in Europe have had a tendency to advance prices of our products in trade centers, and it is well known that both Russia and Great Britain have placed some large orders with our merchants and manufacturers for supplies and munitions of war. A certain degree of stimulus has been felt in our markets because of the European complications, but how lasting this is to be is a question for the future to solve. Outside of the war and rumors of war there has been little change in the business conditions from what we noted last month. We have all the elements of prosperity among us, and only lack the motive power—public confidence in our own future—to set them in motion. We are like a locomotive on a railroad, fired up ready for a forward movement, a clear track ahead of us, and only waiting for some one to open up the throttle-valve and let us rush ahead on the road to prosperity. Just what will be the moving cause to give us the required impetus it is impossible to predict, but when the machinery is all in good working order we are not likely to remain long with the wheels locked. A noticeable feature in general business has been the result of recent large auction sales of cotton goods. These sales occur at regular intervals and are indicative of the feeling in mercantile circles. The recent sales were largely attended, buyers were plentiful and the bidding spirited, the two sales aggregating between two and three millions of dollars.

The prices realized exceeded anticipation, and tended to give an impetus and firmness to transactions in other lines of business. Business in the jewelry trade showed some improvement last month over that of the previous month, but still we heard no one complain of being seriously embarrassed by a plethora of orders. Everybody was fairly busy but entirely willing to become more so. There were a good many buyers in the city, but not enough to over crowd the hotels, or to blockade the streets most affected by the trade. Nor were their orders especially munificent; on the contrary, they showed a disposition to limit their purchases to their actual necessities, which was highly commendable. They thus avoided overstocking, and escaped liabilities that might, possibly, have proved as embarrassing in the future to their creditors as to themselves. Notwithstanding the fact that business has not begun to "boom," as many predicted and all hoped it would, there is a quiet feeling pervading the entire business community that a season of great activity is at hand. It may not come this month or this year, but the general impression is that transactions will steadily grow more frequent and more profitable as the season advances, and that the business of the year will compare favorably with that of some preceding ones that have been characterized as good. Such a consummation is most devoutly to be wished for.

### Trade Centers.

THE RAPID growth and development of this country, and the great area over which its wealth is naturally distributed, preclude the possibility of fixed centers of trade and commerce. In European countries this is different; for the reason that population and productive industries are confined to more limited areas, and a single great commercial city is adequate to supply all their requirements. But nature so distributed the wealth of this country over its whole area, so favoring it in the matter of climate that the whole range of natural products are at our command, that population is distributed in like manner. Wherever wealth is to be accumulated there will men congregate to procure it, and villages and cities grow up as this wealth is secured. Whenever population becomes dense, there must of necessity spring up a trade center that will grow in importance proportionately with the growth of the country immediately surrounding it. It is but a few years since Ohio and Michigan were the frontier, and persons removing there were looked upon as abandoning civilization for all time and condemning themselves to a life in the wilderness. To-day there are dozens of great cities beyond the western boundaries of those States, and the in-rolling wave of population is only checked by the Pacific ocean. With this wonderful growth of population and augmentation of the nation's wealth, there have also grown up great manufacturing industries and commercial enterprises that must draw their supplies from some central trade depots. The time has past when any city can boast that it is

the most important commercial or manufacturing point in the country, for so many others so nearly approach it in the volume and value of trade or products that it is scarcely possible to draw the line between them; but even if this could be done it is impossible for any one of them to claim future superiority as either a commercial or industrial center. Looking back upon the development the country has undergone in the past forty or fifty years, who shall dare predict what the future may bring forth either to the country or to special localities?

A few cities on the sea-board must necessarily be the ports of entry for immigration and for the imports required by our people; this of itself will tend to make them great commercial cities in the future as it has heretofore. Around them will gather, also, great manufacturing interests, and there will be large accumulations of wealth in them. For these and other reasons New York, Boston and Philadelphia, will continue to grow in population, and in wealth and importance, but who shall say that they will not be outdone in all these particulars at no distant day by some of the other commercial cities that are more centrally located? The present generation has seen Chicago come up from a prairie bog to a magnificent city containing close on to a million of inhabitants, and ranking as the fourth city in size in the country. It is the great distributing center for the West, Northwest and Southwest. Its business men are noted for their energy and pushing enterprise as well as for the vast wealth they represent. Within the past few years large manufacturing industries have found a foothold in that city or in the neighboring towns tributary to it, and no one can now fix a limit to its future expansion. St. Paul and Minneapolis in the Northwest, Denver and two or three other cities in the West, Atlanta and New Orleans in the South, and various other cities in other localities, have acquired a wondrous development within the past twenty years, having grown from little struggling retail towns to cities that now do a large jobbing trade in all lines. San Francisco commands the trade of the Pacific coast, but not content with this she is steadily pushing Eastward till her trade representatives swarm on the Eastern slopes of the Rocky Mountains. Cincinnati and St. Louis are splendidly located for trade centers, and their growth in population, commercial importance and substantial wealth has been continuous and pronounced. They have not attracted attention so much as some others, but their development has been none the less marked. All the cities we have indicated show every sign of great prosperity and every indication of permanency. Chicago and Cincinnati, and even Minneapolis and St. Paul, can point to massive blocks of buildings that are scarcely excelled in New York, Boston or Philadelphia, and all of them claim full as much wealth, if not more, *per capita*, than the Eastern cities possess.

It would be folly for any city to lay claim to a monopoly of manufacturers or trade interests. Indeed, it would be utterly impossible for any city to supply the demand that exists at present. We can remember when the little factory towns of New England were jealous of every attempt made by their neighbors to engage in manufacturing, yet all of them combined are not able to supply the present demand for their products. Increased demands from distant sections of the country have made it necessary that the source of supply should be located in closer proximity to the consumer, and the building up of new towns and cities is simply in compliance with the demand. As the demand increases in the future, as it naturally must with increased population, other towns and cities will spring up as a matter of necessity, and attain to a degree of importance corresponding to the natural and artificial wealth of the territory tributary to them. There is not the slightest occasion for the existence of jealousy between these trade centers, for as new ones are developed they simply take the natural increase of trade. Notwithstanding the sudden importance achieved by so many other cities, New York, Boston and Philadelphia have lost none of their commercial prestige, but, on the contrary, they have seen their volume of trade constantly increasing and their wealth steadily accumulating.

The jewelry trade has seen manufacturers and jobbers locating in these new cities and doing a thriving and profitable business, yet there were never more factories for the production of jewelry in the Eastern States than there are at present, and Eastern jobbers never had a larger list of customers on their books than now. The newcomers in the new localities supply only a portion of the increasing demand for jewelry, the dealers of the East receiving their fair share of such increase. With an increase of fifteen to twenty millions in our population every ten years, the increase alone in the consumption of all kinds of products is sufficient to furnish employment to large amounts of capital and many thousands of workmen. Eastern manufacturers and jobbers cannot hope to monopolize all the trade of the country, but should rejoice that our national development in wealth and importance is so great that additional trade centers are necessary. Whether they are willing to concede this or not, they cannot escape from the fact that there are now, in various ones of the cities we have named, numerous manufacturers and jobbers in the jewelry trade who are fully as enterprising and ambitious as they, and that they will secure their fair share of trade. Eastern manufacturers may console themselves with the reflection that they are the leaders in the trade, but they cannot help admitting that they have equally active and intelligent competitors in other parts of the country.

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### Trade Organizations.

NEARLY every profession, trade and business calling has some central organization, formed for the promotion of the interests of the specialty it represents. These organizations are intended to regulate the methods of conducting business, to indicate correct practices, and to prescribe remedies for such evils as may creep in to affect the general welfare. In the jewelry trade there are several such organizations in different localities, and it has been found that where they exist there is a better feeling among the members and fewer bad practices to complain of. In a country where credit plays so important a part in business transactions as it does in this, uniformity of practice in regard to it is especially desirable in every calling, and to this end it is important that the fullest information obtainable regarding those seeking credit should be disseminated among all who may be interested. It is with this for their principal object that Boards of Trade have been established in the jewelry interests in New York and Providence. Although their formation is of recent date, they have both already rendered excellent service to members of the trade, and demonstrated that their usefulness can be largely extended with age and increased membership. We earnestly hope to see them so conducted that they will command the confidence of the trade to such an extent that no reputable dealer can afford to stay out of them. Both the Boards alluded to give abundant promise of being able to command this confidence eventually, for the systematic manner in which they have entered on their duties cannot fail to command respect. But there are always some members of the trade who hold back to see what others do, intending to avail themselves of advantages offered if the movement is successful, while, if it is a failure, they escape identification with it. Such has been the experience of those who have been active in forming these Boards of Trade; quite a number to whom the subject was presented, instead of hastening to become members, and so giving it the weight of their names and influence, have said substantially, "Oh, go ahead, and we'll see how it works. If it is a good thing we will come in later!" But it is just at the inception of such an enterprise that all the support the trade can give it is desirable; after it has once got into working order, it can generally stand on its merits. The idea of a Board of Trade in the jewelry interest is an excellent one, and the best men in the business should have taken hold of it promptly and given it force and effect. As it is, it has been rather up-hill work to place them on a solid founda-

tion, but this has been accomplished, and the membership is large enough to insure their permanency. Those who stay out are the only losers, for the members are unanimous in saying that they have already derived more than enough benefit from them to compensate for the expense and trouble they have been to.

There are other organizations in the trade, formed for special objects, that have proven highly successful in their workings. The Jewelers' Association, the Jewelers' League, the Jewelers' Alliance, the Jewelers' Club, and several others, all having a special object to accomplish, are all doing their work honestly and well, and in the best interests of the trade in general. They are not in the nature of combinations to take advantage of the public, but simply to protect the interests of their own members. They are all deserving of encouragement and support; for the more numerous their membership the more influential they become. The Ohio Legislature, that has made itself infamous at its recent session, from the corrupt measures it has passed, last week passed a bill making it unlawful for fire underwriters to have any organizations in their interests in that State. A more absurd piece of legislative idiocy was never made into a law in any State. It might, with as much propriety, have attempted to dissolve the Stock Exchange, the Board of Trade, or any of the religious organizations. Fortunately the Constitution of the United States prohibits the abridgement of the rights of individuals in the manner proposed, and neither underwriters, jewelers, clergymen, nor any other class of citizens, can be deprived of the right to associate together for mutual benefit and protection. We hope the jewelers of Cincinnati will show their contempt for such legislation by at once forming a Board of Trade. Indeed such an organization should exist in every city where there are manufacturers and jobbers; identity of interests should lead competitors to association for mutual help and protection. With a few more local boards in successful operation, it will be possible to organize a National Board of Trade in the jewelry interest, in which every local board shall have representation, and through which evils of a general character may be corrected.

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### Birds of Evil Omen.

WE BELIEVE in people of sanguine temperaments, and prefer to pin our faith to the cheerful, hopeful men than to those who are constantly discounting the future and worrying themselves and others over imaginary evils that may never come. Trouble and disappointment come to us all fast enough and there is no sense in rushing to meet it half-way. Give us for a companion, counselor and guide one who accepts with cheerfulness what the day brings forth, and who confidently looks forward to brighter and better things to-morrow. Chronic growlers and persistent croakers of evil to come should be shut out from the society of reasonable men, and compelled to associate only with each other, that each might talk the other into a fit of the blues. Unfortunately the law does not prohibit the grumblers and growlers from running at large, and consequently they are to be met in every walk in life, on every street corner, and in those places where men most do congregate. Not satisfied with the troubles that are ever present with all men, they assume occult knowledge, and croak out predictions of evils to come with greater volubility than they will display in discussing current topics of interest. In all political, commercial and business movements among the nations of the earth they can see nothing but dire disaster to the special interests with which they are identified, as if a special Providence had selected them to bear the burdens that should be distributed among mankind in general. There is an egotism in grumbling and croaking as there is in self commendation, and some men feel a personal grievance if all

their predictions of disasters to come are not verified. We believe in looking on the bright side of everything; every cloud, it is said, has a silver lining, and if we can lift the depression and gloom from the soul of any man by pointing to the brighter side of things, we shall try to do so. There are croakers and grumblers in the jewelry trade without number, and, if we take for granted that all they say is true, then the trade was never so demoralized, so dishonored or so unprofitable as it is now, and there is a certainty that it is going from bad to worse in the years to come. They see nothing that can bring from them an encouraging word, and, the larger the audience they can get, the more dismal their croakings. It is pleasant to turn from these persons to those veritable *Mark Tapleys* in the trade, whose nature it is to be jolly under all circumstances, and hear them express themselves as content with the situation as it is but hoping for better times to-morrow. We prefer to chronicle the predictions of this class, who give reasons for the faith that is in them, to recording the dismal forebodings of the croakers and the growlers. We see men about us, who have been in the jewelry business many years, who have seen the volume of its products swelling year by year; the number of manufacturing establishments increasing and expanding as the demand for their products become greater; they have seen our export trade grow from nothing to a point where it largely exceeds our imports in value; they have seen American workmen taking the lead in the production of artistic gold and silver goods; they have seen the watch and clock making industries of the world revolutionized by American skill, enterprise and ability; they have seen the simple and complex machinery of Yankee invention usurping the place of tedious hand labor, and thus so cheapening necessary articles that the masses in every civilized country can enjoy them; they have seen every branch of the horological and jewelry business improved by native skill and enterprise, till the work produced in our workshops has no superior in the world. It would be hard to convince these men that there has been no progress in the jewelry business in this country, or that the wheels of progress and of enterprise are to be suddenly blocked and all that has been accomplished obliterated. Some may sigh "for the good old days of Adam and of Eve," but we believe in the present and have unlimited confidence in the future. Fifty years from now the methods in vogue at the present time will be looked upon as we regard the old-fogy methods of half a century ago, and if progress is to characterize the future of the trade it must come of trade prosperity. Even while the croakers are declaring that times never were so dull as now, we observe that the manufacturers are industriously bringing out new goods, and new designs, and are making constant efforts to extend their business; we see old houses expanding, increasing their facilities for doing business, and new firms taking position in the ranks and preparing to compete for their share of trade. Business cannot be entirely dead when it gives such convincing proofs of life and activity, of enterprise and progress. Granting that there has been a period of depression extending over two or three years, and that the volume of sales has been reduced, there has been, nevertheless, something doing all the time, and there must have been some profit found in the doing of it, or the factories would have been shut down and the shutters of the counting rooms put up, while our bankruptcy courts would have been filled with insolvency proceedings against jewelers who had been forced out of the business. We could fill our columns with the arguments of the croakers who hold that this state of things should exist now and who are confident it will exist in the near future, but we prefer to present the brighter side of the picture as outlined by those whose views are more cheerful. Hence, from month to month, in commenting on the business outlook, we give the views and experiences of those who are content with things as they find them, and hopeful for what the future may bring forth. We have no intention of misleading or misrepresenting the situation at any time, but we do not believe it to be our duty or the part of wisdom to seek to discourage the earnest, hopeful workers in the trade. We leave that to those who feel that they have a mission to promulgate predictions of doleful disasters.

## New Outlets for American Products.

THE GENERAL complaint among manufacturers in this country is that our productive capacity is in excess of the demand—that we can make more goods than we can consume, thus forcing reduction in prices, encroachments upon the wages of workingmen and a total obscuration of the margin of profit. When asked why they do not seek the markets of foreign countries, their reply is that they cannot, in many things, compete with European manufacturers, who are enabled to secure labor at much lower rates than obtained in this country. As an offset to this, however, we have brought labor-saving machinery to a degree of perfection that is known nowhere else, and that our European neighbors regard with alarm. We find in a recent issue of the London *Globe* the following admission, that American competition in foreign markets is the thing most dreaded by European manufacturers:

A reduced American tariff means closer competition against this country in the neutral markets of the world. Every diminution of that tariff will give new impetus to American productions, and will be equivalent to additional tightening of the screw of international competition. Unfortunately for this country, there are other elements in the industrial condition of the States which will act to our detriment. One of these is the silver question, the other is the superior mechanical equipment of American industry and the more satisfactory relations prevalent between capital and labor in that country.

But our great fear as to the industrial future of this country, in its inevitable rivalry with the United States, lies in the more perfect organization of our competitor. The American is *par excellence* a mechanical inventor. His natural ingenuity, fighting against the artificial enhancement of prices resulting from the prevalent fiscal system, has driven him to seek relief in mechanical assistance. He had compensated for dearthness of material in cheapness of production. Every workman in every manufacturing center is stimulated to study and master the machine under his charge, with a view to improving it. Mechanical development is part of the character of the nation. We may be sure that the country which produced the grain elevator, the oil pipe pumps, machine-made watches, the high speed printing machines, the ring frame, and other inventions without end, will develop still greater powers under the stimulus of a growing export trade. Where shall we be then? The relations also between the capitalist and labor classes in the States are more of a nature to encourage production and to develop the capacities of rising generations. Greater attention is given to the physical and moral well-being of the American artisan than is considered to come within the sphere of duty of the British or European manufacturer. A certain spirit of emulation pervades the laboring classes on the other side of the Atlantic, in the place of the leveling down to a general average which prevails in this country. The American artisan works for himself, knowing that his success will be recognized and encouraged. He seeks to rise, and his industry progresses with him. Are we doing all we should and all we might do on this side to keep pace with this progressive movement? We fear not, and yet such social advance leaves an indelible mark on its generation, and expresses itself industrially in good merchandise and low prices.

The above is a remarkable confession to come from a country that has, for generations, boasted of its commercial supremacy, and whose business activity and enterprise has placed it ahead of all of its older competitors. It is not these old rivals that are to be feared in the future, but the youngest of all the nations, the Americans, whose products are already known throughout the civilized world, and whose increasing facilities for production will eventually enable it to drive English products out of those foreign markets they have so long controlled. It is all true that is said about Yankee inventiveness, labor-saving machinery, and facilities for production, but it has always appeared to us that our manufacturers have failed to appreciate the importance of building up our export trade, and so creating new outlets for their production. Instead of seeking "new worlds to conquer" they have been too content to remain at home and rend one another in unbusinesslike competition. The bulk of the trade with all the people on this hemisphere legitimately belongs to us, and we are entitled to as much in the Eastern hemisphere as we can wrest from our old-world competitors. Yet the fact is that to-day the greater proportion of the trade with South and Central America, Mexico and Cuba, to say nothing of Canada, is controlled by our European competitors. This is from no lack of ability on our part to supply this trade or of ambition to do so, but comes from insufficient commercial organizations to advance American interests in those countries. It has been suggested that our Consuls should

be permitted to represent business houses abroad, but this is absurd, except so far as it would be a profitable thing for the Consuls. Legitimate trade needs neither government subsidies nor Consular boosting—if it cannot stand on its own merits under equal conditions in foreign markets, it deserves to languish and die out. That our export trade is not greater is due to the lack of proper organization to conduct it. Too much is trusted to native consignees who have no particular interest in pushing our products, and who are lacking in the business qualifications that characterize resident foreigners who compete with them. For lack of personal supervision of their interests abroad, our manufacturers have met with many losses at times, which have induced them to look with anything but favor on any proposition to extend their export trade. Instead of trusting their interest abroad to native representatives, our manufacturers and merchants should establish branch houses wherever they expect to build up a demand for their goods, and place in charge of them young pushing men, whose interest it is to sell all the goods possible and get pay for all they sell. The latter consideration is the more important of the two, for there is little difficulty in disposing of goods at home or abroad, but getting pay for them, under the lax laws of some countries, and the prejudice against foreigners that prevails in most of them, is altogether a different matter, as some of our merchants know to their cost.

In THE CIRCULAR for May we printed a little table showing the amount of gold goods, plated ware and watches exported by France last year to the South American States. The aggregate value was about ten millions of francs. These goods were distributed in the Argentine Republic, Mexico, New Granada, Venezuela, Brazil, Uruguay, Peru, Saint Thomas, Cuba and Porto Rico. The Argentine Republic took the larger amount, Brazil coming in a good second. Mexico and Cuba were each purchasers of French goods to the extent of about one million francs each. This whole South American trade should be ours, and it is the fault of our merchants that they do not control it. Suppose this two millions of dollars of trade had been distributed among our merchants and manufacturers last year, what a surprising difference it would have made in their accounts at the close of the year. With many, their proportion of it would have marked the difference between profit and loss on the year's transactions. As we said before, our merchants are too intent on doing a home business in the face of great competition, to seeking a more lucrative patronage abroad. The ten cent piece of home trade is in such close proximity to the visual organ that it obscures the distant dollar that lurks in the pockets of our nearest neighbors, and while our vision is thus obscured, the vivacious Frenchman deftly abstracts two millions of those dollars that should be ours and scuttles back across the ocean with them. Another great disadvantage experienced by limiting transactions to a home demand, lies in the fact that when a period of depression comes upon the country, its effects are universally felt. All suffer alike and at the same time, and then begins that cannibalistic process of eating each other up. If our manufacturers and merchants had a liberal export trade, a financial crisis at home would be less severely felt, for while the home trade might be dead, some other portion of the world would relieve them of their products and replenish their exchequers. The paragraph we quote above is full of suggestions which may profitably command the consideration of our people.

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### The History of Goldsmithing.

*Continued from page 120.*

THE NAMES of many French goldsmiths of the 15th century have been handed down to us, but since the majority of them wrought no celebrated works, we may consider them to have been obscure artisans; we will, however, mention a few names of those who, by reason of their princely customers, or some other saving clause, perhaps stood at the head of their profession.

At the commencement of the century we first find one Herman Rousel, with the title of goldsmith and chamberlain of the king; Hans Crost or Croist, with the like double title, as an attaché of the Duke of Orleans, and another goldsmith of Paris, Aubertin Boislefèvre, who also worked for this prince in 1414. It is singular that profligacy and ostentation were so incarnate in Charles VII., that even during the averse times of his misfortune, when he was forced to sneak from place to place, to reside in Berry or in Touraine, neither his own luckless condition nor that of the country could wean him from his lavishness, and he managed to eke out enough of money to keep two goldsmiths of Bourges, Guillaume Chenee and Pierre Piettement, and finally one, Lubin de Queux, a goldsmith at Lockes, at work for him.

Flanders also had become famous for goldsmithing; Gand and Bruges were the two most important cities, and each one possessed its goldsmiths of renown; we simply mention the most celebrated one, Corneille de Bonté. We still possess several pieces of his workmanship, particularly the case for the holy oils, fig. 33, and an escut-

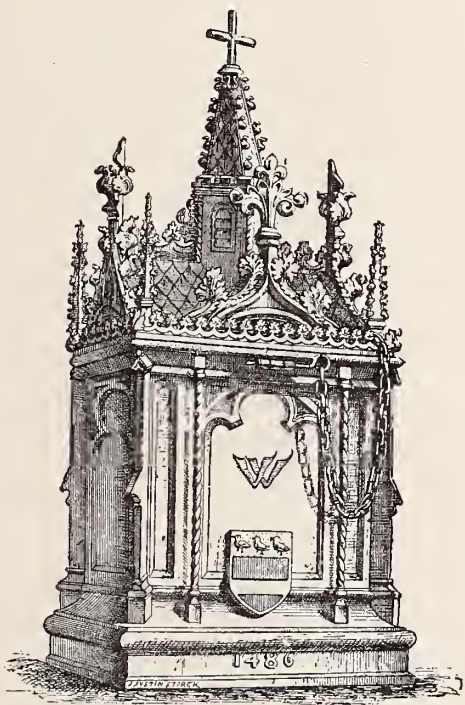


FIG. 33.

cheon, silver-gilt, representing the city of Bruges under the allegorical figure of a young woman seated under a baldachin, the curtains of which are raised by two knights in armor; at her feet a crouching lion, which she caresses, and below two lions sustain the coat-of-arms of Flanders.

4.—*Germany and England (from the thirteenth to the fifteenth century).*

We left goldsmithing in Germany, where the Roman style prevailed longer than in France, in a flourishing condition in the 12th century; as pertaining to this style we mention the beautiful sarcophagus of Charlemagne, at Aix-la-Chapelle, finished between the years 1212 and 1220, which had been commenced toward the end of the preceding century.

From this period forward the large shrines become every day scarcer, both in Germany and France, which can be explained only by presuming that these later times were not as prolific in saints as the former ages had been. Their bodies were gradually divided and subdivided, and the different pieces of their noble "human form divine" drifted into different possessions and countries. The reliquaries henceforward made to contain them became smaller from age to age, and their shapes often indicated what was preserved inside. If it concerned the head of a saint it was inclosed in a bust, for instance that of St. Oswald, still to be seen in the cathedral of

Hildesheim; if the receptacle was only for one or several bones of the arm, it was fashioned in the shape of an arm, to wit, those of the saints Gereon and Cunibert at Cologne. These busts and fore-arms are generally provided with the corresponding vestments, appropriately ornamented with borders, either gilt or enameled, and studded with jewels.

In the following (the fifteenth) century a large number of reliquaries of crystal, set *à jour*, was manufactured, so that the relic itself was visible.

The church of St. Colombia, at Cologne, still preserves one of the most beautiful specimens of this kind of reliquaries.

Many churches in Germany, especially those of Cologne, still contain a large number of pieces of ecclesiastical furniture pertaining to the 14th century. We will simply mention the large monstrance, the beautiful processional cross, and the bishop's crook belonging to this age, in the cathedral of the latter city, as well as the chalice, ornamented with semi-transparent enamel, preserved in the cathedral of Mayence.

Speaking of chalices, the churches of Germany possess a goodly number belonging to the 15th century; Mayence, Frankfort and Cologne each preserve at least a half a dozen in their treasure vaults. Among a large quantity of sacred goldsmiths' work belonging to the same century, found in these churches, are also several reliquaries in form of a cross: the magnificent cross of St. Colombia and the reliquary-monstrance of St. Martin.

Equally worthy of mention is the beautiful reliquary, of silver-gilt, preserved in the treasure vault of Aix-la-Chapelle, as well as that at the convent of the Noble Ladies of Altenbourg, the incense boat belonging to this same establishment, and, finally, the magnificent processional cross belonging (in 1875) to the collection of the Duke of Aumale.

German goldsmiths of this epoch also wrought a limited number of statuettes of saints, of very good workmanship. The Museum of Cluny possesses that of St. Ann; the Kunstkammer of Berlin contains a very creditable Holy Virgin, attributed to Henry Hufnagel, of Augsburg, and the cathedral of Ratisbon preserves the statuette of St. Sebastian, which is of excellent workmanship, though its workman is unknown.

Although, as we have shown, religious goldsmiths' work of the last few centuries of the Middle Ages is not scarce in Germany, the civil branch is much less common, and there is every reason to believe that this branch of goldsmithing was not as universal here as it was in France. We possess a few specimens, however, of exquisite workmanship, among which we single out the covered goblet, shown in fig. 34, contained in the collection of Mr. Seeholzen, of Ingolstadt, Bavaria.

The body of the goblet and lid is of silver, covered with ornamentation, arabesques, and figures of birds and animals, engraven in simple lines. An elegant button, formed of entwined foliage, crowns the lid. A narrow belt of similar foliage, enameled and gilt, encircles the goblet near its middle; a large wreath of grapes and vine leaves, enameled in different colors and enclosed between two borders *à jour*, twines around the foot. A similar double border at the upper part indicates the line of junction of the vase with its lid. Its main distinguishing feature, however, and which at the same time gives it a very charming and airy appearance, is that in place of standing flat upon its bottom it is borne on the shoulders of three wild men in a kneeling position. It may justly be said that German goldsmithing of this epoch possesses nothing more exquisite than this goblet.

We now approach the time when the revolution of taste, so brilliantly embodied a little later in the works of Albrecht Durer, began to cast their first rays athwart the sky of art, and announced the transition from the Middle Ages to the Renaissance.

Nor had goldsmithing been neglected in England, although it possesses only a few remains of this age. Religious goldsmiths' work pertaining to this age has almost entirely disappeared, and we are informed only by contemporaneous writers that it ever existed.

During the 13th century the rich and celebrated monastery of St. Albans still sustained its school of goldsmithing. One of its monks, by the name of William,\* was considered to be an excellent chaser. He taught a few pupils, several of whose names have been preserved to us by the chronicler Mathews Paris. William Fitz Otho was goldsmith to King Henry III., and made many rich ornaments for the use and adornment of the Lady Chapel in Westminster Abbey. In the 28th year of this king's reign (1243) he directed Fitz Otho to make "a dragon in manner of a standard or ensign, of red samit, to be embroidered with gold, and his tongue to appear as continually moving, his eyes of sapphires, to be placed in the church against the king's coming thither." Two years later he ordered the keeper of the exchequer to "buy as precious a miter as could be found in the city of London, for the archbishop's use, and also one great coronal of silver to set wax candles upon in the said church."



FIG. 34.

William Fitzwilliam, a goldsmith, about this time founded, at St. Helen's in Bishopsgate, a priory of Benedictine Nuns, and probably built a church for them, against that of St. Helen's, which afterward came into their possession; the ruins of the nunnery were pulled down in 1799.

Among the fifty-eight adherents of Simon de Montfort, who was defeated and slain at the battle of Evesham, when Henry III. was released from prison, were: Conrad, the goldsmith; John Fitzpat-

rick, goldsmith; and Hubert, the goldsmith; they were banished from the kingdom with the rest. On the submission of the Barons they were heavily fined, and the city of London was obliged to pay 20,000 marks; but Michael Thovy, goldsmith, for holding with the Barons was imprisoned with others, and, by reason of murders and robberies, imputed to him by the Aldermen, he was hanged in 1275.

Another goldsmith, Gregory de Rokesley, lived in the Old Change; he was keeper of the King's Exchange and Chief Assay Master of all the king's mints in England. Sheriff in 1271. He was eight times Mayor, between 1275 and 1285, when, for refusing to appear at the Tower as Lord Mayor before the king's justices—asserting his privilege by throwing off his civic robes at the Church of Allhallows, Barking, and then obeying the mandate as a private individual—he had his office seized, together with the liberties of the city, by John de Kirkeley, the king's treasurer; and Ralph Sandwith (not a goldsmith) was appointed "Custos," in lieu of the Mayor, which office he held from 1286 to 1289. In 1297 the liberties were restored, and the office of Mayor revived.

In the 8th year of the reign of Edward I. (1279) the value of the coins had become so deteriorated by clipping that a new standard of value was established, and a new coinage issued, which was conducted by an agreement with William de Turnemire of Marseilles; groats and half-groats were made, as well as sterlings or pennies. The pound of Easterling money was to contain 12 ounces, to wit, fine silver, such as was then made into foil, and commonly called "Silver of Guthurous Lane," viz.: 11 oz. 2¼ dwt. The dies for this new money were delivered to Gregory de Rokesley on the 27th May, 1280. (Guthurous Lane led out of Cheapside, east of Foster Lane, and took its name from a former resident and owner thereof; it was inhabited principally by gold beaters. It is now called Gutter Lane).

John of Limoges probably resided many years in England, and executed the beautiful tomb, enriched with colored champ levé enamels, of Walter de Merton, bishop of Colchester, still existing in Westminster Abbey.

Laurence Duckett, goldsmith, who had taken shelter in the tower of Old Bow Church, after wounding one Ralph Crepin, was murdered therein in 1284, for which, says Stow, sixteen persons were hung, a woman, named Alice, burnt, and many rich persons "hanged by the purse." The church was interdicted, the doors and windows filled with thorns, till it was purified again.

The treasure vault of St. Paul's, London, contains an inventory of the many pieces of goldsmiths' work the church possessed, drawn up toward the end of the 12th century, which mentions a number of interesting pieces, some of which must have been very complicated. Among them we mention the large altar cross presented by bishop Richard of Gravesend to his church. This cross stood upon a base which was supported by four lions; it was appropriately adorned with representations of scenes and figures, forming, in the language of the times, "toute une ystoire en argent doré," (a history in silver-gilt), commencing with Adam and Eve at the foot, and finishing on top with the figure of Christ, His Holy Mother, and the "well-beloved" disciple.

If, in consequence of the religious wars which swept several times over England, the rich sacred vessels belonging to its ancient worship have almost entirely disappeared, other causes have effected about the same state of affairs with the admirable treasures of goldsmiths' work hoarded by the several English monarchs. Being lovers of ostentation and in a chronic state of straightened circumstances at the same time, on account of their ambitious enterprises and their continual wars, they were frequently forced to pledge their treasures, either in England or in foreign countries, for the more tangible "sinews of war." Thus we see that in the 14th century Edward III. mortgaged his jewels, and finally his crown, to English merchants; and in the following century Henry V. pledges his large necklace, called the Pusan, to the mayor and community of London.

There is no doubt that the goldsmiths of England produced artis-

\* It was very much the practice in the Middle Ages, especially in monasteries, to call not only the monks, but people who were instructed therein, by their Christian names, adding thereto the place or city from whence they came. These establishments were frequently schools for teaching the various arts and the technicalities of trades, among which was that of the goldsmith; by which custom the actual surname in many instances became altogether forgotten. This was the case, more or less, all over Europe. Hence we have John of Limoges, William de Gloucester, Solomon of Ely, Walter de Merten, John de Chichester, Jan Van Delft, Roger of Ely, etc.



tic pieces of workmanship during the 14th century, because even French chroniclers of the time say that English goldsmiths' work was in great demand. In the inventory of Charles VI., of France, we see that he carried a water jug and a large covered goblet with foot, both of gold and enameled, from England, which Henry IV. (of Lancaster) had given him. At the commencement of the succeeding century, in 1414, we read that the queen of England (Catherine of France) sent to the Duke of Bretagne another water jug and a tablet of holiness, both of gold.

Pieces of this enameled goldsmiths' work of English origin are very scarce at present. The most perfect and finest known to us is the cover of a book preserved in the Bodleyan Library of Oxford. The two cover-boards, enameled upon silver, are surrounded by a broad rustic border of silver-gilt, very artistically entwined and of a charming design.

But we repeat that the goldsmiths' work of the Middle Ages is very scarce in England, and very little of it has been shown in the different expositions. The few specimens still existing to-day are owned by ancient corporations and rich families of the United Kingdom, and they barely date back two centuries preceding ours. Few specimens of the 16th century can be met with, while those of the 15th are still rarer.

Of the numerous guilds of the city of London, we believe only that of the armorers possesses a handsome covered bowl, of silver-gilt, about twelve inches high, ornamented with foliage and bearing an inscription, without date; the guild of the iron merchants owns two, one of maple wood mounted in silver, the other a drinking cup, made from a cocoanut set in silver. The college of Oriel, at Oxford, owns two other cups of similar shape and construction, and the college of Corpus Christi, at Cambridge, possesses two others. These few specimens are simply of a secondary interest, and the date of their manufacture pertains to the end of the 15th century.

Beside this silver work belonging to the corporations named there is a covered vase, of silver-gilt, belonging to Lady Rodney. It is perhaps a little older, and is well authenticated, as it has belonged to the same family since the 15th century.

It is very probable that a few other English families possess specimens of goldsmithing of the Middle Ages, but their existence is unknown to us.

It is useless for us to enter into lengthy descriptions of the goldsmiths' work belonging to Russia and Poland, they having been so ably described in this, THE JEWELERS' CIRCULAR, under the heading of "Russian Art Reproductions."

We now approach the time when mighty minds were born who were destined to shape anew the forms of taste. And what country was more likely to produce them than that of the sunny clime?

##### 5.—Italy (from the thirteenth to the fifteenth century).

Up to this date, the reader who has intelligently perused this History of Goldsmithing, will have noticed a certain sort of parallelism in the progress of goldsmithing in the different countries of Europe. But from the 14th century forward this parallelism ceases to exist, at least as far as Italy is concerned. Beyond the Alps the march of art in all its branches has been totally different from that in the rest of Europe. Italy is constantly in advance of other countries, and when the advent of the Renaissance is barely foreshadowed in the latter the former has fairly entered upon it already.

It is not our province to inquire into the causes which produced this early revolution of taste in Italy. We will simply state that the Gothic style, properly so called, while it became firmly rooted in the several European countries, never thrived in Italy, and we only find it in a sort of mongrel mixture during the 13th century.

Siena, at this epoch, possessed goldsmiths of a great reputation, several of whose names have been handed down to us. We will merely mention Pacino, who, in 1265, made a silver cross with figures and a gold chalice for the church of San Giovanni de Pistoja; Andrea Puccio and Tallino, his brother, who, in 1267, made a large altar

covering for the same church; Filippuccio, a renowned goldsmith, in the second half of the same century, and Guccio, who, in 1290, wrought a large chalice in the Gothic style, with raised figures upon a blue enameled ground, which the church in the town of Assisi still preserves.

(To be Continued.)

## The Greenwich Observatory Clock.

Continued from page 108.

THE SAME principle that is used in the barometric compensation with the magnets to alter the rate of the pendulum without stopping it, is brought into play here to correct the error of the mean solar clock. The pendulum rod has fixed to it on the front a permanent bar magnet, about 6 inches long; this magnet has the north pole downward. There is a hollow coil in circuit with a galvanic battery, which is not in action in its ordinary state. Let us suppose that after the mean solar standard and the small mean-time clock on the superintendent's desk have been compared, the small one is found to be half a second too fast. The dial of the commutator has the words "retarding" and "accelerating" engraved upon it. In the present case the handle of the instrument is turned over to "retarding," which turning, sends a current through the hollow coil just mentioned, making its upper end a north pole, and consequently repelling the lower end of the pendulum magnet, and "retarding" it, that is, making it go slower. The battery power is so adjusted that if the retardation is kept in action for ten minutes, the pendulum will have lost one second.

Having reduced the mean solar standard to correct mean time, we are ready and waiting for 10 o'clock, in order to send the first signal of the day. This sending is managed by the clock itself, through the electric wire relays. It is done by a pin on a small arm that is fixed to the arbor of the seconds wheel, and by another upon that of the minute hand spindle. Each pin has to act upon a pair of very fine springs, which are in contact with the sending wire. The seconds hand pair of springs closes the circuit at the 0 of every minute, whilst the minute pair are closed only between the 59½ and the 60½ in each hour. Let us say that the 59½ of the last minute has been reached; then the hour circuit springs are closed, and will pass any current that comes along their wires up to the 60½ minute, when they will be re-opened by the passing away from them of the pressure of the pin on the arbor of the minute hand wheel. But watching the seconds hand during this time, we see that it is rising to the top with every beat of the clock. Finally, it reaches the 60th second, when its pin instantly closes its circuit, and the hour circuit being already closed, as has just been stated, away goes that 60th second up to London, and, before the 61st has been reached, Greenwich mean time is known all over the country; and that is how time is made at Greenwich.

We must not omit the great time-ball that gives its signal to the chronometers of the shipping on the Thames, and also to the surrounding neighborhood. The ball is fixed to the top of a rod that works in a groove of the mast on the east turret of the Observatory. As this ball is the first of its kind that was erected, it may be expected that the mode of hoisting is in keeping with its date—being raised with winch and chain. The Deal ball, and others that have since been put up, are raised by means of a rack and pinion work, a far more suitable way. The lower end of this rod terminates in a piston, resting at the bottom of an iron cylinder. There are a couple of guide rods, having a collar sliding easily upon them, the latter being attached to the end of the winch chain. This collar "takes in," with another, which is fixed to the rod of the ball itself. When the ball is wound up there is a contrivance for keeping it in its place whilst the chain is unwound and the collar that raised the ball returns to its place below. The ball is let go at

the hour of 1 P. M., by the standard solar mean clock. In connection with the closing of the electric circuit by the clock, which has been already described, is an armature, acting upon a detent or trigger, to which levers are attached.

As in other cases, when the sixtieth second of the hour has been reached, the electric current from the clock releases the trigger, and the ball descends. The Deal time ball does so at the same instant, while guns fire at different places. When the Deal ball falls, it sends a return current to Greenwich to say that all is right. When that is not so, a signal is sent by hand. The cylinder and piston at the bottom of the ball-rod are to prevent violence from the ball by using the air in the cylinder as a cushion. Should the ball not act at the proper time, it is lowered to signify that fact, and again hoisted for two o'clock, when it is let down by hand. The time of hoisting it every day is five minutes to one o'clock, and it falls exactly at one.

The hour signals for London pass through the signal relays of the Post Office, St. Martin's-le-Grand. There is an arrangement by which public clocks can report themselves to Greenwich, and obtain an answer; but at present, "Big Ben," of Westminster, is the only one that does this. The country signals go out at 10 A. M. and 1 P. M., unless under special circumstances, these being considered the two most convenient hours for the purpose.

The distributing instrument at St. Martin's-le-Grand is called a chronopher, and the signals are marked off into four classes, to wit, metropolitan, provincial short, provincial medium, and provincial long. Contrary to expectation, elaborate experiments have shown that the roundabout transmission of the hours causes no delay that can have any appreciable time assigned to it. Thus the signal reaches Edinburgh just as soon as it reaches London, so far as the measurement of a high decimal of a second is concerned. Although it must absolutely reach the Post Office before it can go to Kendal or Swansea, the difference in time is so small that it can never be marked as a factor of a second.

We will, ere we conclude, correct a very prevalent error in respect to the Westminster clock, that is, that its pendulum is controlled in some way or other from Greenwich. This is not so. It is perfectly independent in its action. It reports itself to the Observatory twice a day, and there is a galvanic needle beside it, which shows an hour signal from the standard mean-time clock by deflection. Should the clock alter its rate, there are small weights which can be put on or taken off the pendulum to restore the time. It has long been admitted to be the best public clock in the world, and may generally be relied upon to within a second of true time. After heavy gales of wind acting upon its exposed hands, or thunder-storms, it may err by two or three seconds. The first blow on the hour bell, after the quarters have been sounded, is the time.—[ALFOJO, in *Eng-Mech.*

[THE END.]

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### Letters to Watchmakers.

[By DR. LEONARD WALDO, Astronomer in charge of the Horological Bureau of the Yale College Observatory.]

#### VII.

##### THE APPLICATIONS OF ELECTRICITY TO HOROLOGY.

###### *First Considerations.*

IT IS highly probable that electricity will be a very important thing in the present and future development of horology. The watchmaker to-day gets his standard time over a telegraph instrument by electricity. There are numerous systems in which clocks are set over city districts by electrical appliances. The watch and clock maker are constantly called upon to repair electric clocks of various degrees of badness. The vague terms "magnetism," "electricity,"

are often heard of in connection with thunder storms and mainspring breakages. There are shields as well as liver pads which are "anti-magnetic." The careful workman is at a loss to know whether a watch has some "magnetism" in it to account for its vagaries. He does not know the effect of bringing tools, made of iron or steel, near magnets. I have been asked such questions as these: "Will the ticker sounder instrument on my work bench affect my tools or my chronometer?" "How can I find out whether a watch is magnetized a *little*?" "Are these anti-magnetic shields good for anything?" "What are good and what are bad electric clocks?" "How can I demagnetize a watch?" "Suppose I want to invent an electric clock, how can I tell what wires to use, how to wind the magnet cores, and what kind of batteries to use?" "Is there any electric watch which can be made to go?" "How small can you make batteries which would take the place of a mainspring or weight for driving timepieces?"

These are some of the questions which have been addressed to me, and others will occur to the reader equally pertinent to modern horology. Now I propose that we begin to answer these and other queries by getting clear ideas as to what this new force which is to play so important a part in the new horology really may be like. How we can detect its presence or absence, how we can measure it, how we can produce it or destroy it, and, in short, get those clear ideas which will be of use to us whenever we think of the subject or try to apply it to any new invention.

There is probably nothing in science about which there has been more misleading statements made; more unintelligible language used; more confusion of ideas, than the subject of electricity. I well remember the amount to be unlearned, the pernicious ideas to be unseated in my own mind as I followed the study, and gradually began to understand, from experiment, how much had been done in the books and papers to render obscure an extremely interesting and valuable force which could be led anywhere by a wire, was always ready for use, would exert almost any power required, and seemed above all others to be the power for small machines of all kinds.

What is electricity? I don't know. It is a something very different from any matter of which I know. For instance, it does not seem to have any *weight*. It flows—or goes—equally well in any direction. It is not like any of the ordinary "forces." Let us, for our purposes, look upon it as a new kind of matter, without weight, without chemical constitution, so extremely "thin" that it will run instantly through certain kinds of mediums in which it is placed. Now remember I do not give these as facts. They are like the facts in many respects—but we don't know what the real facts are. We can take a copper wire, for instance, or a sheet of metal, and we can pour a certain amount of electricity into it. It may be full already—in that case it is *charged* with electricity. If, now, the wire or metal sheet is brought near enough another piece of metal which has less electricity in it, the electricity will equalize itself in the two pieces of metal. That is, from the piece which is charged full, a certain amount of electricity will flow to the piece which has less in it, and this flow will continue until each is equally full, so to speak, of electricity. Take a stroke of lightning, for instance. In this case a cloud which is overcharged with our unknown material called electricity passes over a spot on the earth where there is not nearly so much as there is in the cloud. Instantly, if the difference in the amount of electricity is great enough, and the cloud is near enough the earth, the electricity from the cloud will leap to the earth, and a certain other electricity will leap to the cloud, and the whole amount of electricity will distribute itself equally between the earth and the clouds. Now, in this case, the electricity has shown itself in two forms. One is called positive, and the other negative. One is only positive in the sense that it is the opposite of the negative part of electricity, so to speak. Both positive and negative electricity are but the integral parts, so to speak, of electricity itself.

The usual way of regarding positive and negative electricity is to make them the two constituents of a fluid-like material which is

itself neutral. We can always produce the positive electricity by breaking up this neutral fluid, when we shall have, at the same time, an equal quantity of the negative electricity. Now it is very convenient to call this electricity a fluid. It passes instantly, almost, through long copper wires, and we can call this passage a "flow." If we remember that this fluid "flows" in any direction, upwards, downwards, wherever its conduit or conductor leads, and practically instantaneously, then we can adopt the very convenient way of talking of calling electricity a "fluid," and of saying that it "flows," and calling the direction in which it flows from "positive" to "negative;" only we must carefully remember that we don't know whether it *is* a fluid, and that we only use these terms because we can thus most easily describe the phenomena and fasten the relations of things in our minds.

As we deal with electricity we must understand the terms used in measuring and using it. *Current* is self explanatory after what has been said. If we look upon electricity as flowing in a stream, current will describe the amount of the stream flowing past any point at the same time. The banks and bed of the stream limit its size. So in a current of electricity, the amount of the current is limited by the shape and boundaries of the *conductor* in which it is flowing, and by the *resistance* which the particles of the conductor interpose. In a stream of water, for instance, the current might be made sluggish by the occurrence of many boulders or mud flats. Or we can think of a stream which has to flow through fine sieves constantly, and is retarded in its flow by these "resistances." So the electric current may be conceived to flow through certain conductors, such as copper wires, which are very clear, so to speak, to the electric current and interpose little resistance, while it may meet with an almost impassible resistance, such as glass or air. Those substances which give an easy passage to the electric current are called conductors. The best conductors in the order of their excellence have been found to be silver, copper, gold, zinc, platinum, iron, tin, lead and mercury.

Those bodies which are such very poor conductors that scarcely any electricity can get through them, are called "non-conductors," and the following list gives the best known non-conductors, the first one (wool) being the best conductor of the lot: Wool, silk, glass, sealing wax, sulphur, resin, gutta percha, India rubber, gum lac, paraffin, ebonite, dry air. From which lists it appears that if we wished to conduct as much electricity as possible, we should use silver or copper, and that if we wish to block the flow of electricity as completely as possible, we should use ebonite or dry air. Thus in an electric light system the conductor of the electricity to the lights is of copper. But at every point at which the conductor rests there are glass or porcelain supports, so that the electricity is stopped in its effort to flow off at the points of contact. So, too, wires are often covered with cotton braid and then paraffined or waxed—this is to prevent the electricity going off into the damp air, or leaving any particular wire to follow a "crossed" wire or wire by accident in contact with it.

We shall have to use some terms which represent the measurements of electricity. Just as in speaking of water power we have "head of water," "aperture of pipe," so in dealing with electricity we ought to get clear ideas as to the terms there used. Electricity being a comparatively new force in civilization, it has been the habit to name the units of measurement after distinguished men who have made important discoveries. Suppose, for instance, that we wanted to speak of the resistance which any given piece of metal or any other object would interpose to a current of electricity. We must say that it is so many times more or less than a certain other resistance, well known to us, which is taken as a unit. Thus, a water stop cock, we will say, has an aperture of half an inch. Its resistance would be denoted by half an inch as applied to a stream of water. So, if the aperture was an inch, its resistance would be so many times less than the first unit of half an inch. Now, in electricity the current is said to have a unit resistance when it is sent through a column of mercury about 41 inches long and about one twenty-fifth of an inch in diam-

eter. The resistance which the current would suffer in flowing through such an arrangement is called "one ohm." A piece of copper wire one hundred and fifty feet long and one-hundredth of an inch in diameter, would give the same resistance. Ohm was a very distinguished physicist who established the common laws which govern the flow of currents. It is quite appropriate, therefore, that we should indicate the resistance which the mediums have in which current flows by "ohms."

(To be continued.)

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THE MEETING of the Executive Committee was attended by Vice-Presidents Johnson and Kimball, and Messrs. Bowden, Howe, Smith, Hale, Lewis, Greason and Sexton.

A new form of application blank was adopted, prescribing a higher standard of physical condition for eligibility.

Six (6) changes of beneficiary were granted.

Resignation of Geo. A. Miller as Counsel was received and accepted.

The appointment of Abel Crook was made.

Two applications were rejected.

Four applications were referred.

Nine applications were accepted as follows:

Geo. Hartje, A. Rosenthal, E. A. Whitfield, A. Wittnauer, New York City, N. Y.; O. C. Robinson, Lyons, N. Y.; W. S. Richardson, Newark, N. J.; I. E. Isaacs, Pittsburgh, Pa.; R. A. E. Staehle, Chattanooga, Tenn.; A. J. Willimen, Newport, Ky.

## Recent Patents.

The following list of patents relating to the jewelry interests, granted by the U. S. Patent Office during the past month, is specially reported to THE JEWELERS' CIRCULAR by FRANKLIN H. HOUGH, Solicitor of American and Foreign Patents, 925 F Street, N. W., rear U. S. Patent Office, Washington, D. C.

*Issue of April 14, 1885.*

315,907—Button, Collar. F. G. Cart, Charleston, S. C.

315,603—Clock, Alarm. W. D. Davies, Brooklyn, N. Y.

315,527—Pendulum, Compensating. A. Maille, Boston, Mass.

315,756—Watch Case. E. C. Fitch, Newton, Mass.

315,755—Watch Movement Box. E. C. Fitch, Newton, Mass.

10,580—Watch, Stem-winding and Setting. D. H. Church, Newark, N. J. Re-issue.

315,829—Watch, Stop. P. V. Perret, Chaux-de-Fonds, Switzerland.

*Issue of April 21, 1885.*

316,144—Button and Necktie Fastener. G. T. Kelting, Washington, D. C.

- 316,194—Button, Collar or Sleeve. F. A. Fox, New York, N. Y.  
 316,254—Clock, Calendar. D. J. Gale, Bristol, Conn.  
 316,360—Clock, Electric Pendulum. F. & O. Haenichen, Philadelphia, Pa.  
 316,112—Clock Movement, Electric. J. E. Carey, New York, N. Y.  
 316,364—Clock, Striking Train. A. G. Hovde, Honefos, Norway.  
 316,135—Jewelers' Rolls. A. Flatow, Ellenville, N. Y.  
 316,020—Scarf Pin. W. C. Edge, Newark, N. J.  
 316,072—Watch Case. G. C. Smith, Chicago, Ill.  
 316,226—Watch, Winding Stop. W. Bell, Boston, Mass.

*Issue of April 28, 1885.*

- 316,767—Watch Case. E. C. Fitch, Newton, Mass.  
 316,814—Watch Case. D. O'Hara, Waltham, Mass.

*Issue of May 5, 1885.*

- 317,239—Button and Necktie Holder, Collar. E. J. Stellwagen, Washington, D. C.  
 317,312—Clock and Lamp Regulating Mechanism, Combined Alarm. J. M. Crawford, Philadelphia, Pa.  
 317,096—Clock, Illuminated. J. M. Crawford, Philadelphia, Pa.  
 317,380—Clock Movement. F. A. Lane, New Haven, Conn.  
 316,965—Watch Barrel. J. Hay, Rochester, Assignor to J. E. Thomson, Marion, N. Y.  
 316,953—Watch Case Springs, Fitting for. W. H. Fitzgerald and G. C. Smith, Chicago, Ill.

## Gossip of the Month.

THE salesmen, book-keepers and other employees in the jewelry houses in New York are kept busily employed at all times. It makes but little difference to them, so far as their labor is concerned, whether trade is good or bad, for there is always enough for them to do to keep them employed from morning till night. There are the goods received from the factory to be checked off, entered up and put away, goods going to the factory to be cared for, the stock to be kept in order, and a thousand things to be done and all too few experienced hands to do it. These employees cannot often afford summer vacations, including trips to the sea-side or mountain resorts, but must keep plodding along on the treadmill of daily routine, regardless of the seasons or the weather. They have but few holidays in the course of the year, and we are glad, therefore, on their account, that the early closing movement—that is, closing all jewelry houses at 1 P. M. Saturdays from June first—has met with such general approval. This will enable them to take a little run into the country to spend Sunday, and they will return Monday morning refreshed by even this little relaxation, and prepared to enter upon the duties of the week with renewed energy and vigor. Too few business men stop to consider how much of their success is due to the unremitting care and zealous interest shown in their affairs by their subordinates. They find them in their places regularly, and the business moves along smoothly, and it is only when some faithful employee drops out of his accustomed duty that the proprietor recognizes how much of care and responsibility had been spared him by the efforts of this faithful and trusted worker in his busy time. Proprietors and employees are all links in the same chain whose perfect construction is necessary to success; let a link be broken or lost and there follows instant derangement of the whole machinery. The hard worked office force is entitled to much consideration at the hands of proprietors, and we earnestly hope that the early closing proposition will meet with the hearty approval of every member of the trade. For several years the Chicago jewelers have followed this rule, and their New York brethren cannot afford to be less generous towards their employees. Let the boys sniff the sea breeze at Long Branch on Saturday, or take a refreshing sea bath at Coney Island or Rockaway, or even enjoy a run among the Catskills for a mouth-

ful of fresh air. It will be entirely safe to trust them near the water, for we are confident none of them would go fishing on Sunday, and, besides, we are informed by experienced fishermen that fish will not bite on Sunday. However the brief rest and recreation each will take in his own way will be of value to him, and, perhaps, save him from an attack of cholera or other dangerous illness.

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WHAT constitutes a jobber in the jewelry trade is a question many ask and few can answer satisfactorily. Those dealers who are recognized as legitimate jobbers, purchasing goods from manufacturers to sell again to retail dealers, are accorded many special privileges that are desirable to have. To obtain these, many retail dealers have at times claimed to be jobbers, and, as some of them were liberal buyers, manufacturers have been inclined to acquiesce in their claim. This, of course, aroused the hostility of other jobbers and the jealousy of competing retail dealers, till the question as to what constitutes a jobber and entitles him to all the privileges accorded that class, has been much discussed for years, but never satisfactorily settled. The manufacturer is apt to look with favor upon the man who sells large quantities of his goods, and it is a common thing for a person who is only recognized as a retail dealer, to buy more goods than his neighbor who is classed among the jobbers. Shall the volume of purchases determine the status of the buyer? Then there are dealers classified as jobbers who have not hesitated to sell goods by retail at wholesale prices. The retail dealers, of course, protested against this, and hold that the selling of goods by retail to any extent constitutes the one so doing a retail dealer, who should not be accorded jobbers' privileges. Then there are a few retail dealers who make a specialty of pushing goods of a certain kind, selling these by retail or in jobbers' lots as the case may be, and they very naturally claim to be jobbers, while the favored manufacturer who supplies them with goods is very zealous in maintaining their claims. When doctors disagree who shall decide? This question has assumed considerable importance of late, in consequence of the organization of the manufacturers and jobbers to which we alluded in our issue of last month, which has for its object the protection of all branches of the trade and the preservation to each of its time-honored rights and functions. It is a vexed question as to who shall be recognized as jobbers by this association, and the discussion of the mooted point has been both lengthy and interesting. It is a subject we do not care to enter into further than to say that it is scarcely possible that it can be decided in the best interests of the entire trade without bringing about individual hardships. The greatest good to the greatest number should satisfy every one, even though a few individuals may be deprived of certain rights they have heretofore enjoyed. If the matter is discussed and decided in this spirit, it will eventually work out a satisfactory solution of the problem, and every dealer will be assigned to the position to which he is justly entitled. The association referred to, has appointed a committee of six—two representatives of the makers of movements, two of the case makers and two of the jobbers—who are to determine which dealers are entitled to a place in the jobbers' list. Wherever there is a doubt raised, they will carefully investigate the case and give a decision in accordance with the facts. It is to be taken for granted that a committee so constituted will be wholly disinterested judges in each individual case, and will discharge their ingracious and thankless duty without fear, favor or prejudice. They will be governed by the best information to be obtained, and, having but one end in view, the best interests of the trade at large, they may be trusted to form a judgment that will be as nearly correct as it is possible to get it. There is no question but the committee selected is worthy the unlimited confidence of the trade, and that it is safe and politic to leave the matter in their hands. If they make mistakes

the association can correct them, but until they do they should have the confidence of all persons in interest.

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THE international exhibition is now open in London, and private advices indicate that it is very fine in its way, offering a wide field to inventors for comparison and study. The American department, we regret to say, is represented as not being so full and complete as was expected, but it is anticipated that additions subsequent to the opening will make it one of the most important departments in the exhibition. As the exhibition was not opened until the first of May, and was then far from complete, we do not expect a detailed report of it in time for this issue, but in our July number we shall be able to present to our readers an account of all there is in this novel exhibit of the world's ingenuity that is of special interest to them. In advance of the opening much interest was expressed in the exhibit of the American Watch Company of Waltham, some account of which we have already printed. Old World watchmakers have looked with dismay upon the improvements made in watch making machinery, the perfectness of which has enabled our manufacturers to compete with those of any other nation in a satisfactory manner both as to quality and price, and to share with them the patronage incident to the export trade. It has been assumed that our American manufacturers keep a jealous watch over their machinery lest some prying foreigner should obtain access to their factories and steal their ideas. It is with marked surprise, therefore, that they see the American Watch Company sending over samples of all its important machines, and the wonder at the audacity of the Yankee, who not only sends the machinery, but sets it up and puts it in motion, supplying skilled workmen to operate it in their very presence, and to turn out their machine-made watches under their very noses. Beside the machinery in full operation, will be exhibited a full line of the watches manufactured by this company, so that the processes and the results may be witnessed within a very limited area. All the jewelry trade papers of London, previous to the opening of the exhibition, had lengthy articles on the subject. The *Jeweler and Metal Worker* says:

The forthcoming International Exhibition at South Kensington, which is to be opened early in May, would not be complete were the American Watch Company not to show us the wonderful tools and machinery which have been invented to keep the largest watch factory in the world going, and we are glad to be able to state that English horologists will be afforded the opportunity of not only seeing these inventions, but also of viewing them in operation under the guidance of experts from the Waltham factory. Watchmaking by machinery has been a source of never-ending discussion among the trades of our readers, and opinion has been considerably divided as to what work and of what quality can be done in this way. Some manufacturers of reputation have stated that first-class goods cannot be made by machinery—that hand labor is only capable of creating them. The controversy has been raging for some years, and although no party acknowledges itself vanquished, there have been many who have adopted some of the American methods as far as they were able. What will be the effect of the closer view of the processes which the Waltham Company are about to give, we will not venture to foretell, but it may be taken as a certainty that they will be closely scrutinized, and some useful knowledge acquired by the inspection.

Then follows a description of the machinery sent over, the article concluding as follows:

From these particulars our readers will see that the American Watch Company are not only willing to show the world their processes of manufacture and to challenge criticism, but are also determined to put their best leg foremost, so as to secure for themselves the distinction which they have undoubtedly won by the creation of numerous machines for the speedy execution of exact and delicate work. Their enterprise sets our manufacturers a good example, and we hope that it will be our province to record in these pages, that the home trade have not only endeavored to do their best, but have succeeded in showing that they are advancing, and that the rivalry of the Americans has not disheartened—only stimulated them to renewed efforts to secure for the old country greater success, if not supremacy, in the manufacture of watches for the million.

From all of which it will be seen that, notwithstanding their pres-

tige as watchmakers, and the many years experience they have had, our English brethren are extremely curious to find out the Yankee secret of unlimited production, excellent quality and medium price; in fact, to obtain, if possible, the key to their wonderful and unparalleled success. But there is no key to it—it is a stem-winder and is due to inherent qualities characteristic of the universal Yankee notions, and cannot be transplanted.

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THERE are comparatively few persons who know how to wear jewelry becomingly and in good taste. It is a common thing to see rare and beautiful gems obscured in a ladies toilette by inappropriate surroundings and violent contrasts that destroy the effects that might otherwise be produced. We were forcibly reminded of this by the first appearance in public of Miss Minnie Palmer, the well known actress. The gem is set in the heart of a beautiful imitation of a Jacqueminot rose, so arranged mechanically that the gem is not visible until the wearer desires, when, by pulling a little golden ball attached to it, the center of the rose revolves, and the great gem suddenly flashes its brilliant light into the eyes of the beholder. The effect of its first public exhibition would have been very great but for the fact that the actress was covered with other diamonds,—necklet, bracelets, solitaires, clusters, diamonds for the hair, for the fingers, the bust, the neck, the arms—in fact, she was bestudded with diamonds, whose value equalled many thousands of dollars. All these shone with dazzling brilliancy, reflecting the bright lights of the theatre which shone upon her from every point. When she suddenly brought the Cleveland gem to view, the effect was scarcely noticed among the flashes of so many dazzling gems. It was like adding another electric light to the illumination caused by a hundred others. Had this magnificent gem, in its unique setting, been her only ornament she would not only have shown better taste, but the diamond, intended to advertise her personality, would have shown to its best advantage and brought her the *eclat* she sought to obtain by its purchase. A lady of culture and refinement, a well known authoress, found herself avoided at a well known fashionable summer resort by ladies of her social position. She eventually ascertained that this avoidance arose from the fact that she made a prominent display of diamonds at breakfast when fashion only permitted them to be worn on full dress occasions. There is a fitting season for all things, and even the most beautiful gems and exquisite jewelry may be regarded as vulgar, if the wearing of them is characterized by bad taste, either as to the time or manner of their display.

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IN OUR May issue THE CIRCULAR congratulated the trade on the fact that the demoralization existing in the silver case trade, which had seriously affected manufacturers, jobbers and retail dealers alike, was likely to be removed by the formation of an association which includes in its membership the manufacturers of movements, silver case makers and jobbers. The fundamental object of this organization is the protection of the retail trade by confining the current of business to its legitimate channels. During the past five or six years we have persistently directed attention to the encroachments that were being made upon the legitimate retail trade by outside dealers, who carry lines of cheap jewelry as an advertisement to allure patronage to their regular lines. These outsiders, not depending upon their sales of jewelry for their profit, were content to sell such articles at cost, or even less, for the sake of attracting customers. Of course, the legitimate trade was injured by just so much as the sales of the outsiders amounted to. This and some other evils that have crept into the trade, it is the purpose of this organization to cure, the determination of all interested being to encourage trade in following

the natural channels from the manufactory through the hands of the jobber to the shelves of the retail dealers. All recognize that the retail dealers, who come in immediate contact with the consumers, are the only practical medium upon which manufacturers can rely for disposing of their products, but as they cannot reach the entire retail trade, jobbers step in as the natural distributors to that trade of the products of the factories. This being recognized, it becomes essential that each branch should be protected in its natural privileges. That a few manufacturers have catered to the outside trade it is useless to deny, but the practice is found to be demoralizing. Nor is it profitable in the long run, for the reason that outside buyers are fickle and not to be depended upon. Even the bazaar men, who have at times handled cheap jewelry, change their plans according to circumstances, and one who was a liberal buyer last year, may abandon his fancy for jewelry this year and not buy a dollar's worth. So it comes about that the retail dealers constitute the only legitimate outlet for the products of the trade. They have gone into it as the legitimate business enterprise of their lives; each selects his locality, cultivates his constituency, ascertains their requirements and strives to meet them; by fair and honorable dealing, by enterprise and energy, by identifying himself with the community, he strives to command the confidence of that community, and to build up a profitable business for himself. This he cannot do if he is undermined by the very men from whom he buys goods, and to whom he looks for encouragement and support. He certainly has a right to demand from them that they shall not, by themselves or outsiders, step into his field and force him into an unprofitable competition to retain the trade he has built up. To aid and assist the retail dealers, and to prevent such competition is, as we have said, the first purpose of this association. The next in importance is the prevention of the practice of cutting prices on staple goods, whereby the retail dealer has heretofore always been placed at a disadvantage. Hereafter there is to be no cutting of prices, but movements, cases, and other staple goods will have standard prices attached to them, so that when a dealer makes his purchases he will have an assurance that his neighbor has not bought on better terms than he, and so be able to undersell him. There is an earnest and determined feeling among the manufacturers and jobbers that the objects of this association shall be carried out in good faith. If this is done it will mark an era of reform in mercantile practices that will benefit the entire trade to a great extent. A short time only will be required to show the retail dealers who, if any, are violating these principles, and they then have the remedy in their own hands. They have but to withdraw their patronage from them and bestow it upon those who are deserving of it, because of their efforts to protect them. There should be reciprocity in all things, and when the wholesale dealers honestly and in good faith seek to promote the interests of the retail dealers, the latter should return the compliment by exposing and refusing to patronize those who seek to rob them of their trade by any illegitimate practices.

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A GOOD many watches and a good deal of jewelry is stolen in this country every year, and the thieves show an amount of ingenuity in disposing of the proceeds of their robberies that is worthy of a better cause. Many of these stolen goods find their way to the pawnbrokers, who may or may not be innocent purchasers of them, and some are sent over to Canada to be "worked off" in the easiest manner possible. Before disposing of movements or cases, or other goods bearing numbers, the services of an engraver are called into requisition, and a figure added to the number, or some alteration made in the existing figures with so much skill that it is almost impossible to detect it. Usually, however, a close scrutiny under the glass will show where the alteration has been made. Suspicious goods should always be thus examined by any dealer to whom they

may be offered for his own protection, lest in having them in possession he may be suspected of being an accomplice of thieves. Jewelers have so many means of protection now, by associations and otherwise, that they are not robbed so frequently as formerly; individuals contribute mostly to the crop of stolen watches and jewelry, and they seldom get their goods back. There ought to be, however, more hearty and systematic co-operation between members of the trade in this country and Canada, in pursuance of which the thieves would have as wholesome a fear of detection over the border as they do on this side. Here they have been taught by bitter experience that the jewelers are not safe persons to operate upon, for depredators are pursued with persistent energy and prosecuted with relentless vigor. It would be an easy matter to make Canada undesirable ground for them to fly to or to secrete their booty in if proper efforts were made to secure the co-operation of the trade in that country.

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OUR readers will heartily welcome, as we do, the first of a series of articles from the pen of Professor Leonard Waldo, of the Yale observatory, on the science of horology, that appears in this issue of THE CIRCULAR. These articles have been secured by us in pursuance of our determination to spare no reasonable expense to include among the contributors to our columns the best technical talent to be obtained. This has been one of the main objects of THE CIRCULAR since it was first established, and how well that purpose has been carried out a reference to the back numbers of the magazine will show. Professor Waldo is among the foremost horologists of the age, and his contributions to its literature have been numerous and valuable. We have long sought his services as a regular contributor, and now congratulate ourselves that he has made such arrangements as will enable him to comply with our persistent importunity. His articles will appear regularly in consecutive issues of THE CIRCULAR.

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MANUFACTURERS evidently have faith in "the good time coming," for they have put on the market an abundance of new designs in goods of all kinds. It is wonderful to see how many new designs, and even forms, can be given to standard articles of personal adornment. Bracelets, for instance, are staple articles of jewelry and necessary to every lady's toilette; they have been in use so many years, even centuries, that one would suppose the field of novelty had been exhausted long ago, yet new forms, styles, patterns or designs are to be found in the stock of nearly every manufacturer—Yankee ingenuity will acknowledge no limit. But new designs do not necessarily crowd out old ones that have become popular, for there is a steady demand for these all the time. The same may be said regarding pins, ear rings, finger rings, and other necessary articles—long as they have been worn and numerous as are the styles already in vogue, there is something new constantly being brought out. When buyers seek this market, as all do at times, they find their chief difficulty lies in making their selections where everything is so tempting.

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WITH this issue we bring to a close the series of articles on the Russian Reproductions in the Metropolitan Museum of Art. The description of these specimens of ancient art have been elaborate and accurate, while the excellent illustrations accompanying them have conveyed to the eye of the reader a correct idea of the form and workmanship of the articles described. This collection forms

one of the most attractive features of the art museum, and is universally pronounced to be of rare beauty and value. For the convenience of those especially interested in such matters. We have reproduced these articles in book form entitled "Russian Reproductions," which can be obtained by addressing THE JEWELERS' CIRCULAR.

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DEALERS in all sections of the country can contribute something towards increasing the demand for jewelry by having copied in their local papers some of the paragraphs that appear in THE CIRCULAR each month. It is our purpose to chronicle the news in the trade and also to make particular note of prevailing fashions. Our Fashion Gossip is filled each month with just such notes as rural editors delight to transfer to their columns, and if each dealer, when he receives his CIRCULAR, would call in or on the editor of his local paper, that individual would be thankful for the opportunity of making some selections from our columns. In this way more general public interest in the jewelry business would be excited, and a consequent increase of trade follow. Dealers who will interest themselves in this way will, by notifying us, be supplied with proof slips of interesting news paragraphs or fashion gossip each month simultaneously with the publication of THE CIRCULAR, so that they may supply their local paper without destroying their file of the magazine. To keep the public informed as to what goods are fashionable and popular is one of the best methods of increasing the retail trade.

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Russian Reproductions

At the Metropolitan Museum of Art.

[BY JOHN W. MILES.]

Continued from Page 104.



Bracelet, Gold, Greco-Scythian.

INCLUDING our review with this chapter, we return again to that stronghold of the goldsmiths' art, the famous city of Augsburg, to notice a magnificent gold toilet service known as that of the Empress Anna Ivanovna. The service consists of a large number of pieces, including candlesticks, lamps, saucers, dishes, breakfast and tea services, as well as those requisite for the uses of the toilet. They are all fitted into a great chest, a beautiful mirror (which will be figured later on) having a place in the lid. This service is said to be used at imperial coronations and marriages. It is part of the immense stores of valuable plate kept in the Winter Palace in St. Petersburg, which, being in daily use by the sovereign, is, of course, rarely seen. Nine of the principal pieces are reproduced, forming part of this collection, and two of them will be illustrated here. The probable date is 1730-40, and the probable artist, judging from an inscription scratched beneath a portion of the mirror, was one Ludwig Biller. Nearly every piece exhibits chasing and strap work on a matted ground, festoons of flowers and fruit, shells, scrolls and diapers with cartouches containing scenes of animal life and of the chase. Part of the ornamentations enumerated may be seen upon the ewer, illustrated in figure 39. This is in the form of a casque, with a hinged cover shaped like a shell. The handle, consisting of scroll work supported upon the head of a mermaid, is very beautiful. In fact, the entire piece is full of grace. The helmet pattern for ewers came into fashion at the latter part of the 17th century and lasted forty or fifty years. In the treasures of the Goldsmith's Company, London, there is one of this style made by their most prominent goldsmith, Paul Lamerie, in 1741, and which was

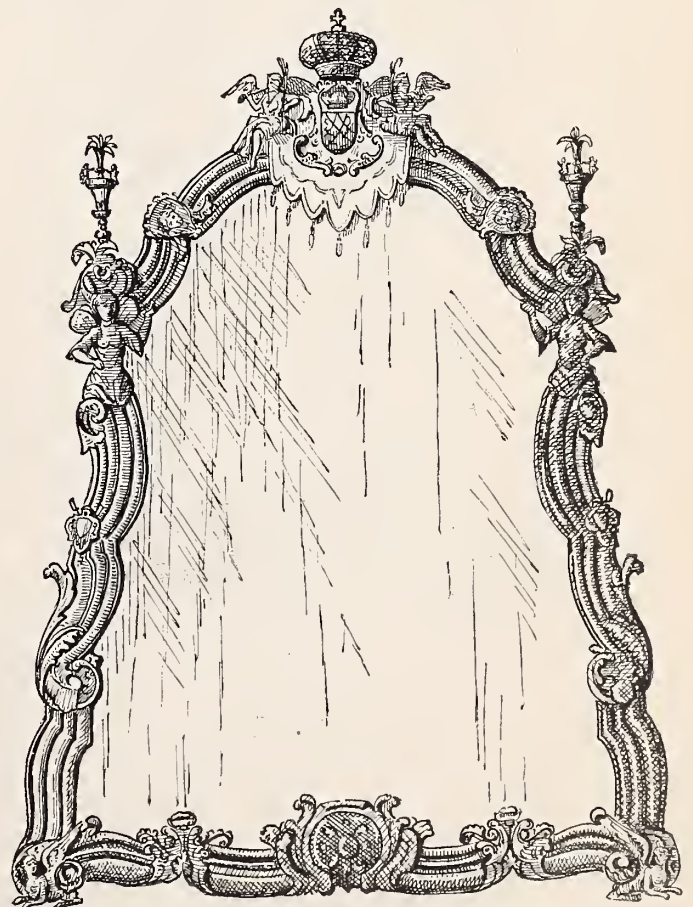
claimed to be the finest specimen extant. It does not, however, equal the one figured either in delicate taste or artistic outlines although more elaborate. There is a dish or salver matching also reproduced. Height of ewer 10 1/2 inches.

But perhaps the most elegant piece of the entire service is the mirror frame, figure 40, exhibiting workmanship of the most elaborate description but with the same exquisite taste. It is made up for the most part with scroll designs with ornaments applied in various appropriate places. The feet are two Sphinxes couchant produced with a skill especially noticeable even in this remarkable piece so full of admirable adornment. In the central portion of the frame between these is a painted enamel medallion of the double-headed eagle. Upon the two sides nearly to the top of the frame are embellishments of leaf work and cords. Surmounting this are two female half figures with butterfly wings, draped and supporting

with the inner hand the portion of the frame above them, the other hand, with flexed elbow, resting upon the hip. Over them and springing from a scroll are two rather tall vases of flowers, each bearing upon the upper part two little Cupids. Between these and the center of the top on either side is an applied shell pattern containing the mask of a woman. At the summit there is a shield with



Ewer, Gold, Augsburg, 18th Century, Figure 39.



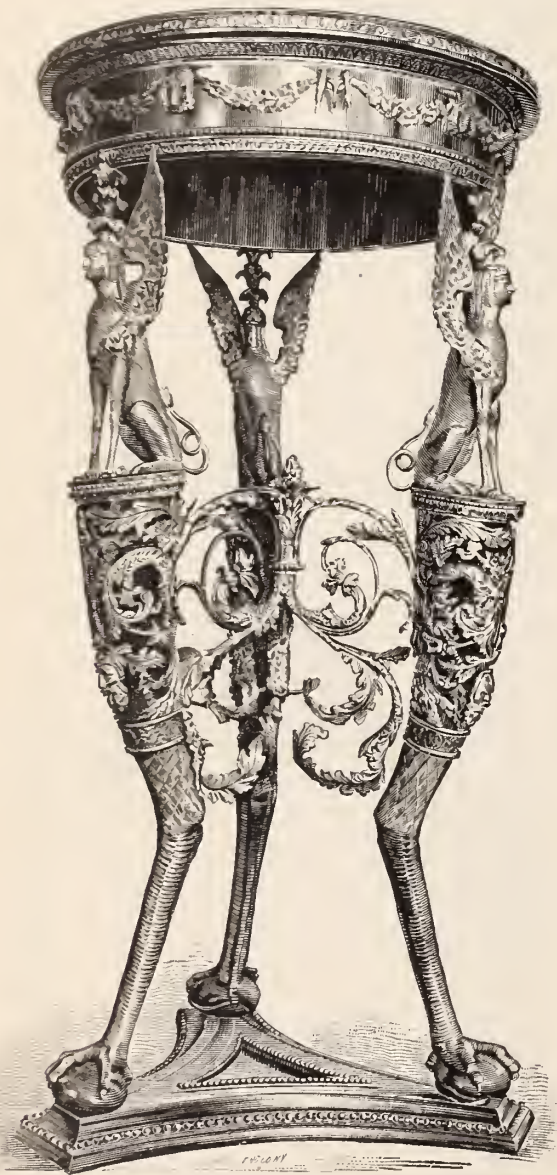
Mirror, Gold, Augsburg, 18th Century, Figure 40.

mantle upon which is enameled the imperial cypher surmounted by a large imperial crown having a red base of translucent enamel. The supporters are two draped female figures with wings, holding branches of palm and blowing trumpets. Below this, and hanging

over the glass is a small engraved curtain with an escalloped edge from which hang loosely little pendant tassels.

Although produced subsequent to the death of Louis XIV. we cannot fail to trace in this piece the influence of those styles which prevailed during his reign and which has entered so largely into the designs of modern work, but we must not forget that it is of the 18th century when original ideas were rare and artists did not hesitate to copy. That the ideas were skillfully and artistically handled the piece is itself an evidence, betraying in the delicacy of its treatment and richness of its effect a most commendable sagacity.

Of French work in the collection there are but seven pieces of plate and four of bronze, three of the latter being in gilt or ormolu. One of these will be found illustrated in figure 41. With a few slight differences it is a copy, but a copy of that period of art to



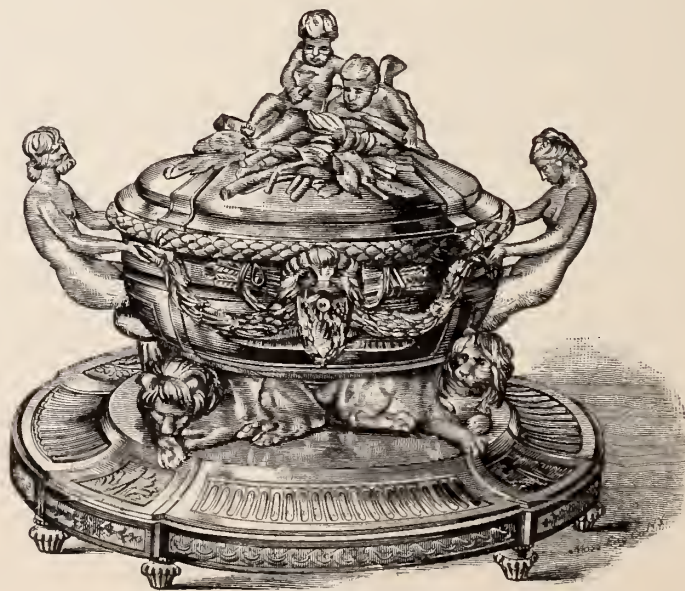
Table, Ormolu, French, 18th Century, Figure 41.

which we all bend in reverent adoration—the period of Greece and Rome. Indeed, it is said to be almost a duplicate of a tripod well known in the Museo Borbonico. At the angles of a triangular base arises three birds' legs, the upper part covered with applied work of hammered leaves and vines delicately executed. The legs are connected by a similar design. Upon the summit of each leg is a Theban sphinx in a sitting posture, and with wings stretching upward touching with their tips the wide band above. Between the head of each sphinx and the band is a leaf construction which furnishes the support for the top. The band itself has festoons of flowers caught up at equal distances circling around it, and furnishes the mounting for a slab of agate which completes the table. The style is that of the Pompeian braziers with the top reversed. For obvious reasons

we may be sure that it belongs to the latter half of the 18th century. Its height is 36 inches, its original in the Museum of the Hermitage.

The world of art owes much, and will probably owe still more, to a certain eruption of Vesuvius in the year A. D. 79. In that volcanic overflow two fashionable cities of the Roman empire were buried completely, Herculaneum by basaltic lava which soon hardened into stone, and Pompeii by scoria and ashes. For nearly seventeen centuries the two cities lay entombed and forgotten, until, in 1713, Prince d'Elbœuf discovered Herculaneum, and in 1750 some peasants Pompeii, both accidentally. Many beautiful works of art thus preserved became the legacy of the more modern world, producing an excitement among the savants and artists resembling that of the Renaissance, and providing new studies for the artificers. We can scarcely blame the artist of our table for copying such a beautiful piece, more particularly since it was one of a form most popular with the Grecian and the Roman. In the history of both peoples, especially the former, we find the tripod frequently mentioned, and many of them were so beautiful in form and of such valuable materials that they were deemed worthy of presentation to the temples and often possessed a national reputation as something unusually rich and magnificent. The Grecian warrior, soliciting the favor of the gods upon the day of battle, vowed tripods as thank offerings in case of success. It was upon a tripod that the Pythian priestess sat when delivering the oracles of Apollo at Delphi, nor did the responses of this famous oracle cease until Constantine removed the sacred tripods to adorn the hippodrome of his new city, Constantinopolis, (about A. D. 328). It was a massive tripod of gold that Cræsus dedicated to Ismenian Apollo, together with lustral vases, bowls, etc., all in the precious metals. But one might occupy whole pages enumerating the instances where this article is prominently mentioned as intimately connected with the life and religion of the ancients. From the etymology of its name we know them to have had three feet, but of their artistic character we possess very little information. The one figured, which is without doubt a copy, may give us some idea of the exquisite designs of antiquity, but a multitude of others must have been different and were most probably as beautiful, if not more beautiful, than this.

French work in silver-gilt is represented by tureens and tureen covers, candelabra and a salt cellar, principally from the Winter Palace. Of these a tureen only has been selected for illustration, figure 42. It is one of a set of 12 similar in general character but



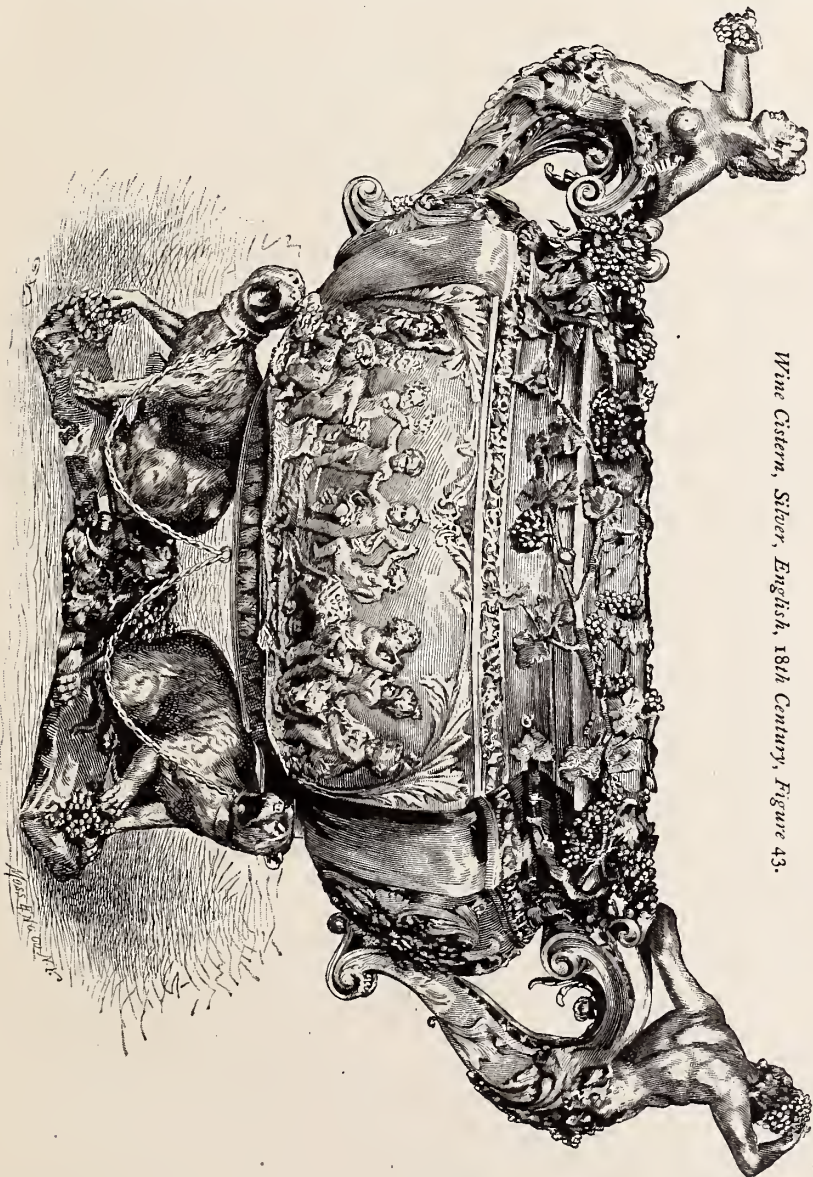
Tureen and Cover, Silver-gilt, French, 18th Century, Figure 42.

differing in details. The one figured rests upon a plateau having eight small melon feet and with the upper surface gadrooned in panels. The tureen itself, borne upon the backs of four couchant lions, is ornamented with festoons of laurel caught up by masks and quivers of arrows. The two handles represent a mermaid and a merman,



both nude. The cover bears a pair of Cupids playing. Other covers of the same set exhibit also amorini drinking from a helmet, holding a bird cage and birds, blowing a horn, etc. Like almost all the pieces in the collection the name of the artist is unknown.\*

This is but another example of the rich goldsmiths' work stored in the plate room of the Winter Palace which has escaped the mint. During the first half of the 18th century French taste was the law of Europe in articles of plate, a taste not wholly wanting in grace and dignity. Vast quantities of the precious metals were made up into furniture either for use or simply ornaments, until the palaces were crowded with the splendor of gold and silver. But the sovereigns had other ends than display in this apparent extravagance. The banking facilities of those days were not as convenient as now, and, as with the ancient Persians, the rulers hoarded the revenue embodied in these articles. They formed a convenient resource when the



Wine Cistern, Silver, English, 18th Century, Figure 43.

exigencies of State demanded funds for any purpose and particularly that of war, when they were unhesitatingly thrown into the mint regardless of the art which might be incorporated in them. It is for this reason that so few of these works of skill are extant to-day, rendering more valuable the ones that still remain and especially those of the period to which our tureen belongs, the period of "Louis seize," when artists produced furniture and gilt metal work of matchless elegance.

Not the least interesting piece is a wine cistern or cooler, of English origin, figure 43. This was made in 1734. It is very large, measuring 5 feet 6 inches long by 3 feet 6 inches wide. The original in silver weighs 8,000 ozs. This immense wine cistern was

without doubt a very remarkable and prominent piece in its day, and it is said that a carefully executed engraving of it is still preserved in the Art Library of the South Kensington Museum. Until this reproduction, however, the piece itself had long been forgotten in England. It is in the form of an oval vase resting upon four leopards with collars upon their necks, to which chains are attached and fastened to the bowl above. Each has one paw playing with a bunch of grapes, and grapes are on the ground behind and around them. The bowl is worked in panels with deep flutings between. Upon the side panels are groups of boys and young satyrs dancing, drinking, holding bunches of grapes, etc., after the usual Grecian representations of Bacchanalian scenes. The handles or terminals are of scroll design, from which spring nude half figures of a man and woman respectively, each resting one arm upon the piece and extending the other holding a bunch of grapes. They resemble somewhat the Grecian *Bacchantes*. Around the upper edge is applied vines, leaves and bunches of grapes hanging over the edge both inside and out. Lizards, flies, frogs, etc., are also applied in great variety. The bowl has an inner lining or skin, the chamber beneath which, it is supposed, was designed to hold the ice. To give some idea of the expense attending the reproduction of this collection, it may be stated that this *replica* alone cost upwards of \$2,000. It is indeed a grand piece and one likely to first attract the attention of the public. The terminal half figures are especially well done, particularly that of the man, whose muscles stand out well defined, exhibiting a powerful physique. The work is principally cast.



Salt-Cellar, Ivory, German, 17th Century; Silver-gilt Mountings, Russian, 18th Century, Figure 44.

The tall object illustrated in figure 44 is a salt cellar, the pool for the salt immediately under the cover. The mounting is Russian work of the year 1800, and is not distinguished by anything very remarkable. The drum of the salt, however, is of ivory, German work of the 17th century, and a very artistic specimen. It represents different mythological groups and figures, of which our illustration shows most plainly that of Melpoméné with the lyre, and Pallas-Athena holding a spear and shield, and with the owl (a bird sacred to that deity) at her feet.

Ivory, a rare material during the 13th and 14th centuries, was largely used by the artists of the 16th century. At no period has any country excelled the Japanese and Chinese in delicate ivory carving, but at the time of the Renaissance it was treated either as an auxiliary or as objects upon which might be displayed the most beautiful mountings. In cups especially it was often used with cover, base and handle of the precious metals, and one is now in the Windsor Castle strongly resembling our salt cellar in workmanship and design. Regarding the annals of the salt cellar much has been written, not only by the author of this description† but by many others, and still there remains a large amount of interesting study upon this one subject. To no other one article of table service has there been accorded in the past as much distinctive honor, an honor often bordering upon veneration if not worship. Its history begins in the most remote and prehistoric ages and clustered around it through

\* Was it Antoine de Villeclair?

† "The salt cellar as an exponent of Renaissance Art."

all succeeding time we may find the most noble sentiments of friendship and hospitality. From the Egyptian "Festival of the Lamps," when salt was mixed with the oil, to the mediæval epoch, when its position upon the table formed the dividing line of rank and blood, this necessary condiment has received especial honors. From the darkest and most barbaric ages, when it was a pledge of fealty stronger than the ties of blood, to the days of the Italian Revival, when no receptacle could be too beautiful to contain it, the character of holiness has followed it and its nature has been adored as "divine." Modern civilization has forgotten the sacred honor which was bestowed upon the salt cellar in the past, but there still exists among the dependencies of the Russian throne many tribes to whom this article is of more importance than all beside. Even at the coronation of the late Czar numerous salt cellars were included in the gifts of distant subjects, perhaps as a pledge of unwavering loyalty, in accordance with the unwritten ancient law.

In conclusion, a few words to the amateur regarding the study of these pieces, for by the generosity of one man they have been secured at great cost and placed upon exhibition simply and solely to be studied. A pebble from Mount Ararat would be quite as valuable as a mere curiosity. These have a higher and more useful character. They represent to us the thoughts, the dreams, the intellectual rank of the epochs producing them. They are indices of the past as plainly expressed as a mathematical problem. Given the condition and types of art at a certain period what was the state of civilization at that period? The indications to an acute observation cannot be mistaken. During the progress of this description many historical references have been made. The scope of this work demanded that they should be most brief, but slight as they have been they may serve as suggestions of great possibilities to one who seriously undertakes the study of art work in metals in its application to the inner life and thought of a people. It is by investigating the causes that we more thoroughly understand the effects. The influences which sway the minds of men develop themselves in the work of their hands, and the causes which at any period of the world's history produced beneficent results are certainly those which must be of great value to the present age. Through such specimens as those of this collection we are enabled to trace the effects of differing civilizations, of differing social laws and of differing governments. The study covers a vast field of research, including as it does the simplest habits of the individual as well as the grandest system of governmental law. It is to be hoped that this fascinating collection has not come to us, as has been suggested, two generations too soon, and that it will meet with that high appreciation which it merits. In this hope the writer believes that he has the sympathy of all that is best and truest in society, and that every patriotic heart will echo the wish for a new art that shall weave out of inspirations derived from nature and past skill, designs distinctively American in character and sentiment. There are already indications in the sky of our civilization of a new Aurora, already may be seen the roseate tint of a new day. That it may end in glorious fruition, resolving our dreams into brilliant realities will depend very largely upon the appreciation and demand of the great public, stimulated by familiarity with such art collections as this of Russian Reproductions.

[THE END.]

### Lives of Celebrated Goldsmiths.

GHIBERTI.

LORENZO GHIBERTI also belonged to the early days of the Renaissance, and took a leader's place in the sculpture of bas-reliefs, as Brunelleschi did in architecture. He was born at Florence in 1378, and died in 1455. Spring-tide of Renaissance was setting in

in full flow, and the earlier religious sentiments, undermined by the revival of classic learning and philosophical speculation, was losing its purity and fervor, while the appreciation of the excellence of antique art had led to the adoption of its forms and ornamentation, more or less modified by individual and local tastes. The results, however, were extremely beautiful, and in themselves the sculptures of this period claim the next place in our admiration to those of the school of Greece. A craving for artistic creation became almost general, and city rivaled city in the erection of temples rather than churches, and in the enrichment of those already built. Andrea's gates to their "*bel san Giovanni*" simply stimulated the Florentines, then in the full growth of their prosperity, to the desire for more. Meanwhile, Ghiberti was studying metal work under the teaching of his excellent father-in-law, Bartolo di Michiele, the goldsmith, and painting in fresco at Rimini, until, informed that the signory and merchants' guild had decided on erecting another set of bronze portals to the baptistry, and had invited artists to compete for the work, he, by the advice of Bartolo, returned to Florence, entered his name for the artistic tournament, and was to break a lance with his townsman, Brunelleschi, with Quercia and Valdambrini from Siena, with Nicola of Arezzo, and with Simone da Calle, while Donatello did not compete. Finally all were rejected but the models of Brunelleschi and Ghiberti, and for a time there was a doubt as to which of these artists would be preferred. It had happened that, while Brunelleschi had been struggling for the commission for the building of the dome, Ghiberti had annoyed him very much, and, indeed, after the work was begun, he did not cease his interferences. For this reason it could scarcely have been expected that Brunelleschi should favor Ghiberti; but the true nobility of his character declared itself, and he publicly acknowledged that Ghiberti's model was finer than his, and retired from the contest. The record of this interesting episode in art history remains to us in the original trial pieces, which are preserved in the museum at the Bargello, in Florence, and of which electrotype reproductions are in several European art museums.

The gates on the north were first executed; they were begun in 1403, and finished twenty-one years later. They contain twenty scenes from the life of Christ, with the figures of the Evangelists and the four Fathers of the Church, in a very beautiful frame-work of foliage, animals, and other ornaments, which divides and incloses the larger compositions. These gates are in a style nearer to that of Pisano and other artists than are his later works; from the first, however, Ghiberti showed original talent, for even his model of the Sacrifice of Isaac, which is preserved in the museum of the Bargello, together with that of Brunelleschi, proves that he had a new habit of thought.

Beautiful as these gates are, those on the east are finer and far more famous; it is of these that Michael Angelo declared, "they are worthy to be the gates of Paradise." Here he represented stories from the Old Testament in ten compartments: 1. Creation of Adam and Eve. 2. History of Cain and Abel. 3. Noah. 4. Abraham and Isaac. 5. Jacob and Esau. 6. History of Joseph. 7. Moses on Mount Sinai. 8. Joshua before Jericho. 9. David and Goliath. 10. Solomon and the Queen of Sheba.

The decision of the signory that events from the Old Testament history should be represented upon the gates on the larger spaces afforded by dividing each valve into only five panels, gave more scope for Ghiberti to indulge in his pictorial rendering of the compositions with a plastic facility that stands unrivaled. He states that he strove to imitate nature to the utmost by studying how forms strike upon the eye, and endeavored to blind the theory of pictorial and sculptural art—a fallacy offensive in practice by any hand inferior to his. But one gladly forgets all theory and rule in gazing upon the wonderful art displayed in these compositions, in which the effects of perspective and distance upon the *relievo* and details are conveyed to the eye as by a pencil drawing, and with an accuracy that almost defies criticism.

Ghiberti showed most consummate skill in the composition of the

different scenes mentioned, and told the stories with wonderful distinctness, although he who sees them the first time will experience a feeling of disappointment on account of the confusion which comes from the multitude of figures. But when they are studied attentively this first effect passes away, and the wonderful skill of their maker is revealed. They must ever remain one of the great monuments of this most interesting age of the Renaissance.

Ghiberti also made the Sarcophagus of St. Zenobius, which is in the cathedral of Florence, and is the greatest work after the gates. Other sculptures of his are in the churches of Florence and Sienna.

Ghiberti died in 1455, leaving the rich prize which now surrounds Andrea's gate to be completed by his sons and scholars.

Clustering around his great work was a school in which he taught many scholars, several of which became noted artists; for instance, Lamberti, Pollainolo, Michelozzo, and for a time Donatello.

## Flashions in Jewelry.

### A Lady's Rambles Among the Jewelers.

RECENT importations of fine French clocks for drawing-rooms and boudoirs, introduce to the public again the old styles of decoration belonging to Louis XVI.'s time. Many of these clocks are enclosed in old gold cases of exceedingly ornate design; others are of bronze with the old gold finish. Again old gold and fine *cloisonné* enamel are associated in one clock. Noteworthy fac-similes of Louis XVI.'s time are white marble clocks with dead gold decorations. The marble in these reproductions is of that yellow tinge indicative of age, and so perfect is the illusion, it is believed these modern copies will figure in many drawing-rooms as veritable heirlooms. There is certainly no reason to prevent this deception except that rare virtue termed "tender conscience." Royal Dresden clocks are also a conspicuous feature among the expensive timepieces for parlor and boudoir. Indeed, the tendency in all the fine French clocks and mantle ornaments is toward a richer and more gorgeous style or decoration. The metal clocks all show this tendency. Brass cases are more decorative in effect, and the same can truly be said of the iron clocks. These last, by the way, have failed to gain as yet much favor. Even when the design is pleasing and the workmanship most artistic, the cold sombre character of the metal is against the popularity of iron work, at least for such articles as clocks and mantel ornaments. Brass clocks remain in favor, and onyx and marble ones are never out of date—the last mentioned show specimens with perfectly plain cases, the only decorative thing about them being their enameled faces.

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THE miniature "grandfather" clocks have proven quite popular in and about New York. These imitate in toy sizes the old hall clocks, and are many of them decidedly ornamental with their mahogany and rosewood cases.

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ENGLISH clockmakers for many years claimed and gained the reputation of producing the most accurate of timepieces, and especially did they lay claim to the perfection of their astronomical clocks. Latterly, however, American manufacturers have been able to compete with imported clocks, even the complicated ones, and not a few of the rich New Yorkers who did not inherit a tall time-piece to stand in their hallway, are patrons of these American clocks. There are on exhibition and for sale to-day, modern clocks of

American manufacture which, when in operation, show the local time in hours, minutes and seconds; the difference of time at Chicago, Washington, San Francisco, London, etc., the day of the week, calendar day of the month, month of the year, the season, signs of the Zodiac, etc., etc. These complicated works are enclosed usually in cases of antique design; sometimes they are faithful reproductions of old Holland clocks dating back two hundred years or more; again, they are English in design, reproducing the Chippendale cases of a century and a half ago. It is claimed for these cases that they endure this climate better than do the imported ones.

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TIME was when watchmaking was a secret art and a timepiece represented a small fortune. Now, the names of good watchmakers is legion, and average good timekeepers are found in cheap grade watches manufactured almost entirely by machinery. A great impetus was given to American watches and clocks of low cost by the importation of nickel cases. Since 1876, according to one authority, the manufacture of watches costing from \$8 to \$12 dollars has increased a thousand fold.

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A FEW years ago a watch in a silver case was looked upon as a necessary convenience by the owner who carried it, because the gold watch was a luxury beyond his reach. To-day there are silver watches that rival gold ones, not only as regards expense, but as works of art. Notable among these are the silver cases upon which appear beautiful etchings. There are also some wonderful specimens of enamel on silver cases.

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AMONG the cheaper grades of imported watches, are nickel and silver ones covered with French enamel and studded with semi-precious gems. The coloring obtained in some of these is very harmonious and pleasing.

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THERE remains no question as regards the desirability of fine enameled jewelry. This enamel appears on both gold and silver, often in association with colored gems. Flowers and insects are popular subjects; among the former figure conspicuously the common field daisy and double English forget-me-not. A beautiful illustration seen of fine enamel was a hair pin on which appeared a puff-ball set on a quivering stem and glittering with small diamonds. Enamel also appears on tortoise shell, and is used with admirable effect on ornamental pins of tortoise for the hair. A unique design confined to scarf and ribbon pins is that of a rooster's head, enameled in rich bright colors to simulate the natural hues of comb and feathers. Many of the finer specimens of enamel are, of course, the Limoges, but there are also excellent enamels produced at home. Some very beautiful effects are produced by translucent enamel in various colors, laid in thin coatings over the design incised in the metal.

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THERE is a class of watches, however, which comparatively few watchmakers can produce, and for the possession of which the purchaser must pay a price far exceeding the value indicated in the

case. These are known as complicated watches—watches which note the fractions of seconds, which strike not only the hour, but minutes of the day, and which furnish a perpetual calendar. When one watch embraces the chronographic and repeating attachment with a perpetual calendar, it is needless to explain that their works deserve the name of "complicated," and are worthy of the high prices asked for the same.

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THERE are complicated watches for ladies now, but these are rather exceptional. As a rule, a lady is content with an accurate noting of the hours and minutes of the day. There are no changes to report as regards the fashion in cases for ladies' watches. The plain case of small size, with monograms or initials etched or engraved thereon, still represents the watch that sells best. Of course, there are always jeweled and enameled watches for dress occasions. One seen the other day was enclosed in a gold case entirely covered with small diamonds of uniform size.

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THE desire for color in both gold and silver jewelry is not confined alone to enameling. Much of the beauty of the decoration is owing to processes of metal amalgams and applied work. The continued and increased use of colored stones is to meet this requirement for color. Never in the history of jewelry in this country have colored stones—both gems and semi-precious stones—been in greater request than now. Every nine pieces out of ten in fine gold jewelry, colored stones appear. Many of these are very small, it is true, but the setting is usually so artistic and the finish so harmonious, that even the tiniest of gems proves a pleasing addition. Semi-precious stones incrusting in silver, where a rough surface has been treated with acids to gain dark and bright effects, add often to the effectiveness of the design. Coming back to gold jewelry and precious gems, may be cited instances where the color is entirely due to the gems. A beautiful illustration is a pin in form of a common garden pink, composed of rubies of the desired hue so set as to show no gold. Scarf and bonnet pins there are, which, when inserted in scarf or ribbon, leave to view only a single gem.

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IN SEAL rings, for which there is a fair demand again, are employed sapphires, sardonyx and other stones suited to the purpose. The wearer has the choice of an engraved or intaglio signet ring, as fashion favors both. Sardonyx, like onyx, owing to the different layers of the stone, afford good contrast for the display of the engraving. The better stones among sards take on a most beautiful polish, and are especially adapted for seals, as they "deliver" easily from the heated wax without destroying the impression. This quality is remarked by Pliny, who extolls the sard above the sapphire for seals. Entirely new in seal rings, but likely to find favor with an exclusive trade only, are solid gold rings with seal shaped top into which the crest is cut.

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THE fashion is again in vogue for fancy rings; rings of unique design and showing small gems. These rings, it need hardly to be explained, are valued because of their peculiar designs and fine workmanship, rather than any great importance of the gems. Many of the designs are similar to those seen on scarf and ribbon pins. A wishbone of gold finished with tiny diamonds on either end, a

crescent of small brilliants, a lady-bug with a gem for a body, are a few of the many patterns that appear on these rings.

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FOR children's rings, the turquoise is the favorite; it comes nearer to the shade of blue termed "baby blue" than any other stone. Blue enamel is also a popular decoration for children's jewelry, and consequently appears on pins, rings, ear rings and lockets. A new design in ear rings just out consists of a little forget-me-not enamelled on gold, and having a tiny diamond in the center. Finger rings show the same floral pattern.

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THE turquoise, notwithstanding its comparatively small cost, is always more or less fashionable, and often associated with valuable gems when its peculiar blue color is desired. The Persian turquoise represents the finest blue stones of commerce, and consequently the most valuable ones. It is subject to change of color, although in nothing like the proportion of other and inferior varieties. If not brought into contact with acids or scents it retains its hue for many years, turning at last to a green or white. Inferior varieties of turquoise will often turn on the lapidary's wheel from a fine blue to a sickly green or whitish tint; other specimens retain their color for some weeks, breaking out afterwards in white specks which gradually overspread the entire surface, while others, again, begin to whiten or become green first around the edge. Some specimens regain their color by being soaked in water or weak uric acid, but lose it as the stone becomes dry. In some cases the inferior stones retain their color for years, but, as a rule, it is wise to pay a good price only for the best varieties. The inferior stones may be distinguished from the real turquoise by the stratum (in most cases apparent at the back), being of a pale yellowish-red color instead of dark brown. The fossil turquoise, or odontolite, is, as the name suggests, fossilized bones colored by phosphate of iron. This resembles the real stone closely enough to deceive many persons. The color is fine, but of an inky blue which is never seen on a Persian turquoise.

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THE Queen chain has not only succeeded in gaining its own popularity, but it has increased the demand for unique charms, which are often worn in place of the ball or cube that originally finished the chain. A charm just introduced by a leading manufacturer of fine gold jewelry, and which bids fair to out-rival the compass charm in form, is the thermometer charm, a tiny affair encased in a chased gold frame that does its work as accurately as the average thermometer. Miniature watch seals are another popular charm for the Queen chain. Of course the little gold vinaigrettes are always desirable.

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LEADING manufacturers of gold pens and pencils are kept busy supplying the trade with new designs in pencils and glove and shoe buttoners. Many of the new designs are fanciful, especially when small in size and intended to be worn on a chain. They are often, furthermore, veritable surprises, being taken for a charm merely, until a pencil-point, a button hook, a whistle, or a cigar cutter unexpectedly appears. Such is a tiny pistol which, on being cocked, shoots out a pencil. Among odd designs recalled are a champagne bottle, a fish, a lantern, a mortar and pestle, an hour glass, a cat, a dog, etc. Again the conveniences mentioned come in slide form and depend on the decoration of their cases for ornament. Probably

the best selling articles known to the retail trade in this line are the slide glove and shoe buttoners and pencils. These, when closed, occupy but little space, and are, or ought to be, carried about by every man, woman and child. All these articles come in solid gold and silver; they are also manufactured in gold plate. When purchased of trustworthy manufacturers they last always.

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IN THIS connection it may be well to mention the fact that ladies on shopping expeditions, when they do not carry a slide pencil in their portmonnie, wear one attached to a chain either fastened to the button hole of the dress or glove, in which latter case, the pencil when not in use is slipped inside the glove next to the palm of the hand.

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FOR gentlemen, in addition to new patterns in buttoners and pencils, are any number of novelties in match boxes, cigar cutters, cigarette holders and tooth picks, in gold, sterling silver and fine rolled gold plate. These come in a wide range of prices, according to the material and style of decoration. The chased finish is an attractive one and just now very fashionable. Ladies who are always in quest of presents for gentlemen, are assured that any of the above articles will prove welcome, combining, as these all do when made by trustworthy manufacturers, utility and beauty. As much time, labor and expense is bestowed on the decoration and designs of these little conveniences, nowadays, as is given to the ornamentation of fine jewelry.

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THERE is a disposition on the part of many persons to give the name bracelet only to the ponderous gold bands so fashionable some twenty years ago, and to class the present styles of ornaments for the arm under the term bangle. This confusion of terms has resulted in conflicting statements as to the present popularity of bracelets. Now, the word bracelet, properly speaking, has two definitions: 1. An ornament for the wrist; 2. A piece of defensive armor for the arm. The goldsmiths of the nineteenth century have had to do only with bracelets as ornaments, though it must be confessed some of their productions were large and cumbersome enough to suggest articles of defense rather than of personal decoration. Not a few of the old time bracelets were exact copies of bands and armllets worn by Greek and Roman men and women. Goldsmiths are indebted to the Greeks for the idea, even, of giving to spiral bracelets the form of a snake, which form still exists. But as time grows apace, the workers in precious metals have come farther and farther away from the heavy, homely types suggestive of endurance and a certain value expressed in avoirdupois, until now, it is safe to say, that a personal ornament devoid of artistic merit and fine workmanship goes begging for patronage among progressive jewelers and refined men or women. In a word, the manacles and ponderous armllets worn a few years ago are a thing of the past, happily, too dead for any hope of resurrection. The bracelet of to-day, therefore, is as unlike the bracelet of twenty years ago as the lace pin is unlike that breast plate once termed "breast-pin" and "brooch." The bracelet of 1885 is entitled to the definition of ornament in its fullest sense. It is exceedingly light in weight, artistic in form, and highly decorative in finish. It is not valued for the amount of gold it contains—that is a minor consideration—but for the originality of its pattern and the excellence of its workmanship. All ornaments for the wrist then, be it understood, are bracelets, though all bracelets are not bangles. It

need hardly be added, that the bracelets of to-day, both in gold and silver, are exceedingly popular.

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A BANGLE bracelet in silver, worthy of mention because of the originality of its design, consists of a light chain from which are hung four pendants representing in form the four quarters of the moon. Each of these pendants are double faced, showing on one side a humorous expression and on the reverse a lugubrious one. Antique coins are still employed with pleasing effect on gold and silver bracelets. An attractive pattern consists of a chain terminating with a coin in place of a ball or cube. In stiff bracelets, the very narrow gold band, with stones set high so as to show little or no gold, is the preferred sort. A very popular bracelet is one with gold or silver links in cushion shape, with chased surface, each link having a colored gem set in the center. Chain bracelets with a gem appearing now and then in among the links represents another favorite. Retail dealers, by the way, are anxious to see the elastic reversible gold bracelets described in last month's issue of THE CIRCULAR, and designed for the fall and winter trade.

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IN sterling silverware, many old English styles are reproduced in odd pieces. Some of these are sure to meet with favor; such, for instance, as the little sugar baskets, made of silver wire and designed for lump sugar with after-dinner coffee, or a five o'clock tea. These baskets are fashioned after the open work willow baskets, are small in size and oblong in form. Some of the new sugar lifters introduced for the berry season, are also reproductions of old English designs.

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DECORATIVE lamps continue to shed a subdued light in the drawing rooms and vestibules of fashionable people. Lamps much prized by the more exclusive Gothamites are cameo ones, for these, being tediously wrought by hand, are too expensive to become common, and they cannot be imitated. The lamps perched high on decorative standards are used in parlors, one being placed on either side of folding doors, or at the entrance; occasionally these are placed in halls, and again they are used in dining rooms. For fastidious folk, who object to kerosene oil, are imported French lamps arranged for burning rape seed oil. It may be well to add that manufacturers and dealers generally give preference to the duplex burner for fine lamps.

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THE employment of decorative lamps in nowise conflicts with the popularity of candelabra and candle sticks. There is room for all in the modern house, provided the lamps are decorative and the candelabra and candle sticks of antique pattern.

ELSIE BEE.

### How to Make and Engrave Silver Bangles.

BY EXPERT.

THE process of etching (to continue my article in April number) is merely to protect certain portions of the plate and leave bare the parts to be acted upon. To produce the "bunny" shown in the April number, we carefully scratch through the coating of etching wax with our etching needle, working and managing the

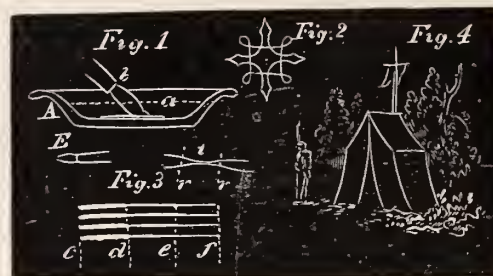
lines precisely as we would if we were making a pen and ink drawing, forcibly drawing the outline of the rabbit, and if the pupil is confident of his ability to preserve the roundness of the form, let the furry appearance be given in the etching, if not, content yourself with the outline and a few vigorous touches as shown. Also etch or trace with your needle a portion of the foreground and weeds, leaving the greater part of the high weeds to be bright cut. If the idea is properly caught, the manner of disposing of the dull lines of the etching, in contrast to the brilliant bright cut lines, will readily suggest themselves to the reader. The etching, or "biting in," as it is termed, is best done with nitric acid, diluted with three or four times the amount of water. The piece to be etched should be protected all over either with etching wax or shellac varnish (shellac dissolved in alcohol). The article or plate to be etched is best sunk in the dilute nitric acid, where it should be brushed (as it lies immersed in the acid) with a camel's hair pencil to remove gas bubbles. A little practice will enable one to judge of the time required, as acids vary so much in strength that no rule can be given. The etching can be carried to different degrees of depth and width, by the time to which it is subjected to the action of the acid, as for instance, the same line can be bitten in with acid so as to be so fine and delicate as to be almost imperceptible, but if the acid action is continued it will bite deeper and deeper until a full, heavy strong line is obtained. Gold can also be etched by using nitro-muriatic acid (2 parts muriatic, 1 part nitric), diluted in about the same proportions. In our rabbit dime we can vary the effect by matting some portions and leaving others bright—say, cut out the general form of "bunny" in paper, and cement the paper on the dime, so as to leave the rabbit exposed to the action of the frosting machine or revolving scratch brush. This will give a contrast to the polished surface of the rest of the dime. After the etching is complete, and before the bright cutting is done, the plate (or dime) should be cleansed of the etching wax, by washing with spirits of turpentine, and then with soap and water, when it should be dried in boxwood sawdust. After the etching wax is entirely cleaned off, the etching lines should be rubbed with a fine wire scratch brush to remove any black oxide of silver remaining in them. Such etch effects can be made in figures of men or animals, but more particularly landscape scenes. When in the hands of a skillful designer, a witching little rural scene, no bigger than one's finger nail, can be lined in, in a comparatively short time.

The writer has continued this series of articles much longer than he intended when he started under the title; but he has sought to make them the medium through which he could convey many useful ideas on engraving, not only for mere bangles, but for more pretentious works of the engravers' art. He (the writer) would beg to say this will be last of this series, but he will at their close commence a series on free hand and mechanical drawing, illustrated with cuts, both in black and white lines.

Before closing the subject of etching, it is well to mention that many ornamental devices, like borders, tail-pieces for bangles, can be copied from patterns and etched in, the tracing being done by means of the pentagraph from a pattern. These figures are best of some definite or conventional form, as shown at fig. 2. This is a very simple design, but serves to show the principle. The design should be made on zinc, and three or four times the size. These pentagraph patterns admit of almost endless variety. Most of the patterns known as geometric lathe work can be produced by pentagraph patterns. The simple device at fig. 2 is chosen to illustrate more than for its beauty. Such patterns are very useful, as they have the look of great care and labor, when, in reality, with a pentagraph, after the first pattern is cut, they can be done in a few seconds.

While we have the subject of etching in hand, we would say a few words to such persons as have an ambition to try something of more importance. In this day some of our finest and most effective works of art in monochrome are etchings. Etching has many

advantages over a pen for an artist to express himself. We will suppose two men of equal skill start to make the same design, one uses a pen, and the other an etching needle. The person using the pen has many disadvantages from which the etcher is free. A pen will not always make the same sized mark; and again it will not mark; and certainly we can not vary the size of the line with that certainty which we can depend upon in etching. We will continue the comparison, as it will assist in conveying the ideas or methods of etching. If we make a false or incorrect line with a pen it is very bothersome to erase—not so in etching; if we make a false line, we have a little pencil brush and moisten it in turpentine, and rub up some of our etching wax on some unimportant part of the plate, and with the brush, paint out the line, and after a short time the turpentine will dry out, when we can trace our line over with the etching needle. A very good substance to etch on is the common sheet zinc, such as is used for a thousand and one domestic purposes. Such zinc needs but very little preparation before using. Rub off one side (the best one) with fine emery paper, and finish with rotten stone and oil, and you will soon have a nice, smooth surface. The zinc plate should be well washed with soap and water, to remove the oil, when it is ready to be coated with etching wax, as described in last article, when it is ready for the etching needle. A design can be transferred by using Indian red tracing paper. It is to be remembered that the coating of etching wax is to be smoked black over a candle. Now trace our lines carefully with the needle, making the design as elaborate as we desire. One little fact in etching worth knowing is, if in tracing with the point two lines run into each other as at *t*, the part between the dotted lines *r r* should be stopped out, as described above. The biting in is done with weak nitric acid—1 part acid, 6 parts water. The plate should be covered with acid to the depth of about half an inch. At fig. 1 is shown a glass preserve dish for biting in dimes, and at *b* is shown a brush for removing gas bubbles. The



brush shown at *E* is the right size for stopping out with turpentine. Have a small bottle, like a watch oil bottle, filled with turpentine, into which you dip the pencil brush, then rub up with the brush wet with turpentine some of the etching wax on your plate, near the edge where you do not intend to make any lines, and paint over any work you wish to change. Dissolve a stick of best red sealing-wax in alcohol, or simply dissolve shellac in alcohol. This is for large stopping out purposes. Suppose you have a zinc plate, four or five inches square, you wish to etch. You paint over the edges and back with the sealing wax dissolved in alcohol, or, if you use the simple shellac dissolved in alcohol, have a small cup or dish into which you pour some dissolved shellac; to this add just enough Chinese vermilion to give it color. This is freely applied to all such parts as have no work on (lines to be etched), when it will dry in a few minutes. Of course a larger dish is necessary than shown—a plate or platter. At fig. 3 is shown the effect of biting in. We will suppose we let the acid remain on the lines for one minute, when we take out the plate and wash it well and dry it, and paint out the portion of the lines between *e* and *f*. We put in acid again, and let remain say two minutes, after which we wash, dry and stop out from *e* to *d*. Put back in the acid, and after, say five minutes, we have the depth of line from *d* to *c*. Any gradation of line almost can be secured in this way. Wash off the plate with turpentine, and it is ready to be printed. Any copper or steel-plate

printer will print it for you ; and such a zinc plate will give several thousand copies. Copper is etched in the same manner. In the design at fig. 4, the back-ground is etched lightly, then stopped out in gradations, until in the foreground the biting is continued until the necessary depth is obtained.

### Mr. Glasgow's New Book\* on Clock and Watch Making.

THIS is a handy little book of 341 pages, well printed, fairly well illustrated with outline wood cuts, and is well worth the price charged for it. It is a thoroughly English book, having much the scope, and maintaining most of the views advanced by his predecessors, Sir Edmund Beckett and Mr. F. J. Britten. In the first chapter, Mr. Glasgow, after speaking of the elegance of French designs for cheap clocks, says :—"English makers having unfortunately used no efforts to supply obvious public requirements either in the way of cheapness or elegance, suddenly wake to the fact that their trade was gone." . . . . . "The quarter clock, striking, and generally repeating the hours and quarters, is a distinctly English production, and has never been rivalled in its own peculiar province, that of a hall clock. Even in these days of low prices and keen competition, it has generally maintained its position, quality, and even price, which it commands now as much as it did fifty years ago." . . . . . "Regulators or astronomical clocks are still made here, and also exported on a small scale, and, save some cheaper attempts at the same thing imported from Austria and Germany, have no foreign rival." Evidently the "quarter strike" hall clocks of the American makers have not yet reached England, as they are sure to do ; and though American astronomers hold in high repute the names of Dent and Frodsham as makers of astronomical clocks, yet who will say that Tiede of Berlin, and Hohwü of Amsterdam, have not put their names to specimens of equally artistic horological work ? It is indeed a very open question to us on this side of the Atlantic as to whether the English horology is maintaining the high stand it has had in the past in the matter of clocks and watches. Mr. Glasgow's remarks on the decadence of the English watch trade are also interesting. He says :—"This hall marking, though in itself no trade mark, but merely a guarantee of the high quality of the metal, is found useful by foreign makers in helping them to pass off their watches as of English make. This is proof, if any were required, of the high value set upon English made watches, and of the estimation in which they are held by foreigners. And what would become of this esteem if instead of continuing to maintain our high position, we were to compete with the slop trade of Switzerland or America ? . . . . . No ! If we are to make a more marketable article in the way of watches, let us proceed in the right direction, by organizing our system of manufacture, by altering and improving the plan of our movement, not by the elimination of the fusee, but by, amongst other things, the total abolition of the full plate in favor of three quarter and half plate movements, and by imparting more intelligence and education among our workmen."

Now we are very much in doubt as to whether such changes would seriously affect the position of the English watch in the world's market. The fact of the matter is that there are only a few people who care anything about a watch either as an article of jewelry or as a theoretically perfect machine. So long as watches were chiefly worn by the wealthier and more æsthetic classes, and that was the time of the predominance of the English watch trade, and as long as the prices were high enough to justify really artistic hand work, it would do to urge a high degree of skill and formal attention to the details of watch making. But a totally different order of things has come in. The ordinary watch buyer of to-day cares nothing for the last quarter of a minute in the daily rate of his watch. He has no

regard for the escapement, fusee or any thing else which goes to make a good timepiece in the estimation of the capable horologist. All he cares for is to know the time within a minute a day or even to a less degree of accuracy, and he only looks at the "presentableness" of the case, dial and hands from a much less cultivated standpoint than the buyers of fifty years ago. He is a clerk, or a salesman, or a laborer, or a tinsmith. His watch, with the growing drive of a nineteenth century civilization, is a tool of trade which needs no accuracy, and he cares only for the price. Now here comes in the American watch factory. It produces its thousand watches a day. There are several factories competing. Their managers study their market and carefully investigate this question : "What is the largest error my watches may have and still meet the demands of a buying public ?" Satisfied on this point for the masses they make their millions of watches by factory processes, and our good friends, the English watch people, look on with surprise and say with Mr. Glasgow, "we must improve our manufacture." Now that is not what is wanted for your success, if British human nature is like ours. You must change your whole system of manufacture of cheap watches. You must adopt the interchangeable method of watch part manufacture. You must make for the demand to which you sell, and remember that your greatest opponent to success is that bitter feeling of your working people which prevents the free use among them of improved machinery and new methods. In this nineteenth century and in the United States, there is no such thing as "tradition" in the manufacture of clocks and watches. The only question asked of any device or any machine is "will it work ? Is it cheaper than the thing it supplants ?" No, my English friend, keep your fusee and your careful handwork for your beautiful watches and your marine chronometers ; but you will never found a large industry, one that shall have its hundreds of thousands of operatives, and its millions of pounds sterling invested, unless you see your present mistake of policy and manufacture your cheap watches and clocks in the same way that the so-called "slop work" of Switzerland and the United States is done.

To return to the book in hand. The manufacture of the watch is taken up at length, and those escapements which are important in modern watches are carefully elaborated. There is an absence, however, of that careful and detailed explanation in regard to the adjustments for position which one would naturally expect in an English book, and the whole treatment of the question of the balance spring makes the reader ask himself whether "Excelsior's" book on the subject is known to English writers. Mr. Glasgow's remarks on glass and palladium springs are highly interesting, but he ought to point out perhaps that Paillard's palladium springs are not pure palladium, but are an alloy.

The chapters on the "Compensation Balance" are perhaps the most valuable in the book. Americans perhaps would have liked to see a reference to the Van Woerd balance, if no other than an historical one ; and the balance now used by Mr. Heinrich is certainly giving good results in the watches sent to the observatory trials in the United States. Kullberg's beautiful flat rim balance is described at length. On the question of watch and clock oils, Mr. Glasgow has nothing to say ; and yet I think this is perhaps the first point the horologist looks after in a new book. There is certainly nothing more important in a watch or clock, than the preservation of a uniform friction. It would be a valuable service if some one would carefully describe what constitutes a good clock and watch oil, and give a series of tests, not too difficult in their application, by which the user could determine for himself whether the oil he used would be satisfactory.

Something too might be said about observatory watch trials and the construction of hot and cold temperature testing boxes. The new observatory has already commenced its important work of substituting definite figures for indefinite statements as to the performance of English timepieces, and the preparation of timepieces for

\*"Watch and Clock Making." By David Glasgow, Vice-President of the British Horological Institute. With 69 diagrams. Cassell & Company, Limited. London, Paris, New York and Melbourne. 1885. \$2.00.

such trials will henceforth be the pride of those who aspire to do the best work in their art.

Forty pages are given to pendulums for clocks and clock escapements. This is good, as far as it goes. But will the time not come when it is clearly recognized that to compensate a *pendulum* is quite another problem from the compensation of a *clock*? Let any one of the advocates of the Dennison four or six legged gravity escapement, for instance, oil the jewels on which the escape arms rest before unlocking by the pendulum. Try the experiment of running a clock so, and then with the same surfaces perfectly dry, and note the effect. The clock's rate will be changed anywhere from one to four seconds per day, depending on the other details of the clock's construction, the kind of oil, etc. Now if this is the case in a detached escapement like the Dennison gravity, how much more is it the case in a dead beat? Now if variations in the *train* produce the variations in the clock rate, it is absurd to attempt to compensate a clock by adjusting or compensating a pendulum except in connection with its movement. Of course it may be done approximately, but a clock which is to be a standard of comparison cannot be made in separate parts. Whatever the escapement, so long as the pendulum has any connection with it, the escapement and pendulum must go together.

There is also no doubt that for some reasons unknown, the best clocks so far built have all had the mercurial compensation. Zinc does not seem to return to its place with the certainty necessary. Then too the effect of the suspension spring is imperfectly understood. There is no doubt that the variation in the elasticity of this spring, owing to changes in temperature, exercises an important influence on the arc of vibration, and consequently on the rate of fine clocks. It is true, as Mr. Glasgow points out, that the pendulum suspension spring does not store up the power of the impulse as the watch balance spring does, and therefore variations in its elasticity have no such large effects in the pendulum's vibration; but it is also true that the molecular friction of the spring is very seriously affected by temperature and that this change in the spring must be compensated for by the construction of the pendulum.

As to the clock weight in the case there is no doubt but that it ought to be kept in an entirely separate compartment from the pendulum, with no connection between the two, so that air currents cannot affect the pendulum by having less space in which to flow when the clock weight is low in the case. A glass jar, too, for mercurial pendulums, while admirable as far as its co-efficient of expansion is concerned, cannot be accurately enough worked to make clocks of the best class.

Mr. Glasgow's book closes with a chapter on "house clocks," "electric clocks," and chimes of bells.

L. W.

### The Jewelers' Security Alliance.

President, DAVID C. DODD, JR.

First Vice-President, AUGUSTUS K. SLOAN.....Of Carter, Sloan & Co.

Second Vice-President, HENRY HAYES.....Of Wheeler, Parsons & Hayes.

Third Vice-President, DAVID UNTERMAYER.....Of Keller & Untermeyer.

Treasurer, W. C. KIMBALL.....Of H. F. Barrows & Co.

Secretary, C. C. Champenois.....Of Champenois & Co.

#### EXECUTIVE COMMITTEE.

C. G. ALFORD, Chairman.....Of C. G. Alford & Co.

J. B. BOWDEN.....Of J. B. Bowden & Co.

E. F. DORRANCE.....Of Dorrance & Brother.

J. T. SCOTT.....Of J. T. Scott & Co.

N. H. WHITE.....Of N. H. White.

CHAS. G. LEWIS.....Of Randel, Baremore & Billings.

#### EXAMINING FINANCE COMMITTEE.

JOS. STERN.....Of Stern & Stern.

GEO. W. PARKS.....With E. J. Franklin & Co.

Counsel, HON. ALGERNON S. SULLIVAN.

For further information, Application Blanks for Membership, By-Laws, etc., Address  
P. O. Box 3277- 170 Broadway, New York.

THE second annual meeting of the Jewelers' Security Alliance was held at 170 Broadway, on the afternoon of May 5th, 1885. The meeting was called to order by the President, David C. Dodd,

Jr., who announced the order of business. The minutes of the preceding annual meeting were read and approved. The report of the Treasurer for the year ending April 30th, 1885, was read and general satisfaction expressed at the constant increase in the General Fund. The report of the Committee appointed to audit the accounts of the Treasurer, was also rendered and approved. The report of the Executive Committee was read by the Chairman as follows:

#### REPORT OF THE EXECUTIVE COMMITTEE.

New York, May 5th, 1885.

Since making our report a year ago, while there has been a general depression in business, affecting the jewelers, in like manner with other branches of the trade, we are pleased to report an increased membership and a stronger financial condition. We have now 460 members, and the revival of business looked for in the early fall, will doubtless induce many dealers who have intended becoming members ere this, to forward their applications.

While a large number of the trade have never been disturbed by the professional burglar, continued immunity from their depredations is by no means a certainty. The existence of the Security Alliance and its facilities for effective work, is well known to the desperate men who prey upon the hard-working jewelers. Although safe burglaries are of frequent occurrence, the *Certificate* of the *Jewelers' Security Alliance* warns the thief to look elsewhere if he would avoid the probability of swift arrest and punishment. In our report last year, we called attention to the tools used in the Ellenville robbery. It is within the knowledge of your Committee that similar implements, remarkable for their ingenuity, and of wonderful power in the hands of the scientific burglar, are in existence. That they will be used upon the safe of some jewelers during the coming year is not at all improbable; that they will be used upon the safe of any member of the Alliance we consider *very improbable*.

While by our *Constitution* we can only engage to protect the safes of our members outside of business hours, several matters have occurred during the past year, whereby we have been enabled to render valuable assistance to our members and to the trade.

Concerning these cases we are not at liberty to speak at this time.

It is with pleasure, however, that we congratulate the trade upon the arrest of Frank Landers, one of the most successful swindlers who has ever practiced his arts upon the jewelry trade. This sleek and cunning knave "gathered in" nearly \$100,000 from the trade in San Francisco, New Orleans, Philadelphia, Louisville, Cincinnati, St. Paul and other large cities. Some of his exploits were known to us through the press in different parts of the country; but Messrs Myers & Finch, of St. Paul, Minn., were the first to take any practical steps towards securing his arrest. We were enabled to render them some assistance, but to their untiring energy and to the skill of the Pinkertons, the trade are deeply indebted for the capture of this dangerous villain, who is now likely to spend many years in the State Prison of Minn.

We are also pleased to bear testimony to the valuable counsel and effective work rendered us by the Pinkerton National Detective Agency, since our organization.

The detail work necessary to the interests of the Alliance has been attended to with regularity throughout the year; your Committee having held 16 regular and special meetings.

May 15th, 1884, Mr. H. W. Hiller resigned his position as secretary, and May 24th, Mr. C. C. Champenois was elected in his place. January 8th, 1885, Mr. C. B. Bishop, having removed to Philadelphia, resigned from the Executive Committee, and Mr. N. H. White was elected in his place.

Our expenses are now reduced to a minimum, the only person receiving any compensation for services, being our Assistant Secretary, a lady, who has charge of our office, which is always open, and to which we cordially invite our members, and the trade who may be desirous of information regarding the Alliance.

Once more we invite your co-operation in enlisting new members for this organization, instituted in the interests of the entire trade.



Thoroughly mutual in its plans, we furnish you the best security attainable, at the minimum cost.

With the protection we offer *so ample*, with the amount of money necessary to secure this protection *so small, who* among the trade can afford to be without a certificate in the Jewelers' Security Alliance.

Respectfully submitted,

C. G. ALFORD, *Chairman.*

An amendment to Art. IV of the Constitution was submitted by Mr. A. K. Sloan, previous notice having been given the Ex. Com. as required—making the Secretary one of the Executive Officers of the Alliance, and adding two (2) Vice-Presidents. The Article to read as follows:

"The officers of this Alliance shall consist of a President, Three Vice-President, Secretary and Treasurer, and an Executive Committee of six, and the President, Vice-Presidents, Secretary and Treasurer shall be members *ex-officio* of the Executive Committee."

This amendment was unanimously carried.

And an amendment was proposed to Art. I of the By-Laws, making the Vice-Presidents, in their consecutive order, preside and perform all other duties of the President, in his absence.

The Article to read:

"It shall be the duty of the President to preside at all meetings of the Alliance, and in his absence, the Vice-Presidents, in their consecutive order, shall preside and perform all other duties of the President."

This also was carried.

Mr. Dodd then announced that the election of officers was next in order, and called on Mr. C. G. Alford to act as Chairman.

Nominations for President being called for, the name of Mr. David C. Dodd, Jr., was proposed, and he was unanimously re-elected to that office. The Chair appointed a Committee of two, Messrs. White and Bowden, to escort Mr. Dodd to the Chair. Mr. Dodd then thanked the Committee and in his address to the members spoke as follows:

#### PRESIDENT'S ADDRESS.

I thank you gentlemen, for the honor conferred in re-electing me as your President. At this, our second annual meeting, it is a matter for congratulation that the Alliance has so ably fulfilled the purpose for which it was intended, and its members may well feel protected when they consider that since our organization, two years ago, no safe, protected by an Alliance Certificate, has been touched by burglars. To the care and interest manifested by your Executive Committee and Officers this result is largely due, who, receiving no compensation whatever for services, have personally aided the institution, by spreading a knowledge of its object and the advantages to be attained by membership, among their customers and the trade in general. If individual members would interest themselves in like manner, our membership would doubtless double itself within a short time.

This organization is of especial interest to the country dealers. All merchants doing business in the larger cities avail themselves of every possible means of protection for their stock, even at a comparatively large expenditure for the result attained. How much more, then, must protection be needed in the country towns and among smaller dealers, and how invaluable to the trade an organization that offers almost absolute protection at a very small cost. The Alliance is no longer an experiment; it has fully proved its importance and great protection to its members, by the fact that, although safe burglaries are of constant occurrence, the members of the Jewelers' Security Alliance are left unmolested by the professional, who is too familiar with our Alliance Certificate, and what it implies, to risk certain capture when safes unprotected are as easy of access. As loss to the retail dealer by burglary affects also the manufacturer and jobber, so protection against the same insures his creditors from loss as well as himself.

Again thanking you, gentlemen, for the continued confidence placed in me, I hope we will meet next year, with double, yes, four-

fold our present membership, and able to look back at our year's work with great satisfaction.

Mr. A. K. Sloan was elected First Vice-President, and Messrs. Henry Hayes and David Untermeyer respectively Second and Third Vice-Presidents. Mr. W. C. Kimball was elected Treasurer, and Mr. C. C. Champenois, Secretary.

As members of the Executive Committee, Messrs C. G. Alford, N. H. White and Chas. G. Lewis, were elected for a term of two (2) years, and Mr. J. T. Scott was elected to fill the vacancy in the Committee caused by the election of Mr. Untermeyer to the Third Vice-Presidency.

Messrs. Jos. Stern and Geo. W. Parks were appointed as Examining Finance Committee for the year.

A vote of thanks was tendered Mr. C. G. Alford for his services rendered as Chairman of the Executive Committee during the past year.

A vote of thanks was also tendered the Trade Journals, for their kindly interest and notices of the Alliance during the year.

On motion, the meeting adjourned.

## Proceedings of the Horological Club.

### A DISTINGUISHED BODY OF WATCH AND CLOCK MAKERS.

*One hundred and thirty-first discussion.—Communicated by the Secretary.*

[NOTICE.—Correspondents should write all letters intended for the Club separate from any other business matters, and headed "Secretary of the Horological Club." Direct the envelope to The Jewelers' Circular Publishing Company, Seth W. Hale, President. Write only on one side of the paper, state the points briefly, mail as early as possible, as it must be received here not later than the eighth day of the month, in order to be discussed and reported in the CIRCULAR for the next month.

#### TRANSPARENT CEMENT.

*Secretary of Horological Club:*

In the May number of THE JEWELERS' CIRCULAR was a receipt for transparent cement, (page 125). The druggist says the receipt is not right. Please answer through THE JEWELERS' CIRCULAR.

Will you please inform me of a way for tempering small springs with oil? E. J. W.

Mr. Clerkenwell, on looking up the recipe, said that the quantity of rubber was excessive for the amount of solvent. A small piece will swell up to fifty times its original size while dissolving. The quantities should probably read: 60 grams chloroform; 75 grains rubber; 15 grains mastic. Either the translator or the compositor may have caused the mistake, by putting grams instead of grains. The rubber must not be vulcanized, but the pure gum caoutchouc, and plenty of time must be given it to dissolve.

Small springs (after being properly hardened,) are sometimes tempered by boiling in oil, sometimes by putting them in an iron spoon, covered with oil, heating the spoon till the oil takes fire, and letting it burn off. This is sometimes done two or three times. The treatment differs with the kind of springs, the temper wanted, etc., and only experience and judgment can insure success.

#### ESSAY ON THE GOING BARREL.—EXCELSIOR'S BOOK.

*Secretary of Horological Club:*

Would you kindly let me know if the essay on "The Going Barrel," by I. Herman, to which I saw reference in the last issue of THE JEWELERS' CIRCULAR, is to be obtained in pamphlet form, or will it be printed in THE CIRCULAR?

Also are you the publisher of a book or treatise (bearing on watch-making) called Excelsior? I. D. P.

Mr. Isochronal said, after looking over a file of THE CIRCULARS, that he saw no reference to any essay on "The Going Barrel," by I. Herman in the last number, nor in any number issued this year. In the March CIRCULAR, page 56, was mentioned a prize essay on "The

Adjustment of a Four-Jewel Cylinder Watch," by Hermann Hermann, but that has already been published in THE CIRCULAR, in Volume XV. Our friend should be more specific in his reference.

As to the other question, there is a book on watch repairing, by a first-class practical workman, who assumed the *nom de plume* of "Excelsior," and under that name became known throughout the trade, both here and abroad. The book treats specially on the fine adjustments of watches and chronometers and is a standard authority on these points. It is for sale at THE CIRCULAR office, price \$3.50, and is a work which should be in the hands of every watchmaker.

BACK NUMBERS OF "THE CIRCULAR."

Mr. Secretary stated that Mr. J. H. Bell, of Tarborough, Edgecombe Co., N. C., had several volumes of THE CIRCULAR, containing all of Excelsior's articles, which he would sell. Mr. W. P. Kerr, of Tonawanda, N. Y., has about twenty numbers, dating from 1877 to 1881, most of which contain Excelsior's "Practical Hints on Watch Repairing." Neither one states his price, and those wishing to purchase can negotiate directly with the parties at the addresses given.

LOOSE JEWEL MOVING IN A DIRECTION CONTRARY TO THAT OF THE PIVOT.

Secretary of Horological Club:

I here give you my explanation of the rolling jewel which is being discussed by the Club: My theory is that the wheel in all such cases is probably considerably out of balance. It would be difficult to find a wheel that is not more or less out. The consequence of this would be that when it is running at a high velocity, the pivot would slide round and round in its hole, bearing on each part of the circumference of the hole successively in the same direction that the wheel turns. Now to see what the effect of this would be on the jewel, take a wheel which has no pinion and lay it down on the bench inside of a ring just a little larger than the wheel. The wheel will represent the jewel and the ring its setting. Then insert the point of a pencil or some instrument that will enter the hole of the wheel loosely and slide it round and round in the hole as if turning a crank, or the same as a pivot would slide in its hole if the wheel were out of balance. The wheel will then turn, or roll around in the ring, but the opposite way to the motion of the hand.

Theoretically the jewel should turn for each revolution of the wheel just the difference between its outside circumference and the inside circumference of the setting. Practically it would turn somewhat slower than that, owing to friction in the setting, and to a more or less jumping motion of the pivot, which would prevent a perfect rolling of the jewel in its setting. The jumping would be controlled largely by the weight of the wheel and the amount it is out of balance. There would be in any case, as is found in practice, only a slow turning of the jewel, even with a rapid motion of the wheel.

W. G. B.

Mr. McFuzee thought that this explanation seemed about as plausible as any yet offered, especially in light machinery like watches, and with the arbors vertical. But it could hardly explain the action in the case of large machinery, where the axles are horizontal, and the heavy wheels keep the journals at the bottom of their boxes or thimbles. It has been stated that these thimbles also move in the same way as the watch jewels. In those cases some other explanation is required, and probably the true cause, whatever that may prove to be, will explain the phenomenon in all the places where it occurs. Let us hear from all of our philosophical friends who think they can account for this action, and out of the many possible causes we may finally select the real one. A good way to test the explanation of Mr. B. would be to poise the wheel, and then run it with the arbor in the horizontal position, to see if the jewel still acted as it did before poisoning the wheel.

Mr. Windbag thought he could explain the thing, but the Chairman stated that the honorable gentleman had already offered one explanation, and the constitutions and by laws prohibited any change of base *in transitu*. Mr. Windbag looked bewildered and sat down, but declared that he would hire a hall and explain the thing anyhow, in spite of the "transitu."

PRECIPITATION OF GOLD.

Secretary of Horological Club:

Can gold be precipitated from solution, supposing it to contain

gold, silver, copper and iron, without first removing the other metals, as described in THE CIRCULAR, Vol. XIV, February No., 1883? If so, you will confer a favor by giving process in June No.

Yours, etc.,

T. TERRY.

It cannot be done.

## Communications.

SACRIFICING QUALITY TO PRICE.

To the Editor of the Jewelers' Circular:

I note your article in last number under the title of "Sacrificing Quality to Price," which refers to gold jewelry, and now wish to lay before your readers *facts* which seem to me to be fully as disastrous to the best interests of the jewelry trade as these mentioned in your article.

Some years ago the silver-smiths very generally adopted the "Sterling Standard,"  $\frac{925}{1000}$  fine, in place of *Coin* which was always supposed to be  $\frac{900}{1000}$  but which in reality was often fully 100 points below the proper quality.

I have no desire to question the trustworthiness of any one of our leading makers, who invariably stamp their wares not only with the word "Sterling" but with their own trade mark in addition thereto, thus enabling any dealer to at once place the responsibility for quality where it rightfully belongs.

I will class the goods now being offered in the market under three heads:—

*First.* Those makers whose wares are stamped and whose trade mark is an almost sure guarantee for the quality being fully up to the standard. And regarding these I would say that the result of frequent assays proves the goods of such makers to be very reliable, almost invariably coming up to  $\frac{925}{1000}$  or a fraction over.

*Second.* Makers whose knowledge or facilities are such that the qualities of their wares must be largely a question of chance or guess-work, and several assays of this class show considerable irregularity, but nearly always come up within 25 or 30 points of sterling, thus,  $\frac{905}{1000}$ ,  $\frac{897}{1000}$  (where there should be  $\frac{925}{1000}$ ), but in these cases I attribute this not to intentional dishonesty so much as to want of accuracy, or possibly, lack of knowledge of how to be exact in producing metal fully up to the standard, but it is noticeable that such goods never run over the proper standard of  $\frac{925}{1000}$ .

*Third.* Those makers who intentionally make dishonest goods and market them in such a way that it is a fraud, not only upon the public, but nearly always equally so upon the dealers.

This is the class of makers to which I desire to direct the special attention of the jewelry trade.

I have before me now specimens from two different makers. One of Eastern manufacture and the other a Western production; of the former I have had two assays made on different occasions. The assay in one case proving to be  $\frac{819}{1000}$  fine (should be  $\frac{925}{1000}$ ) the other assay made from another spoon, proved to be  $\frac{814}{1000}$  fine (should be  $\frac{925}{1000}$ ) or over 100 points below the standard. The western maker is only about half as dishonest relatively as his eastern neighbor. His goods prove by assay to be  $\frac{899}{1000}$  (should be  $\frac{925}{1000}$ ).

These goods are offered in the general market, and I personally know of dealers who accept them without question, and not only sell them as the equal of honest goods, but endorse the fraud by having their own name stamped on them, thus sharing the responsibility of the maker without reaping any benefit from his stealing 15% of the bullion value of the goods sold.

If the jewelry trade would only buy of manufacturers after careful and repeated assays have been made, this practice would be stopped effectually. Any jeweler who will take the trouble, can have these assays made at a nominal cost by sending to the U. S. Mint at Philadelphia or to any reliable assayer.

Any goods made bearing only the words "sterling" and without

the makers trade mark, are open to suspicion and should be so regarded by jewelers wherever and whenever offered.

The next article on this subject will treat of a quality of silver ware, made for and sold by certain houses in the jobbing trade.

Yours respectfully,

EDWARD HOLBROOK.

### The Adjustment of a Four-Jewel Cylinder Watch.

[By G. VOGET, in *Allg. Journal d. Uhrmacherkunst.*]

*Continued from page 102.*

IN THE course of our work heretofore we sought to reduce the different frictions to a minimum, so as to carry to the escapement a power as free from inequality as possible.

In order to obtain a uniform action, it is necessary to examine the different parts of the escapement with the greatest possible care.

To ascertain whether the scape wheel and cylinder stand in correct proportions to each other, it is first necessary to see that the cylinder stand upright to the plate; it is indispensable for obtaining a good rate, that the cylinder stand upright to the plate.

If the cylinder inclines forward, that is, if the balance inclines toward the scape wheel bridge, it is easily corrected by stretching the lower cylinder bridge, called chariot. In accordance with whether the escapement stands deep or shallow, the bridge is hammered in front or behind the foot pins. Should the cylinder incline backward, it becomes necessary to drive the upper bridge further forward, a job easily done with a little care.

Attention must be paid at the same time that the cylinder stand at proper height to the escape wheel, so that the tooth pillars may enter undisturbed into the small notch of the cylinder. The tooth pillar must halve the space of the small notch. But when the breadth of this notch exceeds the threefold thickness of the pillar, the cylinder must be left to stand a little deeper.

If the cylinder notch is too small, it is to be widened with the ruby file, by so much as is required for the necessary action of the wheel. Should the wheel bottom be unnecessarily thick, it is to be ground thinner from below; this is also to be done with the tooth pillars if in this condition.

The cylinder can with facility be displaced, by giving it either above or below a little shake, according to the necessary displacement, and diminishing the shake at the other end correspondingly. If the cylinder stands too high, and the lower pivot is full long, ends are quickest obtained by shortening this pivot. If, however, the cylinder stands much too high, so that the small tube of the cylinder hinders the tooth pillars from entering notch, or that they rub upon the surface of the plug, the lower pivot is to be turned again and shortened.

But if the cylinder stands too deep and the tooth pillars strike on the edge of the exit lip, the plug must be replaced by a new one, the arbor of which is longer.

If the space which separates the cap jewel from the jewel hole is fully large, it is often possible to correct the defect by diminishing this space. In general, this space between the cap jewel and jewel hole must be small, so that the oil will adhere well to the pivots by force of attraction and capillarity. If the quantity of oil added be too large, it will spread over the entire surface of the cap jewel, increasingly so with the width of space between the two jewels.

Should the two jewels lie full flat upon each other, either one or both are apt to burst in consequence of a little jar.

When the cylinder height has been regulated, as well as its height shake, its performance in the watch is closely observed by passing the balance from side to side, watching the locking, the lifting, the drop and the tooth shake.

The train, except the barrel, are to be mounted, when examining the escapement, the necessary power being produced by the pressure of the left index finger against the center wheel. I do not wedge the

balance with a piece of paper, because, when testing the tooth shake of the cylinder within and without, the shake of the lower cylinder pivot may cause an equivocation. Conduct the balance with the point of a pegwood, and retain it with the left thumb at those places where you wish to institute a close examination.

When observing the motion, study first the locking. An unequal locking is caused by an untrue scape wheel. If the defect is large, the scape wheel must be replaced, but if the differences in the locking are only small, it suffices to place the action a little deeper, so that all teeth have sufficient locking. The adjuster may also correct the highest teeth.

The lifting can be ascertained by the dots upon the plate. The distance of the two end points amounts to  $40^\circ$ . These  $40^\circ$  must be divided at equal parts from the center, or  $20^\circ$  on either side. So as to satisfy yourself of the correctness of this statement, lay the balance upon a graduated disc, and mark  $20^\circ$  with rouge, on each side of the dot which serves as mark for the stud. When the cylinder is mounted in the plate, you will ascertain whether the division upon the plate is correct. If not, the dots can easily be changed, and the marked places can then be again effaced from the balance.

It is not whatever necessary to institute this comparison with every adjustment; it is necessary only should the error be so palpable as to attract attention.

When closely observing the lifting, it is indispensably necessary to mark the balance with rouge at the place where the tooth leaves the rest and lifting begins.

Lifting varies much in cylinder escapements, and even in escapements of movements of the same caliber. The lifting is dependent upon the height of the lifting plane of the escape wheel and the form and breadth of the lips.

The lifting arc measures from  $24$  to  $30^\circ$  in medium sized watches; in those of smaller size it is larger by a few degrees.

If the lifting arcs described by the balance are unequal, the cause may be looked for in an untrue cylinder wheel, or else the defect is due to the unequal height of the lifting faces of the scape wheel; teeth differing in length are also apt to produce above defect.

An unequal drop and unequal shake of tooth is produced by these same causes. The method of correcting the cylinder scape wheel teeth will be described further on.

If there is more drop upon one side of the cylinder than upon the other, it is due to a cylinder either too large or too small.

If the cylinder is too large, that is, the diameter of the cylinder bore, the tooth has more drop upon the inner locking than upon the outer. A plentiful inner drop is not as injurious as one upon the outer locking, because the inner one occurs upon a shorter lever. Too small a cylinder causes too much outer drop. If, added to this, the tooth has no shake in the interior of the cylinder, it would become necessary to shorten the teeth, whereby the outer drop would be increased. A new cylinder, therefore, is necessary under all circumstances. The repairer will, in the course of his business, frequently meet with cylinders of this kind.

A cylinder may also either be too far or not sufficiently opened.

With one of correct proportions the standing part must measure  $196^\circ$ , that is, nearly the  $\frac{1}{2}$  part of the diameter. An unduly opened cylinder causes small arcs of oscillation, and diminish in size the nearer the notch approaches the center of the cylinder ( $180^\circ$ ).

If a cylinder is suspected to be too open, it may be measured with the micrometer. The greater number of works on horology contain proportion tables for the cylinder escapement. A slight deviation from the prescribed size of opening need not be noticed, because an opening smaller or larger only by a few degrees will exert no appreciable influence on the amplitude of the balance. But if the repairer desires to produce balance vibrations of large amplitude, he must, in case he have a cylinder with wide lips, replace it by another and better one.

Large amplitudes are indispensably necessary in timing, and the balance will then have power enough to conquer the accidental

resistances occasioned by the inequality of traction and other causes.

A cylinder that is closed too much, is apt to produce the so-called "setting," because the scape wheel has too much locking. Another defect would be produced by setting the escapement more shallow, in order to diminish the quantity of locking. The middle of the lifting plane of the scape tooth would then no longer pass through the center of the cylinder, whereby the outer drop would become stronger than the inner. In this case, it is well to cut the exit lip with the ruby file deeper, and then to burnish it well.

Some time ago, the author was called on to replace the cylinder in a fine cylinder watch with independent second. The jewel holes of the lower cylinder pivot and scape wheel pivot were in one bridge, they were therefore immovable to each other. I took the distance with the depthing tool, in order to observe the performance of the escapement with a new cylinder in the depthing tool provided with graduation. Before doing this, I satisfied myself that the center of the lifting face passed through the center of the jewel hole by laying the scape wheel upon the lower side of the plate, in such a manner that the upper pivot was placed in this (lower) jewel hole. In this manner the tooth comes so near to the jewel hole, that it can be ascertained almost with certainty whether the middle of the lifting plane lies in the center of the cylinder.

I had the choice between a correctly opened cylinder, with  $4^\circ$  locking, and a closed one, showing  $13^\circ$  on one side.

Since the size of the latter cylinder suited exactly, and in general possessed superior characteristics, I concluded to take it. Purposely, I did not enlarge the opening of the cylinder before I had turned it in, desiring to observe the rate with a cylinder opened gradually, with the same wheel. Without having effected an alteration at the large notch, the action, because it had a large quantity of locking, could easily be stopped; but after I had ground out the exit lip about  $15^\circ$  deeper, and had carefully shaped and polished it, the action could no longer be stopped, and also the amplitude of the balance had increased by several degrees. Since the tooth pillars butted upon the bottom of the small notch, when the banking pins struck on the banking stud, I was compelled to also grind this notch deeper, which finished the job.

We finally mention another defect, due to the incorrect proportions of the escapement parts; this is the outer and inner scant drop of the wheel. This defect becomes visible when the cylinder shell is too thick (it must measure one-eighth of the lifting face of the wheel), or else the wheel teeth are too long. It would be necessary in this case to shorten the teeth, which must, however, be done in a correct manner.

In order to avoid loss of power and to make timing easy, it is necessary to only shorten those teeth which unconditionally require it. It is easy to single out the long teeth by investigating the drop and the tooth shake in the following manner:

Slowly conduct the balance to the right, up to that point when the tooth leaves the entrance lip; then let the balance go back a little, whereby the tooth comes to stand in the cylinder with its two points. Retain the balance at this place, and examine the tooth shake, by imparting a to and fro motion with a pegwood point to the wheel. If the tooth is immovable, you may accept it as a sign that it pinches; therefore mark it with rouge. The balance is then conducted to the left, until the tooth drops from the exit lip, when it is brought back a little in the same manner. The cylinder will then stand between two teeth, between the point of one and the heel of the other. You then can recognize in the manner explained above whether the wheel is movable. If not, mark it at the appropriate cut-out.

In this manner conduct the examination around the entire wheel, and when finished take it down and inspect it carefully. So as to know where the offending teeth are to be shortened, it is to be recommended to measure each tooth with a hole gauge, and the space between the two teeth with a turning arbor. You can easily find out in this manner where the tooth is shortened to best advantage.

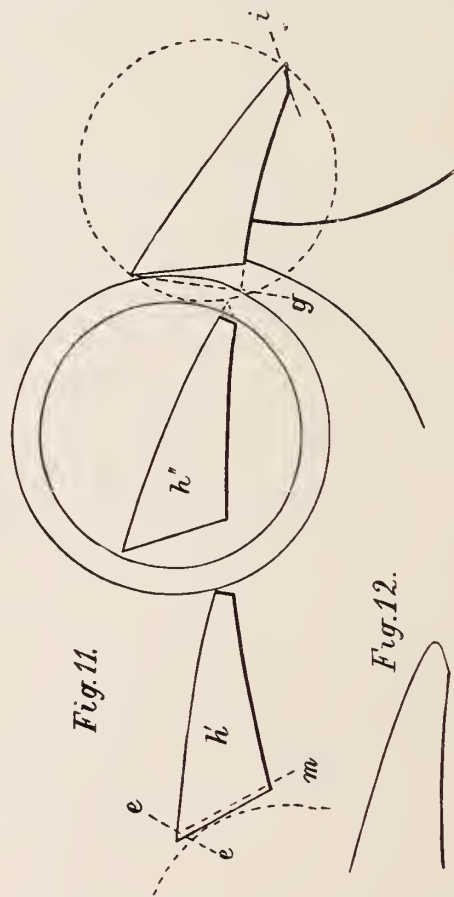
If it is to be shortened at the heel, it must not by any means be

done in the manner indicated by the line  $e e$  (fig. 11). In case that there is too high a lifting face, which would produce the so-called "setting," the tooth is to be ground in the direction of the line  $m$ . Generally speaking, it is of little effect to shorten the teeth at the heel, except in the case that the tooth has too rectangular a shape, and the heel assumes the direction of the line  $g$ . This tooth would occasion a pinching inside, when the balance has accomplished a vibration of one-third revolution. This pinching takes place outside on the cylinder immediately after leaving the entrance lip.

It is most effective and best to shorten the tooth points, wherefore it is oftenest resorted to. But in what a careless manner this work is frequently done can be seen by the raised scape wheels, whose tooth points, in the manner of tooth  $h'$  and  $h''$ , are ground entirely flat.

I cannot believe that this is done intentionally with the view of increasing the friction upon the inner locking, in order to thereby decrease the inner complementary arc.

If it is true, even, that the complementary arc occurring upon the inner locking is generally larger by a few degrees than the outer, these workmen do not think of the disturbance which takes place during the passing from the state of locking to that of lifting, and how destructive such a tooth operates upon the exit lip.



The friction, without considering the unequal length of the levers, will, with flat-ground tooth points, always vary, because it occurs alternately upon a convex and a concave surface. Tooth  $h'$  in spite of its obtuse shape, acts undisturbed upon the exterior locking, but as soon as it assumes the position of the tooth  $h''$  the friction (upon the inner locking) alters to an important degree.

If a tooth is to be shortened at the point, it must be done in the direction of the line  $z$ , and the consequent sharpness is removed by a slight rounding, as shown in the magnified tooth, fig. 12. The points are then polished, and to be certain that no burr remains, the lifting of the teeth is passed over with the burnishing steel.

For the examination of these delicate and important parts, of which almost perfect exactness is required during their action, a magnifier of greater power is to be used. With its aid, defects are often discovered that might give rise to vexations, which, with the ordinary glass, might easily be overlooked.

(To be Continued.)

### The Barometer.

THIS USEFUL instrument being of leading importance to the "weather-wise," for measuring the weight of the air, and the variations of its pressure, in order to determine the changes in the weather, the heights of mountains, etc., we insert the following valuable directions:

The changes of the weather seldom produce a variation in the height of the mercury which passes the limits of 28 and 31 inches, which is therefore a sufficient length for the graduated scale, but to use the barometer as a weather glass, several particulars must be attended to:

1. The rising of the mercury presages, in general, fair weather, and its falling, the contrary, as rain, snow, high winds, and storms.
2. In very hot weather, the falling of the mercury indicates thunder.
3. In winter, the rising presages frost; and in frosty weather, if the mercury falls three or four divisions (tenths of an inch), there certainly will follow a thaw; but in continued frost, if the mercury rises, there will be snow.

4. When foul weather happens soon after the fall of the mercury, expect but little of it; and on the other hand, till a fair weather may be expected, when it becomes quickly fair after the rising of the mercury.

5. In foul weather, when the mercury rises much and high and so continues two or three days before the foul weather has gone away, then a continuance of fair weather may be expected.

6. In fair weather, when the mercury falls much and low, and continues so for two or three days before the rain comes, then a great deal of wet and high winds may be expected.

7. The unsettled motion, or frequent rising and falling of the mercury, denotes changeable weather.

8. The words on the plates are not so strictly to be observed as the rising and falling of the mercury, for if it stand at "Much rain," and then rises to "Changeable," it presages fair weather; though not to continue so long as though the mercury had risen higher; and so, on the contrary, if the mercury stand at "Fair," then falls to "Changeable," it presages foul weather, though not so much as if it had sunk lower.

From this it appears that it is not from the point at which the mercury may stand, that we are to form a judgment of the state of the weather, but from its being in a state of rising or falling; therefore it is necessary to attend to the following directions:

1. If the mercury is in a rising state, it stands higher in the middle of the tube than at the sides.

2. If the middle is hollow, it indicates its fall.

3. If level, it is steady.

4. Before observation, gently tap the barometer near the top, as the mercury will occasionally, where the tubes are small, slightly hang to the sides of the glass, and prevent its predicting any very delicate change which may have taken place in the air.

The following explanation of the scale and vernier, and examples to show the manner of reading them, may be of use:

The scale is divided into inches and tenths, and again, by means of the vernier, subdivided into hundredths of an inch; the observations, therefore, are better made from the figures than from the words.

*Example 1.*—Suppose the mercury to stand nearly a tenth above 30, turn up the vernier till the top stands even with the surface of the mercury, and observe which of its divisions or figures exactly coincides with any one of the divisions on the barometer scale; suppose 9 on the vernier to agree with one of the lines, the height of the mercury as then shown will be 30.09 inches, that is 30 inches and 9 hundredths of an inch from the level of its surface in the cistern.

*Example 2.*—Suppose the mercury to stand a little below 30, but not a tenth below, set the top of the vernier level with the mercury, and suppose 6 on the vernier to coincide with one of the lines on the barometrical scale, the height of the mercury will then be 29.96 inches, or rather, more than  $9\frac{1}{2}$  tenths above 29 inches.

The greatest height of the mercury is observed when an easterly or northerly wind prevails. Within the tropics and near them, it does not vary more than from 1 to 3 tenths; this being the case, greater care should be taken in noticing the observations.

### Western Wiles with a Bogus Watch.

"Did you know Frank Healey?" asked Tom Rowe of an old acquaintance the other day. "He was the smartest sport that ever crossed the Missouri coming West. He used to work the auction dodge in early days, but he did it under difficulties. The game, of course, was a bogus watch, but, unfortunately for him, he had only one, and he had to take more care of it than he would have given to a \$400 Geneva. That watch was sold on an average of four times a day for a year."

"How was that?"

"Well, one of the cappers would come into the auction shop with the watch. The auction shop was a place on Blake st., with two or three boxes of cotton socks, a half gross of spoiled neckties and a dozen cotton handkerchiefs. Healey's ostensible business was to sell these, but as soon as the capper would show up he was on deck.

"Where did ye get that watch?" he'd say.

"Then the fellow would work 'the last of an ill-spent fortune' racket.

"It was given me by my father just before I left the States," he'd say, 'and it cost \$125.'

"Is it gold? Do you warrant it?"

"That's what! It's good stuff."

"Then the watch would go up, and after being bid on for a while would be knocked down to some duffer for about \$50. The fellow would pull out his buckskin bag, weigh out the dust and then start. Just on the outside he'd meet capper number two.

"What have you got there?" he'd ask.

"The sucker would show his snap.

"I don't think that's good,' capper number two would say; 'but let us take it to a jewelry store and see.' And together they'd go and find out that the watch wasn't worth 50 cents.

"Then capper number two would loom. 'See here,' he'd say, 'this is a swindle, but you can play back. Take it to the auction shop and sell it over again. There was a lot of fellows bidding on it when you left. You can get your money back, and maybe more.' So back they'd go and run through the same business. The sucker would say the watch was given him by his father, and that it cost \$150 in gold, and that he was broke and wanted to put it up.

"Do you warrant it?' Healey would ask.

"Yes,' he'd say. So up she'd go. One of the boys would bid a dollar, and another a dollar and a quarter, and they'd run it up to about two dollars. Then she'd be knocked down. If the sucker kicked they'd tell him that he had warranted the watch and would not be allowed to scandalize it by saying it was brass. He would generally see the point and skip. Healey has sold that watch five times in one day and took his ten per cent. commission on it, but, at the same time, it caused a good deal of anxiety."

"How was that?"

"Well, as I said, it was the only one in the Territory, and it had to be looked after. Suppose some fool had carried it off, what would the boys have done for another? It would have taken three months to bring one from the States and there would have been no business in all that time. They never breathed easily until the watch turned up again. It was worth a genuine one a dozen times over. I used to watch that game with a good deal of interest whenever I had any leisure time on my hands. I got pretty nearly as anxious about the watch as the fellows who lived off it. But it always managed to turn up in some way."

"What became of it at last?"

"I think they put it in the corner-stone of the first church built in Denver. They had got a gross from the outside, and didn't have to waste money buying the old one back."

## Foreign Gossip.

**ROBERT H. SABINE DEAD.**—An eminent man in the domain of the electro-technic, Robert H. Sabine, has been called off by death Oct. 25, 1884. He was the son of an English attorney and born at Dorchester in 1837. He wrote several valuable works on electricity, and his works were considered standard.

**NEW HELIOMETER FOR THE CAPETOWN OBSERVATORY.**—The British government has granted the sum of £2700 for the purchase of a new heliometer for the Capetown Observatory, and has ordered its construction by the German optical firm Repsold, of Hamburg, who are to deliver the instrument up to Dec. 31, 1886.

**LARGE LEGACY.**—A Mr. Forney has bequeathed the sum of 200,000 francs to the city of Paris, with the provisos, first, that it be expended in the purchase of a library containing books only of an industrial, technical, or technico-artistic character; and, second, that all tradesmen shall have free access to it at all times, to consult said works.

**AN INTERESTING CLOCK.**—A Frenchman, who has "done" this country, says that he discovered an interesting relic of bygone days, in the shape of a clock, in the White House. It is of alabaster, surmounted by a statuette of the muse of history, and it has ticked in the White House time out of mind, for it was a present from Bonaparte to Lafayette, who, in turn, presented it to Washington, who decreed that it should be handed down to his successors in the presidential office. And so, while the presidents come and go, the clock ticks on, and tells its tale of time to all alike impartially, and, finally, when it is about time for them to "get up and get."

**ANOTHER GREAT WATCHMAKER GONE.**—Barely were our type distributed announcing the death of the eminent German horologist Moritz Grossman, when we received the additional sad announcement that another great watchmaker, and the intimate co-laborer of the former, M. Gerich Heinrich Lindemann, for years the president of the horological school at Glashütte, Saxony, had departed this life Sunday, March 29. The deceased was, up to a few weeks before his death, engaged with heart and soul in promoting the best interests of the school. The horological school of Glashütte may well stand at the graves of their departed illustrious teachers and disconsolately ask the question, "who shall fill the vacancies?"

**WORLD'S FAIR IN PARIS IN 1889.**—The committee appointed for devising measures and consider the practicability of holding a world's fair in Paris in 1889, have resolved that it shall take place upon the Champs de Mars, with the addition of the Trocadero, the Esplanade des Invalides, and the Palais d'Industrie. The roofing of this area will, according to the calculation of the Engineer Ferrand, cost only 10 millions of francs, which, according to the characteristics of estimates means 20 millions. The different localities will be united by railroads, principally to be propelled with electricity. It stands to reason that the various details have not yet been entered into, but it is the intension to make the Exhibition of 1889 the grandest of the 19th century.

**A PERFECT WORKMAN.**—Only he who works by the promptings of the following three principles can be called a perfect workman: *First.* He endeavors to be just to his work, which he loves for its own sake, and is not satisfied with it if it should have the least appearance of looking slovenly and unworkmanlike when leaving his hands. *Second.* He endeavors to be just to his employer, to expend his whole skill and knowledge for the salary he receives, nor to waste the time for which he is paid to work, nor willfully to ruin valuable material, nor to deliver work the workmanship of which might injure the credit of the establishment, of which he is a component part. *Third.* He endeavors to be just to himself, and this can only be done by conscientiously keeping in view and discharging the preceding two maxims to the best of his ability.

**NEW DIAMOND DIGGINGS.**—When old fogies bewail the deterioration of morals of the present day, and especially the fearful increase of lying, and laud the truthfulness of the "good old days," why we feel very, very sad at our degenerate epoch, and wonder what will become of us eventually, if we keep on in wickedness. Prompted by these sad, sad feelings the other day, we took down an old volume, to read, at least, the truthful accounts of bygone days, and found the following item at first start: "An \$800 diamond was vomited up by a chub-mackerel caught near Sheffield's reef in Connecticut. The young fisherman started for home after capturing the chub, thinking of the 'fisherman's luck,' as he gazed on the solitary mackerel. This mackerel seemed to have become suddenly attacked with convulsions, and during a spasm vomited a glistening substance of the size of a small pea. The boy picked it up, and to his surprise found that it was a real diamond. Its value has been estimated at \$800." We are sorry that the item does not state whether it was cut, but we presume it was. Oh, for the degeneracy of our times.

**WHO MADE THE CLOCK?**—A few months ago, an Englishman rambled into a jeweler's store in Lampasas, Texas, when the following conversation ensued: "'Ave you got hany good hold Henglish timepieces in the nature of clocks?" asked the Englishman. "We have nothing but American-made clocks," replied the jeweler, "they are by far the best, and of superior workmanship." "Ho, no, you are mistaken, if I cawn't get me an Henglish clock, I must send hover to Hengland, and 'ave me old family piece sent hover by steamer, you know." The jeweler said "very well," and the Englishman went home and wrote for his marvelous family timepiece. In due course of time it arrived, and as the Englishman was conveying it up from the express office, he dropped into the jeweler's to exhibit it. "Aw, now," he said, with his face wreathed in smiles, "look hat this for a minute, 'ere's a timepiece which has been in our family for many a year, and has halways kept perfect time. Look hand see hif you don't consider hit superior to American clocks." The jeweler examined the exterior of the clock, and then opened it. Brushing the dust from a dinly printed label in the back, he revealed to the astonished Briton the following label: "Win. L. Gilbert Clock Co., Winsted, Conn., U. S. A., 1840." "Aw," said the Englishman, with a gloomy brow, "'ow the blawsted Yankee does spread himself."

**EXTENSIVE BURGLARY IN PARIS.**—The telegraph, some time ago, informed us of the extensive burglary committed in the jewelry store of Gabriel Levy, in Paris, and our European mail brings the following details: The two clerks of the establishment found on the morning of the 17th of February, the doors uninjured and the locks in working order, but when they opened the store, a scene of pillage presented itself. The large iron safe in which the jewelry was kept, had been broken open, and the watches, bijouterie, etc., lay strewn around the store. The broken locks of the bursted safe lay upon the table, and the latter had been forced open with a very powerful jimmy. The thieves must have spent considerable time in the store, and chose their booty very carefully, refusing everything with a mark, and their plunder therefore consists largely of gold chains and jeweled necklaces, ear rings, etc. Several of the necklaces are worth from 40,000 to 50,000 francs, and the entire burglary would amount to from 700,000 to 800,000 francs; the store was one of the richest in Paris, recently established, and contained 1,500,000 francs worth of jewelry. The store had no watchman; Mr. Gabriel Levy lived at some distance in the country, and his two clerks in the city. The owner was compelled to acknowledge another piece of carelessness: about a month ago the three store keys were lost or stolen, and were the next day found in a pile of rubbish in the cellar while nobody could explain how they came there, and beyond doubt, duplicates were made of them. The robbery must have been planned a good while ago, and the thieves were well informed of the disposition of the premises. It is presumed that some of the personals of the store assisted or connived, and that the thieves took the first train to England. No trace or clue of the perpetrators has as yet been found.

## Workshop Notes.

**MALLEABLE BRASS** is prepared as follows: 33 parts copper and 25 parts zinc are melted together, melting the copper first. When fused, the zinc, to be free from sulphur, is added, and the alloy is then cast into bars.

**ENGLISH POLISHING AGENT.**—An English polishing agent consists 94.25 per cent. oxide of iron and 5.25 per cent. finely powdered charcoal. The mixture is ground in a moist state upon the slab, and the mass is again pulverized after drying.

**JEWELERS' CEMENT.**—Put in a bottle 2 ounces isinglass and 1 ounce of the best gum arabic, cover them with proof spirits, cork loosely, and place the bottle in a vessel of water, and boil it till a thorough solution is effected, then strain it for use.

**GOLD AND SILVER COLORED CEMENT.**—For filling hollow gold and silver articles consists of 60 parts shellac, 10 parts Venetian turpentine, and 3 parts gold bronze, or silver bronze, as the case may be. The shellac is melted first, the turpentine is then added, and finally, with constant stirring, the gold or silver bronze.

**TO RE-SHARPEN OLD FILES.**—According to the *Eisen Ztg.*, cleanse the old files with soda and warm water, then immerse them in water, to which add sulphuric acid in drops, until gas bubbles begin to form on the files. Leave for a few minutes in this bath, then take out, and rinse with clean water. The files are said to be good again for work.

**HARD GOLD ALLOY.**—A very hard gold alloy which may be used for many purposes, is obtained by melting together 3 parts gold, 2 parts silver, 4 parts copper and 1 part palladium. The mixture is of a brownish-red color and assumes a high polish. We should think that it would be excellent for jewel holes; a good hard alloy would be preferable to colored glass jewels seen in many low-grade watches.

**TO COLOR BRASS A GOLD YELLOW.**—A gold like appearance may be given to brass by the use of a fluid prepared by boiling for about 15 minutes, 4 parts caustic soda, 4 parts milk sugar, and 100 parts water, after which 4 parts of a concentrated solution of sulphate of copper is added with constant stirring. The mixture is then cooled to 79° C., and the previously well cleaned articles are for a short time laid into it. When left in it for some time they will first assume a blueish and then a rainbow color.

**LIGHT GILDING ON BRASS BY BOILING.**—Gold dissolved in nitromuriatic acid evaporated until the later is dissipated, water boiled with cyanide of potash in an iron pot, the gold added and thoroughly boiled, the fluid filtered; a second time boiling clean water, and pouring in of the gold fluid, until a dipped-out sample dissolves gold, boiling continued, adding from time to time portions of the extract of gold—this would, perhaps, be the simplest and cheapest way of coating brass with a gold film. Cleanliness is the great indispensable condition, and the proportions for this boiling process are 50 grams (1 oz. 12 dwts. 3½ gr.) cyanide to 3½ grams (2 dwts. 6 gr.) gold. The quantity of water used is ascertained with facility.

**COLORING GOLD.**—Gold articles may be "colored" by immersing them in the following mixture: Alum, 3 ounces; saltpeter, 6 ounces; sulphate of zinc, 3 ounces; common salt, 3 ounces. This mixture should be placed in a common pipkin and allowed to fuse, the articles being removed occasionally, to see if they are of a good color. After the articles have been removed from the pipkin, they should be allowed to cool, and then immersed in diluted sulphuric or acetic acid, which will remove the flux. When this is done, the articles may be rinsed in a weak solution of potash or soda, and finally brushed with hot soap and water; they must then be rinsed in hot water and placed in warm, clean boxwood sawdust. A badger hair brush is the best to remove all traces of sawdust from articles which have been dried in it.

**TO EXAMINE GOLD AND SILVER ORES.**—To examine gold ore, pulverize a few pieces, and put the powder in a glass or porcelain vessel, pour muriatic acid upon it, until covered, and heat to boiling. If gold is present, no change will take place, if not, ebullition and change of color takes place by the action of the acid. By silver ores, pour nitric acid over the powder, and heat until everything is dissolved, then dilute with water, and throw a few grains of table salt into the fluid, when, if silver is present, it will deposit as chloride of silver, to be seen by the ensuing milky turbidity.

**TO BLUE HARDENED STEEL.**—It may sometimes happen, that hardened steel parts require a few finishing touches, which cannot be done because they are too hard, and their polish would be ruined by annealing them, because it turns blue, and the piece then requires renewed polish, which consumes a great deal of time. The most practical way then is to cover the steel part with the oily dirt from the oil-stone, after which it can be annealed with impunity, that is, the flame is, with the blow-pipe, directed to the point required. The article is afterward cleansed in benzine.

**CEMENT FOR BRASS UPON GLASS.**—C. Puscher recommends in the *Ind. Bl.* a very tenacious cement for fastening brass upon glass, which is said to be very useful for cementing brass burners upon the glass bulbs of kerosene lamps, since the kerosene cannot penetrate the cement, nor will it chip off in heat (water will attack it superficially only). This cement is prepared by boiling 1 part caustic soda and 3 parts colophony in 5 parts water. A soap-like product is obtained, which is kneaded with gypsum (say about one-half its weight). The cement obtained hereby hardens in one-half or three-quarters of an hour.

**TO MOUNT A GRINDSTONE.**—Small as is a watchmaker's or jeweler's grindstone, it is after all not a very easy job to mount it correctly, in such a manner that it shall not "wobble" to and fro, or hang untrue. The hole is to be at least three quarters or half an inch larger than the axis, and the former as well as the latter must be square. Then make wedges for each side, all of which are to be equal and sufficiently thin, so that a wedge passes from each side through the hole. These wedges are to be inserted from both sides. If the hole through the stone is regular and equal, the wedges will fix the stone as it ought to sit. But if it is not at right angles to the stone, it is to be made so, or else the wedge must be arranged accordingly, so that they will equalize any irregularities.

**TO OXIDIZE SILVERWARE.**—The so-called oxidized silver is silver which has been provided with a more or less heavy coating of sulphide of silver. When a silver article is to be coated entirely with sulphide of silver, it is to be cleansed thoroughly from every trace of fat and dust, and dipped in a solution of sulphuret of potassium (Germ. *Schwefelleber*). The adherence of the coating increases with the length of time consumed in forming, wherefore it is advisable to only employ very dilute solutions of this agent, and to avoid heat. A far more adhesive coating is obtained by exposing the silver for a length of time to the influence of moist sulphuretted hydrogen gas. The article taken out of the bath is quickly rinsed with water and dried, and must appear colored equally gray. The gray surface may be ornamented with devices, either by removing the layer of sulphur with a graver or by drawing upon it with a goose quill dipped in nitric acid. In this operation the sulphide of silver is at the spots oxidized into sulphate of silver, and then removed by boiling in water. Sharper and better defined designs are produced by writing upon the silver article with a very concentrated solution of sulphuret of potassium, thickened with mucilage, leaving the article to stand for 24 hours, and then heating it until the mucilage loosens by heating. A nice bluish gray to black tone is in this manner produced upon pure silver. The tone will more incline to black if the alloy contains much copper. A very dark, velvety black coating is produced by dipping the article in a solution of proto nitrate of mercury before it is entered into the sulphuret of potassium bath.

## Trade Gossip.

T. Le Boutillier sailed for Europe May 16.  
 S. Lawson has removed to No. 4 Maiden Lane.  
 J. F. Newbro succeeds W. F. Hunt at Truckee, Cal.  
 John J. Cluin succeeds Cluin & Allen, Lowell, Mass.  
 W. G. Gardner succeeds L. T. Murphy, La Gro, Ind.  
 H. W. Patterson succeeds W. Patterson, Salem, N. J.  
 Quist & Westfall succeed H. P. Quist at Somerset, O.  
 Ludwig Nissen & Co. have removed to 18 John street.  
 T. B. Bynner has removed from 908 to 177 Broadway.  
 Loehr & Koerner have removed to 10 Courtlandt street.  
 Moses Levy succeeds R. H. Sellock, Seneca Falls, N. Y.  
 Willis & Keefer succeed Wm. Thompson, Lancaster, Pa.  
 Richard Herz succeeds William Goeggel, Reno, Nevada.  
 J. A. Musch has moved from Bloomer to Fairwater, Wis.  
 Logan Ferrill moved from Doniphan, Mo., to Cobden, Ills.  
 Jos. Kesselmire & Co. succeed Jos. Kesselmire, Galion, O.  
 Malm & Pearson succeed Chas. A. Malm, Newton, Kansas.  
 G. W. Barrett has moved from Magnoketa, Iowa, to Boone.  
 J. J. Caldwell has removed from Caldwell to Bridgeport, O.  
 A. Roberts has removed from Georgetown to Denver, Colo.  
 J. J. Pratt has moved from Lyndon, Vt., to East Hardwick.  
 S. Brunswick sails for Europe in the steamer *Elbe*, June 3d.  
 Bobbs & Strickler succeed Degler & Meader, Scottsdale, Pa.  
 F. A. Pell has moved from Plano, Texas, to Chatsworth, Ills.  
 Charles Knapp has temporarily removed to 17 Maiden Lane.  
 E. Doton, of Bradford, Vt., is succeeded by Chandler & Doe.  
 John Tibbetts & Co. succeed Chas. Hale & Co., Bangor, Me.  
 A. E. Roby has removed from Alta, Iowa, to Topeka, Kansas.  
 L. I. Heid succeeds the firm of F. Weil & Co., Rockport, Ind.  
 W. H. H. Booth succeeds D. J. Tarner at Sioux Falls, Dakato.  
 Martin & Labourn succeed Geo. L. Stanfield, Lyndon, Kansas.  
 W. C. Wyche has moved from Whitney, Texas, to Hillsborough.  
 Geo. D. Chace has succeeded F. C. Luquer, Montgomery, N. Y.  
 R. N. Peterson, of Peterson & Royce, sailed for Europe May 16.  
 P. Hecht retired from the firm of Levy, Dreyfus & Co., June 1st.  
 J. C. Hardy succeeds his son, Geo. W. Hardy, Lebanon, Oregon.  
 John R. Norris has removed from Augusta, Ga., to Leesville, S. C.  
 W. W. Dale has removed from Milford, Ills., to Terre Haute, Ind.  
 Walker, Manch & Adams succeed George Hahn, of Marshall, Mo.  
 Frederick Sandoz has removed from Shubta, Miss., to Mobile, Ala.  
 Sam'l A. McMaster has removed from Duncannon to Avondale, Pa.  
 Austin Travis, Jackson, Mich., is succeeded by E. F. Webb & Co.  
 Cobb & Waldorf succeed Hutchinson & Cobb, Hornellsville, N.Y.  
 F. A. Wilcox, Marion, N. Y., has removed to Clifton Springs, N.Y.  
 A. J. Wagner, Monroe, Mich., is succeeded by A. J. Wagner & Bro.  
 Louis Megede, of Richmond, Mo., has admitted his son to partnership.  
 Bostwick & Veitch have succeeded John Bostwick, of Cambridge, Ohio.  
 T. W. Kirlin has moved from Johnstown, Pa., to Storm Lake, Iowa.  
 A. W. Bates has purchased the business of W. J. Withers, Traer, Iowa.  
 Lawrence Garman, of Jersey Shore, Pa., has admitted his son to partnership.

Roediger Bros. & Co. succeed Phillip Maret & Co. at Belleville, Ills.

Payne, Steck & Co. have removed from 191 to 177 and 179 Broadway.

Benjamin Booth succeeds the firm of Booth & Booth, Noblesville, Ind.

David W. Cheney succeeds the firm of Cheney & Sugden, Sparta, Wis.

F. Haldeman, Newark, has removed to 928 Broad street in that city.

Olof Johanson has removed from 71 Nassau street to 16 Maiden Lane.

Atkinson Bros., Philadelphia, Pa., have moved to 926 Chestnut street.

Geo. L. Vose & Co., Providence, have removed to 59 Clifford street.

John E. Prigg, of Washington, D. C., is succeeded by W. M. Frank.

W. H. Bear, succeeds the firm of Bear & Mosher, Burlington, Kansas.

A. J. Laundry succeeds the firm of Laundry & Perry, Clyde, Kansas.

D. C. Carpenter, formerly at Breckenridge, has removed to Coma, Colorado.

The firm of Marshall & Marsh, of Bellaire O. is succeeded by N. L. Marsh.

Geo. R. Thompson has purchased the business of G. W. Kimmell, Findlay, O.

Chester Billings, of Randel, Baremore & Billings, sailed May 9 for Europe.

F. D. Melhnish, of Montrose, Pa., is succeeded by J. & F. D. Melhnish.

B. W. Ellison has retired from the firm of Ellison & Vester, Providence, R. I.

Louis Neresheimer returned from his usual European trip in the *Fulda*, May 9th.

Geo. R. Calhoun succeeds the firm of G. R. Calhoun & Co., Nashville, Tenn.

The firm of Beck & Childs, Osage Mission, Kansas, is succeeded by Frank Childs.

W. R. Caldwell has purchased the business of Hight & Fairfield, South Bend, Ind.

Dewey & Wetzal, of Ravenna, O., have dissolved. D. A. Dewey continues the business.

Frank W. Martin has been admitted to partnership in the firm of J. F. Hopkinson & Co.

Kness & White, of Kirkwood, Ills., have dissolved partnership, J. S. White continuing.

Frear & Woodworth, Binghampton, N. Y. is changed to Frear, Woodworth & Schenck.

E. J. Wells, formerly of Kimban, Dakota, will open a jewelry store at New Hampton, Iowa.

The business of Mrs. A. Lehman, deceased, will be continued by her son at Lagrange, Ga.

The firm of Joseph G. Willeke, Springfield, Mo., is succeeded by Joseph G. Willeke & Co.

The firm of Parsons & Cross, of La Porte, Ind., has dissolved, James R. Parsons continuing.

Mr. Fairchild has retired from the firm of H. A. Avery & Co. & Fairchild, Lake City, Colorado.

Louis Manheimer will remove July 1st from Indianapolis, Ind., to 175 State street, Chicago, Ill.



The firm of French & Fisher, Elyria, O., has been dissolved, E. H. Fisher continuing the business.

The firm of Dodge, Platt & Co., Providence, R. I., have dissolved, and are succeeded by Dodge & Card.

The entire trade will be interested in the advertisement of Henry Abbott in this number of THE CIRCULAR.

The firm of Abeytia & Co., Santa Fe, is succeeded by Abeytia & Mares, and they have removed to Las Vegas.

A. G. Foogman has succeeded G. W. Foogman, at Hillsborough, Dakota, and the latter has removed to Grafton.

Henry May has fitted up his new offices at Nos. 21 and 23 Maiden Lane in a very handsome and attractive manner.

John W. Ruth, of Shelbyville, Tenn., has admitted his son to partnership, and the firm is now J. W. Ruth & Son.

The firm of Schilling & Brandes, of Oswego, N. Y., has been dissolved, and Mr. Schilling will continue the business.

Corg & Williams, Providence, R. I., have removed to 119 Orange street, and A. S. Gardner & Co. to 111 Summer street.

The firm of Diefenthaler Bros. & O'Donnell have dissolved by mutual consent, J. & G. Diefenthaler continuing the business.

The firm of Sexton & Cole having been dissolved, the business will be continued by Wm. L. Sexton, at No. 30 Maiden Lane.

The firms of G. F. Bauck & Co. and Theo. Ernst, of Fort Madison, Iowa, have consolidated under the firm name of Ernst & Bauck.

The T. A. Willson Optical Company have arranged with the manufacturer for the sole agency in this country of the Bijou opera glass.

R. F. Simmons & Co., and S. E. Fisher & Co., are temporarily located at No. 42 Maiden Lane, until their offices at No. 41 are fitted with elevators and re-modeled.

B. & W. B. Smith, the well known show case makers, have just issued an illustrated catalogue of some of their new designs, which will be sent to parties desiring them upon application.

S. Valfer & Co. are the makers of a very neat and attractive ornament for the show window. It is called the Bartholdi Statue, and is used for the holding of Rings, Watches, Chains, Pins, etc.

McElree, of Charleston, believes in advertising. He recently occupied an entire page of the daily *Courier* of that city with notices of the novelties he has to offer to the public in that vicinity.

The American Watch Tool Co., of Waltham, are singularly fortunate in the recovery of their stolen goods, having recovered all the tools stolen from their factory the past winter, also the lathe stolen from the office of W. W. Wilcox recently.

B. W. Ellison, late of the firm of Ellison & Vester, was appointed Grand Marshal for the Decoration Day parade in this city by the Grand Army of the Republic. He imported an Arabian stallion on which to exhibit himself on that occasion.

The Meriden Britannia Company received the highest award at the New Orleans Exposition for silver plated flat and hollow ware. Their exhibit was exceedingly attractive, and received numerous flattering notices from the press of New Orleans and other cities.

The committee appointed to investigate the failure of Webb C. Ball, of Cleveland, after thorough investigation, have reported in favor of accepting thirty-five cents in settlement of his liabilities. The report was accepted and the settlement will be made in accordance with it.

The following Chicago firms have removed their places of business: Blauer Watch Case Co. to 149 State street. A. M. Church & Co. to 55 Fifth avenue. Cogswell & Wallis to 105 State street. Hart Bros. to 154 Clark street. Theo. Kearney & Co. to 149 State street. E. V. Roddin & Co., to 149 State street. J. & F. M. Soloman to Fifth avenue and Madison street. A. M. Weinberg to 70 E. Madison street. Chas. Wendell's Sons to Madison and Dearborn streets.

E. J. Schofield, for the past fifteen years associated with the Elgin Watch Company, has been appointed to succeed L. L. Woolley in charge of the Eastern department of that company's business. He is well known in the trade, and his selection for the place is regarded as a judicious one.

That enterprising young firm, Westen & Co., 18 East Fourteenth street, have on hand a fresh importation of imported silver filigree jewelry. The present exhibit includes several large specimens in decorative pieces for toilet sets. These are of Genoa manufacture and well worth a visit of inspection.

To illustrate the practicability of the anti-magnetic watch case made by Giles, Bro. & Co., of Chicago, we would state that it has been adopted by the employees of several western railroads. It is not generally understood that the receiver of a telephone gives out sufficient electricity to magnetize a watch.

J. T. Bonestell, of Levison Bros. & Co., San Francisco, we understand has recently received a patent for a unique charm, a sample of which has been sent East with a view to having them made in quantities. It is said that they are meeting with special favor on the Pacific coast. They are very attractive in appearance.

The invisible joint case made by the Blauer Watch Case Company, of Chicago, is meeting with general favor in the trade. It is claimed that it is stronger, the joint being inside, preventing it from opening too far, and also that it is dust-proof. It makes a very handsome case, for the reason that there is no joint in sight.

In consequence of ill health, L. L. Woolley was compelled to resign the Eastern agency of the Elgin Watch Company. Mr. Woolley has held this position for the past nine years. He is at present in Baltimore receiving medical treatment at the hands of his brother. His many friends will wish him a speedy and permanent recovery.

The Gorham Manufacturing Company and Le Boutillier & Co. have fitted up No. 9 Maiden Lane for a branch store. A full line of samples of their goods will be kept at the down-town store for the convenience of buyers who do their trade mostly in that part of the city. The store is handsomely fitted up and is exceedingly attractive.

The building just made over by Otto Young, of Chicago, is elegant in all its appointments, and has been converted into one of the most convenient buildings for offices in that city. It is located at No. 149 and 151 State street, and numbers among its occupants, in addition to Mr. Young's extensive establishment, the Blauer Watch Case Company and T. Kearney & Co.

Leroy W. Fairchild, the well known manufacturer of gold pens, pencil cases and novelties in charms, 18 John street, is the happy possessor of two first gold medals, awarded at the New Orleans Exposition. One of these medals was gained by the exhibit of Fairchild gold pens; the other was a prize for novelties in charm pencils, whistles, cigar cutters, etc.

S. F. Myers & Co. have engaged M. Landman to take charge of their material and optical department. This firm has also been appointed agents of the New Haven Clock Company and of the Middletown Plate Company. A stock of the goods manufactured by these companies will be carried by Myers & Co. They also import musical boxes and carry a full line of them.

Samuel Swartchild is meeting with unexpected success in the sale of watchmakers' tools and material, at his new place of business at No. 71 Washington street, Chicago. His enterprise was looked upon as a doubtful experiment at first, but his energy has overcome all obstacles, and he now does a large and extended business, supplying material to an extensive clientage in the West and Northwest.

H. Muhr's Sons, Philadelphia, have received from the New Orleans Exposition a gold medal for each of their exhibits, viz.: standard filled rings, lockets, charms, and crown filled cases. They also received special mention for their process of manufacturing, they having exhibited in full operation, machinery for making rings. Their exhibit was highly creditable to them and was greatly commended and admired by all visitors.

Some disgruntled employees of the Brooklyn Watch Case Company having circulated the report that the company was making cases below standard, the managers caused some cases taken indiscriminately from their products to be assayed. It is needless to say that the result was highly satisfactory to their customers. The absurdity of the report was manifest from the fact that the company sells only to the jobbing trade, and could scarcely deceive such experts, even if they desired to do so.

Henry C. Haskell, 12 John street, has recently completed an elegant military prize medal, which has the merit of being essentially military. It consists of a miniature winchester rifle, knapsack, overcoat, cartridge box and scabbard combined, enameled in appropriate colors, with the figure "17" set in fine diamonds. Artistically and mechanically it is pronounced perfect. Another very handsome badge, just completed, is a jewel for a Past Grand Commander of Knights Templar. Special designs for medals, badges, etc., receive prompt attention.

The annual meeting of the Iowa Retail Jewelers' Protective Association, was held at Des Moines, April 8th. The following officers being elected for the ensuing year: S. W. Gray, of Fort Dodge, President; Mr. Joseph, of Des Moines, and Henry Robinson, of Council Bluffs, respectively first and second Vice-Presidents; W. F. Bingham, Secretary and Treasurer. Messrs. Boynton, Parmelee and Startzman, compose the Executive Committee. The meeting adjourned until the second Wednesday in April, 1886, when they will again meet in Des Moines.

A National Commercial Convention, recently held in Atlanta, adopted resolutions favoring a national bankruptcy law, and the bill before Congress to stop the further coining of silver. The convention was an important one, bringing together representative men of the North and South to discuss the commercial problems presented daily to the business community. Its proceedings were characterized by some sense regarding the present situation and the steps that should be taken to secure prosperity for the future. Business men in every locality should perfect organizations to co-operate and influence state and national legislation in the interests of sound commercial practices.

Early in May the large building in Brooklyn in which Howard & Möhle, the well known refiners and assayers, had their factory, was destroyed by fire, involving them in a total loss of machinery, which was partially insured. They immediately made arrangements for continuing their business; and leased the five story building, situated at Nos. 380 and 382 Water st., corner of Oliver, this city, where due care and attention has been exercised in fitting up their establishment with the latest and most improved machinery. They are now prepared to refine sweepings, tailings and waste of every description. Mr. Howard, who is well and favorably known to the trade, desires to notify his friends, through the columns of THE CIRCULAR, that their facilities are again complete. Their office is still at No. 10 John street.

A sleeping car conductor on the Lake Shore road recently took occasion to overwhelm a traveling man with violent abuse because he wished a seat in the sleeping car; a lady was subjected to similar ill treatment, which so incensed the traveling man that he made a complaint to the N. Y. Central Sleeping Car Company. The company recently sent a courteous letter to the traveler informing him that investigation had confirmed his statements, and that the offending conductor had been suspended from duty and pay for one month, which, the paper says, "will be a sufficient reminder for him to treat the traveling public with the courtesy they are entitled to." It will thus be seen that those in authority are inclined to discipline their employees who are uncivil, and that complaints will be attended to when addressed to the proper parties.

During the past month the following named dealers, among others, have been in the city: George Wolf, Louisville; G. B. Gardner, Canaan, Conn.; G. J. Wilson, Reading, Pa.; Mr. Cook, of A. Stowell & Co., Boston; W. P. Morgan, of Levison Bros., San Francisco; G. G. Castle, Buffalo; C. Weaver, of Bailey, Banks & Biddle, Philadelphia; F. W. Brooks, Ithaca; S. C. Tappin, Troy; A. S. Mermod, St. Louis; Major Shreve, Boston; Mrs. Thomas Dickinson, Buffalo; I. Seely, Ogdensburg; C. E. Gifford, Fall River; O. B. Rudd, Ilion; G. W. Collins, Denver. The following representatives of the out of town wholesale trade were in attendance at the National Jobbers' Association: Benjamin Allen, Otto Young, C. H. Knights, L. Flershem, S. Perry and T. Davis, of Chicago; D. F. Corover, S. Muhr, T. B. Hagstoz, of Philadelphia; C. Hellebush, Cincinnati; G. B. Barrett, Pittsburg; L. Bauman, St. Louis.

The announcement will be welcome news to all watchmakers that the Waltham Co. now make all their full plate movements for open face stem winding watches to set by the pendant only. Watches should be so constructed as to require no handling by their wearers, that is to say, no unnecessary manipulation for the performance of the daily operation of winding and that of setting. As great a step forward as it was to replace the key winding watch by stem winders, which did away with opening the back of the watch for the daily winding, just so great a step forward again is the introduction of the pendant set to do away with the opening of the front of the case. Opening the backs for winding admitted dust into the watch, causing the wearer the expense of cleaning rather frequently. Opening the front of the watch was often the occasion for breaking off the hands, and sometimes also for chipping the dials. To these annoyances wearers of the new Waltham pendant setters will not be exposed; neither will watchmakers have to lose their valuable time by such petty repairs for which they would not charge their customers. The pendant setting in itself is no novelty, but its application to full plate American watches is decidedly new. Its simple and indestructible mechanism is covered by patents, and adds one more to the many virtues of the Waltham watch.

At the meeting of the New York Academy of Sciences, April 13, 1885, Mr. Geo. F. Kunz exhibited a Ceylonese zircon of  $6\frac{1}{2}$  karats weight, penetrated its full length by three crystals of acicular rutile, also a pearl found in a common oyster, *ostrea borealis*, from the Shrewsbury river. This pearl bore a striking resemblance in appearance to a small human eye, measuring over  $\frac{5}{8}$  inch (17 mm.) across, the part representing the pupil being dark green and gradually shading into a pure white. It was said to be the largest pearl of this variety yet observed. That portion of the surface which was of a white color had the characteristic wavy radiated reflection usually observed in pearls from the common conch, *strombus gigas*. Like all other pearls from the common oyster it lacked the beauty and luster requisite to a commercial value. Mr. Kunz also showed a diamond of the form described by him in the *Science* of May 30, 1884, made up of a multiplicity of twinnings, called also "extreme durate" by the French. It had been cut into the rude outline form of a brilliant, and its table had been placed on a diamond polishing wheel for 100 days. The average circumference of that part of the wheel on which it was placed being about  $2\frac{1}{2}$  feet, and the wheel going at the rate of 2,800 revolutions per minute, the surface that traveled over the diamond table amounted to over 7,500 miles. At times, four and eight pounds were added to the usual  $2\frac{1}{4}$  to  $2\frac{1}{2}$  pounds of the clamp or holder, and for a time forty pounds extra were added, this last causing the wheel to throw out scintillations for several feet. The diamond fairly ploughed the wheel, practically ruining it, so that it required planing before it could be further used. No polish was produced, however, sufficient to give the brilliancy necessary in any diamond gem. These experiments were conducted by Messrs. Tiffany & Co., who were also the owners of the diamond.



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## THE JEWELLERS' CIRCULAR AND HOROLOGICAL REVIEW

*The recognized organ of the Trade, and the official representative of the  
Jewelers' League.*

A Monthly Journal devoted to the interests of Watchmakers, Jewelers, Silversmiths, Electro-plate Manufacturers, and those engaged in the kindred branches of art industry.

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### Does the Trade Want Honest Goods?

IN THE June issue of THE CIRCULAR we printed a communication from Edward Holbrook, on the subject of sacrificing quality to price, regarding which we have had much to say heretofore. Mr. Holbrook shows that some manufacturers of silverware who stamp their goods "sterling," ( $\frac{925}{1000}$  fine), make such errors in preparing their metal that the goods produced fall short a hundred points or more of the standard. Such a discrepancy is not the result of accident, but of a deliberate intention to sacrifice the quality of the goods in order that they may be sold for a less price than they could be afforded for if the quality honestly conformed to the marking. Of course, this is a deliberate, willful deception, perpetrated with intent to defraud the public, and is a criminal offence for which the perpetrator could be imprisoned if prosecuted and convicted. That similar frauds are practiced in connection with gold goods is well known; indeed, the opportunities for fraud are greater in the production of gold goods, for a greater variety is manufactured without any marking to indicate fineness, although represented when sold to be of a specified quality. There is no standard of quality for gold goods, and the integrity of the manufacturers is the only guarantee attainable. Custom, however, has decreed that certain kinds of goods shall be 18 karats fine, others 14, while a lesser degree of fineness is acceptable in still others. If they are only what they purport to be, and are sold for just what they are, they are honest goods. There is a demand for goods of all degrees of quality, and the traffic in them is perfectly legitimate and honest. But when the quality is not up to the standard it purports to be, a fraud is perpetrated, and all who are knowingly parties to foisting such goods upon a deluded public are engaged in a swindling transaction, for

which they might be indicted and imprisoned. It is obtaining money under false pretences, an offense of which the law will always take cognizance.

Few manufacturers, probably, look at the matter in this light. They find that the trade demands degraded goods, that are a misrepresentation on their face, and they supply them; dealers find the goods attractive and salable, and have no hesitation in selling them, although they know they are not equal in quality to what they are represented to be. There is such a demand for degraded goods that we have frequently heard it asserted that the trade does not want honest goods. Retail dealers require, as they assert, something attractive that they can sell at a low price, so the manufacturers make 18 karat goods out of 14 karat gold, and 14 karat goods that will not assay more than 10 or 12 karats—some run even lower, and we have seen samples of 14 karat jewelry assayed that did not have 7 karats of gold in them. Now, who profits by this swindle? The manufacturers claim that they sell the goods to dealers at a price that is a positive indication of their quality; the dealers claim that they sell them at the usual advance on manufacturers' prices. If this is true, then no one is absolutely swindled, in a pecuniary sense, but the public is none the less deceived. The man who wants an 18 karat ring may be deceived into buying one only 14 karats fine, paying a 14 karat price therefor; he is not swindled out of any money in the transaction, but he is deceived by misrepresentation, and if he knew the facts it would be difficult to convince him that he had not been defrauded.

But the question arises, if no one makes a profit by degrading the quality of goods and misrepresenting them, why is it done? If the manufacturer, jobber and retailer each makes as much profit on honest goods as they do on those that are degraded in quality, and that necessitate falsehood and misrepresentation to dispose of, why is it that fraudulent goods are manufactured? The assumption that no one profits by the fraud is simply absurd. No manufacturer is going to steal three or four karats from the quality of his goods unless he makes something by doing so; no jobber or retail dealer is going to seek for degraded goods unless he finds more profit in handling them than he does in honest goods. It is useless to mince words on the subject—any goods that are made and sold under a misrepresentation as to their quality, are a fraud and a swindle, and the persons who knowingly are parties to the transaction are amenable to criminal prosecutions for obtaining money by false pretences. The manufacturer who attempts to deceive himself with the excuse that the trade demands such goods, knows in his heart that it is not the public that desires such goods, and that if the trade demands them, it is simply that the public may be deceived and defrauded.

But we do not believe that the trade desires goods that are false as to their intrinsic value. Degradation of quality is the outgrowth of excessive competition. Smith originates some new design in jewelry which he makes up in honest goods and sells at a fair profit; they become popular and the demand for them excites the envy of Jones; he at once proceeds to make similar goods, but, in order that he may

undersell Smith and steal his trade, he steals something from the quality, and offers his goods to the dealers something below Smith's price. Smith hears of this through his travelers, and, in order to meet this dishonorable and dishonest competition, is forced to reduce the quality of his goods and meet Jones on an equality as to price. And so it goes on, one cut in quality and price necessitating another, until finally the integrity is entirely cut out of the goods, and nothing is left but the dishonesty of the whole transaction.

We must not be understood as herein discrediting the jewelry trade in general, for there are numerous representatives of all branches of it who would close up business sooner than be a party to any fraud whatever; but we do say that the opposite class is so numerous and degraded goods so plentiful in the market, that it makes it up-hill work for those who honestly strive to do business by legitimate methods to maintain their custom. The trade in general is regarded as a most honorable one, having among its representatives many of the most respected and estimable gentlemen to be found in any community; it is exceedingly unfortunate for them that these dishonorable practices have crept in, and forced upon them a competition that injures their business prospects and reflects upon their standing as business men.

While we thus pointedly characterize an evil in the trade, it is pertinent to ask if we have a remedy to suggest. We have, most decidedly, and it lays exclusively in the hands of the jewelers themselves. It is simply to enlarge the sphere of usefulness of some of the jewelers' organizations—the Jewelers' Association, Boards of Trade and kindred associations—and give them supervision of the quality of goods. It is better for the trade to reform itself from within its own membership than to wait till State legislatures take the matter up, and go to the extreme of enacting laws that may be oppressive. Let the jewelers themselves declare what standards shall be observed in the manufacture of gold and silver goods; take 24 karats, for instance, as the maximum degree of fineness for gold, and provide that no goods alloyed more than one half, or below 12 karats, shall be regarded as gold goods, and that between 12 and 24 karats all goods must be precisely of the quality represented, while all below 12 karats shall be sold on the basis of the metal forming their largest proportion, in fact, as base metal. If the manufacturers would agree to adopt some such standard, and the jobbers and retailers agree to sell as gold goods no articles that did not conform to the standard, the trade would at once be relieved of the burden of carrying a lot of trash that is at present neither fish nor fowl—goods too degraded to be recognized as gold, and too high priced to be sold for base metal. Some such agreement as that suggested, voluntarily adopted, would tend greatly to purify the trade and to elevate it in the estimation of the public. We hope some day to see some decided action taken by the trade in relation to degraded goods that are sold by fraud and misrepresentation, and we do not expect to witness the arrival of the millennium either; there ought to be sufficient commercial honor in the trade to work out this needed purification.

### A National Bankruptcy Law Required.

**D**URING its last three sessions Congress has had before it a proposition for the enactment of a national bankruptcy law. What is known as the Lowell bill, drafted by Judge Lowell, of Massachusetts, at the instance of various commercial organizations, has been very generally commended by the Boards of Trade of the country, and cordially endorsed by business men. It has been urged upon Congress most persistently, but has encountered a degree of opposition thus far that has prevented its adoption. Its fate indicates that it is necessary for the business men of the country to organize their forces and place them under competent leadership if they

would secure the passage of the Lowell or any other bankruptcy bill. The opposition comes from those sections that are largely composed of the debtor class, that is opposed to any plan that would enforce an honest settlement with creditors. The same sections produce numerous failures, and are under the jurisdiction of State laws that make it extremely difficult for a creditor from another locality to collect his honest dues from an unwilling debtor. Congress is full of demagogues and impractical business men ambitious for a re-election, who, in any controversy, are willing to side with the faction that makes the most noise; this renders it almost impossible to get intelligent action upon any measure of importance to general commercial interests. It is of importance, therefore, that such a pressure of public opinion should be brought to bear on members to induce them to support a bankruptcy bill, that they cannot resist it.

The necessity for a national bankruptcy law has been abundantly demonstrated during the past few years. Where business is done on credit to the extent that it is in this country, a uniform system of dealing with insolvency cases is demanded by commercial interests. Reliance upon diverse State laws, under which legal proceedings for the collection of debts are different in each State, has been found to operate disastrously to those who give credit, tending to develop dishonesty and rascality among debtors. The jewelry trade is largely interested in securing a bankruptcy law, for it is called upon extensively to make settlements with insolvent debtors. Under present conditions creditors might almost as well throw away their claims against insolvent debtors as to attempt to collect them by legal means. As a consequence creditors have fallen into the habit of accepting such terms in compromise as their debtors find it convenient to offer, twenty-five and thirty per cent. being considered quite a liberal offer as a rule. Trade organizations throughout the country have adopted resolutions urging Congress to pass a bankruptcy bill, and the organizations in the jewelry trade might, with advantage, follow this example. No effort to impress Congress with the importance of the matter should be omitted.

In England, where there are no complications arising from different State laws, there is a bankruptcy code, of recent enactment, in force. The following extract, from the Manchester *Guardian*, indicates something of its scope and workings:

Deeds of private arrangement with creditors, whether by way of assignment or composition, are undoubtedly increasing, and the only question seems to be, what is the best remedy for an admitted evil? The causes of this continued increase are the last bankruptcy act and the way in which it is being administered. However successful that statute may be in keeping debtors out of the Court of Bankruptcy, this is quite another matter from the prevention of insolvency. Failures in business there must always be—genuine *bona fide* failures for the most part—and with these the act has not even attempted to deal satisfactorily. The pendulum has, in fact, swung back again to the old theory of treating bankruptcy as a crime, or at all events as a misdemeanor. As Mr. Chamberlain said, he would put every insolvent debtor in the position of a captain who had lost his ship. This is a very striking, and, in some respects, a most suitable though dangerous analogy, but in others it is extremely misleading. After all has been said, the creditors of a debtor are the parties at least primarily, if not principally, concerned. When these creditors are offered a fair deed of assignment or composition by their debtor, which they at once see is the best he can do, and when no fraud is in question, can we wonder that they prefer this inexpensive and speedy arrangement to the costly and dilatory process of a bankruptcy or an arrangement thereunder? Indeed, the very safeguards that were placed around any such arrangement after petition have defeated their own object. To carry a scheme of assignment or composition under the act, there must be two meetings of creditors, a public examination of the debtor, a receiver's report (both wholly needless from an assenting creditor's point of view), and, finally, an approval by the court upon moral and public grounds of an offer long before accepted by the creditors interested as a matter of business. Surely, then, it is not surprising that private arrangements prosper, and that in this respect the last act is evaded. There are only two remedies for this condition of affairs. One is to make the arrangement subject to the confirmation of the court, which cannot be done without disturbing the whole scheme of the act of 1883 in this respect. The other is to require that all such deeds of arrangement, assignment, or composition should be registered as bills of sale. By this means the injurious element of privacy would be done away with, and the insolvency be known to future creditors and the trade generally. The Trade Protection Societies at their recent meeting resolved that this evil required a remedy, and they should know something of the wants of creditors. But in any event this proposal

is only ranking such deeds as bills of sale, and so seems as fair as it is certainly feasible.

Regarding the working of the act, Mr. Chamberlain has written as follows :

In reply to your favor I am happy to say that the returns show that the operations of the Bankruptcy act have been even more successful than I could possibly have anticipated. I have no reason to believe that the number of private arrangements has very materially increased, but even if that were the case, there would be no objection under the existing law, since the opposition of a single creditor can bring the estate into bankruptcy. If, however, all the creditors of a debtor are agreed to release him from his obligations, there is no reason why they should be prevented from making such an arrangement. Under the old system, what was objectionable was that a majority of the creditors were able to override the minority, and very often, by collusion with the debtor, to make an improper and insufficient arrangement. The returns of the act show that the average amount of dividends has very largely increased, and that the distribution of assets has been quickened in a remarkable degree, while the average percentage of costs has been greatly reduced. At the same time fraud, or attempt at fraud, has been in many cases prevented and punished. I believe that the act is making steady progress with the commercial classes, and, as its operations become more widely known, I expect that the number of private arrangements will continually tend to diminish.

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### How Money is Squandered in Advertising.

EVERY enterprising business man knows how essential to success is advertising, and every successful merchant has been an extensive advertiser. But it requires good judgment to combine extensive advertising with a judicious selection of the mediums to be employed. This is the season of the year when business houses are solicited to give their orders for all sorts of advertising schemes for the fall and winter trade. Recently the *Commercial Bulletin* contained an article full of sound, sensible advice on this subject, showing how business men are tempted to squander their money on wild advertising projects that never return them a dollar of benefit. Within the last few years it has become the fashion with some people to do their advertising in their own private way, instead of through the newspapers. Some distribute cards, some circulars, some pamphlets, some even almanacs, and some inconceivable monstrosities of oddity, circulating them by the hundreds or thousands through the mails. The printers' art has been taxed to the utmost to gratify the tastes of these advertisers. Some of the finest as well as some of the basest specimens of the art of engraving, of chromo-lithographing and of color printing are being produced for these purposes, and every conceivable style of fancy paper is brought into requisition. The advertisers vie with each other in the elegance of their designs and the costliness of their devices, taking it for granted that the receivers will conform their estimate of the status of the advertiser to the artistic pretensions of his advertisement. Some people may regret that the noble art of printing, at the period of its highest achievements, should be subjected to such debasing uses ; but, to those who thus employ the art, it should be equally a matter of concern that the debasement so completely fails of the object for which it is intended. With him who notices such advertisements at all, the first feeling on receiving one of these superb specimens of typography or engraving is apt to be one of disgust that it relates to the artistic pursuits of his butcher or his bootmaker, or that the subjects of its elegant illustrations are chairs and tables, refrigerators and brooms ; he throws it down with an indefinable grudge against the man who has been guilty of such a ridiculous prostitution of art, and, without exactly knowing it, he is distinctly convinced that a tradesman who spends so much money in such an incongruous way is not likely to be endowed with the common sense of a good man of business or to sell cheaply.

In truth, however, those who take any notice whatever of this flood of announcements form but a very small percentage of those who receive them. They have come to be the nuisance of both the parlor and the counting-room. At home they are never opened but with disappointment, because they come in the place of letters really hoped for. In the office the merchant finds his morning mail stuffed

with these intrusions upon the serious affairs of his business, which he inwardly curses or impatiently consigns to his waste-paper heap. In short, if a public vote could be taken, it would unanimously declare these drumming missives to be an intolerable nuisance that should be denied the privilege of the mails. If one would ascertain how little attention is paid to this gaudy and obtrusive form of advertising, let him watch some of the boys and men who are hired to stand in the streets and distribute lithographic and fancifully printed advertising monstrosities. Half the passers-by refuse to take them as they are held out to them, while those who do take them throw them away after a passing glance at them. We have seen the sidewalk in Broadway strewn for blocks with these rejected advertising circulars as thickly as the falling leaves of autumn strew the ground. People do not like to have other people's business thrust under their noses, either in the street or by means of their letter bags.

Men of business who resort to this method of advertising cannot be ignorant of the fact that the people whom they would reach have become nauseated with it. They must be aware that they themselves disregard all such appeals for patronage ; and what reason have they to suppose that others receive their applications with more patience ? Sagacious advertisers are beginning to see this and are returning to the old method of public announcement. The newspaper is, in every sense, the best medium for advertising ; and, for a given result, it is by much the cheapest also. It reaches a far greater number of possible customers than any private announcement can ; and it is more certain to receive attention. The private circular is thrown aside as a thing which people have come to regard as a bore, and which is neglected because its recipients have no time to attend to it. The newspaper is used in each day's hour of leisure, and readers find interest in reading its advertisements as well as its news, because of the variety they present and the information they convey respecting a wide diversity of interests. It may be safely estimated that an announcement made through the press is noticed by fifty readers, where, made in a private way, it would reach but one. If, therefore, the same amount were expended in either case, the result would be fifty-fold better from the former method than from the latter. Since the multiplication of what are termed trade papers, each of which is devoted to a special industry, the necessity for private circulars has passed away. The trade paper makes a business of reaching every one interested in the industry it represents ; it is the business of their editors and publishers to cover the entire field of its usefulness, and it may be taken for granted that they have a larger list of persons in the business whom advertisers would like to reach than any individual who does not make a specialty of obtaining such addresses is likely to have. A trade journal goes directly to those whom advertisers in that trade desire to reach. An advertisement in such a journal goes regularly at stated intervals, and says to the reader repeatedly what a circular privately addressed would only say once. There are, undoubtedly, cases in which the circular is a better medium than the newspaper. Such, for instance, as where the matter is necessarily lengthy, and the cost of newspaper space would therefore be very large. But such cases are quite exceptional ; and the sooner advertisers learn the folly of their present large expenditures in seeking publicity through private means, the better for their pockets and their success.

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### The Silver Bill.

THE BILL before the last session of Congress providing that the coinage of silver shall be stopped, was defeated at almost the last minute, but the agitation in favor of it has not ceased. There is nothing so embarrassing to trade and commerce as a debased currency, and business men have no use for a piece of metal purporting to be worth a dollar whose intrinsic value is but eighty-five cents. That it is not wanted in commerce is abundantly shown by the fact

that these dollars are piled up in the treasury vaults to an extent that is embarrassing to the treasury officials. They do not know what to do with them; they overflow the vaults, and there is not sufficient storage room for them. Yet the law requires that the mints shall continue the manufacture of them at the rate of \$2,000,000 a month, adding this amount to the piles already on hand for which there is no demand. It was to stop the further coining of this fraudulent cheap dollar that the bill referred to was introduced in Congress last winter. The various organizations representing business interests urged its passage, but the demagogues in Congress who are afraid to go against a sectional clamor for "more money" defeated it, and so the mints keep on piling up the eighty-five cent dollars, to the discredit of the government and the disgust of all honorable men. If the government was insolvent, its creditors would cheerfully accept eighty-five cents on the dollar in liquidation of their claims, but when it is prosperous beyond comparison, and holds more money than it knows what to do with, to issue this debased dollar is neither more nor less than a fraud—a transaction which, if perpetrated by a bank or an individual, would be denominated a barefaced steal.

These cheap dollars are the offspring of a popular clamor in favor of the government interfering in some way to relieve the wide-spread depression existing just previous to 1879. At such periods the unthinking attribute their financial ills to an insufficient volume of money in circulation, and there goes up a cry for cheap money. There came a demand for more greenbacks, from a flood of which the country was only saved by President Grant interposing his veto. Then Congress devised the eighty-five cent silver dollar, and that was foisted upon the people. For a time it was kept at par with gold, through the belief that before enough of them were coined to prove an embarrassment the bill would be repealed and their manufacture stopped. A few millions of them could readily be absorbed by the business of the country without perceptible injury, and comparatively little opposition to the measure was developed. But the limit of toleration has been passed; the volume of fraudulent dollars has become too large to be carried off through the ordinary channels of business, and, unless the supply is stopped at the fountain head, commercial disaster must follow. Let there spring up a sudden demand for gold that will withdraw a large amount of it from circulation, leaving the debased dollar to fill the void, and there will come a panic that will be fraught with great disaster to business interests. This is a peril that is constantly impending so long as the coining of silver dollars continues. It will take many years for the country to absorb the amount already stored away, but, unless their manufacture is stopped, the quantity that will be accumulated under the existing law will prove too heavy a load for the country to carry.

At the recent Commercial Convention, held at Atlanta, unusual exertions were made to ascertain the sentiment of the country regarding the silver question, and after the reports were in and the discussion closed, a resolution was adopted by a large majority calling upon Congress to put an end to the further coining of silver. It was an encouraging fact in connection with the final vote of the convention that the Southern States ranged themselves very generally beside the Northern ones in favor of an honest currency. The question presented for discussion was thus formulated: "Does the public interest require the temporary suspension of the compulsory coining of silver?" The vote was taken by States, and is interesting as given in detail. It was as follows:

Yeas.		Nays.		Yeas.		Nays.	
Alabama.....	2	3	N. Y. Board Trade.....	18	..		
California.....	10	..	New Hampshire.....	2	..		
Connecticut.....	2	..	New Jersey.....	2	..		
Florida.....	5	..	Ohio.....	65	2		
Georgia.....	42	27	Pennsylvania.....	8	..		
Indiana.....	15	..	South Carolina.....	11	..		
Illinois.....	38	..	Tennessee.....	14	8		
Kentucky.....	15	..	Texas.....	5	..		
Kansas.....	4	5	Virginia.....	2	7		
New Orleans.....	1	..	Dist. Columbia.....	2	..		
Missouri.....	35	36	Nat'l Delegates.....	4	1		
Michigan.....	2	..					
North Carolina.....	1	8	Total.....	297	107		

This action by a convention of so much importance has served to encourage the friends of the bill, and another effort will be made next winter to secure its passage. Every industry and every trade organization should lend its influence to strengthen the hands of those members of Congress who are working for the bill, and we certainly expect to see the various organizations in the jewelry trade take similar action to that taken by the National Commercial Convention. Trade may be depressed, and business men may feel blue in consequence, but they can be assured that a cheap or debased currency will never bring them prosperity. On the contrary, the first and most essential requirement of commercial success is honest money. Give the people that as a basis to build on, and from it they will work out, sooner or later, their own prosperity.

### Lives of Celebrated Goldsmiths.

DONATELLO.

THE THIRD illustrious name on our list is Donatello, who contributed powerfully to bring about the Renaissance. His real name was Donato di Betto Bardi, and was born at Florence in 1386, and died in 1468. Donatello is important in the history of art, because he lived at a time when every advance was an event, and he made the first equestrian statue of any importance in modern art. This is at Padua, in the square before the church of San Antonio; it represents Francisco Gatta-Melata, and is full of life and power, and Donatello well deserves the fame of being, perhaps, the greatest sculptor of the age, until the giant mind of Michael Angelo arose. Several of his works are at present in the South Kensington Museum.

He made some very beautiful groups of dancing children for the front of the organ in the cathedral, but the greatest piece of work from his hands is, perhaps, the statue of St. George, in the niche of the church of Or San Michele, which is worthy of being ranked with any work of art of any age, time or country.

Not having been a goldsmith, we simply mention Donatello as having been instrumental in bringing about the Renaissance, and close his life with mentioning an anecdote of him, beside the one we have told of him in connection with Brunelleschi, which shows that he was impetuous and generous by nature.

A rich Genoese merchant gave him a commission to make a portrait bust in bronze of himself. When it was finished, Cosimo de' Medici, the friend and patron of Donatello, admired it so much that he placed it on a balcony of his palace, so that all Florentines who passed by might see it.

When the merchant heard the artist's price for his work he objected to it; it was referred to Cosimo, who argued the case with the merchant. In this conversation the Genoese said that the bust could be made in a month, and he was willing to give the artist such a price that he would receive a dollar a day for his time and labor. When Donatello heard this he exclaimed, "I know how to *destroy* the result of the study and labor of years in the twinkling of an eye!" and he threw the bust into the street below, where it was shivered into fragments. The merchant then became ashamed, and offered Donatello double the price he had asked if he would repeat his work; but, though the sculptor was poor, he refused to do this, and remained firm in his decision, although Cosimo himself tried to persuade him to change his determination.

When Donatello was old, Cosimo gave him a sum of money sufficient to support himself and four workmen, but in spite of this generous provision the sculptor paid little attention to his own appearance, and was so poorly dressed that Cosimo sent him a gift of a red coat, mantle and hood, but Donatello returned them with thanks, saying that they were far too fine for his use.

His patron and friend died before him, and during the last few years of his life the sculptor was a bed-ridden paralytic. Pietro dé Medici, the son of Cosimo, took his father's place in administering to Donatello's wants, and when the latter died his funeral was conducted with great pomp.

He was interred in the church of San Lorenzo, near the tomb of his friend Cosimo. The artist had purchased the right to be thus buried—"to the end," said he, "that his body might be near him when dead, as his spirit had ever been near him when alive." The church possesses several of his sculptures, which are a more suitable monument to his memory than anything could be that was made by others after his death.

#### BENVENUTO CELLINI.

With the short biography of the last but most important person, Benvenuto Cellini, we close our hasty review of the Revival by the heroes of our art during the mediæval age. Before doing this, however, it is necessary that we should more closely examine the times and men surrounding the subject of this sketch.

Four hundred years prior to the time we speak of, Bishop Bernard, of Hildesheim, had announced the coming of the time when the goldsmiths' art should largely contribute to effect a revolution in art and science; four centuries, however, were still to elapse before this prophecy was to be fulfilled. In this period historical events paved the way for the development of Oriental culture in the Occident. The crusades had instilled into Christendom a religious fervor, whence emanated the romantic faith and knighthood with its high-soaring, idealistic longings and purposes. The church recognized its mission and opportunity and became all-powerful, and in proof of this ecclesiastical power and romantic spirit it reared those mighty buildings and gigantic domes whose halls afforded to every art and artist ample space to produce and ornament it with the best and most beautiful pieces of workmanship for the honor and glory of God—be it either in painting or in architecture, in carving, sculpture, bronzes, or in ornamenting the altars with crucifixes and ecclesiastical utensils of gold and silver. The returned knights and priests had, in Byzantium and in the cities of the Moorish Empire, beheld the artistic work in arms and accoutrements wrought in Oriental shops, and carried them back home with them, as patterns worthy of imitation. The citizens had, by united action and armed resistance, disenthralled themselves from despotic authority and attained to a state of independence, and for mutual protection formed into armed guilds, both defensive and offensive. The several trades and guilds, ambitious of their good name, permitted none but good work to be performed by the craftsmen belonging to them, and pitilessly destroyed everything below a certain standard. Commerce spread its radicles throughout all the then known countries and enriched the citizens. The contact with the Orient had stimulated a keen taste for art and scientific pursuits, which awakened a desire for the antique, and the mediæval spirit was no longer content with the old order of things, the nakedness and insufficiency of which became painfully apparent; genius cast about for means to improve it; it conceived the necessity, and this, the mother of inventions, bore as fruit the art of printing, copper engraving, the reformation, the discovery of America, etc. Truly, they were noble scions, and worthy of their sires.

Italy, with its rich, powerful cities, led the van in this regeneration. Antiquity had left, sown broadcast over its territory, the noble monuments of its existence, and what was more natural than that human intellect, continually surrounded by these evidences, should commence its regeneration, stimulated by the constant contact with these vestiges of ancient culture? It is no wonder, therefore, that in the Italy of this period we find men like Bellini, Leonardo da Vinci, Perugino, Michael Angelo, Correggio, Peruzzi, Titian, Giorgioni, Bartolomew, Raphael, del Sarto, Coravaggio, while in their immediate footsteps followed the second generation, to wit, Volterra, Bassano, Salviati, Vasari Tintoretto, and hundreds of others.

And commensurate with this intellectual birth, growth and florescence, we find the art of goldsmithing develop itself and assume noble proportions, upon the products of which are indelibly imprinted the characteristics and advances of the time in which they were wrought. Ornaments became common, artistic designs were more and more desired, and the advancement of art and science and the luxuries of life also stimulated the goldsmith to nobler and better exertions.

This is a short review of the times and men when Benvenuto Cellini was born. He saw the light of day at Florence, in 1500, and died in 1571. He gives a very interesting though improbable account of the origin of his family, to wit: "Julius Cæsar had a chief and valorous captain named Fiorino da Cellino, from a castle situated four miles from Monte Fiascone. This Fiorino, having pitched his camp below Fiesole, where Florence now stands, in order to be near the river Arno, for the convenience of the army, the soldiers and other persons, when they had occasion to visit him, said to each other, 'Let us go to Fiorenza,' which name they gave to the place where they were encamped, partly from their captain's name of Fiorino, and partly from the abundance of flowers which grew there; wherefore Cæsar, thinking it a beautiful name, and considering flowers to be of good augury, and also wishing to honor his captain, whom he had raised from an humble station, and to whom he was greatly attached, gave it to the city, which he founded on that spot."

When the child was born, his father, who was quite old, named him Benvenuto, which means "Welcome," and being the city piper and passionately fond of music, he desired to make a musician of his son. But the boy was determined to be an artist, and his time was divided between the two pursuits until he was fifteen years old, when he went as an apprentice to the goldsmith master, Antonio Sandro, at Florence, learning so rapidly that in a few months he knew more than his master.

We must not forget that to be a goldsmith in the days of the Renaissance meant in reality to be a designer, a sculptor—in short, an artist. The goldsmith made altars, reliquaries, crucifixes, caskets and many sacred articles for the churches, as well as the splendid services for the tables of rich and royal patrons; he made weapons, shields, helmets, buttons, sword-hilts, coins and many kindred objects, besides the tiaras of popes, the crowns, scepters and diadems of sovereigns, and the collars, clasps, girdles, bracelets, rings and numerous jeweled ornaments then worn by both men and women. So exquisite were the designs and the works of these men that they are now treasured in the museums of the world, and belong to the realm of art as truly as do pictures and statues.

Benvenuto was of a fiery temper and he early became engaged in a serious quarrel, and was forced to fly to Sienna, and then to Bologna. When he dared he returned to Florence and resumed his work, but soon again became angry because his best clothes had been given to his brother, whereupon he walked off to Pisa, where he remained for a year. Meantime he had become skillful in the making of various articles, and not only his execution but his designs were so fine that in some respects he has never been excelled.

When Cellini was eighteen years old, the sculptor Torregiano—who had given Michael Angelo a blow upon the nose which disfigured the great sculptor for life—returned to Florence to engage workmen to go with him to England to execute a commission which he had received. He desired to have Cellini among the number, but the youth was so outraged by Torregiano's boasting of his disgraceful deed that he refused to go, in spite of the natural desire of his age for travel and variety. Doubtless this predisposed Michael Angelo in his favor, and led to the friendship which he afterwards showed to Cellini.

During the next twenty-two years he lived principally in Rome, and was largely in the service of Pope Clement VII., the cardinals and Roman nobles. The pope had a magnificent diamond—for which Pope Julius II. had paid thirty-six thousand ducats—and he wished to have it set in a cape button. Many artists made designs

for it, but the pope chose that of Cellini. He used the great diamond as a throne, upon which sat a figure representing God; the hand was raised to bless, and many angels fluttered about the folds of the drapery, while various jewels surrounded the whole. The other artists shook their heads at the boldness of Cellini and anticipated a failure, but he achieved a great success.

Cellini, according to his own account, bore an active part in the siege of Rome, May 5, 1527. He claims that he slew the Constable di Bourbon, the leader of the besieging army, and that he also wounded the Prince of Orange, who was chosen leader in place of Bourbon. These feats, however, rest upon his own authority. Cellini entered the castle of St. Angelo, whither the pope retired for safety, and he rendered such services to the cause of the church that the holy father pardoned him for all the "homicides he had committed, or might commit, in the service of the apostolic church."

But in spite of all his boasted bravery on this occasion, Cellini acted a cowardly part a few years later; when he was called upon for the defense of his own city, he put his property in the care of a friend and stole away to Rome.

In 1534, Cellini committed another crime in killing a fellow goldsmith, Pompeo. Paul III. was now the pope, and because he needed the services of Cellini he pardoned him, but the artist felt that he was not regarded with favor. He therefore went to France, but returned at the end of about a year, to find that he had been accused of having stolen certain jewels, the settings of which Clement VII. had commanded him to melt down, in order to pay his ransom when he was kept a prisoner in the castle of St. Angelo. Cellini's guilt was never proved, but he was held a prisoner for nearly two years.

In 1540, his friend, Cardinal Ippolito d'Este, obtained his release on the plea that Francis I., king of France, had need of his services. He remained five years in France, and received many gifts and honors. He was made a lord and was presented with the Hôtel de Petit Nesle, which was on the site of the present Hôtel de la Monnaie. The story of his life in France is interesting, but we have not the space to give it here, and he never made the success there which he merited as an artist, because Madame d'Etampes and other persons who had influence with the king were the enemies of Cellini. Francis I. really admired the sculptor, and on one occasion expressed his fear of losing him, when Madame d'Etampes replied that "the surest way of keeping him would be to hang him on a gibbet." A bronze nymph, which he made for the Palace of Fontainebleau, is now in the Renaissance Museum at the Louvre, and a golden salt cellar, made for King Francis, is in the Cabinet of Antiquities in Vienna; these are all the objects of importance that remain of his five years' work in France.

At length, in 1545, Cellini returned to Florence, never again to leave it for any considerable time. He was favorably received by Duke Cosimo, and received a commission to make a statue of Perseus to be placed in the Loggia dei Lanzi. When Cellini heard this his ambition was much excited by the thought that a work of his should be placed beside those of Michael Angelo and Donatello. The duke gave him a house in which to work, and a salary sufficient for his support. Nine years passed before this statue was in place and uncovered. Meantime the sculptor had suffered much from the hatred of his enemies, and especially from that of Baccio Bandinelli. In one way and another the duke had been influenced to withhold the money that was necessary to carry on the work, but at last the time came for casting; everything was prepared, when, at the important moment, when great care and watchfulness were needed, Cellini was seized with so severe an illness that he was forced to go to bed, and believed that he should soon die.

Preparations were going on during his sickness, but the resinous pitch pine in the furnace shot up a tremendous flame, the roof of the workshop caught fire, and a part burnt down. A tempest was raging outside, and torrents of rain entered into the furnace and cooled the metal; as he lay tossing in agony some one ran in and exclaimed: "O, Benvenuto! your work is ruined past earthly remedy!" Ill as

he was, he rushed to the furnace, and found that the fire was not sufficient. By superhuman efforts he remedied the disaster, and, finally, the bronze again became liquid; he prayed earnestly, and when he saw that his mold was filled, to use his own words, "I fell on my knees and thanked God with all my heart, after which I ate a hearty meal with my assistants, and it being then two hours before dawn, went to bed with a light heart, and slept as sweetly as if I had never been ill in life."

When the statue was at last unveiled it was as Cellini had predicted: "It pleased all the world excepting Bandinelli and his friends," and it still stands as the most important work of all his life. Perseus is represented at the moment when he has cut off the head of Medusa, who was one of the Gorgons, and changed every one who looked at her into stone.

After the completion of the Perseus, Cellini visited Rome and made a bust of Bindo Altoviti, concerning which Michael Angelo wrote: "My Benvenuto, I have long known you as the best goldsmith in the world, and I now know you as an equally good sculptor, through the bust of Messer Bindo Altoviti." This was praise indeed. He did no more great work, though he was always busy as long as he lived. A marble crucifix which he made for his own grave he afterward gave to the Duchess Eleanora; later it was sent to Philip II. of Spain, and is now in the Escorial.

We have spoken of his autobiography, which was honored by being made an authority in the Accademia della Crusca, on account of its expressive diction.

His life was by no means a good one, but he had a kindly spot in his heart after all, for he took his widowed sister with six children to his home, and treated them with such kindness that their dependence upon him was not made bitter to them.

When he died every honor was paid to his memory, and he was buried in the church of the Annunciata, beneath the chapel of the Company of St. Luke.

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## Lathes and Lathe Work.

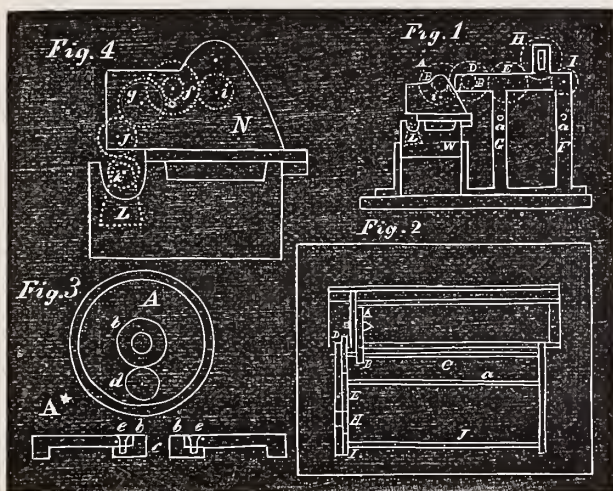
BY THE MODEL WATCHMAKER.

WE HAVE now got to the condition of our lathe that we can mount our wheels and try our ability to turn a good sized piece of metal in it. We have described how to cut our zinc wheels and gave the size and number of teeth of the driving wheel. It is imperative in turning large pieces of metal, especially wrought iron or steel, that the work should run quite slow. This matter depends somewhat on the size of the work in hand, but the peripheral velocity of the work should be 2 or 3 inches per second; say we were turning a piece of steel 2 inches in diameter, it should revolve about once in two or three seconds. With a foot lathe, where we have a protracted job on hand, we cannot calculate on moving the treadle up and down oftener than once in a second, consequently our foot wheel should make two or three motions to one revolution of the work we are turning. To do this we must arrange our countershaft so as to produce such a result. If our driving wheel, to which the treadle is attached, is two feet in diameter, and our largest pulley on the countershaft is six inches, we will have four revolutions of the countershaft to one of the wheel. Now, as we want to reduce the speed of the lathe to less than the speed of the driving wheel, we must reduce the speed from the countershaft to  $\frac{1}{8}$  or  $\frac{1}{2}$  of its velocity. About as good a way to accomplish this is to put an additional countershaft to the one shown in the October, 1884, number. There are many ways in which this change can be made, and the manner shown can be considered as one of them. The idea to be kept in mind is, for turning large work, the piece should not pass the tool faster than 3 inches per second, and the advance of the tool should not be more than  $\frac{1}{16}$  of an inch, that is, the feed screw should not carry the tool forward more than this distance. For driving the



work in the lathe we will suppose a loose pulley turning around one of the centers  $4\frac{1}{2}$  inches in diameter and cut into 84 teeth, and shown at *A* in dotted outline; working into this is a pinion shown at *B* of 21 teeth. This pinion is mounted on a countershaft shown at *C*, fig. 2. This pinion *B* is fastened to the countershaft *C* with a set screw, so it can be moved to any point to engage the wheel *A*. There is also mounted on this countershaft *C* another wheel of 84 teeth and  $4\frac{1}{2}$  inches in diameter, which is shown at *D*. This last mentioned wheel is fixed permanently to *C*. At *J*, fig. 2, is shown the main countershaft connected by belt with the foot wheel shown and described in October, 1884, number. The small countershaft *C* is  $\frac{5}{8}$  in diameter and 20 inches long, and runs on two pointed set screws. Mounted on *J* is a pinion  $1\frac{1}{2}$  inches in diameter cut into 28 teeth. These countershafts are supported by the frame work *F* *G*. These two frames are of cast iron and are connected by rods at *a a*, fig. 1. One of these rods is shown in fig. 2, but the other is beneath the countershaft *J* and consequently is not visible, but its location is defined in fig. 1. The intermediate wheels *H E* are attached to the frame *F* with heavy screws, and serve to merely convey the power from *J* to *C*. The wheel *H* is set so as to be adjustable and admit of a change of size of pinion at *I*. In the train of wheels shown *J* will turn 12 times as fast as *A*, which carries the work in the lathe. This will be better understood, perhaps, if we look it over. *I* contains 28 teeth, one-third of 84 in *H*, consequently *J*, carrying *I*, turns 3 times to *H* once, and *H* makes the same number of revolutions as *C*, carrying *B*. Now *B* will turn 4 times to *A*

make this wheel *A* is to have the small wheel *b* of hard brass and shaped as shown in diagram *A\**. To fully explain the wheel or pinion *b*: It is made of hard red brass,  $1\frac{1}{2}$  inches in diameter, and perforated with a  $\frac{5}{8}$  hole, which just goes on the dead center; this wheel *b* has a hub  $\frac{3}{4}$  of an inch in diameter which extends through the wheel *A*. These wheels, *A* and *b*, are securely fastened together by 4 screws, two of which are shown at *e e*. Now, as the wheel *A* is  $\frac{1}{2}$  an inch thick, and the wheel *b*  $\frac{1}{4}$ , and the recess in *A* is  $\frac{1}{4}$ , and the hub on *b*  $\frac{1}{4}$ , the compound wheels *A* and *b* must be  $\frac{1}{2}$  an inch thick. The recess in *A* extends to within  $\frac{3}{8}$  of an inch of the extreme outer edge of *A*, which leaves ample strength for the teeth. Working into the wheel *b* is a smaller wheel *d*, which is 1 inch in diameter. This wheel *d* is mounted on a short arbor, which extends through the head block at *i*, fig. 1. Attached to this arbor is a pinion  $\frac{3}{4}$  of an inch in diameter and  $\frac{1}{4}$  of an inch thick, with 20 teeth; this works into a wheel  $2\frac{1}{4}$  inches in diameter and 60 teeth. Of course these teeth are finer than those used for propelling the work. The train of wheels conveying the motion from *i* down diminishes the motion until the piece to be turned in the lathe makes 12 or 15 revolutions to the feed screw 1; and also in cutting screws, the wheels shown at *f g h j k* can be disposed so as to cut screws of 10, 20, 24, 30, 36, 40, 48, 50 or 100 to the inch, or even finer than 100 to the inch. The pinion which goes on the feed screw is tapped to match the thread, so that you can set the head block at any place and run the pinion *k* to place, fix it to the feed screw and go on with your work. How to do this and to cut screws with a rotary mill will be next considered.



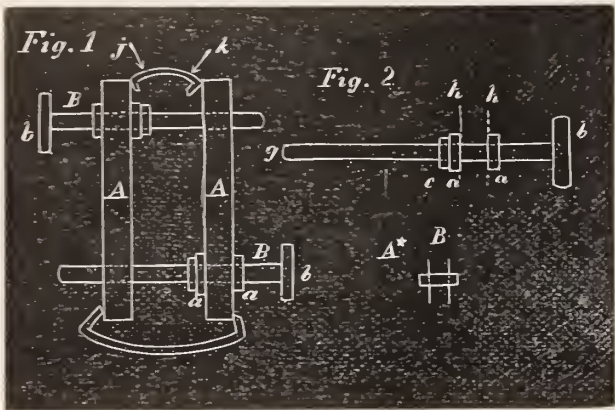
once, and  $3 \times 4 = 12$ , or the countershaft *J* will turn around 12 times to the work in the lathe once. Now, by means of the wheel *H* being adjustable, we can change the size and number of teeth in *I*, and vary the speed of the work in the lathe. If *I* is  $1\frac{1}{2}$  inches in diameter with 28 teeth we have  $\frac{1}{3}$ ; if *I* has 21 teeth,  $\frac{1}{4}$ ; if *I* has 42 teeth we have  $\frac{1}{2}$ , or the work turns  $\frac{1}{3}$  as fast, consequently we can make almost unlimited changes in our speed by simply changing the wheel *I*. We suppose it is hardly necessary to say that fig. 1 is a view seen in the direction of the axis of the lathe, and fig. 2 is a view seen from above, or a plan, as it is more correctly called. We next come to the arrangement for turning the feed screw located in the recess at *L*, fig. 1. The end of the bed and ways are shown at *W*, fig. 1, and at *L* is shown, in dotted outline, the cock for holding the end of the feed screw. This screw has been repeatedly mentioned and described, but we would say, to save the bother of looking it up, it is 24 inches long,  $\frac{7}{8}$  in diameter, turned of soft steel, with 10 threads to the inch. The wheels for propelling the feed screw need not be as thick as those for driving the lathe, and they can have fine teeth. If the wheel *A* is made  $\frac{1}{2}$  inch thick, the wheels for moving the screw need not be more than  $\frac{1}{4}$ . At fig. 3 is shown the wheel *A*; it is recessed so as to allow one of the  $\frac{1}{4}$  inch thick feed wheels to work inside, or perhaps it would be better to say two of the feed wheels inside of it, as the wheel *d* is also inside the recess. The wheel or pinion *b* is firmly attached by a hub to *A*, surrounding the hole *c*, which goes on the fixed center of the lathe. The best way to

### Advice to Watchmakers' Apprentices.

BY A MAN WHO HAS SPENT TWENTY YEARS AT THE BENCH.

I MENTIONED in my last article about bending pallets if too wide or too close; to do this well requires a special tool. This tool is quite easily made, and is shown in fig. 1. It consists of two pieces of brass or steel shown at *A A*. Those pieces should be about 2 inches long and  $\frac{3}{16} \times \frac{1}{4}$  in cross section (shown at *A\**). These pieces are drawn together or forced apart by two screws shown at *B B*. These screws should be about  $2\frac{1}{2}$  inches long and made of steel wire about  $\frac{1}{16}$  of an inch in diameter, and threaded nearly the whole; one end is provided with a thumb nut shown at *b b* to turn it by. The construction of this screw will be better understood by inspection of diagram *B\**, where three loose nuts are shown which serve to enable us to use the clamps *A A*, so as to either close the pallets we are operating upon together or force them apart. To make the screws *B*, as shown in diagram *B\**, turn a piece of thick sheet brass for the thumb nut *b*; drill a hole in it and tap out the hole; then cut a short screw on the upper end of *B*, and screw the thumb nut on and rivet it fast to *B*. It would be as well to cut the thread for the part of the screw doing the clamping, which extends from the dotted line *d* to the extreme end at *g*, before the nut *b* is put on. We next provide 3 small brass nuts, shown at *a a c*. After the screw *B* is threaded up to the line *d*, we run on one nut until it jans against the unthreaded portion of *B* at the line *d*; we next pass our screw through one of the pieces *A*. Each of these pieces is pierced with two holes, one of these holes being large enough for the screw to pass freely through, and the other tapped to fit the screw *B*. We put the screw we are considering through the largest hole and run on another nut *a*, until it clasps the pin loosely. We next run on the third nut *c*, to act as a jam nut to hold the last nut we put on in place. This process is repeated until both screws *B B* and jaws *A A* are in place, as shown in fig. 1. It will be seen that by this arrangement this kind of clamp can be made to either close a pair of pallets or open them. At *C* is shown a pair of pallets being closed, and at *D* is shown a pair being forced apart. The method of using this clamp is to put the verge in as at *C*, if the pallets are to be

closed, and screw the clamps together so as to exert considerable force on the pallets, but of course not enough to endanger their breaking. While the tension is on the verge apply heat, either with the flame of your lamp, or a blowpipe jet to the verge at the points indicated by the arrows *j k*. The choice in these points being directed by the desire of which pallet you wish to give the greatest inward bind. And so again, in spreading a set of pallets, as shown at *D*, the heat is applied to favor the pallet most in need of changing. Of course the depth of the engagement of the pallets and scape wheel will have to be changed so as to compensate for the binding. Having facilities for changing the pallet action will pull a man out of a good many holes in clock repairing. In cleaning even Yankee clocks, when we have to take them apart, is best done with soap and water a little above blood heat. And the writer has never found a soap so generally useful around a jeweler's place as "Babbitt's Best." This is no advertisement for "soap," but over 15 years of use prompts the remark. After wash-



ing, dry in hot boxwood sawdust, being careful to brush, with a very fine brush, all the sawdust off. Here let me call the attention of the trade to the advantage of using your sawdust hot: It does the work in one-fourth the time and much more satisfactory. In washing a clock movement, a tolerably stiff brush should be used; and in washing the plates, if care is used in manipulating the brush, very little, or any, pegging out pivot holes will be needed. Of course any and all repairs are done previous to the washing. The use of benzine for clock cleaning, except for removing gummy oil from the mainsprings is of questionable service. I imagine let any person give warm water and soap and benzine both a fair, square trial, and there will be but one verdict, and that will be for the soap and water. In cleaning French clocks, a cyanide dip, made by dissolving  $\frac{1}{2}$  an ounce of cyanide of potash in 1 quart of water, is very useful. Here again it is understood that all repairs are made before the dipping is done. After dipping 15 or 20 seconds, the parts so dipped should be well rinsed with warm water, or clean water at any rate; then dried and brushed with a hard brush and chalk, being careful, in subsequent handling, not to stain. Vienna lime gives an exquisite polish to French clock plates, but it is next to impossible to get it out of the pivot holes, where it does a power of mischief. The pinions should be carefully searched for rust or rough unfinished places. If rust is found it should be oiled and rubbed off with some steel instrument, not hard enough to make deep scratches in the pinion. A pointed piece of pegwood and oil and oil-stone dust rubbed rapidly back and forth in the pinion leaves will soon get them smooth; then follow with diamantine and alcohol in the same manner. Ammonia mixed with soap and water for the gilt portion of French clocks is an excellent preparation; but avoid using it on simple brass surfaces, as it stains them abominably. Even the gilt parts must be carefully rinsed with an abundance of pure water, or the gilt surfaces will break out with grains of bright green verdigris. Pivoting of the wheels of French clocks is not very readily done either with the wax or split chuck lathes. The best method is a double center lathe, using a back rest, which has been often described and illustrated in this journal.

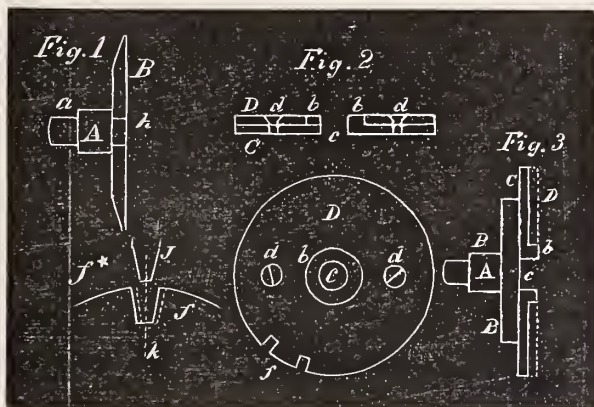
Very frequently, the entire cause of a French clock stopping lies in the mainspring and barrel. The old and dried oil has been allowed to accumulate until it is thicker than tar, and prevents the mainspring uncoiling. The best method is to remove the spring and cleanse it thoroughly with benzine. The great difficulty attending this method is getting the spring back in the box or barrel. A large mainspring winder is the tool experience has taught us to be the best; but they are expensive and but few jewelers have them; still they are an essential tool where one gets many French clocks to repair. Taking out and putting in mainsprings in these barrels with one's fingers is reprehensible, as it always puts a twist in a spring so that when free from the barrel it will stand cone-shaped. If you have no mainspring winder, put a large amount of fresh oil in the barrel, and wind up the arbor several times. Then soak the barrel and spring in benzine, shaking it about until the old oil is well washed away. After the benzine has all evaporated and the spring looks clean then apply fresh oil. Some expert workmen will take out a spring by holding the arbor in the bench vise, and put the spring (bound with wire) back in the same way. This method is not so very easy to learn even with some one to show you; but to describe it intelligibly would take a great deal of space, and it is not so very much better than the benzine process anyway.

### Problems in the Detached Lever Escapement.

BY DETENT.

A LITTLE machine, attached to any live spindle lathe, can be made at a small cost, which will grind the teeth of either a club or ratchet tooth scape wheel to almost absolute accuracy. This subject is of more importance than most watchmakers imagine, as even in our American watches, with their justly boasted accuracy of machinery, there is more error in the form and size of the scape wheel than in all the rest of the watch. The attachment referred to is one which requires extreme accuracy in making, but the assurance that it will amply repay should be sufficient to incite all who are really ambitious to excel to make one. The first thing to be made is a diamond lap for your lathe. This should not be of copper, as has been directed for water grinding pallet stones, as this lap is used dry. It should be made of steel and spring tempered, but shaped exactly as directed for the copper ones described in former articles. The form of the lap is shown at fig. 1, where *B* represents the lap, seen edgewise, or looking at right angles to the axis of the lathe. The chuck *A* and screw *a*, which goes into the lathe, can either be of steel or hard brass wire. The object in making *B* of steel is to have it hold the fine particles of diamond with more tenacity. An excellent experiment to prove how diamond dust will imbed itself into the softer material, is by taking a large burnish bench file, and taking a very little diamond dust on the point of a knife, and try to grind it as a painter grinds and mixes his colors on his pallet with his pallet knife. The diamond dust should be dry; now try to rub the dust with the flat side of your knife point and you will find the particles gradually reduced in size, but many will be imbedded in the knife point, but none in the harder steel file, and still the knife is comparatively hard. The lap *B* should be spring tempered and turned off true and flat, and the face ground before the diamond dust is imbedded into it. The imbedding or working in should be done with a piece of agate or steel; if the latter, let it be as hard as fire and water will make it. The diamond dust must be as fine as possible, avoiding all coarse particles. We next want a division wheel, for spacing the teeth, of 15 accurate divisions. This wheel must not be more than  $1\frac{1}{2}$  inches in diameter, and should be composed of two discs, as shown at *C D*, fig. 2, united by two screws, *d d*. One of the discs is made of brass, just twice as thick as the other, so as to permit a socket to extend through the other. This will admit of one disc being turned

on the other, and leave the centers exactly coinciding. This will be understood by inspecting fig. 2, where *C* shows the thick brass disc; *b* the socket, and *c* the hole for mounting on the arbor. If you have a Universal lathe, making such a pair of discs is mere nothing. All you have to do is to put a piece of thick sheet brass in your lathe, bore out the hole *c*, recess back to form the socket *b*, then cut out to the right size. If you have no Universal lathe, it is a little more difficult; but we will suppose you have some kind of a going spindle lathe, so as to take a chuck like *A*, fig. 1. On this we fit a plain brass disc for a small face plate. It is made precisely as shown in fig. 1, except to say that *A* and *B* are firmly screwed together at the dotted lines at *h*, and the outer end of the screw riveted, the face turned off true and flat. The hole in face plate where the screw is should be countersunk to give the riveting firm hold. We next get out a piece of thick brass,  $1\frac{1}{2}$  inches in diameter, and soft solder it to our face plate, as shown in fig. 3, where *B* represents the face plate just described, and *C* the thick sheet brass. We next turn in the center shown at the dotted lines at *c*; then turn away the disc *C*, until it is cut back to the dotted lines, leaving the hub *b*. A disc of thinner (half the thickness of *C*), should be fitted on the hub *b*. The fitting of these two discs *C* and *D* should be nicely and carefully done, so that the disc *D* will revolve on the hub *b* without side shake. The piece or disc *C* should now be removed from *B*, and the two discs *C* and *D* united by the two screws *d d*, fig. 2. These screws should be exactly



opposite to each other, as shown, so that *D* can be turned half way around, and the screws go in their places. We should now cut in, with a dividing engine, 15 notches, two of which are shown at *f*, fig. 2. These incisions, or notches, should be almost or quite straight in, and, in the present instance, should be about  $\frac{1}{16}$  of an inch wide and  $\frac{1}{10}$  deep. After the notches are cut, the discs are turned half way around, and, if any inaccuracy of spacing should exist, this changing will remedy it. To illustrate, we will suppose on reversing the discs, that some of the incisions present the appearance shown in diagram *f\**, where the full lines represent, say the disc *C*, and the dotted ones the disc *D*. Now, the actual line of division of 15 spaces of our composite wheel is on the line *k*, and if our stop piece *j* is slightly wedge-shaped, and works on a radial line, our spacing must be absolutely correct, or if not positively correct, so near correct that we can detect no error. The next thing to do is to mount our dividing wheel on a suitable arbor. Here comes a chance for very nice fitting and turning. A piece of large steel wire,  $1\frac{1}{2}$  inches long, and  $\frac{3}{8}$  in diameter, is drilled through the entire length, with a hole  $\frac{1}{10}$  of an inch in diameter. Upon this hollow arbor the division wheel described above is mounted; and an arrangement by which the wheel can be adjusted, so as to bring the teeth of the scape wheel against the diamond lap at any angle in succession of 15 perfect spaces.

The full details will necessarily run into another number, in which will be given a full description of all the parts. A great advantage of such a device is it permits the scape wheel being taken out and actually tested in the watch, and then put back in the machine and the mere tips of the teeth again touched up. For

such persons as would like to see what they can do in making an escapement for themselves, the writer would say, with this device, it is perfectly practicable to make a club tooth escapement, utilizing fully  $11^\circ$  scape wheel action.

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Letters to Watchmakers.

[By DR. LEONARD WALDO, Astronomer in charge of the Horological Bureau of the Yale College Observatory.]

VIII.

THE APPLICATIONS OF ELECTRICITY TO HOROLOGY.

First Considerations.

Continued from page 137.

OUR *ohm* then is the measure of the resistance through which electricity is flowing. It may take any shape we like. For instance, it may be a long thin piece of copper wire, or a shorter piece of German silver wire, or a bit of wood, or paper, or any substance we like. The one condition which our *ohm* fulfills is that it *resists* the current just as much as the standard piece of copper or German silver will, which we call the unit *ohm*.

This ohm has been determined with very great care, and you can buy from any electrical instrument maker a piece of wire, carefully sealed up in paraffine, which is a good non-conductor, which has just this amount of resistance. These standard ohms are so arranged that you can send any current of electricity through them, by connecting the conducting wires with the screw cups at the top of the small brass box in which the piece of wire representing an ohm is sealed up. The wire used for such, and generally for all "resistance boxes" as they are called, is German silver. This metal not only has a high resistance, and therefore requires shorter lengths than other easily obtainable metals, but it changes its resistance only very slightly with changes of temperature. The reader will readily understand that not only single ohms are thus put up in boxes, but any number of ohms, divided in any way desirable, may be enclosed in the same box. Thus I have before me a box which I can so arrange that the current passing through it has to go through any resistance I please, from  $\frac{1}{100}$  of one ohm to 11,000 ohms. Such boxes, made of spools of German silver wire, may be bought of the makers, or the reader, if he chooses, can make one himself. If he wishes to do the latter he will find a full description of a way to make such a resistance box in the third series of "Spon's Workshop Receipts." (E. & F. N. Spon, New York, 35 Murray street. \$2.00).

If we were considering a fluid like water instead of a fluid like electricity, we should also remember that not only is its quantity or flow dependent on its aperture or resistance, but it is also dependent on its "head." A column of water ten feet high flows out of a half inch hole at its base with a very different force and pressure than does the water from the same sized hole in the bottom of a bucket in which the water is but a foot deep. Now this difference of "head" or height of column has its counterpart in electricity. There may be a very great "pressure" of the electricity in its effort to flow from one metal to another for example. This difference of "pressure" or "head" in the case of electricity is called a difference of "potential." We might use the same term with water. Suppose that a pond was ten feet higher than a mill wheel outside. We could say that the water in the pond had a difference of potential, or potential, as compared with the water at the mill wheel, which was ten feet under it, of ten feet. In the case of water, therefore, a difference of potential would mean a difference of level. We understood, however, that electricity flows in any direction with equal facility. We cannot, therefore, say that there is a difference of level in the case of electricity, but we do say there is a difference of potential whenever there is an effort of the electricity in one metal or substance to pass to another metal or substance.

Take a little piece of sheet zinc and a copper cent. Put one on top of the tongue and the other underneath it. As long as they don't touch each other there is no taste in the mouth. Now bring the edge of the zinc against the edge of the copper. Immediately there is a distinct metallic taste. This "taste" is produced by the flow of a weak electric current from the copper penny to the zinc plate. The electricity in the copper is at one "potential." That of the zinc is at a much lower "potential." When the two are brought in contact there is an immediate "flow" of electricity from the copper to the zinc. In speaking of the difference of potential in the case of water we say it has a "head" of so many feet. Now it is manifestly improper, in speaking of a difference of potential in electricity to use the term "feet," and in seeking some good name for describing the difference of potential it was decided to call it so many "volts."

Here, again, we have the name of a distinguished scientific man attached to a unit of measurement, as was the custom in electrical measurements. Alessandro Volta, who did his best work about a hundred years ago, was a very noted Italian physicist, who did a great deal to show how electricity could be obtained from batteries. Batteries, therefore, are often called Voltaic piles, and the unit of electric pressure or potential has been called a "volt."

So far we have been trying to get clear ideas of the electric current flowing through any kind of a conductor which has a certain resistance, and into which the current flows with a certain head. Now the amount of electricity which is flowing through a conductor at any time depends on these two things: its head or pressure, or, in electrical language, its "potential," and the freedom with which it moves in the conductor, *i. e.*, the resistance it meets with in its path. Of course, as in water flowing, the resistance which fixes the amount of electricity which can go through a given conductor is that resistance which is greatest at any one point. Thus a large copper wire, through which the electric current flows with almost no obstruction, may be imperfectly soldered to another wire equally large. The size of the wires in this case is practically nullified by the imperfect joint, because here the current meets with a large resistance, and only a small part of it can pass at the same time. Suppose we had a river bed with wide bottom lands over which the water spread out on both sides of a narrow rocky gorge. It is perfectly clear that the freedom with which the water spread out over the flats would have no effect on the obstruction at the gorge, and that the "resistance" there interposed practically regulated the stream, if we leave out of consideration the head of water which accumulates up the stream.

The electric current then depends in any given case on two things: the number of "volts" of "potential," and the number of "ohms" of resistance in the circuit.

What do we mean by "circuit?" Broadly defined it means any system of conductors through which an electrical current is flowing. Thus, if a jeweler sets up a cell of battery, a clock and a break-circuit attachment in his regulator, the whole arrangement is a "circuit." In a telegraph line the "circuit" includes the operating key, the sounder, the relay, the batteries, the wire and the earth.

There are two more terms with which we must become familiar before we can talk intelligently about any practical applications of electricity. We have generally to deal in practice with the actual current flowing through a conductor without regard to its potential or the resistance of the circuit. We want to express the amount of current that is flowing past any given point of a conductor at any time, without regard to its origin; whether from a dynamo machine or a battery, or whether it has come through one ohm or a thousand ohms' resistance, is immaterial to us. We want to know, for electrical depositing on metal purposes suppose, just the amount of current going through a given conductor before us.

The amount is expressed in "Amperes." One ampere is the current we have when, with a difference of potential of one volt, the resistance of the circuit is one ohm. Or, expressed in a bit of doggerel verse,

"A volt through an ohm  
Gives a current one ampere."

I think, that if this couplet is fixed in the mind, that its constant remembrance will do much to shorten the somewhat difficult path of getting clear ideas in regard to electrical measurement. *One* volt through *one* ohm gives a current of *one* ampere. Then two volts through one ohm would give two amperes of current. Twenty-five volts through an ohm would give twenty-five amperes of current. So also, one volt through half an ohm would give two amperes of current, or twenty-five volts through one twenty-fifth of an ohm would give six hundred and twenty-five amperes of current. It is reasonable to suppose that if you increase your "volts" (or "head" or "potential") of electricity, the resistance remaining the same, the current or "amperes" will be increased proportionately. So, too, if you diminish the resistance or "ohms" in the circuit you increase the amount of the current by removing the obstructions in its path. The name "Ampere" is that of a distinguished French physicist and electrician.

The second new term we have to use is "electro-motive force."

Electro-motive force is generally the same thing as the difference of potential, and in all ordinary cases is expressed in volts, just as difference of potential is. Professor Fleeming Jenkin, of the University at Edinburgh, who has written the best little book\* which has yet appeared on the general subject, gives the following clear statement of the relation between difference of potential and electro-motive force:

"The name electro-motive force, often written for brevity as E. M. F., is given to the property in virtue of which any combination or system tends to produce a current. Thus, when two conductors at different potentials are joined by a wire, a current flows through the wire, and the electro-motive force is in this case identical with what we have hitherto called difference of potentials; we shall find certain cases in which a current may be maintained in a wire although all parts are at one potential, just as a current of water might be maintained in a horizontal pipe immersed in still water and open at both ends if a wire were drawn through it. The term electro-motive force describes the property in virtue of which the arrangements both in the first and second case produce a current of electricity; E. M. F., it will be seen, is not a force at all, but is a magnitude of the same class as difference of potentials. A given E. M. F. is completely described, when besides its magnitude we have stated the places between which it tends to cause a current to flow.

"It is measured in the same units as difference of potential; in many cases the words difference of potential and E. M. F. may be indifferently employed, but E. M. F. as the cause of a current has a wider signification. E. M. F. cannot exist independently of a source of energy, that is to say, when E. M. F. produces a current, work is done."

We are now in a position to understand the application of the fundamental law governing the flow of electrical currents, first laid down by the German physicist Ohm. It is substantially that the intensity of the current in any circuit is always equal to the electro-motive force divided by the resistance. Generally this law is expressed in this form:

$$I = \frac{E. M. F.}{R.}$$

Where I = the intensity in amperes.

E. M. F. = the difference of potential in volts.

R. = the resistance in ohms.

I say generally, because in some rare cases, which are not likely to occur in horology, it will not do to consider the E. M. F. as the same as a difference of volts in potential.

This formula can be expressed in the three forms:

1. The current in amperes is equal to the difference of potential in volts divided by the resistance in ohms of the entire circuit.

\* "Electricity," by Fleeming Jenkin, F. R. S. 12mo, pp. 128. Published by the Society for Promoting Christian Knowledge. New York: Pott, Young & Co. London, Northumberland ave., Charing Cross. 40c.

2. The difference of potential in volts is equal to the current in amperes multiplied by the resistance in ohms of the entire circuit.

3. The resistance in ohms is equal to the difference in potential in volts divided by the current in amperes.

With these explanations we can work out all the problems ordinarily occurring in horological electricity, so far as the current alone is concerned. Let us consider a few examples: In the case of the piece of zinc and the copper coin mentioned in the first part of this letter, suppose that the difference of potential between the zinc and the copper is one volt. Suppose that the resistance which the tongue offers to the current to be five hundred ohms, how much current passed when we brought the two ends together, and we "tasted" the current, supposing that we brought the two ends so closely together that they made a good connection and did not sensibly increase the resistance there?

In this case we have from (1) the current in amperes =

$$\frac{1 \text{ volt}}{500 \text{ ohms}}$$

which gives  $\frac{1}{500}$  of one ampere.

Again, suppose we need one-half an ampere of current in our circuit to work an electric dial, and that there is already in the circuit enough telegraph instruments and other clocks, wires, etc., to make the resistance sixty-five ohms, how much difference of potential in volts must we have in our battery?

Here from (2) we have: the difference of potential in volts =  $\frac{1}{2}$  an ampere multiplied by 65 ohms, which gives  $32\frac{1}{2}$  volts.

Again, suppose in a given clock circuit we had measured the current flowing through the circuit by an ampere meter to be  $\frac{1}{10}$ th of one ampere, and we knew that we had a battery of twenty-five cells of Daniell's gravity battery, each cell of which had an electro-motive force of  $\frac{8}{10}$ th of one volt, we want to know how much resistance there is in the whole circuit, batteries and all?

Here we have 25 cells, each giving an E. M. F. of  $\frac{8}{10}$  volt, so that we have a total E. M. F. of  $25 \times \frac{8}{10} = 20$  volts, and then by (3) we have:

$$\text{The resistance in ohms} = \frac{20 \text{ volts}}{\frac{1}{10} \text{ ampere}} = 200 \text{ ohms.}$$

Examples will suggest themselves to the reader, and, if he chooses to exert his mind in this direction, he can find an excellent collection of examples worked out and unworked in that admirable little book published by Macmillan & Co., London and New York, by R. E. Day, and entitled "Electric Light Arithmetic." (Small 12mo, 40c., 80 pp.)

(To be Continued.)

## Horology of the Early English Patent Office.

BY LEONARD WALDO.

### I.

IT would have been a boon to those interested in the history of early horology if inventors had been encouraged to patent their inventions in the seventeenth century and later, and thus made some record of their ideas. Unfortunately, it is only within a very few months that those burdensome restrictions about the English Patent Office, which have always repelled the poor, but, perhaps, deserving inventor, have been removed, and the English mechanical artisan encouraged in protecting the product of his brain labor by patents.

The early English patent records are full, however, of the best ideas of the times, and very much which we now think is new, may be found among the descriptions of the office.

The records lead off with a patent by Edward, Marquis of Worcester, February 8, 1661, which describes how "to make a watch or

clocke without string or chaine, or any other kind of winding up but what of necessity must follow if the owner or keeper of the said watch or clocke will know the houre of day or night, and yett if hee lay it aside severall dayes and weeks without looking or meddling with it, it shall goe very well, and as justly as most watches that ever were made."

Abraham Hill (March 3, 1664), tries his hand at inventing a marine pendulum timepiece as follows:

"A new way of making of watches and clocks to be used at sea for exact measuring of tyme towards the finding the longitude and knowing the true course and place of a shipp, differenced from all other sorte of watches by having, instead of a balance, a rodd of wyer, or a thynn narrow plate, with a weight at the lower end thereof called a pendulum, and at the upper end an arme with twoe catches or holes to move it, and certaine crooked places or cheekes for regulating the motion thereof, which motion is produced by one or more springs or weights, the said watches being fitted with balls and socketts to hang by for goeing steadily at sea.—"

John Hadley (March 3, 1693), brings out the precursor of the three-wheel watch as follows:

"A contrivance of measuring time a more compendious way with one wheele onely, which will goe much more exact then movements with multiplicity of wheeles, which will be of very great use and advantage both by sea and land."

And September 23, 1695, is followed by Edward Booth and William Houghton's patent, which describes:

"A new sort of watch or clock with the ballance wheeie or swing wheeie either flatt or hollow, to worke within and crosse the center of the verge or axis of the ballance or pendulum, with a new sort of teeth made like tinterhooks, to move the ballance or pendulum withall, and the pallets of the axis or verge of the ballance or pendulum are to be circular, concave and convex, or other teeth or pallettes that will not goe but by the helpe of the spring to the balance, which will make such watch or clock goe more true and exact, and be of greater use to our subjects, both at sea and land, than any heretofore made or now used."

The first appearance of patenting anything connected with jewelery watches appears May 1, 1704, in a patent taken out by Nicholas Facio, Peter Debanfre and Jacob Debanfre, describing

"An art of working pretious or more comon stones (whether naturall or artificial), christal, or glass, and certain other matters different from metals, so that they may be employed and made use of in clockwork or watchwork and many other engins, not for ornament only, but as an internal and usefull part of the work or engine itself, in such manners as have not heretofore been used."

Repeating quarter-hour clocks appear in a patent of January 11, 1732, to John Rowning for

"A new invented clock, which with only one set of wheels besides the watch part may be set in the comon course of its motion to strike the hours only, or the hours and quarters, or the past hours with each quarter, or to be silent, and also, by pulling a string, repeats both hour and quarter."

The first pickpocket preventive appears in a patent issued to Benjamin Cartwright, Jan. 31, 1749, for

"A secret spring to secure a watch in the pocket or to the side. The spring is fastened to the wearer's dress by a string on two small screws, and the watch chain falls into or is attached to a loop, which by an easy pressure locks so as to prevent the watch from falling out of the pocket or being snatched from the side. The loop may be easily opened again by touching a small knobb or button."

Machinery and "tools and engines for the preparing, stamping, fixing, turning, cutting and finishing," parts of a watch were patented by George Sanderson, June 25, 1761.

Frederick Kehlhoff patented November 29, 1764, a form of remontoir escapement, and the combination with the fusee principle of the snail and mainspring. He describes his remontoir as follows:

"This little spring makes the watch go, because the power of the main-spring goes no farther than to wind up that little spring, and is the great spring. If the second or third wheels take in a little too deep or not deep enough, it cannot cause an unequal pit, because this little spring is always wound up."

Eardley Norton, May 2, 1771, invents

"A clock which strikes the hours and parts upon a principle entirely new, and a watch which repeats the hours and parts, so concisely contrived and disposed as to admit of being conveniently contained not only in a watch but also in its appendage, such as a key, seal, or trinket."

John Arnold's first important patent for the vertical spiral balance spring and the compensated balance, appears with the date of 1775, December 30th, as follows :

"A new pendulum spring for timekeepers, and the method for compensating the effect of heat and cold of the same." A helical or cylindrical spiral spring, made by winding a straight lamina of steel round a cylinder, on which it is hardened and tempered, is fastened to the balance vertically. The compensation is in the balance, and on the under side is affixed a spiral, composed of two metals, brass and steel, the inner end of which is screwed to the collet of the verges ; the other end has a small hole into which the pivot of a lever is inserted. Two segments of circles are combined with this lever, by means of arms, and made to approach the center of the balance in hot weather, and recede from it in cold, by the expansion and contraction of the said spiral.

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### Clock and Watch Oils.

BY LEONARD WALDO.

AS MECHANICAL science has been developed, and it has become an object of great importance in measuring machines of precision that screws should move with absolute uniformity, the influence of films of oil has been carefully considered. There is no use in pretending to measure with a vernier calliper gauge to the one-hundred-thousandth part of one inch, if it is established that the oil used for lubricating the screw threads itself makes that difference in measurement at different temperatures.

So difficult did it appear to those interested in measuring engines to get rid of the varying qualities of oil used in lubricating them, that now it is a recognized principle of construction that bearings in such precision machines must be between metal and jewels (or agate surfaces), and be used without oil. Watches and clocks are the machines now in which the oil plays the most important part of any lubricant in any machinery. Ordinarily the excellence of the lubricant may vary within wide limits without affecting the quality of the output of a machine. The article manufactured has little to do with the lubrication of the machine making it. In clocks and watches, however, there is a direct influence on the watch's or clock's rate, whenever the oil, for any cause, varies the friction which occurs between the moving surfaces in the different parts of the train.

The qualities which a theoretically perfect lubricant for watch and clock trains should possess may be summarized as follows :

1st. *There should be no change in its viscosity between the temperatures of 0° F. and 100° F.* That is, the oil should flow just as readily at the cold temperature as at the warm. This may be tested in several ways, the best among them being to take a plate of clean glass, and insert it at an angle say of 30° in such an oven as is ordinarily used for rating watches. Bring the temperature of the oven up to 100°, and then let a single drop of the oil to be tested fall from a round tube at the upper edge of the plate. The oil will begin to start down the plate, and after twenty-four or thirty-six hours will have made a certain progress which can be measured in inches. Now, take a similar glass plate inclined at the same angle and inserted in a box which can be completely surrounded by a mixture

of ice and salt made in the proportion of two parts of snow or pounded ice to one part of common salt. This will give a temperature to the ice-box of about 4° F., which is low enough for this experiment. Now, having brought the plate of glass to the low temperature, drop the oil from the same tube used in the hot box on the upper edge of the glass plate, and measure how far the oil will travel in the same time, as before. Except in the case of a good oil, it won't travel at all : and the oil approaches perfection in this particular as the times are nearer the same.

The glass plates used in these experiments ought to be *clean*. They may be made sufficiently so by polishing them with paper and alcohol, or benzine, and after cleaning they ought not to be touched by the fingers on their surfaces. Another simple way of testing the viscosity of the oil is to note how long it takes the drops to form and fall from a glass tube which has been drawn out to a point, and which is filled with the oil to the same level in both cases. The tube can be surrounded with ice and salt in one case, and surrounded with warm water in the other. If the oil has the same limpidity at 4° F. that it has at 120°, the times of forming and dropping will be the same in both cases.

2d. *There should be no disposition to "creep" between 0° F. and 100° F.*

The gradual spreading of a drop of oil over its immediate surroundings is an imperfectly understood phenomenon, but it depends, among other things, on both the oil and the surfaces to which it is applied. It is probable that some preparation could be found, which, applied around any given oil about a pivot hole, would limit the oil within the circle described by it. So far as the "creeping" belongs to the oil itself it may be tested by the glass plate placed horizontally in the oven or refrigerator. Let a drop fall in the middle of the glass plate and examine it at the end of a week, and then of a month. In the case of some oils of very good repute for their other qualities, it will be found that the drop has spread over several square inches. In the case of the very best oils, however, the drop will remain as at first put on the plate, round, with no border to it.

3d. *There should be no evaporation at 120° F.*

This may be tested by putting a smaller drop than in 1 and 2 in a glass plate in the oven and keeping it at 120° for two weeks. If at the end of that time the drop retains its form, and there is no appearance of gum or thickening at the edges when viewed with the bench eye-glass, it may be assumed to be free from evaporating substances which in time would cause it to "gum" in a timepiece.

4th. *The oil should be free from any substance which will in time act on the brass or steel and so change its chemical constitution.*

This may be tested by placing in a bottle of the oil a number of small pieces of highly polished brass and steel, putting it away in the dark, and after a month or so examining the surface of the metal. In this experiment care must be taken to have the pieces of metal *clean*, and free from the effects of handling. They ought to be carefully washed first in alcohol, and then rinsed in distilled water. At the end of the month the oil will probably have turned a shade darker, and the metal will have become slightly tarnished. The test is a very severe one, and in the case of ordinary oils with traces of acids, etc., in them, the metals become badly tarnished, and the oil quite "gummy."

A second test of the same nature is to place a drop of the oil on a surface of polished brass. In a few weeks the greenish color of the drop of oil will indicate its inapplicability to good timepieces.

5th. *The oil should be free from free water or acids, and should not change its chemical constitution by age or exposure to light.*

If a little of the oil is shaken up with distilled water, and then the water after settling is carefully siphoned from under the oil, the water can be easily tested by a piece of blue litmus paper. If it turns red in the water, acid, of course, is present. The action of light on the oil can best be ascertained by exposing a bottle of the oil to the sun for several weeks. A dark or brownish deposit indicates a disintegration of the oil.

6th. *The oil or liquid used must be a lubricant in its nature, and not mucilaginous, or with a tendency to cause surfaces to "stick" together, or to cause the particles of the oil itself to adhere too closely to themselves.*

Two plates of glass, with a thin film of the oil between them, ought to slide apart when they are inclined even a very few degrees.

There is no lubricant known among the oils which will fulfill all the above conditions; but there are some general principles which ought to be considered in deciding upon an oil for any particular purpose.

It is not very important that the oil should be a very good lubricant. It is only important that the oil should retain its uniformity of structure and friction through varying conditions. Water, or ether, or alcohol, or carbon disulphide, or many other liquids might be named, not oils, which would probably lubricate the surfaces sufficiently if they would only remain in place. Of the oils, the petroleums most nearly have the properties which fit an oil for watch and clock work. Unfortunately, they all evaporate, and most of them "creep." In the term "petroleums" I include all mineral oils.

A very accomplished watch and clock maker, who "served his time" in England before coming to the United States, told me that he always added a certain proportion of refined kerosene to his clock oil, and that a very excellent clock oil was obtained by simply adding to refined winter pressed sperm oil a certain proportion of kerosene. Now, undoubtedly, a very good oil for temporary purposes can be obtained in that way. The addition of the kerosene to sperm or olive oil seems to enable these latter oils to resist the tendency to form acids when brought in contact with brass for a considerable time. But the final result will be the same. The kerosene will gradually evaporate, the sperm or olive oil will gradually absorb the oxygen of the air, and six months or a year witnesses the green coloring, and the "gumminess" which characterizes pure sperm or pure olive oil alone. The broad rule may be laid down that mineral oils alone exposed in their surfaces to the light and air will gradually become acid and evaporate, while the sperm and olive oils alone will gum and clog. We must, therefore, seek oils of another class, and in the present state of knowledge, without any rule to go by in our search, experience has shown that certain other fish oils than the sperm, such as the oil from the black fish, the porpoise, and other fishes of like nature. Some of these oils, treated by processes which are trade secrets, fulfill more of the six conditions above laid down than any mineral or animal oil yet discovered will do.

I do not think, however, that the future lubricant for clocks and watches of a high grade has yet been discovered. Some time since I had occasion to lubricate one of the bearings of a telescope, exposed to very great changes of temperature, and yet a bearing which I wanted to move uniformly at all seasons of the year.

I tried the experiment of mixing enough graphite, obtained in its finest powder from one of the graphite crucible companies, with a high quality of watch oil, to make a pasty mass. The lubricant has kept its place for two years, has remained unchanged, and is a striking example of the value of a lubricant made up of the permanent qualities of graphite and the moistening qualities of the watch oil. In adapting such a lubricant to clocks and watches two difficulties will present themselves. The mixture of the graphite and oil being mechanical, the graphite will gradually settle to the bottom of bottles holding it, and, it is difficult to get a powdered graphite free from grit. Both these difficulties can be overcome. The second most easily by preparing the graphite by some method of precipitation which will give the final powder in an impalpable form.

This seems to me a very promising direction in which to experiment, and I hope that by uniting some thoroughly stable liquid with graphite that a lubricant may be found sufficiently thin and stable to do the work required.

There ought to be a distinction made between the oils used for

the different parts of a watch. Thus the Menhaden oil will rapidly corrode a brass plate, and yet used in a jeweled hole with a steel pivot, would probably answer very well. It ought to be remembered that brass contains several ingredients which are attacked by very weak acids even, whereas steel is attacked with much greater difficulty, and forms compounds with the acid which are more apt to merely result in taking up the acid and forming an insoluble salt of iron which exerts no further effect in the oil than to neutralize the acid and leave it practically free from further corroding effect. It is, therefore, important from the standpoint of the oil that bearings be jeweled. In this case the oil does not act on the brass, and has only the action on the steel pivot to impair it.

Those parts of the watch which are protected from the air and are closed within themselves, such as the mainspring in its going barrel, can be oiled with any such petroleum as vasaline or cosmoline with advantage. Prevented from evaporation these lubricants are excellent—and if not too thin they will not "creep."

Among the clock or watch oils sold in the market, I can say, after a critical examination of some fifteen different brands of manufacture, that there is the widest range of excellence. Several of them are conspicuously above all the others, and among them are oils which can only be used to the disadvantage of the work in hand. I am not at liberty to make the results of this examination public, but I would like to suggest to the watch and clock oilmakers that a competitive trial of oils would lead to some highly interesting results, and that one of the important things which capable jurors on horology can do in such exhibitions as the present "London Inventories" is to make careful reports, founded on direct experiment, concerning the clock and watch lubricants now manufactured.

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## Gossip of the Month.

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THERE has been little change in the business conditions of the country since our last month's issue. In the dry goods market there have been some very large sales of staple goods by auction, and it was gratifying to observe that they found ready buyers at good prices. In fact, those interested were most agreeably surprised that prices were so well maintained, as many had anticipated a heavy break. This was particularly noticeable in the sales of cotton goods, and also in flannels, aggregating millions of dollars, and the result put fresh courage into those who handle these and kindred lines. As a rule, however, business men still complain of a lack of activity among buyers; while there is a respectable volume of trade, keeping everybody doing something, there has been no rush of buyers, and the anticipated "boom" has failed to materialize. The banks carry millions upon millions of dollars in their vaults for which there is little demand; money is about the cheapest thing in the market, provided one has good collaterals to offer as security. But business men do not require it and so it lies idle, for the banks pay little or no interest—indeed, they do not like to be responsible for its custody when they cannot invest it profitably. Enterprise languishes; there are but few extensive public works in progress to employ money and keep it in circulation; there is little railroad building, and the great manufacturing industries are either idle or running on part time. Why there should be this dullness is inexplicable; no one appears to be able to solve the problem of inactivity. The country is in a most excellent condition, abounding with products of all kinds and excellent prospects for the future, yet there seems to be a general reluctance to "push things" on the part of business men. The jewelry trade is neither better nor worse off than other lines of industry; it has its fair share of the business that is being done, but it suffers in common with all others from the general inactivity. In our visits to the various manufacturers and jobbers we find them anxious for increased trade, but thankful for what they have, cheerful and full of hope for the future. In some places we

find everybody busy, and are informed that they have a fair amount of orders, but the amounts are smaller than in previous years; still there is enough doing to convince them that the time has not yet come for putting up the shutters. In other places we have found the employees playing checkers for the want of more profitable, if not more congenial, occupation. The next day, probably, they were the busy ones, and their neighbors the checker players. So it goes—the trade fluctuates, good one day and dull the next, and it is on the dull days that the grumblers are out in full force. But, with all their grumbling, they are confident that a reaction from present dullness must come, and that the closing months of the year will show more activity than those that have passed have done.

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THE early-closing-on-Saturday movement went into effect very generally on the first of June, and is pronounced to be a success. There is just as much business done during the week as there would be if the offices were not closed at one o'clock on Saturday, while proprietors and employees obtain a much needed respite from business. It enables many a tired man, worn out by the daily routine of his labors, to spend Sunday in the country, which he could not do but for the Saturday half-holiday. Steamboats and railroad trains run with the greatest frequency, and an hour or two suffices to transport one from the dusty streets and brick-and-mortar piles of the city to some fresh rural scene, where all the surroundings are in direct contrast to those which he encounters in his daily work. After a quiet Sunday in the country, an early train brings him back Monday morning, refreshed and rejuvenated, ready to enter upon the duties of the week with increased vigor. Add to this the fact that employees recognize the kindness of their employers in the matter, and are grateful to them for it, and there is nothing lost through the early closing movement. It is pleasant to note, also, that nearly all other lines of business have adopted the same plan, so that thousands of men and women now enjoy a half-holiday every week during the season when it is most needed by them. "All work and no play makes Jack a dull boy," while a little judicious recreation makes the employed a more valuable assistant to his employer.

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EVERY man engaged in a manufacturing business is compelled to draw on his ingenuity to provide what the public wants, and to keep pace with the progress that is constantly being made in the arts and sciences. In no line of business is there a greater demand for brains, for originality and artistic taste than there is among the jewelers. Fashions and styles are constantly changing, and the manufacturer who would win success must be progressive and prompt in bringing out new designs. To this end they employ artists and designers, and are at large expense in developing their ideas. Frequent failures occur, the articles produced at much cost failing to catch the public taste, and all the labor and money expended upon them are wasted. This is a source of expense that the public knows nothing about, and does not take into account when purchasing goods. The perpetual struggle to please them made by the manufacturers does not appear in evidence, and so is not appreciated. But what an outrage it is for one manufacturer to steal the work of another, appropriating to his own uses the skill and ingenuity that has produced an original design, and reproducing the same goods without the slightest acknowledgment to the originator of them. We have frequently heretofore condemned in vigorous terms these piratical practices, but recent instances of such robberies make a fresh reference to the subject timely. There are those who do not recognize rights of property in the products of the brain, and hence when they see a new design that is likely to become popular, they forthwith

appropriate it as their own. It is no matter to them that the originator may have spent hundreds of dollars in bringing it to perfection; the pirate wants it and deliberately appropriates it, imitates the goods, and enters into competition with the manufacturer who by rights should control the market for that particular article. Possibly the pirate claims to be a good Christian, is a member of the church and moves in the best social circles; he would not pick a pocket or commit a burglary; still he has no compunctions of conscience whatever when he deliberately steals the fruits of another man's brains and labor, and robs him of the benefits he should derive from them. From a moral standpoint we see no difference between stealing brain work and appropriating portable property; the owner is equally defrauded in either case and sustains positive pecuniary loss; when the products of his brain are taken by another, he not only suffers a money loss, but great annoyance and mortification. If his work is patented, he may, after much litigation and further expense, obtain redress, but prosecutions for patent infringements are so rarely continued till a judgment is reached, that the pirates count upon this fact, and so rob their neighbors with impunity. If the person robbed ventures to protest, he is apt to be subjected to further indignity for his pains. To prosecute them for their offences is to send good money after bad customers. Piracy has become so common that even a patent is but little protection, while designs that are not patented have no claim whatever to the respect of these unprincipled pirates. The evil is a most serious one, and greatly tends to embarrass those honorable manufacturers who are earnestly striving to satisfy the public demand for better goods, more artistic in conception, of the best workmanship, and possessed of an intrinsic value to correspond with their appearance. It is certainly discouraging for the manufacturer of such goods to find them reproduced in base metal and sold at so low a price as to drive his finer goods from the market.

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A CUSTOM prevailed for many years among publishers of books—and still does to a considerable extent—of announcing in a particular newspaper that they were preparing to publish a specified book. This notice served to inform retail dealers in advance regarding forthcoming works, and also as a warning to other publishers not to produce the same book. Such notice was generally observed, and few instances occurred where one publisher encroached upon the rights custom accorded to another. It occurs to us that something of the kind might be done to advantage in the jewelry trade. Let the originator of a new design advertise to the trade the fact that he has prepared something new, describe it fully and warn other manufacturers against producing a similar design, at the same time that the jobbing and retail trade is notified to be on the lookout for the goods, and advised not to buy imitations of them from any one else. Let the announcement be accompanied by an illustration showing the peculiarities of the goods, so that purchasers cannot possibly make a mistake. There ought to be enough of the spirit of fair play in the trade to recognize the rights of the originators of desirable goods and buy only from them. If imitations are offered, refuse them, even though the price be lower, and in a short time piracy would cease because made unprofitable. Even thieves would cease their crimes if they had no way of disposing of the proceeds of them. Jobbers and retail dealers could, by co-operating with the manufacturers in this respect, soon drive the pirates out of business, simply by refusing to purchase of them their pirated designs and imitation goods. The multiplicity of articles made may render this idea impracticable, but it certainly ought to be carried in effect, at least so far as patented designs are concerned.

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IN THIS connection, why would it not be a good thing for the various trade organizations to take cognizance of this crime of piracy,



and endeavor, by decided and harmonious action, to put an end to it? From this and other suggestions we have made from time to time, it will be noted that we are of the opinion that the various Jewelers' Associations and Boards of Trade can extend their usefulness. At present they are little more than commercial agencies keeping watch and ward especially over the members of the jewelry trade. While the matter of credits is certainly one of great importance, there are, nevertheless, others that should not be neglected; anything that has a bearing upon the integrity of the business as a whole, or that is calculated to elevate it in public estimation, are certainly subjects that may well come within the purview of existing organizations. It is a point gained that such organizations exist and enjoy the confidence of the trade in the steps thus far taken; having demonstrated their usefulness in certain respects, a progressive spirit might induce them to deal with some other of the evils with which the trade is cursed, besides those relating to credits, which serve to embarrass every man connected with it who seeks to do an honest business. One of the surest and quickest methods of reforming an evil is to drag it into the light of day and expose it to the scorn and contempt of all respectable men. The worst of those in the jewelry business could be exterminated by the united and decided action of the various trade organizations if they could but "screw their courage to the sticking point" of publicly recognizing and denouncing them.

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THE Jewelers' Security Alliance has done a large amount of most excellent work in bringing to justice some noted criminals who have made it their business to prey upon the jewelry trade. Whenever one of its members is robbed, the best detective talent to be had in the country is set at work to capture the thieves and recover the stolen property. So well is this known by the burglars whose trade is the robbery of safes, that when they find a certificate of membership in the Alliance hanging in a jewelry store they regard it as a sufficient warning to keep off the premises, for they know no effort will be spared to hunt them down. It is not the purpose of the Alliance to supply dealers with preventives against robbery—that is a matter for them to provide for the protection of their own property—nor to indemnify them for losses sustained in consequence of robberies; but its object is to secure the punishment of thieves and robbers, and thus break up those gangs of criminals who infest the country, robbing one jeweler after another, and to secure for them immunity in the future. It has been remarkably successful thus far, and the good work it has done entitles it to the confidence of the entire trade. A certificate of membership is of itself such a degree of protection as to be worth more than the cost of membership, and every dealer in the country should be provided with one—indeed, none can afford to be without it, for it is a duty every business man owes to his neighbors—and especially to his creditors—to provide himself with every available means of guarding his stock, and the thieves have such a wholesome dread of the Alliance, that a membership therein is one of the best safeguards to be obtained. Dealers desiring to become members should address C. C. Champenois, Secretary, 170 Broadway, N. Y.

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THE National Association of Manufacturers and Jobbers, having fully completed its organization, is doing a good work for the trade in a variety of ways. It has weeded out the list of jobbers considerably, retaining upon the list only such as have a legitimate claim to that title, thus wiping out quite a numerous class of persons who claimed to be jobbers, demanding all the jobbers' privileges, but whose trade was really that of a retail dealer. The intention is to

put all retail dealers upon an equality, and not give a privileged few unbusinesslike advantages over their competitors simply because they print the word "jobber" or "wholesale dealer" upon their business cards. To obtain such privileges in future, one will need to be a jobber in fact as well as in name. Of course, those who are left off the list are doing considerable grumbling just at present, and are devising all sorts of methods to circumvent the Association, but these attempts are not likely to be successful, for its members are very much in earnest in their determination to protect the retail trade from all encroachments upon their prerogatives from whatever source the attempt may emanate. Much good has been accomplished also in getting back to uniform prices for certain standard goods, so that all dealers can obtain their goods on equal terms. These are movements in the direction of protecting the retail dealers that THE CIRCULAR has persistently advocated for several years past; and if they are carried out in good faith, they will be of great benefit to the trade. While the manufacturers and jobbers are thus striving in the interests of the retail dealers, these should not forget the reciprocity of favors which should be found in all transactions, but should buy their goods of those who are seeking to protect them. They have complained loudly in the past of those manufacturers and jobbers who have sought the retail trade or have sold to outsiders. They now have an opportunity to show how much sincerity there has been in their complaints by refusing to have any dealings with houses that do this, and bestowing their patronage upon those who seek to restore trade to its legitimate channels. The "you-tickle-me-and-I'll-tickle-you" principle holds good in business transactions as well as in social life. The retail trade has here an excellent opportunity to discriminate between friends and enemies, and to show their appreciation of the efforts made in their behalf by those who seek the best interests of the trade in its entirety.

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WHEN trade does finally take a start, as it is expected to at an early day, buyers will find this market well supplied with elegant goods, rich in design and workmanship. Manufacturers have had an abundance of leisure in which to develop their ideas, and the result is to be seen in the new and novel goods they have to offer. The public will be hard to satisfy if it cannot find in the stocks now offered such articles of personal adornment as will suit their fancy. At present, orders can be filled at short notice, and dealers will do well to make selections at the earliest moment they feel warranted in doing so, for there are good reasons for anticipating an active demand in the early fall, that will keep all hands busy and possibly entail *delay in forwarding goods* upon dilatory orders. Order early and get the pick of the market.

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## Fashions in Jewelry.

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### A Lady's Rambles Among the Jewelers.

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THE demand is growing for originality of design and a higher order of decoration in fine jewelry and silverware. The time has gone by for duplicating commonplace patterns, and sending these out from Maine to Texas dependent on the intrinsic worth represented in the precious metal contained for their chief value. It is not enough now that a brooch, a bracelet, or a pendant be of the finest gold set with rare jems, but the form must be out of the ordinary design; the trinket, in a word, must possess a distinctiveness that sets it

apart from other trinkets, and a sufficiently high order of workmanship to place it among art objects.

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THE present rage for unique patterns and rare combinations has opened a wide field to progressive designers, who are drawing *ad libitum* from the best models of the past as well as from nature, to say nothing of grotesque and preternatural creations of their own brain. The most successful designer is the one most prolific of the *rara avis*, and the most successful manufacturer the one who presents these designs in the most artistic association of precious metals and gems. The consequence is, in the fine jewelry of to-day, is reproduced no end of fantastic subjects—such as sphinx, sea-monsters, dragons, nondescript sea-weed and amphibia. In this onward march from commonplace and useful articles to genuine art work in precious metals, it must be confessed the patrons have a decided advantage as yet over the manufacturer. They are enjoying the highest order of personal and household adornment ever attained, at little or no advance in price over the old-time commonplace trinkets valued chiefly by weight, while their production has cost the manufacturer infinitely more time, labor and money.

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In fine gold jewelry a greater variety of finish is now offered than was ever before known in the market. One may have jewelry with a polished, plain, Roman, nugget, fiber or snow-flake finish, according as taste dictates. This jewelry may be independent of gems for its ornamentation, or, as is often the case, diamonds and colored stones assist in the decoration. There is quite a tendency to the Indian finish, especially when colored gems are employed, and the desire is for rich Oriental effects. Examples of this style are met with in lace pins, finger rings, and bracelets. A fluted surface is used with excellent results on cuff buttons for both ladies' and gentlemen's wear.

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THE beautiful effects on silver, gained by the use of acids and alloys, has been dwelt upon in previous issues of THE CIRCULAR. A comparatively new and very pleasing method of decoration, employed both in jewelry and toilet articles, is the etched decoration. By this process a variety of effects are gained. Sometimes the groundwork is bitten by the acid, leaving the design in bas-relief; again, the design appears in the form of delicate tracery, when only the details of the design are bitten.

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A DECIDED novelty in jewelry for summer wear is silver jewelry, representing marine subjects, and promising to become popular as seaside ornaments. This "seaside" jewelry, made in artistic as well as strange forms, and with such pleasing finish, is likely to hold a strong place in public favor long after the summer months have passed. Lace pins assume the form of queer little fish with jewels for eyes; sleeve-buttons simulate shells and crabs, while sea-weed and a variety of amphibious subjects lend designs for other articles of personal adornment as well as for accessions to the toilet in way of powder boxes, hair pin receptacles, and the like. A silver lizard may serve as a scent bottle, or a glove buttoner; a sea-horse finds a resting place on a silver paper cutter, while a mass of sea-weed becomes a brooch or a chatelaine. Sometimes the object is conven-

tional in shape, the amphibia being expressed in the decoration of the surface by means of etching or applied work. Again, the marine view is produced by enameling on a surface finished with water effect.

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THE chatelaine promises to speedily become a necessary and important addition to the ladies' toilet. Recent productions in this line are of silver, very large in size, and having eight to ten chains suspended. From these chains are hung a needle-book, a pin-cushion, a pair of scissors, viniagrette tablets, pencil—in a word, all the articles likely to be useful to a lady at home during the day, or when out in the morning on a shopping expedition. It ought to be explained that all these articles are enclosed in silver boxes of exceedingly unique design and beautiful workmanship. One seen had a large mass of sea-weed represented in the chatelaine, the articles suspended therefrom being in form of fish, shells, and other marine subjects.

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QUITE new in viniagrettes is the viniagrette holder, which opens in half to receive an English salts bottle. When closed over the bottle the effect is that of a silver viniagrette with the convenience of a glass bottle that may be removed, cleaned, and refilled without the slightest annoyance. These viniagrette holders are manufactured in silver, and are designed to hang from a chatelaine at the side, and show a great variety of style as regards shape and decoration. Some are beautifully etched, and exhibit lights and shades gained from oxidizing; others present an enameled surface, while others again are beautifully decorated with applied metals and amalgams.

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In gold come charm viniagrettes, in fancy forms, to wear suspended from a Queen chain. These chains are very decorative, many of them being set with gems.

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THE scent bottle, come to take the place of the huge cut glass cologne bottles, which had a short-lived craze, are worthy of a larger patronage. These are of sterling silver, five to six inches long, and designed to be worn from a chain at the side. The surface is oxidized and partly covered with applied decoration in Japanese style. The silver bottles are very beautiful to look at, being veritable works of art as regards their decoration; they are also light of weight and convenient to handle.

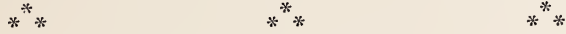
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ANOTHER new thing in way of viniagrettes, is a silver one with screw top and pointed end, designed to carry in the hand, but a little larger in size than the original glove viniagrette of last season. These viniagrettes, like the other styles described, are rich in their number of designs and styles of finish.

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THE newest styles in rings for gentlemen's wear are those which

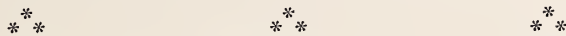
simulate two and three rings. The triple ring consists of two circlets of gold in two colors, the intermediate circlet being of platinum. The double rings show two circlets, one of yellow and one of red gold. A gem is embedded in each of the circlets. A very popular ring for gentlemen consists in a band of crude gold with a gem set low.



THE cords made by twisting together little gold wires and finished off with a running loop are still popular, not only as bracelets, but tied up in knots for scarf pins, sleeve buttons and lace pins. Everybody may not know that this fancy in gold jewelry owes its origin to an old and ghastly superstition, in a word, the luck supposed to attend the possessor of a piece of hangman's cord.



THE single button, either round, square or cushion-shaped, represents the popular cuff button for both sexes, though there remains an active demand for link buttons for gentlemen's wear. The single cuff button comes in three sizes, large, medium and small, the two last being confined mostly to the use of ladies and misses. A button with a rough finished surface and having a small gem in the center, finds much favor. Link buttons in rustic patterns, simulating a bit of bark or a twig, are considered among desirable styles. Every manufacturer has his own idea as to the relative merits of the post, lever, double lever and other patent backed buttons. A customer must indeed be hard to satisfy who cannot find just what he wants in this line nowadays.



COLLAR buttons show as great a variety of finish as do cuff buttons. The most desirable style is the button set with a small diamond or colored stone. These stones are embedded in the center of the button.



THE fancy for carved heads and faces, surrounded by rose diamonds, is a popular one and much employed on rings, scarf and lace pins. A scarf pin seen recently was mounted with a sphinx's head cut in amethyst, the crown and collarette being of diamonds. A Medusa's head in moonstone, set in the center of a diamond star, for a pendant, is exceedingly effective. The moonstone, by the way, figures conspicuously in jewelry now. It is very effective when employed in the manner described.



COLORED stone necklaces are much worn, the gems being suspended from a neck chain so as to swing. In these necklaces, what are termed semi-precious stones play a conspicuous part with their varying and beautiful colors. Pearl necklaces are always fashionable, and the same may be said for diamond necklaces. Coming down to inexpensive ornaments for the neck, are silver necklaces for house and street wear; those consisting of several strands of beads being considered very desirable.



THE rage for wearing diamonds and other gems in all conceivable

places—in the hair, at the thread suspended from the neck, on the shoulder, on the arm, to loop up lace draperies—is at its height, and consequently the majority of rare stones are mounted with a view to becoming a movable ornament. The pendant affords a convenient form for the arrangement of gems, hence pendants are more fashionable than ever, and are made with slide or spring, a pin and a ring, in order that they may serve equally well the manifold purpose of brooch, locket, hair pin and bracelet. An attractive design for a pendant consists of three crescents and a star center, set with diamonds or pearls. Small diamonds are effectively used in pendants as a frame work to a single rare gem. For instance, the small stones form a flower in the heart of which quivers a ruby or other colored gem.



THE neck-slides or buckles which created such a craze abroad last winter, are introduced this season by our own manufacturers in a bewildering number of designs, and promise to have an immense patronage throughout the entire country. It is very safe to say these neck-slides will be exceedingly fashionable this summer to wear with dresses cut low enough to expose the neck of the wearer. The slides are worn on a velvet ribbon of any desired hue, and presents the appearance, as the name indicates, of a buckle or slide. Originally these ornaments were veritable buckles, but the newest productions are made with pins, so that the trinket can readily be transferred from a neck ornament to a bonnet pin. The prettiest styles are those made of small diamonds, pearls, turquoise and other stones, set so as to show almost no gold at all. Then there are all gold neck-slides in pretty patterns. In many instances, these ornaments lose all suggestion of the original buckle and take on the form of a four-leaved clover, daisy or some fanciful design.



THE effort to introduce round pins again, it is believed by up-town retail jewelers, will eventually succeed; at least, there is quite a demand for all pins of this form that show originality of design. Among the more desirable specimens in this line, is one consisting of a crescent of pearls, between the two ends of which is set a beautiful Limoges enamel representing an appropriate mythological subject. An oblong Limoges painting in miniature, encircled with diamonds, is another attractive pin classed with round pins, which must not be confounded with the old time brooch. This latter was uniform in size and usually exceedingly heavy and clumsy in appearance. The modern round pin, on the contrary, as a rule, is irregular in form, suggestive in design and very artistic in finish. It is called "round pin" rather to distinguish it from the lace pin and the flower pin, between which it occupies an intermediate place, than to designate its shape, which, in point of fact, is rarely round.



IT WOULD puzzle a Philadelphia lawyer to decide which of the two exceedingly popular articles, the little ribbon pins, or the gold glove buttoners, exhibit the largest number of ingenious designs. Every possible conceit appears on each, and it is no wonder that ladies usually end their selection of these by buying several. The cost is trifling in comparison with their beauty and convenience, and then they are such pretty little trifles to give away. In this connection it may not be amiss to note the beautiful effects gained in flower and other pins on which enamel is employed by our own manufacturers.



AMONG new things in toilet articles are little silver trays, hair pin boxes, jewel receptacles, powder boxes and the like, in old Dutch

finish. These afford a pleasing change from the etched and oxidized articles now so popular, and, as the fashionable world likes nothing so well as change, will doubtless prove a welcome diversion.

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"FIVE o'clock" tea spoons have already proven acceptable, and are having quite a run. These spoons are larger than the "after dinner" coffee's and smaller than the ordinary tea spoon, being a happy medium between the two. While of a uniform size, each spoon of a set differs in design from its neighbor, and affords a pleasing study over a cup of tea. Enameled sets in coffee spoons, which are made in conjunction with beautifully enameled cups and saucers, are another notable feature in table ware.

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NUMBERED with elegant conveniences for gentlemen are table cigar cutters, which appear with the "after dinner" service. These are of silver, and come in sizes much larger than the ordinary cutter designed to be carried in the pocket or on one's watch chain. The long handles are elaborately carved in grotesque fashion, and oxidized to give the required lights and shades. Match cases, it need hardly be added, are out in designs worthy of a place on the same tray with these new table cigar cutters.

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QUITE the "swell" thing in leather goods, such as pocketbooks, card cases and the like, is English morocco, with trimmings and monogram of silver. Retail jewelers and silversmiths, many of them, supply the silver trimmings to order. Among imported goods, a pretty novelty is burnt alligator skin with silver mountings. This makes an attractive change from the ordinary alligator goods, and comes in cigar cases, card cases, pocket and memorandum books. The newest of all, however, as has been intimated, is the English morocco, which, in point of fact, is a very old style revived. It promises to supersede all the popular leathers, so now is a good time to buy for small price extra qualities in alligator, ivory and Vienna leather articles.

ELSIE BEE.

## Recent Patents.

The following list of patents relating to the jewelry interests, granted by the U. S. Patent Office during the past month, is specially reported to THE JEWELERS' CIRCULAR by FRANKLIN H. HOUGH, Solicitor of American and Foreign Patents, 925 F Street, N. W., rear U. S. Patent Office, Washington, D. C.

### Issue of May 12, 1885.

- 317,854—Button and Sleeve Pin, Combination Cuff. W. H. Riley, Jr., and G. H. French, North Attleboro, Mass.  
 317,837—Clock, Mechanical and Electrical Alarm. I. S. Moser and F. Magee, New York, N. Y.  
 317,898—Clock Movement Frame. W. C. Walter, Richmond, Va.  
 317,596—Finger Ring. B. D. Traitel and H. Ruyther, New York, N. Y.  
 317,914—Watch Case Pendant. A. M. Yeakel, Perkasié, Pa.  
 317,627—Watch, Stem Winding. A. Chopard, Moutier-Grandval, Switzerland.

### Issue of May 19, 1885.

- 318,379—Bracelet. P. Lettre, North Attleboro, Mass.  
 318,124—Watch Movement Box. R. B. Lester, Brooklyn, N. Y.

- 318,208—Watch Regulator. S. V. Sandmark, Ishpeming, Mich.  
 318,329—Watch, Stem Winding Device. H. Vent, Chicago, Ill.

### Issue of May 26, 1885.

- 318,612—Clock, Electric Alarm. V. Gallet, Brest, France.  
 318,762—Clock Pinion Leaves, Machine for Fastening. B. B. Lewis, Bristol, Conn.  
 318,780—Watch Regulator. A. Merkelbach, Bienne, Switzerland.

### Issue of June 2, 1885.

- 319,273—Bracelet. B. B. Lederer, Providence, R. I.  
 319,063—Collar Button and Necktie Holder. W. J. Burtis, Troy, N. Y.  
 318,974—Collar or Sleeve Button. D. P. Fitzgerald, Newark, N. J.  
 318,997—Chain, Ornamental. R. S. Matteson, Providence, R. I.  
 319,085—Clock Case. H. Focken, New York, N. Y.  
 319,259—Clock, Secondary Electric. C. A. Hussey, New York, N. Y.  
 10,605—Watch Case. Re-issue. D. O'Hara, Waltham, Mass.  
 319,072—Watch Makers' Wheel Cutting Engine. J. Cook, Chattanooga, Tenn.  
 319,145—Watch, Stop. G. B. St. John, Boston, Mass.  
 319,095—Improved Setting Holder. Sam'l Joel, New York, N. Y. Re-issue.

### Issue of June 9, 1885.

- 319,467—Button, Collar. J. H. Doll, Newark, N. J.  
 319,588—Clock. T. Kruezowski, Barlosohn, Prussia, Germany.  
 319,925—Clock-Striking Mechanism. H. L. Naramore, Sharon, Mass.  
 319,783—Clocks, Watchman's. R. B. Carr, Boston, Mass.  
 319,534—Clocks, Circuit Closer for Electric. W. F. Weisgerber, New York, N. Y.  
 319,814—Watch Case Hinge. E. F. Heffernan, Lockport, N. Y.  
 319,691—Watch Case Pendant. E. C. Fitch, Newton, Mass.

## The Adjustment of a Four-Jewel Cylinder Watch.

[By G. VOGET, in *Allg. Journal d. Uhrmacherkunst.*]

*Continued from page 154.*

GOOD CYLINDER pivots facilitate the work of timing. In the case of flat-set jewels, the pivots must have 2 degrees shake to insure the free motion of the cylinder. The timing in vertical and horizontal positions is rendered more easy by flattening the pivot ends in the burnishing tool, and slightly rounding off the sharp edges.

When the watch lies in a horizontal position, only one of its pivots ends experiences a friction, while when in a vertical position both rub with their entire length in the jewel hole. The difference of these two frictions is quite important, and a great amount of alteration should, for this reason, be paid to the jewels; those that are either cracked, rough, slantingly set or unduly thick, must unconditionally be thrown aside and replaced by better ones, in order to obtain a good timing. Wide jewel holes also render timing difficult, and either they or the cylinder plugs are to be replaced, according to conditions. The best thickness of the cylinder plugs of medium-sized movements is 10°, in smaller ones about 8°.

Jewel settings, which for some reason are to be renewed, are best and quickest treated in the chuck lathe.

I have, for some time past, made use of the chuck lathe for doing this job, according to the directions given by Mr. Grossmann, in his *Notizkalender* of 1879, and am entirely satisfied with the result. On one point only do I differ with him, however; I have never been able to become partial to his plan of driving in the jewel in the brass bushing. This may, perhaps, be owing to want of practice.

I have successfully employed soldering, however, and believe that, if done skillfully, it is not whatever objectionable. The soldering in

of a bouchon in the upper cylinder bridge is most certainly advisable on account of the two screw holes. My way of soldering in a bouchon is as follows :

I broach out the unserviceable setting fully, and fit in a wire, filed tapering. When soldering fluid and a little tin have been applied, I heat the long end in the alcohol flame until the tin runs. The wire is then sawed off level with the plate or bridge, and the soldered place is well cleaned. Any projecting portions are turned off in the universal lathe. The opposite jewel is centered in the lathe with the pump center, using one with a fine polished steel point. The bouchon is then perforated with a drill, which is from  $\frac{1}{10}$  to  $\frac{2}{10}$  millimeters smaller than the diameter of the jewel. The article is then taken out of the lathe, cemented upon the clamp head of the chuck lathe, paying great attention to setting the hole truly exact.

It is now very easy to make the setting, and the result will exactly coincide if both jewel and drill were measured with the decimal gauge. If a drill has been used which is  $\frac{1}{10}$  millimeter smaller than the jewel, the turning out is to be made with a graver, the shoulder of which stands  $\frac{1}{10}$  millimeter to one side ; if, however, the hole is to remain larger, and a drill  $\frac{2}{10}$  millimeter smaller was used, it is necessary to also use a graver the shoulder of which stands  $\frac{1}{10}$  millimeter to one side. When the cutting has been turned with a tapering graver, the setting is turned down with a specially shaped polishing steel.

The balance must rotate true and flat, so as to cut through the air with ease. It must be carefully equipoised, for which purpose the poising tool is employed.

It is most certainly a commendable habit before taking down the movement to mark the balance with a dot from below.

Imagine a line drawn through the figures XII. and VI., and another line parallel to this which passes through the center of the balance. Said dot is to be made at the spot where this imaginary line intersects the balance below.

After the cylinder has been taken down from the plate, this dot is to be located upon the lower side of the balance, say by a cross filed in. When the balance is poised and a very small center of gravity is found at this place, it will, in the majority of cases, be serviceable in timing, because a cylinder watch will, in rare instances, preserve a uniform rate in the horizontal and vertical positions. With a heavy balance, such a center of gravity outside of the center is even required.

After a watch has been observed in the two positions in twice 2 hours, the result of its rate can be correctly guessed by comparing its seconds hand with a seconds clock, and when the difference has become noticeable the balance may be taken out, and the point of gravity increased or decreased, according to need, by drilling out from the balance. This is easily done with a chamferer.

The banking-pin must pass free by the fourth wheel arbor, except that the banking itself takes place on this arbor. Any incorrectness of banking is remedied by displacing the banking pin.

Many difficulties experienced in timing are due to the careless treatment of the regulating parts, which become sometimes so great that a watch cannot be timed at all.

When the screws of the cap jewel plate have been fastened, this latter must lie firm upon the bridge, the cap jewel must be immovable and the regulator turn with gentle friction.

If the plate is too large, it is necessary not to drive the screws home completely, in order to leave the regulator movable. By doing this the plate remains loose, and it would also move along by the smallest motion of the regulator. It is evident, consequently, that an equal distance of the balance spring buckle from the center of the cylinder throughout is out of the question, and the endeavor to regulate with the regulator may have an opposite effect, which is more especially the case with fully wide curb pins. Such a defect is easily corrected.

The plate is turned off sufficiently until the lower face is of the same plane with that of the regulator. If the plate is too hard or

the screws are situated very close to the edge so that the opening of the holes might be anticipated, the round part of the regulator, near the arm of the balance spring buckle, is cut open with a chisel.

When this round part of the regulator is thin, it may be opened without injury and with good success. The part will, in opening, if the chisel drives the splittings apart like a wedge, assume a springy nature, and the motion of the regulator thereby becomes a gentle one.

It is always hazardous to open a thick regulator in this manner, because such a one possesses no springing capacity.

The chisel is to be made from good steel ; it must be strong and well hardened. The end passing into the regulator is to be only a trifle conical, nor should the cutting face be too sharp. I place the regulator with the lower side upon an anvil and impart the stroke from above.

With thick regulators I have found it best to anneal said part whitish blue, and then to widen it with a three-cornered roller chamfer. The regulator will not break if it is during this operation laid against the filing wood.

For want of a suitable cap jewel, the jewel is to be cemented.

The balance spring buckle and the pin must sit firm and be of equal length ; the projection of the buckle must not stand beyond the pin, otherwise the second balance spring coil might catch on it.

The banking points of the balance spring are to be as small as possible. With a flat-filed balance spring buckle and pin the banking takes place against a short line. Least of all, the banking places should not be round. The pins must stand as close to each other as possible, with only sufficient space between so that the spring is not pinched. If a watch gains, and the deviation from the true time is only trifling, it is sometimes remedied by bending the pins apart.

This should never be done in an adjustment, since the moving power during its activity of 24 hours, loses almost one-third of its full strength ; it is evident that also the extent of the vibration will decrease by a certain quantity. The motion of the balance spring, therefore, is not always uniform, and with curb pins either opened too wide or filed flat, the spring would bank unequally, which would result in a very bad timing.

The balance spring belongs to the main parts that influence the regular rate, and it is therefore a fundamental condition that it be treated with the greatest exactness. A well-conditioned spring promotes timing. Such a spring is of a handsome dark blue color, while the softer and inferior qualities are of a lighter blue. The price of an inferior watch, however, is so small that its spring, even if not up to standard, can be rejected ; nor is this necessary ; but it is indispensably necessary to throw aside a spring with rust spots, or one laboring under other grievous defects. Every unnecessary bending, to and fro, of the balance spring is to be avoided. Every bending must be performed with a gentle curve.

After the spring has been fastened to the bridge and the first coil lies between the pins, the latter must, by rotating the regulator, lie exactly in the middle of the two curb pins, while the collet is well centered to the pivot hole. The first balance spring coil is removed from the second only so much as is necessary for the free performance of the spring. If the distance of these two coils is too great, a buckle must be put in that reduces the space accordingly ; if, on the other hand, the coils lie too close, the buckle may be filed away sufficiently until the necessary space is obtained.

The collet must be in the center of the balance spring, so that the coils perform quietly and open and close in a circle. The coils of an incorrectly mounted spring will move in an elliptic form, and be exposed to the danger of coming in contact with each other. If the spring lies parallel to the bridge, and is at the same time fastened to the collet thus that it lies parallel to the balance, it will also remain flat during its activity.

If the space for the balance spring is contracted, whereby it might, during its greatest unfolding, strike against the center wheel or on the stud, the defect may be remedied by displacing the latter. The

hole in the stud comes thereby outside of the center, and the part standing inside is to be filed away.

If the balance spring is too large and cannot be located under the center wheel, it is to be replaced by a smaller and feebler one. The mounting of a balance spring is an easy job—provided the repairer has a plentiful supply on hand. The strength can be exactly determined by the number of the balance vibrations. The train of an ordinary watch is calculated so that the balance makes 18,000 beats per hour, or 300 vibrations per minute. When comparing with a well-timed seconds clock, the length of the balance spring, which causes the balance to make 150 double vibrations, is easily found. The place which was held between the tweezers comes between the buckle and the stud, if the regulator is set at "slow."

The work required for mounting a balance spring is so simple and can be done so quick, that it is really astonishing when we find an otherwise well-conditioned watch with a carelessly treated spring.

The watchmaker should treat a balance spring with all due consideration, even as a matter of pride, because a good workman can be known by this very piece of work, and all the above described defects are at once recognized by him, and he also knows the remedies that are to be employed.

At the conclusion of the adjustment it is well to duly inspect the secure fastening of the dial, which is invariably fastened by turning the screws to the left. This style of fastening leaves much to be desired, because experience teaches that these screws have a great inclination to work back, whereby the dial is loosened. This occurrence is best corrected by replacing the unsatisfactory screws by those that move a little tighter.

The fastening of the dial on pillars that have not yet been notched, is effected best by locating the notches in such a manner that the dial is retained by turning the screws a little to the right. Screws, the heads of which do not enter sufficiently deep into the pillars, are to be replaced by others with larger heads.

Dial holes unduly small, or holes in which the hand squares stand to one side, are to be enlarged with a round file. The canon of the seconds hand must not be too long.

#### SUMMARY OF THE SEVERAL DEFECTS.

I close my remarks with summing up the several defects and their remedies; those that have been already sufficiently explained will be simply mentioned or passed by:

An incorrect proportion of the escapement parts.

Oblique scape pivots.

Too much shake of the scape pivots.

Insufficiently protruding cylinder plugs.

Pivots either bent or too thick.

Bad or loosely setting jewels.

A scape wheel which is either untrue or out of flat.

One or several teeth with burr. This can be found sometimes at the lowest or at the highest place of the lifting face. It is easily taken of with the ruby file, and all the lifting faces must then be repolished.

A tooth either bent or unduly long.

A defective cylinder. Burr within the cylinder or at the place where the exit lip begins.

An untrue cylinder. Its plugs are to be replaced.

An unequal drop. The stud does not stand at the right spot.

The striking of the balance spring against the center wheel on the stud, or on the inner curb pin.

Scraping of the balance spring on the balance guard. The spring is to be bent higher so as to have it clear between the pins.

Oil which has accidentally come on the balance spring or on the inner curb pin.

An annular burr sometimes loosens from the sharp edge of the collet. This burr can be there unnoticed for a long time, until some jar finally shakes it loose, when it leaves its place and rubs against the bridge. Every collet must therefore be examined closely, and its sharp edge should be taken off. Burr which loosens either from

the recesses or the screw heads of the cap jewel plate, against which the balance spring rubs. This is sometimes found in ladies' and other small sized watches, if the spring stands near to the bridge.

An unsteady balance. Scraping of the balance on the stud, balance spring buckle or center wheel. Scraping of its arms on the point of the scape bridge.

An unpoised balance.

Either too short or too long a banking pin. In the former case the pins butt against the front side of the banking post; in the second case it braces against the recess of the cylinder bridge, or it strikes against the fourth wheel arbor.

The rebounding of the banking pin is corrected by displacing it. In occasional instances this defect is caused by too strong a main-spring.

Too great a quantity of oil is apt to run away from the spot and draw to places where it is of injury.

[THE END.]

### The Jewelers' League.

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THE JEWELERS' CIRCULAR is the *exclusive* official paper of the Jewelers' League, and has been selected for the publication of all matters of interest pertaining thereto. Letters or inquiries pertinent to its business or purposes, and which might interest the trade or inquirers, will herein be answered. Address *Jewelers' League, Box 3,444, P. O., New York*, or the office of THE CIRCULAR.

THE REGULAR meeting of the Executive Committee was attended by Vice-Presidents Johnson and Kimball, and Messrs. Bowden, Howe, Smith, Hale, Greason and Sexton.

Seven (7) changes of beneficiary granted.

Three (3) applications were referred.

The following 10 applicants were admitted:

J. E. Smith, J. H. Reedy, A. Pinover, A. Miller, New York, N. Y.;  
 E. K. Bennett, Lansing, Mich.; E. Deimel, Detroit, Mich.; E.  
 Muhlberg, J. Stenberg, Savannah, Ga.; C. L. Bates, St. Louis, Mo.;  
 R. J. E. Scott, Ont., Can.

### Proceedings of the Horological Club.

#### A DISTINGUISHED BODY OF WATCH AND CLOCK MAKERS.

*One hundred and thirty-second discussion.—Communicated by the Secretary.*

[NOTICE.—Correspondents should write all letters intended for the Club separate from any other business matters, and headed "Secretary of the Horological Club." Direct the envelope to The Jewelers' Circular Publishing Company, Seth W. Hale, President. Write only on one side of the paper, state the points briefly, mail as early as possible, as it must be received here not later than the eighth day of the month, in order to be discussed and reported in the CIRCULAR for the next month.

#### LOOSE JEWEL MOVING IN A DIRECTION CONTRARY TO THAT OF THE PIVOT.

*Secretary of Horological Club:*

Mr. McFuzee says that my theory of the rolling jewel "hardly explains the action in the case of large machinery, where the axles

are horizontal and the heavy wheels keep the journals at the bottom of their boxes or thimbles." He does not say that the thimble does move that way, but that it has been "stated" that it does. The Club is, of course, aware that it is the easiest matter in the world to get statements on any subject that is founded on imperfect and mistaken observation; and many times statements are made where the observation is entirely wanting, though the party making the statement may have a vague belief that some time he did see something corresponding to it. I have spent several years of my life in the machine shop, and that a heavy horizontal shaft (or a light one, either), running steadily *without jumping*, can cause a sleeve in which it runs to turn the reverse way, is so utterly inconsistent with my own experience and judgment that I could never accept it as a fact till McFuzee, or some man of veracity, tells me that he *knows* it to be true. The sleeve is bound to tend to turn in the direction of the preponderance of friction. In the case supposed can there be any friction backward?

W. G. B.

Mr. McFuzee explained that he had not endorsed the statement referred to, for it seemed as unreasonable to him as to Mr. B. But as the statement had been made during the discussion of this subject, it had to be kept in view in considering the possible explanations of the phenomena. Since Mr. B. disputes the correctness of this statement, we may regard it as doubtful, unless further substantiated by parties who actually know it to be a fact. The speaker gave great weight to the opinion of Mr. B., as he had the pleasure of a personal acquaintance with him during some two years or more, and knew him to be a close and careful observer, and thoroughly reliable in his statements, as well as an excellent practical workman. If any of our correspondents know that loose bushes *do* turn backward under such circumstances, we shall be glad to hear from them. Meantime, we would also like to know if any different explanations can be suggested.

DRAWINGS WANTED OF AMERICAN WATCH ESCAPEMENTS.

*Secretary of Horological Club:*

Can you send me the correct dimensions for drawing the escapements of the Elgin, Hampden, Waltham, and Springfield, Ills., 18 size watches? I will pay you for your trouble if you can.

Marion, Ohio.

JOHN MERRILL.

Mr. Clerkenwell said that none of the members had such drawings, or had the time to make them, and we would publish the letter from Mr. M., so that parties who could furnish them might communicate with him in regard to the matter.

THE STOCK OF EXCELSIOR'S BOOKS NEARLY EXHAUSTED.—"PRACTICAL HINTS ON WATCH REPAIRING."

*Secretary of Horological Club:*

I have only recently subscribed for THE CIRCULAR, and I see notices of a book by "Excelsior" on watchmaking. Will you please inform me what the book is, and if it tells all the ways of making watches, etc.

R. R. H.

Mr. Isochronal replied that it did not treat on making watches at all, but on repairing and adjusting them. It comprised the first series of articles written by a thorough practical watchmaker, who signed the name "Excelsior" to them, and were entitled "Practical Hints on Watch Repairing," which appeared in THE CIRCULAR every month for many years, and received the universal commendation of the trade for their clearness, practical nature and excellence. The subjects treated of in the book are the making and fitting of hair springs in chronometers and watches, the adjustment for isochronism, for positions, compensation for heat and cold, rating, and other matters connected with these most difficult and delicate branches of watch work. It is not only the most complete, but the only complete, treatise on these points, which are thoroughly understood by only a small proportion of practical watch repairers, although every workman ought to do so. It is written so plainly that even an intelligent apprentice can fully comprehend it, and has become a standard authority on those points. He regretted to state that he had just learned from the Circular Company that the last edition of these books was nearly exhausted, there being only about seventy copies left. He therefore advised each of our readers as had been postponing the purchase of the work to secure it without

delay, as they would very soon be unable to obtain it at all, except by an occasional haphazard chance to get a second-hand copy—just as the trade is now forced to do to get a copy of the second series of the Practical Hints: by picking up back numbers of the THE CIRCULAR containing them, whenever the fortunate holders would dispose of them, which was very seldom indeed. Less than half a dozen sets have been offered to us during the four years past. It will therefore be seen that that will be a poor dependence for getting the book. Mr. H. can obtain a copy, postpaid, by remitting the price, \$3.50, to the office of THE CIRCULAR.

## Communications.

*To the Editor of the Jewelers' Circular:*

Attention is called to the fact that our bracelets, made of stone, jet and other materials in blocks or plates, are constructed in accordance with, and are protected by, Letters Patent of the United States, No. 203,426 and 272,829, of which we are the sole and exclusive owners; and that we have issued no license to any person or corporation, and that all bracelets embodying the invention so secured to us, and not of our manufacture, are infringements. All infringers, whether manufacturing, using or vending to others to be used, will be prosecuted. Dealers are cautioned against buying from others than ourselves.

COX & SEDGWICK.

[The following is an extract from a private letter written by Mr. Albert H. Potter to Mr. T. W. Burger, his partner in New York City. As it contains matter in regard to position adjustments which has never before been published, and which must prove of great interest to those engaged in the art, we have induced Mr. Burger to permit us to use it for the benefit of our readers.]

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I will endeavor to answer your questions in reference to quarter screws, but if I were to say all that I might on the subject of adjustments, it would take me at least a week to write it. I will, however, state a few facts, and afterwards add some comment upon them. The manipulation of quarter screws in the balance for correcting position errors was practiced long ago, especially in England; but the system has been abandoned by all intelligent adjusters. If the theory was a correct one, and the practice of it could be depended upon, good performance in the positions, pendant up, pendant right and pendant left could be easily arrived at, and such adjustments would be at once reduced to a simple problem. This, however, is not the case. We are one of the few, and perhaps the *only* manufacturers in Geneva employing the four steel quarter screws in the balance, and in reference to the plan of placing the balance when at rest, so that two of these screws shall stand in line with the pendant, as has been suggested to you by some one in New York, I would say that you will find such to be the case in every chronometer we ever turned out; but in our anchor watches the balances are placed differently, for the reason that the four screws in question serve the purpose for which they are intended equally well, no matter how they may stand in relation to the pendant. They do not play any part in the correction of position errors.

If a watch provided with quarter screws in the balance should be tested for 12 hours in the four vertical positions, a correction of its errors could be arrived at by means of the screws; but when thus corrected, if the watch is run for 24 hours in the same positions, the result would be altogether different. Our reason for this is that, in a movement with going barrel, during the first 12 hours after winding the balance describes arcs of say 540° or thereabouts; while during the most part of the last 12 hours, the arcs are reduced to in the vicinity of 360°. Now any change of the screws which give favorable results for the first 12 hours will act exactly the reverse

during the last 12 hours. If this statement of facts is doubted by any one, a few experiments will demonstrate its truth. In order that I may not be misunderstood, I will remind you that in the foregoing I have treated with the vertical positions only. If the piece, while in the condition assumed, be tested lying flat during 24 hours, its rate would be constant during the whole time, provided the balance spring is isochronous. Some are under the impression that an isochronal spring will correct vertical position errors, but this is a mistake, yet it has much to do with the horizontal position, as compared with the vertical. There are many factors which play important parts in the rate of any watch run in all the positions. Sometimes two of these will compromise favorably with each other, and others will tend to aggravate and augment the errors. Of these factors I will mention: want of isochronism; unequal frictions in the different positions; side shake of balance pivots; slight errors in poise of balance; various escapement errors, etc., etc., together with errors in the *poise of the balance spring*. One proof that the latter difficulty is encountered to a greater or less extent in all balance springs, will be found in the fact that *no* two springs adapted to the same balance will give exactly the same results in the vertical positions, though we know that all other conditions of the movement and escapement remain unchanged.

Assuming that the balance is in perfect poise, then the moment the spring is placed on it, and the outer end pinned to the stud, the spring at once forms a part of the mass of the balance when both are rotating, and its effect upon the balance when in action is most peculiar. The first coil near the collet passes through nearly as many degrees of arc as does the balance. The second coil describes a little less extent of arc; the third still less; the fourth still less, and so on until at last we arrive at the outer extremity—the end of the last coil—which is stationary and rigidly fixed. Now all of these different coils, while vibrating, have established in themselves a certain momentum, each differing from the other in their effects upon the balance, according to the mass of each, the velocity of each, the position they occupy as regards distance from their centers of motion, and the degrees of arcs described by each. Any portion, then, of this system of coils which may be out of exact poise, is a disturbing factor. If, however, after careful trials, the preponderance is located at a certain point, and the balance quarter screws be changed so as to counterbalance it, an improved condition would result so long as the balance maintained arcs of about  $360^\circ$ ; but when the watch (going barrel) is full wound and the balance describing arcs of not far from  $540^\circ$ , the error would be more marked than it was before the change in the poise of balance was made. The momentum of a moving body varies with its velocity, and in the coils of a balance spring the variation is according to the square of their distances from their centers of motion, and as the center of gyration in the mass of each coil is always nearer the center of motion than are the balance screws, it is self-evident that these two factors bear unfavorable relation to each other, and consequently the one cannot be made to compromise with the other for the faults of either.

If a balance be poised as perfectly as possible, and the spring mounted without curb pins, and the watch shows pendant right 4 sec. + and pendant left 6 sec. — it can be known whether the fault lies in the balance or its pivots, by turning the rollers and the balance spring exactly half way round on the staff, and if the differences remain the same, it will be proof that the error is not due to either the balance nor its pivots. If, also, it is necessary to prove that the fault is due to an out of poise balance spring, turn *the spring* half way round on the staff and fasten the stud on the other side of the cock. The error will at once be reversed—showing now pendant right 6 sec. — and pendant left 4 sec. +. These are a few out of many experiments which I made years ago to prove my theory, and which led me to the conclusion that with a perfectly poised spring, a well conditioned anchor or chronometer escapement would show the exact same rate in the four vertical positions.

To produce such a spring seems to be next to impossible, but it

can be approximated sufficiently to give satisfactory results. To effect this I employ different means, the most simple of which is to take a small piece from the center coil, repin and recenter the spring. A change in the performance of the piece in the vertical positions will be the result; it may be favorable or the contrary. If the former, it will be necessary to repeat the same experiment until success is attained. After having arrived at satisfactory results it will be discovered that the two pins (that of the collet and of the stud) stand in a certain relation to each other; and it might be surmised that the secret of success lies in this, but such is not the case, and proof of it will be found in the fact that no two springs similarly pinned and adapted to the same balance will give the same results, unless it be now and then by chance.

A badly conditioned watch of any kind or quality cannot be adjusted at all, but a well conditioned piece is already adjusted, with the exception of regulation for temperature, isochronism and poise of balance spring. It is clear, then, that certain conditions must be conformed to before any attempt is made in the three adjustments. Escapement, pivoting, jeweling, shape of balance jewel holes, balance, size, shape and ends of balance pivots, equalizing of the frictions, etc., are a few of the many conditions referred to.

To adjust very closely *all* watches of high grade is possible but not practical, because the labor, time and consequent cost would never be paid for. Taking them as they are made, one with the other (though all of high grade, if you like), we are all more or less in the same boat, at the mercy of wind and tide—even the most learned and experienced are as mere children in the art. Adjustments to temperature, isochronism, together with flat and hanging, are fully and completely under the control of any one who wishes to make them; but the correction of errors in all the positions in watches by the quantity is an unknown art. The mysteries involved in it mock our best efforts.

In the face of these facts, we find plenty of overwise persons who speak of adjustments to temperature, Isochronism and position, with as much freedom as they will mention the days of the week; and they can tell us all about it with as much assurance and "*sang-froid*" as our grandmothers do in giving us a list of the ingredients in their favorite pudding.

Although I have in this letter only touched upon some of the most important points in the study of position adjustments, yet I hope I have said sufficient to answer your question.

\* \* \* \* \*

(Signed) ALBERT H. POTTER,

Nov. 30th, 1882.

Geneva, Switzerland.

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For further information, Application Blanks for Membership, By-Laws, etc., Address  
P. O. Box 3277. 170 Broadway, New York.

A SPECIAL MEETING of the Executive Committee was held at the office of the Alliance on the 9th inst. The resignation of Mr. E. F. Dorrance as a member of the Executive Committee was



received and accepted, and Mr. Geo. W. Parks was elected in his place. There being a vacancy in the Examining Finance Committee, the President appointed Mr. Chas. F. Wood to serve on said Committee. The following applicants were admitted to membership in the Alliance.

F. C. Cook & Co., Janesville, Wis.; E. I. Franklin & Co., No. Attleboro, Mass.; The Providence Jewelry Co., St. Louis, Mo.; S. A. Rider & Co., St. Louis, Mo.; Constantin R. Rueckert, Union Hill, N. J.; Benj. Allen & Co., Chicago, Ill.; C. H. Ankeny & Co., La Fayette, Ind.; B. Detlor, Webster City, Ia.; Thayer & Adams, Brockton, Miss.; Williamson & Co., New York City; Sam'l C. Hall, Hampton, Ia.; Geo. W. Abbey, Midland City, Mich.; Geo. E. Jones, Osceola Mills, Pa.; Geo. E. Lyford & Bro., Boston, Mass; Frederick W. Sim, Troy, N. Y.

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## Correspondence.

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### Chicago Notes.

*To the Editor of the Jewelers' Circular:*

Dull times, depressed trade and the inevitable amount of grumbling incidental to such conditions, are the order of the day in the Chicago jewelry trade. "Nothing doing," "Things could not be much worse," and a variety of such encouraging expressions are the almost invariable comment of manufacturer, jobber and retailer on the present state of trade. There is a silver lining to the dark cloud, however, and, spite of present depression, a general feeling that the worst has been seen, and a hopeful anticipation that with the fall will come a decided revival of business. Values and prices have struck the bottom, and the only possibility now to contemplate is an upward tendency. The experience of wholesale dealers with regard to getting in collections has been somewhat varied. With some, collections are coming in very slowly, while others declare that the country is in a much better condition than it was some time ago, and that collections are much better than anticipated. The depression has been more marked in the country districts than in the large cities, though, even in the latter, business is by no means up to the mark. The generally hopeful reports of the crops from all parts of the country point to a rising tide of prosperity, which will reach its flow during the fall. People have been living economically; stocks have been kept low; manufactures have to a large extent been suspended; so when the good time comes it is sure to benefit all branches of the trade. The experience of the jewelry trade has been by no means singular. All business and trade has suffered from the depression which almost invariably sets in with an election year; and it is certain that jewelers have had no duller times than other business men. The jewelry trade from its very nature must inevitably be one of the very first to suffer in times of depression, as luxuries must yield to necessities. There has been no depreciation in goods to amount to anything for the last six months. Watches in some instances have fallen 6 to 8 per cent., but goods in general have suffered almost no reduction. The general depression and scarcity of money have had a cramping effect on invention and design, and the result is that few novelties of any kind have been introduced into the market. Most of the jewelers' regular patrons have refrained from purchasing altogether lately, and the wealthy, who will buy any way, have had to confine their choice to the old staples among the unconsumed stock.

As regards style, the tendency is towards neat, plain, rich designs. Nothing loud or gaudy will now suit the Chicago connoisseur, for his tastes are rapidly becoming assimilated to those of the East. Chicago is settling down to the basis of strict economy in business, and the recklessness and extravagance which characterized the earlier years of rapid money-making have practically died out. All patterns and designs in watches, plated ware and jewelry, ladies'

sets, pins, chains, etc., must now conform to the standard of plainness, neatness and richness, or else remain to ornament the show case of the dealer. The same tendency is observable in the settings of stones. Diamonds are now preferred in plain settings, and the same holds good of all other kinds of fancy stones. The fashion of the West has yielded to the East, and little difference is now observable in style between New York and Chicago.

As to drift of business, there is in many quarters an increasing demand for fancy stones, such as emeralds, rubies and sapphires. The trade in pearls is good, and in diamonds fair. It is the experience of quite a number of jobbers that the wholesale trade in diamonds from the country has taken a stride forward. A good trade also is being done in silverware, all the staples being in fair demand. Travelers who have just returned from Ohio, Kansas, Minnesota, Wisconsin, and other States and Territories, report business dull. The value of lumber is so low that in the lumber districts there is at present little disposition to purchase anything in the way of jewelry. In the agricultural districts, however, there is a better feeling. Good crops are confidently expected, and from present indications most travelers predict a rush of business in the fall. A traveler who has been over Minnesota and Wisconsin reports the trade in watches, chains, cases and movements fair. Plain and band rings and plated chains are most in demand; but ladies' rings, in small diamonds, rubies and opals, have commanded a fairly brisk run of business. There has been very little demand for the cheap jewelry supplied by the country dry goods merchants, and many of the latter are reported as growing very sick of the business.

Some of the manufacturers have felt the depression in business very little. Most are working their full staff of men full time, and have abundance of work on the main staples. There have been no radical changes in pattern or design, and almost no novelties have been introduced. The Blauer Watch Case Manufacturing Co. is doing a brisk business. The employees are working full time, and during the last six months none of the surrounding depression has been experienced in this factory. The company claims that their invisible joint case has quite struck the popular taste for its neatness and excellent dust-proof qualities. Giles, Bro. & Co., who have had such a run for their anti-magnetic shields, have just taken out a patent for a new kind of case. It is what may be termed a three piece screw case, of very simple construction, and is warranted to refuse admission to even the slightest particle of dust. Fitted with the anti-magnetic shield, the new case is at once unique in design and proof against all possible inroads of electricity or dust. This company reports that it has done a very good business in staples all through the dull times, and that its collections have been much better than expected. Otto Young & Co. have caught the building mania, and are at present making extensive alterations on their premises, which adjoin the new building of the Meriden Company. It is Mr. Young's intention to make his building the headquarters of the Chicago jewelry trade, and with that object in view the upper floors have been entirely remodeled. Two new elevators have been put in and steam heat carried throughout the entire building. The Blauer Watch Case Company, Kearney & Co., The Cowles Manufacturing Co., and a number of other manufacturing jewelers have already made Otto Young's building their headquarters.

The sneak thief—that most dreaded pest of the jewelers—is still around, though his business is becoming increasingly difficult and unprofitable. Giles, Bro. & Co., who have been especially favored in times past with the attentions of this fraternity, received a polite call from one of the experts May 22. He was a faultlessly dressed man about 35 years of age, with light hair and mustache, but as he entered the store the watchful manager thought he recognized in him a well known sneak thief. Resolved to be satisfied the manager directed a clerk to watch the actions of the visitor from a high platform over a vault high up in the wall. A large tray of diamonds was placed before the would-be purchaser by a clerk entirely ignorant of his character, and soon the watcher from his lofty perch saw

the visitor slip a large cluster pin and a solitaire stud into his vest pocket. The thief's mode of procedure was to lift two of the little cards bearing the diamonds, and hold them tightly together, one above the other, so that they might be mistaken for one, and then, when the clerk was looking directly at him, slip one into his vest pocket by a skillful feat of legerdemain, while he tossed the other back into the tray. Just as the visitor was asking to be shown another tray, the watcher stepped down and called in an officer. When the officer intimated that he would like to see him, the thief replied with the greatest nonchalance, "Certainly, my man, can I do anything for you?" The officer, however, used to the bluff of the fraternity, said: "Yes; you can hand me over those diamonds;" and plunging his hand into the thief's pocket, brought out the two diamonds, valued at \$350. The same thief, it was afterwards discovered, had robbed Lapp & Flershem of two locket and eight neck chains by similar tactics, and had also paid visits to many other jewelry establishments in the city.

The working of the recently formed National Association of Jobbers in American watches is giving general satisfaction here, and retailers are already beginning to reap the benefits of the co-operation of manufacturers and jobbers in their interests. The sale of American watches is consequently beginning to leave the dry goods stores, and go, as it ought, to the retail jeweler. W. A. B.

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### The History of Goldsmithing.

*Continued from page 135.*

BEFORE the close of the 13th century we must mention the names of two other renowned goldsmiths, Nicolas and John of Pisa, who boldly abandoned the old beaten track hitherto followed by shallow minds and imitators, who simply worked according to "style" and "pattern," and they thereby ushered in a veritable revolution in the arts of working in metal. Both were eminent artists and sculptors, and their "departure" from the prescribed rules were soon followed. Nicolas left a very celebrated piece, his principal work, the tomb of St. Dominic, in Bologna.

Nicolas died in 1275, but John continued successfully; in common with many other great Italian artists, he was sculptor as well as goldsmith, and he was commanded in 1286 to make an altar-piece of goldsmith work, for the cathedral of Arezzo. Numerous jewels and enamels heightened the splendor of this piece of work, the central portion of which represented the Holy Virgin between Sts. Gregory and Donato. Able jeweler as well as goldsmith, the artist understood how to display upon the bosom of the Virgin a jewel which the historians of that age valued at least at thirty thousand florins.

John associated himself with another goldsmith from Pisa, named Andreas, and two sculptors from Sienna, Agostino and Agnolo. Vasari ranks the latter two among the most distinguished artists of their period, and they taught a large number of pupils, among them various goldsmiths of renown. Vasari especially mentions two brothers, Pedro and Paolo from Arezzo, who together wrought a reliquary of natural size, to receive the head of St. Donato. The same author also makes mention of another goldsmith from Arezzo, Forzare di Spinello, a skillful enameler and chaser, who wrought a great many pieces of silver for Cardinal de Pietremala, and for the bishop of Arezzo an ornamented gold mitre, still to be seen in the cathedral of that city.

This brings us into the 14th century.

Italy still preserves a respectable quantity of goldsmiths' work of this period, wrought by eminent artists, while France possesses very little. This is due to the fact that the 14th century, in the latter country, was principally devoted to profane goldsmithing, caused by the unbridled luxury of its princes and nobility of the kingdom. Representing too large a capital to remain dormant for any length of

time, it was from time to time consigned to the crucible, to again arise, Phoenix-like, into imposing forms, behind which the misery of the country vainly tried to hide its gaunt and spectral form.

The Italian goldsmiths, in working for the church, had more substantial patrons, and their productions stood a better chance of escaping the "tooth of time." Besides this, Italy almost entirely escaped those religious wars, which everywhere else devastated the countries of Europe during the middle age.

There is one piece of work still remaining in Italy, which, when viewed in the light of the history of goldsmithing, possesses for us a peculiar interest—we refer to the Church of Pistoia, of which we already had occasion to speak. Among many other precious objects still to be seen there, we also find perfectly intact a beautiful altar covering of silver, which was, during nearly one century and a half, constructed by the most skillful artists of Toscana. This beautiful piece of silversmithing, about two yards long, comprises fifteen bas-reliefs, the subjects of which, treated with great taste, are taken from the terrestrial life of our Saviour.

Pistoia owned since the 12th century a notable relic of the Apostle St. James, which had become the object of great devotion, and many alms and largesses were bestowed on it. With the aid of these accumulated riches, the administrators of this relic, who already had embellished the chapel containing this priceless treasure with numerous pieces of goldsmithing, resolved, in about 1267, to decorate his altar with a rich silver paliotto, the making of which was confided to two celebrated goldsmiths of this epoch—Andrea Puccio and his brother Tallino. But, in a few years afterward, in 1293, the chapel of St. James was pillaged of its sumptuous decoration by a sacrilegious thief. Many of the stolen objects, however, were recovered more or less intact, and the original altar covering was replaced very promptly by a new and still more magnificent one. This was finished in 1316, and was for many centuries believed to have been wrought by the celebrated goldsmith Andrea d'Ognabene, although it has since become known that he only constructed the front face, while the two side panels, which were added in 1357 and 1371, were made up by two Florentine goldsmiths, Pier and Leonardo Ser Giovanni.

Many other artists also wrought on the altar of Pistoia. Work was not ceased up to and beyond the end of the century, new figures and scenes being constantly added. The principal figure, that of St. James, was made in 1349 by a goldsmith of Pisa, by the name of Giglio.

Finally, between the year 1395 and 1400, a rich altar-piece completed the decoration of the altar. This part of the work, wrought according to the designs of a painter named John Christiani, was confided to the goldsmiths Nofri de Buto and Atto Braccini, of Pistoia. Vasari affirms that two of the half figures of prophets were sculptured by the chisel of Brunelleschi, the celebrated architect of the dome at Florence, who also was a goldsmith. (For his life, see JEWELERS' CIRCULAR, Vol. XVI., No. 4.)

One of the handsomest productions of this age is the silver tabernacle for inclosing the *santissimo corporale*, owned by the cathedral of Orvieto. This beautiful piece of workmanship, still the object of admiration, was made in 1338 by a goldsmith of Sienna by the name of Ugholino.

The basilica of St. John Lateran preserves two silver busts attributed to Giovanni, son of Bartolo, and to Giovanni Marci, both natives of the city of Sienna. Another bust, remarkable for the delicacy of its chasing, that of St. Sigismundus, is still to be seen in the cathedral of Forti. It is the work of two goldsmiths of the 14th century, named Niccolo and Enrico. The cathedral of Florence possesses another one, none the less interesting, that of St. Zanolbia, signed with the name of the goldsmith Andrea Ardite.

This able artist had, it appears, the habit of signing his works. France for a long time possessed a piece made by him—a beautiful enameled chalice, which now belongs to the Prince Soltikoff.

In lower Italy, Monza possesses a paliotto of goldsmith work,

wrought in 1359 by Borgino, of Milan; and at the entrance to the sanctuary of the church of St. Marc, at Venice, is a crucifix of silver-gilt, about two and one-half yards high, made by a goldsmith from Venice, named Giacomo Benato, who lived about the same time.

It is well known that St. John is the patron of the city of Florence, and the Florentines have at all times shown him great reverence. Near the end of the 13th century they resolved to ornament the altar consecrated to him with a rich covering of goldsmiths' work. This piece of work was intrusted to the ablest artists of the epoch, and Vasari says that a celebrated goldsmith, Cione, himself made the largest part. Cione lived in the first part of the 14th century.

But this altar covering soon after was not considered sufficiently sumptuous, and an old document says that the guild of merchants, in 1366, resolved to replace it by a richer one, which was made by Berto Geri and Leonardo Ser Giovanni, the renowned goldsmith living at Florence, of whom we spoke some time ago. These two artists thought it a pity to destroy the beautiful work of Cione; they therefore retained the two side panels, and the visitor will become convinced of the beauty of the design as well as the delicacy of execution of the 14th century.

The work on the new altar covering, which is still in existence, was commenced in 1367. But many stoppages occurred, caused by the calamities that befell Florence during the last quarter of this century. After the death of Leonardo Berto Geri associated himself with another goldsmith, Michael Monte; but the glory of finishing it was not reserved for him. The finishing strokes were given to it by Christophano di Paolo in 1402.

We approach the 15th century, and the birth of the Renaissance.

One name has become more celebrated than that of all the artists of his century who contributed to the decoration of the baptistery of Florence; it is that of Ghiberti. Although he is better known as the constructor of the admirable bronze gates of this church, Lorenzo Ghiberti commenced with being a goldsmith. He was born in 1378, and learned goldsmithing in the shop of his father-in-law, Bartoluccio, who was a master of this noble profession. Barely twenty-two years old, he completed the proposals for constructing the famous bronze gates at large described in Nos. 3 and 4, Vol. XVI., of THE JEWELERS' CIRCULAR.

The citizens of Florence, not content with possessing the handsomest bronze doors in the world, and a very beautiful altar-piece, concluded to have a new one, and the corporation of merchants, in 1476, decided to have the two ends of the altar covered over to harmonize with the front and top. These parts of the altar were divided into four panels, one of them representing the Nativity, was confided to Pollainolo; another, the Decapitation of St. John, to Veroechio, and the last two to Bernardo di Cenni and Salvi, both of whom were at that age the two greatest goldsmiths of Italy. They already belonged to the new generation of artists. Pollainolo was born in 1426; Veroechio, in 1432; Bernardo di Cenni probably about the same time, because he was a pupil of Ghiberti in 1451, and Salvi could not have been much older, being still alive in 1514. The embellishment of the altar could not have been intrusted to better hands.

The great book of the corporation of merchants, still preserved at Florence, contains many interesting and curious details bearing on the execution of this admirable work. The panel of Pollainolo was paid for with four hundred and eighty-seven florins and one livre; that of Bernardo, four hundred and seventy-five florins and two livres; that of Veroechio, three hundred and ninety-seven florins and twenty-one livres, and that of Salvi, three hundred and twenty-four florins and twelve livres. The weight of the panels varied from twenty-nine pounds to thirty-six.

Although Veroechio wrought many celebrated pieces of goldsmithing, among others, several apostles of silver for the Pontifical Chapel, the panel of the altar of St. John is the only one that can with certainty be accredited to him. His name is forever rendered

famous by the equestrian statue of Colleoni, at Venice, and the beautiful group in the church of Or-san-Michele, at Florence.

Pollainolo, on the contrary, although he tried his hand in every art, as sculptor, painter, engraver, etc., was goldsmith by predilection, and even kept a shop at Florence. His first employer was Bartoluccio, whom he left soon after, to work for Ghiberti. Raised in this school of artists, his fame soon spread abroad, and he received many orders both of honor and profit. Both the church and the corporation of merchants of Florence ordered of him crosses ornamented with figures, large chandeliers, a magnificent basin of silver-gilt, a water jug, and a casket of the same metal for Frederic de Monte-Feltro, commander of the troops of the Republic, etc. Pollainolo also made a great many *paxes*, ornamented with numerous enameled figures.

It is thought that the invention of copperplate engraving is due to the manufacture of *paxes*. Many of these were nielloed, that is, ornamented with designs, the lines of which were hollow grooves dug into the surface of the metal, which were afterward filled with a sulphur compound of a blackish appearance, which hardened when exposed to the fire. The goldsmiths of Tuscany excelled in this kind of engraving, and the only additional invention that actually remained to be made was to take the impression upon paper.

This invention is generally attributed to a Florentine goldsmith, Finiguerra, who also had been a pupil of Ghiberti. He was an excellent engraver, and his works were much in demand. The gallery of the Uffizii of Venice owns a *pax* made by him representing the Coronation of the Holy Virgin, which had been ordered of him by the corporation of merchants. It is an exquisite piece of work, and the engraver has collected a large number of figures into a small space, without crowding them. Finiguerra, before introducing the niello matter, desired to inform himself of the success of his work; he applied a greasy ink to the plate in such a manner that it entered into the hollows of the engraved lines, next laid a sheet of paper over it and applied pressure, whereby an entirely new art had been discovered. He took a number of impressions in this manner.

Although Finiguerra became celebrated through his niello works, he did not confine himself exclusively to this branch of goldsmithing. He also worked for the church of Pistoia, and assisted in decorating the altar, making for it several large chandeliers of silver ornamented with enamel.

We have already mentioned that in the 14th and 15th centuries Italy possessed many eminent artists who devoted themselves to goldsmithing. The majority of them were sculptors, although celebrated painters also belonged to this class, for instance Ghirlandajo, who was the son of a goldsmith, and in his father's shop learned the rudiments of the art. The Academie des Beaux-arts, of Bologna, owns two very handsome *paxes*, chased and ornamented with niello and enamel, which were made by him when quite a young man.

It would be an endless task to mention every Italian goldsmith of renown belonging to this period, and we will hasten forward to examine the next century of the Renaissance, and simply say at this place that the school of Sienna sustained its ancient reputation. At the commencement of the 15th century Turino, who was soon afterward aided by his two sons, Giacomo and Lorenzo, wrought a number of statues, statuettes, as well as groups, in silver, several of which became famous. About the same time, Goro Neroccio acquired celebrity as a skillful workman, and quite a number of his pieces are still preserved in museums, among them the exquisite reliquary in shape of an arm, of open work, which he made for the hospital of Santa Maria della Scala; an excellent chalice still to be seen in the gallery of the Uffizii, at Florence, etc.

(To be Continued.)

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### Mirrors.

NOT ALONE the optician, but also the jeweler and watchmaker of country districts, is supposed to be conversant with all the

various manipulations and processes pertaining to the domain of the former; and as it is frequently convenient to be able to silver a piece of glass for special purposes, we compile the following directions for performing this operation:

A piece of clean, smooth tinfoil, free from holes, is to be cut to the same size as the glass, and laid upon a couple of sheets of filtering or blotting paper folded into quarters. A little mercury is to be placed on the foil, and rubbed over it with a hare's foot or with a ball of cotton slightly greased with tallow, until the whole of the upper surface of the leaf be amalgamated and bright. More mercury is then to be added, until the quantity is such as to float over the tinfoil. A piece of clean writing paper, with smooth edges, is to be laid upon the mercury, and then the glass surface, previously well cleaned, is to be applied to the paper. The paper is to be drawn out from between the mercury and the glass, while a slight, but steady, pressure is to be applied to the latter. As the paper recedes it carries all air and dirt with it from between the glass and the metal which comes into perfect contact.

The mirror is now made and may be used for an experiment; but there is still much more mercury present than is required to make the definite and hard amalgam of tin constituting the usual reflecting surface. If it be desired to remove this excess, the newly formed mirror must be put under the pressure of a flat board in a slightly inclined position and loaded with weights.

The success of this operation will be found to depend chiefly upon the care exercised in cleaning the glass.

*Silvering Mirrors for Optical Purposes.*—This is best effected by depositing pure silver on the glass. The light reflected from a mirror made thus has a somewhat yellowish tinge, but photometric experiments show that from 25 to 30 per cent. more light is reflected than from the old mercurial mirrors.

Where *ammonium aldehyde* can be obtained, there is no doubt that this is the best and most economical process whether used on a large or small scale. But those who have not had considerable experience in the laboratory cannot always prepare this compound.

The next best process is based upon the reduction of metallic silver from its ammoniacal solution by salts of tartar. After a trial of several formulæ of this kind, all of them more or less simple, as well as efficacious, the following has been found to yield the best results in the shortest time:

*Silvering Solution.*—In 1 ounce of distilled or pure rain water dissolve 48 grains of crystallized nitrate of silver. Precipitate by adding strongest water of ammonia, and continue to add the ammonia drop by drop, stirring the solution with a glass rod until the brown precipitate is nearly, but not quite, re-dissolved. Filter, and add distilled water to make 12 fluid drachms.

*Reducing Solution.*—Dissolve in 1 ounce of distilled or very clean rain water, 12 grains of potassium and sodium tartrate (Rochelle or Seignette salts). Boil in a flask, and while boiling, add 2 grains crystallized nitrate of silver dissolved in 1 drachm of water. Continue the boiling five or six minutes. Let cool, filter, and add distilled water to make 12 fluid drachms.

*To Silver.*—Provisions must be made for supporting the glass in a perfectly horizontal position at the surface of the liquid. This is best done by cementing to the face of the mirror three nice hooks by which it may be hung from a temporary framework—easily made out of a few sticks.

The glass to be silvered must be cleansed by immersing it in strong nitric acid, washing in liquor potassæ and thoroughly rinsing with distilled water. If the glass has had mercurial amalgam on it, it will probably be necessary to clean the back with rouge. On having this surface perfectly chemically clean in a great measure depends the success of the operation.

Having arranged the contrivance for suspending the glass so that it may be at exactly the right height in the vessel that is to receive the solution, remove this vessel and pour into it enough of equal quantities of the two solutions to fill it exactly to the previously

ascertained level. Stir the solution so that they will become thoroughly mixed, and replace the glass to be silvered, taking great care that the surface to be silvered shall come in contact with the silvering fluid exactly at all points. The glass plate should be rinsed carefully before replacing, and should be put on while wet. Great care should be taken that no air bubbles remain on the surface of the solution or between it and the surface to be silvered.

Now, set the vessel in the sun for a few minutes, if the weather be warm, or by the fire, if it be cold, as a temperature of from 45° to 50° C. (113° to 122° Fahr.) is most conducive to the rapid deposition of a brilliant, firm and even film of silver. The fluid in the sunlight soon assumes an inky blackness, gradually clearing as the silver is reduced, until it is perfectly clear, when exhausted. The mirror should be removed before this point is reached, as a process of bleaching sets in if left after the fluid is exhausted. From 20 to 80 minutes, according to the weather, purity of chemicals, etc., is required for the entire process.

When the mirror is removed from the bath, it should be carefully rinsed with distilled water from the wash bottle, and laid on its edge on blotting paper to dry. When perfectly dry, the back should be varnished with some elastic varnish and allowed to dry. The wires and cement can now be removed from the face, and the glass cleaned with a little pellet of cotton and a minute drop of nitric acid, taking great care that the acid does not get to the edges or under the varnish. Rinse, dry, and the mirror is finished.

*Silver Amalgam for Mirrors.*—The great objections to mirrors coated with pure silver, are the yellow character of the reflected light and the fact that such mirrors are apt to be affected by sulphur. Mr. Lenoir has invented a process which is said to avoid these difficulties. The glass is first silvered by means of tartaric acid and ammoniacal nitrate of silver, or by the process described in the preceding section, and is then exposed to the action of a weak solution of double cyanide of mercury and potassium. When the mercurial solution has spread uniformly over the surface, fine zinc dust is powdered over it, which promptly reduces the quicksilver and permits it to form a white and brilliant silver amalgam, adhering strongly to the glass, and which is said to be free from the yellowish tint of ordinary silvered glass, and not easily affected by sulphurous emanations.

*Care of Looking Glasses.*—When looking glasses are exposed to the direct rays of the sun or to very strong heat from a fire, the amalgam is apt to crystallize and the mirror loses its brilliancy. If a mirror is placed where the rays of the sun can strike it, it should be covered in that part of the day during which it is exposed.

The best method of cleaning looking glasses is as follows: Take a newspaper, fold it small, dip it into a basin of clean, cold water. When thoroughly wet squeeze it out as you would a sponge, then rub it pretty hard all over the surface of the glass, taking care that it is not so wet as to run down in streams—in fact, the paper must only be completely moistened or dampened all through. Let it rest for a few minutes, then go over the glass with a piece of fresh newspaper till it looks clear and bright. The insides of windows may be cleaned the same way; also spectacle glasses, lamp glasses, etc. Unprinted white paper is better, but in the absence of that, a very old newspaper, on which the ink has become thoroughly dried, should be used. Writing paper will not answer.

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### A Decimal System of Time.

THE FOLLOWING is an extract from a paper read before the Canadian Institute, Toronto, Canada, by Prof. W. J. Loudon. The system proposed is based on the decimal system:

The present day of 24 hours would be divided into ten divisions, so that each hour, if we might so call it, on the new system would correspond to 2 hours 24 minutes. This hour would be again

divided into 100 divisions, called minutes if necessary, each minute on the new system thus corresponding to 1.44 minutes, a good fractional unit. Again, this new minute division could be subdivided for accurate measurements into 100 divisions, called seconds. The advantages arising from such a system would be:

1. The abolition of the so-called A. M. and P. M. nuisance—what has already been accomplished by the 24 hour system.

2. All the advantages to be derived from the adoption of any system based on our scale of 10—namely, the inconveniences arising from the continual use of vulgar fractions and the use of symbols for each unit in the ordinary affairs of life.

3. The fact that the time in hours and minutes (which for all practical purposes is sufficient) is indicated immediately by the clock. This is the most important advantage, because in the present system we have always to multiply by five before we know the time—thus 1 means five minutes past, 2 means ten, 11 means fifty-five past, or five to, and so on; and this would really overcome the great difficulty experienced by most children in learning to tell the time.

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### Obituary.

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MOSES G. BALDWIN.

It was with sentiments of profound regret that the members of the jewelry trade learned of the death of Moses G. Baldwin, which occurred at his residence in 25th street in this city, on June 18. Mr. Baldwin was, at the time of his death, the oldest living representative of the jewelry business in this city, having been identified with it for many years, and dying at the age of 78 years and 10 months. His name had been identified with various others in the manufacture of jewelry, the first firm being known as Downing & Baldwin, and the last of his business connections being under the firm name of Baldwin, Sexton & Peterson. He was the first President of the Jewelers' Association, holding that position from September, 1874, to September, 1875. He was a man of great energy, enterprise and ability, combining the essential elements required to make the successful manufacturer and merchant. During his entire career he was noted for his sterling integrity and rigid adherence to strict business principles. Kind hearted and generous by nature, he cheerfully dispensed of his liberal wealth to charitable objects, and extended a helping hand to many an unfortunate individual in adverse circumstances. He enjoyed the confidence and respect of the trade to an unlimited extent. A daughter and a son are left to mourn the loss of their father, the former being the wife of George W. Carleton, the well known publisher.

The funeral of Mr. Baldwin took place from the First Presbyterian Church of Newark, on June 20, and was well attended by representatives of the trade.

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### Plating With Nickel by Immersion.

STOLBA DESCRIBES the following simple process for nickel-plating without using a battery, which may be usefully applied in the case of small objects. He dilutes a concentrated solution of chloride of zinc with twice its volume of water. This mixture he boils in a copper vessel, adding a few drops of muriatic acid should there appear a precipitate of basic chloride of zinc. He thereupon adds a small quantity of powdered zinc. This addition causes a deposit of zinc upon the vessel. Thereupon sufficient chloride or sulphate of nickel is added to the bath to give it a distinctly green color, and the previously cleansed articles are then immersed in the liquid in contact with zinc, and allowed to remain there for about fifteen minutes, the temperature being maintained at boiling during the operation. If the coating is found to be insufficient, the articles are again immersed until a deposit of sufficient thickness be

obtained. In this way, he claims to be able to satisfactorily coat articles of zinc, cast and wrought iron, steel and copper.

By an analogous process described by C. Méne, it is affirmed that metallic articles may be plated with nickel by immersing them in contact with zinc, in a boiling neutral solution of chloride of zinc, in which is contained fragments or a plate of nickel. Should the solution be acid, the plating, it is asserted, will be dull. By this procedure the author claims to be able to coat articles of iron, steel, copper, brass, zinc and lead.

Where electrotypes of type or engravings are to be printed with colored inks that are disposed to become chemically affected by contact with the usual copper surface (as, for example, vermilion, which becomes brownish), it is customary to give the copper electrotype a thin coating of nickel in the usual manner. This nickel renders the electrotype proof against the above-named difficulty that printers experience with electrotypes not so protected.

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### Book Notices.

*Concours National de Compensation de Chronomètres pour les Températures.* Méthode de Classement; Calcul des Bulletins et étude Numérique de l'erreur Secondaire de Compensation. Par M. Gustave Cellérier, astronome-adjoint à l'Observatoire de Genève. Genève, Imprimerie L. E. Privat, Rue de la Bourse, 10. 1885. Quarto, pp. 45 text; 66 tables; pl. xii, with 186 curves.

We have received from the publisher, who also issues our excellent exchange *Journal Suisse d'Horlogerie*, abovesaid work, containing the results of the testing of chronometers, with regard to compensation, obtained at Geneva during the winter of 1883-84. These data are the collected notes of the observer, M. G. Cellérier, who made it his task to establish the secondary error of compensation—that is, the quantity of time which a chronometer either accelerates or retards, after it has been tested exactly in two different temperatures. He then calculated the secondary error of each chronometer for each temperature—that is, he established the rate of each chronometer as if it did not possess a deviation of the primary compensation, and that its mean rate were equal to zero.

This secondary error, thus separated, serves as datum, be it either by itself alone or for comparative purposes. The testing, consisting of two divisions, in which each was observed between the degrees of from 5 to 35° C, the secondary error could be ascertained for both divisions.

It is indeed no easy task to express in a few paragraphs the value of this book. Want of space forbids us to enter more fully into an explanation of the very interesting subject and conclusions. We simply give a few of the results M. Cellérier found:

1. That steel balance springs follow Dent's laws more closely than palladium springs.

2. That the secondary error of the latter is smaller, however, wherefore, taking both these data into account, we find the actual value of both kinds of balance springs to be the same.

He also draws the conclusion, as the result of his investigations, that at the beginning of testing of chronometers, it should be required that the final timing of the chronometers had been done at least three months prior to being sent in for examination.

Both balance and its spring are, in the mounting of the parts of the timepiece, subject to manipulations which may accidentally bruise them more or less, which defects generally disappear after a while, however, and they then resume their proper shape.

We can conscientiously recommend above work as a valuable assistant to the timer of fine watches and chronometers; although being written in the French language, the timing watchmaker will readily understand it by the very copious tables and curvatures shown in the plates.

Orders may be sent either to the office of the *Journal Suisse d'Horlogerie* direct, or to the office of THE JEWELERS' CIRCULAR. The subscription price is 12 francs.

## Foreign Gossip.

**CLOCKS.**—A State street dealer said that there are few things that present more striking characteristics than a clock.—*Metallurgist*. He most probably excepted its striking train.

**THE COMFORTS OF WEALTH.**—The late Duke of Brunswick had an extremely large collection of diamonds, which kept him in constant pain, afraid to go away from home at night, and still more afraid to stay there, for fear of assassination.

—An election was held March 7, 1885, at the German Horological School of Glashütte, to replace the late lamented Mr. Grossmann, and the watch manufacturer, Mr. J. Assmann, was unanimously elected. We congratulate the gentleman on the honor of replacing so distinguished a predecessor.

**TERRIBLE FATE.**—The *Lowell Courier* says that a young woman in southern Illinois has just died from having her ears pierced. Cut this out, young man, and show it to the girl who expects you to give her a pair of diamond ear rings. But do not do it, it is a terrible load to carry the death of a fellow mortal, even though it be only a woman, upon your conscience.

**EXPORT OF SOUTH AFRICAN DIAMONDS.**—Prof. H. E. Roscoe stated, in a lecture before a Manchester society, that from the Kimberley mines the diamonds exported are said to reach an annual value of \$18,750,000, and the total quantity raised since 1870 is reported to have attained the enormous sum of \$200,000,000. The diamonds are found in the yellow and blue "stuff," along with garnets, mica, bronzite, ilmanite, pyrite, etc.

**NUREMBERG EXPOSITION.**—Great efforts are being made by the committee appointed to conduct the affairs of the Nuremberg exposition. Advertisements, circulars, and notices are sent to all countries and regions, and returns and applications for space promise that the exposition will rival our Centennial exposition in grandeur and extent. Those of our manufacturers who desire to exhibit their goods, should apply for space at an early date.

—A practical joker at Warwick, England, recently issued a bogus notice headed, "The Clocks and Watches Act, 1885," and bearing the royal arms, warning the public that all persons exhibiting a clock or timepiece in any public place, hotel, inn, etc., must, within fourteen days from the date hereof, have the dials and works altered to the new code—twenty-four hour dials—under certain serious penalties. There was much surprise and indignation till the bogus character of the proclamation was discovered.

**COMPLIMENTARY.**—The *Allg. Journal d. Uhrm.* contains a very flattering account on the condition of our Chicago workmen, saying, among other pleasant things, that our watchmakers, goldsmiths, and electricians earn from \$15 to \$18; gold beaters, gilders, and case makers from \$12 to \$15 per week—in all of which we heartily concur, except in one thing, when it says that children tend the machines; our humane societies permit no child under the age of 14 to be engaged in any branch of work in our factories, and mulcts and punishments would surely be visited on the employer who should avail himself of the services of a child below this age.

**DIAMOND MINES.**—A writer in one of our exchanges says that a worked-out South African diamond mine looks like the crater of an extinct volcano. The largest and most productive mine in South Africa is the Kimberley. It is a vast hole, worked from the surface, and a thousand natives apply pick and shovel in it, while hundreds of buckets of clay and empty go up and down in rhythmic progression. A network of hoisting apparatus stretches from the surface to the bottom of the mine. The clay, when received on the surface, is sifted and washed. Kimberley is a town of miners and buyers, who purchase the diamonds in the rough, which are generally consigned to Paris and London firms. As is known, the rough diamond is of an octahedron shape.

**SUBTERRANEAN TELEGRAPHY IN GERMANY.**—Germany is successfully carrying out the laying of its telegraph lines under ground. Nearly all its network of telegraph lines already lie out of sight. This was principally caused by the fear that in times of war the enemy might cut the wires, and also to protect them against atmospheric influences. Experience has proven that the wires work with greater regularity underground, and no interruptions whatever have occurred for a long time, due to storms or frost.

**ONE HUNDRED YEARS OLD.**—Firms and factories that attain to the respectable age of one hundred years, especially those of the horological gender, are few and far between, and are deserving of notice. The *Journal Suisse d'horlogerie*, in its March number, mentioned such a *rara avis*: the firm of Dubois et fils, of Locle, established since 1785, and at Frankfort-on-the-Main since 1845; it also had meanwhile a branch office at Amsterdam from 1807 to 1842. THE JEWELERS' CIRCULAR might mention a few American horological firms which have all promise of attaining to that venerable age.

**TECHNICAL EDUCATION IN SWITZERLAND.**—The department of professional and industrial education of Switzerland has ordered an inspection of all those technical schools which draw a certain subsidy from the State. The experts for this purpose appointed are: M. M. Henri Bendel, professor, at Schaffhausen (for the cantons Argovie and Zurich; Ehrstinger, pastor, at Huttlinger (for the canton of Basle, Campagne, St. Gall, Grisons, Schaffhausen); Hunziker, doctor, of the seminary of Kussnecht (for the cantons of Upper and Lower Unterwald, Schwyz, Uri, Zug); Tieche, architect, at Berne (for the cantons of Friburg, Geneva, Neuchatel, Soleure, Vaud, Valois); Wolfinger, professor, at Aaran (for the canton Berne).

**BAREFACED SWINDLE.**—A barefaced and at the same time ingenious swindle has for some time been perpetrated by the casemaker Jac. Hug, of Locle. Gold watches in heavy cases were offered in market at low prices; both workmanship and grade of gold were all correct, and the cases were unhesitatingly stamped by the official hall-mark of Switzerland, until an envious competitor overhauled one of the cases, and found that wherever lumps of solder and even iron rings, heavy springs, and the like, could be introduced, it was done with a lavish hand. Large quantities of these cases were used by the watch factories, and foreign countries will doubtless be flooded with this trash. It is amusing sometimes to read the virtuous indignation of the foreign press when an American has gotten the better over a foreigner, in the way of trade; they straightway hold up their hands in pious horror and exclaim "We told you so, Oh, those swindling Yankees!" While in very truth, we are not able to loosen their shoe string, as far as swindling is concerned. The fact is, that we have no word in the English language that so pithily expresses deceit in manufacturing; we were forced to import it from Europe. Selah!

**HOROLOGICAL SCHOOL OF GENEVA.**—Before us lies the annual report of the horological school of Geneva, Switzerland, for the year 1883-1884. According to the report, the statement is favorable, and the directory have every reason to be satisfied with the success of the institution. The school committee lost by death one of its most energetic members, Mr. Huguenin-Savoie, who, during the course of a long and useful life, has most certainly earned for himself the grateful recognition of his countrymen, for the zeal displayed in the development of the watch industry at Geneva. The document says that 209 scholars visited the establishment, to wit: 74 Genevans, and 8 Swiss of other cantons, 15 French, 4 Italians, 5 Germans, 1 Greek, 1 Russian, and 1 Spaniard. It is a well recognized fact that the apprentice system is losing in importance every year, and not alone the watchmakers, but also all other vocations will in the near future have to depend entirely on these preparatory schools for the supply of workmen, and the material educated in schools like the one in question, will, we know, confer all honor on the establishment that trained them, and we cannot do well otherwise than to wish them a hearty success and God-speed.

## Workshop Notes.

**WATER PROOF GLUE.**—Soak in a cool place half a pound of glue for one night in a quart of good milk, and boil it the next day; it will resist moisture much better than glue dissolved in water.

**TO CLEAN BRUSHES.**—The best method for cleaning watchmakers' and jewelers' brushes, is to wash them out in strong soda water. When the backs are wood, you must favor that part as much as possible, for, being glued, the water may injure them.

**GOOD MUCILAGE.**—An adhesive mucilage for labels, suitable for bottles or glass, may be prepared by soaking glue in strong vinegar, then heat to boiling and add flour. This is very adhesive, and does not decompose when kept in wide-mouthed bottles.

**TO REMOVE TARNISH.**—Silver or electro-plate ware that have been tarnished by exposure to tainted air can be restored to brightness in the following pickle:  $\frac{1}{2}$  pound of potassa cyanuret is dissolved in 2 gallons rain water, and the articles are immersed in it, until bright. Be careful to rinse off the alkali water, otherwise it will corrode the goods.

**TO CLEAN DULL GOLD.**—Dull gold may be cleaned by immersion in a bath of 80 grams calcium hypochlorite, 80 sodium bicarbonate, and 20 table salt, which is dissolved in 3 quarts distilled water. It must be kept for use in well-corked bottles. Goods to be cleaned are put in a basin and covered with the mixture. After some time they are taken out, washed, rinsed in alcohol, and dried in sawdust. The articles then have the same appearance as if new.

**TO PREPARE CHALK.**—Thoroughly pulverize the chalk, then mix it with clean rain water, in proportions of 2 pounds to the gallon. Stir well, and let it settle for about 2 minutes. The gritty matter will now have settled to the bottom. Slowly pour the water into another vessel, so as not to disturb the sediment. Permit the whole to stand until entirely settled, and decant as before. You now have prepared chalk, ready for use when dried. Spanish whiting may be treated in the same way, and makes an excellent polishing powder.

**CLEANING SOAP FOR METALS.**—A German technical paper publishes the following recipe for the preparation of a cleaning soap for bronze, brass and silverware: 50 grams finely cut cocoa soap is by heating mixed with a sufficient quantity of water that it will form a thick paste; again, 5 grams crocus are stirred up with a little water, and  $1\frac{1}{2}$  grams carbonate of ammonium are mixed with it, and then stirred into the soap paste, after cooling. The obtained paste is preserved in stone jars, well tied up with bladder or parchment paper.

**BLUEING SPRINGS.**—There is no advantage, says Mr. Glasgow, gained by blueing a spring; it is not thereby kept free from rust. Indeed it is said that steel, when blued, is in a state of incipient oxidation, and it is known that the blue spring is more frequently found rusted in ship's chronometers than the bright portions of the escapement; but as it is customary to blue springs, I will explain how it is done. The best way to blue a cylindrical spring is upon a block kept for the purpose, and not used for hardening. The block should be solid, so as to heat slowly, and the grooves be cut very shallow, and not fitting the spring too closely, in order that the air may have access to all parts of it. The spring should be fixed with screws, as if for hardening, and the block be placed on end upon a blueing pan over a spirit lamp. If the parts of the spring nearest the pan are coloring more than the upper part, the block must be turned upon the opposite end. Every part of the apparatus must be dry and hot before commencing to blue, and above all things it must be clean, for the least particle of oil or dust will prevent the spring from blueing evenly. Covering the block with a short length of glass tube will prevent external air currents from affecting the spring, and will keep the temperature uniform within the tube. When the spring is the required color, set the block down to cool, and, if the spring has been well polished, it should be a very bright blue.

**ISOCHRONISM OF BALANCE SPRINGS.**—A balance spring, of whatever form, to be isochronous must satisfy the following conditions: Its center of gravity must always be on the axis of the balance, and it must expand and contract in the vibrations concentrically with that axis. When these conditions are secured in a properly made spring it will possess the quality of isochronism—that is, its force will increase in proportion to the tension, and it will not exert any lateral pressure on the pivots. M. Phillips, in his memoir, demonstrates these conditions, and proves theoretically that the terminal curves deduced with the view of satisfying the one condition, verify at the same time the other.

**PRECIPITATING GOLD IN OLD BATHS.**—The baths when no longer fit for use are filtered into a white glass flask, rendered alkaline with a little bicarbonate of soda, and a concentrated alcoholic solution of magenta is added drop by drop until the liquid has taken the deep red hue of syrup of raspberries. The flask is then exposed for six or eight hours to the light of a bright window. At the end of this time the gold is found to be deposited as a violet powder, whilst the supernatant liquid has become colorless. It is carefully decanted, so as to preserve merely the deposit. When a sufficient quantity of protoxide of gold has been thus collected, it is carefully washed upon a filter, dried, and the filter is burnt. The dry residue and the ash of the filter is then dissolved at a gentle heat in an excess of aqua regia, and the solution (diluted with distilled water) is separated from the insoluble substances by filtration.

**CAUTION ABOUT BREGUET SPRINGS.**—A Breguet spring should never be applied to a watch with an index. It is perhaps the best form of spring for a pocket watch, having all the properties in action of the cylindrical spring, and the great advantage of flatness in form, but any attempts at producing a good timekeeper with this spring and curb pins will end in failure. And any attempt at getting time in positions by pressing the outer coil of the flat spring against the outer or inner pin is mere jobbing, and, even if successful, would require to be repeated every time the balance had to be taken out. For flat springs with regulators it would be highly advisable to pin a spring into the collet, in order to get the stud hole and curb pins to correspond. The end of the over coil of a Breguet spring should run into the hole in the stud before being pinned in, and if the stud is screwed into the cock without the balance it will easily be seen if the jewel hole is in the center of the hole in the spring collet, as it should be. This spring should also be pinned at equal turns.

**CONCERNING THE RATE OF A WATCH.**—To the question: "Where can I discover the disturbance in a watch which has been wound up but goes lame and finally stops?" in the *Schweizer Uhrm. Ztg.*, a correspondent replies: When the watch is wound up, and has a lame motion and at last comes to a stop, either the male stop has wedged itself under the female stop in the last winding, or, if it should be a little smaller, then the former applied to a shoulder of the latter, or, the spring is too broad by one number, and, when the barrel cover is pressed in a little, a friction will occur, or, finally, the hole is not located in the center of the spring. The first coil of the spring in this case comes to a stand above the spring core, in consequence of which the inner end of the spring rubs on the cover or bottom of the barrel, whereby the spring is pinched in, and thus contracts its elasticity, which has happened to me several times. I took out the spring, filed the two inner sides of the spring a little smaller, rounded their edges with the graver, and with a round file filed the hole in the center. It also happens sometimes that the spring hook is not located exactly in the center of the spring core; there are also springs of an inferior quality, that lose their elasticity after several weeks or months, whereby the watch makes a lame motion, and stops after from 10 to 12 hours. It may also occur that the balance spring works loose, which defect also produces a slow motion and finally stoppage; this will occur only, however, when the watch has been wound too quickly, whereby the balance is transported into unduly large vibrations.

## Trade Gossip.

Lee Roberts succeeds O. B. Ives, Bristol, Conn.  
 Marks Bros. succeed E. Marks & Son, Troy, N. Y.  
 C. W. D. Tuck moved from Carey to Sycamore, Ohio.  
 J. B. Reed, Lowville, N. Y., has retired from business.  
 P. C. Toutchey succeeds R. B. Camp, Meshoppen, Pa.  
 A. J. Doughty succeeds Thos. A. Hay, Marinette, Wis.  
 Beattie & Laskey succeed B. H. Beattie, Sterling, Kan.  
 J. E. Wood succeeds J. H. Bishop, Owensborough, Ky.  
 Cahill & Kemble succeed R. Cahill, New Lisbon, Ohio.  
 A. O. Bruned succeeds G. W. Dickinson, Larned, Kan.  
 A. W. Barber, Oxford, Mass., has retired from business.  
 L. E. Schario has moved from Newton to Danville, Ills.  
 W. Alexander moved from Clinton to Terre Haute, Ind.  
 Joseph Brown has moved from Sabetha to Oneida, Kan.  
 M. T. Charles succeeds Edson Warriner, Fryeburg, Me.  
 J. H. Rhodes has moved from Marion to Bluffton, Ohio.  
 Jacob Miller succeeds Miller & Somers, Archbold, Ohio.  
 N. B. Blood succeeds H. N. Capoon, Lansingburg, Mich.  
 Krogstad Bros. have again returned to Valley City, D. T.  
 E. P. Clark succeeds W. H. DeLamater, Charlotte, Mich.  
 Howard Wilcox succeeds Chas. S. Willard, Catskill, N. Y.  
 Schilling & Thomas succeed N. N. Schilling, Xenia, Ohio.  
 Lanier & Youmans succeed G. R. Youmans, Waycross, Ga.  
 S. M. Hardman has moved from Ireland to Weston, W. Va.  
 H. Semken, of Washington, D. C., sails for Europe July 1st.  
 Pepper & Horner succeed Garrett Pepper, Cleveland, Tenn.  
 Wyman & Seaverns succeed Louis J. Wyman, Boston, Mass.  
 B. N. Stephenson has moved from Douglass to Olathe, Kan.  
 James W. Ferris has moved from Sabula to Davenport, Iowa.  
 J. C. Frederick has moved from Lake City to Sac City, Iowa.  
 L. Elsohn & Co., Johnstown, N. Y., has retired from business.  
 Smith & Marshall succeed Chas. E. Hughes, Van Horn, Iowa.  
 Levi Hair succeeds the firm of Dinnis & Hair, Navarre, Ohio.  
 W. S. Gaines & Co., Ashland, Ohio, have retired from business.  
 T. A. Haney has moved from Dallas City, Ills., to Lyons, Kan.  
 Schnabel & Richiger succeed Gottlieb Schnabel, Newark, N. J.  
 N. A. Reineman has moved from Pittsburgh to McKeesport, Pa.  
 H. R. Hadrich has moved from East Saginaw to Marquette, Mich.  
 Mrs. Elizabeth Hopper succeeds C. A. Dickson, Richmond, Ind.  
 J. E. Stanley, Delta, Iowa, has retired from the jewelry business.  
 Burbank & Ware, Kingsley, Kan., have sold out to B. H. Young.  
 Robert Lawrie has moved from Tenville, Mich., to Chicago, Ills.  
 H. M. Hillman & Co. succeed Jansen & Hillman, Watkins, N. Y.  
 W. R. Caldwell has moved from Huntington to South Bend, Ind.  
 W. B. Hall has purchased the business of Jos. Victor, Duquoin,  
 Ills.  
 Wm. Newton has purchased the business of C. S. Snively, Carmi,  
 Ills.  
 J. J. Downey succeeds the firm of Shipley & Downey, Atlanta,  
 Ills.  
 L. J. Rhoads & Co. have moved from Nassau to Stevens Point,  
 Wis.  
 Noeman, Hawes & Swedberg succeed M. Swedberg, Luverne,  
 Minn.  
 Wm. Annsbaugh succeeds the firm of Annsbaugh & Shue, Fin-  
 castle, Va.

T. B. Snyder, Three Rivers, Mich., has retired from the jewelry  
 business.

J. Taylor & Son, Grand Meadow, Minn., have retired from  
 business.

Marshall Bros. have purchased the business of B. M. Bailey, Rut-  
 land, Vt.

A. S. Aloe & Co. succeed the firm of Aloe, Hernstein & Co., St.  
 Louis, Mo.

George V. Wood succeeds the firm of Wood & Moore, Reids-  
 ville, N. C.

James N. Tiefenbrun succeeds the firm of Roe & Tiefenbrun, St.  
 Joseph, Mo.

Geo. R. Clark & Co. succeed the firm of Clark & Waller, St.  
 Cloud, Minn.

L. A. Kelly & Co., San Francisco, Cal., have retired from the jew-  
 elry business.

John B. Staininger succeeds the firm of Staininger & Hawley,  
 Tipton, Iowa.

The firm of Seamans & Thompson, Adel, Iowa, is succeeded by  
 J. M. Seamans.

W. W. Houghton, of Fargo, is moving his Minto branch store to  
 Wahpeton, D. T.

Geo. H. Johnson succeeds the firm of W. E. Morrow & Co., Col-  
 umbiaville, Mich.

Arthur H. Freund, only child of Max Freund, died June 2d, at  
 the age of 12 years.

Fred. W. Korn has purchased the business of C. I. Jiszkowitz,  
 Big Springs, Texas.

Smith & McQuiddy, Columbia, Tenn., have dissolved. W. A.  
 Smith will continue.

P. J. Williams has opened one of the neatest jewelry stores in the  
 Northwest, at Fargo.

Pike & Wolfheim, Roanoke, Va., have dissolved. N. G. Pike  
 continues the business.

R. C. Thorold, of Jamestown, D. T., is building up a fine trade in  
 the James River Valley.

E. P. LeDoux succeeds the Lucas Jewelry Manufacturing Co.,  
 Silver City, New Mexico.

John L. Smith, of Brainerd, Minn., is closing out his business,  
 having gone into insurance.

The firm of Steffner & Robertson, Ashville, N. C., have dissolved,  
 J. D. Robertson continuing.

S. Fox, of Fox, Brother & Co., of Cincinnati, returned from  
 Europe recently on the *Fulda*.

The firm of Jarvis Bros., Erie, Kansas, have dissolved. S. A.  
 Jarvis will continue the business.

John W. Ruth, Shelbyville, Tenn., has admitted his son to partner-  
 ship. The firm is J. W. Ruth & Son.

The office of the Columbus Watch Company, W. C. Lippus, New  
 York Agent, has removed to 61 Nassau street.

The Howard Watch Co. have made a material reduction in the  
 prices of their movements, to take effect July 1st.

During the past month we received a very pleasant call from W.  
 A. Moore, manager of the Duebur Watch Case Co.

Paul Wetzold, of Perham, Minn., made a six months' trip to Ger-  
 many this spring, to look after his father's estate, who died recently.

Wm. L. Kirkpatrick has purchased all interests in the New York  
 Dial Co., and the business will hereafter be conducted under the  
 name of Wm. L. Kirkpatrick.

E. A. Lauten & Co. have dissolved by mutual consent, Charles  
 E. Lavten retiring from the firm. The business will be continued  
 under the same style as formerly.



Martin Marcus has resigned from the house of I. Emrich and established the International Jewelry Co., temporarily at 44 Maiden Lane.

The jewelry store of Dendorz Libro, in Zacatecas, Mexico, was recently broken open and robbed of \$15,000 worth of jewelry. The authorities have no clue to the robbers.

Charles G. A. Thompson, formerly with Heller & Bardel, has assumed the management of the Philadelphia office of MacKinney, Smith & Co., which is to be opened July 1.

Joseph Fahys has returned from an extended trip, during which time he visited the Pacific Coast, the Yosemite Valley, and all points of note in that section of the United States.

A new co-partnership has been formed at Providence, under the firm name of W. S. Hough, Jr., & Co.; Walter S. Hough, Jr., and Charles A. Wilkinson being the general partners.

Thos. J. Pairpoint, the originator of the Pairpoint Manufacturing Co., New Bedford, Mass., has severed his connection with the company and is going into manufacturing on his own account.

Berthianne Bros., of Crookston, Minn., have recently refitted and enlarged their store, and are about opening a branch store at Devil's Lake, D. T., which will be in charge of Henry Berthianne.

D. G. Gallett, of Aberdeen, D. T., has returned from a visit to his former home, near Albany, N. Y. Mr. Gallett continues farming and jewelry, having one hundred acres of wheat this season.

Philip Hecht has retired from the firm of Levy, Dreyfus & Co. L. W. Levy and Edward Dreyfus will continue the business, while Mr. Hecht will open an optical goods store in Newport, R. I.

Attention is called to the advertisement of the new improved short-post lever button, made by W. G. Clark & Co., Attleboro Falls, Mass., which is claimed to be especially adapted to ladies' wear.

H. Muhr's Sons, of Philadelphia, have a very brilliant diamond weighing 50 $\frac{3}{8}$  karats, which they have christened "The President." It is larger than the Cleveland gem and originally weighed 128 karats.

C. W. Sprague, formerly from Weedsport, N. Y., but of the past year and a half at Lisbon, D. T., recently brought out his wife and two daughters, having concluded to make Dakota his home for the future.

F. I. Marcy & Co. have largely increased their line of antique sterling silver sleeve buttons, with the Acme Lever Attachment, until now they have the most complete assortment of these goods in the market.

L. M. Lea, successor to the firm of Dehnel & Lea, Sandusky, Ohio, has formed a co-partnership with Jacob Greenfelder under the firm name of Lea & Greenfelder, and will continue the business at 135 Columbus avenue.

I. Meyer, with S. F. Myers & Co., was married June 28th to Miss Bertha Rindler. The employees of the firm showed their appreciation and kind feeling towards the happy groom by presenting him with a handsome parlor suit.

T. E. Thompson, Galveston, Texas; G. Hulse & Son, Goshen, New York; N. A. Soggs, Lima, New York; T. Dickinson, Buffalo, New York; A. Herman, Cincinnati, O.; Geo. Ludwig, Walla Walla, Wash. Ter., have also been in the city making purchases during the month.

W. F. A. Woodcock, of Cumberland, Md., has taken a store at No. 194 Church street, Norfolk, Va., which he is fitting up in a handsome manner, preparatory to an early opening with a well selected stock of jewelry. His address will hereafter be as above, at Norfolk.

Thomas G. Brown & Sons, 860 Broadway, are exhibiting some beautiful specimens of art work in silver, embracing original designs in personal adornments for summer and seaside wear. This jewelry is worthy of inspection by connoisseurs and others interested in new and progressive work in precious metals.

Mr. Jacob N. Bonnet, of Mulford & Bonnet, returned from Europe in June after an absence of several months. In addition to increased importations in precious stones, Mulford & Bonnet will have many novelties in foreign styles of jewelry this season.

Jacot, Juillerat & Co., 37 Maiden Lane, carry a large stock of musical instruments of all the latest styles. There is a growing demand for instruments of this character, and the manufacturers display much ingenuity and progressiveness in keeping pace with the popular demand for novelties.

The Gorham Manufacturing Company find that their "five o'clock" tea spoons are running a neck to neck race with "after dinner" coffee spoons in popularity. These "five o'clock" tea spoons are fanciful in design and finish, and come in sets arranged in handsome cases, suitable for wedding and other presents.

A person about 5 ft. 10 inches in height, and weighing about 145 pounds, slight black moustache, partly bald head, and large, bad-smelling feet, has been victimizing the trade and robbing individuals in the South. He passes by the name of Lane generally, but has several aliases, and claims to represent various firms in Maiden Lane.

Clemens Hellebush, of Cincinnati, O., is owner of a patent for making imitation marble, which he proposes to apply to clock cases, and has organized a company in Cincinnati to be known as the United States Marble Clock Co., for the purpose of making these goods. It is claimed to be equal to the finest French marble. The goods will be ready for inspection about Sept. 1st.

The "Jurgensen Mainspring," now being placed on the market, is made by one of the oldest and most reliable houses in Switzerland. They are packed in boxes containing one dozen each, and each spring has its size and strength marked on a tag. Each box contains assorted strengths and widths. Israel Farjeon & Co., 75 and 77 Nassau street, are the agents, and all first-class jobbing houses have them for sale.

H. L. Simons & Co., drugs and jewelry, of Glencoe and Bird Island, Minn., have recently refitted and newly furnished their Bird Island store. Mr. Newton Risinger is the resident partner, and is taking the lead in the country as watchmaker. H. L. Simons, of above firm, has recently taken another partner—this time for life—the lady being a Miss Stockman, of Minneapolis. Their many friends wish them much success and happiness.

A large, well built, neatly dressed man entered Tiffany's recently, and, representing himself to be the manager for E. S. Stokes of the Hoffman House, asked to be shown some diamonds. He was waited upon by Mr. Cook, who soon detected the stranger in an attempt to conceal a diamond in his coat sleeve. Mr. Cook secured the gem and then called an officer, who took the man into custody. On the way to the station house the prisoner attempted to shoot the officer, and also to assault Mr. Cook, and a severe clubbing was necessary to reduce him to subjection. He was a stranger to all the detectives, but is regarded as a professional thief. He was held for examination and further identification.

Among the departures for Europe recently were the following named gentlemen identified with the jewelry interests: S. Brunswick, of the firm of S. Brunswick & Co.; A. S. Lewis, of the firm of Geo. C. Shreve & Co., of San Francisco; and Wm. Smith, of the firm of Smith & Co. R. H. Galbraith, of the firm of Duhme & Co., of Cincinnati, will sail during the present month. M. Fox, of M. Fox & Co., recently returned from abroad. D. E. Oppenheimer, of the firm of Falkenau, Oppenheimer & Co., arrived in this city by the *Gallia*; he will remain here only a few days, when he will return to the scene of his duties in Europe, as buyer for his firm. George Bacon, of the firm of Bates & Bacon, has also returned from Europe; C. A. Fowler, of Fowler Bros., who recently returned from Europe, sold a liberal amount of goods during his absence to English customers.

During the past month the New York Board of Trade has done some good work in the interests of its members. One illustration is the case of the settlement of the estate of A. J. Robinson, of Providence, who recently failed. An assignee had been appointed, the liabilities being reported at \$10,280, and the stock and fixtures at \$23,504. The Board of Trade sent an agent to Providence to look after the interests of the creditors, and he found the assignee determined to sell the goods at private sale, and to accept the offer of a friend for \$5,000 for the entire stock. The representative of the Board bid \$6,500 for the stock, and by his persistence forced the price up to \$7,100 over a balance due on a chattel mortgage. This made the stock \$13,584 instead of \$5,000, which the assignee wanted to accept. This gives the creditors about 82 per cent. of their claims, when, but for the active interference of the Board of Trade, they probably would not have received more than 25 per cent.

The third annual meeting of the Ohio State Jewelers' Association convened in the parlors of the St. James Hotel, in Cincinnati, Ohio, on the 13th day of May, 1885, with the following officers present: President, S. C. Sisson; 2d Vice-President, C. F. Gray; Secretary, Le Roy Decker; Treasurer, Jno. A. Worrell; Member of Executive Committee, C. McLain. The Constitution was changed from "three members in the Executive Committee" to "five," the President, by request, having read the Constitution. On motion, a copy of the Constitution was directed to be sent every jeweler in the State, with a list of the officers and members printed thereon. Mr. Hammelrath, of Cincinnati, was appointed to canvass the City of Cincinnati, and present the workings of the Association and urge the jewelers to become members of the organization. Seven new members were admitted. Mr. S. C. Sisson was elected to represent the Association in the U. S. Guild, his expenses being paid by the Association. The following officers were elected for the ensuing year: President, D. Furtwangler; 1st Vice-President, Mr. Zoelner; 2d Vice-President, S. W. Brock; Secretary, Le Roy Decker; Treasurer, John A. Worrell. Executive Committee—S. C. Sisson, C. McLain, C. J. Olin, C. F. Gray, H. A. Bedell. Columbus, Ohio, was selected as the place for next meeting, second Tuesday in November.

One of the great attractions of the New Orleans Exhibition, just closed, was the special exhibit of the Waltham Watch Company, among whose numerous articles of interest shone forth conspicuously an enlarged model of the company's split-second chronograph, with split-minute attachment. This model had been built especially for the New Orleans Exhibition, and proved of interest to thousands of visitors, among whom the sporting fraternity especially evinced the greatest delight at the wonderful contrivance. At first it seemed rather difficult to unravel the exact working of the mechanism; but quick to see and quick to learn, they readily understood it with but little explanation on the part of the attending watchmaker, and they expressed much surprise at the simplicity of its construction. The durability of the parts was greatly tried, inasmuch as the model was kept going through its multiplicity of performances from early morning until closing hour. At the end of the Exhibition it worked as accurately as on the first day it was shown—a test which in itself was a triumph. The chief virtues of these Waltham chronographs is that all the starting, stopping and fly-back apparatus is fully exposed to view, and so arranged as not to come in contact with the time-keeping part of the watch proper. The model was built by Mr. Henry A. Lugin, the originator of the system of detachable chronographs.—*Sporting Hour*, June 18, 1885.

At the meeting on June 1st, of the "New York Academy of Sciences," George F. Kunz exhibited a mass of fine gold quartz of such richness as to make it of value as an article of jewelry. It was found during the month of April, 1885, by W. D. Ball, who, with his partner, after 31 years of prospecting, were rewarded by finding the newly discovered property, the "Emma Mine," between Mariposa and Horrioritas, Mariposa Co., California. In all, the pieces found are valued at from \$16,000 to \$18,000. The specimen exhibited weighed 158 ozs. and contained about \$2,000 worth of gold. The specimen is valued for jewelry purposes at \$2,500. Mr. Kunz announced that a new locality for transparent blue beryls (aquamarines) had been discovered at the Great Continental Divide in Colorado. The crystals are a dark transparent blue, resembling the Mourne Mountains, Ireland, crystals. The locality promises well. A crystal  $1\frac{1}{2}$  inches long and  $\frac{1}{4}$  inch wide was exhibited from the locality, the faces of pyramid were 0—2—2 of the prism *I i i*.

In the October issue THE CIRCULAR warned the trade against a tramp watchmaker named Harry Hirsh, who had stolen goods from various jewelers. We are in receipt of a letter from Rowe Bros., of Chicago, announcing the arrest of the man. He turned up at Elyria, Ohio, and applied to C. R. Bickford for work. Mr. Bickford suspected him to be the tramp whose description we printed, and he telegraphed Rowe Bros. Meantime, the chap had moved on to Oberlin, and was about engaging with Mr. Pettis, when Mr. Bickford, who had followed him, took him into custody. Requisition papers were secured and the thief returned to Chicago. Rowe Bros. desire persons who have been victimized by him to come forward and identify him, so as to secure for him the largest sentence possible. Many may recognize him from the description: 28 years old, dark complexion, black curly hair, black eyes; speaks broken, bad English; generally attractive appearance. Rowe Bros. will pay a suitable reward for the return of the following watches and evidence that will trace them to Hirsh's possession: Paul H. Mathey, No. 11,256, 18-k., 70 dwt., Blauer maker; Chas. Tissot, Favre, No. 36,339, engraved H. case, 45 dwt.; "Royal," No. 1,484,654, 14-k., plain hunting case, 24 dwt., ribbon edge.

Some very pretty experiments showing the effects of magnetism on the steel parts of a watch, can be very easily made, as follows: Take a glass of water, a balance wheel and an ordinary magnet, say twelve inch horse shoe. The balance wheel will float if carefully laid on the surface of the water. Bring the magnet near it and it will be attracted, repelled or revolved, as the different poles are brought to bear, and when the magnet is removed to a distance, the balance will arrange itself in the north and south polarity the same as a compass needle. A hair spring will float in the same way, and is much more sensitive to the magnetic influence—the delicate lines of steel are alive to the slightest change of polarity, as exhibited by the magnet, and if left free will immediately arrange itself in the north and south line. Also the fork, the regulator or any of the flat pieces of steel can be made to float (care being taken that they are dry and carefully laid upon the water), and their antics under the magnetic influence are very amusing, appearing "like things of life" as they "bout face," turn sharp corners or "scoot" across the surface of the water in obedience to the attracting force. It will be noticed that the finer finished pieces of steel and those with the finest points are much the more sensitive, thus demonstrating the assertion, that the finer the watch the more susceptible it is to magnetism. These simple experiments, which any watchmaker can readily try, show *why* and *how* a watch, when once magnetized, is affected by varying influences of magnetic or electric conditions. The parts are each attracting the other, but with a varying force as the *position* of the watch is changed, or brought into an atmosphere more or less charged with magnetic or electric forces. Some such simple investigations as these may furnish a key to mysteries which have long puzzled many skillful watchmakers, and will account for the unsatisfactory performance of watches, otherwise perfect.



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## THE JEWELERS' CIRCULAR AND HOROLOGICAL REVIEW

*The recognized organ of the Trade, and the official representative of the  
Jewelers' League.*

A Monthly Journal devoted to the interests of Watchmakers, Jewelers, Silver-  
smiths, Electro-plate Manufacturers, and those engaged in the  
kindred branches of art industry.

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### The Outlook for Trade.

THE MONTH of July presented no especially encouraging features in commercial transactions, notwithstanding which fact the universal sentiment of business men is expressive of hopefulness for better times in the immediate future. Indeed, the confidence with which this hopefulness is expressed on all sides is one of the most reassuring signs of the times. In the jewelry trade the sales during June and July can only be characterized as moderate; but a great volume of business was not expected, so that it may be fairly said that the transactions came up to expectations but not up to what had been hoped for. The trade was somewhat in the situation of the old lady who went into the chicken business, and who proclaimed at the outset that she "didn't expect to make anything out of it, and if she did half as well as she expected she would be satisfied." The trade expected to do a limited business during the summer, but hoped their expectations might be exceeded; the results probably fulfilled their expectations but did not come up to their most sanguine hopes. We encounter manufacturers and dealers who admit that their sales for the first half of 1885 were fully equal to those of last year; they find no occasion to complain, but are patiently waiting and hoping for better things. Others with whom we talk put on lugubrious countenances, and their talk is bluer than the average of city milk; there is no business whatever, according to their version, no profits and no prospects. They assume to be hopeful, notwithstanding, and say they think there will be a good fall trade, though the only reason they can give for so thinking is that everybody else is hopeful. It is a good sign of itself when everyone expresses confidence in the future; it indicates that they do not find present conditions sufficiently discouraging to drive them

out of the field, but filled with enough good seed to lead them to look for a bountiful harvest.

There are, in fact, good and substantial reasons why this confidence in a good fall trade should be realized. Statisticians whose business it is to gather information regarding harvest prospects, report that the southern States promise an excellent cotton crop; the wheat crop promises to be an average one; corn, fair; the wool clip excellent; and so on through the wide range of all our productions, nothing failing, but everything giving promise of yielding returns from fair to excellent. Prices generally are firm, showing a tendency to advance. Sales of staple goods of a general character have been liberal, and prices have held their own with those of last year. There is a falling off in the surplus accumulations of money in the banks, which indicates that the millions that have been withdrawn from commercial and manufacturing investments are gradually being restored to business channels. In view of these and other features of the present situation, it is entirely reasonable to look for a gradual increase in the volume of business in all branches of industry. Stagnation must disappear eventually before this development of public confidence as the fog disappears before the rising sun. It is fair to believe, also, that there will be many goods sold when once the demand sets in, for the stocks in the hands of dealers have been greatly reduced and will need replenishing to the fullest extent. We think the outlook for a good fall business is excellent, and in this we are seconded by representatives of the trade from every section of the country. During the past month many buyers visited the city, making purchases with caution, but exhibiting more confidence than they have shown for some time. Their orders were in no sense of a speculative nature, for their object was to replenish exhausted stocks, liven up their stores by the introduction of late novelties and thus encourage custom, but they took no chances by purchasing largely for a prospective demand and running the risk of being overstocked. This caution and deliberateness in buying is also a good sign, showing that the retail trade is on more of a hardpan basis, prepared to expand when the demand comes. Many of those who have visited the city say that they did so not so much with a view to buying at present as to see just what there is in the market so as to be prepared to order desirable and attractive goods at a later period. Nevertheless, the orders they left behind made a very respectable aggregate. The jewelry trade has simply to abide the issue of coming events, as all other industries must do, possess its soul in patience and hope for better times—hoping much, expecting moderation and being content with what comes.

### The Jewelry Trade in the West.

IN THE June issue of THE CIRCULAR we expressed our views regarding the growing importance of trade interests in the West, giving credit to the energy, enterprise and ability of western mem-

bers of the trade for the manner in which they had pushed forward the enterprises in which they are engaged; we endeavored to state, what is so plainly apparent to everyone, that the industrial and commercial interests of several of the larger western cities have reached proportions that the older cities of the East might envy. A Chicago contemporary, whose June issue reached us just previous to the first of July, after our forms for the July number of THE CIRCULAR were closed, takes us to task for thus recognizing the importance of western industry, and charges us with a lack of consistency; it goes so far as to print in parallel columns extracts from the article referred to together with extracts from an article printed in THE CIRCULAR eighteen months ago, the tenor of which was to disparage western enterprise and glorify New York manufacturers and merchants. This it calls a "journalistic flop over," showing a want of consistency on our part. We might put in the plea that Horace Greely is alleged to have done once under a similar accusation: "Confound consistency! it is a bar to all human progress;" but we prefer to confess to the "flop over." That is to say, we admit that the views of the present proprietors of THE CIRCULAR are at variance on several points with those entertained by him who was its proprietor a little over a year ago. In assuming control of THE CIRCULAR shortly after the death of Mr. Hopkinson, it was distinctly announced that we inherited no prejudice that he might have entertained, and were not bound by any business or editorial policy he might have laid down. Therefore, in conducting THE CIRCULAR, our editorial pages voice the sentiments of its present proprietors, not of those who have gone before or may come after us. In our sentiments there has been no "flop over," nor is there any lack of consistency, however much they may disagree with those expressed in these columns on previous occasions. The convictions we give utterance to are the results of many years' experience in business affairs, and are not influenced by local interests or unreasonable prejudices.

While our contemporary thought to do us an injury by referring to the article in question, we are under obligations to it for bringing the subject once more to our attention. What we said of western enterprise we said from the fullness of our convictions. The time has passed when petty jealousies can be indulged in between the eastern and western sections of the country. Each has its mission to fulfill, and each is working out its destiny in its own way, contributing its best efforts to secure the welfare of the entire country and to promote the best interests of the people in general. We of the East rejoice in the rapid development of the great West in its agricultural, mining, manufacturing and mercantile interests. Eastern capital is largely invested in western enterprises, and eastern manufacturers rely largely upon the patronage of their western customers for their success. It is of the growth and development of the West that the greatest success of eastern manufacturers is born; for them to disparage that growth and development would be to kill the goose that lays the golden eggs. Incidental and natural to the building up of the West, and of the provision it must make for its extended and rapidly increasing population, has come a growth of industrial pursuits, and some of our largest and most important manufacturing establishments are located in that section. They seek markets for their products in all sections and all lands, and the nation rejoices in their prosperity. So far as the jewelry trade is concerned, there is comparatively little danger of overproduction, whether East or West; manufacturers seek to supply legitimate demands, and wherever the demand is sufficient to warrant them, there will the manufacturers locate. There are many articles of jewelry now made in the West, but such production does not even provide for the natural growth of demand consequent upon increase of population, so that no eastern manufacturer can claim to have lost business by reason of western production. It is so in other lines of business; while manufacturing enterprises have sprung up in the West, they have also increased in the same lines in the East. While there must always be competition between manufacturers, there need not be envy and jealousy, but more especially sectional jealousy;

the country is large, its population is rapidly increasing, and there is room enough for every legitimate industry.

In recognizing the claims of western cities to recognition as industrial and commercial powers, we by no means forego the claim of New York to be the first commercial city in the land; it has been so for many years, and must continue to be so. Other cities have sprung up to positions of wealth and importance, but the growth of New York has kept pace with the progress of the country, till it begins to be a question as to what we shall do with all the people; how to dispose of the products of their hands and brains is a problem less difficult of solution than how to provide them with homes. Already New York overflows into adjacent cities, and half the population of Brooklyn, Jersey City and other suburbs do business in New York. In fact, within a radius of thirty miles from the City Hall, it may all be said to be New York City, and within that radius there is a population of about 3,000,000. As a manufacturing city it is unequalled on this continent for the amount of capital and number of persons employed and for the variety of its products. In the manufacture of jewelry it stands at the head in the richness and value of its productions. That it has suffered no loss of prestige by the growth of the industry in other sections is indicated by the fact of new firms continually engaging in the business, composed mostly of young men who have received their education in old established houses. So far from New York or the East being jealous of the growth of the West, it rejoices in and is proud of its development; every year's growth adds to the volume of business transacted in the East and to the profits of eastern manufacturers. He must be shortsighted indeed who would deny the importance of western enterprise as a business factor, or would seek to belittle her vast commercial and manufacturing interests. In voicing such sentiments the present management of THE CIRCULAR does not depart from the paths of consistency, nor do they execute a "journalistic flop over" or any other ground and lofty tumbling. Nor do they, in recognizing facts as plain as noonday, waver in their loyalty to New York City or other industrial points of the East. We claim to be broad-gauge enough to comprehend the whole country within the scope of our vision, and to devote our best energies to furthering the interests of the entire trade without regard to locality.

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#### Identity of Trade Interests.

THE JEWELRY trade was never so satisfactorily conducted or more profitable to those engaged in it, proportionate to the amount of capital invested, than when it was confined to legitimate channels and prosecuted by recognized businesslike methods—when the manufacturer sold to the jobbers only, and the jobbers to retail dealers exclusively, leaving the latter to seek out or supply individual customers. Every intelligent man identified with the trade fully recognizes these phases of the business, and concedes that it is better for all concerned that the matter of demand and supply should flow through these channels. Similar channels and conditions exist in nearly every other branch of manufacturing, and when the peculiar functions of the manufacturer, the jobber and the retailer are fully recognized, the current of trade runs smoothly and with such degree of prosperity as the condition of the country will warrant. But once let one class encroach upon the prerogatives of the others, and demoralization forthwith sets in. To break down any of the barriers which the wisdom and the customs in the trade have thrown up for the protection of producers and consumers, and a flood of evils rushes in that none can check. This has been the case in the jewelry trade; the lines of demarkation between what should be well defined branches of the business were encroached upon, and through the breach there poured such a stream of bad practices as effectually destroyed all hope of profit. No one can say who were the first to ignore trade traditions and customs, for each branch has

been charged with trespassing upon the rights of others—retail dealers claiming to be jobbers to obtain jobbers' privileges, jobbers selling at retail, and manufacturers cutting under both and going direct to the consumer. Out of this grew the catalogue and price list evils, and a degree of competition that introduced a sliding scale of prices in total disregard of cost of production. Then came degradation of quality, that kept the promise of integrity to the eye but broke it in the matter of intrinsic value. And, so matters went on from bad to worse, the trade seeming to ignore the fact that its various branches were identical in interest, and that to cut off one was to sap the life blood of the others. But upon the existing demoralization within the trade came the general stagnation that has afflicted all kinds of business for two years, so it can well be imagined that the outlook for the jewelry trade has not been pleasant to contemplate. Manufacturers have felt the demoralization probably more than either of the other class, for they had their capital invested in their plants, and were impelled to keep their men employed even though there was no profit in it, while jobbers and retail dealers had simply to refrain from buying what they could not sell. The trade was not responsible for the depressed condition of business in general, but it was responsible for the bad practices to be found within its own ranks.

It has at last awakened to this fact, and set about the task of reforming itself from within. The initial step was taken when the National Association of Jobbers in American Watches was formed recently, to the plan and purposes of which we have heretofore referred. This Association fully recognizes the identity of interests between the manufacturers, jobbers and retail dealers, and promises to do all in its power to protect each in its special field. One of the first things to be done was to weed out the list of jobbers whom the manufacturers might recognize as such, and in doing this the number has been reduced considerably. By this means many retail dealers, who had been receiving jobbers' privileges, have been relegated back to their own legitimate sphere, and will no longer have an undue advantage over other retail dealers. Jobbers are not to cater to the retail trade, and outside dealers are to be ignored by all classes. So far as the Association has gone in its work of reform it has done well; it has also demonstrated that the sentiment of the trade is in favor of more extended efforts in the direction of reform. But it is wisdom to secure definitely the steps taken than to attempt to go too fast; the entrance of one wedge makes it easier to drive home a larger one. When the trade fully realizes the benefits to be derived from the action already taken, it will be a far easier matter to suppress the other evils from which the trade suffers. The Association recognizes the fact that the retail dealers are the ones who have borne the brunt of the burdens inflicted by irregular practices, and is determined to protect them in future to the fullest extent, both as against bad practices that have prevailed within the trade and from unbusinesslike competition from without. For several years THE CIRCULAR has harped upon the evils encountered in the trade, mostly originating among the members themselves, till we hesitated to pursue the topic lest we should give the impression that there was no honesty left in its ranks, and be set down as a common scold. It is not pleasant for us to write of anything discreditable to the trade in general or to individuals; we would far rather say none but words of commendation, but when abuses creep in it is our duty to direct attention to them and pursue them till they are eradicated. So we kept hammering away at the old sores, until finally the Association referred to was organized and the work of reform begun. We have done, and shall continue to do, our utmost to second its efforts, and will entertain the hope that its sphere of duty will be sufficiently enlarged before long to enable it to grasp all irregular practices from which the trade suffers and apply the remedy. In this connection it is but just to mention the earnest co-operation of the Chicago, Cincinnati and Philadelphia jobbers with their New York brethren in perfecting this Association and formulating the platform upon which it is based. They not only banded together as a unit in the good

work, but used their influence to secure the co-operation of the jobbers of other cities. It is safe to say that but for the hearty approval of the plan by the jobbers of these cities and their earnest efforts in its behalf, the Association would not have been organized.

There is still an excellent field in the trade for missionary work in favor of correcting abuses; there are a number of bad practices against which the artillery of reform needs to be directed. It is not fair that the new Association should be expected to perform the Herculean task of cleansing all the stables. There are other organizations within the trade that might well share the labor. They have also the prestige of age and experience to lend force to their efforts, together with the weight of influence that comes of the association for mutual benefit of houses of long standing and reputation. These organizations, it is true, were formed for special purposes, but having their machinery in good working order, they might well afford to step out of the beaten ruts of daily routine and engage in the work of reform. But whatever efforts are made, the fact must not be lost sight of that the interests of the manufacturers, jobbers and retail dealers are identical; neither can be sacrificed without injury to the others. The retail dealer is the foundation stone upon which the trade edifice stands; he is the medium that comes in direct communication with the consumer, ascertains his wants and supplies his demands. The jobber is the medium of communication between the manufacturers and the legion of retail dealers scattered all over the land, and if he is to perform his duties successfully he must be protected in the privileges custom accords him. It is only when guerrilla practices usurp businesslike methods that this identity of interest is overlooked, and when it is ignored, nothing but evil results.

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#### Abuses of Credit.

IF ALL MEN would pay their debts, dollar for dollar, at maturity, there would be a great deal more pleasure in doing business. Few persons stop to realize that every man who robs his creditors of any portion of their just dues adds to the burdens every citizen has to carry for some one has got to make up to the creditor the amount he has lost by his dishonest debtors. Bad debts are counted in the cost of doing business, and usually a business man expects to average a certain amount of loss from this cause every year, so that every individual who buys anything has to help pay for the indebtedness of persons who either cannot or will not pay. A portion of this loss to the creditor class—which is shouldered off on to the community at large eventually—is the result of failures from legitimate causes, but a greater proportion comes from the unscrupulousness of the debtor class. An earnest and honest effort on the part of those who have failed would have resulted in more than one-half of them being able to pay their indebtedness in full. For those who have done their best but still have met with misfortune, we have nothing but the keenest sympathy, but for those who have deliberately planned their failure in advance, and, in order to realize as much as possible from it, have pushed their credit to the fullest extent, we have the same feeling that we entertain for any other class of criminals. Their purpose was to defraud, and it would have been no worse had they planned to rob their victims by any of the processes known to the criminal classes. The result to the victim is the same in either case.

The laws relative to insolvency in the various States are well calculated to encourage fraudulent bankruptcy. In many cases they make it so difficult to obtain legal proceedings against a debtor, that a creditor is deterred from resorting to the courts lest he find himself engaged in a litigation that is sure to be costly and the result problematical. In some instances it has seemed almost as though the failure of the debtor was only a trap to entice creditors into the clutches of lawyers and the courts. We know of cases where the creditor has been so plundered while endeavoring to collect an

amount honestly his due that he was glad to get home, minus his debt and expenses, and thankful that he was not imprisoned instead of the man against whom he had invoked the aid of the law. He was like the colored preacher who passed his hat around for a collection, and, on its return, finding it full of emptiness, was "thankful to get his hat back." To remedy these defective and diverse State laws, intended to protect the resident debtor from his alien creditors, there is a pressing need of a national bankruptcy law that shall be uniformly operative in all the States. Such a law needs to be so framed that an honest debtor may conform to its provisions and still be afforded another opportunity to fight the battle of life; at the same time it should be so stringent that no man can obtain a discharge in bankruptcy until he has made a clean showing of his record, and accounted satisfactorily for his failure to meet his obligations. A man in the jewelry business should either have the wherewithal to pay his debts or the goods for the purchase of which he contracted his liabilities. But if he has neither goods, money nor visible assets, a national bankruptcy law ought to be searching enough to compel him to show what he has done with them, and no State law should be permitted to interfere to enable him to escape a full and fair accounting. In the jewelry trade there is always exhibited a great amount of sympathy for an honorable, but unfortunate, debtor, and those who have extended credit to him are always ready to compromise with him on reasonable terms, and to extend a helping hand to start him in business again. But, unfortunately, this readiness to compromise has been taken advantage of by unscrupulous men, who have deliberately and time and again pushed their credit to its full limit, obtained large amounts of goods and then failed with premeditation and malice. Then there always turns up some preferred creditor, or some convenient friend who holds a chattel mortgage on the goods, or the assignment is made in such manner that legitimate creditors get little benefit from the winding up of the debtor's estate. This performance has been repeated so many times, the same individual practicing it on several occasions, that it has become an old story. Committees are appointed to represent the creditors in such cases and to make the best terms possible. The idea of prosecuting a fraudulent debtor is seldom entertained because of the legal obstacles in the way to which we have referred.

The decadence of the standard of commercial integrity is responsible for the great number of failures that have occurred in late years. A few years ago a business man thought so highly of his business integrity that he was led to contemplate an act of insolvency as the end of his commercial career, an act so disgraceful and dishonorable that it would attach a lasting stigma to his name. But all this has been changed. The public has been led to look with too much leniency upon many things that would not have been permitted under the higher standard of commercial integrity. Bankers and speculators use the trust funds committed to their care for the advancement of their own schemes, and instead of meeting with the condemnation and punishment they have richly deserved, they are regarded as simply unfortunate and worthy of pity and sympathy. The conviction of James D. Fish, the imprisonment of Ferdinand Ward and a few embezzling bank officials in New Jersey, indicates that honest public sentiment has been outraged too long and that the people are awaking to a realization of the fact that they have been over tolerant of such criminal lapses from the paths of rectitude. Now that the reaction has set in apparently, we hope to see it extend till the old standard of commercial integrity is re-established and dishonor regarded as a crime. When that time comes we may expect to see fewer failures, and the credit system so revised and amended that there will be fewer bad debts to charge to the profit and loss account.

We wish, in this connection, to again urge upon the various organizations in the jewelry trade the importance of using their combined influence to secure the passage by Congress at its next session of the national bankruptcy law that has been pending for two

years. This measure, known as the Lowell bill, because prepared by Judge Lowell, of Massachusetts, has been heartily endorsed by the principal commercial bodies of the country, and should have the endorsement of every organized body of business men. The jewelry interest of the country is an important one, and its official recommendation would have great weight with members of Congress. A great impetus was given to the agitation in favor of this bill by the action of the National Commercial Convention, held recently at Atlanta, where it received a hearty endorsement. It was an encouraging sign of the times that all the southern and south western States voted in favor of urging Congress to pass the national bankruptcy law. With this example before them, the various trade organizations of the north, representing, as they do, the creditor class so largely, should not hesitate to take similar action. Certainly if those sections of the country not greatly given to manufacturing, but which are large consumers of the products of northern industry, can afford to recommend the adoption of such a law, the manufacturing States cannot afford to do less. We would respectfully urge the jewelers' various trade organizations to take action on this subject without delay. Their voices should be heard and their influence felt by members of Congress before they assemble at Washington, so that when they are called upon to vote they will have a full understanding of what the sentiment of the business element of the country is on this subject.

#### Shall Silver Currency Usurp the Place of Gold?

THE STEADY depletion of the surplus accumulation of gold in the United States Treasury is exciting much alarm among financiers, and should attract the attention of every business man. Should the time come when the gold surplus becomes exhausted, and the government be reduced to the necessity of substituting silver in satisfaction of its maturing indebtedness, the effect would be disastrous to the business interests of the country. But this danger is imminent, for the receipts of gold by the treasury department do not equal the disbursements at present, and interest on bonds is constantly maturing. Should it occur that the government is driven to the necessity of paying its interest in debased silver currency, there would follow a financial panic that has seldom, if ever, been equalled in this country.

So grave is the situation in this respect, that a conference was recently held in this city between Treasurer Jordan and the New York Clearing House Association, at which nearly all the national banks in the city were represented. The following preamble and resolutions were adopted without a dissenting voice:

WHEREAS, After careful inquiry into the current operations of the United States Treasury, it is ascertained that with the continued purchase of two millions silver bullion per month the probable receipt of gold currency will be insufficient to meet the demand upon it until the meeting of Congress in December next, and that the Secretary will be compelled to make his payments in silver dollars, which will become a most disturbing element in the daily business of the country; therefore,

*Resolved*, That to avert this threatened danger, and in the confident belief that Congress will take early steps to prevent the deterioration of its present commercial standard of value, the banks hereby render to the Government from their gold reserves the sum of ten million dollars in exchange for that amount in fractional silver coin, or for such other currency as the Clearing House Committee may approve; the same to be apportioned among the banks in the Clearing House respectively, pro rata of their deposits and gold reserve.

*Resolved*, That should this amount prove insufficient, a further sum not to exceed ten millions be offered, and that the banks of Philadelphia, Boston, Chicago and other cities be invited by the Clearing House Committee to participate in carrying out the objects of these resolutions.

The importance of this action can scarcely be over-estimated, for it brings into prominence more than one unpleasant possibility that is liable to occur, the happening of either of which will be more or less disastrous to commercial and business interests. One of these possibilities is that there will actually come an exhaustion of the

gold surplus in the Treasury, and the government be forced to make its payments in depreciated silver. Another is that Congress may, in defiance of public sentiment, refuse to pass the bill prohibiting the further purchase and coinage of silver bullion. As the law now stands, the Mints are compelled to coin at least \$2,000,000 a month, while the Treasury vaults are overflowing with such coin for which there is no demand. By coming to the aid of the government, as they have offered to do, as above set forth, the banks may temporarily avert disaster, but unless Congress passes the silver bill, the retirement of gold will continue till the country passes from a gold to a silver currency basis.

On July 1 the Treasury vaults held \$120,298,000 net in gold coin, of which but \$20,298,000 was in excess of the legal reserve for the redemption of legal tender notes, and even this excess has already been reduced \$18,000,000. On July 1 interest fell due on coupons (on four per cent. bonds) amounting to \$7,377,000, which must be paid out of the gold surplus. Three months hence further heavy payments of quarterly coupons will fall due, and these also must be drawn from the gold surplus. At the present rate in which gold is being paid into the Treasury, it cannot be expected that the steady depletion of the surplus will be materially checked. The government has already issued about \$101,000,000 of silver certificates, and its vaults contain \$67,921,000 more silver dollars than there are silver certificates outstanding. In the face of such an exhibit as this, what is it but the extreme of folly to persist in adding to this vast accumulation of silver coin? But, unfortunately, the silver craze has, like most other follies, not only its apologists, but its advocates; and before it can be finally overcome, its opponents in and out of Congress will make a fatal mistake if they expect to vanquish them, and thus maintain the credit of the government and the stability of the business interest of the country, without a determined fight. Every business man should, to the extent of his power, aid in bringing such influence to bear on members of Congress as will convince that body that the commercial interests of the country demand a suspension of the coinage of silver. The "bonanza kings" of the West will do their best to make the government a market for their silver production, but their interests are of little importance in comparison to the general business interests of the whole country that are imperilled by their persistent efforts to substitute silver for gold as the currency basis.

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### Letters to Watchmakers.

[By DR. LEONARD WALDO, Astronomer in charge of the Horological Bureau of the Yale College Observatory.]

#### IX.

##### THE APPLICATIONS OF ELECTRICITY TO HOROLOGY.

##### *Sources of Electricity—Batteries.*

*Continued from page 171.*

EVERY PRACTICAL jeweler knows that there are two ways most commonly employed for obtaining a current of electricity. One of these ways is exemplified in the steam engines and large dynamos used in electric light systems. The other, and the method with which we shall particularly concern ourselves, is the method of obtaining an electric current by the use of chemicals which decompose one another, and of which we have every day examples in the batteries used in telegraph instruments, clocks and electro-plating apparatus. The electricity from these two sources is, of course, absolutely identical in its nature, and there may be times, as in the case of certain electric clocks recently patented, when the motive power in the clock is applied by means of a small dynamo machine; of these we shall speak later.

Suppose that we had a circuit made up of a number of materials, all of which are fairly good conductors. For instance, a copper wire

attached to a piece of zinc, the zinc lying in water which has a little sulphuric acid in it, the water in contact with another body of water in which a little sulphate of copper has been dissolved, and this sulphate-of-copper-water has dipping into it the other end of the copper wire whose first end was attached to the zinc. We have then a series consisting of copper, zinc, sulphuric acid, sulphate of copper, and in this series the chemical substances are all joined together. Now, if these substances could be mixed together without affecting each other there would be no electricity produced. It has been found, however, as a matter of practical experiment, that whenever two chemicals which act on each other are brought into such contact that a mutual chemical decomposition takes place, there is immediately shown an amount of electricity which varies with the chemicals employed, but is always the same in *potential* for the same chemicals.

This is the first time we have applied the word potential as a practical term, and it is better to stop right here to explain its use in this connection. We may say that the hydrogen and the oxygen, which united form water, have always the same tendency to unite; to put it more familiarly, they have the same willingness or eagerness to unite. In large or small quantities, in any place, these two gases will rush together with the same force to form water. We may consider, therefore, that there is a fixed pressure or tendency with which hydrogen tries to unite with oxygen to form water and that this force or pressure would be directly measured by the power necessary to separate the water into its two constituent gases of oxygen and hydrogen.

It is evident, therefore, that a certain amount of electrical work or pressure or potential is expressed by the electrical current, furnished by the chemical action which takes place in the disintegration of water, and we should find that the difference of potential between a zinc plate and a copper plate immersed in the water and joined outside of it would be always the same, no matter what the size of the plates or the distance apart in the water. In this case we should have a feeble current of electricity flowing through the wire which connects the copper and the zinc outside of the water, the copper, the water and the zinc. What I want to make clear is that this feeble current will always have the same potential, no matter what amount of water, or copper, or zinc is employed, and that this potential depends only on the chemical reaction and not on the size or quantity of the chemicals involved. The current in the case mentioned would be exceedingly weak and have a very low potential. If a little sulphuric acid is added, however, the chemical action becomes much more intense, and the new chemical combinations taking place produce a current of a much higher potential. Test this by taking a tumbler of water and a strip of zinc and a strip of copper, put one pair of ends in the tumbler without touching, and bring the other pair of ends above and below the tongue—the very slight metallic taste in the mouth reveals the electric current. The addition of a little sulphuric acid to the water in the tumbler will very much intensify the metallic taste in the mouth.

The tumbler of acidulated water with the copper and zinc strips constitute a cell of battery.

Such a cell as this would give us a very respectable amount of electricity; for instance, if we had one part in five hundred of sulphuric acid and used the copper and the zinc strips, the difference of potential for this battery would be about one volt; and, if we used carbon with the zinc strip, the difference of potential would be about one volt and a quarter. These potentials are as high as we have in cells of battery, much more complicated, which are set up for telegraphing or for plating purposes.

If we try to use our simple battery, we very soon discover that while at the start we get a good current, that this current very rapidly diminishes, and when we come to examine the reasons for it we find that the sulphuric acid rapidly dissolves the zinc, forming a solution of the sulphate of zinc, and that the hydrogen gas which is set free from the sulphuric acid adheres closely to the copper plate,

forming a coating around it which very quickly prevents further sensible action of the cell.

We must arrange a cell in such a manner that the chemical action taking place will be continuous, and that the products of such chemical action will be the same in kind as those originally put into the cell, and will not mechanically obstruct the action of the cell. The materials, too, must be cheap and the cell must be so arranged that it will be easy to clean and to replace its various parts. We have before noted that the potential of the current depends on the intensity of the chemical action, and we find, as a matter of experience, that strong acids are necessary for strong and continuous currents, but we do not commonly, in horology, care so much to have very strong currents as to have very constant and uniform ones.

The first battery that we shall consider is the Daniell sulphate of copper battery. This is the very best battery which has been so far made known for all purposes where a constant current is required not large in amount. It consists essentially of the series zinc which is surrounded by a sulphate of zinc solution, and which joins a sulphate of copper solution, and lastly, copper which is immersed in a sulphate of copper solution. The two ends of the wire conductor through which the current is to flow are connected respectively with the copper and the zinc. This battery is made in many different forms and called by many different names. When Daniell first made it in 1836, he tied the zinc up in a bladder or else put it in a porous pot of earthenware, filling the bladder or the pot with acidulated water which soon formed sulphate of zinc. The form of the Daniell most used until recently is shown in figure 1, where we have three Daniell cells coupled in series.

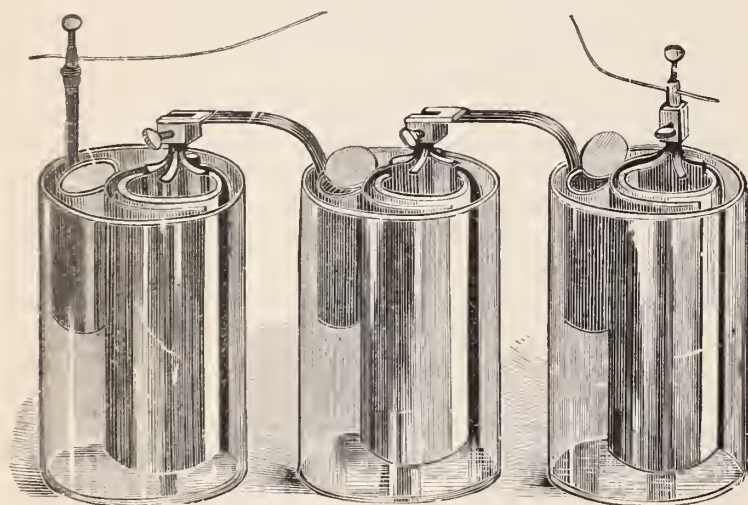


FIG. 1.

By *coupling in series* is meant that the zinc of one cell is coupled to the copper of the next, and so on through any number of cells. In this case in the figure we have first a glass jar within which is a copper cylinder cut open on the right side. Opposite the opening and attached to the copper cylinder is a smaller copper cylinder having a closed bottom which is filled with crystals of sulphate of copper when the battery is in use. Within the large copper cylinder is a porous earthenware cup, within which a zinc casting, having the section of a cross, stands. To set this battery up after the parts are arranged, as shown in figure 1, the porous cup is filled with a very weak solution of sulphate of zinc, and the very best results are obtained, so far as this solution is concerned, when the density of the sulphate of zinc solution is expressed by a specific gravity of 1.2891. This may easily be determined by any cheap hydrometer. When the density is greater than 1.16, the resistance offered by the sulphate of zinc solution to the flow of the current has been diminished to one-sixth of the resistance which is offered with a very weak solution of sulphate of zinc. As a matter of practice, however, the cell is set up with simple water in the porous pot, and a half ounce of sulphuric acid added quickly forms enough sulphate of zinc to put the cell in good condition. The glass jar is then filled to the level of the liquid in the porous pot with a concentrated solution of

sulphate of copper. This cell is more complicated than the one ordinarily used, of which a typical pattern is shown in figure 2. This form is commonly called the Crowfoot Gravity Battery. The separation of the sulphate of zinc from the sulphate of copper in this form is effected by a difference of density of the two solutions.

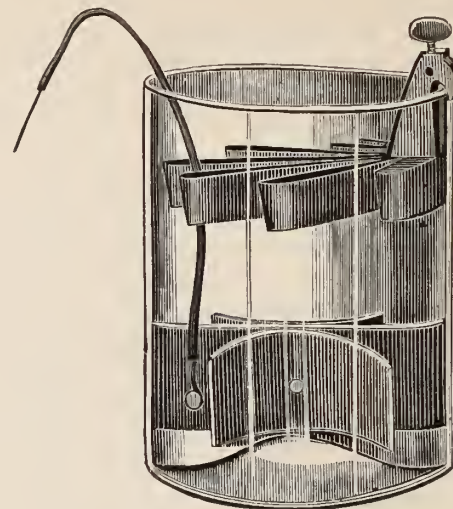


FIG. 2.

In figure 2 a rubber covered copper wire descends to the bottom of a glass vessel, and is then attached to sheets of copper bent so as to expose considerable surface. Suspended from the edge of the jar is the "crow-foot" of zinc. The copper is surrounded by a concentrated solution of the sulphate of copper, and copper crystals are put in until they completely cover the copper sheets; this solution of the copper about half fills the jar. The specific gravity of a saturated solution of sulphate of copper is about 1.21. Now, if the specific gravity of a sulphate of zinc solution is less than this it will float on the top of the sulphate of copper solution, providing it can be poured in without mixing the two solutions. The jar is filled with the weak solution of sulphate of zinc, and the "crow-foot" is then put in its place and the cell is ready for action.

All this reads very simply, but when it actually comes to maintaining a series of these cells for long periods of time there are a number of practical devices to be mentioned, by observing which trouble will be avoided.

The sulphate of zinc which is formed by a gradual dissolution of the zinc, creeps up over the top of the zinc, the projecting rubber covered wire and the glass cell. To prevent this, take a tin pan large enough to receive the mouth of the glass cell inverted, and melt in the pan enough paraffine or beeswax to cover it an inch deep. Now, simply dip the edge of the jar in the melted paraffine or wax, and in a few seconds after removal the jar will have a uniform edge of solid paraffine over which the sulphate of zinc does not creep.

To make the concentrated solution of sulphate of copper, and, in fact, to do all the work about batteries requiring strong chemicals, the glazed iron ware known as granite iron ware, will be found very convenient. The sulphate of copper, or bluestone, is simply to be boiled until the water will not dissolve any more, and this is very quickly determined by seeing whether a little taken out in a cup will deposit crystals on cooling.

In this form of battery a very little sulphate of zinc is desirable, and this can best be obtained by adding, say, one part in five hundred of sulphuric acid to the water which is to be poured in on the sulphate of copper solution occupying the lower half of the gravity cell which is to be set up.

It is not a simple matter to pour the water on to the sulphate of copper solution without mixing the two. The least downward motion of the water when it reaches the sulphate of copper causes it to mix with it, and generally the first result of setting up such a cell is a weak sulphate of copper solution, which promptly proceeds to deposit copper on the zinc and very much decrease the efficiency of the cell. The device which I have found most satisfactory is to make a funnel



out of a lamp chimney by tying a small piece of coarse toweling smoothly over its lower end, then put a layer of about a quarter of an inch of sand over the inside of the bottom of the lamp chimney. Now, if you pour in water at the top of the chimney it strikes first the sand which deadens its fall, then filters through it and finally oozes out of the meshes of the piece of toweling as gently as the falling dew. With this funnel held with the towel surface just against the sulphate of copper solution, it will be found perfectly easy to add the acidulated water and to leave a perfectly sharp line of demarkation between the two solutions. Of course, the funnel must be gradually raised with the hand that holds it as the water is poured in.

After the cell has been put up and the water covers the zinc, if a layer of about a quarter of an inch of kerosene oil is poured on the upper surface of the water it will prevent its evaporation.

In this cell the chief point to be attended to is to keep the upper solution so dilute that it will not gradually sink and mix with the sulphate of copper. Sulphate of zinc is being constantly formed in the upper solution by the action of the free sulphuric acid which comes out of the sulphate of copper. This latter deposits its free copper in the bottom of the cell in the form of a dark red spongy mass. The water at the top, therefore, should be drawn off from time to time, either by a siphon or such rubber syringes as the rubber dealers sell. When this is drawn off its place must be filled by pure water.

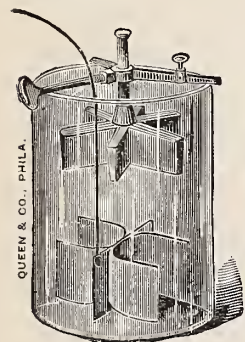


Figure 3 and figure 4 show other forms of these gravity cells.

In all forms of gravity cells the substance to be replenished is the sulphate of copper, and the substance to be removed is the sulphate of zinc. We can draw off the sulphate of zinc with a siphon, but it is not so easy to add the sulphate of copper. A good many devices, therefore, have been proposed for furnishing a continuous supply of the sulphate of copper. The simplest device is to use a zinc shaped as in figure 4, with a large round

hole in the middle so that a glass bottle or jar can be inverted after being filled with sulphate of copper and act as a self-feeding arrangement. The glass jar must be small enough to pass inside the hole in the zinc; its length is immaterial. It is first filled with copper sulphate crystals and enough solution of sulphate of copper

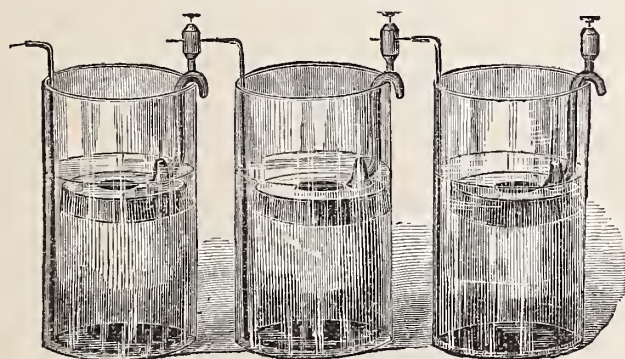


FIG. 4.

poured in to completely fill the bottle or jar. A strip of cloth or paper is then drawn over the mouth of the jar with its two ends reaching down to the bottom so that they may be grasped by the fingers. The jar is then quickly inverted and inserted with its mouth underneath the copper sulphate solution in the cell of battery. If this is done skillfully there will be very little spilling, and the cloth can be drawn away from under the mouth of the jar, leaving all the sulphate of copper in the jar as a self-feeding supply to the cell of battery.

The electro-motor force or difference of potential of the Daniell cell is very nearly one volt, but the amount of current which we can get from it, as we have seen in a previous letter, will depend upon

the resistance in the circuit as well as upon the potential of the battery. The internal resistance of these batteries—and by that we mean the resistance which the different liquids, metals and connections oppose to the passage of the current—varies with the size of the elements, the degree of saturation of the liquids, the presence of a porous cup as in the first form of battery, or the absence of it as in the latter forms of batteries described. The internal resistance may be no more than three or four ohms, or it may be twenty-five or thirty for each cell. If we had a Daniell cell with an E. M. F. of one volt and an internal resistance of ten ohms, we should only get, for reasons already stated, one-tenth of an ampere of current. No matter how thick the conductors were outside the battery, nor how little resistance we put outside, the internal resistance of the cell is so large that we would only get this exceedingly small flow of current. Suppose that we join three such cells in series, each of them has an E. M. F. of one volt and each of them has an internal resistance of ten ohms. By joining them in series experiment has shown that we have three volts potential and thirty ohms of resistance, and through a thick wire outside we should still get a tenth of an ampere of current, because we must divide the three volts of potential by the thirty ohms of resistance to get the amount of the current in amperes.

Suppose, however, that instead of coupling our three cells in series that we connect the zincs together, and that we connect the coppers together so that we practically make the three zincs, and the three coppers and the solutions as parts of one large cell. Since the internal resistance of each of the small cells is ten ohms, we have decreased the total internal resistance of the three cells to one-third of the resistance of any one of them. Our total resistance now is three and one-third ohms, and our E. M. F. is that of a single cell, one volt. Applying the same rules as before, we find that we now get a current of one divided by three and one-third or about one-third of an ampere, or approximately three times the current which we did in the first instance. This is interesting; it shows us that we can vary the amount of current by connecting the battery in such a way that the quotient arising from dividing the total potential of the battery by the total internal resistance will be as large as possible. It is always to be remembered that we can increase the potential of the battery by connecting "in series," and that we can diminish the internal resistance of the batteries by connecting "in parallel." By "in parallel" we mean the connecting of the zincs together and of the coppers together. These connections can be made in a great many different ways. Suppose we had twenty gravity cells; we might couple them "in parallel" in sets of four and then couple each of the sets of four in series. In this case we would have five times the potential of a single cell, and five-fourths of the internal resistance of a single one of the cells.

What I wish particularly to point out is, that it is oftentimes highly advantageous to connect the cells in an entirely different manner from that ordinarily done in telegraph practice, and that the particular way in which they are to be connected depends entirely on the internal resistance of the cells themselves and the external resistance of the circuit.

(To be Continued.)

#### Wanted—A School for Horologists.

WITHOUT looking up the statistics of the matter, it is pretty safe to say that there are a hundred thousand men, women and children already dependent upon the American horological industry, and there are perhaps a hundred millions of capital invested in it in the United States.

The art of producing has completely changed its character in American hands, and the visitor is very much impressed with the immense range of capacity for doing all classes of mechanical work

which characterizes any one of the several large watch and clock factories. It is quite the custom in these establishments to manufacture the machinery for the production of the parts of clocks and watches, and in the same establishment will be found the facilities for refined photographic manipulation, processes for electro-gilding, plating of all descriptions, lapidary work in jewelery, steam hammers and foundries for welding and casting large masses of metal, and, indeed, an exhaustive completeness which is not equalled in any other branch of manufacturing known to me.

It is also true that these methods are the methods under which the world will be furnished with timepieces. Free trade or protection, there is no possibility of hand labor in a small way competing with these immense and highly organized establishments. It is a trade necessity that the English, the French, the Germans and the Swiss alike shall essentially adopt the American system or their large relative trade will become, as it is becoming now, a thing of the past.

So far, the demand for timepieces at a low price throughout the world has been such that it has not been particularly necessary that the factories should be scrupulously careful as to the economy of production. The American process is so very much cheaper than any system of hand labor that there could be a certain laxity in the cost of production and still leave a large margin of profit as compared with the older methods. No very great care, therefore, has been necessary in training up a number of first-class men who might be called horological engineers, and whose experience and training would fit them for high positions in administering the executive positions in these large factories. The same order of ability is required which it takes to design large marine engines or build suspension bridges or do any other work of a high engineering character. The same large financial interests are involved; the same knowledge of mathematics and physics and mechanics and chemistry is involved in determining the economic performance of small machines as in large ones, and the accomplished horological engineer must include a general knowledge at least of the chemistry of enameling the smallest lady's watch and the engineering involved in putting in place the ponderous frame of Big Ben in the Houses of Parliament.

It would seem as though the industry were old enough in the United States to furnish twenty-five or thirty intelligent fathers who believe that it would be profitable to give their sons a broad training, looking to horology as a profession. If this is so, the time has come to seriously agitate the establishment of an influential school for American horologists, which should have the same relation to the future career of the student as the best of the schools in medicine or law or engineering have to the young men who enter these schools in preparation for their professional lives.

I think such a school should be founded on broad principles and that a wide range should be given to the courses of study pursued at it. The foreign schools, therefore, are not models which can be safely followed in my opinion. There is vastly more in the successful American horologist than work-bench ability. The knowledge of men, the wide reading in French and German of professional works, the freedom from all traditions of the trade, which will come from a liberal professional course, are, in my judgment, essentials to the success of the American horologist.

I do not think, therefore, that boys should be admitted to a horological school at too early an age. There ought to be a certain preliminary training such as is afforded generally by our public high schools. Boys should be already quite conversant with the English language. They should know algebra through quadratic equations; they should be familiar with the elements of geometry; and they should know these things quite as much—or even more perhaps—because of the mental training which they give than because of the actual knowledge they have attained in studying them.

In order that the studies of such a school can be pursued with equal profit by students and the class not be hampered by dullards, the preliminary examination for admittance ought to be insisted on;

and the age of admission could hardly be fixed at less than sixteen years. It seems to me, too, that the course should be at least three years in duration, and that it ought to be divided into two large classes of studies; first, those studies which are purely intellectual; and, secondly, laboratory or manipulative work. In the first class of studies would belong the continuation of algebra to be followed by elementary analytical geometry, descriptive geometry, and the calculus. It is impossible to consider many problems of the pendulum, the balance spring and the theory of escapements without a knowledge of the calculus, and I assume that no one could be called a horologist who is not able to read and understand the best papers and memoirs on these subjects which have been written by such men as Bessel, Phillipps, and Sir George Airey. French, German, and, later, the elements of patent law, the theory of machines, and theoretical horology in all its branches would perhaps comprise the first division of studies.

The second division, comprising manipulative studies, and which would perhaps occupy the second half of the day throughout the entire course, would begin in the laboratory with physics and chemistry, and in physics I would include experimental mechanics as well, and, in fact, all that which we used to know under the term Natural Philosophy. The subjects of heat and its effect on the expansion and contraction of metals; of friction and the diminishing of its effects by pulleys and levers; of electricity and its wide and growing applications to horology; of optics and the distance of vision and the intensity of illumination of dials; effects of contrasts in color, the intensity of illuminants; the principles governing the construction of bells and sound-transmitting apparatus would also be a part of this course to be studied experimentally, with most of the apparatus employed in the experiments constructed by the students themselves.

In chemistry, besides the elementary reactions of acid and bases on each other, the student should be taught by actual experiments of his own the chemistry of photography, of watch and clock oils, of electro-metallurgical processes, of enameling, dialing, alloying, the management of cupel and assay furnaces, and the chemistry of solders and fluxes.

He should also receive a systematic course in free-hand and mechanical drawing, to be followed by instruction and practice in the elements of artistic design.

These mechanical studies would occupy a quarter of all the time at the student's disposal for the three years' course; and, if we assign half the time to the purely "book" studies first mentioned, we have one-quarter of his entire time still left for bench work in clock and watchmaking.

Such a scheme as this would be a very expensive one if the instructors employed were to be paid from the school alone. No way occurs to me by which the scheme is feasible, except to carry it out in connection with some one of our scientific schools whose instructors are already occupied for a considerable part of their time in teaching their present classes. It might be possible to arrange to have such students in horology admitted to the regular classes as special students in these schools, or it might be preferable, until the horological school attains some dignity of its own, to make private arrangement with the instructors to give additional instruction in the horological school. In either case the expense for salaries would be reduced to a minimum. It would be necessary to locate the school near some one of the large scientific and technical schools now endowed and in successful operation. There ought to be a fund so arranged as to be equivalent to an endowment fund of not less than twenty-five thousand dollars, the interest of which could be used for the minor expenses in starting and maintaining such a school for the first few years of its existence.

The expenses of a boy at such a school away from home and with moderate economy would not be far from six hundred dollars per year, and this would include his tuition fee, which could hardly be less than two hundred dollars and have the school live.

At the close of the course the student would receive a certificate or possibly a degree of some kind, and this would mean to the outside world that he had faithfully carried out the tasks set him at the school, and that he was ready to begin his new education in the practical world without prejudices, with broad views and with the capacity, after his additional years of experience, of becoming a first-class horologist.

LEONARD WALDO.

## Gossip of the Month.

A CORRESPONDENT calls our attention to a practice that he has sometimes found objectionable, which is that travelers occasionally make too free with his employees. On more than one occasion he has returned to his store after a brief absence to find a traveling man engaged in conversation with his salesman or his watch repairer, and making himself as familiar with them as though they were old friends or boon companions. All work is suspended while this chat is going on, and the employer is losing the services of his paid assistants. Then there is always the suspicion that the suave and chatty traveler is slyly pumping the employees as to the business affairs of the dealer, seeking to obtain information regarding him in a surreptitious manner. Of course, the dealer is antagonized at once, and does not hesitate to say no when solicited to purchase from the samples the traveler is so anxious to exhibit. Our correspondent says, further, that it is not an uncommon thing to find a traveler hobnobbing with employees after business hours, visiting saloons with them and "seeing the sights." All this dealers naturally regard as an underhand way of obtaining information about themselves and they resent it accordingly. They are suspicious, too, that these interviews may be preliminary to the workman setting up in business as a competitor, and that the traveler is encouraging him to "branch out for himself" in order that he may have another customer to sell to. A dealer will resent anything that he regards as an intermeddling with his affairs, and many a traveler who has been surprised at the cool reception a dealer has given him and his failure to obtain an order, may find the reason in the fact of his being found in conversation with the employees. Our correspondent says that he has several times refused travelers solely for this reason. The head of a house likes to have his position recognized, and any attempt to exalt a subordinate into prominence is sure to arouse the opposition of the one who regards himself as slighted. Travelers not only injure themselves but the business of their employers by following this reprehensible practice. Another complaint we have frequently heard made against travelers, is that they are prone to make the store of the dealer a loafing place while they are waiting for a train or for some other cause. A courteous dealer feels bound to entertain his visitor, thus losing time that should be devoted to business, but he feels all the time that he is being imposed upon. Of course, these offences against good business practices are unintentional, resulting from thoughtlessness; but they betray a lack of consideration not creditable to him who indulges in them. But no man has a right to be thoughtless or inconsiderate in business matters; business has its laws and customs, and a plea of ignorance is of no more avail regarding them than it is regarding the general laws of the country. If a traveler knows the customs of business, he has no excuse for offending against them; if he does not know them he has no right to be on the road. Among the most pertinent business mottoes are these: "No talking with employees;" "No loafing on these premises."

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THE early-closing-on-Saturday movement was observed among the jewelers almost universally during June and July and will continue to be during August. They were the first of the widely

extended callings to adopt the plan, but others soon followed, and to close at one o'clock on Saturdays is now the rule among manufacturing and mercantile houses. It is estimated that fully 5,000 persons are thus released from business half a day each week, and the exodus from the city between one and two o'clock on Saturdays is something wonderful. Some of the railroads have put on extra trains, leaving the city between those hours, while others have changed their time tables to accommodate the rush Saturday afternoons. A short ride brings these tired workers into the mountains or to the sea side, where they obtain thirty-six hours of fresh air and change of scene. It is a great relief to them, re-invigorating and rejuvenating them. The half-holiday is a great blessing to city employees.

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IT is such a pleasure to record the fact of the conviction and sentence to imprisonment of a prominent and influential rascal, that we cannot forbear referring to the fate of James D. Fish, formerly President of the Metropolitan Bank of this city. Although he was not connected with the jewelry trade, he was one of those magnificent rascals whose operations were so extended as to exert their influence upon every branch of business. He was a member of the firm of Grant & Ward, and he and Ward connived together to rob everybody who could be induced to confide in them, while as president of the bank Fish had control of the money of that institution and widely squandered it with the rest. Friends, relatives, acquaintances of the members of this notorious firm were drawn into the net and remorselessly plundered. When the firm failed the bank was ruined and a number of business firms were made bankrupt. For a time there was apprehension that a general financial panic would ensue, but this was averted by good fortune. After interminable delays Fish was brought to trial for using the funds of the bank, was convicted, and, a year after his exposure, was sentenced to State Prison. All that wealth and influence could do to save him was done, but in this instance the law had too good a hold upon him. Ward has been confined in Ludlow street jail ever since the failure of the firm, but has not yet had a trial. There are several indictments against him, and there is every prospect that he will soon join Fish in State Prison. The case of Fish is one instance where a wealthy rascal, whose business was that of genteel robbery, has been brought to punishment, and the community breathes freer for it.

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THE business depression that has formed such a general subject of complaint for the past two years, has not, by any means, been confined to this country. On the contrary, the times have been equally hard in Europe, and, as a consequence, greater suffering has resulted. Here, if a man cannot obtain work at his special trade, he can almost always, if so inclined, find something to do to prevent his starving, but in European countries, where the population is so dense, every calling is overcrowded, and there are no openings for surplus labor. Our exchanges contain pitiful accounts of the sufferings, verging upon starvation, among the workmen who have been thrown out of employment by reason of the closing of factories and manufacturing establishments. In some places subscriptions have been taken up in the jewelry trade to provide the necessaries of life for the families of men formerly employed in the manufacture of jewelry, while many are drawing a weekly allowance from the town relief funds. The workingmen of this country have been subjected to hardships because of the stagnation that has pervaded manufacturing industries, but comparatively few have of necessity become objects of charity. The opportunities for labor are so numerous here that if a man cannot find employment of a kind he has been trained to do

he can, at least, find work enough of some kind to supply him with food. A few days since the writer got into conversation with the driver of a street car, and found that he was formerly employed in a manufacturing jewelry establishment in Newark where he earned from \$20 to \$25 a week; the factory now runs with half the number of hands formerly employed, and he was among the ones discharged. For a time he worked as a 'longshoreman, loading and unloading vessels, but finally obtained a place as a street car driver, earning on an average about \$9 a week. He seemed cheerful and contented, but was hoping for better times when he could return to the bench.

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A GENTLEMAN largely interested in the electric light and in constructing machinery for electrical purposes, informed the writer that the electricians found great difficulty in obtaining workmen to put their ideas into practical shape. The mechanism required is different from almost every other kind—much of it has to be invented as it is required—and very few workmen have sufficient knowledge of the science of electricity to enable them to work intelligently on the apparatus required. He said, however, that their best workmen came from the watchmakers and jewelers. He found that, as a rule, they were more intelligent than the average of mechanics, and in addition had a delicacy of touch in using light tools that made them valuable in an electrical machinery factory. As electricity is being applied in an infinite variety of ways and is rapidly growing into one of our greatest industries, unemployed jewelers and watchmakers would do well to study up in the science.

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THERE ought not to be any unemployed watchmakers, at least competent ones, for there is a constant demand for skillful, steady, trustworthy workmen, who have sufficient ability to do watch repairing in a workmanlike manner. There are plenty of half fledged watchmakers—too many, in fact—going about the country and imposing themselves upon the retail dealers, working a week here and a month there, but they are not the kind that is wanted. They are an aggravation and an expense to whoever employs them, and some late developments show that the employer is fortunate if his "tramping jour." does not turn out to be a thief as well as an incompetent workman. Since the breaking up of the old apprentice system the number of skilled workmen is growing smaller by degrees and beautifully less.

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SOME recent decisions by the Patent Office at Washington indicate that the granting of a patent to an inventor confers upon him no rights whatever; a patent indicates simply that he claims to have invented something of value, but if somebody else sets up a similar claim to the same thing, the patent authorities are powerless to decide between them. In short, the obtaining of a patent is an invitation to pirates to come and plunder you; it is an announcement that you have got a good thing, something worth stealing, and the whole gang of pirates stands ready to swoop down upon you. If you object the matter goes into the courts, where the law's delays are pretty sure to tire out the aggrieved party before a decision is reached. There are a good many patent pirates in the jewelry trade who do not hesitate to appropriate whatever they choose of their neighbors' designs and inventions; to sue them is to become involved in an interminable lawsuit, with all its long array of fees and costs, with no prospect of reaching a decision before the patent becomes valueless by the lapse of time. Our patent laws need an overhauling and

made so stringent that when a man pays his money for a patent he will have something of value to him. It ought to be feasible for the owner of a patent to go into any United States Court and obtain an injunction against an infringer, restraining him from the production of goods covered by the patent, and to force him to an accounting for whatever goods he may have made. All that should be required to obtain such injunction should be the production of the patent and proof of the infringement. Then if the infringer wants to contest the validity of the patent let him do so, but let the injunction hold good till he has established his right to make the goods. Under such restrictions the patent pirates could not live. But the trade might do much to put down this evil by refusing to buy imitation or pirated goods; it is generally pretty well known who are the inventors of the different patented goods in the jewelry line, and the trade should encourage inventors by cheerfully according them the fruits of their labors.

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A CORRESPONDENT complains that we permit some of our advertisers to announce in their advertisements the prices of various materials, and assert that such announcements are injurious to retail dealers. He says that dealers cannot charge reasonable prices for their work when the prices of the material they use are made public. In answer we have simply to say that our patrons pay for the space their advertisements occupy, and within that space they have the absolute right to say whatever they please that is not opposed to law or the public sense of propriety. The space is the advertiser's so long as he pays for it, and we have no right to sit as a censor on what he says. Of course, if one should attempt to offend against public decency, the law would sustain us in rejecting his advertisement, but fortunately we have never been called upon to exercise this discretion and probably never will be. If a manufacturer chooses to advertise his prices he has a perfect right to do so, and does no more than many manufacturers in other lines are in the habit of doing. Our correspondent is a retail dealer, and his complaint is leveled against those who advertise the prices of watch material especially. We fail to see how this can injure his business, for every sensible man knows that the value of his watch does not lie in the cost of the material of which it is composed, but in the science and skill that have combined to put that material together in such form as to produce the results obtained. So, when a man has his watch repaired, he expects to pay not only for the material required, but for the labor expended upon it as well as for the skill and experience which enable the workman to do the work satisfactorily. In short, it is the workmanship, not the material, he cares about. If his watch needs a new mainspring, it makes no difference to him whether mainsprings are worth a dollar a piece or a dollar a bushel by the quantity; he knows that it is a delicate piece of work to adjust one to his watch, requiring an experienced workman to do it satisfactorily, and he is content to pay what this service is worth. This is the basis on which the repairer should make his charge, not upon the value of the base metal he uses. Physicians are employed because of their supposed skill in the cure of diseases, and their services are not paid for on the basis of the value of the drugs they compel one to swallow. As a matter of fact, skill and labor constitute the principal items of expense in all kinds of business, and the public does not hesitate to pay reasonably for them. Our correspondent cannot have a very exalted estimate of his calling if he measures the value of a watchmaker's services by the cost of the material he uses; it would be quite as reasonable to measure them by the cost of the tools he employs, or the value of the glass he screws into his eye. Brains count for something.

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IN A spirit of banter, a western dealer recently wrote to a partner

in a New York house: "Business here is dead just at present; nothing doing; we all sit around in the store watching the flies in their pedestrian matches. Don't you want to go into the cattle business? Splendid opportunities offering out here; only a little money required and 'there's millions in it.'" We think we see these two jewelers transformed into cowboys, rounding up a herd of long horned Texas steers! What a success they would make of it! With little knowledge of this wild frontier life, no training calculated to adapt them to it, and utterly ignorant of the care of cattle, they would soon wish they had continued watching the flies on the ceilings of their counting rooms. They are good business men in their line and have been successful, but are so unfamiliar with agricultural or stock-raising affairs that we doubt if they know which end of a horse to put a bridle on. The writer of this is in about the same situation, and would as soon think of riding an untamed balloon as to undertake cattle raising. Every man to his business is a very good motto to be guided by.

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A MANUFACTURER recently said to us that he had kept his factory running all through the dull times, and that his sales would compare favorably with those of the last two years. When asked how he contrived to keep running when everybody else pretty much was complaining of dull times, he replied that they made additional efforts to sell their goods. The firm has kept its full number of travelers on the road, and has filled each one with an ambition to keep up his average of sales. Thus inspired, the travelers have been diligent in hunting up new customers; when they lost patronage from an old one they would feel that they were bound to make this good, and so would stop at towns they were not in the habit of visiting and push for a new customer. This gentleman said that the firm made it an object for the best travelers in the business to work for them by paying them liberally; every one they had out they had unlimited confidence in, and each took as much interest in the business as the partners do; they are thorough going business men, full of resources and expedients, and take pride in keeping good their average of sales. Through the energy and enterprise of the travelers the firm has been able to keep its full force of men employed at the factory. It pays to keep your employees interested in the business; it also pays employees to take such interest whether they have a share in the profits or not, for it insures them employment when the dull times come.

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EVERY business man in the city feels that he must get away from its hot, dusty streets and its unwholesome perfumes for at least a portion of the summer, and so it has come to be regarded as almost a matter of course that everyone should have a summer vacation. But where they formerly went for pleasure and recreation, employing the time in getting rid of their superfluous cash, they now go for economy, and to enable them to save the difference between cheap board and extravagant housekeeping. Instead of going to the five-dollar-a-day summer resorts in the mountains or at the sea side, they now seek the ten-dollar-a-week boarding house, and content themselves with less style and more substantial food. Hotel keepers complain of the scarcity of customers who pay their bills without scrutinizing the items, while keepers of boarding houses complain that they cannot find rooms for all who desire board. The Americans are a people who readily accommodate themselves to circumstances; when they are prospered they squander money recklessly, but when there is a scarcity of funds to their credit in the bank, they come down to cheap fare with the best grace imaginable. August is a favorite month for vacations in this vicinity, and jewelers will, no

doubt, economize in this way this year as well as other people, and familiar faces will be missed from "historic" Maiden Lane for various periods. Well, we wish all who go an abundance of enjoyment, a gain in health and vitality, and a return to business with renewed energy and determination.

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OPTICAL goods are in constant demand at all seasons of the year. There may not be in dull seasons so ready a sale for opera glasses and fancy articles, but spectacles and eye-glasses are always in demand. The times never get so hard that a man can afford to neglect his eye-sight, and if he loses or breaks his glasses he will have a new pair even if the children are crying for bread. We noticed a few days since in a house that deals with that class of goods, that the number of clerks had been increased recently, and all seemed as busy as they could be serving customers or packing goods for shipment. We noticed packages addressed to almost every section of the country, and were informed that there had been no let up in their business for a long time. Every retail dealer in the land should not only carry a good stock of optical goods but should exhibit them in an attractive manner. He should also obtain such instruction as will enable him to fit his customers with glasses in an intelligent and satisfactory manner. These are articles of necessity, and the more goods of that description a dealer carries in stock the larger his sales are sure to be.

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"I'LL never invest another dollar in any business outside of my own," said a jeweler to the writer recently. He went on to explain that at various times he had been induced by over-sanguine friends to put a little money into outside enterprises, and, in every instance, he had not only not made anything, but in most of them had lost the capital invested. He had been persuaded to put a little money in mining, had bought an interest in a new electrical invention, had taken "a flyer" in the stock market, had backed a man who had a patent chicken coop with an incubator attachment and a spring chicken broiler annex, had put a little money out to help a friend, but in no single instance did he get a dollar in return. He was through with outside speculations, and full of a virtuous determination to devote his entire energies in the future to building up his own legitimate industry. Sensible conclusion to come to. The man who keeps his capital under his immediate eye and subject only to his manipulations, is more likely to succeed than the one who trusts his interests to another or invests in speculative enterprises. The man who has received special training in a particular line of business and understands that business well, ought to be able himself to employ to advantage all the capital he can command. If he, with his training and opportunities, cannot make it reproductive, he ought not to expect another to make a profit for him.

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THE CIRCULAR has been a persistent advocate of the adoption of a fixed standard for wrought gold and silver goods, believing that to be the remedy to cure the evil of debased goods with which the trade is cursed. When goods are required by law to be equal in quality to what they pretend to be, there will be fewer opportunities for fraud. We have advocated the passage of a law by Congress establishing a standard for gold and silver goods, but that body will not be apt to take up the subject until the trade itself demands. Manufacturers of gold cases have, for some time, been contemplating a step in the direction of establishing a standard for their products,

requiring that every case made shall bear a stamp correctly indicating its quality. The idea has not yet assumed practical shape, but the proposition contemplates the formation of a gold case maker's guild, to which all cases made shall be submitted, and which shall be stamped with a corporate guild stamp indicating the quality of the gold employed in its manufacture. A meeting of manufacturers is contemplated to take action in the matter, and it is possible we may be able to give a report of their proceedings in another part of this issue of THE CIRCULAR. We commend this or any other movement that is calculated to fix the quality of all goods in the jewelry trade, and to preserve their integrity by providing that the intrinsic value of any article shall correspond to its markings or to the representations made regarding it. So long as discrepancies in these respects are permitted, so long will frauds be perpetrated and the reputation of the trade suffer correspondingly.

### Gold, and its Treatment in Smelting and Rolling.

WE WILL here state that it is our desire to go through a kind of apprenticeship in respect to the processes employed in the manufacture of gold. We hope that the information thus afforded, beside being very valuable to the practical workman, by giving him facilities which will result in the more successful performance of his work, will prove useful to the manufacturer also, by imparting to him that with which he has hitherto been unacquainted. We shall lay most stress upon those processes of art-workmanship and management in which we venture to believe we have been more successful than most of our compeers.

We shall commence with the first procedures in the course of the manufacture, viz.: the preparation of the alloy and its subsequent treatment in the crucible, in order to describe minutely the processes or methods of working with the precious metals.

When purchasing the materials for alloying, where a fair average trade is being carried on, there is an advantage in buying copper in large quantities; but with gold and silver the reverse is the case. Irrespective of the disadvantage of the cash lying idle, gold being always bought for cash, some of its particles are so fine and minute that every time it is moved about or touched some portion is sure to be lost; the quantity may, perhaps, be very small indeed, but when we take into consideration the extremely valuable nature of gold in above state, the loss in the course of the year may be something amazing. For these and other reasons which could be adduced, we recommend the purchase of gold at the time it is needed, and sufficient for the purposes required.

In preparing the mixture of gold, silver and copper for the crucible care should be taken in weighing them accurately in order to prevent improvement or deterioration in the qualities of the gold constantly in use. In melting all qualities it is a wise plan to place the lightest of the metals to be melted at the bottom of the crucible, viz.: the copper first, the silver next, and the gold last; by so doing the melter is more likely to get a perfect amalgamation of the metals, as the gold, being the heaviest, is sure to find its way to the bottom of the pot. When spelter is employed it must not be put in until the other metals are melted; being of so volatile a nature, it would be all evaporated before the mixture of alloy was properly incorporated, consequently the bar of gold would fall short of its original weight, the quality would be improved, and the manufacturer would be unable to compensate himself without remelting with an addition of alloy.

Plumbago crucibles are the best for all practical melting purposes, and with care will last from twenty to fifty times; if new, a very small quantity of charcoal powder should be put into the pot with the mixture of alloy. This coats the surface of it, and prevents the metals from adhering. When the gold is at the point of fusion, fling on it about a tablespoonful of perfectly pure vegetable charcoal.

The layer of charcoal which forms upon the surface of the gold in the crucible protects the mixture from the action of the air, which would refine the gold by destroying some of the alloy. When perfectly fused, the mixture must be well stirred with an iron stirrer (consisting of a long round piece of iron sharpened at the point), which should previously be made red hot, to render the whole mass uniform in quality. The pot is then quickly withdrawn, and its contents poured into a suitable ingot-mold, previously warmed and greased, to prevent adhesion. The warming of the mold is quite indispensable; but, if made too hot, the metal, when poured into it, will spit and fly about; besides incurring great loss of gold, dangerous results may thereby happen to the person in charge; the same remark applies when the ingot-mold is cold; this part of the process must therefore not be neglected, but carefully attended to. The ingot-mold, we may state, is hot enough when you can just touch it with the hand for a second or two. In nine cases out of ten, if the gold is properly heated in the melting and cast all right with the charcoal flux we have recommended, the working qualities in its subsequent treatment will be found all that could be desired for any purposes whatever.

When it is desired to produce very tough gold, use as a flux a tablespoonful of charcoal, as before, and one of sal-ammoniac, adding it to the gold on the eve of melting; the sal-ammoniac burns away while toughening the gold, leaving the charcoal behind to perform the functions already indicated. The employment of the mixture of sal-ammoniac will bring the ingots of gold up bright and clear; it will also prevent them from splitting or cracking at the rolling-mill, and in subsequent working; if proper attention has been paid to it, the gold will then be found tough and pliable. This does not, however, apply to every kind of alloy, but it may be affirmed of those we have described, and can be safely and thoroughly depended upon.

The furnace used by most jewelers is the ordinary wind furnace, built of brickwork, which is admirably suited for such purposes; a size convenient for every requirement is of the following dimensions: eight inches square inside, and sixteen inches deep from the grate which supports the fire.

For producing tough gold, the employment of common salt as a fluxing agent is sometimes strongly recommended. There is not, however, much to be said for its use, as it produces a very liquid flux, and is not half so clean as the one we have recommended. In the casting, unless very great care is exercised, it runs into the ingot-mold with the gold, producing a brittle-like substance, and this forces itself into the bar of gold, the surface of which becomes irregular and full of holes; on this account alone it is objectionable, in preparing clean and smooth bars of gold. The same may be said of borax, but that is still largely used in the jewelry trade for melting purposes. Nevertheless we are confident, from long practical experience (the result of many years' study and practice, during which time we have worked up many thousand ounces of gold), that there is no better flux than a mixture of sal-ammoniac and charcoal, for every possible purpose required, in the subsequent treatment of the different qualities of gold; and that for toughness, cleanliness and producing good workable properties it cannot be surpassed.

In melting scrap gold from the workshop, care should be taken to see that it is quite clean and free from organic matter, wax, etc. To effect this it is a good plan to heat the scrap in an iron ladle until all wax or grease is removed; this should be done before the workman weighs his scrap into the warehouse, and should be a special rule of every establishment. It has a great tendency to reduce the working loss, which is almost unavoidable. This kind of scrap is best remelted by itself, and the same flux may be employed as has been recommended for new gold; if the bar of gold should split in rolling, it is due to the presence of some foreign metal, such as lead or tin, or it may be iron or steel. Then remelt the bar with two parts carbonate of potash and one part of nitrate of potash (saltpeter), the saltpeter will draw the iron or steel into the flux, leaving the alloy of

gold free. If lead or tin should get into the gold, very serious results follow—a very small portion being sufficient to split a large bar and render it totally unworkable and exceedingly brittle; when broken the grains appear close and pale. Bi-chloride of mercury (corrosive sublimate) is the best flux to use when these defects make their appearance, in the proportion of two parts charcoal to one of corrosive sublimate, when all will go right again. Sandiver is also a very useful flux when iron or steel gets into the gold. Such gold, when remelted, always loses in weight, some of the alloy being lost on account of the many small pieces of gold of which the scrap consists. This, of course, improves the quality; therefore it is necessary, in order to keep the gold of one standard, to add some small portion of alloy, either silver or copper; but, as the scrap may contain a little solder, copper will be the best to use. The following calculations may be relied upon for the different qualities:

TABLE OF CALCULATIONS.

Wet-colored scrap.....	3 grains of copper per ounce.
12-karat scrap.....	6 grains of copper per ounce.
10-karat scrap....	9 grains of copper per ounce.
9-karat scrap.....	12 grains of copper per ounce.

Any gold bearing the English Hall-mark make no additions.

All qualities of scrap should be well sorted and undergo the action of a magnet before remelting, and the greatest care exercised in keeping every quality separate.

Sometimes in remelting scrap gold it is necessary to make some addition, either in fine gold or alloy, for the purpose of improving or reducing the quality. This happens when different qualities of goods are required on the spur of the moment, and it may not be convenient to procure fine gold at the time sufficient for the purpose; this is very often the case with beginners who have embarked in business with a limited capital, which may already be partially invested; to such persons the advice we may give may prove serviceable. There may be possibly existing at the time in the workshops a large quantity of scraps of the regular quality, and if the proper rules for alloying, in reference to reducing and improving the qualities, were understood thoroughly, use might be made of it in the above direction, not only to the pecuniary interest of the man of business, but also to the advantage of all parties concerned. We shall be as simple and as concise as possible in our modes of calculation, and will employ the usual arithmetical signs. In preparing the scrap for reducing great care must be taken in selecting it free from solder or other impurities, otherwise the calculation, as regards extreme accuracy, will be thrown out; and sometimes this is of importance, but, more commonly speaking, when the quality is not for hall marking, the difference likely to be made is of very little importance. The numeral 20 in the following tables will always be consonant, because it represents the number of pennyweights in one ounce of gold. The multipliers and divisors will be different, and will vary with the quality of gold required.

As an example, suppose we want to find how much pure gold will be required to be added to 1 ounce of 9-karat scrap in order to raise it to 15-karat gold, we should proceed thus:

$$\begin{aligned}
 20 \times 15 &= 300 \\
 20 \times 9 &= 180 \\
 300 - 180 &= 120 \\
 120 \div 9 &= 13 \text{ dwts. } 8 \text{ grs.}
 \end{aligned}$$

Therefore to every ounce of 9-karat gold we shall have to add 13 dwts. 8 grs. of fine gold to make 15-karat gold. The divisor 9 does not represent the quality of scrap about to be improved, but is the difference between the quality manufactured and the numeral 24, which represents the number of karats in one ounce; consequently, when it is desired to improve the scrap, the divisor will always represent the difference between the quality as improved by the addition of fine gold and 24. When it is desired to reduce the scrap the reverse will be the case; the divisor will always indicate the quality to be made.

Let us take another case as illustration of what we mean. Suppose it is desired to reduce some scrap in quality, no alloy being suitable to be found in the alloy book, we shall have to make a sort of guess-work or hap-hazard calculation. If we adopt the system we are recommending it will become very simple. To reduce 18-karat scrap in order to make 15-karat gold we shall proceed as follows:

$$\begin{aligned}
 20 \times 18 &= 360 \\
 20 \times 15 &= 300 \\
 360 - 300 &= 60 \\
 60 \div 15 &= 4 \text{ dwts.}
 \end{aligned}$$

To every ounce of 18-karat scrap must be added 4 dwts. of alloy. This case clearly illustrates the difference in the divisor between reducing and improving the quality. If it is of importance to know how much mixture of alloy should be added to one ounce of fine gold, in order to produce qualities of inferior standard, the numeral 24 becomes consonant, thus to produce 18 karats:

$$\begin{aligned}
 20 \times 24 &= 480 \\
 20 \times 18 &= 360 \\
 480 - 360 &= 120 \\
 120 \div 18 &= 6 \text{ dwts. } 16 \text{ grs.}
 \end{aligned}$$

Therefore, in making 18-karat gold, to every ounce of fine gold a mixture of alloy consisting of 6 dwts. 16 grs. must be added. The above examples represent almost every case, and any others which may arise out of them may be safely calculated, taking these as basis or starting point.

### Free-Hand and Mechanical Drawing.

BY EXPERT.

A CERTAIN AMOUNT of skill in drawing in these days is demanded of every business man, and particularly mechanics. This knowledge usually extends only to the capability of delineating in outline such forms as is desirable to impress on our own recollection or the understanding of others. There is really but little difference between so-called free-hand and mechanical drawing; the usual distinction might be defined by saying mechanical drawing is a style of drawing in which the forms are established by means of instruments, such as dividers, straight-edges, etc. This definition is all very well, but yet a mechanical drawing made without any instrument, except pen or pencil, would answer every practical purpose. Still, for many purposes, especially if the drawing is an elaborate one, a definite scale should be used as well as certain drawing instruments. Such instruments ensure accuracy, and if skillfully used add elegance to the drawing. It is the writer's intention to give in these articles such simplified instructions as will enable any person who will practice sufficiently to produce drawings which will be intelligible to any skillful mechanic, and also be accepted at the U. S. Patent Office with the proper specifications in application for letters patent. And in free-hand be expert enough to draw all ordinary subjects any man in business life would be called upon to delineate. But I would beg to say to the reader, the skill will be exactly proportionate to the practice. For mechanical drawing, a very expensive case of instruments are by no means necessary. The sets which come in boxes are not, as a rule, the most desirable. A few good instruments are much better than many inferior ones, and good instruments are always somewhat expensive. The idea which some people have that cheap instruments are good enough to learn with is a great mistake; a learner should have everything of the best. In mechanical drawing accuracy is of the first importance; next, elegance. To ensure accuracy we must first have accurate scales; next, accurate instruments for transferring these measurements to the paper. The following may be considered as instruments absolutely necessary: A 6 inch scale—preferably a Brown & Sharp steel scale divided in  $\frac{1}{16}$  and  $\frac{1}{8}$  of an inch. In using such a scale care must be taken with the fine divider points to not blunt them.

A boxwood scale, if well made, will answer. A pair of 5 inch hair spring dividers; a pair of 4 inch needle point dividers; a pair of 6 inch dividers with extension bar. The 4 and 6 inch dividers should have pen and pencil attachment. A 5 inch protractor showing  $\frac{1}{2}$  degrees; a pair of 6 inch parallel rules; a  $4\frac{1}{2}$  inch drawing pen; a cake of super super India ink; a pair of 6 inch proportional dividers. From the above list the hair spring dividers and the proportional dividers can be left out, although they are of first-class importance. Add to above some 303 Gillot pens and an H. H. drawing pencil. For free-hand drawing the pen and pencil just given, and a bottle of Roemy or Windsor & Newton's liquid India ink. The liquid India ink is not as good as the kind coming in cakes or sticks, but it is much more convenient, especially for free-hand drawing. I would strongly recommend the use of a pen for all free-hand drawing, even in sketching from nature; it has so many advantages; first, its convenience, as it requires only a tablet of white paper. The best tablets for this purpose is hot pressed (having a smooth surface) light weight paper, united at the edges so as to make a firm block or board for drawing upon. As soon as a drawing is complete, a knife easily separates the drawing from the remaining leaves of the tablet which is ready for another drawing. About the best size for outdoor sketching is  $4\frac{1}{2} \times 6$  or  $5 \times 7$ , or some size convenient for the pocket. In sketching, a faint outline can be made with a very hard lead pencil, the pencil giving only the faintest trace, then working out the details with the pen; but all this will be given as the articles progress. Preparing or grinding the India ink is something of a task; it should be rubbed up with water on a suitable slab or dish until an intensely black liquid is obtained. There are India ink dishes which come on purpose with a cover; the grinding surface of these dishes are at first a little too rough for preparing the ink perfectly, but they soon wear to the proper condition. An ordinary small white porcelain plate can be used, but the glazing is too smooth and grinds the ink very slowly; but if the inside of say a little stone china sauce plate is ground carefully with a bit of cork, or, what is better, a wad of rag, wet with water and dipped into flour of emery until the glaze is deprived of its extreme smoothness, it makes as good a grinding dish as one could desire. The only fault is the ink evaporates very fast; this can be avoided to a great extent by covering the dish with a bit of glass. A better course is to rub up quite a quantity and turn it into a small bottle; in this way it can be kept for weeks ready for use. The greatest error the beginner has to contend with is he prepares his ink too thin, consequently his lines when dry are not perfectly jet black. We have lots of rules given as a test for the proper consistence of ink, but about the best of these is to use your ink as thick as it will flow from the pen. Here comes another consideration: ink which an experienced person who works rapidly would have no difficulty in using, would dry up and clog in the pen for an inexperienced, slow working beginner. Consequently it is best for the pupil in his early efforts to use his ink a little too thin for any work which has to be used for photographic reproduction. It would be well to bear in mind the idea, however, that as soon as he acquires the skill that he must use his ink as thick and black as it will possibly flow from the pen. Few persons, except artists and those connected with the printing business know of the facility with which a well made pen and ink drawing can be made into a block for printing purposes. I don't mean by this that the drawing is actually transformed into a relief block for the printer's use, but it (the drawing) serves to do all the work of engraving. Suppose, to illustrate, the reader has some machine he wants to advertise; he makes a clear, careful drawing of the machine he wishes to illustrate. The drawing is 3 or 4 times the size he wishes the cut, and made with the blackest ink on the whitest smooth-surfaced paper—Bristol board. He sends this to some of the photo-engraving companies, and for 20 cents a square inch they will send him a cut in type metal mounted on a block type high ready for the printer's hand. Or it might be some comic or sentimental line drawing in free-hand which would catch the eye in an advertisement.

If a man only has the skill to make the drawing he can get a cut made of it so cheap as to make the expense next to nothing. Only fancy a cut  $2 \times 2\frac{1}{2}$  inches for one dollar—who would not illustrate their advertisements? It is the writer's intention in his next article to give instructions how to delineate first simple geometric forms of surfaces with complete directions for the use of instruments; then proceed afterward to the consideration of subjects represented as seen in nature, both mechanical and natural. This, of course, will include the rules for perspective drawing. The advantages claimed by these articles over the usual text books on this subject are, first, simplicity, avoiding many of the technical details which have heretofore been deemed necessary; second, several new mechanical devices by which the eye can be aided in drawing correctly from nature; third, the idea will be kept in mind that the drawings are to be made for photographic reproduction.

### The Preservation of Health of the Goldsmith.

MR. PAUL HIELE, in the *Journal der Goldschmiedekunst*, editorially makes several very pertinent remarks on the care and preservation of health of the goldsmith. Everyone knows how very easy it is to transform an originally healthy body by the neglect of the simplest hygienic rules into a sickly one, a condition favored especially by the forced sedentary habits of the goldsmith, and we think that the workman should make himself acquainted with the common rules of health in order to avoid sickness and medical expenses.

Let us first examine the workshop. This should unconditionally be a high, spacious, well lighted and ventilated room; its light should be from the north; avoid opposite high walls, which, for the purpose of increasing light, are either painted white or whitewashed, as the brightness will invariably fatigue and irritate the eye of the workman, a fact quickly recognized by the painfulness of the eye and blurred sight. Having found such a locality, make provisions that the good air which it contains is not rendered unfit, say, by chemical agents and other emanations and vapors injurious to health, as is often found in workshops; such kinds of works should, as far as possible, be performed in open air or under a well drawing flue. Attention must next be paid to the heating and ventilating of the shop; these conditions must always stand in due proportion to each other; heating, as far as possible, must always be uniform and avoid sudden extremes. The moist condition of the air must always be preserved, and never allowed to fall below its natural percentage.

When steam heat cannot be employed we must have recourse to the old way of heating with stoves, which, radiating a dry heat, quickly consume, the hygroscopic percentage of the air, and an open vessel with water should constantly stand upon the stove to restore the lost portion of aqueous vapor.

The purposes of ventilation are so well known that we need not enter into a lengthy explanation. It should progress both day and night and be strong enough to carry off all the air vitiated by breathing, introducing fresh air in place. To give an illustration of the importance of ventilation, we append the following:

At a school in Norwood, England, containing 600 scholars, the dreaded scrofulosis prevailed to an alarming extent, and many children died in consequence. The cause was ascribed to insufficient food. Dr. Arnott was appointed to examine both food and locality, and found the former to be good and wholesome, but recognized at once that the building was insufficiently ventilated. Thorough correctives were applied, in consequence of which the disease disappeared quickly, and 1,100 scholars, enjoying excellent health, now live in the rooms which formerly sheltered 600 sickly and diseased children.

After having attended to the above and made alterations to suit, if necessary, we bestow our attention to the work bench and seat.



Have these two of such a height that in sitting the lower body is compressed as little as possible, and that the upper part of the body need not bend forward and downward.

This is effected by having the seating surface of the stool from 1 to 3 inches higher than the knee of the workman, whereby his thighs slope downward.

The work bench, next, must be of such a height that the person seated before it must just clear its surface when extending his arms horizontally; at this height of the bench the person is forced to sit straight and upright; this position is of importance, especially for young men who are still growing and in course of development; an inclining and doubled up position too often produces the unsightly curvature of the spine, called a "hump" or "hunchback."

Beside this physical deformation, it must be remembered that the functions of the interior parts of the body are partly contracted in their activity, especially those of the lungs and stomach, and for this reason we should invariably pay great attention to comply with above rules for sitting. Avoid the use of cushioned seats and give cane seats the preference. The heat of that part of the body sitting in the cushion is retained in it, and in turn overheats the part, producing costiveness, piles, etc., while with a cane seat a constant ventilation takes place. Do not sit down to the bench immediately after meals, but take at least one-half hour's exercise by walking or any other light occupation.

Remember the old adage that "cleanliness is next to godliness." Bathe, especially in the morning after getting up; if you have no other facilities, take about a gallon of water in your wash basin and with a large sponge rub over your whole body; do not dry yourself, but let the corporeal heat gradually dissipate the water and you will feel cool and nice all day. The friction of the towel is apt to create too much heat.

Our greatest attention, however, is due to the care and preservation of our eyesight. It would be useless to say that this organ is indispensable, but it is the very one of all our five senses which is taxed (and abused) most, and for the care and protection of which we are apt to do nothing.

He who is anxious to preserve his sight unimpaired, should never, under any circumstances, work or read in twilight or by an insufficient or unsteady artificial light. Never work in the glaring immediate sunlight or under the influence of sunlight reflected from an opposite white wall. The most appropriate light will always be that falling from above our left shoulder upon the piece of work we are engaged on, and, whenever practical, never work with the face turned toward the window, but turn your left shoulder toward it, which is easily effected by a slight change of the bench. The rays of artificial light, either in the dwelling room or in the workshop, should never strike direct into the eye, and the bench lamp must be placed sufficiently low so that the shade keeps the eye in darkness.

With night work, the so much abused light balls are decidedly to be recommended; they collect and concentrate all the rays of light with great intensity upon a certain optional point, and when a shade of pasteboard is placed over them they shade the eye completely, and it is not irritated by any ray of light falling in any other direction. When purchasing these globes choose them of a good size; it is also necessary to have the water crystal clear, which is easily done by dropping a few drops of chemically pure nitric acid into it; the globes are then well corked and set aside for some time to clarify.

The clearness of the water increases with age. High standing or hanging lamps in dwellings must always be shaded with globes of ground or milk glass. The very injurious metallic shades are fast going out of use; they used to gather the heat of the lamp and radiate it on the eyes and brain, thereby occasioning headaches, etc.

Should the eye be accidentally injured medical aid is to be sought at once, and, during the time that it arrives, unduly great heat must be kept down by application of cold wrappings.

Never try to expel foreign bodies that accidentally enter the eye by rubbing, because you simply irritate and inflame it thereby. It

is better to raise the upper lid or draw it down over the lower, so that when returning to its place it slides over the lower eyelashes and is swept clean by them, so to say. This manner will, in the majority of cases, suffice to remove the foreign body, but if not, the object may often be gotten out with a strip of white paper or a camel's hair brush. Never, however, let any one use a hard instrument; if this is necessary to be done, it is best to at once send for or go to a physician.

It often happens that the goldsmith is using all manners of chemical agents and acids, which processes are generally performed with an astonishing carelessness, and it is often a cause of wonder that so few accidents, invited by this carelessness, occur. Let him take great pains not to put his hands into contact with such materials and poisons. Whenever it is indispensably necessary that it must be done, let him afterward wash his hands carefully with warm water and soap, otherwise frequently incurable skin diseases are produced by his neglect.

Much more might be said on this subject; we think, however, that we have mentioned the principal points, which, if carefully attended to, will cause the intelligent workman to have a due regard for his health.

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## Fashions in Jewelry.

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### A Lady's Rambles Among the Jewelers.

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THE bracelet is one of the most popular articles of jewelry worn by ladies at the present time, and it is represented in a greater diversity of patterns than almost any other personal adornment. The padlock bangles, which have had a wonderful run, chanced to tickle the fancy of sentimental youths and maidens, and were, doubtless, the origin of the present furore for bracelets as engagement tokens. The engagement bracelets are set with diamonds, rubies, pearls or other precious stones denoting good luck. The design, too, is often suggestive, any number of love stories being told in the language of jeweled and enameled flowers. Heart'sease, pansies, daisies, forget-me-nots and double violets are favorite subjects. Often the bracelet proper is but a simple round wire, on the lapped ends of which occurs all the ornamentation. Again the bracelet is finished on top with a true lover's knot of gold, in the center of which appears a gem. Sometimes the bracelet is of twisted wire, with a placque representing a spider's web into which has walked a jeweled fly. A pretty and popular design for bracelets is that of a whip, the braided lash of which encircles the arm and knots round the jeweled handle forming the top of the ornament.

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A CRAZE running a neck to neck race with the bracelet furore is the one indulged in about jeweled pins. Under this comprehensive head comes all manner of ornamented pins for both sexes. Men as well as women are affected with the prevailing desire for a unique collection of decorative pins. For the distraction of the fair sex the manufacturers of fine jewelry have provided new and alluring temptations in way of lace, round, bonnet and flower pins, and last, but by no means least, neck pins, or ribbon pins as they are also called. Quite new in lace pins are the slender gold bars on which appears a jeweled insect or flower, or a star or a crescent. Occasionally one sees a jeweled fly pierced through with a pearl headed pin, or an enameled wild rose on which rests a jeweled butterfly. The daisy is a favorite subject in jewelry and appears on all classes of pins, its

leaves being represented sometimes with enamel and sometimes with pearls.

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CLASSED under round pins are gold knots showing three, four and sometimes more rings and studded with gems. Large pansy pins with diamond hearts come under this classification; so do pearl stars with a yellow diamond in the center.

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PARIS dudes, it appears, have awakened to the fact that jewelry is fashionable, and, taking advantage of the situation, are wearing two finger rings at one time and on one finger. The favorite finger, if we may believe all we hear, is the little one of the right hand. Finger rings are, however, but the beginning of a list of ornaments, including chains, studs, buttons and scarf pins. Scarf pins, by the way, are worn *ad libitum* by the gilded youth of the gay metropolis, who have a collection appropriate to each hour and occupation of the day. These pins are as fanciful and varied in design as are ladies' ribbon pins, the crowning feature being jeweled ones with which to fasten down either end of white ties worn with evening dress. Below the immaculate white tie and its two unique scarf pins comes a broad expanse of white pique shirt front from the center of which gleams one stud, provided the youth possesses a large and rare gem; otherwise the absence of quality is made up in quantity, and the correct style becomes three studs. These dudes of dudes have also revived the fashion of wearing a watch and chain with evening dress, though, as yet, the chain is carefully concealed beneath the waistcoat.

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GENTLEMEN, by the way, are wearing vest chains almost or quite as light in weight and delicate in workmanship as are the ladies. Many of these new chains are composed of platinum and gold, the former metal being still largely employed in the making of fine jewelry. The chief supply of platinum, everybody may not know, comes from the platinum mines of the Ural mountains, in Russia, being shipped first to dealers in France and England.

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THE new patterns in scarf pins for gentlemen are legion in number and decidedly interesting in character. There is no doubt whatever about the exceeding and wide-spread popularity of this article. Like the new watch chains, the new scarf pins are very dainty in design and small in size. Jeweled pins are all the rage and tiny stones of all kinds and qualities are employed. Sometimes the gems are set in form of a little cross or crescent; again the pin represents a sabre, the handle of which is jeweled. The sabre pattern is perhaps one of the most popular in scarf pins, though there is a growing fancy for miniature crosses. Flies, butterflies and spiders are also popular designs. Quite new to the present generation are the scarf pins showing a colored square stone in the center set round with pearls, the whole being framed in a tiny gold rim. These square pins were worn half a century ago as love tokens, a braid of hair being concealed beneath the center stone, or sometimes a miniature portrait appeared in place of the center stone. These old time pins were made with a pin and catch, and were worn on the center of the shirt front, whereas the modern ones are mounted on a long scarf pin to fasten in a scarf.

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LITTLE square pins, arranged to fasten with a short pin and catch,

for ladies' use, have followed close in the wake of the neck buckles described last month, and are designed to wear on a neck ribbon, bonnet tie or elsewhere, as the wearer may prefer. Fancy and semi-precious stones are employed with good effect in these square pins. The term "ribbon pin" is being given now to all the little ornaments made with short pin and catch to distinguish these from the bonnet pins that are made scarf pin style. Favorite designs in these ribbon or neck pins as they are variously called are clover leaf, daisy and other flower patterns set with pearls. These pins, already popular, are destined to have a long run. It ought to be added that the slide and buckle forms are still made and divide honors with the trinkets that fasten with pin and catch.

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WHILE the Queen chain remains the leading one for ladies, there is quite a demand for a fancy vest chain, a trifle longer than the Queen, with a bar and attachment for charms. The tendency is more and more to the wearing of several charms on all styles of chain in place of a single charm or ball. Conspicuous among charms are tiny gold viniagrettes and watch seals. The tiger-eye is largely used as the seal on ladies fancy vest chains.

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IT IS a remarkable fact that while one is always seeing pretty shapely hands covered with costly rings, not one lady in one hundred wears rings that fit her fingers. Some are so large they must be kept on with a guard, while others are so small they are put on and off over the joints with absolute discomforture. A connoisseur in gems in a leading New York house, commenting on this peculiarity, expressed great surprise that ladies who are so averse to a wrinkle in bodice or glove should be actually slovenly as regards the fit of their most expensive adornments. He also censured the jewelers who had mounted the gems, because they, at least, should understand the importance of a well-fitting ring, if their customers do not. Aside from the annoyance to the wearer arising from rings not properly adjusted to the fingers, is the fact that ill-fitting rings detract from the otherwise pleasing appearance of the hand and its ornaments.

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BLACK enamel on gold appears on new collar and cuff buttons that present a slightly rounding surface with a gem set flush with the surface in a sort of cup made to receive it. These buttons give the impression of onyx ones of considerable bulk, whereas, in point of fact, they are quite thin and light, being pushed out and in a button hole with the same ease as is a flat button. The gem may be a diamond or a pearl, as best suits the wearer's taste.

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AN OLD style revived and improved upon, which promises to have a big run, is the initial cuff button. The new buttons are a decided improvement on the old-time button with its staring single letter in black or blue enamel that informed the most indifferent of observers just where in the alphabet the wearer's name belonged, and provoked speculation as to whether the name was Smith, Smithers, Simpson or Sands. The present styles are unobtrusive, and present a bewildering variety from which to select. In a word, though the entire population should adopt the new button, no two persons need wear the same pattern, for there are buttons with old English, script, block, engraved, etched and rustic initials; monograms, intricate

and graceful in their interwoven tracteries, and last, but by no means least, crests and coat-of-arms. These buttons come both single and double. The linked ones will prove popular, it is believed, as gifts between the sexes, owing to the fact that they accommodate two sets of initials or two monograms, and occupy somewhat the same position among love tokens as do the padlock and other engagement bracelets.

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AMONG new link buttons is an ingenious arrangement which does away with slipping the buttons through the button hole at all. One of the buttons is so adjusted it can be readily disconnected from the link, which latter is put through the button hole, after which the button is again attached. This convenient contrivance has been introduced in a line of beautiful silver cuff buttons so fashionable now for morning wear and for traveling purposes. The new link buttons also represent the present popular fancy for having two buttons of widely differing form, size and design on one link.

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BLACK onyx is used with admirable effect on scarf pins for gentlemen. A popular pattern is a globe or ball of black onyx in the center of which appears either a diamond or a pearl. The globe is held in a bird's claw of gold, the bird's leg forming the pin.

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FOR youths come sets of three and four studs connected with each other by little gold links that insures them against being lost. Boys wear these sets in their blouse waists, and little girls find them both ornamental and convenient for fastening the waists of summer dresses. These buttons are larger in size than the ones heretofore provided for infants' wear, and are greatly pleasing the little people.

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AN OLD favorite revived in pleasing form is the cuff pin. It is shorter than of yore, measuring only about three-fourths of an inch, and, as in former times, it serves a multitude of purposes. It is to be seen on the baby's bib, the little girl's collar, the ladies' scarf, and, where it most of all belongs, on the dress sleeve to secure the linen cuff underneath. From the time the old cuff pin went out of style to the present, ladies have found linen cuffs a troublesome article of apparel. We bespeak for the new cuff pin, therefore, a prosperous run, and believe anybody who wears a pair will find the cuff nuisance abated. These pins show all the popular styles of finish to be found in cuff buttons, and are with and without gems as best suits the wearer.

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THERE has also grown a demand for shawl pins, the popular style being two ornamental ones in either gold or silver and connected with a chain.

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GOLD hair pins are fashionable and come in size much smaller than the ones first introduced, being but a trifle longer than the average wire hair pin. The tops are usually ornamented and often

jewels are employed, but there are also perfectly plain pins. Silver and tortoise pins are out in styles similar to those made of gold.

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EAR rings are made to match lace and ribbon pins, consequently they represent a wide range of subjects from the floral and insect world. Like all other articles in jewelry they employ gems. Never in the history of fashion have small gems and semi-precious stones figured so conspicuously in jewelry. Gems are by no means confined to gold jewelry; they are used profusely in silver ornaments, and this is as good a place as any to speak again of the popularity of silver jewelry for morning and traveling wear.

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A WELL known importer of gems says that rubies of desirable size and color are higher in price now, notwithstanding the times, than before in twenty years, while sapphires are greatly reduced in value, being sold at twenty-five per cent. less than ever before. A black diamond, when perfect of its kind, is valued higher than a white stone of equal size and weight on account of its exceeding rarity. A diamond showing a clear blue tint is also greatly prized; so are diamonds of canary color. The price of diamonds abroad has advanced somewhat, owing to the presence of American buyers, and during the autumn it is believed that prices will rule a little higher here.

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IN BOTH gold and silver come beautiful buckles for garters, the garters being of silk elastic and the buckle covered with a placque variously ornamented. Sometimes the surface is of nugget finish, with an enameled flower or insect applied; again, jewels appear. Occasionally the horse shoe occurs, and sometimes there are gold or silver loops on which are engraved a text in French or German.

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BUCKLES also appear for wraps and traveling dresses. These are made of silver set with onyx, cat's-eye, tiger eye and other stones; or they are in antique patterns and oxidized to impart the desired shades. Silver buckles are also made for leather belts to be worn with yachting, tennis and similar costumes requiring to be belted down at the waist.

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PURSES are again fashionable, and the very latest style is a little netted silk bag of some pretty color, suspended from two gold bars, the ends of which are finished with tiny filigree balls. A filigree gold ring attached by a dainty gold chain to one of the bars adds to the decorative effect of this attractive little money bag, and also secures its contents from loss. These purses are also made with silver bars and rings, giving a choice of selection and gradation of prices.

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FOR presentation pieces leading silversmiths have produced exceedingly choice examples in ivory and silver. Sets of salad spoons and forks of this character are instances in illustration, and these furnish a pleasing change from the same articles made wholly of ivory. The bowl in these remains, of course, ivory, while the handle is an elaborately wrought silver one, or, both bowl and handle

may be of ivory with ornamented silver bands encircling the handle. Often the ivory remains the natural color; again it is stained a yellow brown, and on this mellow background is etched the delicate tracery of some desirable design in white.

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SILVER dessert sets with gilt surface, while from their great cost can never become popular, are an exclusive fashion that is finding favor in many palatial homes. Not only are gold fruit plates provided, but beautiful gold compotes and finger bowls of artistic shape and pleasing designs. Then, too, there are gold ash receivers and other conveniences for smokers, to match or harmonize with the dessert service.

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SILVER handled cutlery is fashionable now when made in design to match spoons and forks, so that table, breakfast and dessert knives, as well as game and meat carvers, may all be of uniform pattern. In many instances, while the general outline and appearance is the same, the engraving or etching on the handles is significant of the use to which the knife, spoon or fork is to be devoted, as, for instance, marine subjects on the fish set and floral and fruit designs on the dessert set.

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IN IVORY handled table cutlery are a variety of styles, such as stained ivory etched and ivory with silver trimmings. In cheaper goods are domestic celluloid handles and the imported ivoride handles, for each of which many merits, in addition to their cheapness, is claimed, such as durability, non-cracking, etc.

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THE present is a convenient season for jewelers throughout the country to make arrangements for diversifying their stock with such articles as are in harmony with their legitimate wares, and likely to meet with a remunerative patronage. Not a few progressive retail firms have tried this plan in self defense against the encroachments of dry goods and fancy stores that are carrying jewelry and silverware. These firms, almost without exception, report favorably on the scheme. Decorative pottery and faience afford many articles that promise speedy sale; these articles are furthermore an ornament to any store. Gold and silver cane, umbrella and whip handles constitute another popular line of goods, and will find a sale in almost every town, being favorite subjects for presentation.

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WHEREVER the mania for house dogs prevails a brisk trade is carried on in dog furnishings. The collar and leader are important items and naturally fall to the jeweler, for the collar must have at least a silver plate with the name of the pug or terrier, as the case may be, engraved thereon, and a padlock and key. Not unfrequently the collar is liberally ornamented with silver trimmings and little bells and bangle chimes. Occasionally the fond owner of the dog indulges her pet in the luxury of a silver chain for a leader, in which case there is usually a little whip with decorated handle and a call whistle of silver.

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DOULTON ware vases, imported for the fall trade, show exceedingly graceful shapes and a new tapestry finish very beautiful to behold. From Bordeaux and Geneva comes some beautiful faience;

and then there are any number of new shapes in pitchers, jugs, vases and mantel ornaments in Crown Derby and Royal Worcester.

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IN CHEAPER wares are also to be found some very desirable forms and styles of decoration. There is a new Mizza ware which greatly resembles agate in its coloring and polish. Then there are beautiful effects gained in ivory gloss with rustic decorations. An Egyptian style of decoration, likely to prove acceptable because of its novelty, is also out in art pottery at a comparatively low figure. Vases of Bohemian glass, in pitcher and urn shapes, present an entirely new combination of colorings and designs. Bisque figures in new subjects are other popular ornaments.

ELSIE BEE.

### The Sharpening of Fine Files.

AFTER the files have been liberated from the adhering dirt and fat, with a fine wire scratch brush and a hot, fairly dilute solution of crystalized soda, or, what is still better, warm soapmaker's waste lye, place them alongside each other in an earthen vessel, upon the bottom of which two strong wires were laid, so that the files can come in contact from below with the following fluid: This fluid consists of a careful mixture of 8 parts cold water and 1 part concentrated nitric acid, to be prepared in another vessel. Sufficient of this is poured upon the files that they are just covered. The acid is left to operate upon the files for about 25 minutes. After the lapse of this time, they are taken out of this bath, treated with the scratch brush in clean water, similar to the first time; they are then immersed a second time in an acid bath of the same strength (8 parts water and 1 part nitric acid), for 25 minutes, during which time they are several times changed about. The files are then again treated with the scratch brush, and returned to the same bath, to which one-half part of English sulphuric acid has been added. The bath heats, and reddish-brown vapors escape, during which time the sharpening of the files by corrosion progresses. Care must be had to keep the vessel (best is an earthen) in a rocking motion, so that the acid operates equally upon the files, which are not to be left in it longer than 5 minutes; they are then withdrawn, again treated as abovesaid, with the scratch brush and clean water, and again placed in a new bath of the same composition, in which they must not remain longer than 5 minutes.

This ends the operation. They are then treated with the scratch brush, first with clean water, and finally they are for a few minutes laid in a bath to which a little lime water was added; this is done for the purpose of neutralizing every trace of acid. They are then well rinsed in clean water, wiped with a dry rag, and heated to dry the moisture. At conclusion, rub a little oil on them.

### Valuable New Alloys.

WE LEARN from our French exchanges, that Messrs. Meiffren et Cie., of Marseilles, have composed two new alloys, the uses of which in gold and silversmithing are highly spoken of. The recipes for manufacturing them being given in the metric system, we reproduce the same formulas, converting them into the American equivalent.

*Aphthite, factitious gold.*—In order to manufacture such an alloy, which has the appearance of and the color of gold, put into a crucible 800 grams (25 ounces 14 dwts. 9.6 grains) pure copper, 25 grams (16 dwts. 2 grains) platinum, and 10 grams (6 dwts. 10.32 grains) tungstic acid. When these metals have been smelted thoroughly,

they are stirred together and then granulated by pouring the mixture into water which contains 500 grams (16 ozs. 1 dwt. 12 grains) of slaked lime and 500 grams potash to each cubic meter (220 gallons) water. This mixture possesses the characteristic of purifying the alloy.

The granulated metal is next collected, dried, and remelted, adding this time about 170 grams (5 ozs. 9 dwts. 7.4 gr.) gold. An alloy is now produced which, when cast into bars, has the appearance of red gold of 0.750 fine. The inventors have named it "Aphthite," or "Unchangeable." The color of the alloy may be changed at pleasure by varying the proportions of the metals.

Boracic acid, nitrate of soda (soda saltpeter) and table salt, in equal parts fused together, are to be used as flux. The proportion in which it is to be used is 25 grams (16 dwts. 2 grains) to each kilogram (2.205 pounds) of the alloy.

*Sideraphthite, factitious silver.*—The alloy, an imitation of silver, consists of 65 parts iron, 23 parts nickel, 4 parts tungsten, 5 parts aluminum, and 5 parts copper. The iron and the tungsten are smelted together, and granulated in the manner stated above for the gold alloy; the water, however, must contain 1 kilogram (2.204 pounds) slaked lime and 1 kilogram potash to each cubic meter of its quantity. The nickel, copper, and aluminum are smelted and granulated in the same manner, by dropping the mixture into the same kind of water. Care must be paid during the smelting of the metal in the two separate crucibles, that they are covered with a flux consisting of 1 part boracic acid and 2 parts saltpeter. Into the crucible, containing the aluminum and copper, throw a piece of sodium, weighing about 2 grams (1 dwt. 6.86 grains) for each 5 kilograms (11 pounds) of the 3 metals: nickel, copper, and aluminum, together, in order to prevent the oxidation of the aluminum, and for the same purpose add charcoal, to prevent the oxidation of the copper. Before granulating the metal, it should be stirred well in the crucible with a stirring apparatus made of fire-clay.

The granulated metals are then dried in the manner described, smelted together in the given proportions in the crucible, well stirred, and cast into bars.

The obtained alloy, which has been named "Sideraphthite" or "unchangeable iron" has the same white appearance as silver, and is no dearer than German silver.

Both alloys fully resist the action of sulphuretted hydrogen, and are not whatever attacked by vegetable acids, and only slightly by mineral acids. At the same time they are supple and malleable in the most perfect manner

## Recent Patents.

The following list of patents relating to the jewelry interests, granted by the U. S. Patent Office during the past month, is specially reported to THE JEWELERS' CIRCULAR by FRANKLIN H. HOUGH, Solicitor of American and Foreign Patents, 925 F Street, N. W., rear U. S. Patent Office, Washington, D. C.

### Issue of June 16, 1885.

- 320,220—Bracelet Clasp. H. A. Church, Providence, R. I.
- 320,127—Watch, Dust Proof Case. C. K. Giles, Chicago, Ill.
- 10,613—Watch, Self Winding. H. Von der Heydt, Chicago, Ill.

### Issue of June 23, 1885.

- 320,593—Jewelers' Dust Box. J. A. Sherwood, Plainwell, Mich.
- 320,870—Watch, Breast Pin. D. Goldsmith, New York, N. Y.
- 320,584—Watch Case Bezel. C. V. Peyn, Brooklyn, N. Y.
- 320,699—Watch Key. D. Roberts, Waltham, Mass.
- 320,609—Watch Winding Device. A. G. Wiseman, Webster Groves, Mo.

### Issue of June 30, 1885.

- 321,402—Clock Case. A. D. Tyrrill, New Haven, Conn.
- 320,997—Clock, Electric. F. Bauman, Waldenburg, Switzerland.

- 321,407—Ear Jewels, Ball Covers for. G. W. Washburn, New Brighton, N. Y.
- 320,991—Ear Ring. C. E. Westcott, Providence, R. I.
- 321,041—Chuck for Gem Settings. C. I. Loveren, Brooklyn, N. Y.
- 321,302—Diamond, Artificial. E. E. Kipling, Roselle, N. J.
- 321,021—Watch Case. E. Haas, Philadelphia, Pa.
- 320,992—Watches, Machine for Roughing out Pinions for. C. V. Woerd, Waltham, Mass.

### Issue of July 7, 1885.

- 321,861—Collar Button. C. M. Sharpe, Philadelphia, Pa.
- 321,653—Button or Stud. J. F. Thayer, Providence, R. I.
- 321,674—Clock. P. C. Bensel, New York, N. Y.
- 321,415—Clock, Alarm. T. L. Bissell, Charleston, S. C.
- 321,613—Clock Case. A. M. Lane, Winsted, Conn.
- 321,526—Clock Winding Mechanism. L. F. Portebois, Paris, France.
- 321,826—Watch Case. J. Lamont, Sag Harbor, N. Y.
- 321,886—Watch Case Bezel. W. Burns, Jr., Coshocton, Ohio.
- 321,687 and 321,686—Watch Cases, Forming Rims on. C. Cabot, Philadelphia, Pa., 2 patents.
- 321,611—Watch Escapement. G. Krichevski and A. Edmonds, New York, N. Y.
- 321,854—Watch Movement Box. N. V. Randolph, Richmond, Va.
- 321,896—Watch Plate. G. E. Hart, Waterbury, Conn.
- 321,571—Watch Protector—J. Adler, Mulheim, Prussia, Germany.

## The Jewelers' League.

*President*, HENRY HAYES.....Of Wheeler, Parsons & Hayes.  
*First Vice-President*, JAMES P. SNOW.....Of G. & S. Owen & Co.  
*Second Vice-President*, ROBERT A. JOHNSON.....Of Colby & Johnson.  
*Third Vice-President*, WM. C. KIMBALL.....Of H. F. Barrows & Co.  
*Fourth Vice-President*, AUG. KURTZBORN.....Of L. Bauman Jewelry Co. St. Louis, Mo.  
*Secretary and Treasurer*, WILLIAM L. SEXTON.....Of Sexton & Cole.

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 GEORGE R. HOWE.....Of Carter, Sloan & Co.  
 CHARLES G. LEWIS .....Of Randel, Baremore & Billings.  
 E. S. SMITH.....Of Smith & Knapp.  
 S. H. HALE.....With Robbins & Appleton.  
 J. R. GREASON.....Of J. R. Greason & Co.

THE JEWELERS' CIRCULAR is the *exclusive* official paper of the Jewelers' League, and has been selected for the publication of all matters of interest pertaining thereto. Letters or inquiries pertinent to its business or purposes, and which might interest the trade or inquirers, will herein be answered. Address *Jewelers' League, Box 3,444, P. O., New York*, or the office of THE CIRCULAR.

AT THE meeting of the Executive Committee, held on July 2d, 1885, there were present the Chairman, J. B. Bowden, Messrs. C. G. Lewis, S. H. Hale, J. R. Greason, Vice-President Kimball, and Secretary Sexton.

One change of beneficiary was granted.

An assessment of two dollars was ordered on account of the death of Werner Frese, of Chicago, Ills.

Two applications were referred.

Four applications were accepted as follows:

L. Hirsch, New York City; I. Hunt, Uniontown, Pa.; W. E. McMillen, Des Moines, Iowa; S. Leopold, Americus, Ga.

The next meeting of the Committee will be held on Friday, Aug. 7th, 1885.

## The Antique Craze.

THE COLLECTING of "antique" and works of art has become a fully developed mania on the continent, and we fancy that our shoddyites are not exempt from it. A well defined and full equipped branch of art has, for the last few years, sprung into exist-

ence; old objects of art have been multiplied by electro-plastic, copying, etc., until they are almost worn out in the process, and the imitations flood the market. The most eminent European artists have left off producing modern objects of art, for which they receive nothing, and engaged in the manufacture of the antique, for which they are paid double and triple.

Under the heading of "Old Enamel," one of our Amsterdam exchanges brings the following anecdote, which may be of interest to collectors of objects of art and antiquities, to enjoin on them an extra amount of caution.

The enamel manufacturer, Soyez, of Paris, made the following remarkable statement about "old enamel" a few days ago, to the committee of inquiry: "It is daily ordered of me, and I make it under one condition, that I be permitted to state upon it from what original it was copied. This is generally refused, however. The originals are then sent to Amsterdam where they are copied, and come back to Paris to be sold at art auctions, and sometimes they fetch wonderful prices. Such a copy was not long ago brought to me for repairs; it represented the murder of the Duke de Guise. 'Can you repair the piece?' I was asked. 'Certainly,' I responded; 'I will repair it in the same manner in which I made it originally.' 'You? I bought it for 10,000 francs; it was begrimed and dirty all over, and you do not believe the trouble I had to clean it.' 'I know that; but in order to fully convince you I will show you the design from which I made it.' I know a collector of antiquities in Amsterdam, who owns perhaps two million francs' worth of snuff boxes and enamels of Limoges, Leonard Limousin and Pierre Reymond. In order to complete a dozen, he paid for one plate of the latter 3,000 francs, and the same plate, which bears the name of my firm, was made by me, and I sold it for 150 francs.

Verily, the fools are not all dead yet!

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## Proceedings of the Horological Club.

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### A DISTINGUISHED BODY OF WATCH AND CLOCK MAKERS.

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*One hundred and thirty-third discussion.—Communicated by the Secretary.*

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[NOTICE.—Correspondents should write all letters intended for the Club separate from any other business matters, and headed "Secretary of the Horological Club." Direct the envelope to The Jewelers' Circular Publishing Company, Seth W. Hale, President. Write only on one side of the paper, state the points briefly, mail as early as possible, as it must be received here not later than the eighth day of the month, in order to be discussed and reported in the CIRCULAR for the next month.

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#### SOFT-SOLDERING GLASS ON METAL.

*Secretary of Horological Club:*

I would like to know how to soft-solder glass on metal, such as English black garnet jewelry.

THOS. ALLAN.

Mr. Ruby Pin replied that the soldering, in such cases, consisted merely of adhesion by exclusion of air. By heating the glass or stone and getting the soft solder to make perfect contact with it, avoiding openings through it and consequent air bubbles, metal which had been previously well coated with an adherent film of solder could be pressed into close contact with the glass, and the atmospheric pressure alone would hold them together. There was no real "soldering" about it, for by heating the glass the solder could be wiped off; of course, care must be taken in the heating so as not to crack the glass.

There was a later method which consisted in giving the glass or stone a coating of silver, for which directions were printed in THE CIRCULAR last month, and then soft-soldering to the silver. He believed, however, that this process was patented, although the patent might not cover the particular employment mentioned by our correspondent. He thought that it was limited to soldering real or imitation diamonds, etc., into their settings. But for our corres-

pondent's purpose the old way would probably be equally good and less troublesome.

"THE CIRCULAR" FOR SALE WITH THE WHOLE OF EXCELSIOR'S  
"PRACTICAL HINTS ON WATCH REPAIRING."—LOOSE  
JEWEL MOVING CONTRARY TO THE PIVOT.

*Secretary of Horological Club:*

I have fifteen full volumes, unbound, of THE JEWELERS' CIRCULAR, being a subscriber from the beginning. I would be willing to sell if I got a good price for them. I have every number from the first to date, and as I am pretty well advanced in years I think I might as well sell them. They contain all of Excelsior's papers, which are decidedly the best treatise on horology published in the English language. They are plainly written, while at the same time they are highly scientific, and will stand the tests of the highest mathematical demonstrations. It is a great loss to the rising generation of watchmakers that Excelsior has stopped writing on the subject. It is the duty of every young man who aspires to become a first-class workman, to procure Excelsior's works on watch repairing at any reasonable cost. Really, they are not too dear at any price. Every young watchmaker ought to read them over attentively several times; every time he reads them he will find something to appreciate.

I have been studying and experimenting with the question of a jewel moving backwards in its setting, while the train is running down at a rapid rate, and have come to the conclusion that such a thing cannot happen—that it is altogether an optical illusion. The eye must have been deceived by the downward motion of the train while running down, and the parties imagined that the jewel was moving backward when it was really moving forward with the train, if moving at all. It is like a person seated in a railway coach standing still on the track and another train passing by on another track, and while looking at it through the window you would imagine that it was the train you were in which was the one in motion in the opposite direction—which is nothing more nor less than an optical illusion. Just so with the jewel moving backwards while the train is moving forward. This is my view of the question. I would like to hear more on the subject.

Cheraw, S. C.

H. L. LOUGHLIN.

Mr. McFuzee said that here was a rare chance, indeed, to obtain back numbers of THE CIRCULAR, and doubtless Mr. L. would very soon find a customer. The Club fully agrees with Mr. L. in his estimation of Excelsior's writings, as is shown by our constant endorsements of them from their beginning. His name has become almost a "household word" among all the older watchmakers, who have generally managed to provide themselves with a copy of them, leaving only the younger workmen and the less enterprising among the older ones to be supplied or to be informed of their value.

As regards the loose jewel question, one correspondent last month expressed disbelief that the bushes in large machinery could move in the reverse direction, and now another one disputes the reality of the phenomenon in any case. This, however, is probably a little too sweeping in its terms. At our January meeting a Mr. S. declared that he had seen it and tested it by moving the train backwards and forwards, and said that in whatever direction the pivot was caused to turn the loose jewel would turn in the opposite direction, but more slowly than its pivot. Having tried it repeatedly and being unable to detect the cause, he applied to the Club for an explanation.

At our March meeting, Mr. Moss, an old and experienced workman, said that the phenomenon had come under his notice "a few times in forty years." Others have discussed the matter, and, without saying that they had seen it, some of them implied that they had. We can hardly dismiss it entirely, therefore, as an optical illusion, although no member of the Club, now present, recollects ever having observed it. Let us hear positively from those who have seen it in the past, and, if anyone should hereafter come across such a case and will send it to the Club for examination, we will endeavor to determine which one of the explanations offered is correct by testing them. If none of them satisfactorily account for the phenomenon, we will try to discover what is the true cause of it.

#### TOOL FOR SEIZING RINGS IN REPAIRING.

*Secretary of Horological Club:*

I have invented a tool for determining the amount to be cut out

of, or inserted in, one ring to make it the size of another, or a given size on the ring gauge. Is there any tool of that kind in the market, and what is your opinion of the value of a tool for that purpose if it is exact?  
ED.

Mr. Clerkenwell did not know of any tool for that special purpose, and thought that there should be a considerable sale for it if it was exact, easily used and not expensive.

BOOKS FOR RECORDING WATCH REPAIRS.

Secretary of Horological Club:

Can you advise me where to get a blank book properly ruled for keeping account of the watches repaired in the shop, the price, what was done, etc.? Also, I see you speak of the only way to get Excelsior's "Practical Hints on Watch Repairing" is to buy up the back numbers of THE JEWELERS' CIRCULAR with them in, and in another place there is an advertisement of them published in book form at your office for \$3.50, which looks like a contradiction. But perhaps I don't understand it correctly.  
F. M.

Mr. Uhrmacher said that W. B. Dickie, of 69 William street, New York, publishes a book for watch repairs, and will send descriptive circulars to any one wishing them. There are also two or three others, but as they are not advertised he could not give their publishers names.

As regards the apparent contradiction about Excelsior's writings, the "Practical Hints on Watch Repairing" appeared monthly in THE CIRCULAR for several years. The first portion of them has been republished in book form, containing the articles on the springing and all the fine adjustments of watches and chronometers—in short, all the finer and more particular classes of work the watch and chronometer is called upon to do. It is this book which is advertised, and has become a standard authority upon the subject of which it treats. But it includes only one part of Excelsior's articles. The remainder, or latter portion, has never been republished, and, as frequently stated, the only way to obtain that part, or the whole, of the articles is to secure the back numbers of THE CIRCULAR which contain them. Mr. M. will therefore see that the contradiction is only an apparent, not a real, one. The opportunities for securing the requisite back numbers are very rare, and, as it appears that the stock of the books is nearly exhausted, even the first series of "Practical Hints" will soon be difficult to obtain. Mr. M. would do well to correspond with Mr. Loughlin, who has offered a complete set of THE CIRCULAR this month. If unable to obtain them, he should at least secure the first series of the article in book form, and be sure of so much, for nowhere else can he find anything equal to it as a full, clear and practical book of directions for the workman.

The Test of Chronometers at Geneva During 1885.

WE MAKE the following extract from the interesting report of the Director of the Geneva Observatory on the test of chronometers during the year 1884: It says that 529 watch movements were tested, of which 183 of class A; of the latter, 112 obtained a *very satisfactory* rate certificate and were the only ones admitted to competition. Their mean rate per day was 0.408 second (0.425 in 1883), corresponding to a change of position of 1.85 seconds (1.653 in 1883), and error of compensation of 0.112 (the same as in the preceding year), per degree of thermometer. The testing lasted 45 days, divided in 8 periods, each of 5 days, with 4 days between, which are not counted. It will be remembered that the limits for a *very satisfactory* rate certificate are  $\frac{3}{4}$  seconds for the daily rate,  $2\frac{1}{2}$  seconds for the different positions, and  $\frac{1}{10}$  for error of compensation for degree of temperature. The *good* points were accounted thus that an absolutely perfect watch obtained 300 points, and one of the lowest grade, 0, still received *very satisfactory*.

The watch which was declared to be best approaches very nearly to the celebrated watch of M. Alex. Favre, which, in 1881, excited the admiration of all competitors and obtained the extraordinary number of 232 points. That of 1884 obtained 230.6 points, therefore

a trifle less. The manufacturer omitted to send in his name, but the adjuster is M. Marius Favre, fils. The tests show the following results: First test, 9.28\* seconds; second, 0.51 seconds; third, 0.42 seconds.  
\* This should doubtless be 0.28 seconds.

Twenty-five firms sent watches, although only 8 sent 5 and more; these 8 only entered into competition, and the firm of Patek, Philippe & Co. received the prize, as the average of the 5 best chronometers furnished by him was 184.94 (182 in 1883) points.

Concerning the excellent degree in the timing of these chronometers, the Director, Colonel Gautier, says: "A watch makes 5 beats per second, or 432,000 ticks per day; therefore, one making either 432,004 or 431,996 beats per day for a length of time of 45 days, is excluded from competition. Among those awarded a prize we have some, the mean rate of which is about 2 seconds, that is, watches which in 24 hours make at most 432,001, or at least 431,999 beats.

The Genevan watchmakers have attained to so high a degree of perfection!

The Jewelers' Security Alliance.

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First Vice-President, AUGUSTUS K. SLOAN.....Of Carter, Sloan & Co.  
Second Vice-President, HENRY HAYES.....Of Wheeler, Parsons & Hayes.  
Third Vice-President, DAVID UNTERMAYER.....Of Keller & Untermeyer.  
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CHAS. F. WOOD.....Of Chas. F. Wood.  
*Counsel*, HON. ALGERNON S. SULLIVAN.

For further information, Application Blanks for Membership, By-Laws, etc., Address P. O. Box 3277. 170 Broadway, New York.

THE REGULAR meeting of the Executive Committee, held on the 17th inst., was attended by Vice-Presidents Sloan and Hayes, and Messrs. Alford, Bowden, Parks, White and Lewis.

The following applicants were admitted to membership in the Alliance:

Victor Ackerman, Nyack, N. Y.; T. R. Cushing & Co., Brockton, Mass.; A. E. Groneberg, Baltimore, Md.; Alfred Humbert, Philadelphia, Pa; J. H. Massey, Allentown, Pa.; Geo. P. Osmond, Bordentown, N. J.; Z. J. Pequignot, Philadelphia, Pa.; H. Silverthorn, Lynchburg, Va.

Frosting and Coloring Gold and Silver.

FOR 15 to 18 karat gold the work should be well polished, first with glass paper, then with crocus and oil used on a circular brush revolving on a lathe spindle. Wash out clean with soap and hot water with soda, and dry in hot boxwood sawdust. Take 2 parts saltpeter, 1 part alum, 1 part common salt; reduce them all to powder, place them in a rather large crucible or a proper color-pot of plumbago and set over a gas jet; add a very little water to moisten and allow the whole to dissolve, stirring occasionally to prevent burning. While this is dissolving, set a kettleful of water on the fire to boil. Take the gold articles out of the sawdust; dust away any particle of the latter and anneal the articles, attaching each one separately to a silver wire (which may be thin), and twist all the articles up into a bundle and tie the ends of wires on to a stick of cane or firewood, allowing the goods to be colored to be spread out slightly.

By this time the ingredients will have boiled up into a froth. You must so arrange that this effect is produced, regulating the heat to produce that effect by the time you are ready.

Now, dip the bunch of goods into the color-pot, thoroughly immersing them, and keep them moving gently for five minutes; then withdraw and pour boiling water from the kettle over them to rinse, holding them at the same time over a pipkin to catch the rinsing.

Now, pour about 1 ounce of boiling water in the color-pot, allow that to froth up, dip the bunch again, move about for four minutes and rinse as before; add 2 ounces of water, dip again for three minutes and rinse; add now 3 ounces of water, let it froth up, dip for two minutes and rinse; add 4 ounces of water and rinse as before; then 5 ounces of water, re dip for one minute and rinse for the last time.

The operation of coloring is now complete. Remove the goods from the wires, and boil them in a pickle of nitric acid and water for a few minutes and afterwards in plain water, throwing away the water when it boils and replacing it with cold. The goods are now ready for frosting.

Have a very fine scratch-brush mounted on the lathe, with an arrangement for dropping size water on the front or top of the brush; set the lathe going and hold the article so that the ends of the wires of the brush just touch it; drive it fast and turn all parts of the work to the action of the revolving brush. It is a good plan to take a stick of hard wood with bristles or wires are made to spring on to the article when the scratch-brush revolves.

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## Correspondence.

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### Chicago Notes.

*To the Editor of the Jewelers' Circular:*

The growling and discontent which were so characteristic of the jewelry trade in the west during the month of June are beginning to disappear, and in their place a feeling of returning hopefulness and confidence is springing up throughout the trade. In general experience July is the dullest month of the year, but with not a few houses there has been quite a marked revival of business during the last two or three weeks. It is now pretty generally allowed, making all due allowances, that the first six months of the year compare favorably in nearly every respect with the same period of last year. On all hands there is the feeling that the trade is now on the eve of a decided revival, though nothing approaching a "boom" is anticipated. Business during July has been healthy all over, though orders, generally speaking, have been light. The volume of mail for July has been about 20 per cent. less than for June, but there were more dollars in the orders. Though there is an increasing demand for novelties every year, the trade in watches, chains and other staples has been much better this summer than in jewelry strictly so called. This may be regarded as a distinctively healthy sign, as novelties in general are not much good towards piling up the dollars. More pieces of goods are now being sold for less money than at any time in the history of the trade. A jobber, however, needs to sell one-fifth more goods to realize the same money that he did some years ago. Thanks to the good effects of the new National Association the prices in watches have been well maintained. Travelers from all parts of the west and northwest report business very quiet, but the general consensus of opinion is that there will be a brisk fall trade. Harvest prospects, should no unforeseen accidents occur, are exceedingly good, and by the middle of August the fall trade should have fully started in. Many jobbers declare that the trade has never been in a better or healthier condition. Business has for some time had pretty much of a hand-to-mouth character, and retailers have been simply giving orders for what will fill their immediate demands. If a jobber were now to receive as large an

order as was quite common about five years ago, he would look well over the ground before supplying it and want to know the reason annexed to it. Never in the history of the trade have retail stocks been so light and buying so cautious as at present. Should present expectations of the crops, therefore, be realized, there is no question that the retailer must buy pretty extensively to meet the demands of increasing prosperity. All indications point to a steady increase of business setting in considerably earlier than last year.

The trade in fine goods and fancy stones is fully up to the mark. There is, in fact, a brisk demand, particularly for the very fine and very expensive classes of goods. The moneyed people who used to make their purchases in New York, Paris or London, are now beginning to bestow a larger portion of their patronage on the home jeweler, who they find keeps just as fine a class of goods as his eastern competitors.

Chicago is rapidly becoming a favorite summer resort, and the numbers of merchants who annually visit the western metropolis tend to give a considerable impetus to trade. The jewelers are reaping the benefits of this influx of visitors in as great a degree as any other class of merchants, and not a few important orders are being filled for pleasure-seeking merchants. This class of business, however, goes almost exclusively to the larger State street stores, and outside of these city trade is quiet.

B. F. Norris has just returned to the city after a prolonged absence. He has been looking over the business field, and feels satisfied that things are in a healthy condition, and that everything points to a brisk fall trade. Like most other jobbers he finds collections rather slow, but with a tendency towards improvement. One of the most sanguine and energetic men in the trade is Samuel Swartchild, formerly of Kearney & Swartchild. He has been doing a good business ever since he opened his new premises at No. 71 Washington street in the beginning of February. His specialty is tools and materials, and his extensive acquaintance and active business capacity are rapidly gaining him a good trade connection. His improved watchmaker's bench, which is both neat and compact, is securing a ready sale throughout the country. Giles, Bro. & Co. report the trade in diamonds keeping up very well. Their diamond cutting department has been a center of attraction for many of the summer visitors to Chicago.

Cogswell & Wallis, who have been doing business for a considerable number of years at No. 146 State street, returned on the 1st of May to their old headquarters at No. 103 State street, which they occupied for five years after the fire. The premises have been elegantly papered and decorated, and with their gilded pillars and attractive show cases form perhaps the lightest, and certainly one of the handsomest and best appointed, jobbers establishments in Chicago. Glickauf & Newhouse have had a somewhat different experience from many others in the trade. They say that June was their best month this year. From the reports of their travelers they anticipate a good fall trade, but feel sure that retailers will buy cautiously at first. The firm speaks highly of its new departure in mainsprings. Each spring is coiled and done up by itself, thus affording an immense amount of convenience to the watchmaker. These mainsprings are in good demand, and the ability of the firm is taxed to its utmost to fill its orders.

Benj. Allen & Co. report that their business in the watchmakers' tools and material department has kept well up all the season, and that their sales have been nearly as great as in the busy times. They make a specialty of supplying a line of goods for the finest watchmaking, and this part of the business is under the charge of John H. Mather, a man of ability and experience. Mr. Allen's travelers are getting ready to go out for the fall business. They will start in the beginning of August and cover every State and Territory from Michigan to Texas. Their impression is that business will show a slight improvement over last fall, but they are not looking for any "booms."

A good many of the large Chicago jobbers are away on vacations just now. Some are in the east, and others have extended their



journeyings as far as Great Britain and the European continent. They are combining business with pleasure, and will shortly return with carefully selected assortments of stock. Several who have already returned from the east declare that things are even duller there than in Chicago, and such reports afford a sort of grim satisfaction and comfort to our local grumblers. In the opinion of the most conservative jobbers the prospects for a lively fall trade are considerably better than they were last year. The reports of the crops from the west and northwest are so encouraging that there seems no room to doubt that a rushing trade will be done this fall in the agricultural districts, but, to quote a long-headed Chicago jobber, "No boom need be expected till about 1890. W. A. B.

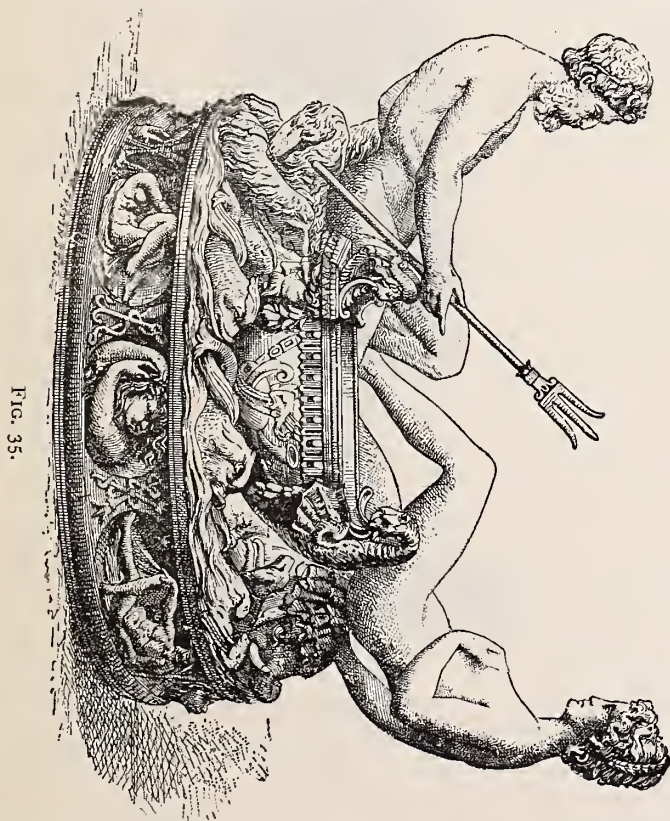
## The History of Goldsmithing.

*Continued from page 185.*

### CHAPTER VI.

*Renaissance (Sixteenth Century).*

WE HAVE, in Nos. 4, 5 and 6 of THE JEWELERS' CIRCULAR, described at large the Renaissance and the lives of its founders; we therefore deem it unnecessary to go over the same grounds again, and merely append two cuts of Cellini's work: his famous gold salt cellar, which he made for Francis I. of France; it can at present be seen in the Cabinet of Antiquities at Vienna. Salt cellars were at his time still in great esteem upon the tables of the rich, and Cellini essayed to make a *chef d'œuvre* of its kind. We give a picture in fig. 35, and borrow its description from his own writings:



"Two principal figures, representing the Earth and the Sea, embodied in Berecynthia and Neptune, are seated, facing each other, the former upon a flowery hillock, the latter amid floating weeds; between them a basin destined to hold the salt; the whole rests upon a basement decorated by various figures in relief."

As far as ingenuity of composition, delicacy of chasing, gracefulness and good taste of the details are concerned, this piece, beside the value of the metal of which it is wrought, most certainly deserves the high reputation which it enjoys.

It has elsewhere been stated that Cellini excelled particularly in the thoroughly Italian art of fashioning gems and crystals into cups,

vessels and other objects both rare and precious. The Cabinet of Gems of the Gallery of Florence possessed for many years a most charming cup, of lapis lazuli, with three handles, enameled and ornamented with diamonds; beside this, the family of the Medicis preserve the enameled lid of a cup of rock crystal, said to have been made by him. At Munich can be seen a cup of a very bizarre shape, formed of the horn of a rhinoceros, the rich mounting of which, composed of figures and ornaments of gold enameled, is supposed to have been the work of the great Florentine goldsmith. The Louvre of Paris also possessed once a beautiful water pitcher, of onyx, mounted in above style, made by Cellini; it is at present to be seen in the collection of Mr. Beresford Hope, into whose possession it came in some unknown manner.

The next cut, fig. 36, is a silver water pitcher made by him. It is well known, having been copied in all sorts of metals, brass, tin, German silver, etc.



FIG. 36.

It might be said that Benvenuto Cellini was the last of the great goldsmiths of Italy who wrought with their own hands. Several eminent painters of the sixteenth century, for instance, Perino del Vaga and Polidoro de Caravagio, furnished designs and models, without themselves putting hands to the work. From the death of Cellini forward the goldsmithing of Italy began to decline.

The rest of Europe, although it could not keep up with the rapid strides made by Italy, more or less adopted the fashion introduced by it; local circumstances and the particular genius of the people adopting it modified and altered it to conform with its tastes and proclivities.

Spain was one of the first to follow the example of Italy, which is easily explained by the fact that partly by reason of affinity and the business relations of the two people, and partly because Spain, barely liberated from the dominion of the Moors, had not had the time to create, so to say, a national art.

Goldsmithing however had, in the second half of the mediæval age, been practiced quite successfully, and had left traces. Due to the

turbulations of the times, the works have been lost, although history has preserved us their names; we find one Rodrigo Fernai, who flourished at Oviedo in the fourteenth century, and several others in the fifteenth, none the less celebrated, for instance, Nadar Irro, Pizarro, and Juan de Segovia, Jacobo and Juan and Jean de Castellon, de Valencia. It is useless to repeat a long list of simple names, there is one, however, belonging to a family of *plateros* (silversmiths), established at first in the city of Leon, who furnished three generations of eminent silversmiths, from the end of the fifteenth to the first few years of the seventeenth century, who have left quite a number of their works behind.

The first one known to us, Henry de Arfé, was, it is said, of German origin, and at the beginning of the sixteenth century he became very celebrated. This was at the time when, by the discoveries, the New World was drained of its treasures with incredible avidity by the conqueror, and inundated Spain with precious metals. Numberless largesses were bestowed on the church, and silver had everywhere become so common that in many cases it was used in place of stone in the decoration of the holy places. Thus we see that Henry de Arfé was ordered to construct in the cathedral of Leon, for storing the Holy Sacrament, a tabernacle, entirely of silver, six feet high.

This piece of work was so beautiful that the city of Toledo, in 1515, resolved to have one like it. Arfé was therefore called to this city, and six hundred and sixty-one marcs of silver were turned over to him for constructing the custodia still preserved there. He next made two others of the same kind: one at Cordova, and the other for the monastery of Sahagun. The handsome cross of the cathedral of Leon, fig 37, is also said to have been wrought by him.



FIG. 37.

Henry de Arfé had a son by the name of Antonio, who also became an eminent goldsmith, and one grandson, Juan de Arfé y Villafañe, who appears to have surpassed both of them in skill.

Juan de Arfé was born in 1535, and when barely in his twenty-fifth year, he was ordered to make a custodia for the cathedral of Avila. He next made two others, one for the cathedral of Burgos, and the

other for the cathedral of Sevilla, which is still in existence, and fully deserves the celebrity of being considered a masterwork of the Spanish Renaissance. In short, all the renowned churches of Spain were proud to possess a piece made by him. He was for some time head of the mint at Segovia, but he soon quitted this post in order to devote himself to the execution of a large command given him by Philipp II., of Spain, toward 1597; he was ordered to construct for the Escorial, sixty-four busts of natural size, destined for the reception of relics.

Arfé, who had no sons, associated himself in the last few years of his life with his son-in-law, Lessres Fernandez del Moral. In 1599 we read of him as having received from Philipp III. the large sum of four thousand and fifty-four ducats, as payment for a fountain and a water pitcher, of brass, ornamented with enamel. It is not definitely known when he died, but his death is generally placed in the next following year. Similar to that of Benvenuto Cellini, Arfé has left a very valuable book, which has run through several editions, treating of the principles of the goldsmiths' art.



FIG. 38.

Portugal also had, during the 15th and 16th centuries, made very large advances in the art of goldsmithing, and several specimens have come down to us.

The cathedral of Evora still owns a very beautiful monstrance, which once belonged to the celebrated Dom Henriquez, who from bishop became king, about the end of the 15th century. A handsome processional cross, dated 1490, can also be seen in the private collection of the Academia de los Belles Artes, in Lisbon, which also possesses several paxes of excellent workmanship. But the most remarkable pieces are certainly those to be found in the collection of Dom Luis, the king of Portugal, to wit: A superb basin, representing in high relief the triumph of Alexander, several plates, and an excellent water pitcher. Beside this, a monstrance belonging at present to the monastery of Belem, which gives us a fair idea of the development of goldsmithing in Portugal in the 16th century.

The monstrance of Belem, which bears the date of 1506, is an

interesting specimen considered from several standpoints. A clause in the testament of King Emmanuel, names the author and acquaints us with the circumstances under which it was made. The gold from which it is wrought, was obtained from the tributes paid to the king by several heathen princes of eastern Africa; and the pious monarch thought that it should in some manner be sanctified. He therefore resolved to convert this gold in a superb object of religious goldsmithing, he entrusted with it a goldsmith of the greatest merit, one Gil Vicente. The work delivered by him was of so excellent a character that he is fully entitled to the renown of being the foremost goldsmith of his time. This beautiful monstrosity was exhibited at the Universal Exposition of Paris, in 1867. We give the cut in fig. 38, by which can be seen that its shape still conforms to the gothic style, possessing all its elegance and graceful airiness. The twelve small enameled figures represent the twelve apostles kneeling around the Holy Sacrament; they are most skillfully worked, and entirely appropriate to the whole style of the composition.

The chapel of the palace of Ajuda owns another specimen of workmanship of the 16th century, a very beautiful chalice, and our account would be incomplete if we were not to mention it. The cup is ornamented with the figures of the twelve apostles, and the foot represents various scenes from the Passion of Our Lord.

### 2. *The Renaissance in France.*

We have endeavored to describe the dawn of the Renaissance in Italy; we followed its development and noticed its gradual diffusion over southern Europe. We will next turn our attention to France and see how it was received there.

Unhappily, the 16th century opened very darkly for our industry in this country. In place of encouragement, it had to contend with naught but obstacles, general poverty of the people, and sumptuary laws. Distant wars, foolishly undertaken, had literally drained France of all its resources, and so great was the scarcity of the precious metals during the first years of the reign of Louis XII., that he considered it to be his duty to issue the edict of 1506, prohibiting the goldsmiths to manufacture without his special sanction any silver kitchen vessels, basins, wine flagons, etc., and limited to the maximum of three marks the weight of cups, pots, salt cellars, spoons and other tableware made by them for sale. Goldsmith work for ecclesiastical purposes alone was exempt. We have had occasion heretofore to speak of sumptuary laws and their futility, and this one fared no better than its predecessors. It was happily rendered ineffective by the opportune discovery of America, from whence the rapacious Spanish taskmasters began to ship vast quantities of the precious metals, and soon after the equilibrium of these metals was restored in France, so that towards 1510 goldsmithing again attained its wonted proportions.

From henceforward, France strove for the leadership in matters of arts and *luxure*, and the seed sown by Italy fell upon a fruitful soil. The Cardinal d'Amboise, the rich and fastidious minister of Louis XII., whose mausoleum is still admired in the cathedral of Rouen, left, it is said, at the time of his death, ecclesiastical utensils of goldsmithing estimated at two millions dollars; a magnificent set of tableware, silver, partly gilt, and various pieces of goldsmiths' work, one of which alone, a cup, was valued at two hundred thousand dollars.

As for Louis XII. and his spouse, Anna of Bretagne, their great wealth of silver dishes can best be judged from an inventory drawn up in 1595, and preserved in the French Archives. At his entrance into Tours, five years before this, the city tendered him a gold medal with his portrait, executed according to a model of the celebrated sculptor, Michael Colombe or Coulomb.

The goldsmith of Louis XII. was named Henry, and of the queen, Arnoul du Viviers.

But the general adoption of the Renaissance style in France commences to date only with the reign of Francis I., and the arrival of Benvenuto Cellini equally had an influence upon it. The former, ever jealous for the honor of France, saw with envy the

great strides made by Italy, and by dint of flattery and princely payments, he soon surrounded himself with the choicest spirits of Italy: Leonardo da Vinci, Le Rosso, etc., and Cellini.

Fig. 39 represents a handsome shrine presented by Cardinal de Bourbon to the church of St. Denis, of which he had been appointed first abbot in 1520. This shrine was intended to hold the sacred remains of the king, St. Louis, the illustrious ancestor of the giver. If we are to believe the superstitious chronicler, there was a sort of ill-luck attached to the sainted remains of St. Louis. Philipp the Handsome, as we saw at the proper time, had a handsome gold shrine made for the corpse of his father; next, the historian, Don Doublet, records that Charles V., in 1368, gave sixteen thousand and forty gold francs for the same purpose, although it is difficult at this day to say what became of all this money (unless it shared the fate of the sums voted in our modern times); because twenty-five years afterwards, the unlucky Charles VI., who had providentially escaped

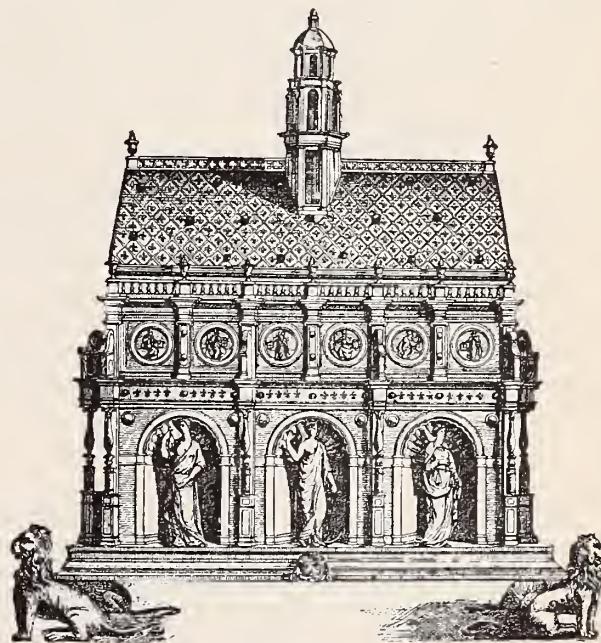


FIG. 39.

the danger of being roasted alive at a masked ball, voted, in gratitude, two hundred and fifty-two marks of gold for making a shrine for the remains of St. Louis, and a sum of one thousand francs for a tabernacle to cover it; this time the shrine was really made, but soon afterward, the English seized upon France, and the wealth of the churches came very opportune to them; everything they contained was coined into money. Finally, the shrine of the Cardinal de Bourbon, the making of which had accidentally been retarded, shared the same fate of being destroyed even before it was used. It is, as will be seen, constructed according to the purest style of the Renaissance. All the historians of the abbey have left their descriptions, and Felibien added a large drawing, from which we copy the accompanying cut. At the two ends are the figures of St. Louis and the Cardinal; each long side contains three niches in which stand virtues of different attributes. The six medallions of the second story contain the busts of various peers of France; the roof is studded with fleur-de-lys, and from its center rises a bell-tower. The edifice stood upon four sitting lions.

(To be Continued.)

### The Metallic and Mineral Wealth of Brazil.

THE MINERAL products of Brazil are world-renowned; they consist principally in diamonds, other jewels and gold. The most celebrated diamonds are found in the two provinces, Minas Geraes and Matto Grosso, which possess the same geological formations as the other known gold countries, and, at the same time, it is remarkable that the best diamonds come from the unhealthiest dis-

tricts; it has been calculated that this industry has cost 100,000 human lives.

The yield of gold is declining, having decreased to one-fourth of the quantity mined during the past century; the annual yield of diamonds was estimated at from 12,000 to 15,000 oitavas (at  $\frac{1}{8}$  ounce). About 6,000 oitavas came from Sta. Isabel in Bahia, where these jewels are called "Diamonds from Cincora;" they are thus named for the diocese where they were discovered in 1544. About 4,000 oitavas were found in Rio San Antonio, Rio de Peixe, Riberao do Inferno, Rio de Jequitinhonha, de Itambé, Rio Manso, in the eastern tributaries of the Rio das Velhas, Rio de Paraná, and in the Rio Sipo. The rest come from the provinces Goyaz, Cuaba, etc., but principally from the district Rio de Bagage, where the celebrated "Star of the South" was found. The diamonds of Cincora are the least valuable, and the best come from the Rio de Jequitinhonha, Riberao do Inferno and Rio Sipo, although very few are found in the last mentioned place; those from Rio Antonio, de Peixe and Itambé are also very beautiful, although very small. Those from the Province Matto Grosso are small but of the purest water, and even in their raw state they are distinguished by a luster excelling all other diamonds from Brazil.

Apart from gold and jewels, of which emeralds, euclases, sapphires, rubies, topazes, beryls, etc., are found, Brazil is very wealthy in the other useful metals. Quicksilver is as plentiful in the Province Paraná as in the largest European mines. Copper is found in large quantities in the Provinces Matto Grosso, Minas Geraes, Bahia, Maranhao, Ceará, and principally in Rio Grande do Sul. Manganese, lead and excellent iron pertain to the most common products of Brazil, to which we may also add tin, antimony, bismuth and arsenic.

#### Color in Electro-Gilding.

A CONTEMPORARY says that it is of the greatest importance to possess a knowledge of the art of regulating the current and general working of hot electro-gilding liquids, so as to make the process useful in producing not only deposits of gold, but those of any desired color. As a general rule, it will be found best to obtain any excessive color by additions to the bath, and not by attempting to work it up to this by the current or temperature. Thus, to obtain red or green gold of decided color it will be necessary to make additions of acetate of copper and nitrate of silver. But if it is not required to perpetually gild in this color, or at least until all the added metal is worked off, the bath will be spoiled for ordinary gilding. It is, therefore, always wiser, when excessive color is required, to either make up a separate solution for that particular color, or to make the main bath up in that manner if the work is always to be carried on.

To make up a bath for red gilding, grind a little of the acetate of copper (crystallized) to powder, dissolve in water and add to the bath, with stirring, every evening as much as may be required. In a new bath, where there will be no troublesome sediment to disturb, the addition may be made at any time and the quantity augmented if the color is not sufficiently deep. It must not be forgotten, however, that gold so colored is not so fine as yellow gold. Attention should be given to some of the directions which follow, so that the battery power and temperature may be regulated to assist in the production of deep color, it being important that too many foreign substances be avoided in a good bath.

To obtain green and white gilding, the addition is a solution of the crystallized nitrate of silver. This is added in the same way as the copper. A very little (a few drops) will generally produce green gilding, and a little more, white.

To deposit a gold of pink appearance is a more troublesome matter. The surface is first coated yellow and then thinly red, and over this is produced an exceedingly thin coat of silver in a silvering solution. Such surfaces are very lasting and should be burnished.

A good cyanide gilding solution should be of sufficient strength to

allow of its producing from a pale and poor looking deposit to a deep and nearly red rich gold. For such purposes the solution may even contain as much as  $1\frac{1}{2}$  ounce of gold per gallon, but over this it is not advisable to go for the reason that the paler tints are not readily obtainable. The poorer solutions will produce fairly pleasing tints when the current is strong and the temperature high, but the darker shades are very apt to have a dingy appearance, instead of that mellow and clear surface which is the chief aim of the practiced gilder.

A dead gilding will be produced by the addition of a little of the fulminate of gold in solution to the bath immediately before gilding, or dip the articles (brass and copper) before gilding in a mixture of sulphuric and nitric acid.

#### Wellington's Watches.

AN EXCHANGE says that the Duke of Wellington was extremely fond of watches, and at all times had fully half a dozen ticking their liveliest lying around him. Fearing that some ill might befall those just under his eye, orders were given that whenever he traveled to have as many more stored away in a portmanteau made to fit his carriage. One timepiece was, above all others, his acknowledged favorite; it was of old fashioned English construction, and had once been the property of Tippoo Sahib. Another of the Duke's treasures had a strange history. Napoleon had ordered it of Breguet for the fob of his brother Joseph, and, as an extra courtesy, directed a miniature map of Spain to be wrought in niello on one side and the imperial and royal arms on the other. Just as this lovely gift was finished, Joseph was driven out of his kingdom by the Duke, and the Emperor, for reasons best known to himself, refused to take or pay for the costly bauble. At the peace it was purchased from Breguet and presented by Sir E. Paget to the Duke of Wellington. Another watch owned by the Duke was made for Marshal Junot, and a great horological curiosity it is. There has never been known more than two others like it. They are constructed to mark both lunar and weekly movements.

The great Duke gave preference to certain *montres de touche*—of which he had several—a contrivance of Breguet's having sundry studs or knobs by which one could feel what hour it was, and this merely by what seemed "just fumbling in his pocket."

#### The French and their Clocks.

WATCHMAKERS in dull quarters of Paris derive good fixed incomes from being employed to attend weekly to the chimney clocks of prosperous bourgeois. Punctuality is not a French virtue, and half an hour's law is given at private dinner parties to those invited. At public dinners the guests sit down at about an hour after the time specified in the cards of invitation. Railway clocks on the façades of terminuses are five minutes in advance of those inside. An appointment is hardly ever punctually kept. Gambetta was one of the rare Frenchmen who are always to the minute. But his friend, M. Spuller, sometimes gives himself a couple of hours' margin. M. Clemenceau piques himself on the observance of social duties, and is, in this respect, a pattern Radical; but when he makes an appointment he is not vexed if the person he is to meet is half an hour late. M. Barthelemy St. Hilaire and De Lesseps keep time by marine watches purchased abroad. I know a deputy who piques himself on his observance of social duties. One day I had an appointment with him for 1 o'clock. He came after 2. When I ventured to reproach him with being so late his answer was: "I am very sorry you had to wait so long, but why did you come so early?" The way in France is for each of the parties who have made a rendezvous—unless as duellists—to give the other half an hour's margin, which being taken on both sides makes in all an hour. This system of addition is analagous to what a Californian said of a

big tree. It grew so high that it took two men and a boy to see the top.

The Prussians have been branded since 1870-'71 with the name of Voleurs de Pendules. They were especially tempted by the pinchbeck looking galvano-plastic articles which are usually protected from the air by glass shades. Timepieces of a severe style, and in real bronze, were not so often looted. Prince Bismarck took a fancy to a dark bronze clock which stood in his sitting room at Versailles on an elevated bracket. It represented the fall of Lucifer. The defeated archangel was more Byronic than Miltonic. When negotiating the preliminaries of peace, M. Thiers was placed at the table opposite this timepiece. He was nervous and fatigued, and, though not habitually superstitious, felt very uncomfortable whenever his eye caught the sardonic visage of Lucifer. Bismarck secretly noticed his discomfort and enjoyed it. At last M. Thiers avowed that he could no longer endure the irritation which the sinister looking figure caused him, and asked to be allowed to change places with the Chancellor. He would have been glad if Lucifer had been taken out of the room. The proprietress of the house was asked by Bismarck to let him have the clock at a valuation. He wished to keep it as a souvenir of the event which took place under its shadow. It was reluctantly sold to him. In speaking of Thiers' nervous fear that the fallen archangel on the timepiece augured no good to France, the German Chancellor said: "He reminded me of what the Princess Palatine said of the Duc d'Orleans (the Regent), her son—'Il ne craint pas Dieu, mais il a une peur blanche du diable.'" (He does not fear God, but has a deathly fear of the devil).—*London Daily News*.

#### To Remove Foreign Bodies From the Eye.

BEFORE resorting to any metallic instrument for this purpose, Dr. C. D. Agnew (*American Practitioner*, May, 1884), would advise you to use an instrument made in the following manner: Take a splinter of soft wood, pine or cedar, and whittle it into the shape of a probe, making it about the length of an ordinary dressing probe. Then take a small, loose flock of cotton, and, laying it upon your forefinger, place the pointed end of the stick in the center of it. Then turn the flock of cotton over the end of the stick, winding it round and round so as to make it adhere firmly. If you will look at the end of such a probe with a two inch lens you will see that it is quite rough, the fibers of cotton making a file-like extremity, in the midst of which are little interstices. As the material is soft it will do no harm to the cornea when brushed over its surface.

When ready to remove the foreign body, have the patient rest his head against your chest, draw the upper lid up with the forefinger of your left hand, and press the lower lid down with the middle finger, and then delicately sweep the surface in which the foreign body is embedded with the end of the cotton probe. When the foreign body is lodged in the center of the cornea, it is most important not to break up the external elastic lamina; for if you do opacity may follow, and the slightest opacity in the center of the cornea will cause a serious diminution in the sharpness of vision.

#### Novel Plan for Producing Diamonds.

TO TRANSMUTE the baser form of carbon into the priceless diamond has been the dream of alchemists for ages. The latest enthusiast in this field has gone to the trouble of erecting quite an extensive apparatus, by which, with the help of a force of nature, in the manifestation of a flash of lightning, he hopes to attain some tangible result. The experimenter, who is a correspondent of *English Mechanics*, described his device as follows in a recent issue of that publication: "If a source of heat could be obtained of sufficient intensity to liquefy carbon or charcoal," he asks, "would it on cooling assume the same crystallized form as glass? The ques-

tion is, how can a heat be obtained some thousand times greater than can be produced by any quantity of galvanic cells or dynamo machines? I propose to utilize a flash of lightning in the following manner: I have erected in my garden a long iron conductor attached to a wooden spar firmly fixed in the ground, and three wide ropes as stays. This is about forty feet high and the conductor extends twenty feet above it. On the top of the conductor is fixed a copper ball eight inches in diameter; the rod is attached to the spar by iron clasps insulated with gutta percha. The rod is bent about two feet from the ground, leading into a wooden box containing a tube of biscuit earthenware, and about one inch inside diameter and one foot long. The end of the rod is connected to a piece of copper wire  $\frac{1}{2}$  inch thick, and passes about one inch into the end of the tubes. The other end has a rod connected the same way, and passes down into the earth. The tube is filled with charcoal or any other carbon. Mr. Swan (of electric light celebrity) suggested lamp black; but this or any other conducting material could be inserted. An earthenware tube I consider preferable to glass, for if an explosion took place, which probably it would, the effects on the carbon could be better seen than among broken glass. I have never yet been fortunate enough to have the conductor struck, as thunder storms are not very frequent in this neighborhood."

This man should go into partnership with Wiggins, the manufacturer of weather to order. One could produce the thunder and lightning and the other manufacture diamonds out of them.

#### Ancient Egyptian Mechanical Methods.

PETRIE, who is the author of a treatise on ancient metrology, has lately turned his attention to ancient Egyptian processes. Though much labor has been bestowed on the literary remains of Egypt and the description of monuments, little attention has been given to finding out the tools and methods by which their results were reached. The first conclusion to which Mr. Petrie comes is that stone cutting was performed by means of graving points far harder than the material to be cut. These points were bedded in a basis of bronze; and in boring, the cutting action was not by grinding with a powder, as in a lapidary's wheel, but by graving with a fixed point as in a planing machine. From discovering spiral grooves in diorite and granite, at least  $\frac{1}{100}$  of an inch in depth, the author supposes that an instrument was used of sufficient hardness to penetrate the material that far at a single turn. In this, however, he was corrected by Mr. Evans. The simplest tool used was a straight bronze saw set with jewels; but there is proof of one circular saw which must have been six and one-half inches in diameter. For hollowing the insides of stone objects, the inventive genius of the fourth dynasty exactly anticipated modern devices by adopting tubular drills varying from  $\frac{3}{16}$  of an inch in diameter and  $\frac{1}{16}$  of an inch in thickness, to eighteen inches in diameter. Other drills, not tubular, were used for small holes, one measuring  $1\frac{1}{16}$  inches long and  $\frac{8}{100}$  of an inch in diameter. But this is surpassed by the Uaupes of South America, who drill holes in rock crystal by the rotation of a pointed leaf shoot of plantain, worked with sand and water. The writer of this note has seen in Porto Rico stone beads of the hardest material two inches long, bored longitudinally with an orifice  $\frac{1}{8}$  of an inch in diameter. The Egyptians understood rotating both the tool and the work. For the finishing of vases a hook tool must have been used; but the early Egyptians were familiar not only with lathes and jewel turning tools, but with mechanical tool rests, and sweeping regular arcs in cutting. In addition to the tools mentioned, are to be noticed those for dressing out drilled cores, stone hammering and smoothing, saws with curved blades, mallets, chisels, adzes and bow drills. For marking and indicating the plane of the stone, red ochre paint was used in a variety of ways, well studied out by Mr. Petrie. Rock excavation, both for saving the stone and for the creation of vaults and chambers, was altogether an affair of drilling. Granite boulders were utilized in the pyramids, but the best stones were taken from quarries. The method of handling these immense masses is not known. Mr. Petrie concludes with a sensible remark upon the oft alleged inhumanity of the pyramid and temple builders. To require a man every six years to serve upon the public works, during the season when he could do nothing else, would certainly not be a great hardship.—*Journal Anthropological Institute*.

## Foreign Gossip.

**DIVISION OF TIME.**—The *Schw. Uhrm. Ztg.* after comparing the present different kinds of time divisions, to wit: international, decimal and local time, find the first one will be the prevailing style, and that it is simply a question of time when it shall be introduced into common use. By international time we understand the 24 hour division.

**DUTY ON WATCHES.**—The committee on revenue of the German Reichstag fixed on the following import duties: Watches in gold case, 3 marks; in silver case, either gilt, partly gilt, gold plated or partly gold plated, or movements without case, 1½ marks; watches in cases of other metals, ½ mark; gold cases without movement 1½ marks; other cases without movement, ½ mark.

**COMPETITIVE ESSAYS.**—The society for promoting trades and arts in Prussia has for 1885 and 1886 published various questions to be solved by competition; among them the following, to receive a prize of 1,000 marks: To specify the different methods employed for hardening metals; to indicate their influences, and to state their practicability and their disadvantages. The answer to embrace both metals and alloys.

**WATCHMAKERS' CLUB IN LONDON.**—We see that there is a large German Watchmakers' Club in London, England, existing for the past ten years, and the report says that it is in a very thriving condition. German watchmakers of note and celebrity belong to it, and deliver weekly lectures. Herrman Horrmann is the presiding officer, Ludw. Carl the corresponding secretary. The club meets every Thursday evening, at 114 Long-Acre, W. C. We extend to it our hearty congratulation for its success.

**EXHIBITION OF PATENTED INVENTIONS IN FRANCE IN 1885.**—For many years France was the only market for inventions of all kinds. In Paris, inventors from all countries first sought to obtain patents for their inventions, and here they were also wont to find the necessary capital for a start, which from hence made their way into foreign countries. This condition of affairs is gradually changing, and the market for patents is going over the border into Germany, or across the channel into England. This may be due to the fact that the French government is at present exhibiting little interest in matters pertaining to the property of the industries, and again, perhaps, because the French industrial class finds much competition. Recently the French have opened their eyes to the true state of affairs, and the Inventors' Union, existing since 1849, is offering vigorous assistance to inventors, both native and foreign. The Union has concluded to hold an exposition of inventions, made since 1870, in the Palais de l'Industrie, to commence on July 1, 1885, and end November 31. Such an exposition was held in 1881, in Germany, and England is on the eve of holding a similar one.

**OSTENTATION OF SPANIARDS.**—The *Exporteur* says, when speaking of the export of jewels and watches to Spain, that the passion of the Spaniards to dress and wear jewelry, creates a large market for gold and silver jewelry, genuine, low-grade, and false. Pforzheim sends the cheaper, Gmünd the better class of goods. The higher classes of Spain are great lovers of fine jewels. The gentlemen wear precious diamond rings, and the ladies adorn themselves with the costliest of the goldsmiths' art. The present import duty is, per hektogram (100 grams=3 ounces, 4 dwts. 7.2 grains):

Gold ornaments, with pearls and jewels.....	25	francs.
Silver ornaments.....	3.50	"
Gold, silver, platinum in vases, utensils, and ecclesiastical utensils.....	2 60	"
Watch in gold case.....	7.50	"
Watch in silver case.....	1.80	"
Clocks of all kinds.....	1.10	"

An important business is transacted in watches, principally those of French Switzerland; larger cities also have depots of clocks, both French and Black Forest.

—The Observatory Bureau for timing watches at Chaux-de-Fonds, which was organized last year, has added another severe test for the watches and pocket chronometers submitted to it. The timepiece, after having been subjected to the general run of observatory tests, are for a certain length of time worn by the different members of the institution, to try their "pocket rates." The members are requested to hang them up, lay them flat, and in all other positions, over night, and next day they come together at a certain hour to compare rates. This "pocket rate" is, after all, the true test of a timepiece.

**OPTIC TELEGRAPHY.**—The almost forgotten idea of telegraphing with light appears to have received new life by the development of electric light. The French periodical *l'Electricité* says that experiments to telegraph at night by using an electrically lit balloon were lately instituted. The latter was for this purpose filled with hydrogen and carried a Swan lamp in its interior. The conduits passed up from and down to the ground with the rope by which the balloon was anchored. When the lamp was set into activity the balloon was brightly illumined, and different signs could be given by connecting or disconnecting the current. It is plain that such an apparatus can become very useful in times of war.

**MUCH LIGHT.**—The French architect M. J. Bourdais, the constructor of the Trocadero, intends to rival the brightness of the sun by constructing a central source of light, of 2,000,000, say, two millions carcel burners, locating this immense power of light upon a tower 300 meters (387 yards) high, to be built on the Esplanade des Invalides, Paris. A number of electric lamps, which together radiate this gigantic luminosity, illuminating the entire city of Paris, the Bois de Boulogne, Neuilly, and Levallois as far as the Seine, will be installed upon the point of the tower. We here in America have had but indifferent experience with these central light stations, having had to contend with the great contrast between light and shadow; for instance, we have full light in streets running toward these luminous sources, and darkness in the cross streets. But this plan of Bourdais, is to our mind a monstrosity, and will founder in its very construction. This new Babylonian tower, which is to be higher than any other structure in the world, and carry at its point a luminosity of two millions carcel burners, or sixteen million candle lights, is a sheer impossibility not alone to the eyes of the layman, but also to the technical man.

**POWER OF TELESCOPES.**—The last total moon eclipse of Northern Europe has been used by European astronomers for all kinds of scientific experiments. The following is one of the most interesting: The readers of *THE JEWELERS' CIRCULAR* know that there are two kinds of telescopes: lens and mirror; in the former case the light, passing through the glass lens, is *broken*, whence the name *REFRACTOR*, in the second the ray of the light falling upon the mirror is reflected, hence such an instrument is called a *REFLECTOR*. The optical advantages of these two kinds of instruments has often been a matter of contention, wherefore the astronomer Pritchard, of the Observatory at Oxford, seized the opportunity of said last eclipse, to decide the question by direct observation. This observatory possesses three instruments of the same size: One 12¼ inch refractor by Grubb, and two reflectors, one with silvered glass mirror, the other one with a metallic mirror, each of 13 inches diameter. These three instruments were during the eclipse directed to the feeblest visible star in the vicinity of the moon, and it was found that four feeble stars of the twelfth magnitude were visible in the refractor, but only one of them in the metallic mirror reflector, and none in the glass mirror. He then employed a photometer, and found that the luminous strength of the refractor was about twice as great as that of the metal reflector, and 1½ times as great as that of the glass reflector. Professor Pritchard therefore comes to the conclusion that the former kind is best adapted for celestial observations.

## Workshop Notes.

**PICKLE.**—A good pickle is prepared by mixing one-eighth of one ounce of sulphuric acid with one ounce of rain water.

**CLEANING GOLD TARNISHED IN SOLDERING.**—Gold tarnished in soldering is usually cleaned in dilute sulphuric acid. The pickle is made in about the proportion of one ounce of acid to one ounce of rain water.

—Hardening in petroleum of small articles of steel can be recommended. The tempering is done in the ordinary way; the articles remain white and do not warp. Be careful, however, not to go near the fire with the oil.

**BURNISHING POWDER.**—A good burnishing powder is prepared from  $\frac{1}{2}$  pound white chalk, 2 ounces pipe clay, 2 ounces white lead,  $\frac{1}{2}$  ounce magnesia carbonate, and colored with the same quantity of jewelers' rouge. It is said to be unrivaled for cleansing silver.

**TO REFINE SWEEPINGS**—To 8 ounces of the dirt which has been washed and burnt, add salt, 4 ounces; pearl-ash, 4 ounces; red tartar, 1 ounce; saltpeter,  $\frac{1}{2}$  ounce; mix thoroughly in a mortar, melt in a crucible, and dissolve out the precious metals in a but-ton.

**BENZINE.**—Dirty benzine may be again rendered fit for use by filtering through animal charcoal. One of our friends stops the end of an ordinary pint glass funnel with paper and presses therein calcined bone dust till it is about three parts full. On the top of this is poured the benzine to be filtered.

**TO BLUE SCREWS EVENLY.**—Take an old watch barrel and drill as many holes into its head as you desire to blue screws at a time. Fill it about one-fourth full of brass or iron filings, put in the head, and then fit a wire long enough to bend over for a handle into the arbor holes—head of barrel upward. Brighten the heads of your screws, set them point downward into the holes already drilled, and expose the bottom of the barrel to your lamp, until the screws assume the color you wish.

**OIL SINKS.**—With regard to oil sinks, the views of watchmakers differ. One is in favor of large, the other of small sinks. Needless large, flat oil sinks, as well as projecting bouchons, both labor under disadvantages: the former of permitting to escape, and the latter of attracting the oil from the spots where it is wanted. With large sinks the oil spreads very easily and becomes contaminated with dust and fibers, while projecting bouchons prevent the oil from again returning to the pivots.

**BARREL ARBOR.**—In the absence of a suitable tap or screw plate, when turning in a Swiss barrel arbor, if the collet is good it may be used as a plate. Soften the collet and file two slight passages across the threads with a fine three-cornered file; screw a piece of brass wire through the collet, so as to free the threads from burr; then re-harden the collet and cut the screw on the arbor with it. A pair of pliers with faces curved to suit the collet are used to hold it. In an emergency the old arbor may be prepared for use as a tap if the old collet is not available.

**HORIZONTAL ESCAPEMENT.**—The horizontal or cylinder escapement possesses one preferable property which renders it peculiarly adaptable for going-barrel watches, to wit: that it is not so much affected by any change in the motive power of the watch as any other escapement, the frictional rest of the tooth on the cylinder exercising a compensating power over the extent of the vibrations, so that any additions to the motive force is attended with additional friction on the cylinder, while the balance is performing the supplementary arcs of vibration, and so retarding it and compensating for the additional force of the impulses. This isochronizing power was what recommended it especially to the Swiss, who saw the possibility of suppressing the fusee, of which they had never been in favor, and which, in fact, they never thoroughly understood.

**NEW TEST FOR SILVER.**—A German exchange is rather lavish with its adjectives, and says that the following is a "simple, sure and excellent silver test solution." Dissolve potassium bichromate in water, and add a little sulphuric acid, which gives the solution a blood-red appearance. Grind the object with the stone and apply the solution; if silver, a red sediment will remain, but if base metal, the coated parts will disappear or turn yellow. The testing stone must be washed off after using.

**ANILINE BRONZING FLUID.**—A bronzing fluid which is said to be very brilliant, and applicable to all metals, as well as to other substances, is prepared as follows: Take 10 parts of aniline red and 5 parts of aniline purple, and dissolve in 100 parts of 95 per cent. alcohol, accelerating the solution by placing the vessel in a sand or water bath. Solution having been effected, add 5 parts of benzoic acid, and boil for from 5 to 10 minutes, until the greenish color of the mixture has been converted into a fine light-colored bronze, which is applied with a brush and dries easily.

**NON-CORROSIVE SOLDERING FLUID.**—The different fluids bearing this pompous name all labor only under one disadvantage, viz.: that they corrode the article for which they are used. We cannot, however, vouch for the fact whether the following will do the same thing: Small grains of zinc are thrown into muriatic acid until this latter is saturated, to be recognized by the cessation of the ebullition; the zinc also being added after this point remains undissolved; add about one-third the volume of spirits of ammonia, and dilute with a like quantity of rain water. The solution of the zinc is materially accelerated by slightly heating the acid. This fluid causes no rust on iron or steel.

**DUPLEX ESCAPE WHEEL.**—The duplex escapement has but few parts; the scape wheel, pallet and ruby roller may be said to form the escapement. The scape wheel, having two sets of teeth, is difficult to make, and, as it is of the utmost importance that it should be perfect in all its parts, special tools and skill are required for its production, and chronometer and duplex wheel cutting has long been a distinct branch of watch making. This wheel should be made of the very best and hardest brass; the long or resting teeth are sometimes cut with radial faces, and sometimes tapering to a point back and front from the rim of the wheel. The point of the face of the impulse teeth should be exactly between two of the resting teeth, and those teeth should stand upward out of the plane of the wheel. They are in the form of a triangle, with the faces undercut at such an angle that when the points are at the commencement of the arc of intersection with the pallet they are parallel to its face; if they are radial they will fall on the point of the pallet instead of its face, and cut very rapidly. The wheel should be as large as possible, just freeing the arbor of the fourth wheel pinion.

**FITTING THE HANDS.**—If the body of the canon pinion will not bear turning in fitting it to the hour wheel, the hour wheel should be opened in the mandrel, as it cannot be kept true by opening the hole in the fingers. Fitting the hands to a watch deserves more care and attention than are generally given to it. The way hands are commonly fitted to watches is bad in principle. The pipe of the hour wheel is left too long, and that of the minute hand too short, and when the end shake of the hour hand is adjusted, as it usually is, lay the boss on the hour wheel and the dial, the end shake of the center wheel affects it, sometimes giving it too much and bending the hour hand by its catching the minute hand either in setting the hands or in the going of the watch. In fitting the hands, the examiner should fit the glass, if to a hunting case, as high as the case will admit, ascertain the space available by placing a piece of beeswax on the dial and pressing the glass down on it, and turn the canon pinion until it projects from the dial the height of the beeswax; the hour wheel pipe should rise just perceptibly above the dial, and the end shake of the hour hand be adjusted by the pipe of the minute hand and that of the hour wheel.

### The Death of General Grant.

The death of General Grant, which occurred on the morning of July 23, cast a gloom over the entire country; indeed, the whole civilized world has looked on with sympathy at the heroic struggle the first citizen of the Republic has been having for months with an incurable disease. While every heart was saddened by the announcement that the great soldier and ex-President was dead, there was also a feeling of relief that he had escaped from the suffering he has undergone with so much patience and fortitude. He was unquestionably the ablest soldier this century has produced, an honor cheerfully conceded by those who stood next to him in rank and command during the war, and it is through his campaigns that posterity will know him best. As a statesman he could not be classed among the foremost, yet, during his incumbency of the Presidential office, he gave the country an even and strong administration, characterized by no special brilliancy, yet so even handed that the country prospered under it. Great as he was, honored, feted at home and abroad, proud as we were and are of him, there was nothing in his whole career that so aroused the tender sympathy of all people as the patient, uncomplaining manner in which he struggled with the fell disease that daily was making inroads upon his strength and slowly eating away his vitality. How intense his sufferings were can only be surmised from the efforts he made to conceal them from his nearest friends. Yet even better than the attending physicians he noted the progress of the disease, his waning strength and wasting vitality, yet he watched the oncoming of death with as much composure as he displayed when reviewing the armies in years past. Conscious in the full performance of his duty to his fellow men, death had no terrors for him, but he finally gave up his life with the same degree of calmness with which he had exposed it on hundreds of battle fields. In his sickness and death he taught, by his example, such lessons of patient, uncomplaining resignation as his most brilliant achievements in the war could not have inculcated. Other pens, however, have written his eulogies in words of burning eloquence, and the nation mourned as the bells tolled the sad knell announcing the final ending of his last battle. All the honors that we could bestow were heaped upon him while living, and at his death a mournful tribute of respect was paid to his memory by the civilization of the whole world.

"The stars on our banner grow suddenly dim,  
Let us weep in our darkness, but weep not for him;  
Not for him, who departing left millions in tears;  
Not for him, who has died full of honors and years;  
Not for him, who ascended Fame's ladder so high—  
From the round at the top he has stepped to the sky!"

### Trade Gossip.

T. A. Haney has removed to Lyons, Kan.  
David Wolff returned from Europe July 11.  
W. H. Bahney, of Red Bluff, Cal., has sold out.  
Lee Roberts succeeds O. B. Ives, Bristol, Conn.  
S. & M. Mayer succeed S. Mayer, Leadville, Col.  
W. B. Hall succeeds Joseph Victor, Dugouin, Ills.  
L. E. Schario moved from Newton to Danville, Ills.  
T. Bascom moved to Shellsburgh, Iowa, from Olive.  
Cahill & Kemble succeed R. Cahill, New Lisbon, O.  
Chase & Owen succeed Chas. G. Chase, Chicago, Ills.  
J. H. Rhodes has moved to Bluffton, O., from Marion.  
A. O. Bruner succeeds G. W. Dickinson, Larned, Kan.  
Beattie & Laskey succeed B. H. Beattie, Sterling, Kan.

Pepper & Horner succeed G. Pepper, Cleveland, Tenn.  
Schilling & Thomas succeed H. H. Schilling, Xenia, O.  
John G. Barr has moved from DeWitt to Oregon, Iowa.  
Lea & Greenfelder succeed L. N. Lea, Sandusky, Ohio.  
J. J. Downey succeeds Shipley & Downey, Atlanta, Ills.  
Joseph Brown has moved from Sabetha to Oneida, Kan.  
E. D. Scott succeeds F. D. Schaumberg, Southold, N. Y.  
N. B. Blood succeeds H. H. Capron, Lansingburg, Mich.  
M. F. Charles succeeds Edson Warriner, Fryeburgh, Me.  
Wyman & Seaverns succeed L. J. Wymans, Boston, Mass.  
C. W. D. Zuck has moved from Carey to Sycamore, Ohio.  
Isaac Davis has moved from Hartford to Fontana, Kansas.  
W. F. Walker has moved from Allegan to Plainville, Mich.  
Lanier & Youmans succeed G. R. Youmans, Waycross, Ga.  
J. M. Seamans succeeds Seamans & Thompson, Adel, Iowa.  
J. C. Frederick has moved from Lake City to Sac City, Iowa.  
James W. Ferris has moved from Sabula to Davenport, Iowa.  
John W. Poe & Co. succeed J. F. Doty & Co., Centralia, Ills.  
Marks Bros. succeed the firm of E. Marks & Son, Troy, N. Y.  
N. G. Pike succeeds the firm of Pike & Wolfheim, Roanoke, Va.  
C. S. Snively, Carmi, Ills., has sold his business to Wm. Newton.  
H. A. Reineman has moved from Pittsburgh to McKeesport, Pa.  
W. R. Caldwell has moved from Huntington to South Bend, Ind.  
Scott & Stanislausky succeed H. Stanislausky, La Grande, Oregon.  
Mrs. Elizabeth Hopper succeeds C. A. Dickinson, Richmond, Ind.  
W. A. Smith succeeds the firm of Smith & McQuiddy, Columbia, Tenn.  
Hoeman, Hawes & Swedberg succeed M. Swedberg, Luverne, Minn.  
Specker Bros. & Co. succeed Specker, Buddeke & Co., Cincinnati, O.  
The Tryner Jewelry Co. has succeeded James P. Tryner, at Denver, Col.  
Deempster, Hazlett & Green succeed L. A. Green, Geneva, Nebraska.  
A. Friedenthal starts for a tour through the southern States early this month.  
P. C. Foutchey has purchased the business of R. B. Camp, Meshoppen, Pa.  
James H. Tiefenbrun succeeds the firm of Roe & Tiefenbrun, St. Joseph, Mo.  
F. Hahn & Co. have purchased the business of J. M. Fox, Jacksonville, Ills.  
J. E. Wood has purchased the business of J. H. Bishop, Owensborough, Ky.  
Chas. L. Passmore succeeds the firm of Passmore & Schneider, Savanna, Ills.  
F. W. Korn has purchased the business of C. I. Jiszkowicz, Big Springs, Tex.  
D. H. Stites & Sons have removed from 41 Maiden Lane to 51 Maiden Lane.  
F. B. Satterthwait has purchased the business of G. L. McCoy, Ottawa, Ohio.  
John B. Staininger succeeds the firm of Staininger & Hawley, Tipton, Iowa.  
H. M. Hillman & Co. succeed the firm of Jansen & Hillman, Watkins, N. Y.  
B. H. Young has purchased the business of Burbank & Ware, Kingsley, Kan.  
A. J. Doughty has purchased the business of Thos. A. Hay, Marinette, Wis.



John A. Denny has purchased the business of J. H. Stapleton, Assumption, Ills.

Geo. S. Tait, Calvert, Texas, died recently; his widow will continue the business.

R. N. Peterson, of the firm of Peterson & Royce, arrived home from Europe July 20.

Delos A. Smith & Son have purchased the business of J. H. Mowers, Perry, Mich.

Geo. H. Johnston has purchased the business of W. E. Morrow & Co., Columbiaville, Mich.

Marshall Bros. succeed A. S. Marshall, and have purchased the business of B. M. Bailey, Rutland, Vt.

D. Untermeyer, of the firm of Keller & Untermeyer, left Europe in the steamer *Fulda* on his return July 29.

Mr. Olmstead, of Cady & Olmstead, Kansas City, Mo., was in the city recently on his way to a summer resort.

M. A. Eiseman, of Chicago, has admitted his brother to partnership under the firm name of M. A. Eiseman & Bro.

L. & M. Kahn & Co. have removed their Paris establishment from No. 17 Rue de Chausseandun to the corner of Rue Lafitte.

M. Wollstein & Bien, proprietors of the United States Smelting and Refining Works, are now located in new quarters at No. 23 Gold street.

Charles H. Place has purchased the stock of C. F. Huntington, of St. Albans, Vt. Mr. Place has been connected with the business for several years.

The extensive catalogue issued by S. F. Myers & Co. attracts marked attention in the trade, and is found exceedingly convenient by all dealers.

S. Joel has recently been granted a re-issue of his patent on his improved setting holder. He notifies the trade that he will prosecute all infringers.

The thief known as "Kid Glove Steve," who recently attempted to steal some diamonds from Tiffany & Co., was sentenced to imprisonment for ten years.

E. T. Baker, formerly with the Derby Silver Company, has been engaged by the New York Silver Plate Company, and will travel in their interest hereafter.

The Southington Cutlery Company, of Southington, Conn., has opened a New York office at No. 18 Maiden Lane, under the management of H. G. Balch.

George Varrelman, with M. J. Paillard & Co., will make an extended trip through the west to exhibit to the trade the line of musical boxes, etc., carried by this firm.

James A. Webb, of the firm of Webb & Hall, Janesville, Wis., has sold his interest in the business to Isaac Farnsworth. The old firm was well and favorably known in Wisconsin.

Charles E. Hayward and Walter E. Hayward have formed a co-partnership under the title of C. E. Hayward & Co., and will continue the business of the old firm of C. E. Hayward & Briggs.

The W. & M. mainspring introduced by Samuel Swartzchild, of Chicago, is meeting with great success. They give excellent satisfaction and it has been impossible to supply the demand for them.

A game of base ball was recently played between the American Watch Company nine and the Maiden Lane nine, S. H. Hale, umpire. The Watch Company scored a victory, making 39 runs to their opponents 11.

The Chicago Jewelers' Association at its recent meeting elected the following named gentlemen as officers for the present year: F. E. Morse, President; Lem. W. Flershem, Vice-President; and H. S. Peck, Secretary and Treasurer.

An elaborate setting for diamonds and white stones has been invented by Mr. Blancard, of the well known firm of Blancard & Oberlander. It is struck out of one solid piece with bezel included. It makes a light, strong and labor-saving setting.

G. W. Washburn, for many years the superintendent of the manufacturing department of Randel, Baremore & Billings, has formed a co-partnership with W. L. Sexton, under the style of Sexton & Washburn; both gentlemen are well known in the trade.

Watchmakers' attention are called to the advertisement of Henry Ginnel & Co. in this number. It seems they have secured the entire lot of Ellery nickel key and stem, a very desirable movement, of the American Waltham Watch Co.'s manufacture, which they are offering to the trade at a large reduction over former prices.

Attention is called to the advertisement of Mackinney, Smith & Co., manufacturers of white stone goods, who have, up to the present time, sold their goods only to the jobbing trade; they have now taken a new departure and will sell to the retail as well as the jobbing trade; they have fitted up a very attractive office at 178 Broadway.

The repairing branch of the business of J. P. Wathier & Co., of Chicago, is meeting with great success in the trade. They do repairing of all kinds for dealers, and are in receipt of orders from all over the Union. They have recently increased their facilities greatly, and employ a large corps of experienced workmen for this branch of their business exclusively.

Colonel J. M. Rutherford, the well known jewelry auctioneer, has recently sold the stocks of J. G. Thompson, of Westchester, Pa.; J. J. Maguire, Harrisburg, Pa.; D. Davidsburg, Wilkesbarre, Pa.; and Will. H. Sassmilch, of Duluth, Minn. Prices generally were good and the attendance large, indications that money is beginning to circulate more freely among the people.

The well known firm of Reed & Barton, manufacturers of silver plated ware, have acquired a deserved reputation for the quality of their goods. They have made extensive preparations for the fall trade, having brought out new designs and patterns in a great variety of goods which cannot fail to become popular. Their salesrooms present a most attractive appearance with the bountiful display of goods of every variety.

Peter Hartmann, of this city, has recently patented an ink stand which is desirable and convenient. A funnel-shaped glass tube extends down into the ink stand in which the ink rises convenient to the pen, thus preventing the smearing of the pen by too deep dipping. It also preserves the ink in good condition for use, prevents evaporation and the accumulation of dust in the bottle. It makes one of the most convenient desk ink stands in the market.

R. Cowles, of Cleveland, Ohio, calls our attention to the fact that an unusually large number of broken mainsprings have been brought in for repair recently, and would like watchmakers generally to report if they have had similar experience. He would also like to have some explanation of the fact, and to know whether the cause is local or extends throughout the country. We have heard of several cases in this vicinity of mainsprings breaking during the recent hot, dry weather without any apparent cause. Communications on the subject may be addressed to this office.

“OFFICE OF THE DUEBER WATCH CASE MFG. CO.,  
NEWPORT, KY., July 3, 1885.

*To the Editor of the Jewelers' Circular:*

It has been suggested that the balance of the fund contributed to the flood sufferers in February, 1884, by the jewelers of the United States, now on hand and unexpended, should be turned in to the Jewelers' League of New York City. We have sent a circular similar to this to all contributors to said fund, and would like an expression of opinion from them if such action would be satisfactory. If no reply is received within thirty days from date we shall consider such a disposition of the balance of this fund is agreeable to your wishes. Yours respectfully, JOHN C. DUEBER.”

The suggestion is an eminently proper one, and we earnestly hope the contributors to the flood will acquiesce in this disposition of the surplus. There is no other fund that represents the interests of the jewelers so generally as the contingent fund of the League.

The *Watchmaker, Jeweler and Silversmith*, of London, says: "The exhibit of Waltham Watch Company is by far the largest and most interesting in the horological section of the exhibition. Machinery in motion is always attractive, but we never recollect to have seen it more so than in this exhibit, the crowds that gather round the operatives and linger there show the interest is unbounded. Americans are not the only exhibitors of machine tools. Some watchmakers boast of far greater results than the Waltham people show, but they are careful to hide their light under a bushel, whereas the Americans show you these things."

"The faithful sight engraves the lesson with a beam of light."

The Spencer Optical Manufacturing Company has published in convenient form a treatise on the eye, by Dr. C. A. Bucklin, the well known ophthalmic surgeon and writer of ophthalmic literature. It is entitled "The Detection and Correction of Visual Imperfections with Test Type." The work is conveniently divided into chapters, each of which treats of some disease of the eye resulting in imperfect vision. The work also treats of lenses and other means of strengthening the vision, and gives such clear instruction regarding the adjustment of lenses, that he who reads can scarcely go astray. Every dealer in the country who handles optical goods should obtain a copy of this work, from which he can learn how to properly adjust glasses to suit his customers.

The English crape stone jewelry invented by C. A. Fowler, of Fowler Brothers, was such a new departure in the matter of personal decorations for persons in mourning, and the goods have become so popular, being now classed as staple goods, that the editors of Appleton's Encyclopedia have given the subject a page of description in the volume of that work recently issued. This is an honor conferred only upon inventors and manufacturers who produce something of special importance and value to the community at large. While the crape stone is made by Fowler Brothers into almost every form of mourning jewelry, they also make it into various other articles of use, such as buttons, etc.; in fact, there is scarcely a limit to the forms and designs in which it can be manufactured.

A. Luthy & Co. have recently produced an elaborate piece of diamond jewelry that deserves special mention. It is a necklace and pendant containing 112 brilliants, weighing 110 karats, the stones varying in weight from  $\frac{3}{8}$  karat to 9 karats. The necklace is made with a series of twenty-eight knife-edged boxes, each containing two stones, these boxes being connected by brilliants in single settings, thus making a continuous chain of gems for encircling the neck; from each of the boxes drops a large solitaire diamond which falls upon the neck of the wearer. The pendant consists of one nine karat stone surrounded by four smaller diamonds and four sapphires. The large stone is so arranged that it can be removed and inserted in the necklace when the pendant is not worn. The arrangement of the brilliants was in accordance with an original design furnished by Mr. Luthy.

The fine new building, Nos. 41 and 43 Maiden Lane, recently remodeled by Charles Knapp, is now ready for renting. In reconstructing this building, Mr. Knapp has had especially in view the requirements of the jewelry trade, and has succeeded in arranging a number of suites of offices that are light, airy, well-ventilated equipped with all modern requirements and desirable for jewelers' offices. The building has a frontage of forty-five feet on Maiden Lane, and runs back towards John street 130 feet. The front of the building is constructed of iron, brick and stone, with terra cotta trimmings. There are two stores on the ground floor, with offices in the remaining five stories. Light is introduced by means of what is termed a light court, for which the architects have obtained a patent. The building is equipped with elevators and every convenience for the transaction of business.

Elsewhere we have alluded in this issue to a movement among the gold case makers to secure greater uniformity in the quality of their goods. On July 21 a number of the leading manufacturers held a meeting in this city with a view to forming a permanent association, having for its object the carrying out of such reforms in case making as may be deemed necessary. S. H. Hale, of the American Watch Company, was called to the chair, and H. Untermeyer, of Keller & Untermeyer, was chosen as Secretary. A resolution was adopted declaring it to be desirable to have stamps to indicate the different standard qualities of gold cases, and a committee was appointed to put this idea in proper shape. A committee on constitution and by-laws was also appointed, and the meeting adjourned till such time as the committees are ready to report. There is evidently a fixed determination on the part of many case makers to secure standard qualities of cases, and to insure the public that the quality of gold employed in their construction is equal to the representations made. An association stamp impressed upon a case would be a guarantee of its quality. It is to be hoped that at the next meeting all case makers interested will be present, and that the plan suggested may be perfected and receive their cordial endorsement.

A number of jewelry firms were victimized last month by a Frenchwoman named Pauline Jacquin. She had spent several months gaining the confidence of the firms, representing that she had some wealthy customers who desired to see desirable goods. She obtained numerous articles of value on memorandum and made many good sales. She finally opened an establishment in an apartment house and went into the business under the firm name of P. Jacquin & Son. She introduced her son to the trade and he finally did the buying. A dealer who had loaned them goods on memorandum had an opportunity to sell them and called for their return. As there was some delay his suspicions were aroused, and he insisted on having his goods at once. The lady went out but soon returned with the articles. But suspicion had been excited, and when the dealers called for their goods they found their birds had flown, probably to the congenial shores of Canada. An examination of the safe on the premises disclosed a large number of pawntickets, all labeled with the names of the victims whose goods had been pawned. Some pawnbrokers had also been swindled by these sharpers, and it is estimated that they made about \$25,000 by their operations. The woman was traced to a town in New Jersey, where she was arrested, and is now held for trial.

Among the members of the craft who have visited New York within the past month were the following: T. R. J. Ayres & Son, Keokuk, Iowa; Otto Young, E. H. Goodrich, S. Ehrlich, Jacob Florsheim, L. Sonenschein, M. Benjamin, A. Shakman, M. Luckerberg, G. Shader, H. F. Hahn, Mr. Elbogen, A. Hirsh, M. C. Eppenstein, L. Heller, J. A. Gratz, Mr. Wolff, of A. Rosenblatt & Co., Chicago, Ills.; J. J. Sweeney, Houston, Texas; G. W. Fairchild, Bridgeport, Conn.; A. M. Hill, New Orleans, La.; O. E. Curtis, Decatur, Ills.; A. N. Bonnet, Zanesville, O.; J. A. Norton & Son, Atchison, Kan.; Chas. Haas & Son, Stockton, Cal.; J. Jones, Troy, N. Y.; T. H. Wheeler, Rutland, Vt.; G. T. Tress, Columbus, O.; C. P. Barnes, Louisville, Ky.; Ernest Schall, Hartford, Conn.; J. L. Bliss, Atchison, Kan.; Henry Wright, Baltimore, Md.; Aug. Kurtzborn, of L. Bauman Jewelry Co., St. Louis, Mo.; T. E. Thompson, Galveston, Texas; Mr. Cady, of Cady & Olmstead, Kansas City, Mo.; I. Amberg and Mr. Ochs, L. Guttman, Frank Lewald, A. Schwab, L. Strauss, A. Plant, Clemens Oskamp, Cincinnati, O.; Otto Heeren, of Heeren Bros., Pittsburgh, Pa.; F. E. Morse, Chicago, Ills.; S. Eisenstadt, J. Bolland, J. L. Leighton, S. A. Rider, St. Louis, Mo.; Mr. Dreyfus, of Koch & Dreyfus, New Orleans, La.; S. Kind, Phila., Pa.; Chas. Heintz, of Heintz Bros., and Mr. King, of King & Eisele, Buffalo, N. Y.; Chas. Sumner, of J. M. Chandler & Co., Cleveland, Ohio; Geo. Greensweig, of San Francisco, Cal.; S. K. Merrill, Sparta, Wis.



## THE JEWELERS' CIRCULAR AND HOROLOGICAL REVIEW

*Official representative of THE JEWELERS' LEAGUE and of THE NEW YORK JEWELERS' BOARD OF TRADE, and the recognized exponent of Trade Interests.*

A Monthly Journal devoted to the interests of Watchmakers, Jewelers, Silver-smiths, Electro-plate Manufacturers, and those engaged in the kindred branches of art industry.

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### The Outlook for Fall Trade.

AT THIS season of the year trade ought to be quite brisk, unless the precedents of previous years are to be ignored. With the passing away of the summer months, and the advent of cooler weather, business men in general return from their vacations and make up their minds to settle down to business for the remainder of the year. Usually they feel urged, by inclination or necessity, to throw increased energy into their several enterprises, and to push them for all they are worth, in order to swell the volume of their transactions, and consequently their profits. Everybody looks forward to the gradual approach of cold weather, and begins to prepare for the change; merchants lay in their fall stocks in time, in order to be ready for the anticipated demand, and a general activity is presumed to set in about this time in all lines of business. The jewelry trade keeps pace with other industries in this respect, and is now engaged in putting things to rights after its Summer vacation.

The Grant obsequies occupied public attention during the first part of August, and for over two weeks interfered materially with the transaction of ordinary business. It was an event in which every section of the country felt interested, forming the chief topic of conversation among all classes. One good thing resulted—the immense number of persons attending the different memorial services all contributing something towards putting money into circulation. Many hundreds of thousands of dollars changed hands during the time, most of it finding its way into regular business channels. Subsequent to the obsequies a slight improvement in trade was perceptible in the jewelry trade, many buyers visiting the city and placing their orders. They almost universally report improved trade prospects,

and predict a more generous amount of business during the remaining months of the year. Crop prospects warrant the belief that a season of prosperity is near at hand. The cotton yield is most bountiful, while wheat, corn, and other staple productions promise abundance. There is indicated a slight shortage in the yield of wheat, a fact that will tend to keep up the price, and put more money in the pockets of the holders than would otherwise be the case. In other words, the money value of the crop will be about the same as it would if the yield were greater, but the proceeds will be in fewer hands. Other staple crops, however, promise to more than compensate for the shortage in wheat. Another indication of increased activity in business lies in the fact that the banks are slowly paying out from their large accumulations of surplus, showing that the demands of commerce are becoming greater, and that the bank hoardings are gradually being used in productive enterprises. The reports of the banks show that they are loaning money freely, the New York banks having put out \$6,000,000 more in July than they did in June. Money in bank does no good to any one, but when it once gets afloat on the broad sea of commerce everyone feels the effects to a greater or lesser extent. A gentleman from the West, representing an extensive manufacturing industry, said to us a few days ago that the business of his firm showed more activity in August than it had for two years, and that during the first half of the month their orders exceeded the aggregate for the entire month of August last year. Their business is derived from every section of the country, and while it was improved in all directions, he thought the most marked improvement was manifested in the Southern States. Manufacturers and jobbers in the jewelry trade are, as a rule, sanguine that a good fall trade awaits them. So confident are they, that they have made preparations for it, and have large and attractive stocks of goods on hand, ready to supply liberal orders promptly. From all the data we can obtain, we have come to the conclusion that a season of activity is at hand, and that the jewelry trade will get its fair share of largely increased transactions during the coming months of the year. Already an improvement is felt in the trade, and those who note most closely the signs of the times are the most sanguine.

### Monthly Statements.

IT IS wonderful the amount of misapprehension that exists regarding those little *billet doux* sent out to the trade by jobbers and manufacturers on the first of each month. Many regard them in the light of dunning letters, and take offence at the regularity with which they put in their appearance, while others look upon them as invoices, and pay no attention to them. From time immemorial it has been a custom in commercial circles for creditors to send monthly statements of their accounts to their debtors. These are not, necessarily, in the nature of a reminder of existing indebtedness, but are more frequently mere memorandums, to enable the debtor to make com-

parisons between his own books of account and those of his creditors. Suppose a buyer comes to New York in the latter part of August and buys a bill of goods; they are sent to him with an invoice; errors may be made in charging up the goods; they may not reach their destination; or any one of a hundred things may occur to make a difference in the account between the debtor and creditor; on the first of September the creditor sends to his debtor a statement of his account to date; it cannot be considered a demand for payment, for the goods were purchased on four months' time; it cannot be a duplicate invoice, for it may include items that had been purchased and delivered months before, or that the purchaser took with him. It is simply and solely what it professes to be—a statement of account as shown by the books of the creditor. The debtor is expected to compare it promptly with his own books, and if any discrepancies are discovered, to send notice thereof forthwith; if goods are charged that were not ordered, or if others were bought that were not sent, the statement should reveal the errors and lead to their immediate correction. Suppose the man who purchased goods in August on four months' time makes other purchases in September; on the first of October he will receive another monthly statement, which will include both his August and September purchases, and every time he buys goods he will find his invoices supplemented by the monthly statement, showing the condition of his account. The primary object of the monthly statement is to facilitate the correction of mistakes, and, in case of the miscarriage of goods, to enable them to be traced. In the multitude of packages sent out by manufacturers and jobbers, there are unavoidable mistakes made in packing, addressing, or entering on the books, and if monthly statements received from those to whom they are sent that degree of attention they should, these mistakes would be detected before the lapse of time made them undiscoverable. A case in point: A dealer in the far west bought a bill of goods some time ago of a jobber in this city, on four months' time; they were duly forwarded with the invoice; on the first of the following month the monthly statement was sent, which, on being received, was mistaken for an invoice and filed away; at the end of the four months another statement was sent, with a reminder that payment was due. Then the purchaser replied that he had never received the goods. Although so much time had elapsed, the railroad company sent out a "tracer," but no clue to the missing packages could be found. Finally, after the lapse of fifteen months, the railroad company very reluctantly concluded to pay for the goods, not because they were convinced that they were responsible for the loss, but simply because they could find no record of delivery. Had the purchaser, on receipt of the first monthly statement, notified the seller that the goods had not arrived, they could probably have been traced, and much trouble and annoyance saved. In another case, a dealer took offence at being served with a monthly statement, regarding it as a dun, and withdrew his patronage from the house sending it. He could not be convinced that it was a harmless document, but insisted that it was evidence of a lack of confidence in his ability or willingness to pay.

In these days of many transactions, and divided responsibility regarding them, it is essential that every possible safeguard should be thrown around both buyer and seller. The buyer comes to the city, is waited on by a salesman, and makes his selections; his order is turned over to another person, who makes up the packages; all the items must be entered in the books, and finally the package sealed, directed, and delivered to the express company. Suppose John Smith, of Pontiac, to be the buyer; there are three or four other John Smiths on the books of the seller, located in different places. In the rush of business the goods may be charged to John Smith, of Pontiac, but sent to John Smith, Dowagiac, or the wrong Smith may be charged with the goods. If these gentlemen, when they receive their monthly statements, would promptly call attention to the errors, they would be as promptly rectified; but if they are permitted to pass unchallenged, there is likely to be trouble growing out of future settlements. Business men cannot be too methodical

in their methods, and there is nothing like promptness and care in all matters to beget long friendships. Dealers living in the country, where everything moves slower than in the city, are not apt to attach that degree of importance to little things that men do who are obliged to move with rapidity. In the cities all things are done with a business-like snap, and he who fails to keep pace with the great car of our commercial juggernaut is liable to be crushed under its wheels. If our country brethren would but pay a little more attention to these small matters—such as providing for their notes at maturity, acknowledging the receipt of goods, invoices, and other business transactions—they would save themselves and others much unnecessary annoyance.

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### Standards of Value.

IN THE August issue of THE CIRCULAR we noted the fact that the gold case makers were considering the question of forming a guild among themselves for the purpose of securing the perfect integrity of the gold cases sold to the public. The plan proposed is to have all gold cases submitted to the guild, and stamped with a guild stamp indicating the quality of the gold of which the case is made. This is in accordance with the idea frequently put forth in these columns, only we would go much further, and have the marking include everything made of gold and offered for sale to the public. The greatest reproach to the jewelry trade to-day lies in the fact that there is a lack of confidence in the integrity of the goods made and sold by it. The fact that an article is marked 14-k. or 18-k. does not carry conviction that these figures truly indicate the fineness of the gold of which it is made, for it is well known that many goods so marked will not assay anywhere near the degree of fineness indicated. It is also known that the representations made regarding the quality of unstamped goods are not always to be trusted. It is unfortunate for the trade in general that there are manufacturers possessing such elastic consciences that they are not troubled in the least when they put a 14-k. stamp on 10-k. goods, for such acts bring reproach upon the trade, and subject everyone engaged in it to suspicion. A trade dealing so largely in precious metals should, like the United States mint, be above suspicion; its integrity should be so well established that its products would be received unquestioningly at their face value, as is the coin turned out at the mint. Because this is not so, and because instances of misrepresentation of quality have become quite common, the public have come to look for adulteration in gold goods as they have in sugar or tea, and require the strongest guarantees of purity before putting faith in them. It is to prevent misrepresentation as to quality—misrepresentation that is nothing more nor less than fraud—that we have favored the passage by Congress of a national law, defining clearly the standards for wrought gold, and providing severe penalties for misrepresentations of quality. The English standard might be adopted—24-k. representing pure gold, 12-k. the limit of adulteration; everything degraded below this to be regarded as base metal, and all intermediate grades to be stamped in accordance with their intrinsic value. The law should require that all goods be stamped by the manufacturer, according to this standard; or, when it is impossible to stamp them, that they shall be accompanied by a bill of sale, setting forth their quality—such bill of sale to be construed as a warranty. With such a law in force, fines and imprisonment being provided for all violations, deceptive and fraudulent goods would soon be driven from the market, and "skin" manufacturers forced to close their doors. In various States there are stringent laws to prevent the adulteration of food, drugs, liquors, etc., and to prevent fraud being perpetrated by means of such adulterations. We see no reason why fraud in the sale of wrought gold should not also form the subject of legislation.

Excessive competition is said to be responsible for the degradation of quality, but we confess we cannot see any excuse for a person

being dishonest. Excessive competition may reduce his profits, but is no excuse for robbery. But when one manufacturer degrades the quality of his goods, it makes it hard work for the maker of honest goods to compete with him; in fact, he cannot do it except at a loss, and it therefore becomes a matter almost of self-defence that he should also debase the quality of his goods. It is none the less robbery, however, and the competition excuse will not satisfy the conscience of a thoroughly honest man. A law making it a misdemeanor to falsely stamp or otherwise misrepresent the quality of goods would be a protection to the honest manufacturers, as well as to the public.

Pirating of designs goes hand in hand with degradation of quality, the two combined serving frequently to utterly drive from the market a desirable line of fine goods. A manufacturer spends his time and money in getting out some new style of goods, makes it up in fine gold, and offers it to the trade. Scarcely is it on the market when some pirate steals the design, and reproduces it in debased metal. Of course, he can undersell the genuine goods, and so the originator of the design must either abandon it to the pirate or imitate his method of manufacture, and proceed to swindle the public by selling goods that are deceptive and fraudulent. The worst of this is, that many retail dealers will buy the fraudulent goods in preference to the genuine ones, even after the character of the swindle has been explained to them. Indeed, the retail trade is largely responsible for the debased quality of some gold goods. They find that certain goods made by Jones & Robinson are popular, and if they could only undersell their competitors, they could control the demand for them. So they write to some manufacturer, "Send me a line of Jones & Robinson's goods, made of 10-k. gold, marked 14-k.," and if they succeed in getting their order filled, of course they can undersell their rivals. When a manufacturer is thus robbed of the fruits of his labor by these unscrupulous pirates, it is hard to condemn him for following their example, and making the goods in the same style they do, and force the competition. But two wrongs never yet made one right. It is better to suffer a wrong than to do it. The remedy for pirating and swindling in quality would be found in a law prescribing standards of quality for wrought gold, and providing severe penalties for misrepresentation and fraud. The movement among the gold case makers to secure the integrity of gold cases, is a step in the right direction. The time may not be propitious for making the movement successful, but the simple fact of the present discussion of the question will make it easier to carry it through to success when the proper time arrives. Every honest manufacturer should join in every reasonable effort to weed out dishonesty and fraud as practised by unscrupulous manufacturers. Debased goods have brought enough scandal upon the trade, and made it a difficult matter for honest men to make a living by legitimate methods.

But debased quality is by no means confined to wrought gold goods. It extends to every form in which gold is used, to solid silver goods, and to plated ware. Adulteration is the order of the day, and covers all lines of goods handled by jewelers, as it does those handled by the grocer, the druggist, or the dry goods merchant. As we have laws enacted to remedy some of these evils, our law makers should go to the fullest extent, and provide penalties for adulteration and misrepresentation in everything. It is no more of a crime to sell oleomargarine for butter than it is to sell 10-k. gold goods for 14-k. goods. It is a swindle in either case, and should be made the subject of special penalties. If honest manufacturers and dealers would take hold of this matter for themselves, securing such legislation as will protect them as well as the public, they will be doing a great public good; if they do not, the time will come when the legislature itself will take up the matter, and the jewelry trade, without distinction, will find itself legislated against as though it was one of the criminal branches of industry that must be hedged about by special laws. The legislation, that is bound to come eventually, should be directed against fraudulent manufacturers, and not against the trade in general.

### Protection to Retail Dealers.

IF THE jewelry trade is ever to be restored to its legitimate channels, and be once more conducted according to ancient and venerated usages, the greatest amount of protection must be thrown around the retail dealer, in order that he may derive the greatest amount of benefit from the patronage that is to be found in his field, and that by right belongs to him. He it is who comes in direct contact with the consumer, and is the proper medium through whom the manufacturer should dispose of his goods. But because retail dealers are too numerous and scattered over an extended area of country, the jobber comes in as an intermediary, taking the products of the manufacturers and distributing them to the retail dealers, each in his particular locality. For doing this the jobber is allowed certain privileges, chief among these being the privilege to buy goods at a price that will permit of his selling them again to the retail dealers at a profit. One of the crying evils in the trade for the past few years has been the fact that some jobbers have not been content with the patronage of the retail dealer, but have entered into competition with him in his own markets, selling his goods at retail to individuals at the same prices he would to the retail dealer. Of course, in such a competition, the legitimate dealer must go to the wall, for the jobber has a decided advantage over him in buying goods, and can afford to sell at prices that would be ruinous to the dealer, who has to pay a jobber's profit on all the goods he buys. The complaints against this pernicious practice have been numerous and loud of late years, till at last some attention has been paid to them.

The formation of the National Association of Jobbers in American watches is intended to afford protection to retail dealers to a certain extent, so far as movements and silver cases are concerned, but it does not go far enough. We have given an earnest and cordial endorsement to this association, and can therefore venture to offer a few suggestions to it without being regarded as presumptuous. The association has undertaken to indicate to the makers of movements and cases whom they may regard as jobbers, and accord to them jobbers' discounts. In making up their list, these jobbers have left out many persons whose chief business was that of a retail dealer, but who, through favoritism or some other cause, had been accorded jobbers' privileges. This made quite a reduction in the list of jobbers, but the association itself would have been considerably reduced if it had gone still further and compelled its own members to elect which they would be regarded in future, jobbers or retail dealers. There are those who claim to do a jobbing business exclusively, who represent to the retail dealers that they never sell goods to anyone at retail, yet who are found seeking the orders of individuals on the sly. Strangers can buy single articles from them at the same price the retailer has to pay for them by the quantity. They also sell to outsiders, whence comes the worst competition the retailer has to meet, thus fostering a rivalry that is unprofitable and disastrous to the legitimate retail trade. The jewelers of Canada have an organization somewhat similar to the one referred to, but one of the first requirements of membership is that the applicant shall elect which branch of his business he will pursue, that of a jobber or retail dealer. Both cannot be recognized in the same person. If such a rule were enforced here, there would either be a material reduction in the number of members of the association or of the number of retail dealers in the principal cities. The retail dealers of the country are entitled to protection at the hands of the Jobbers' Association, to prevent jobbers selling to their customers by retail at wholesale prices; but we do not understand that the association exacts from its members or the jobbers whom it recognizes, any pledge or agreement not to retail goods. It virtually says that retail dealers shall not be recognized as jobbers, but does not pledge the jobbers not to sell any goods at retail. If to the offence of retailing goods the jobber adds that of selling to outsiders, he contributes about all in his power to make the business of the retail dealers unprofitable, if not disastrous. When such practices have

been permitted to prevail, it is not to be wondered at that every dealer in the country became ambitious to be recognized as a jobber. The Jobbers' Association claims to be the friend of the retail dealers, and ambitious to protect them from illegitimate competition from every source. We would respectfully suggest that it would be well for the association to require all dealers, including its own members, to confine their transactions to one branch of the business. If they elect to be jobbers, require them to abandon the practice of selling goods at retail. If they prefer to conduct a retail business, then deny them jobbers' privileges and place them on an equal footing with other retail dealers. The association at present assumes to deal only with American watch movements and silver cases, but what we have here said is applicable to the sale of jewelry of all kinds as well as to watches. Jobbers and retail dealers have distinct fields of operation, and it should not be possible for either to encroach upon the other. Until the line of demarkation between them is recognized and observed by all interested, the complaints of unbusiness-like practices will continue to be made and the trade to suffer from a competition that is unfair, demoralizing and unprofitable. It is already alleged against the Jobbers' Association that it has made some unfair discriminations in preparing its list of jobbers for the guidance of movement and case makers, and it might well give the subject further consideration. The retail dealers are entitled to all the protection that can be provided for them, for theirs is an unenviable lot at best, and if they are forced to enter into competition with jobbers as well as outsiders, there is little hope of their being successful. They are expected to pay dollar for dollar of their indebtedness, yet the very class of men who are their creditors often force them into positions where they must make a sacrifice on every dollar's worth of goods they sell.

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### The History of Goldsmithing.

*Continued from page 217.*

THE SHRINE was magnificent, but the Cardinal of Bourbon had an eye to economy in its making. Félibien says that he took from the treasury of the abbey two gold crowns and several trinkets ornamented with jewelry, and used them in making it.

We next must make some mention of the numerous pieces of goldsmithing offered in the course of the 16th century by the city of Paris to the various kings and queens of France on the occasion of their ascension to the throne or their entry into the city. They were invariably large allegorical pieces, complicated to excess, crowded with persons, wrought with much art, but their style was nevertheless commonplace and overloaded.

We do not alone refer to the pieces manufactured at the beginning of the century, or the trinkets presented to Louis XII., to Francis I., to Claude of Savoy, or to Queen Eleonore, but also to those offered in 1549 to Henry II., and in 1571 to Charles IX.

In the first we have three kings (Louis XII., Francis I. and Henry II.) with crowns on their heads, grouped around a palm tree and surrounded by allegorical figures more or less symbolic to each of them—a Janus with double face, Justice holding in its hands a sword and a purse, Mars clad in sparkling armor, each one bearing mottoes and supported by three figures of Harpies.

The piece offered to Charles IX. was still more complicated, as follows:

Upon a platform, borne by four dolphins, was seated Cybele, the mother of the gods, surrounded by Pluto, Neptune and Juno, figures made in the likeness of the queen and the brothers and sister of the king. Higher up, between two pillars, was raised the equestrian statue of the king himself, crowned by an eagle sitting upon the crupper of his horse. At the four corners of the pedestal were placed Charlemagne, Charles V., Charles VII. and Charles VIII., and upon the friese the great battles gained by them. The chroni-

cles of the times say that the whole piece was of fine silver, gilt with ducat gold, chased, engraved, etc.

About the same time Francis I., desirous of offering a gift of devotion to the Holy Chapel of the Palace, presented it with a gold bust standing upon a pedestal of silver-gilt, and weighing one hundred and forty pounds. But the bust was not made in the likeness of the saint whose relics it was to inclose; it was simply the portrait of the king himself, who most assuredly was never canonized. His successors quickly recognized this fact and were not slow in turning it to their account. An inventory of 1573 says that it was smelted and the metal used for the benefit of the king.

Neither the sacred character nor the pious intention of the donor sufficed to save the pieces of goldsmithing possessed by churches from going the way of all flesh. We thus see about the same period that the large shrine of St. Piat, at Chartres, a handsome piece of workmanship, adorned with numerous figures, was smelted to satisfy the rapacity of the royal treasury, which was always in a chronic state of depletion.

Among the holy vessels belonging to the 16th century we must most certainly class the beautiful chalice of the church of Saint-Jeandu-Doigt, in Brittany, which, tradition avers, was presented by Queen Anne.

But the greater number of pieces of sacred goldsmithing wrought at this period possessed nothing that might be called original, although it is undeniable that much taste and art was bestowed on their making. For instance, in the beautiful group of "The Resurrection," donated by Henry II. to the cathedral at Rheims, immediately after his consecration, the figure of Christ, those of the soldiers and four sybils, placed at the corners, were grouped around a tomb excavated in a magnificent piece of agate.

The inventory of the vessels and gold jewelry, found in the cabinet of the king at Fontainebleau, shortly after the death of Henry II., mentions a figure of Christ bound to an agate pillar, an *Ecce-homo* of which the body is of mother-of-pearl, St. John preaching in the desert, a group of figures, of gold, enameled, upon a large coral rock, several crucifixes and saints enameled in colors, etc., all of them very handsome pieces, but possessing nothing in common with the sacred goldsmithing of former ages.

Pirame Triboulet, a goldsmith of Paris, is named in an old chronicle of 1529 as being very skillful in the manufacture of vases from hard precious stones.

Another goldsmith at Paris, Pierre Mangot, bore the title of royal goldsmith during the reign of Francis I., and constructed many articles for personal use for the latter. One of the passions of this prince was that of being represented in all forms and materials. Mangot, in 1529, and Benedict Ramel, in 1538, had the honor of making his likeness in gold.

But the most celebrated goldsmith of this age was Etienne Delaulne, born at Orleans in 1520. Very few pieces of his making are in existence to-day; the most important of those attributed to him is a water pitcher, at present in London, in the collection of Captain Leyland, fig. 40. It is of silver-gilt, about sixteen inches high, and embellished with a rich decoration, half-flat, of various mythological scenes enclosed in divisions. A faunus serves as handle. The plate on which it stands is twenty inches in diameter and very richly embellished. The bottom contains four allegorical medalions, representing the four elements, and, between them, the principal gods of the Olymp. Upon the border are figured the twelve months of the year.

The reign of Henry II. is generally credited with having been the epoch when the French art of the Renaissance attained its highest degree of perfection, although under the subsequent reigns the art of goldsmithing still produced very eminent pieces of work. Among the most important always belong the pieces presented to the kings and queens of France. We already mentioned the piece presented by the city of Paris to Charles IX. at his solemn entry in 1571, and on the same occasion it offered to the queen a buffet furnished with

handsome brass dishes and vessels, and silverware of the weight of two hundred ounces.

Charles IX., although he had no warlike inclinations, loved the glitter of arms, and as no occasion offered to employ the more hurtful kinds, his passions were calmed by surrounding himself with the ornamented baubles, thereby furnishing occupation to goldsmiths. His parade helmet and buckler are still preserved in the collection of the Louvre, and it is said that they are without equals in the way of ornamentation. They are of gold, ornamented with scenes and figures, both chased and half-raised; the carnations are of colored enamel; the ground upon which a battle is being waged, which forms the principal center figure of the ornaments, is suitably embellished with colored enamels to correspond. Thirty-two oval medallions, intertwined with olive branches, form the border of the buckler, which, continues M. Labarte, from whom we have borrowed the description, is ornamented in the same style; it also contains a Medusa head, the face of an old man, clusters of fruit and trophies of arms.



FIG. 40.

It appears that it was the passion of these times to make everything artistic, no matter what be its value or the material from which it was made. While the court, always in a state of distress, lavished every cent it could squeeze out of the people on jewelry and luxury, the artisan catering to its morbid desires incessantly strove to produce something new and startling, which gradually undermined the foundations of a pure art taste; the people, also, became more exacting in their desires for luxury and aped the manners of the aristocracy. Whoever could not afford the luxury of silverware ornamented with scenes from mythology used tin, and although he could not for the making of tin dishes call on the assistance of the goldsmith, still, a separate trade of tinsmiths sprung up, who, in the 16th century, counted in its ranks men of eminent talent, who were worthy of ranking with many goldsmiths of their epoch.

The best known among them is Francis Briot. His creations, thanks to the cheapness of the material from which made, are still plentifully found in European art collections, and both the Louvre and the Cluny Museum possess several very handsome specimens. They generally consist of water pitchers, drinking cups, plates, table ware, etc., and are executed with a remarkable purity of style and gracefulness of decoration. These handsome pieces were first cast and then retouched with tools.

We are approaching the end of this unfortunate century, unfortunate both for France and for the arts which had become developed. Of all the misfortunes that can befall a country there is none so terrible as a religious war. While ruthlessly it destroys the masterworks of by-gone ages as conflicting with its religious scruples, it prevents the creation of new. France, at the latter end of the 16th century, began to be devastated by both a civil and a religious war, and, as a consequence, goldsmithing declined.

Another circumstance materially aided to bring about the decadence of goldsmithing: the people at once became infatuated with the desire of possessing precious stones of all kinds; this occurred under the reign of the last of the house of Valois. The glitter of the diamond and pearl suddenly eclipsed the brightness of gold and silver and the plastic representations of the goldsmith; the industry of the jeweler, which once had been an auxiliary only to that of the goldsmith, became at present so well suited to the whims of an effeminate court that the goldsmith was forced to assume a second rank from this date forward.

We next turn to the

### 3. *North of Europe.*

Of all the other European countries, Germany is perhaps the only one where the Renaissance took the definite forms suited to the country; it is the only one the artists of which were bold enough to blend their own conceptions of the beautiful and the Renaissance, so-called, together, and create a distinct, well-defined German Renaissance. Its artists, we are happy to state, did not blindly follow the dictates of the new movement originated in Italy. At the head of the German artists belonging to this age stood Albrecht Dürer. The gothic style was still dominating, but, while preserving the elongated forms characteristic of this style, the artists belonging to Dürer's school modified the elements constituting it. With the rigid lines of its architecture they at first mixed, and afterward almost entirely substituted, a style of ornamentation borrowed from the vegetable kingdom, capriciously interlacing branches and leaves in such a manner as to preserve the harmonious symmetry of the piece.

This style of decoration, which was inaugurated toward the end of the 15th and prevailed during the first part of the 16th century, according to our opinion, characterizes best the true style of the German Renaissance. One of the best defined examples of this kind, and which fullest expresses our meaning, is the accompanying monstrance, fig. 41, presented by Emperor Maximilian to the abbey of Donauwerth. Nothing is more handsome and ingenious than the composition of this beautiful piece of sacred goldsmithing. As will be seen on inspection, the principal part is a genealogical tree of Jesse (the allegorical genealogy of the Holy Virgin), the trunk of which, taking root in the very breast of the sleeping patriarch, spreads out into numerous branches; each of them bears the figure of a king, while at its top it is crowned, like a beautiful flower, with the radiant figure of Mary. At its center is seen a calvary, and, below it, a reliquary, with armorial bearings, in form of a square, inclosing a piece of the true cross. Finally, several small figures representing the fathers of the church, various saints, the emperor himself, and the abbot Bartholomew Boschorin (1517) complete the composition.

As aforesaid, we do not believe that there exists in the whole range of goldsmithing another piece as expressive of the German Renaissance. In later ages this well-defined style was somewhat modified by exterior influences, those of the Italian art especially, and it softened somewhat its particular characteristics.

It is evident that especially Germany had on the acceptance of a

new style to contend against many difficulties; it had just thrown off the catholic faith, and with it, of course, ceased the manufacture of sacred vessels for the church. All the other countries, Italy, Spain, France, etc., still adhered to the true belief, and their greatest pieces of masterworks were made for the church, thus retaining a certain resemblance of style. From the day that Germany forsook the adoration of the saints and the greater part of the exterior ceremonies of the catholic faith, the shrines, reliquaries, censers, bishops' crooks and all the other pieces of ecclesiastical furniture ceased to have a significance.



FIG. 41.

On the other hand, profane goldsmithing remained in a flourishing condition. Its principal places of production were, as formerly, Augsburg and Nuremberg, from which issued the greater number of pieces of admirable workmanship still preserved in the various collections of Munich, Vienna, Berlin, Paris and England.

Among the most celebrated goldsmiths of Nuremberg we must mention Wenzel Jamnitzer, who was very eminent; he had a nephew named Christopher Jamnitzer who has also left several pieces of excellent workmanship, at present to be seen in the *Kunstammer* of Berlin. This collection also contains a very skillfully chased cup by Jonas Silber, and a medalion of Albrecht Dürer by Hans Petzolt, both of Nuremberg.

A water pitcher and a baptismal basin of the electoral family of Saxony is kept in the *Grüne Gewölbe* at Dresden; both are said to be masterpieces of the goldsmith Kellerthal.

(To be Continued.)

occupants at the death of General Grant, and their respect for his memory. Few of the side streets made a more general display of mourning than did those in which the jewelers are mainly congregated, and on the day of the obsequies all places of business were closed. Elsewhere the trade was also conspicuous in honoring the memory of the departed chieftain, again demonstrating that members of the jewelry trade are foremost among good citizens in every public movement by which love of country or the welfare of the community is calculated to be promoted.

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WE ARE in the habit of hearing much said about the intrinsic value of the "solid old English silverware," made many years ago, quantities of which are heirlooms in some families, having been handed down from generation to generation. The general impression seems to be that this old silver service was "made on honor," and that, while we may have improved artistically in the production of such goods, we have fallen off in the degree of purity which should characterize the metal of which the service is composed. Recently a wealthy family in a neighboring State determined to dispose of a large quantity of this old English silverware, which, in the course of a century or more of wear and tear, had become valueless for everything except the intrinsic worth of the metal. It bore the trade-mark of a silversmith famous in olden times, who had probably supplied half the plate possessed by the old families of England, and had always been esteemed for its purity, as well as its associations. Arrangements were made with a New York house to take the entire lot at the price of old silver; the articles were weighed, and found to aggregate several hundreds of dollars. While the process of weighing was going on in the shop, a workman quietly cut one of the spoons in two, just to see how old English "sterling" looked inside. What was his astonishment to find that the solid silver spoons were made up on a basis of common iron wire, and were, in places, worn nearly down to their foundation. An examination of the remainder of the "solid silver" revealed an equally base foundation for the other pieces, and the trade was declared "off." The representatives of English aristocracy took back their base metal, decidedly chagrined to learn that their treasured heirlooms had no market value whatever, but if treasured at all in future, must rest their claims to respectful veneration solely upon their associations with their progenitors of yesteryear. Possibly, in some long remote generation, some spendthrift representative of the family had disposed of the service of solid silver and substituted a cheaper variety, as the nobility are reported to frequently do with their wives' diamonds; but if so, why should the famous old maker have loaned his name and trade-mark to such a palpable fraud? Nothing but the absence of worshipful veneration for relics of past ages on the part of a Yankee workman prevented his employers from being badly victimized, in consequence of the lack of integrity manifested by the most eminent silversmith of his day. As a matter of fact, there is as much commercial integrity today as there ever was; from the time when Cain took an unfair advantage of his brother Abel, men have been trying to get the better of their neighbors, and, if necessary to do so, are ready to swear iron is silver, or resort to a club to enforce their transactions. The reason moralists decry the alleged degeneracy of the present day is because there are more people in the world, and fraud increases in a direct ratio with increase of population. Furthermore, the present magnitude of journalistic enterprise brings to light every transaction of a fraudulent character; whereas our forefathers were able to conceal their peccadilloes under a bushel. Now, as in the olden days, the man who wants a real, Simon-pure, genuine article, can obtain it quite as readily from the present degenerate race of Adam as he could in the days when our oily Puritan fathers robbed and mur-

## Gossip of the Month.

MANY of the buildings occupied by jewelry firms in this city were conspicuous for the artistic draping which testified to the grief of the



dered the Indians of this country for the glory of God and their own pecuniary advantage.

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AS WE look in upon our manufacturers from time to time, and glance over their stocks, we are surprised that there should be any demand for new designs, or that they themselves should be racking their brains in pursuit of novelties. It seems as if almost everything in the way of personal decoration has been brought out in every conceivable pattern and design, while in silver and plated goods, and other articles of kin to jewelry, ingenuity would seem to have been exhausted in the production of articles of use and ornament. But we have yet to encounter the first manufacturer who is satisfied with his productions; he is continually prodding his brains and his employees to get up something new, and the result is that the market is better supplied with attractive goods to-day than it ever was before. The introduction of new styles means the shelving of old ones, and thousands upon thousands of dollars' worth of perfectly new goods are consequently consigned to the melting pot every year. This process gives back the value of the metal used in the goods, but the labor expended upon them is a loss. Possibly if this craze for novelty could be controlled within more reasonable limits, manufacturers would find more profit in their business. That it could be controlled there is no doubt, if the manufacturers would expend as much energy in working off old styles that they do in devising new ones. New goods, new designs, new styles, are good indications of the enterprise of the trade, but they often have a boomerang attachment that brings this enterprise back to plague its originator, by forcing him to destroy goods that he might dispose of at a profit, had not his own efforts driven them from the market. There is a heap of wisdom in Davy Crockett's advice: "When you get a good thing, keep it." As conscientious publishers of a medium of communication between producers and consumers, we would amend this advice, and say: "When you get a good thing, advertise it," that all men, also women, may know you have it, and where it is obtainable. You can't sell gold dollars for ten cents, even, unless you let people know you have them to dispose of.

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OUR MONTHLY notes on "Fashions in Jewelry" are designed to inform the public relative to the most attractive goods in the market. They are written by a lady who has long been a fashion writer for the daily press, and knows what appeals to the feminine eye and taste; also, what the masculine mind covets in the way of personal adornment. She is a domestic person as well (which does not necessarily mean that she is encumbered with a husband or other impedimenta of the marital state), and knows what is desirable in house or table decorations. In preparing her articles, she is not by any means limited to mentioning new goods exclusively, as some seem to suppose, but will direct attention to whatever seems to her attractive and desirable. As these fashion notes are extensively copied—one agency alone sending extracts from them each month to 120 different newspapers, scattered all over the country—it will be seen that they form one of the best mediums possible for educating the public regarding all kinds of goods in the hands of jewelers. Our representative has been generally cordially welcomed by those in the trade whom she has called upon, and the greatest alacrity shown in furnishing the information desired, the fact that the good of the trade is sought being recognized; but there have been two or three encountered who seemed to feel that they were conferring a personal favor upon our representative by showing her their goods. We wish distinctly to disabuse the minds of all such of such impressions. In publishing these fashion notes, THE CIRCULAR has in view only the

welfare of the trade, and it is entirely optional with its members whether they receive recognition in those notes or not. Those who do not desire it have simply to decline giving information, and their productions will be most studiously ignored in our columns.

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WE HAVE had considerable to say in THE CIRCULAR about that very common abuse in the trade, the pirating of designs, and did not suppose there could be two opinions as to the atrocity of the practice. But it appears that there are two sides to the question. A manufacturer of fine gold goods recently exhibited to us an elegant article of jewelry, new in design, elaborate in workmanship, useful in form, and in every way a desirable article. He said that it had cost him considerable money to perfect it, but it was now ready to put on the market, and he hoped the manufacturers of plated goods would immediately copy it and rush the sales all they could. He argued that cheap goods educate the taste of the public and create a longing for better things, precisely as the introduction of cheap chromos has had a tendency to stimulate a more extended appreciation of legitimate art work. There are already two classes of purchasers of jewelry, he said; one of these demands fine goods, and will be satisfied with nothing less, and the other wants the imitations, because they cannot afford the genuine, and their sensitiveness is not sufficiently acute to make them reject the attainable when their purses are limited. Some persons are so constituted that they cannot endure shams of any kind, and would suffer a loss of self-respect if compelled to wear paste diamonds or imitations of fine jewelry; others will glory in the false, provided it makes as good a show as the genuine. According to our informant, the former class is constantly on the increase, and they never hope to sell to the latter class until its members have been educated up to a higher standard. He instanced, in illustration, the fact that his own literary tastes had been cultivated by an early indulgence in blood and thunder novels. As a lad he reveled in the yellow-covered literature which embraced such thrilling romances as "The Red Avenger of the Spanish Main," and kindred blood-curdling trash, but he soon learned to realize the fantastic exaggerations of these stories, and turned to Dickens, Thackeray, and a better class of authors for the literary stimulant he required. By degrees his standard was elevated, till he became a persistent reader of the best there is in English literature. There is, no doubt, some truth in this reasoning, but it has its limitations, and can scarcely be extended to matters of personal adornment. We all know how gentlemen have protested against waiters being dressed in costumes similar to their own; and we imagine that a lady, reveling in an article of fine jewelry, would find her placidity of temper disappear on the discovery that her maid, her cook and her washerwoman were wearing jewelry that, to all outward appearance, was precisely the counterpart of her own. Her treasures would fall below par in her estimation, and probably find their way to the melting pot before many days. But even admitting that piracy is an educator of the people, that fact cannot condone the offence of the pirate. Shakespeare said, "He who steals my purse steals trash;" but it was none the less a crime on the part of the thief who took the purse, and in these days he would have been sent to the Island for it. Dick Turpin and Jack Shepard were glorified because they robbed the rich and gave to the poor, but they were highwaymen all the same, and were duly hanged for their offences. If piracy is to be excused or tolerated in the trade, we might as well make up our minds to forgive Indian massacres, provided the red-skinned murderers will send the scalps of their victims to their bereaved families. No amount of logic can make robbery respectable.

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THERE have been a good many buyers in the city during the past

month, coming from all sections of the country, and these, with the utmost unanimity, speak encouragingly regarding trade prospects. They say that they have already felt an improvement in their business, and that the indications are in favor of a steady increase during the fall and winter months. They left orders enough behind them to furnish convincing proof that there is still some vitality left in the country, and to make the manufacturers and jobbers more hopeful than they have been of late. But it is curious to note the different views expressed by members of the trade regarding business, past, present and future. Some declare that there has been no business for two years; that they have not made expenses; that it never was deader than at present, and that they see no prospect for the future. These are the ones who always take a gloomy view of everything, and would not admit the fact if they were making a million dollars a day. Then there are others who admit that times are dull, but that they are nevertheless doing a fair business and making a reasonable profit thereon; they are spurred on by the very dullness to redoubled efforts to sell goods, and so keep doing something all the time. An aggregation of small orders results in an amount of business that is not to be despised. They look for increased business at an early day, and are confident that the average for the year will compare favorably with that of previous years. Then there is the over-sanguine man who is constantly looking for a "boom" in business, and when it does not come as he predicted, always has some good excuse to offer for the postponement. It is singular how men, arguing from the same conditions, can arrive at conclusions so opposed. The inference is that their peculiarities of temperament affect their judgment. The phlegmatic temperament, that takes things as they come and is always satisfied with present conditions, is the one to be envied. He lets no business cares disturb him, but keeps on the even tenor of his way, hoping for the best and looking always on the bright side. But neither hoping nor despairing will have any influence upon the volume of business, except so far as it can be stimulated or depressed by an exhibition of confidence or the lack of it. This is a country of too magnificent resources to be long under a cloud, and brighter days to come is a safe prediction for anyone to make. The hour of their coming may be precipitated if all business men would but unite in extending confidence to one another and using their best efforts to extend the belief that the remedy for dull times is to make brisk times. It was General Grant who said, "The way to resume is to resume." We might paraphrase this by saying that the way to revive business is to revive it. This can never be done by doleful croaking or constant predictions of evils to come.

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A VETERAN jeweler was heard to say the other day that the manufacturers of this country had increased their facilities for production in excess of demand, and that the consequence was an overproduction that broke prices, wiped out profit, and was the cause of business depression. He declared the only remedy lay in an increase of population, and held that there must be a large increase before the limits of our present producing capacity were reached. He seemed to forget that the manufacturing facilities of the country were increased only as demand made it necessary, and were only equal to that demand in a prosperous period. The normal condition of the country is one of prosperity. This condition is broken in upon periodically and with great regularity by seasons of financial depression, which paralyze industry and destroy enterprise. When this occurs it takes time to restore normal conditions; but, when they do return, all our manufacturing facilities will be required. Indeed, it is doubtful if they will be adequate to the demands made upon them, for, while they have been lying idle, the increase in population has been going on with the utmost regularity, and there are several millions more people in the country than there were

when manufacturing machinery was being driven to its full capacity. Give us one year of normal prosperity and there will be employment for all our manufacturing facilities.

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THE purchases made by buyers who have visited the city of late show that they intend to keep a more diversified stock of goods than heretofore, with a view to attracting custom and preventing their patrons drifting into outside places to buy jewelry. Some with whom we conversed say that they tried the experiment last year with good results, introducing bric-a-brac, perfumery, toilet articles in general, and a few other goods which the public requires. They not only sold these at a fair profit, but secured the patronage of persons to whom they had never sold before, and also sold more jewelry than they could have done but for the fancy articles they had in stock. They intend to extend the experiment to include a still greater variety of goods, and thus strive to increase the temperature for those outsiders who have been underselling them. There are many varieties of goods not classified as jewelry that are not out of place in a jeweler's establishment; such are artists' materials of all kinds, bric-a-brac, artistic glassware, stationery, musical instruments, etc. In all the large cities there are special stores for the sale of artists' materials, and very attractive they are usually made. In these days, when half the young maidens of the country draw and paint with a greater or less degree of artistic excellence, a place where the refined material can be obtained is almost a necessity in every community. The profit on such goods is on a par with that charged by druggists, where fifty cents' worth of raw material will make five dollars' worth of prescriptions. Manufacturers and jobbers in the jewelry trade should be the last to oppose diversified stocks, as we have heard of some of them doing, for whatever contributes to aid the business of the retail dealer, enables him to dispose of more jewelry than he otherwise would, and, of course, he has to buy just so much more. It is not necessary for the dealer to carry a miscellaneous and incongruous lot of goods, mixing codfish and wet groceries with his jewelry, but there are many things that harmonize beautifully with gold and silver goods, and tend to lend attractiveness to them. Let the dealer make his establishment the headquarters for a few lines of necessary articles, keeping only the best and selling them at a reasonable profit, and there is but little doubt about increasing his sales of his legitimate stock of jewelry. It is not a matter of experiment with many, but is a fact demonstrated by their own experience. It is the surest way to head off outside competition and to catch the public when it is inclined to pass you by.

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THE exhibition business is being so much overdone that manufacturers and inventors are growing tired. There is an inventors' exhibition now in operation in London; one is proposed in Nuremberg; another at Rome. An exhibition of American products and inventions is announced for 1886 in London. New Orleans is organizing a permanent show out of the debris of the recent exposition held in that city, and which was a conceded failure. All of these put forth claims to be of international importance, and solicit the attention of all classes of people. The fact is, international exhibitions are a thing of the past. The early ones were important because of their unselfish and unspeculative character; they were really a means of introducing to each other the various industries of all civilized countries. But they have fearfully depreciated of late years, and have become more the mediums of speculation than anything else. An ambitious city determines that an international show will attract attention to the merits of that particular locality, and

will bring thousands of visitors who will spend money liberally to the profit of the residents. In some instances the prizes to be awarded and honors conferred have been hawked about among the exhibitors and awarded to those who would make the most liberal contributions to the exposition funds. It costs exhibitors large sums to ship their goods and maintain them on exhibition, and the return they get for the expenditure of time and money is slight compensation. Special exhibitions have been more successful, because non-speculative. Such were the exhibitions of electric appliances in London and Philadelphia, the railway exhibition at Chicago, and the cotton exhibition at Louisville. Something of this kind might be organized to great advantage in the jewelry trade and among kindred industries, and we hope it may be done at no distant day. But it will scarcely be found profitable for representatives of the trade to participate in the so-called international expositions. Such shows have served their purpose and had their day.

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THE Congressional Committee appointed to visit Central and South America in the interest of commerce between those countries and the United States, has returned and submitted its reports regarding Ecuador, Venezuela and Guatemala. The members were cordially received by the officials of those countries, who expressed an earnest desire to cultivate more intimate relations with the United States. In the opinion of the Commissioners, what is required to build up our trade with those countries is lower freight tariff, a judicious selection of goods adapted to the wants of the people, and by observing the same care in the shipment of goods that is manifested by our foreign competitors in those markets.

## Recent Patents.

The following list of patents relating to the jewelry interests, granted by the U. S. Patent Office during the past month, is specially reported to THE JEWELERS' CIRCULAR by FRANKLIN H. HOUGH, Solicitor of American and Foreign Patents, 925 F Street, N. W., rear U. S. Patent Office, Washington, D. C. Copies of patents furnished for 25 cents each.

### Issue of July 14, 1885.

- 322,061—Bracelet. H. Liebel, North Attleboro, Mass.  
 322,110—Clock, Electric Alarm. C. Korfage, Brooklyn, N. Y.  
 322,364—Jewelry Pin. H. Fletcher, Cincinnati, Ohio.  
 322,097—Pendulum Regulator. J. Ganss, Brooklyn, N. Y.  
 322,093—Watch Balance Wheel. W. D. Davies, Brooklyn, N. Y., Assignor to Ansonia Clock Co., Ansonia, Conn.  
 322,297—Watch Key and Pendant. J. Lamont, Assignor to Fahys Watch Case Co., Sag Harbor, N. Y.  
 322,185—Watch Regulator. P. & C. Kaul, Lancaster, Pa.

### Issue of July 21, 1885.

- 322,640—Breast Pin. H. P. Pruium, Grand Haven, Mich.  
 322,673—Eye-Glass. J. J. Bausch, Rochester, N. Y.  
 322,461—Eye-Glasses. A. C. Lord, Northfield, N. H.  
 322,435—Finger Ring, Adjustable. F. N. Foster, Duluth, Minn.  
 322,680—Watch Case. W. Carpenter, Salida, Col.  
 322,449—Watch Case. E. F. Heffernan, Lockport, N. Y.

### Issue of July 28, 1885.

- 322,901—Bracelet. H. E. Chadwick, Providence, R. I.  
 323,167—Button or Stud. J. J. Lindauer, New York, N. Y.  
 323,370—Watch Case. C. H. Shaw, Brooklyn, N. Y., Assignor to Fahy's Watch Case Co., New York, N. Y.  
 323,272—Watch Dials and Faces, producing the Painted Roman Capital; Numeral Letters upon. D. R. Buchanan and E. L. Dodge, Assignors to L. R. Taft, Springfield, Ill.

### Issue of August 4, 1885.

- 323,543—Breast Pin Tongue. A. Thommen, New York, N. Y.  
 323,688—Brooch or Breast Pin. R. R. Hug, Cincinnati, Ohio.  
 323,577—Clock-Striking Mechanism. C. Hahlweg, Stettin, Prussia.  
 323,654—Watch Case. R. E. Fenner, Assignor to C. K. Giles, Chicago, Ill.  
 323,777—Watch Movement. A. D. Bingham, New Haven, Conn.  
 323,852—Watch Plate. S. T. J. Byam, New Haven, Conn.  
 10,631—Watch, Stem Winding. D. H. Church, Waltham, Mass., Assignor to R. E. Robbins, Boston, Mass., and T. M. Avery, Chicago, Ill. Re-issue.  
 323,795—Watches, Hand-Setting Mechanism for. W. E. Doolittle, Assignor to New Haven Watch Co., New Haven, Conn.

## Communications.

### THE BREAKING OF MAINSPRINGS.

To the Editor of the Jewelers' Circular:

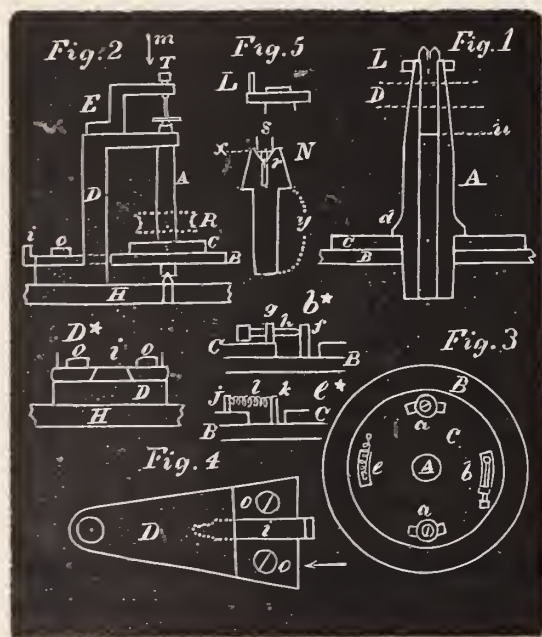
Noticing the communication in your valuable paper from R. Cowles, of Cleveland, Ohio, in relation to broken mainsprings in watches, please allow me to say that I have noticed the same thing. In my experience of 33 years I have never known of so large a per cent. of broken springs at this time of year. I always have noticed that there was a large increase in the breaking of mainsprings in watches in the fall of the year. For over seven years I was in the finishing rooms of the American Watch Factories, and there I always noticed a large increase in the breaking of mainsprings in the fall of the year. I have taken pains to inquire of watchmakers in the repair shops about the country. They always said there was a large increase in the breaking of springs in the fall of the year, and further, that they generally calculate to put in more springs in about two months in the fall of the year than they would in the other ten months. I have given the subject a good deal of thought for a number of years, and have come to the conclusion that it is due to the amount of electricity in the atmosphere. I will give some facts that have lately come under my observation, that prove this very point. A few weeks ago there was a severe thunder storm about 10 o'clock in the night, and in the morning, as the workmen were going to the shop, there were left at my office five watches in which the mainsprings had been broken during the night, and, on comparing them together, I found that they had all stopped between the hours of 10 and 12 o'clock. And on another occasion that has recently come to my observation, is this: there was a shower about two o'clock at night, and, as before, the workmen, on their way to the shop in the morning, left seven watches with broken springs, and all broken within two hours of each other. I would be pleased to see the opinion of others upon this subject in your paper. Some weeks ago I noticed in one of our daily papers that a watch repairer—in New York City, I think—estimated that there had been as many as 5,000 mainsprings in watches broken during the recent thunder storm that had passed over the city. Respectfully,  
 O. C. Dow.

## Problems in the Detached Lever Escapement.

BY DETENT.

WE LEFT the device we were describing for trueing up the teeth of scape wheels with the spacing wheel cut ready for mounting on a suitable arbor. Now comes the making of this arbor. We said in the July number that the arbor should be drilled in the direction of its axis from end to end; this is done to facilitate the removal of the center at one end for holding the foot of the scape wheel pinions, and the hole extending the whole length of the arbor

has also a tendency toward accuracy by enabling us to broach out the hole so as to have a taper center. The best drill for drilling the arbor is a twist drill about  $\frac{1}{8}$  of an inch in diameter. The length will vary somewhat according to the lathe, but from  $1\frac{1}{4}$  to  $1\frac{1}{2}$  inches will be about the length. At *A*, fig. 1, is shown the arbor of the full size, and shaped as shown. It will be remembered that the division wheel (described as having 15 spaces),  $1\frac{1}{2}$  inches in diameter, is to be mounted on this arbor. Now in actual practice it is better to have the division wheel cut into 60 teeth, using 4 of these spaces to represent each tooth of a scape wheel. Driven securely on the arbor *A* is a thick brass collar shown at *C*, fig. 1; this collar is driven to a shoulder *d* turned on the arbor *A*. This collar is about 1 inch in diameter and serves to hold the spacing wheel *B* in place. The spacing wheel is not fast to the arbor, but turns upon it at *c*, and is held in place by two screws, *a a*, working in slots; between the screw heads and the collar *C* are washers, so the wheel *B* turns freely on the arbor. At *b* is a device for rotating the spacing wheel *B* a trifle more than the space of 1 tooth. What we wish to accomplish with this attachment is to produce a comparatively cheap machine which will present a tooth of a scape wheel to the diamond lap (formerly described) at any desired angle, and exactly repeat these motions for each tooth. And the rotary motion produced by the device shown at *b* is of great importance. Two other motions are also given by means of slides similar to a slide rest, which advance the scape wheel toward the diamond lap either in the direction of the axis of the lathe or at right angles. Now it will be seen that by means of these compound movements we can with the greatest steadiness and regularity grind each tooth consecutively to the most perfect form. The device for slowly rotating the wheel *B* is



shown (enlarged) in elevation at diagram *b\**, and consists of two studs *f g* and a screw *h*. The stud *f* is attached to the wheel *B* and works in a slot in *C* as shown at *b*, fig. 3. The stud *g* is fast in the collar *C*. The screw *h* is tapped in *g*, and the point which is cone-shaped works in a pit in the stud *f*. Now there is at *e*, shown opposite to *b* in fig. 3, a spiral spring attached to two studs, which serves to keep the point of the screw *h* in place. The device shown at *e*, fig. 3, is also shown in elevation (enlarged) at diagram *e\**. This device also consists of two studs attached to the collar *C* and wheel *B*. The studs *j k* are united by means of the spiral spring *l*, the action of which is counter to the screw *h*, diagram *b\**. It will be seen that relative action of the collar *C* and the wheel *B* is very similar to the maintaining power to a fusee watch; the spiral spring *l* having a tendency to revolve the wheel *B* in one direction and the screw *h* to push it in another. At fig. 2 is shown an elevation of the arbor *A* and wheel *B* seen in the direction of the axis of the lathe, together with the devices for holding them (arbor *A* and wheel *B*)

in position. These parts consist of a bed piece *H*, a cock or bridge *D* for holding the upper end of the arbor *A*, and a smaller cock *E* which supports the top pivot of the scape wheel pinion. A plan or top view of *D* is shown as seen in the direction of the arrow *m*. This view shows the cock *E* removed; and at *i* is shown a slide working through the upright part of *D*. The inner end of the slide *i* catches and holds the teeth in the spacing wheel *B*. Now is evident the object of the devices shown in diagrams *b\** and *e\**. We will suppose we have a scape wheel in our device to grind; we slip the slide *i* into one of the (60) teeth in the wheel *B* which comes nearest to the position required; then, by means of the screw *h*, we bring the tooth to be ground into exact position. The cock *D* should be of hard (cast) brass and about  $\frac{3}{16}$  thick when finished, and shaped as shown. The slide *i* is shaped as shown in fig. 4, the dotted outline extending into the spacing wheel *B*. At diagram *D\** is a rear view of the foot of the cock *D*, showing how the piece *i* is held steady by the pieces *u u*. These pieces are made separate from *D* and riveted fast, and are also held by the screws *o o*. The slide *i* is best made of steel and the point slightly wedge shaped, as was explained in July number of this journal. The upper end of the arbor *A* is conical as shown, and is fitted to a conical hole in *D*, as shown at the dotted lines in fig. 2. The foot of the arbor is held in place by a steel screw with a cone-shaped point, as shown at *p*; this screw, when in place and the arbor *A* pressed up into its bearing in *D*, can be filed off smooth with the lower side of *H*, and a slot can be cut in it (*p*) in case any lost motion is detected in *A*, so it can be turned in. The hole in the upper end of the arbor *A* is broached out taper so as to admit of small center fitted up specially to receive the foot of a scape wheel pinion. Such a center is shown at *N*, fig. 5; it is accurately fitted to the upper end of *A* when a hole is drilled in a trifle larger than any scape wheel pivot; then the conical recess *r* is turned in; this conical recess receives the shoulder of the pivot. The diagram at *N*, fig. 5, is much (5 times) magnified, so as to show the idea which the steadiness of the pinion when it holds the scape wheel for grinding does not depend on the mere strength of the pivot but on the shoulder. The same principle is used at the upper end at *T*, fig. 2. A few changes of *N* will suffice for all sizes of scape wheel; the centers extend downward to the dotted line *u*, fig. 1, where there is a hole for forcing out the centers *N*. In fitting up such centers it is well to mount the portion shown in fig. 2 on the place where your lathe head goes, putting a temporary pulley on the arbor *A*, as shown in dotted outline at *R*, fig. 2. The arbor *A* should be mounted so as to come to the same height as the lathe spindle, so as to use your rest and graver precisely as if doing ordinary turning. If this is done the lower part of the centers *N* can, as contained in the dotted brace at *y*, fig. 5, be turned in an ordinary split chuck to fit the upper end of the arbor *A*; if the center is now cut off on the line *x* and inserted in *A*, and the whole of fig. 2 mounted as suggested, the recess at *r* can be centered and drilled with extreme accuracy.

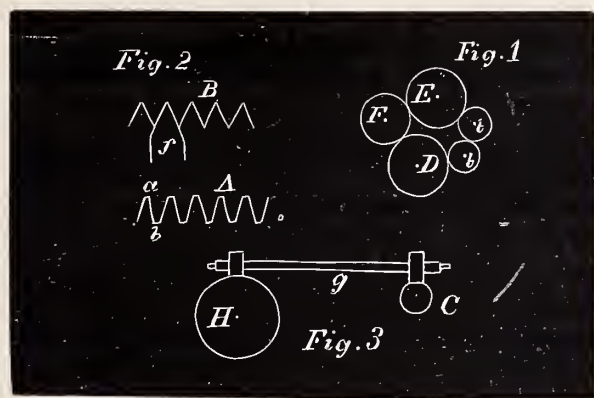
## Lathes and Lathe Work.

BY THE MODEL WATCHMAKER.

WE HAVE carried our lathe through the system of two dead centers, and shown how the power can be conveyed from the foot wheel to a counter shaft, and from it to the work in the lathe; we have also shown how the motion is carried from the work we are turning down to the feed screw. It is of course understood that the feed wheels described in July number can be used on either end or head block, and that the pinion which goes on the feed screw could by means of a jam nut be used in connection with either head or tail stock.

Now it has been the desire of the writer to instil into the reader more of the true principles of the lathe and the work it can accom-

plish than to describe methods in use, and he chose unusual conditions quite as much for the purpose of freeing the mind from trammels and habits as for any benefits to be derived from a lathe constructed as described; still it is true that a lathe with two dead centers has several advantages in matters of accuracy. Still I am ready to admit, for the ordinary work and jobs of the workshop, a live spindle lathe is the most rapid, and, if the centers are kept true, quite accurate enough. With a lathe constructed as I have described it can be used to make a live spindle of superior excellence. The train of feed wheels described and illustrated in July number of the present year the reader will understand is given only as an illustration of one of the modes of effecting the motion of the feed work. The details of all the sizes of wheels, with the consequent change in the number of teeth for cutting threads of different pitch, *i. e.*, a different number of threads to the inch, is hardly necessary to give. I would say however to the reader that for ordinary turning a reversing motion should be given, so the turning tool will have the same feed when going back as it had in the advance. This is easily effected, as shown in fig. 1, where the wheels *ED* represent two of the principal wheels in the transfer system, and *F* a transfer wheel which only serves to convey the power from one to the other. Now if we use one wheel as shown at *F*, the wheel *D* will turn (say) to the right, but if we use two wheels as shown by the dotted outline at *b b* the wheel *D* will reverse and turn to the left. It is of course understood by the reader that the size of the wheels *F* or *b b* will make no odds with relative speed of *ED*. We now come to cutting a screw with a milling tool in the tool post instead of an ordinary cutter. This system of cutting, especially for accurate screws, is



much to be commended. To make the advantage of the rotary cutter more apparent let us consider the action of cutting a screw in the lathe with the ordinary turning tool. The usual form of thread is the so-called V-shaped; the angle usually used is about  $60^\circ$ , as shown at *B*, fig. 2. A better form is shown at *A*; the angle here is about  $30^\circ$ , which leaves a portion of thread flat, as at *a d*. In this form of thread we have enough of the V shape so that we can easily take out any side shake or lost motion from wear or other causes. But to resume and consider the conditions under which a thread is turned in an ordinary lathe. In fig. 2, at *f*, is shown in dotted outline the form of a cutter such as is in common use for turning screw threads. Now this cutter is gradually set forward, and repeated cuts made until a thread of sufficient depth is obtained. In the process of cutting the tool cuts on both sides of the A-shaped tool. Now it must be evident to all persons of a reasoning turn of mind that the cutting must be untrue to an extent inadmissible in any other species of lathe work. As, for instance, a hard spot is encountered by the tool, the work must dodge to an appreciable extent, and again, if a soft place is met the tool will eat in. Not so, however, is it if a mill is used; the mill, if not urged too fast, will cut its way through places of all reasonable degrees of hardness with great accuracy. Even in turning a plain cylindrical piece in which we desire great accuracy the rotary cutter, generally termed a mill, will be found to produce superior results. It may not be amiss to say that for such jobs as are made of steel, to be subsequently hardened and ground, the

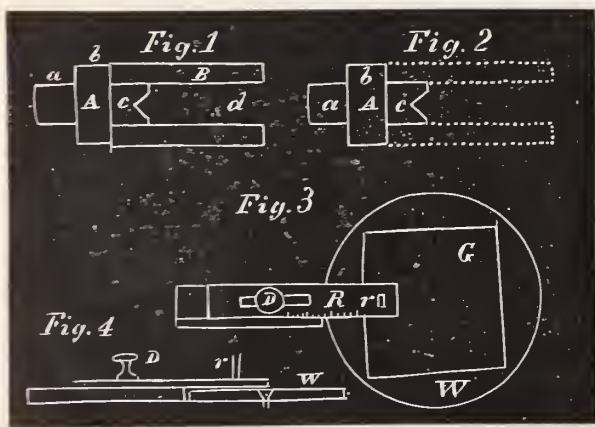
trouble of turning with a mill would be an unnecessary waste of time, as the process of hardening would spring a piece of any length somewhat out of true, which would have to be corrected by grinding with an emery wheel, which acts precisely as the mill. Screws, however, are seldom or ever hardened when they are to be used in places where great accuracy is desired. In the present instance I propose to describe how to cut a screw with a mill applied to our lathe with two dead centers, but the plan will be equally available for live spindle lathes which have a screw cutting attachment. A slight change must be effected in our lathe in order to use the milling tool in the tool post; the first of these is we must arrange our lathe so the work will turn very slow. By the work I mean the screw we are cutting; this should revolve proportionate to the diameter of the screw we are cutting. We will suppose in the present instance the diameter of the screw to be  $\frac{5}{16}$  of an inch. Now the screw we are cutting should not revolve faster than once in 2 minutes and the cutter in the same time make at least 1500 revolutions. To effect this change we would let the train of transfer wheels acting from the lathe center be set so as to cut a screw of 20 threads to the inch, which is about right for a screw  $\frac{5}{16}$  in diameter. We will now tell how to get the relative speeds and then tell how to mount our rotary cutter. The driving wheel we left on the driving center in July number contained 84 teeth; now we wish to have a speed of about 1 revolution in 2 minutes. The foot wheel, such as we started with, can be worked steadily say at 60 revolutions to the minute; if the countershaft turns 5 times to the driving wheel once we have 600 revolutions of the countershaft in 2 minutes. If, now, we make an endless screw to engage the *H*, fig. 3, this wheel representing the driving wheel 84 teeth, then the arbor *g* will have to make 84 turns to one of *H*. Let *C* represent the countershaft running parallel to the axis of the lathe. It is understood that the arbor *g* runs at right angles to *C*. If another endless screw is mounted on the countershaft *C*, and a pinion of 8 teeth put on the arbor *g*, we have a motion of 672 revolutions of *C* to one of *H*. How to fit up the revolving cutter will be given in next article.

### Advice to Watchmakers' Apprentices.

BY A MAN WHO HAS SPENT TWENTY YEARS AT THE BENCH.

ALMOST everybody knows that Yankee clock movements are lacquered to protect them from corroding, but how it is done is a mystery to them. The art, and it is quite an art to lacquer well, is one not hard to learn; the proper material and a little practice will soon do it. The lacker or lacquer, and I think lacer, are the indiscriminate spelling of the word which means a solution of gum lac in alcohol; to this is generally added some resinous coloring matter to imitate certain colors of metals. These coloring matters are usually gamboge or saffron for yellow or gold colored, and dragon's blood for a red. A very little experimenting with the substances named will do more to give practical ideas than a volume of receipts. The best way is to make good lac varnish by dissolving shellac in alcohol and to this adding such coloring of gamboge and dragon's blood as best suits the work in hand. The qualities of gum lac vary somewhat, but you take as a rule 2 oz. of shellac to one quart of alcohol; these proportions are a little too much shellac, but if you make your alcoholic solutions of gamboge and dragon's blood separate in alcohol the proportions will be found about right. If a mixture of alcohol and shellac is left to stand for some time a clear dark-colored liquid will rise on the top and a muddy precipitate settle to the bottom; these will usually be about in equal proportions, *i. e.*, there will be about as much of the clear liquid on top as there is of the turbid at the bottom. The clear liquid at the top makes the best work, but for ordinary jobs the whole fluid shook up together does very well. Aloes and turmeric root decoctions are also used for yellow coloring matter, but gamboge gives a harder lacquer, while

dragon's blood, if added in any quantity, makes a lacquer very difficult to dry hard. Mix a little of the shellac varnish (shellac and alcohol as given above) with a little of the gamboge and dragon's blood (dissolved in alcohol) and try it on some brass work until the color suits and you will soon know how to mix for color. Now comes the putting on; this is done with a very soft camel's hair brush proportionate to the work, but one about the size of one's little finger will be about the right size for clock work. The plates of clocks are dipped in the lacquer. A good deal of care and skill is required to make the coat even in this way, but dip quickly and draw out a little slow will do it. If lacquer is applied with a brush the article should be heated up to about as hot as one can bear to touch the lip. A quick flowing touch with a full brush is the way to ensure an even coat. Pendulum balls for clocks should be burnished to get a mirror polish; the same methods of burnishing as is used for silver plated work, *i. e.*, a steel burnish used with a solution of yellow rosin soap in water. For clock bezels a rouge polish is to be used, but no polish for lacquering looks as well as a burnish polish. Pendulum balls are generally polished in a lathe arranged purposely for the job. For removing old dried-on lacquer boil the article in borax water, re-polish and lacquer again. In the present time the little Yankee lever is the common clock one has to deal with; they cost next to nothing and consequently have to be fixed cheap. The usual trouble with these are the balance pivots are worn stunted; to remedy this a wax chuck lathe is the quickest. Soften the pivots and provide a deep hollow chuck and turn up the pivots and re-harden, making them as hard as a red heat and a large lump of beeswax will make them. The chuck to be used for clock balance pivots is made as shown in figs. 1 and 2. A piece of large brass wire is turned as shown in full outline in fig. 2 at *A*; *a* being to screw into the lathe, *b* the shoulder; *c* is turned like *a* and a screw cut on it the same as if it was to screw into the lathe chuck; but a large piece of brass wire is drilled so as to form a piece as shown at the dotted outline in fig. 2. This is tapped at one end and screwed on



*A*, as shown in fig. 1. The hollow cone shown at *c* is to receive the inner end of the balance staff to center it. The steel hollow cones very seldom need anything to be done to them, but if they do need any changes don't fool away any time on them while hard, soften and shape, then make them as hard as fire and water will make them. Polishing will do but very little good; if smooth and hard they will do quite well. I suppose it is hardly necessary to say that the tubular part of the chuck shown at *d*, fig. 1, is to be filled with lathe wax. Such a deep chuck holds the work much firmer than mere wax. In your clock work do not neglect your cases; restore them to as fresh a look as possible, it pleases the customer, for they can see the case, but how well the movement is repaired is a matter of confidence. A little French polish rubbed over the case is very quickly done and will add 25 or 50 cents to the job. In cutting round glasses for clocks provide yourself a wooden wheel to which the glass is temporarily cemented by 3 or 4 little patches of simple beeswax. The wheel *W*, fig. 3, should be 15 or 18 inches in diameter and secured to a table with a common wood screw, counter-

sinking for the head; on this the glass is fastened by warming the glass and pressing it on the bits of wax. A piece of thin board is arranged so as to form a bridge (*R*) extending over the glass as shown in fig. 4, which is an edge view of fig. 3. This bridge is secured in place with a thumb screw *D*, which works in a slot in *R*. At *r* is a hole cut which will admit a diamond or one of those little cheap steel wheel cutters. Now the manner of using this simple affair is to cement a piece of glass large enough for your job on the wheel *W* (the glass is shown at *G*). You next set the bridge *R* so the hole at *r* is in the right place. This can be determined by having the edge of *R* divided into a measure. If now your diamond is inserted into the hole at *r*, and the wheel *W* revolved at the same time, a perfectly circular cut will be made. If you have the divisions on *R* made to correspond to the rest of the parts you only need to measure for the size of glass and set *R* to correspond and one turn of *W* and the work is done. One of those 10 cent glass cutters will last for years in such a machine and do its work as well as a diamond.

### Practical Hints for Rapid Timing.

[By THEODORE DÖHRING, in *Deutsche Uhrmacher Zeitung*.]

THE MANNER of timing an adjusted or repaired clock or watch in the shortest possible time is so important to the repairer that I may be pardoned for publishing the following hints. Our horological papers generally steer clear of the question, and the apparatus gotten up for assisting in timing are frequently so complicated and bewildering to the ordinary watchmaker that they are of little or no real benefit to him.

I first make a few random remarks about the time necessary for my method of timing. I classify timing under five different heads, as follows:

I.—A mantel clock with striking train requires on an average six observations, which must be taken hourly, so that only one day is required for performing all the labors connected with timing, and the clock can be delivered immediately after repairs.

II.—An ordinary watch, both with and without a seconds hand, requires a greater number of observations, because it requires to be timed in two positions (horizontal and vertical); from 6 to 20 will generally be sufficient. But as a skilled timer, if necessary, can in one hour take from 5 to 6 observations, from 2 to 5 hours are in urgent cases required to make even difficult timings. Watches with Breguet balance springs, under certain conditions, require a greater number of vibrations, and in the case of a good watch with compensation and exposure to the oven the number of observations must be unlimited. This work is in London paid for with £1 10s, which is in many cases not enough, because the art of timing should handsomely be paid for.

III.—A regulator with weights may, on an average, be timed in five observations, which can be taken hourly; after repairing the timepiece one-half day more is fully sufficient to have it ready for delivery.

IV.—Watches without seconds calculation, such as little ladies' watches with 13 or 11 teeth in the cylinder scape wheel, as well as almost all older English watches, with less or more than 18,000 vibrations per hour, may be observed in a similar manner as pendulum clocks without striking train. But as they are to be timed in at least two positions, and as one observation only can be taken per hour, such a timing, if very difficult, will generally require two days, although under circumstances a half a day may be enough.

V.—Black Forest clocks (for the reason, to be explained hereafter, that they can be observed only once every three hours, and as they require on an average six observations) will need almost two days for timing.

I. *The timing of an 8-day mantel clock with striking train.*—The timing contrivance, which is managed through the small square above the figure XII, is to be set in such a manner that the square can be turned an equal quantity to the right as well as left. The pendulum regulating nut, in case there is one, must be split, so that it moves with gentle friction, in order to render a disturbance in transport impossible; it must also be divided into one-eighth parts by lines and dots.

If not too much pressed for time, clocks with striking work can very commodiously be regulated. Place a clock in the vicinity of a standard clock with seconds pendulum, and let it go at first with a feeble power, winding it, say, one and one-half coils; place the minute hand to a short time before full, and wait until unlocking takes place by the going of the clock, following with eye and ear the seconds beat of the standard clock. As soon as the first stroke of the clock resounds, note the time, for instance, 8 hours, 17 minutes, 12 seconds, or, to make it shorter, 8.17.12. It next depends upon establishing, after the lapse of one hour, again the minute and second at which the first stroke of the clock takes place. If we remember, however, how deeply we are sometimes engaged with our work, for instance, when examining an obstinate depthing, etc., we must confess that this exact timing has its difficulties, and the close observance of the right time is one of the great factors of my method. Having a good deal to do in this line, I keep a well-timed regulator with striking train specially for this purpose. As soon, now, as I have jotted down 8.17.12, I move this regulator one minute beyond full, and then return to my work in hand until 59 minutes afterward the regulator strikes and attracts my attention to the fact that in about one minute an observation is to be taken. When there are many large clocks ticking and striking in a shop, it might easily happen that the striking regulator used as alarm will be unnoticed, and in order to avoid this I muffle the gong by putting a piece of paper in it. A watchmaker can summon up sufficient fortitude to listen to the noisy striking of various clocks in course of repairs, or to suffer the abomination of diverse cuckoo clocks in his sleeping room, but when the sound of the muffled gong strikes his ear his whole nervous system is jarred, and he is forced to hasten to the place of observation.

If the first stroke of the clock now takes place at 9.16.58, it will result in a difference of "14 sec. too fast" in one hour. For the difference of one second in one hour I screw the regulating nut one-eighth turn; in this case, therefore,  $1\frac{3}{4}$  turns. If the thread is very open less will do; with a close thread take a little more. A long pendulum requires for the same difference a great deal more shortening than a short one, and only the practice of years will enable you to hit the mean—how much a pendulum is to be shortened or lengthened. A theoretic calculation would be out of place, as it will be seen by the following observation how much has been effected by one turn.

We will next assume that the difference has been lessened, and for the next observation we place the alarming regulator only one-half a minute beyond full, immediately after the mantel clock has again been corrected, and the time of the first stroke say occurred at 10.16.58, which is jotted down. I then devote myself again to my work until the hated muffled sound again jars my ear, and tells me that in one-half a minute more I must take an observation. The first stroke takes place, let us say, at 11.17.1 $\frac{1}{2}$ ; the clock therefore has lost in one hour 3 $\frac{1}{2}$  sec. I then set up the simple rule-of-three example:  $1\frac{3}{4}$  turns effected so much for 17 $\frac{1}{2}$  seconds, how much do I need for the still existing difference of 3 $\frac{1}{2}$  seconds? =  $\frac{7}{10}$  turn! The regulating screw, however, is divided in eighths; I have to turn  $\frac{7}{10}$  turn, therefore  $8 \times \frac{7}{10}$  of the eighths of the nut are  $2\frac{4}{5}$  eighths, or, to make it short,  $\frac{3}{8}$  turn. Nor will the error be grievous if in place of the  $\frac{7}{10}$  turn I make  $\frac{1}{3}$  turn by eye measurement.

Let us suppose the case that the next observation still results in a difference of 1 second in 1 hour too slow. I might be satisfied with

this result for the time, because 1 second in 1 hour is equal to about 3 minutes per week, and I might time the clock more closely, after having delivered it to the customer, in 2 or 3 visits, each after the lapse of a week, by moving the little square spoken of. But I prefer to let the clock keep on going; again I jot down the data of the last observation and difference, and then wind the going train altogether, in order to find out whether and how much the clock accelerates with full power. This difference generally is not great; should it be, however, we must consider what difference there should be, in order to have a correct rate with medium power. Another calculation can next be instituted, to ascertain the quantity still to be screwed so as to obtain the desired rate.

At this point it appears to me that the ken of the timer meets its limits, because it is beyond his knowledge to what temperature the clock will subsequently be exposed, and what alteration of rate is thereby required; just as little can it be judged by how much the rate of the clock will vary when set up in another place. Nor do I consider that the repairer is "empowered," or, more plainly said, "paid," to institute experiments for ascertaining the differences of rate with different powers or in different positions.

If the pendulum bob does not rest upon a nut, the length of the pendulum can be measured with the sliding gauge, and the calculation evidently is to be made as follows: If a lengthening or shortening of the pendulum of  $a$  millimeters effected an acceleration or retardation of  $b$  seconds, how many millimeters are necessary for the still existing difference of  $c$  seconds?

I hold that an exact theoretical calculation is barely possible, if from the change of the pendulum length and the thereby produced change of rate as known factors, the unknown factor of the change of the pendulum length still to be effected is to be deduced, and if together with the change of the pendulum length also the shifting of the center of gravity is to be considered. Although it would be interesting to hear the opinions of a good theoretician, although I suspect that the practical repairers would not venture to go beyond the above specified process with the rule-of-three.

It is evident that by this method the correctness of the observation depends upon the precise drop of the lifting piece; if, therefore, its function takes place irregularly, on account of too much shake, or if the relieving pin does not fall out at right angles from the canon, so that for this reason the drop might take place irregularly, it is better to make the observation direct on the minute hand, in a manner to be explained in paragraph III. for regulators. The observation can be made one minute after full, by using as alarm the artificially ruined sound of the gong at the full stroke. This method can also be recommended in very urgent cases, where a great exactness of the observations is necessary, and when, at the same time, only a few can be taken for timing.

It is evident that in case of an interruption of the regular hourly observations the difference is to be ascertained for one hour, and that, if an accident prevented us to set the alarming regulator right, it is only necessary to move it one minute more forward than is shown at the time by the clock to be regulated. It will then also naturally strike one minute earlier and give the timer an opportunity to direct his attention to the observation.

All kinds of clocks with seconds calculation may be observed at desirable intervals, and if only such are to be regulated it is well to stop the going of the disagreeably striking alarm regulators, so as not to get accustomed to it.

II. *Timing a common watch.*—If the watch has a seconds hand I make the observation generally at the 15th second, although the division is sometimes so defective that some other point is better suited; it is then only necessary to make at this place a mark with rouge. The question next occurs on establishing precisely at what time the seconds hand passes the given point. At the beginning of the observations, say, it occurred exactly at 9.41.3 $\frac{1}{4}$ , and at the

second observation, which accidentally took place exactly 18 minutes after the first, at  $9.59.6\frac{1}{2}$ , then the watch differs in 18 minutes by  $2\frac{1}{10}$  seconds, or  $9\frac{1}{5}$  seconds in one hour.

(*To be Continued.*)

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### Letters to Watchmakers.

[By DR. LEONARD WALDO, Astronomer in charge of the Horological Bureau of the Yale College Observatory.]

#### X.

#### THE APPLICATIONS OF ELECTRICITY TO HOROLOGY.

#### *Sources of Electricity—Batteries.*

*Continued from page 199.*

WE HAVE dwelt thus at length on the Daniell form of battery because it is the most important of all batteries for general use, and it occurs in so many different forms that it can be applied to almost any purpose. It is always to be remembered, that of all known batteries this one gives the most constant current, with the least expenditure of money for materials or of supervising care in its maintenance. The amount of current which can be obtained from it has the widest variation, because the internal resistance of the various forms are so different. Thus, suppose it becomes desirable to have a very weak current continuously applied, such as would be necessary in some forms of electric clocks, it would be quite possible to use a form of Daniell cell, in which a flat spiral of copper wire, at the bottom of a common tumbler, should have over it say from twenty to thirty sheets of blotting paper, which had been dipped in a solution of sulphate of copper. The same amount of blotting paper, dipped in a solution of sulphate of zinc, and laid on the top of the sulphate of copper blotting paper, and the whole surmounted by a piece of sheet zinc, serves to complete a simple Daniell cell. Of course, the copper wire should be covered with a thin piece of rubber tubing or some other insulating material, where it is led past the zinc and the zinc sulphate solution. Another simple way of constructing a Daniell cell is to put in the crystals of sulphate of copper over a coil of copper wire or sheet of copper at the bottom of a glass vessel, and then to cover the crystals of sulphate of copper with a layer of sand, say half-inch or more thick. The sulphate of zinc solution is put in after the sulphate of copper solution has been used to fill the vessel up to the top of the sand. Sometimes the entire cell is filled with sawdust, the copper sulphate, zinc sulphate, and zinc maintaining their relative positions, the sawdust being wet with the solutions. A neat way to make small porous-cup cells is to make the porous-cup of parchment paper. This may be most easily accomplished by taking a square-ended stick and placing the end of the stick in the middle of a sheet of parchment paper. The sides of the paper may then be folded around the stick in such a way that there will be a square paper cup made when the paper, after being folded around the stick, is slipped off from its end. With a little copper wire, a pound or so of sulphate of copper, and some sheet-zinc, a large number of small cells can be made in this manner, at a cost of only a few cents per cell. I have found small tumblers with sides as straight as possible, to answer admirably for cells of this description. In experimenting with these and other forms of home-made cells, it is to be remembered that in all porous-cup cells the copper does not come in contact or pass through the sulphate of zinc, and therefore needs no insulation. The simplest way of insulating copper wire is to run it through a piece of glass or rubber tubing.

It is absolutely necessary, to have any ideas which are worth having on the subject of batteries, that the learner should experiment himself with them; and I want to urge upon those who desire to acquire a practical knowledge of this subject, that they begin experimenting with the construction of a Daniell cell.

There are two other types of batteries of frequent use in horology.

It is oftentimes desirable to exert the force of a powerful electric current, but for a short time only. The ringing of bells; the driving of clock hands once a minute or once an hour; the releasing of time balls or the firing of time guns; the synchronizing of clocks at stated intervals, all require more powerful currents than we can readily obtain with a Daniell cell.

The two types we are about to describe differ from the Daniell cell in having a larger electro-motive force, or difference of potential between the terminals of a cell, and in having a smaller internal resistance. They have not, however, the constancy of the Daniell cell, and they are most advantageously used for sending currents of short duration, and at intervals sufficiently long to allow of the complete self-restoration of the cell.

The first type is that in which carbon and zinc are together immersed in a concentrated solution of chloride of ammonia. It is necessary that the carbon should be surrounded by some deoxidizing mixture, such as the black oxide of manganese. This is accomplished by enclosing the carbon in a porous cup, which is filled around the carbon with black oxide of manganese in crystals, or by securing to the carbon plates of agglomerated black oxide of manganese by means of rubber bands. This agglomerate consists of

- 40 parts black oxide of manganese,
- 52 parts of carbon,
- 5 parts of gum lac,
- 3 parts of sulphate of potassium,

the whole compressed at the temperature of boiling water, under a pressure of three atmospheres. This form of battery does away with the porous pot, has less internal resistance, and is in every way superior to the older porous pot form described above. Both cells have been patented by Leclanchè, and the user can do no better than buy them of the dealers. The cells cost at retail from \$1.10 to \$1.75 per cell.

The Leclanchè cell has the very great advantage of requiring no attention for a year or more at a time, and of always being ready for use. The solutions employed are not strongly corrosive or poisonous, the materials of which the battery is made are not expensive, and the electro-motive force of both forms above described is about one and one-half volts (1.48 volts when not polarized).

The internal resistance of the porous-pot cells is from 9 to 10 ohms for the small size, 5 to 6 for the medium size, and about 4 ohms for the large size.

For the other and better form of Leclanchè battery, in which the agglomerate plates are held in place by rubber bands, the internal resistance varies from 1.8 ohms to .9 ohms, depending on the size of the elements.

Six of these cells, coupled in parallel pairs, would give enough current for a small electric light to be used a few minutes at a time. Thus, for instance, it requires about  $1\frac{1}{4}$  amperes of current to fully light up a small incandescent lamp. The reader will easily see that with such a combination of cells, we should have a total electro-motive force of  $3 \times 1\frac{1}{2}$  volts, and a total internal resistance of the battery of about  $1\frac{1}{2}$  ohms. If we suppose the internal resistance of the lamp to be 2 ohms, we should have a total resistance in the circuit of  $1\frac{1}{2} + 2 = 3\frac{1}{2}$  ohms, and an electro-motive force of  $4\frac{1}{2}$  volts. If we divide  $4\frac{1}{2}$  by  $3\frac{1}{2}$ , our quotient (which indicates our current) is about  $1\frac{1}{3}$  amperes. It would be impossible, with any of the ordinary forms of Daniell cells, to obtain this amount of current.

The most powerful of all of the cheaper forms of batteries is that which is commonly known as the bi-chromate of potash battery. The cell in this battery occurs in almost as many forms as does the Daniell. It consists essentially of an amalgamated zinc and a carbon, separated from each other by a mixture of a solution of bi-chromate of potash and sulphuric acid. It was first devised by Poggendorff in 1842. The zinc must be amalgamated, and the proportions of the liquid vary with the work to be performed. A solution devised by



Tissandier in 1882 gives, in practice, admirable results. The proportions are as follows :

- Water, 100 parts by weight.
- Bi-chromate of potash, 16 parts by weight.
- Sulphuric acid (of strength 66°), 37 parts by weight.

Two elements of this solution—the bi-chromate of potash and the sulphuric acid—are unpleasant things to handle. The bi-chromate of potash, because it is very poisonous, and in pulverizing it the particles are apt to float in the air and be inhaled ; and the sulphuric acid, because of its violent corrosive properties. I have found it convenient to dissolve as much of the bi-chromate as possible in hot water, and add the sulphuric acid last of all, carefully stirring the solution in a large granite-ware kettle. The amalgamation of the zincs is best accomplished by immersing them for a few seconds in a solution made as follows :

- 1 part by weight of mercury,
- 2 parts by weight of nitric acid,
- 4 parts by weight of hydro-chloric acid.

These should be gently heated together in the open air until the mercury is entirely dissolved, then add 6 parts by weight of hydro-chloric acid, and keep for future use in glass-stoppered bottles. This operation ought to be carried on in the open air because of the dense and poisonous fumes of nitrous acid, which are freely given off when the mercury is added to the hot acids. For actual use it is convenient to pour this liquid into a flat glass dish, and to immerse the zinc in it for a few seconds. The amalgamation is complete, and this method is by far the simplest and most efficient after the solutions have been prepared.

In all of the above experiments it is not necessary that the chemicals should be chemically pure, except that a very good grade of chloride of ammonium should be employed in the Leclanchè cells, and the ordinary commercial chloride is hardly pure enough.

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### Lick's Observatory in California.

THE FOUNDER of the largest observatory in the world, which will be ready only in two years more, was James Lick, who was born in 1796, in Pennsylvania, of German parents. Originally a piano manufacturer, he resided for the greater part of his life—until fifty years old—in South America, where, by diligence and honesty, he accumulated a large fortune. Shortly before the discovery of gold in California, he settled in San Francisco, but did not go to the mines, employing his money in purchasing real estate. Although he understood nothing of astronomy, he took a great interest in it after the completion of the Washington telescope, and consulted various authorities whether it was possible to construct a still greater one, which should eclipse all those existing at present. Seized by this idea, he appointed a committee, and for this purpose placed at their disposal the vast sum of \$700,000. He decided that the object lens should be of a size of at least 40 inches, and that the most competent firm should do the work, no matter where it was established—whether in America or Europe.

No German house, not even that of Mr. Merz, of Munich, however, felt inclined to take the responsibility. Finally, Howard Grubb, of Dublin, who had, in company with his father, constructed the large reflector of Melbourne, Australia, and the excellent telescope of Vienna, Austria, assented. The work naturally commenced with the lenses for the object lens. A contract was made in the year 1880 with Alvan Clark & Sons for the manufacture of one lens, with an inner clear area of 36 inches, the greatest lens ever cast since the invention of the telescope. Mr. Feil, of Paris, undertook the manufacture of the necessary flint glass, in which he was successful ; but when he undertook the founding of the crown-glass, he encountered such difficulties that, as far as we know, it has not yet been delivered to the optician,

When the founder has a mass of glass weighing several hundred pounds ready, the clay mold in which it has been cast must be broken. The exterior portions of the glass, which are always impregnated with the clay and other impurities, must be cut off with a wire and sand and water. This process is extremely laborious, and requires weeks, sometimes months. When this has been done the mass is reheated to nearly the point of fusion, and pressed into the shape of a disc, something like a thin grindstone. When Feil commenced to heat his glass it crackled into many pieces, and he was successful only after seventeen failures.

The construction of the gigantic and yet very delicate machinery by which the 60 foot telescope can be directed to any part of the heavens, which motion is effected by a clockwork, has not yet been commenced. The large masses of metal forming the axes and supports of the instrument must be set in motion by a mechanical apparatus, some parts of which are as delicate as those of a watch. It can be imagined that the micrometer will be a very complicated piece of work ; and for all these single apparatus a special astronomical mechanician is required.

As is known, the observatory, the completion of which the magnanimous founder was not destined to see, will be built upon Mount Hamilton, an elevation 4,400 feet above sea level, in the California coast range, not far from the city of San José, and command one of the best localities for the purpose in the United States.

The erection of the buildings and the construction of several instruments, one of them a photo-heliograph, for taking solar photographs, which during the late transit of Venus rendered valuable services, progresses rapidly. On the completion of the institute it will be delivered to the curators of the University of California, who will make the appointments of the astronomers.

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### A Pattern Country.

MENTALLY passing in review the entire list of European countries, there is truly not one among all of them so well entitled to the highest respects and encomiums than Switzerland. Fenced in between barren rocks, interspersed with grim sentinels of a forbidding mien, the little nation seeks to make the best of bad circumstances. These thoughts were called up on reading an advertisement in a scrap of Swiss newspaper, entitled the "Bund," without name of place or date of issue. The notice reads as follows: Competitive prize concerning the introduction of a new branch of industry in Switzerland. A magnanimous gentleman has handed to the Central Committee of the Swiss Exposition the sum of 3,500 francs, for the purpose of awarding them to the three best solutions of the question:

"What new branches of industry might advantageously be introduced into Switzerland, or what branches are susceptible of a higher development than heretofore? Ways and means are to be indicated which would lead to a successful end."

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### To Produce a Grained Surface on Brass.

THE *Journal Suisse d'Horlogerie* contains a recipe for effecting the graining upon brass. The process for producing it by means of silver powder demands a certain skill, to make the graining uniform. The watchmaker, who is but seldom called upon to perform this work, will advantageously use the following simplified process, which does not require much skill. A little culinary salt is dissolved in a mixture of equal parts of sulphuric and nitric acid. This produces a grained surface upon brass, copper and German silver. By adding a little more salt, a coarser grain is obtained. It will be understood that before the procedure the articles must be well ground and cleansed.

They are next suspended to a horsehair, and dipped in the

said mixture for the space of a few seconds. They are quickly withdrawn and afterwards dipped into hot water, after which they are scratch brushed with beer, for which operation may be used a brush of brass, German silver, or even of glass thread. When this has been done, the parts are with ease silvered, again scratch brushed and then gilt. An equally grained surface of a uniform and desirable color is obtained in this manner.

## Sight.

WHAT THE OPTICIAN SHOULD KNOW ABOUT OPTICS.

Based upon an extensive hospital experience in Austria, Germany, England and New York. By C. A. BUCKLIN, M. D., New York. Author of Detection and Correction of Visual Imperfections, Cause and Cure of Cross Eyes, Effects of Color on Distance, and Monograph on Astigmatism.

OPTICIANS who are not perfectly familiar with the theory of optics, and the practical application of optical laws to the correction of visual defects, should at least learn a routine form of experimenting which will bring them to very satisfactory and practical conclusions. In reporting a case to any one at a distance from whom you desire an opinion :

State first the age ; next report what the person complains about ; a very practical point may be brought out by the simple statement of the person to be examined.

*Case I, Master B., age 16.*—Complains of fatigue upon use of his eyes for fine work.

Upon placing him at twenty feet from the usual distant visual test, we find that he can read with either eye the XX line at twenty feet, or the XV line at fifteen feet, or the X line at ten feet.

If we use the test at twenty feet and he cannot read the letters at any greater distance, his vision is normal, which fact is expressed by the following formula :  $V \frac{2}{0}$ . If he can read the XX line at thirty-five feet his vision is  $\frac{3}{0}$ , or more than normal. The same is true if the XV line is used at fifteen feet, or the X line is used at ten feet.

Having determined the greatest distance at which the line of letters to be used can be read, we represent the result as follows :

$$R \text{ (right eye) } V \text{ (vision)} = \frac{2}{0}.$$

$$L \text{ (left eye) } V \text{ (vision)} = \frac{2}{0}.$$

We now begin to place convex glasses before his eyes, gradually increasing the strength till we reach the *very* strongest convex lens, through which he can still see the XX line, if this line is used. Whichever line is used—XX, XV, or X—he must be placed at the very greatest distance at which he can see these letters. This person allows us to increase the convex lenses to No. 12 in each eye, by giving him plenty of time to consider, and he still sees the required letters at the required distance ; this demonstrates that he is far-sighted,  $\frac{1}{2}$ , and this is probably the cause of his weak vision.

To report this case we would write as follows :

$$R-V = \frac{2}{0} \text{ with } +\frac{1}{2} = \frac{2}{0}.$$

$$L-V = \frac{2}{0} \text{ with } +\frac{1}{2} = \frac{2}{0}.$$

Consequently a pair of No. 12 convex glasses for reading, with the center of the lenses set at least  $\frac{1}{8}$  of an inch nearer together than the distance between his pupils, will cause all his symptoms of weak vision to disappear.

This case illustrates a very common class of cases.

*Case II, Miss C., age 18.*—Complains of fatigue if she attempts to read for any time. We determine the greatest distance at which she can read the XX, XV, or X line of distant letters. We begin by placing convex lenses before the eyes. She states that all lenses make vision worse. We are unable to give her any lenses which relieve the very unpleasant symptoms of which she complains. Not being an *expert* with the ophthalmoscope, the facts in the case cause us to suspect "far-sightedness." We next give her a solution of atropia, containing half a grain atropia to one fluid drachm of water, directing her to drop it into the eye three times daily for two days.

It is best to confine this experiment to one eye at a time, and thoroughly explain to them that while the pupil is dilated the vision will be very bad, but that there is no possible danger to the eye from the use of the drops. Upon a second trial the distant letters are frequently seen through a convex 14 or 12 lens, when before all convex lenses were refused. After testing the other eye in a like manner lenses may be given which relieve the weak vision. Always be sure to have the distance between the centers of the lenses decidedly less than the distance between the pupils.

Those who are expert with the ophthalmoscope can determine very correctly the degree of far-sight without atropine, but to do it one must be very experienced and perfect master of the instrument.

*Case III, Charlie D., age 6.*—Complains of nothing. Parents complain that he looks cross-eyed at times.

Vision  $\frac{2}{0}$  ; refuses convex lenses ; atropine treatment causes him to accept convex 12, which, if worn constantly, will cause his tendency to look cross-eyed to disappear.

*Case IV, Mr. S., age 20.*—Unable to see distant objects ; reads with perfect comfort ; convex lenses make distant vision decidedly worse ; concave lenses improve distant vision when we increase their number up to 14 ; he sees  $\frac{2}{0}$  distinctly ; objects do not appear unpleasantly small.

This lens being the weakest which brings distant vision out distinctly, we give, without further experiment, concave lenses No. 14, to see at a distance, and have him remove his lenses for reading.

*Case V, Mr. C., age 18.*—Has pain in his eyes when he reads ; tires very easily ; while concave lenses improve distant vision, convex lenses make reading easy.

If atropine is used in such case it will be found that there was spasm of the accommodation. The concave lens necessary to bring out distant vision distinctly are much weaker than was formerly required before atropine was used. Sometimes you will find that there is no near-sightedness, but the person under atropine accepts *convex* glasses for the distance. These cases are said to have spasm of the accommodation. I have named them false near-sightedness.

*Case VI, age 20.*—Complains of holding objects too near to the eye. Test of distant vision with concave lenses demonstrates that No. 5 is required to bring out distant objects. These lenses may cause distant objects to appear too small ; experiment must determine how strong a lens will prove pleasant, and distinctness of distant vision is to be sacrificed to comfort. It will also be necessary to give him weak concave lenses to enable him to read at twelve inches, providing he complains of the distance at which he is obliged to hold reading matter.

*Case VII, age 60.*—Distant vision is poor, and near vision is also indistinct, and it is not until convex 12 is placed before the eye that distant vision becomes distinct. If the individual is old enough to require lenses on account of his age, the lens usually required by persons of this age, added to convex 12, will be the lens required for reading.

*Case VIII, age 50.*—Distant vision perfectly normal ; not improved by any lens, but unable to read. We place fine print before the persons, and place before the weakest convex lens which brings the print out distinctly. It should not have the appearance of being magnified, but simply of being distinct.

*Case IX, age 20.*—Near and distant vision *indistinct* ; not improved by concave nor convex lenses. The radiating lines of the astigmatic fan do not look equally dark ; the center ones are very dark. We commence by trying convex cylinders, which do not improve distant vision ; but by gradually increasing *concave* cylinders up to No. 16, with the axis  $180^\circ$ , the lines of the fan all come out distinctly, and distant and near vision are normal.

*Case X, age 18.*—Concave 18 was found to improve distant vision the most, although it was still imperfect, but upon the addition of a concave cylinder No. 24, axis  $180^\circ$ , distant vision came out distinctly.

I will take up the subject of astigmatism in my next communication in its details.

I print a blank, upon which a detailed observation of a person's vision can be reported by an unskilled observer :

VISUAL REPORT

OF THE

*Spencer Optical Manufacturing Company, 13 Maiden Lane, N. Y.*

By.....

Through the convex or concave glass selected, how do the lines of the radiating fan look, and how do they look without glasses?

Age.....

Right eye.....Left eye.....

Complains of.....

If the radiating lines do not appear equally dark without lenses, or with the best concave or convex lenses you have found, do + or - cylinders of any number at any axis improve distant vision or the appearance of the lines?.....

Are glasses desired for reading, distance, or both?

If so, state No. and the axis of the + or - cylinder, combined with clearest + or - lens, also No. of line each eye is able to read with it.

What glasses has the person worn?

Right eye.....Left eye.....

At twenty, fifteen or ten feet, what is the number of the finest line of letters person can read?

If neither concave nor convex lenses improve distant vision, how much can you improve distant vision by the use of simple + or - cylinders? State No. axis and finest line read.

Right eye.....Left eye.....

Can you improve the distant vision by the use of + (convex) lenses?

Right eye.....Left eye.....

How strong a convex lens can you place before the eye without making the distant vision worse?

If cylinders have been required to bring distant vision out with the cylinder lens remaining before the eye at the same axis, what is the number of the weakest convex or concave lens necessary to bring the print out distinctly on the card at 13 inches?

Right eye.....Left eye.....

If (convex) + lenses do not improve distant vision, can you improve it with (concave) - lenses?

Right eye.....Left eye.....

What is the finest line of distant letters you can bring out with - lenses, and what is the number of the weakest concave lens which enables them to read this line?

Left disk contains - or concave lenses?

Right eye.....Left eye.....

Right disk contains + or convex lenses?

Upper disk contains + and - cylinders?

The + or - sign always appears under the numbers of the upper disk, denoting whether it is a convex or concave cylinder.

*Always have the patient's head square before the instrument, or there will be an error in the axes.*

Any skilled person can judge very accurately of the nature of the trouble complained of with these questions carefully answered.

Leap Year.

THE FIRST division of time worked by Adam was that indicated by light and darkness; and the evening and the morning were the first day. Yet how to mark the beginning and ending of

the day was not so simple a matter. With the Babylonians, Persians, Syrians, Greeks, and nearly all the nations of Asia, the day began at sunrise and lasted through the period of daylight and darkness to sunrise again; and with the Jews, Turks, Austrians, and several of the European nations, it began at sunset. The Arabians, however, and with them the astronomers and navigators of all nations, have always begun the day at noon, while modern Europeans, Americans and the Chinese place its beginning at midnight, which seems the most convenient plan of all.

The day proper has always included the entire period of twenty-four hours of the earth's revolution on its axis, and subdivisions of this time came later. At first the ancient Chaldeans, Syrians and Jews divided the twenty-four hours into four parts. Ancient Rome took no notice of any divisions save that of mid-day, when the sun shone straight "between the Forum and the Græco stairs." No mention is made of hour in the Scriptures until the time of Daniel, 552 B. C. When the Jews made the division of time into hours it was entirely arbitrary, and consisted of dividing the time of light and also that of darkness each into twelve parts. So the length of an hour differed with the latitude and the time of the year. The Romans followed this plan also for many years. The division of the hour into minutes and seconds originated with the Babylonians, whence it was taken by the Greek astronomer, Hipparchus, about 200 B. C., into his country, and thence went to Egypt and Rome, and was carried down the stream of civilization until it found a resting place where nothing could dislodge it or the dial plates of our watches and clocks.

We may remark, in passing, that although most nations have their timekeepers marked with the twelve hours, thus dividing the day proper into two parts. The Italians, Bohemians and Poles mark theirs with twenty-four, running from one to twenty-four o'clock, and there is a probability that the latter division may be adopted in this country. The Chinese, on the other hand, have but twelve hours, each being twice the length of one of ours. And the French, when they attempted at their Revolution to turn all civilization upside down, divided the twenty-four hours into ten, to suit their decimal system.

Morning and afternoon are arbitrary divisions, originating, no doubt, in the adoption of the mid-day meal. It is still held in England and Scotland that all the time before dinner is morning. Thus, one day, entering the office of an English gentleman, and finding him deep in accounts, I greeted him with the usual "Good afternoon." His sole reply was the droll ejaculation: "Happy mortal! thou hast dined." The Mexicans have the same custom: before noon the salutation is, "Buenas dias;" after dinner, "Buenas tardes;" and at night, "Buenas roches."

To return to primitive man, whose dinner hour suited the convenience of his larder only. The next great natural division which he probably marked was that indicated by a lunar revolution, a moon, or month. This is the period during which the moon revolves once around the earth, and is equal to 29 days, 12 hours, 44 minutes, 3 seconds. And, while watching the changes of the moon, he naturally observed the movements of the stars also, and thus traced the passage of the sun through the Zodiacal signs, and marked the beginning of the year. Before he did this however, the changes of the season had made an impression, distinctly felt, on his senses. It is rather remarkable that the most ancient nations chronicled only two seasons, summer and winter, as though the difference between them was so great as to obliterate all shades of temperature intervening. This distinction of seasons would be observed to depend on the position of the sun in the heavens, his alternate elevation and depression; but the actual division of time into solar years was obliged to wait until something had been learned by the watchers concerning astronomy. When this had been done, the Chaldeans, Egyptians and Hindoos, and other ancient nations, measured the periodical returns of the seasons by twelve lunations,

and then the year and its constituent part—the month—began to be understood.

The division of the month into weeks, though entirely arbitrary, was of ancient origin. The Jews had weeks of seven days each, making the number of days in which the world was created. But the Hindoos and Chaldeans had a similar week, and whether they took it from the Jews, or attached it to a similar legend, cannot now be known. We take the names of our days of the week from those used by the Saxons, thus:

Sunnan daeg—Sunday.	Woden's daeg—Wednesday.
Monan daeg—Monday.	Thor's daeg—Thursday.
Tuesco's daa—Tuesday.	Friga's Daeg—Friday.
Sater's daeg—Saturday.	

Now, the names of the Roman days of the week were not at all similar in sound, but very similar in meaning. The first day with them was also the day of the Sun—*dies solis*; and the second day of the moon—*dies lunæ*. The other days were given to the deities of like character to those chosen by the Saxons, a coincidence that is very difficult of explanation.

The German names are very similar to those of the Saxon, being of like Scandinavian origin. The French names are taken direct from those of the Latin.

We have the names of our months from the Romans, with whom we find our present calendar evolved in the time of Cæsar. It had been found very difficult to adjust the measure of the year correctly. The first measure of a year was twelve lunations, which was a period equal to 354 days, 8 hours, 48 minutes, 49 seconds. The solar year was then fixed at 365 days, and the odd hours were dropped. But as they could not be annihilated, and, in accumulating, threatened to change the character of the seasons, in 44 B. C., Julius Cæsar made a readjustment of matters. Assuming the overplus of time to be six hours daily, he decreed that every year should have 365 days, except the fourth, which should have 366. The repeated day was to be the 24th of February, the sixth before the Kalends of March, and the year was therefore called Bissextile. We call it Leap Year because the insertion of an extra day makes all following dates leap a day. Julius Cæsar arranged the months and their days so that every odd month—first, third, etc.—should have 31 days, and every even month thirty days, except February, which had thirty only in a Bissextile year. He retained the names of the months as they were supposed to have been originally given them by Numa Pompilius, except that he gave his own name to the seventh month. This arrangement of months and days was changed by Augustus Cæsar, who, desiring to give his own name to the eighth month, took a day from February to give this thirty-one days, and then transposed the number of days in the months following, making November and September the shorter months instead of the others. As thus arranged the months still remain. The very convenient verse beginning, "Thirty days hath September," might have been written by Augustus Cæsar himself, but it probably was not. It was, however, no doubt in common use long before the first record was made of it—in 1606.

### The Shell Trade of the United States.

EUROPE obtained its supply of shells, both fine and common, formerly from the Mediterranean and Indian Oceans, and China and Japan also exported large quantities thither. For the past few years, however, a very important and continually growing trade in the finest as well as ordinary shells is developing on the Pacific Coast, with headquarters at Los Angeles, San Diego, San Pedro and Santa Barbara. The Pacific Coast, with its islands down to Mexico, furnish excellent shells, and many are imported from China, Japan and the South Sea, all of which find a ready market in Europe. France buys the greatest quantity; next, Germany, Belgium, Holland and England. The products of the shell fisher-

ies on the Pacific Coast consist of mother-of-pearl shells and the ordinary kinds of shells.

Small shells bring from \$50 to \$70 per cwt., and are brought to the Coast in sacks. The costliest shell is the mother-of-pearl, also called Tahiti shell; it is exceptionally large, from 5 to 8 inches in diameter, round and flat, and has a delicate, milk-white, lustrous surface. The mother-of-pearl is obtained from the bottom of the sea near Tahiti, and brought by traders to California. Its fishery is very dangerous, and many a fisherman, who essayed to explore the vastness of the ocean's bottom in search for it, has never more beheld the rosy light of day.

These Tahiti shells are paid for from \$1.50 to \$4 per piece, and exceptionally fine specimens fetch as high as \$50 per pair. The Tahiti shells can be seen in show windows and dwellings of wealthy people. In Europe, however, where immense mother-of-pearl industries exist, they are used for ornamenting *articles de luxe*, toilet articles, such as fans, ladies' parasols, etc.; and these productions are again shipped to the United States, where they fetch high prices.

After the mother-of-pearl, the pearl shell is the most important and costliest. It is fished on the Mexican Coast and imported to France to be manufactured into shirt buttons. Other shells of minor importance, which are used as imitations of mother-of-pearl, are generally large and sold by the ton, the price of which ranges from \$700 to \$1,000. Gray shells cost \$700 per ton; the black, \$1,000.

The shell trade of California increases from year to year, and promises to assume gigantic proportions in the near future. A single firm of Los Angeles announces that it ships every sixty days 40 tons of shells to Europe, in fulfillment of a contract entered into with a Paris firm in 1882.

The products of the shells which have been transformed into ornaments by the art industries of Europe, are readily sold among our richer classes in the United States. But when we ask why are these shells not shipped to New York, Boston or Philadelphia, and why do we not establish American mother-of-pearl industries, we must answer the question with the fact that the railroad freight for 200 tons of shells from Los Angeles to Philadelphia costs \$30, but from San Pedro to Havre only \$11.75. The difference in freight, therefore is \$18.25 in favor of Europe, and this is an essential hindrance to the development of an American mother-of-pearl industry, which would afford occupation to thousands of men and women of this country; and until we have no other facilities than the railroad of receiving the shells, there is little prospect of building up an American industry.

### Measuring Power of Telescope.

EVERY METHOD yet devised for this purpose seems to be open to some objection. The plan of setting up marks at 100 yards or so fails, for the simple reason that the power on an object at 100 yards is very different to the power on a star, while dignameters differ in results, and with a high power it is difficult to judge exactly when the small circle of light just touches the sides of the taper slot. The object of this article, however, is not to point out faults, but to suggest a method which requires no special apparatus and no special training, and yet is reliable, accurate and easy.

Take the eye piece whose power is desired in front of a window, and look through it. A circle of light will be visible, which is the field of view. Step back or forward until the circle of light is just exactly apparently equal to the clear opening of the window. Measure the distance from center of window to stop of eye piece, and measure the clear opening of window. Draw a line on paper as many inches in length as window is feet in width, and set up a perpendicular from center in same proportion to distance of window; join the ends of first line and perpendicular, and measure the angle at vortex. This can be obtained by calculation as easily, and is the

angular field of view. Now put the eye piece in the telescope and time the passage of an equatorial star across the field; divide the first obtained angular field of eye piece by this actual field in sky, and the power of the eyepiece on the object glass or mirror in use is obtained in a moment. This is much simpler in practice than it looks on paper. For instance, I find the field of eye piece in my possession  $25^\circ$  apparently. An equatorial star passes through the field in 25 seconds. This is  $375''$  of an arc;  $25^\circ = 126,000''$ , and this divided by 375, gives 336 for the power.

## Proceedings of the Horological Club.

### A DISTINGUISHED BODY OF WATCH AND CLOCK MAKERS.

*One hundred and thirty-fourth discussion.—Communicated by the Secretary.*

[NOTICE.—Correspondents should write all letters intended for the Club separate from any other business matters, and headed "Secretary of the Horological Club." Direct the envelope to The Jewelers' Circular Publishing Company, Seth W. Hale, President. Write only on one side of the paper, state the points briefly, mail as early as possible, as it must be received here not later than the eighth day of the month, in order to be discussed and reported in the CIRCULAR for the next month.

#### WARRANTY ON WATCH CHANGING OWNER.

*Secretary of Horological Club:*

I would thank the Club for an opinion upon the following question:—Mr. A. has a mainspring put in his watch by myself. Mr. A. in three months' time afterwards sells his watch to Mr. B. Does my guarantee end when Mr. A. sells the watch, or am I still liable for the balance of the twelve months to Mr. B.? FLORENCE.

Mr. McFuzee said that it all depended mainly upon the custom of the watchmaker himself. He could establish any rule he thought proper about it, and if it was so understood by his customers they would be bound by it. In the absence of any well understood rule or agreement, it would generally be held that the warrant on a mainspring would continue till the end of the year, irrespective of ownership. If there is anything about a spring or its adjuncts which made the spring unusually liable to break, and the owner was accustomed to it and knew how to manage it safely, it would of course be undesirable to have it pass into possession of anyone unused to it, as it would greatly increase the risk of breakage. And in such cases the workman should inform the owner that the warrant was to him only, and would not go to a subsequent purchaser.

#### NEW JOINTS ON LOCKETS AND BRACELETS.—PRICE MARK FOR NAMELESS WATCH MOVEMENTS.

*Secretary of Horological Club:*

Among the large variety of repairs which a jeweler is called upon to make, there is one that is often done in a most slovenly and unworkmanlike manner, *i. e.*, repairing a broken joint to a soft solder back plated locket or bracelet. A very presentable job, however, may be done in cases where hard soldering a new joint is entirely out of the question, and a description may be interesting to some who peruse your records. File a slot in the rim of the locket or end of the bracelet, directly over the broken section of joint, a trifle wider than the old joint, and parallel with the end of the remaining piece, and undercut it; then take a wide pintongue, joint and rest, and bevel the rest or plate, so that it will just slide into the undercut slot and be tight and firm when in position, and in line. In place of a pintongue, a piece of joint wire may be hard soldered to a plate; flow a little soft solder under the plate, and finish on outside with burnisher and buff. This makes a joint as strong as though hard soldered, and if care is taken the soft solder will not be detected. It is well to have the plate to which the joint is soldered a little wider than the rim of the locket, and then cut it out on the inside with the graver. So many articles have been written, justly condemning the indiscriminate use of soft solder, and holding such work up to ridicule, that we are apt to consider all soft solder work as botch work; but such is not the case. Every workman knows that there are cases where the use of this much despised material is indispensable, and although "the rejected stone" may not "become the head of the corner," still it occupies an important place, and it is possible to do a *fine job* with soft solder.

The variety of nameless American movements is so large, and the difference in appearance between many of them so slight, that a system of tagging each movement saves time and trouble. If the price is marked on the boxes they often get changed, and mistakes result. I have adopted the plan of marking the selling price of each movement on a small strip of copper ribbon. Small copper wire, rolled as thin as the rolls will make it, or the thin brass stops that are put under the balances of new movements will answer. Loosen one screw of the barrel bridge, insert one corner of the tag under, and screw it down again. Of course, the tag should be taken out when the movement is sold. This prevents mistakes, and does away with the objectionable custom of consulting a price list before customers. The price should be marked with a fine tracing point.

J. H. S.

Mr. Rolliver said that soft solder was all right in its place, and there were a good many places for it. While it was generally inexcusable to repair hard solder jewelry with soft solder, it was, of course, out of the question to hard solder over soft solder. In such cases as those mentioned by Mr. S. there generally would be no other way to make the repairs except by soft soldering. By having a good sized plate to extend into the article, the solder would hold by a large surface and have considerable strength.

In putting tags under the barrel bridge it would be necessary to be very careful not to disarrange the bridge, by tipping one edge down, by reason of the strip put under the other edge. Some movements are so closely fitted together that there is no margin left for change of position without causing something to rub together. Even screwing the bridge down either more or less tightly than before, will often alter the position or distance apart of the two plates of the movement. The idea of marking the movement is a good one, if it is done without injury to the adjustment of the parts.

We hope to hear again from Mr. S., and from all others of our readers who can give us new ways of doing work, new ideas on any point of interest to the trade, who have new tools or other attachments for saving labor and time, or new "kinks" of any kind. Let every one contribute something good, and the aggregate benefit to the trade will be very great—each one will receive far more than he gave.

#### LOOSE JEWEL TURNING IN A DIRECTION CONTRARY TO THAT OF THE PIVOT.

*Secretary of Horological Club:*

I have read several discussions on the loose jewel question in your proceedings lately, the last one stating that it cannot move in the opposite direction. I say it will, and will try and prove it. In the first place, a pinion when running will occasionally give a shaky or curved motion to the upper pivot, the same as a top does when it is nearly run down. After spinning a top, the top point will gradually begin to get shaky, or turn in a circle in the same direction as the top is turning.

Now, we suppose our jewel is loose, and has a little side shake in the setting (the pivot may fit all right), then any time the pivot gets that shaky motion our jewel will run in the opposite direction, as any one may prove by taking a wheel, say, for example, an English mainspring barrel, and place it inside of one a little larger; then put a piece of pegwood, or anything with a point, in the center of the small wheel, and turn it around the inside edge of the large wheel. You will find the small wheel turning in the opposite direction every time, but of course slower.

E. J. F.

Mr. McFuzee said that, in the circumstances supposed, the action would be such as described. But when a wheel is running as described, with the pinion in an upright position and the upper end loose, will the pivot always have the *circular* motion, or will it merely shake about irregularly, in no one particular direction more than another? That is the vital point in this explanation. If it always has this circular motion, then we may look upon the explanation as at least a highly plausible one. But if it is correct, then the phenomenon can only occur with the pinions vertical. Is that the case? Have any of our friends ever noticed it with the pinion arbor *horizontal*? There may be a good deal to be said yet, and we should like to hear from all who know.

## TOOL FOR SIZING RINGS IN REPAIRING.

Secretary of Horological Club:

Permit me to say to "E. D.," in regard to taking measurement for changing the size of rings, that an "Allen's ring stick" and a pair of dividers—tools that every jeweler has, or should have—are all that is necessary for taking a very accurate measure.

In describing my *modus operandi* it will be necessary for me to suppose a case, for the reason that to do the *work* is my forte, but not to explain it on paper.

Suppose we have a ring measuring No. 8 on the ring stick, and we want to make it measure No.  $6\frac{1}{2}$ . Set one point of your dividers at No. 8 on the *small* scale at the little end of the stick, and the other point at No.  $6\frac{1}{2}$ . The space between your divider points will indicate the size of the piece to be taken out of the ring to make it No.  $6\frac{1}{2}$ . The same rule applies to making rings larger by inserting a piece.

If the measurement is carefully taken it will never occur to cut a ring open a second time. J. M. I.

## PROPER WAY TO NUMBER WATCHES IN THE BOOK OF REPAIRS.

Secretary of Horological Club:

I have on my repair book at this date the numbers (movement and case) of 3667 watches. I have, probably as many as five hundred times, on different occasions, taken the number of a certain watch, and looked back a year or two on the book to see when, if ever, I had repaired the watch, what was done to it, etc., and have never in any instance found corresponding numbers, unless they had been taken from that identical watch.

Is it at all probable that two watches can be found, of any or of different makes, of the same number?

I was subpoenaed not long since to prove the number of a watch that had been stolen. The defence set up that it was quite common to find different watches of the same number.

Please give the opinion of the Club.

M. A. M.

Mr. Clerkenwell remarked that our friend had entirely overlooked the most important part of the whole system of marking watches. The mark of the watchmaker is his private mark, put in the case by him. This is the only *identifying* mark, the numbers already in the case or on the movement are simply entered in the book as *descriptive*. Mr. M. will appreciate this point if he will suppose, for a moment, that every watch he had ever repaired had been numbered consecutively, from 1 to 3667, and that he had scratched the proper number of each one inside the case somewhere, and then entered the same number in his repairs book, with the proper description of watch, what was done, date, price, owner's name, etc. How easy it would be, after finding his number marked in the case, to run along the first column in his repairs book till he reached that particular number, and there find all the information he wanted! There would be no trouble then about identifying any one of them, even if he had repaired fifty others having the same case makers' and movement numbers.

The fact is, our friend has never marked his watches at all. He should first make his entry in the book, give the entry its proper consecutive number, then, with a fine steel point, mark that number in the edge of the case, where it will not be noticed, with his initial after it, or in some way give his mark sufficient individuality to enable him to know his mark among the other marks which other workmen have put there. The figures should be small, but well made and deep enough to be seen clearly with a glass, although not conspicuous to the naked eye. Some cases have coarse, scrawling marks all over the inside of the case. This is very objectionable, and many owners would prosecute a workman for disfiguring their watches in that way. But if the figures are small, and put near the rim, in the back case, they will hardly be noticed. Some even put their marks on the edge of the cover. Always put the marks in the same place in the cases.

Mr. M. could mark the case "3667-M.," or "3667-85," or "3667-M-85" (to give the year), or any similar way. But however it may be done, every watchmaker should mark the watches that he repairs or sells, and enter in his book, under that number, whatever information it is important to record in connection with that transaction. The defence could not set up that it was quite common to find

different watches having the same number put in them by him, for he could say that he had never put the same mark in two watches. He could identify any watch positively by his mark, and the accompanying description in the book. Not only that, but it would save him hours of valuable time in looking up a particular watch. As the book numbers run right along in regular order, it need not take ten seconds to find any number and watch in the book, and in a few minutes he could find every place where he had ever entered any repairs on that watch, from the beginning down to date.

## TOOL FOR SIZING RINGS.—LOOSE JEWEL REVOLVING IN DIRECTION CONTRARY TO ITS PIVOT.

Secretary of Horological Club:

I notice in your proceedings for August an inquiry regarding a tool for determining the amount to be taken out (or filled in) a finger ring, in changing the size of the same to any desired size, larger or smaller. Enclosed you will please find illustration and specification, forming part of letters patent No. 291,373, dated January 1st, 1884, for an improved ring gauge, which is very accurate and practical when used to determine the above amount. It can be used also as a standard ring gauge as well. The cost of the same will not exceed the price of F. E. Allen's well known standard ring gauge. The right to manufacture and sell the same is for sale.

In my limited experience of fifteen years I have seen what you call loose jewel turning contrary to a rapidly revolving pivot, and when the rapidity of the wheel's motion was somewhat retarded I always found that the jewel would cease turning. I have a theory regarding the cause, but will not bore you with it now.

I have several copies of the *Journal* when published by Mr. Miller, containing very interesting articles on friction, etc., etc.

F. D. McD.

Mr. Uhrmacher explained that the tool patented by Mr. McD. was a ring stick, having the usual size marks, and also oblique side marks, by which was shown the length of piece to be taken out or put in—a simple and practical ring gauge and sizer.

He was sorry Mr. McD. had not sent us his "theory" on the loose jewel problem, as that is what the trade is wrestling with just now, and the more ideas we have on the subject the more likely we are to solve it.

## Description of Different Escapements.

## ENDERLIN'S ESCAPEMENT.

The escape wheel is composed of the two equal sized wheels  $r$  and  $s$ , which are connected with each other in such a manner that there is still a small space between them. Their position to each other is thus that the tooth of one wheel stands in the center of the tooth space of the other (or alternate). As is shown in the cut, the balance staff carries a hollowed-out disc, its lips  $b a$  are cut bevel, in order to form the lifting planes. The detent takes place upon the flat part of the disc.

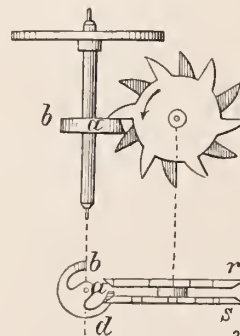


FIG. 1.

This escapement is objectionable on account of too much friction, which is exerted in an unfavorable manner; the rate of the watch becomes variable, and the movement soon wears out. Beside this, the double wheel possesses too great a moment of inertia, and for these several reasons the escapement has become obsolete. Swiss manufacturers tried to resuscitate it, but to no purpose. The escapement used in metronomes is a modification of the one described. The escape wheel is single, while the second wheel is replaced by a double disc upon the balance staff. Each of these discs is provided with only one lifting plane.

## DESFONTAINE'S ANCHOR ESCAPEMENT.

This escapement was exhibited first in the Paris Exposition of 1855.

This dead beat anchor escapement differs from that of Graham in that the lifting plane is only on one side of the anchor, while the other arm serves as detent.

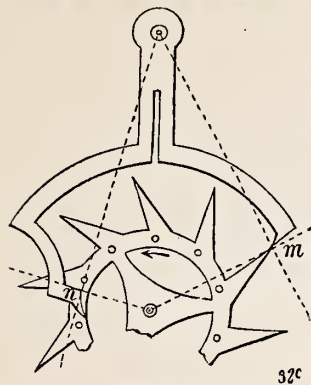


FIG. 2.

The escape wheel has two kinds of teeth; on its circumference the detent teeth, which are long and pointed, and next the lifting pins at the base of the teeth for the propulsion of the anchor.

In consequence of the superior length of the detent teeth, they place themselves only with feeble pressure upon the detent plane *m* of the anchor. The lifting pins standing vertical to the face of the wheel operate strongly upon the lifting plane *n* of the anchor.

The drop of the wheel is calculated so that a wearing cannot take place. The good qualities of this escapement consist in its great simplicity of execution, and in that it shows the full second after each two oscillations of pendulum; this escapement is therefore well suited for mantel and hanging clocks with half second pendulum.

The theoretical principles of Desfontaine's escapement are easily understood from the accompanying cut, fig. 2.

FREE ESCAPEMENT OF FRED. BERTHOUD.

The escape wheel *e* is represented in the figure in the state of repose, the tooth at *d* braces itself against the end of a lever *d'*, which itself is at repose on the pin *g*, or is retained in its position by the weight of the small mass *s*. The part *n* *t*, which in this escapement replaces the anchor, is fastened upon an axis *t*, upon which is also a lever not shown in the cut, and the exterior end of which is connected with the upper part of the pendulum in such a manner that the motion is transported upon both.

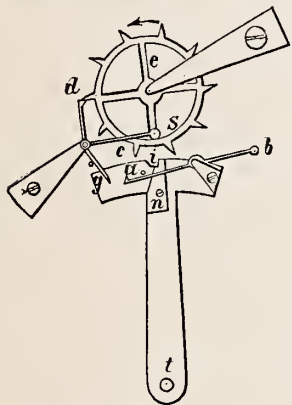


FIG. 3.

The fork *n t* has a free motion to the right without coming in contact with the scape wheel. At its return the lever *a b* braces itself upon the end of the lever *d* *g*, and the motion to the left continues free. When the oscillation again returns to the right, the lever *a b* acts upon the detent part *d g* and unlocks the scape wheel. At the same moment the notch *i* of the fork stands before the tooth *c*, which imparts the impulse; after the impulse another tooth falls upon detent upon the lever *d*, the former having become free again after its end *g* loosened from hook *a*.

This escapement is very ingenious and well conceived, but the complication is injurious to its exactness, so that it does not bear a comparison with a good dead beat escapement.

FREE ESCAPEMENT OF TH. REID.

The escapement *s v* is provided with pins which impart the impulse, and at the same time pointed teeth upon which detent takes place.

The anchor *b' a b* which moves upon an arbor *a*, has, as usual, pallets *b'* and *b*, which are of the same shape as those of a dead beat escapement. These pallets operate only with their inclined planes upon which the pins exert the impulse; the detent planes, the arcs of which are described from the same center as the anchor, glide through between the pins without touching them as soon as the wheel is at detent.

The levers *d d'* are fastened upon separate arbors *c c'*, which stand parallel to the anchor staff and almost touch it. Their weight retains them upon the little stud *g g'*; their position can be regulated by the screws *m m'*. These levers at *e e'* are provided with pallets or beaks behind the screws, which project from underneath the teeth and retain the wheel when the points of the levers touch the studs. The

screws *e e'*, situated on the levers, brace with their points against the back side of the pallets *s v*, so that the anchor cannot move either to the left or right without having to lift either one or the other lever.

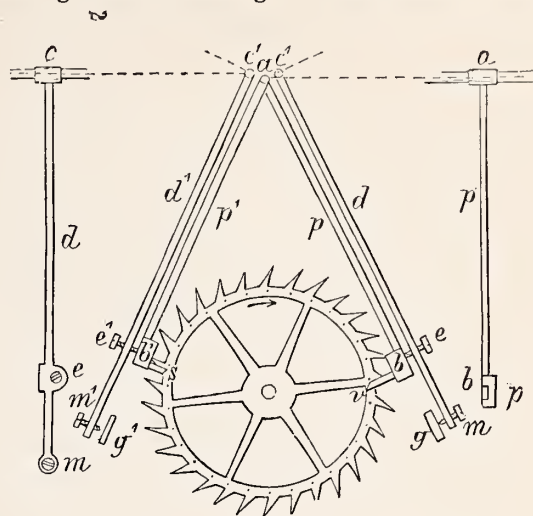


FIG. 4.

When, for instance, the pendulum oscillates to the left, as has been shown in the figure, it draws the anchor and the lever *d'* with it; the latter leaves the pendulum only when this enters on its return to the right, as it is then held fast by the stud *g'*. During this process the wheel is in detent upon the projection *b* of the lever, and the pallets pass free through the spaces between the pins.

When the pendulum continues its motion to the right, the anchor strikes at the end of the screw *e*, lifts the lever and frees the wheel. The pin falls then upon the pallet *b*, and by the pressure upon the inclined plane it again compensates the loss on the pendulum; when the pin has been unlocked, another tooth falls upon detent upon the projection *b'*. The pins and the teeth in course of activity always occupy an opposite position.

To the right of the figure, at *p*, will be seen an anchor staff from the side; the jewel pallet *b* is let into a square notch. One of the levers is shown at *d*; the swell on the side of the screw *e* serves for fastening the projection not shown. This projection also is of jewel.

The rate of a clock provided with this escapement has been observed from time to time, and has, during a period of 83 days, preserved a correct rate to the second without deviation. Mr. Reid says, however, that this extraordinary rate may possibly have been purely accidental, and no reliance should be placed on the utter exactness of this escapement.

THE SAME ESCAPEMENT PERFECTED.

Mr. Reid subsequently made the following alterations so as to render the escapement more easy of execution:

The escape wheel has no pins; the tooth points give the impulse and afterward also constitute the detent. The pallets, as will be seen at *b*, are provided with a slight bevel, which forms the point of repose as soon as the tooth has actuated.

The anchor *n* is here situated upon the same staff with the levers *p p*, as will be seen at *a b*; nevertheless it is always free and the levers are independent from each other. The staff carries a segmental piece, *m g*, bent over at the two ends so as to accommodate the point of the screw *e*, and thereby effect unlocking.

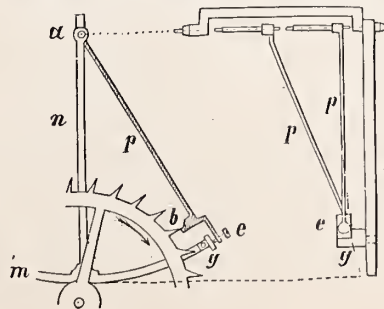


FIG. 5.

We would call attention to one improvement which produces great alteration in the performance of the escapement; when, for instance, the oscillation of the pendulum to the left has unlocked the left lever, then the lever upon the right side falls upon the inclined plane, and pushes it back in consequence of the force of the train, until it is retained by the small beak in which the pallet ends.

The pendulum finishes its path free and then returns to the right, always drawing with it the anchor and the left lever. As soon as the projection  $g$  has touched the screw  $e$ , the wheel becomes free and imparts its impulse to the left pallet which it previously kept back; it now pushes it back and then falls upon it on repose. The pendulum now accomplishes its path to the right, carrying both the anchor and the right lever along; the latter, which is no longer retained by the tooth of the scape wheel, accompanies the motion of the pendulum.

It will thus be seen that there is no connection between the train and the pendulum; the scape wheel operates alternately upon the levers; these are drawn along by the pendulum in its reciprocating motion; the operation of the return motion, however, is stronger than that of the forward motion by the quantity of the impulse of one tooth. The lever, in its return, presses longer upon the pendulum, and it is this difference that produces the entire impulse.

The amplitude of the oscillations, therefore, is regulated by the proper weight of the levers; the power of the train does not exert the least influence upon it. With the ordinary escapement, an increase of the traction power would have as consequence a diminution of the amplitudes, since the impulse does not alter, and a greater loss of power would arise only at the time of unlocking.

#### THE BALL ESCAPEMENT OF VERITE.

*Description of Escapement.*—An eccentric disc  $a$  is fastened upon the arbor of the last wheel; the lever  $c c'$  is also mounted upon this arbor.

A lever  $d d'$  carries upon its center of motion a fork  $b$ , the prongs of which embrace the eccentric disc; projection  $e$  is another arm of the lever  $d d'$ ; it still possesses an elongation not visible in the figure, being covered by the end of the lever  $c c'$ ; a second part, similar to this, is seen on the lever  $c c'$ . The detent of the train is effected by the contact of these two parts, and activity is regulated in such a manner that the pressure of the lever  $c c'$  against the prolongation  $e$  occurs at right angles to a line imagined as drawn from the point of contact toward the center of motion of the lever  $d d'$ ; this latter, be it stated, is in perfect equipoise.

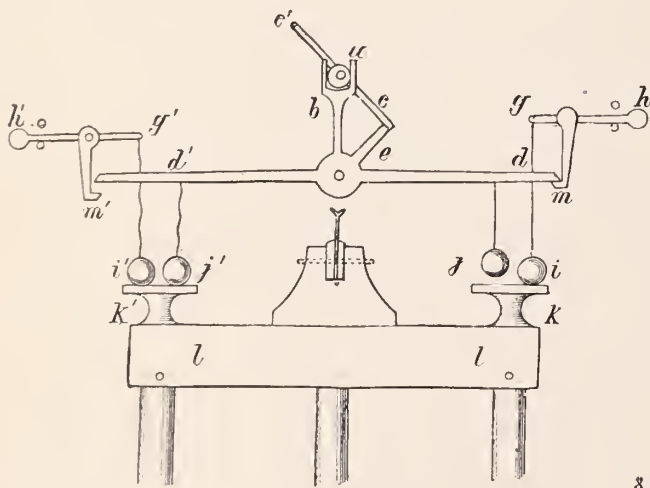


FIG. 6.

Two balls are suspended from the lever  $d d'$  which impart the impulse to the pendulum.

At each side of the lever  $d d'$  two parts,  $m$  and  $n'$ , movable around an axis, are arranged; their lower ends are provided with two small detent planes upon which the ends of the lever  $d d'$  lay themselves alternately.

Two balls  $i i'$  are suspended on the arms  $g g'$  of the levers  $g h$  and  $g' h'$ , and fastened on the same arbors as the detents  $m$  and  $m'$ , and their arms  $h h'$ , which are heavier than the arms  $g g'$  pertaining to them, move between two pins.

Finally, the upper end of the pendulum is provided with a cross

piece  $l l$ , which carries at the two ends level planes  $k k'$ , upon which rest alternately the balls imparting the impulse.

*Action of Escapement.*—Accompanying sketch represents the end of an impulse from right to left, which was first commenced by the ball  $j$  and is still continued by the ball  $i$ ; the balls  $j'$  and  $i'$  on the opposite side are already lifted by the level plane  $k'$  of the cross piece.

When the pendulum continues its oscillation from right to left, a part of the weight  $i$  will cease to exert its pressure, whereby the ball  $i$  will draw after it the lever arm  $g$ . The descent of the lever arm  $g$  forces the detent  $m$ , fastened with it upon the same arbor, to liberate the point of the lever arm  $d$  to which the ball  $j$  is fastened; the weight of this ball then draws the lever arm down, and in this manner unlocks the connection of the projection  $e$  with the lever arm  $c$ . The train, which is now no longer in detent, turns the eccentric disc  $a$ , which again draws into sympathy the fork  $b$  and with it the lever arm  $d d'$ . The lever arm  $d d'$  in its motion assumes precisely at the moment detent upon repose  $m'$ , when the arm  $c'$ , after it has accomplished one-half a revolution, strikes again at the place of the projection  $e$ , and thus again stops the activity of the train. This return of the detent of the lever  $d d'$  determines the falling height of the ball  $j'$  in the now occurring impulse from left to right, and at the same time lifts the ball  $j$  in order to hold it ready for the next occurring impulse from right to left.

It will be seen from the drawing that the eccentric disc  $a$  does not entirely fill the space between the prongs of the fork  $b$ . This is for the purpose of permitting the ball  $j$  to make the slight descending motion which is caused by the unlocking of the train. It is not so large, however, that the ball is able to reach the pendulum thereby.

When the pendulum has accomplished its oscillation from right to left, the motion of from left to right begins under the influence of the proper weight of the pendulum and the weight of the two balls  $i'$  and  $j'$ . When the motion has progressed as far as a certain point, the ball  $j'$  ceases to exert its pressure upon the pendulum, so that the latter then receives its impulse only from the ball  $i'$ , which finally also leaves the level plane of the pendulum and remains suspended upon the arm  $g'$ , where, by its weight, it draws back the repose  $m'$ , upon which, until now, laid the point of the lever arm  $d'$ . The ball  $j'$ , which is now no longer retained by the resistance of this repose, compels the lever  $d d'$  to make a small motion, through which again the position of rest of the parts  $e$  and  $c$  is destroyed; the train, and with it the eccentric disc  $a$ , commence to move, whereby the lever  $d d'$  is again brought into the position shown in the drawing, and in this manner the falling height of the ball  $j$  is established for the next impulse. The next succeeding impulse is prepared by the simultaneous lifting of the ball  $j'$ .

So as not to overcrowd the drawing, a small fly situated upon the arbor of the eccentric disc was left off.

The ball escapement of Verite, the description and drawing of which we have given from Henri Robert's work, formed the basis of the far more perfected ball escapement of the celebrated Adolph Lange, of Glashütte, Saxony.

## Correspondence.

### Chicago Notes.

*To the Editor of the Jewelers' Circular:*

The time to which the jewelers of Chicago and the northwest have been looking forward with eager anticipation during weary months of depression has now arrived, and the prospects of a brisk fall trade seem likely to be realized. Never has there been a time when a revival in business would be more opportune and more devoutly welcomed by both jobber and retailer. Business during the past month has not been particularly brisk, but there is a good feeling among dealers. One or two describe things as being still



backward or on the lag, but with a great many last month has been the best of the year. "Business," said one of the most conservative men in the trade, "is too poor to be called good, and too good to be called mean." If the volume of business were larger, traders would certainly be easier financially, but it is matter for congratulation that the number of orders is decidedly on the increase. Lapp & Fler-shem state that July has been the only month of this year that has been up to the corresponding month of last year, and they consider trade to be in a healthier state than it has been for five years. "Things are brightening up," said another large jobber, "and if Congress wouldn't meet for six years, or at least eschew financial legislation, we would all do a good business. Retailers are allowed to be more out of debt than they have been at any time since the war, and their stocks at present are so light that large buying seems inevitable if harvest prospects are realized. The uncertainty generated by a change of administration is no mean factor in making money timid. Orders, however, though smaller, are more numerous than at almost any corresponding time for years, and hope and confidence are returning. The fall trade is yet barely entered on, and it is premature to make too sanguine a forecast of its probabilities, but there is at least every reason to believe that we are on the verge of brighter times and easier financial feeling. When the harvest is all gathered in, and threshing has got fairly under way, the volume of business to be done will soon be evident. Nearly all the wholesale houses sent out their travelers early in August to drum up the fall trade, and some have even had them in the field since the middle of July. Reports already received from the west and northwest show that the whole trade is talking improvement, and that all that the retailers need is a little encouragement. Collections are still rather slow, and accommodations are being largely asked for on account of the quiet trade of the spring and summer. This has been especially noticeable among those who have always hitherto done a cash business. Still, there is some improvement in this direction, and from now on it is confidently expected that payments will become reasonably prompt. The demand is small as yet, and the orders are chiefly to fill up crevices in the stock, but the next two or three weeks will doubtless bring in a rising tide of business, which will largely compensate for the losses of the earlier months of the year.

The trade in all kinds of staples is fully maintained, but fancy goods still remain low. In watches a fair business is being done, though during the last two months things have hardly been up to the mark. Still, agents and jobbers report that the total business to date for the year is fully up to the corresponding period of last year. No little of the present stagnation is to be attributed to the inability of the factory to turn out supply equal to the demand. The American Watch Company is considerably hampered at present on account of the change in size of ladies' watches, and the difficulty in keeping the output of gold filled cases up to the demand. But for this things would have shown up much better than last year. The diamond trade is slow, though perhaps up to the usual. This branch of the business is increasing every year, and taste is improving so much that the standard in gems is higher than anywhere in the old country.

The city trade is considerably slower than that in the country, and matters have not been improved by the Grant obsequies, which have drawn off a good deal of attention from business in the large cities. While very few report business to be booming, one or two of the Chicago jobbers are doing a very brisk business in specialties. Samuel Swartchild has made quite a hit with Washburne & Moen's patent American mainsprings. Though not an agent, he has almost the exclusive sale here. The sales have increased enormously, and the supply is barely able to cope with the demand. Mr. Swartchild reports that he has sold 2,000 dozens in the last two months, and that there have been no complaints made or stock returned. Cogswell & Wallis report a great improvement in their lines of specialties. Their initial and name goods in brooches, rings and pins have struck the popular taste, and are having an unprecedented run. It is eminently creditable to the jewelry trade of Chicago that

amid the trying and depressing times which have held business down for two years, so many have been able to meet all their obligations, and keep their heads above water. In other businesses the depression has been signalized by crash after crash, but among jewelers failures have only occurred once in a way at long intervals. One such event, however, must be chronicled among the happenings in the trade during August. Perry Bros., who have carried on business as jobbers at No. 163 State street for over three years and a half, have made an assignment to Norman L. Richmond, of the Richmond Ring Company, Providence, R. I. The firm is composed of four brothers. Mr. John H. Perry personally informed your correspondent that the liabilities of the firm were in the neighborhood of \$60,000, and that the assets would figure up on paper pretty much the same amount, though their actual value could not possibly approach anything near that figure. The liabilities were almost entirely with eastern manufacturers, and were pretty widely distributed. No business has been done by the firm since the assignee started in to take stock. The report that the firm immediately after the assignment offered to settle at forty cents on the dollar is expressly denied by Mr. John H. Perry. He has never made any offer, and has not even filed a schedule of liabilities and assets yet, proposing to take advantage of the provision of the law which allows him twenty days in which to file a schedule, and the assignee the same time to give a bond. The failure is chiefly due to lack of capital and depreciation in stock. The want of money during the last year and a half has compelled the firm to buy on long time, and it is well known that the only profits of many old established houses with large capital were the discount obtained by buying for cash. Another unfortunate complication, that still further hampered the firm, was the loss of a trunk containing a full line of jewelry, which was destroyed by fire on the Wabash Road last January. Mr. Perry places the value of the trunk at \$9,800, and there is not much prospect that he will recover anything from the railroad company. Perry Bros. have always been regarded in the trade as honest, square-dealing men, and much sympathy is expressed for their misfortune.

W. A. B.

### The Jewelers' League.

*President*, HENRY HAYES.....Of Wheeler, Parsons & Hayes.  
*First Vice-President*, JAMES P. SNOW.....Of G. & S. Owen & Co.  
*Second Vice-President*, ROBERT A. JOHNSON.....Of Colby & Johnson.  
*Third Vice-President*, WM. C. KIMBALL.....Of H. F. Barrows & Co.  
*Fourth Vice-President*, AUG. KURTZBORN.....Of L. Bauman Jewelry Co., St. Louis, Mo.  
*Secretary and Treasurer*, WILLIAM L. SEXTON.....Of Sexton & Cole.

#### EXECUTIVE COMMITTEE.

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 GEORGE R. HOWE.....Of Carter, Sloan & Co.  
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 E. S. SMITH.....Of Smith & Knapp.  
 S. H. HALE.....With Robbins & Appleton.  
 J. R. GREASON.....Of J. R. Greason & Co.

THE JEWELERS' CIRCULAR is the *exclusive* official paper of the Jewelers' League, and has been selected for the publication of all matters of interest pertaining thereto. Letters or inquiries pertinent to its business or purposes, and which might interest the trade or inquirers, will herein be answered. Address *Jewelers' League, Box 3,444, P. O., New York*, or the office of THE CIRCULAR.

AT THE regular monthly meeting of the Executive Committee of the Jewelers' League, held August 7th, 1885, there were present the Chairman, J. B. Bowden, Vice-President Johnson, Messrs. Lewis, Howe, Greason and Secretary Sexton.

Two changes of beneficiary were granted.

One (1) application rejected.

One (1) application referred.

Eighteen members were accepted as follows:

S. Fink, D. W. Granbery, W. Kinscherf, W. O. Winthrop, New York, N. Y.; A. M. H. Bonnet, Zanesville, Ohio; C. L. Deatrck,

Defiance, Ohio; S. S. Frye, Columbus, Ohio; L. Chambaut, San Francisco, Cal.; J. D. White, S. H. Barley, Santa Cruz, Cal.; L. E. Jerome, New Haven, Conn.; A. Lynde, Chicago, Ill.; T. C. Parker, Wilkesbarre, Pa.; F. P. Clough, Lynn, Mass.; A. E. A. Miller, Louisville, Ky.; H. S. Lilius, Selma, Ala.; R. B. Emmons, Oscoda, Mich.; T. Perkins, Leavenworth, Kans.

An assessment (No. 55) of two dollars was ordered on account of the death of Charles E. Rodgers, of Ontario, Canada.

## Fashions in Jewelry.

### A Lady's Rambles Among the Jewelers.

MANUFACTURERS of fine jewelry and silverware have, some of them, been exceedingly cautious about showing new goods in advance of the fall trade, or, indeed, of talking about prospective novelties. A number of reasons are given in explanation of this reluctance. Some houses have a surplus of last season's stock on hand and are anxious to be relieved of this before starting out new ventures; and others are waiting to spring surprises on an admiring patronage when sea shore and mountain are deserted and city homes have been resumed. But the most important reason has been the fear of having fresh designs copied in cheaper grades and the value of the original thus depreciated, a fear, it must be confessed, that is liable to be realized.

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THERE appears, however, to be two ways of looking at the question of holding back novelties until the eleventh hour, for some of our most flourishing manufacturers are always ready, not only to exhibit samples just received from the factory, but to show and explain cuts and photographs of articles in the process of making. This class argue their past experience justifies the belief that the out-of-town and transient custom is materially augmented by the early exhibition of new things, and that the foreshadowing of things to come, in descriptive fashion articles copied throughout the country, is an admirable advertisement, inasmuch as a curiosity and interest is excited, which insures, at least, an inspection of the same when finally in stock.

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NO ONE, of course, enjoys seeing his designs reproduced in goods that can be sold for less than the original, and yet there are manufacturers who console themselves with the remembrance that patrons who appreciate the best and can afford to pay for it are never satisfied with anything but the best, and those who are content with less will buy the cheaper grades in any event. This may be cold comfort, but it contains more than a grain of truth.

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THE notes presented this month report the newer and more attractive articles in jewelry and silverware, as seen in the stock of progressive manufacturers and the show cases of the larger up-town retail houses. There are no startling changes in any direction, but an evident improvement everywhere, with rapid strides toward still greater perfection in art work in all precious metals. The new goods, for the most part, are new because of some variation in form or manner of decoration, rather than, as has been stated, from any radical changes or innovations. The feeling prevails in retail houses that

the autumn will bring a better trade than has been known for some years past; and, certainly, the present styles in dress indicate an increased patronage of artistic jewelry in way of personal adornments to a lady's toilette.

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THE distinctive features in gold jewelry are light delicate designs, artistic finish and fine workmanship. The gold jewelry worn by ladies now-a-days owes its popularity in polite society to the fact of its being an art production. The heavy carving seen on some of the newer patterns is decidedly rich and decorative in effect, and finds popular expression on cuff buttons for both sexes. The orange, alligator and lava finishes, all of which leave a surface more or less rough, are counted with desirable styles.

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AN INDICATION of the times is an increased desire for something unique and distinctive in character; ornaments, in a word, that owe their value to an inspiration of the designer rather than any intrinsic worth of the materials employed. Hence the popularity of silver jewelry, the perfection of which has never before been attained in this country.

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LEADING New York retail houses consider the growing demand for sets in jewelry as a fact full of significance to the jewelry trade. It has been a long time since ladies have desired a neck pin with ear rings to match, but the beautiful short pins of irregular forms, so fashionable of late, appear to have created a disposition for ear rings that harmonize in pattern or finish. These sets, it must be understood, are as unlike the prosaic and clumsy brooch and ear rings of twenty years ago as are the bracelets to-day worn unlike the broad, massive styles of old times. Occasionally ball ear rings and the ball worn at the end of a Queen chain show similar finish and decoration, such as a rough surface with gems imbedded.

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THE short pin is unquestionably increasing in favor, and it certainly presents a pleasing change from the long bar pin. These short pins have been produced in such a variety of patterns as to insure every lady's finding exactly what she wants. Garden and field flowers, and birds and insects have lent themselves as models. A desirable pattern is that of a gold rose or pansy set with a diamond or other gem. Often the pin shows a glittering surface of small gems that form a setting for one or more large stones. A huge butterfly of jewels makes a popular pin, so does a half moon of diamonds with a colored pearl or ruby swinging from the center.

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THE knife edge bar is a popular form of lace pin. A beautiful one seen was set with the tiniest of rose diamonds and a moonstone face in the center. A bar of twisted wire tied in a knot in the center, while not a new form, remains a popular one.

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FANCY pins, coming under no special classification, are in great favor. These are usually shorter than the old lace pins and unique

in design. An artistic pin is that of a lattice work of gold or silver, through the openings of which appear the blooms of a wild rose vine. A gold spoon with a pearl in its bowl, a gold shovel heaped full of small diamonds, a fan on which appears Japanese figures, are numbered with other designs to be found in these pins.

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THE most exclusive style in cuff buttons for ladies' wear, so far as New York fashions are concerned, is represented in a single button of small size, either square, round or cushion-shaped, and elaborately carved. These buttons come with or without gems, as may be desired. Link buttons are popular and are made in a great diversity of patterns. Often each link presents two distinct patterns.

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IN FINGER rings, where gems are employed, the fashion continues of making the gold circlet and setting subordinate to the gem. A favorite style is the setting of three or more fine stones in a row, though many others are equally fashionable. Fancy rings still hold a place in the fashionable world, as do seal rings. The latter, especially if engraved with a fac-simile of the wearer's calligraphy, is considered quite the correct thing among both ladies and gentlemen.

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SILVER jewelry appears to have come to stay awhile. The beautiful effects gained with the assistance of oxidizing, acids and applied metal decorations, have proven too attractive to be dismissed as a passing fancy. The marine designs have proven popular beyond the widest hope of the manufacturers, and have found a prominent place in silverware as well as silver jewelry. Dolphins, mermaids, sea monsters, fish, shells and seaweed are engraved, etched and applied in metal on silver back ground, showing usually what is termed water finish. The fish pins, simulating trout or other of the finny tribe, with jewels for eyes, while no longer new, continue to be more or less popular. Numbered with new silver pins are broken columns of silver representing in rich chasing antique scroll work with a gold medallion at one end. This pattern is also beautifully represented in gold, the medallion being an enameled one. New, too, in silver jewelry is that which receives its decoration in applied brass work.

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AMONG attractions in jewelry cases are those covered with chamois skin and decorated with hand painting. Less expensive, but at the same time pretty cases, are the painted chamois skin. An attractive case is one covered with chamois skin and ornamented with silver filigree bands.

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THE racing season each year is marked by a greater or less number of articles in jewelry representing suggestive subjects. The jockey cap, for instance, appears on scarf pins for gentlemen, and ribbon pins for ladies, enameled with the colors of celebrated stables. Sport designs are of frequent occurrence on cigar cutters, as a fishing rod engraved on one side and a fish on the other, or a gun and wild game.

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AT THIS season, too, there is a tendency to patronize tennis jewelry and other adornments suggestive of out-door pastimes. These

articles, especially in silver, are considered quite the correct thing to wear with tennis, yachting and mountain costumes by many ladies, while the jewelry in marine designs is popular for morning wear at the sea shore.

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THE wire bracelet remains a favorite and divides honors with the knife edge bracelet. These bracelets are usually decorated with a simple but artistic ornament at the top, such as an amethyst cut in form of a pansy with a diamond in the center, or a double rose of gold, a shell with a pearl resting on the pink background, or a buttercup carved out of onyx with a brilliant in its heart. The knife edge bracelets are often set round with small gems, one or more fine stones being associated on the top. In illustration may be described a bracelet set round with rose diamonds, the glittering circlet terminating with a clover leaf of different colored pearls. The Hungarian knot continues to find a place on wire bracelets and on lace and scarf pins.

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THE belts worn by ladies at the present moment are a noticeable accessory to their toilette on account of the beautiful clasps and buckles employed to fasten them. Many of these clasps are exceedingly artistic and decorative in effect. Some are of silver in antique patterns, and oxidized to obtain the appearance of great age; some are of gold richly chased, and not a few are studded with gems or semi-precious stones. Occasionally one sees a belt buckle or clasp in which turquoises and pearls are set together; again, they present a surface flashing with doublets or Rhine stones. Rhine stones, doublets, turquoise and garnets, by the way, are the stones most frequently seen now in silver jewelry. Decorative buckles and clasps are by no means confined to ladies' belts, but find places on wraps, dress bodices and draperies in the large patterns, while smaller ones are popular on neck ribbons and garters.

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TOILET articles have never been so fully represented in precious metals, wrought by artistic workmanship, as at the present time. It is impossible to ask now for any accessory which cannot be obtained in silver, or, at least, with silver trimmings, while many leading articles are manufactured in gold. An artistic and popular mode of decoration is furnished on some pieces, with an elaborate etching of one's initials, and in such intricate patterns that the decoration appears a bewilderment of harmonious lines and curves, from within the maze of which it becomes a serious matter to extricate the three hidden letters.

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AMONG new things noticed in toilet articles is a shoe buttoner, the handle of which follows in outline the shape of a human leg. This handle is ornamented with several suggestive designs in enamel and etching, such as Cinderella at the ball, a clock dial indicating the hour of midnight, and a slipper dainty enough to attract the attention of any prince.

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GENTLEMEN who ape English customs, long ago abjured the ordinary hair brush for the military brushes affected by English officers. Military brushes, everybody may not know, come in pairs and are

without handles, being in form something like a short, broad clothes brush. These brushes are used simultaneously and with all the vigor that may be possessed in the two hands of the owner. The backs of these brushes are finished in solid silver, in *repoussé* work, etching or popular finishes seen on other articles for toilet purposes.

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A POPULAR article with both sexes is represented in silver handles for umbrellas, canes, parasols and whips. Many of these handles are genuine works of art, having been made to order to insure the owner's possessing at the same time a unique and exclusive pattern. When made by trustworthy manufacturers these handles will, it is claimed, wear a life time, and can be transferred with ease from one article to another as the caprice of the possessor may dictate. In a word, one handle may be made to provide a decorative finish to any number of umbrellas, parasols, canes and the like. Gentlemen are more or less given to subjects of sport in the designs of these and similar decorations, and ladies may wear on the end of their riding whips the fac-simile of the head of a favorite saddle horse, or that of a pet fox terrier or pug on parasol sticks.

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THE nautical and other marine subjects so popular in jewelry, are being lavishly employed on silverware for the table. Soup tureens, fish and oyster dishes and similar pieces naturally suggest these subjects, but by no means monopolize them, for they appear on articles that have no connection with the sea or anything that therein is; as, for example, punch bowls and fruit dishes. A very beautiful example seen in the show rooms of one of our largest manufacturers, was a water pitcher and tray with shell decoration, chased and colored to nature.

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GROWING out of this disposition toward marine subjects has come the water finish as a background, with pearl edge and rope finish for borders, on the newer pieces of silverware.

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THE fruit season has naturally brought to notice many elegant conveniences in silver and glass table ware. The newer compotes are medium in height, and berry dishes remain in low forms. An attractive round bowl for berries, which later on may serve as a salad dish, sets on the table without standard or feet; its distinctive feature is an irregular brim that curves out and in in wave-like lines. These dishes and compotes represent in this finish all the various decorations now fashionable in silverware, such as chasing, etching, *repoussé*, oxidized and bright finish with fluted border.

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AMONG fruit spoons, the orange spoons are, perhaps, the most useful of any, as these are equally convenient and appropriate for ice cream and water ices, the sharp point and long, shallow bowl being admirably adapted to cutting into a hard ice without any annoyance from its slipping about on the plate. Of course, with this spoon the orange, cut in half, can be scraped out and eaten with a certain

degree of elegance rarely attained in the consumption of this juicy fruit.

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THERE are any number of pretty conceits in little sugar dishes and sugar sifters. The sugar dishes are sometimes in boat shape with a handle on either side; again, they simulate wicker baskets, and yet again they are simply tiny round bowls without covers, and showing a heavily chased finish. A fanciful design attracting attention is that of a little bag gathered at the top and loosely tied with a cord. This pattern is represented not only in a sugar bowl but a cream jug to match. These unique sugar and cream receptacles are appropriately employed, not only in serving fruit, but in *tete-a-tete* sets or for after-dinner coffee.

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LADLES and salad forks, with handles of wood, decorated with silver trimmings, are fashionable in the drawing room of the house beautiful. So are carving sets with wood handles, covered with a heavy deposit of silver, which imparts a rough surface similar to that of the bark of a tree, and affords a change with the silver plating on metal. Always beautiful and always fashionable are the sets with elaborately carved handles of stained ivory.

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FOR serving asparagus one is afforded a choice between a silver shovel broad enough to lift and convey to an individual's plate a suitable portion of the asparagus, or the asparagus fork with four wide tines and capable of carrying an equal quantity in safety.

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LOVERS of Edam and pineapple cheese complain of the lack of suitable dishes in silver on which to serve these, though there are any number of pretty receptacles in fine china. Perhaps as convenient an arrangement as any are little basket bowls of silver just large enough to receive the cheese. There are also little silver knobs that screw into the top of the cheese, making it possible to lift it like a cover and without soiling the fingers. Thus dressed a cheese appears on the table with a silver finish top and bottom.

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THE spoon work furnished in solid silver, affords, some of it, a wonderful study with its great diversity of patterns and ornate decoration. There are historical spoons, a notable illustration of which are the "Indian spoons." These are finished with statuettes at the top of the handle, after the fashion of the "apostle spoons," and are veritable studies from Catlin's illustrations of the North American Indians, and from objects in the National Museum at Washington. These spoons are supplied in combinations of dozens or half dozens, pairs or single spoons, no two of which are alike in design. Another spoon pattern in its ornamentation illustrates the story of court life some centuries ago. Another gives a pictorial description of shells and seaweeds; another interests little folk as well as grown people with the story of little Red Riding Hood or one of Mother Goose's rhymes in etchings or engravings. A pattern attracting attention just now is called the "American Berry" pattern, because each size of spoons in a set exhibits in its ornamentation the foliage and fruit

of a different berry, the smaller spoons naturally being reserved for the smaller fruits and the large ones for the mammoth kinds.

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THERE is no more harmonious or attractive association for the table than that of fine cut glass and silver. The wonder is that this combination is not oftener made. Water pitchers exhibited this summer, and exceedingly refreshing to look upon during the hot, sultry days, are of fine cut glass set in a silver rim and finished with silver bands and handles. Equally pleasing in effect are the claret cups with silver covers and handles, and a trimming of bands of silver.

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MANY fanciful designs appear in odd pieces of silver for the table. There are olive dishes, for instance, that simulate a gold leaf, a silver shell or a pear cut in half. A pretty conceit is a mussel resting on four tiny shells that serve as feet.

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INDIVIDUAL "salts" afford a prolific subject for unique designs. A leading house has on exhibition a line of "salts" that represent in form all the garden vegetables, such as turnips, beets, carrots and radishes. Very pretty are little half globes of cut glass set in engraved silver rings. A notable pair of salts consists of Australian shells of a beautiful pink hue resting on silver standards, that simulate a broad leafed marsh plant.

ELSIE BEE.

### Watch with Independent Second.

WE BELIEVE that the following described watch with independent second, made by Mr. Adrian Philippe, a Swiss manufacturer, is about the simplest construction of the kind we know of. It has one barrel and one train. Its details are as follows:

The watch has a diameter of 18 lines, and its train consists only of a barrel and two center wheels. The escapement is on the duplex system and the balance makes 14,000 vibrations per hour. The minute work is actuated by the barrel; the eccentric setting of the hand is effected by means of a displacement from the center.

The minute work is not shown in the cut so as not to overcrowd the latter; the place where the setting of the hands takes place is designated with *M*.

The size of the barrel is remarkable; it makes 8 revolutions in 24 hours, and contains a spring which can be wound about 5 turns whereby a more uniform development and equable transmission of power takes place. The power itself, in spite of the length of the mainspring is still large enough to propel a balance, the dimensions of which correspond to one ordinarily used in 20 line watches.

The vibration arcs described by the balance are larger when the mainspring is wound than when run down. For this reason, as well as for the well known law that springs with a great number of coils unfold most uniform, a spring of this caliber has been chosen.

Before we proceed to explain the reason why an escapement with only one impulse had been chosen, let us describe the mechanism of the independent second, because the choice of the escapement depends upon the good function of said mechanism.

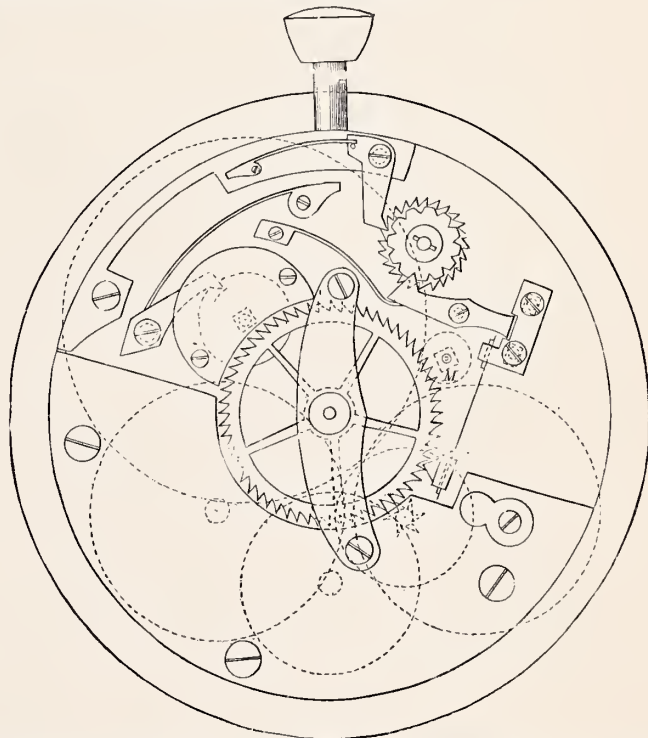
The latter is located underneath the dial and is extremely simple. A large steel wheel of a highly delicate construction is provided with 60 ratchet-like teeth. It is actuated regularly in each second by one of the 6 teeth of a star-shaped wheel, fastened upon the arbor

of the scape pinion. A click stops each time the motion of the wheel and retains it once between each second to be seen by the hand fastened upon the wheel.

One of the pivots of the steel wheel works in the plate, while the other one goes in the canon of a steel bridge upon which the wheels of the motion work are arranged.

It is easily seen from this why it is necessary that a single impulse loosens a tooth of the center wheel, because only in this manner can a stoppage in the motion of the hand be prevented; the use of a 12 tooth scape wheel is justified by the employment of a 6 tooth star, which, by each second impulse of the scape wheel upon the balance, permits the second to escape.

The click also is very delicately constructed, as it is easily seen that the resistance which it opposes to the lifting by the wheel must be reduced to the smallest possible quantity, because the scape wheel forms the power generator for this lifting.



The click consists of a metal head provided with a ruby triangle. This head is fastened at the end of a click spring, the other end being fastened to a piece of steel which serves the click, formed in this manner, both as foot and slide, in order to stop the independent second.

By the push-button, located in the case bow, and which operates through a system of clicks, which are set in activity by a ratchet wheel with double teeth (an arrangement still imperfectly known at present), it is possible to draw back the head of the click by so much that, by the large wheel, the teeth of the star pass freely through a tooth space; by another pressure upon the push-button the head of the click is permitted again to arise so far, that this, drawing the fourth wheel behind it, returns it again into depth with the teeth of the star and thus actuates the seconds hand.

By closely following the drawing the student will be struck with the great simplicity in the construction of this watch, and will perceive a skillful division of the forces, exact calculation of the size of the single parts and disposal of room occupied by them, added to which, last, but not least, is the extremely delicate construction, which is true especially of the division of the fourth wheel.—[*Journal Suisse d'Horlogerie*.

### The Manufacture of Repeating Watches.

SOME TIME ago, Mr. John Huguenin, President of the Horological Society of Arts at Geneva, a watchmaker of the first rank, contributed a series of valuable articles to the *Journal Suisse*

*d'Horlogerie*, on the subject of "The Manufacture of Repeating Watches." Other and more urgent matter prevented our publishing the article at the time of its appearance, but we hasten to do so at the earliest moment, thinking that a good practical article partakes of the nature of a railroad ticket, viz., it is good until used.

Before taking a repeating movement to pieces to get at the escapement, the repairer should ascertain whether it is necessary to raise the dial by laying an edge (silver) around it, so that the hour wheel and the bridge over the setting hand wheel can have sufficient freedom without being obliged to thin them too much or to cut away the back enamel of the dial.

If it is a minute repeating movement, care must be taken to make sure that the height of the snails agrees properly with that of the quarter and minute pieces, to determine exactly the definite position of the canon pinion, of the hour and minute wheels, and to exactly calculate the necessary height for the dial; one will thus avoid lost space, which will be doubled when the case is made if the pendant is planned to come in the middle of the band.

Be certain that the space between the center and third wheels is sufficient for the balance, reckoning the height of the rim equal to half of that of the mainspring. If the space is not judged to be sufficient, the third wheel ought to be lowered with care before the holes are jeweled; the face of the third pinion must be kept a little higher than the center wheel.

If it is not possible to lower the third wheel, the two wheels must be thinned as much as possible, and the height of the rim of the balance carefully reduced.

It is to be remarked in certain pieces that the leaves of the fourth pinion are not sufficiently free of the circumference of the balance of which the diameter is generally equal to that of the barrel cover; in this case the leaves should be lowered, so that the face of the pinion is only one-tenth of a millimeter above the third wheel, that being properly in its place.

If the pinion only wants lowering a little, simply to insure its not fouling the balance screws, it would be easier to lower the fourth wheel; this would obviate the re-cutting of the hollow and re-polishing the face of the pinion.

These operations ought to be done before planting the escapement in order that the scape pinion and the balance staff may be pivoted in agreement with the new positions of the third and fourth wheels.

Next examine if there is sufficient space between the end of the "surprise" and the center part of the barrel cover. In the contrary case the examiner should introduce this necessary quantity of space, after having verified the depth of the barrel in the center pinion.

When the setting hand pinion touches on the edge of the barrel cover, the examiner should not, before turning it up, that the gearing of the sliding pinion for setting the hands will bear it.

The striking works of minute repeaters for hunting case movements is so arranged that there is a possible danger that the quarter piece, on which are the three teeth which act against the lifting of the small hammer, may foul the fingers of the stop piece. It is advisable to get the stop work as low as possible, and to drill the barrel arbor with a sufficiently so that the pin may be partly sunk in the thickness of the finger piece.

In these same pieces the spring of the quarter piece passes over the lowest part of the barrel cover and under the quarter snail. This part of the cover ought to be turned level with the bottom of the plate; this will allow the blade of the spring to be left sufficiently broad to prevent it riding up in working.

The opening in the brass edge of the pillar plate for the arm of the rack is often longer than necessary to limit the return at the moment that the stopping is effected. It is expedient, before taking off the striking work, to mark, by a line on the plate, the position of the arm entirely brought back, in order that the maker of the slide may have an indication to limit the length of the draw so that there shall be no play after it has been fully drawn up.

Mark on the plate the places for the case screws, so that one of

them may be near the foot of the bells, and that the blocks may not be in the way of the case springs or of the slide.

Before taking off the keyless and repeating work, select a place for stamping the number.

#### PLANTING THE ESCAPEMENT.

The proportions which have been indicated for the diameter and height of the rim of the balance are not always able to be adhered to, and may have to be modified to suit the calliper.

When the bell of the large hammer requires the balance being drawn off, the diameter of the latter should be reduced in order that the escapement maker may not break into the countersink of the screw in freeing the center wheel bar.\*

In certain pieces the fourth wheel arbor does not allow of a balance as large as the barrel cover; the calliper is also sometimes arranged that the teeth of the barrel are too close. Balances with higher rims should be used for these escapements, if the space between the center and third wheel permits. It is well to order screws of 14 and 18 karats in place of the low quality gold that is usually used.

For a general rule, it is necessary to calculate the diameter and height of the rim of the balance, in agreement with the strength of the mainspring and the quality of the escapement, in view of obtaining a vibration not less than a turn and a half, the mainspring being fully wound up. Its complete development varies between six turns and six turns and a half for a stop work of four turns, and from seven turns to seven and one-half with a stop work of five turns. With these conditions the occasional drags, caused by the repeating mechanism, will exert no influence on the performance of the watch.

The large train wheels should be given out to the escapement maker, also the hour hammer, that the foot of the balance cock may be freed of it.

#### CASING.

Before sending the frame to the case maker, it is necessary to ascertain that it is perfectly true from the center hole, in order that the middle of the case and the circle of the dial may be equally concentric. The socket of the winder should be screwed on, and one of the wheel bars for the height of the rim of the case.

In flat movements, in order that the bells may have sufficient space, the pillar plate should pass through the case on the dome side, and, in hunters, the case springs ought to be entirely inside the hand.

If the case is obliged to have a glass under the dome, a block should be put on the upper plate or on the bar, the same height as the square of the barrel arbor, in order to insure sufficient room in the glass. This same block will also serve for cases with ordinary domes, which, when shut down, should nearly touch it, that is, if the cases are desired to be closely made; otherwise there will always be lost room on the dome side, the pendant being placed in the middle of the band.

When hunting repeaters have many bands passing over each other in the center, it is advisable to give the case maker the required height above the dial; this will serve as a base for him in dividing the case, and will insure sufficient room being left for the glass.

The joints are generally placed opposite the pendant, but in uneven pieces, where the disposition of the striking work varies according to the calliper, it is often necessary to place the bottom joint opposite the nibb, between the fourth and fifth hour, to obtain room for the action of the slide.

It is always preferable that the dome joint shall be outside the circle of the middle part of the case, as much to insure space for the bells as to preserve the movement from dust.

The case maker should be told that the places for the case screws are marked on the plate, in order that he may not forget to solder the blocks.

A false dial should be furnished for crystal glass cases, a shade

\* A "bar" movement is being described.

thicker than the dial which will be ordered for the piece. The minute circle of the dial to a minute repeater requires to be perfectly concentric with the center hole of the plate. To easily obtain this, a strong edge should be made, well fitted on the plate, and quite free of the shutting edge of the glass bezel.

#### CASE FITTING.

The case being made, it is sent with the frame to the case fitter, the pendant soldered or not, with the bow and the gold for the slide; the button may be furnished either by the manufacturer or by the case fitter.

(To be Continued.)

### Communications.

HAVERHILL, N. H., August 11, 1885.

To the Editor of the *Jewelers' Circular*:

DEAR SIR—I have an old clock that has the name (Gas Gradelle, Dublin), engraved on the dial, also on each corner of the dial is a cross and crown held by two human figures; now, if you can tell at what time this maker made clocks, if it would not be too much trouble, I would esteem it as a great favor and also pay you for the trouble, only if it is going to cost very much please let me know how much the expense will be.

Yours respectfully, C. N. MINER.

### Clock Making in the Black Forest.

[From Report of the Royal Commission on Technical Education.]

BY MEANS of lotteries and further grants, the Gewerbe-Halle was erected and opened in 1874, and the school was transferred to the new building, and was reconstituted and formally opened in June, 1877. The Government grant for this purpose was £650. The school is managed by a local council chosen from the surrounding districts and consisting of eight persons. The annual budget is £360, of which sum the Province of Freiburg contributes £25 and Gillingen £50. The school is held in two small rooms, very ill-suited for the purpose, and a new building is in course of erection by the local Gewerbe-Verein (trade society) at a cost of from £1,250 to £1,500. There are at present eighteen pupils. Most of them are admitted free, and many are supported by exhibitions which are given by the neighboring towns, and may amount to £20 per annum. The school fee is £1 per annum. The students must have been previously engaged, for at least two years, in practical clock making before they can be admitted. The course lasts one year. In the morning they have theoretical studies consisting of geometry, arithmetic, algebra, physics, mechanics, technology of watch and clock making, geometrical drawing, projection, technical drawing, bookkeeping and commercial arithmetic, together with thirty hours' practical work per week in the shops in the afternoon. The lathes and tools seem excellent of their kind, but the accommodation was very cramped.

By far the most important manufacture of the Black Forest is that of small carved clocks, many of them with musical accompaniments, known as cuckoo clocks. In Triberg, and a group of small towns and villages surrounding it, known as the clock country, 13,500 people, the population of upwards of ninety parishes, are engaged in clock making. We went to Schoenach, a village in the hills above Triberg, where almost every cottage is the home of a clock maker. The houses are large and substantially built. They are generally a considerable distance apart and are surrounded with meadow land and pastures. In addition to the home workers there are three or four small factories in which the wheels and other parts of clocks (Uhrenbestendtheile) are made. In one of these, visited by us, there

were about five or six workmen employed and an apprentice. The power was derived from a small overshot wheel. There was a wire cutting and straightening machine for preparing the pinions, some fine drills, a tooth cutting machine, a shaping machine for the wheel teeth and a small press for driving on the bosses, etc. The machinery was ingenious and well adapted for its purpose. The rough castings made in the village were excellent. We were told that the men working piece work in the factories could earn from two to three marks per diem, though a very small proportion of the working men can earn the latter sum. In a second factory we visited subsequently, the movements made here were being fitted together and made into clocks. Carpenters were making the rough framework to contain the wheels, and others were preparing the varnished outer cases. The clock passed from hand to hand, one man adding the winding barrel, another the train of wheels, a third the escapement, and another placing the works into the case. The clocks were being packed up for sale in another part of the works. They seemed all pretty much of one pattern, and of a very common description. The proprietor informed us that he had produced clocks of exactly the same kind as those that were made in the cottages. They went mainly to various parts of Europe. None now go to England or to America. The Americans not only supply themselves with cheap clocks, but they have driven out the Black Forest maker from the English market. The people employed at clock making live, we are told, very poorly—mainly on potatoes—though we saw soup and meat in some of the cottages. The cottages are very large; some of them contain as many as twelve families. Many of the people have only one or two rooms and a bit of land, probably about twenty perches, for which they pay from ten to fourteen marks rent per month. An old gentleman mowing in a very wet meadow was pointed out to us as the Burgermeister of Schoenach. We went into several of the cottages and saw the people at the work. The women were polishing the clock cases and the men were making the wheel work. We were told here that an industrious worker at home could earn as much as a good workman in a factory. The water power is everywhere most ingeniously utilized, and the water itself is, as in many parts of England, employed for irrigation on the steep hillsides.

### Official Awards—New Orleans Exposition.

THE OFFICIAL list of the awards made at the New Orleans Exposition to members of the trade was delayed by the managers, and we herewith give it for the first time that it has appeared in any trade paper. The gold medal approved by the management and awarded as a prize, was designed and manufactured by P. L. Krider, of Philadelphia. The following is the list of awards:

D. S. Spaulding, New York.—Tortoise shell jewelry, honorable mention.

H. Muhr's Sons, Philadelphia.—Solid gold and seal and set rings, for gold and stone lockets, gentlemen's wear, and for filled rings, plain and chased, medal of first class.

N. Federgren, New York.—Display of diamonds, honorable mention.

Leroy W. Fairchild & Sons, New York.—Gold, silver, gold and platina pencils and pens and pencil cases, medal of first class; for novelties such as match boxes and cigar cutters in gold and silver, gold and platina and gold plate, medal of first class; for display of gold pens, pencils, pen and pencil cases, match boxes, etc., honorable mention.

The New York Theatrical Jewelry and Armor Manufacturing Company, New York.—Stage jewelry, medal of second class.

To American Watch Co., Waltham, Mass.—Dust proof and pendant set watch cases made in solid gold, gold fluted and solid silver, medal of first class. Chronographs, fine split seconds, and split seconds and split minutes, medal of first class. Largest and

finest display of watches, medal of first class. Watch cases, such as diamond incrustated, elaborately ornamented and enameled gold cases, medal of first class. Watch movements, number of grades, durability, excellence of finish, timekeeping qualities, etc., medal of first class.

To The Meriden Britannia Co., Meriden, Conn.—First: For articles requiring great strength and durability, especially adapted for hotels, steamship and club use, plated on hard, white metal and nickel silver, medal of first class. Second: For silver plated knives, forks, spoons, etc., bearing trade mark "1847, Rogers Bros., A1," or "1847, Rogers Bros., XII," plated with pure silver on best quality of nickel silver, for sectional or XII plating, where an extra quantity of silver, three times the usual thickness, is deposited by a patented process on the parts of spoons, forks, etc., most exposed to wear, medal of first class. Third: For large variety, extra fine finish, artistic electro gold and silver plated hollow ware on fine white metal and nickel silver, bearing trade mark "Meriden Britannia Co., Quadruple Plate," medal of first class. Fourth: For collective display of silver, medal of first class.

To C. N. Thorpe & Co., Philadelphia.—Display of filled watch cases and improved method of manufacturing, medal of first class. Solid silver cases with patent dust band, medal of first class.

To H. Muhr's Sons, Philadelphia.—Crown filled watch cases and elaborate ornamentation, medal of first class.

To Seth Thomas Clock Co., N. Y.—Tower clock, medal of first class. General display of hanging, standing and mantel clocks in metal and wood, medal of first class.

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### Care of Watchmakers' Brushes.

WATCHMAKERS' brushes are a constant accompaniment to the watch bench; nothing except pliers, screw drivers and tweezers being in more constant use; and how few use them properly, or rather, how few keep them in proper use. A soft brush for rough work is quite useless, a hard one for fine work is ruinous, and a dirty brush of either kind is a nuisance. The methods adopted for cleaning them are nearly as varied as the workmen that use them, and there are some who never even make the attempt. Some clean the brush with dry bread; some lay a piece of tissue or other paper across the wide open bench vise, the sharp corners formed by the jaws taking off on the paper a little of the dirt; others vigorously brush a piece of clean cork; and one man we knew who used his knuckles for the same purpose. All these various methods are imperfect, while some of them can be called slovenly. The only good way to clean a brush is with soap and water—warm water, if convenient, being preferable. Wet two brushes, soap them and then rub them together in plenty of water and the job is done. The only objection to this way is the delay by drying; but this need not be, for six brushes assorted will give you three clean ones to use while the other three are drying; and the workman who cannot afford half a dozen had best seek some more lucrative occupation. More damage to the appearance of the movement is done by injudicious brushing than by any other means. The watch may not be injured in its quality as a timepiece, but it grows prematurely old in looks by such severe treatment.—*Revue Chronometrique*.

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### Diamond Turning Tools.

IT IS sometimes desirable to reduce the dimensions of a hardened steel article that has received a lathe finish without first drawing the temper, as this necessitates a re-hardening and re-tempering. The usual method of lathe reducing of hardened steel articles by corundum wheel grinding is necessarily confined to straights or tapers, no

offsets, collets or shoulders being amenable to this style of work. A model maker and bright mechanic has succeeded in utilizing the black diamond, or bort, as a turning tool for hardened steel. He places a crystal in the end of a piece of iron or brass for flat turning, and one on the side of the end or on a corner of the end, for side or shoulder turning. He has succeeded in doing some good work with these crude looking tools.

The chips taken from the hardened steel are literally chips, not turnings, and are very minute. But viewed under the microscope they are seen to be cut from the hardened steel, and not merely disengaged crystals. One of the specimens of work with these bort tools is a well finished V-thread, about 32 to the inch. Two differing crystals of the diamond were employed to cut and true the thread. An adaptation of bort tools to the planer is evidently possible, and there seems to be no reason why its use might not be extended with economical results in the treatment of hardened steel and of chilled iron.

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### Properties of Quicksilver.

ONE OF the most curious properties of quicksilver is its capability of dissolving or of forming amalgams with other metals. A sheet of gold foil dropped into quicksilver, disappears almost as quickly as a snow flake when it drops into water. It has the power of separating or of readily dissolving those refractory metals which are not acted upon by our most powerful acids. The gold and silver miners pour it into their machines holding the gold bearing quartz, and, although no human eye can detect a trace of the precious substance, so fine are the particles, yet the liquid metal will hunt them out and incorporate it into its mass. By subsequent distillation it yields it into the hands of the miners in a state of virgin purity. Several years ago, while lecturing before a class of ladies on chemistry, we had occasion to purify some quicksilver by forcing it through chamois leather. The scrap remained on the table after the lecture, and an old lady, thinking it would be very nice to wrap her gold spectacles in, accordingly appropriated it to that purpose. The next morning she came to us in great alarm, stating that the gold had mysteriously disappeared and nothing was left in the parcel but the glasses. Sure enough, the metal remaining in the pores of the leather had amalgamated with the gold and entirely destroyed the spectacles. It was a mystery which we never could explain to her satisfaction.—*Fireside Science*.

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### An Antique Clock.

DR. ED. SWIVEL, of Huntington, Pa., is the possessor of an antique clock which has a remarkable history. In 1712, the ancestors of Mr. Swivel left Germany for America, and among their effects was a large old-fashioned clock that was prized highly by them as an heirloom. Before reaching America the vessel on which they had sailed was wrecked, but fortunately no lives were lost. A few weeks after the cargo of the vessel was recovered by wreckers, when the old clock was sent to its proper owners in Pennsylvania. At this time the Indians had become very troublesome in the Cumberland Valley, where the Swivels had settled, and the inhabitants of that region were kept in constant dread of an impending invasion.

Finally an attack was made on the settlers, many of whom were killed, a number taken into captivity and their village destroyed. Among the number taken captive were the Swivels, who were treated barbarously by their dusky captors, but by kind attentions shown to the Indians during sickness, were finally liberated, after months of privation and suffering. From the date of this occurrence nothing was heard of the old clock until about two years afterwards, when a party of Indians who were trading in the Juanita Valley—where the Swivel family had subsequently moved—exchanged the old timepiece for ammunition to the very family from which it had been stolen during the Indian raids in the Cumberland Valley.



## Foreign Gossip.

**PLENTY OF AMETHYSTS.**—A large vein of amethysts has been discovered in Silesia, while blasting a railroad through the porphyritic rock of the mountains. It is a very important find for the stone cutting establishments of Warmbrunn.

**NEW METAL.**—Professor Websky has proposed the name of Idunium for the metal discovered by him. He found it to be one of the constituents of lead vanadate; the mineral is rather scarce, of a yellow color, and contains several other metals, especially zinc, iron and arsenic.

**ANOTHER EXPOSITION.**—An exposition has been planned to be opened on July 15, and to end Sept. 30, 1885, at Nuremberg, for the purpose of exhibiting motive power, machinery, and all the lesser details and auxiliaries of the smaller trades. It is proposed to make this exposition of use as well as ornament.

**UNIVERSAL TIME.**—It appears that the Greenwich Observatory intends to make the first move toward introducing universal time, having set the astronomical clock, which sends out the time signals, to mark the beginning of the day at midnight, and not, as customary hitherto, at noon. The dial is divided into 24 hours.

**OBSERVATION OF PENDULUM VARIATIONS.**—During the residence of the French expedition sent by the government to Puebla, Mexico, the academican, Bousquet de la Grye, constructed in the chapel of Fort Loreto a seismograph of so great a delicacy that it rendered the attraction of the moon perceptible. The effect was strongest when it almost arrived at its zenith, and the influence of the sun was also remarkable.

**WAGES.**—A Paris journal publishes interesting statistics on the weekly wages paid to a goldsmith in different parts of the world: Chicago, 52 marks; France, 48 marks; New York, 40 marks; England, 36 marks; Holland, 32 marks; Belgium, 28 marks; Switzerland, 25.50 marks; Germany, 20 marks; Austria, 20 marks; Russia, 16 marks; Calcutta, 11 marks; China, 10 marks; Cambo-dja, 8 marks; and Anam, 7.20 marks. For the information of our mathematical friends we would say that \$1 = 4.25 marks.

**A RARE OCCURRENCE.**—Some time ago a violent storm tore off the large hand of the steeple clock at Altona, Germany, and hurled it more than 100 yards, when finally it lodged, point down, in the roof of a house. The clock is about being superannuated, and proceedings were on foot for placing in a new one. The old hand, doubtless, became impatient at the tardy action of humanity, to several generations of which it had pointed out their time between the cradle and the grave, and hence its unseemly haste in desiring to be relieved.

**PATENT BUSINESS OF GERMANY.**—The German Imperial Patent Bureau gives the following statistics on the patent business of the Empire, for 1884. During the year 8,607 patents were applied for, and 4,459 granted; 3,984 went out of existence for nonpayment of fees. The greatest number of patents applied to electrical apparatus (256). At the end of 1884, there were 10,994 patents in force. The receipts of the office are constantly increasing since the enactment of the new law of 1877; its receipts during 1884 were 1,265,581 marks, and disbursements 658,458 marks.

**A GIANT DIAMOND.**—A very large diamond was about a year ago found by a boer in the territory of the Orange Republic. He kept it hidden for about a year, under the well grounded fear that miners might kill him and steal it. A diamond trader was finally lucky enough to see it, and he persuaded the owner to put it on market. The stone appears to be a second edition of the Star of South Africa, at present owned by Lord Dudley. It was finally purchased by a syndicate, formed of the most important diamond traders of London and Paris. It weighs 487 karats, and when ground will be reduced to about 225 karats, being heavier by 89 karats than the Regent.

**A PRINCESS AS GOLDSMITH.**—A goldsmith shop was lately established and opened with great pomp and circumstance at the Austrian bathing place, Meran, and the neighborhood is at present daily thronged with carriages, bearing thither the nobility of the place. The Archduchess, Maria Theresa, belonging to the Austrian imperial family, has taken the fancy to learn the art of goldsmithing; she sits at the bench with her apron on like any other apprentice, learns the manipulation of the file, blowpipe, etc., much to the astonishment of said nobility, who watch her eagerly. But whether, as youngest apprentice, she has to sweep the shop, fetch water and run errands, we are not informed.

**CHIMES.**—The larger cities of the continent are reviving the ancient custom of connecting their clocks with a chime of bells, a custom which was in great favor during the first half of the past century. One of the finest specimens of this kind was located in the steeple of the former hunting-palace Hubertusburg, near Wermisdorf, (district of Leipzig). People came from far and near to listen to its charming strains. As is well known to the student of history, Saxony was arrayed against Frederic the Great, during the Seven Years' War, and he, desiring to reimburse himself for his losses, seized on said chimes, and had them taken to Potsdam, where they are still the admiration of both foreigners and natives.

**COSTLY SNUFF DOSES.**—At an auction of the collection of snuff doses belonging to Count Sapia, at Paris, prices were obtained which can be paid only by men whose wealth enables them to gratify every taste and whim. An oval-shaped gold box with green enamel, and a love scene upon the lid, painted by Formey, brought 6,500 francs; another one, with enamel painting, representing a female player of a triangle, after van Loo (of the time of Louis XV.), sold at 10,000 francs; an enameled box with a Turk and an Odalise, after Leprince, brought 4,250 francs; an octagon gold snuff dose, with iron gray enamel, and a painting of Messalina soliciting pardon from Claudius upon the lid, 4,250 francs; a box with pearl gray enamel and an allegory of painting, after van Loo, 8,700 francs. About 50 bonbonnière and snuff doses of the past century sold at 83,347 francs.

—Platinum wire can be drawn so fine that it is no longer visible to the "naked" eye, and only can be felt. It can be seen with a magnifying glass when the wire is held against white paper. To draw it out, a piece of platinum wire is firmly inclosed in a silver tube, which is then, with its platinum core, drawn out to the thickness of the original piece of platinum wire. A short piece of the silver plated platinum wire, produced in this manner, is then again inclosed in a silver tube and drawn out. This process is repeated until the platinum wire is of the desired thickness, or rather, thinness, when the silver is corroded off with nitric acid, which, having no effect on platinum, leaves the platinum wire. At conclusion, the wire must be annealed several times. This wire is used in place of the spider's thread in telescopes and similar instruments, but is very difficult of manipulation on account of its extreme tenuity.

**WEALTHY CONTRACTORS.**—We clip the following notice from the Russian exchange *Mosk. Listok*, in order to give an idea of the ostentation of the really only rich men in Russia—the contractors of the gold mines in Siberia. An order was lately filled by the celebrated firm of Chlebnikow & Sons, goldsmiths, in Moscow, which perhaps at the present epoch stands sole of its kind, both with regard to artistic execution and value of material. The order called for a silver table service for 70 persons, and was given by the heirs of the Siberian gold miner Basanow. All the plates, knives, forks, spoons, platters, vases for champagne, fruit, confectionery, flowers, salt cellars, spice boxes, candlesticks, etc., consist of pure silver, partly gilt, and contain the name of the owner. The cost of manufacture was about 100,000 roubles (1 rouble = 64½ cents), and more than 1,880 pounds of silver were worked up. The service was sent to Siberia, well packed up in cushioned boxes, lined with chamois leather.

## Workshop Notes.

**BALANCES.**—A gold balance is preferable to a steel balance. The latter metal has the advantage of being less affected by alteration of temperature, but, on the other hand, gold is denser than steel and is not liable to rust or be magnetized.

**SPRING TEMPER TO BRASS.**—A spring temper may be imparted to brass by drawing it through a wire plate. A small piece can be hardened by burnishing it hard. Soft pin tongues are sometimes stiffened by twisting the wire, but if carried too far it will crack or injure it.

**BUTTING.**—The tendency of pinion leaves to butt the wheel tooth when coming into contact is caused either by the bad shape of the teeth or the leaves, or by using a pinion of an improper size, or by the wheel and pinion being placed at an incorrect distance from each other.

**THE FUNCTIONS OF OIL SINKS.**—Oil sinks are formed in watch and clock plates so that by capillary attractions the oil is kept close to the pivot instead of spreading over the plate, and back slopes are formed on the arbors so that the oil may not be drawn all up the body of the arbor. The "attraction" is sometimes negative and becomes a repulsion, as is the case with mercury in a glass tube. It is still called capillarity, whether the fluid is raised above its natural level or depressed below it.

**FLAT POLISH ON STEEL WORKS.**—To polish such parts as rollers and collets, first get a flat surface by rubbing with fine emery on a glass plate or a bell metal block, and afterward finish off on a zinc block with diamantine; but for levers you must use a long, flat bell metal or zinc polisher, and press the lever into a piece of soft wood (willow is the best) in the vise, moving the polisher instead of the work. For large articles, such as indexes or repeater racks, which are not solid, and springs, it will be found best to wax them on to a small brass block and polish them underhand in the same manner as rollers.

**SOLDERING.**—The functions of a flux is to cleanse the surfaces to be united, and various substances can be employed for this purpose, for instance, sal ammonia reduced to powder, and either stirred into a paste with sweet oil or simply dissolved in water. Again, sal ammonia and pulverized resin are made into a paste with water or oil. Resin alone will answer for soft soldering copper or brass. Another agent is Venice turpentine, which has the advantage of not causing steel to rust, although it is disagreeable, because it makes the objects sticky, and they must, after soldering, be rinsed in alcohol or turpentine.

**ARTIFICIAL SAFETY LAMP.**—The use of the ordinary lamp or of matches should never be used in dangerous places for obvious reasons, and the watchmen of the city of Paris have resorted to the following contrivance, which is at once very convenient and quite safe: A small piece of phosphorus of about the size of a pea is put into a very clear glass bottle, which is then filled about one-third with boiling olive oil, after which it is corked tightly. When the light is to be used uncork the bottle for an instant, then re-cork tightly, and a light equal to that furnished by a lamp will issue from the bottle. When it becomes dim, uncork the bottle for a short time so as to admit fresh air.

**TO BRONZE BRASS.**—Saunier recommends the following fluids: Copper turnings are to be dissolved in nitric acid until this is completely saturated, and in this fluid immerse the brass objects to be bronzed after they have been cleaned, smoothed with water of Augstone and heated to such a degree as the hand can just support; on being placed over a charcoal fire they will assume a green color; rub them over with rags, repeat the immersion and heating over charcoal until the required tint is obtained. The shade may be improved by oiling the finished surfaces. It is asserted that by immersing copper articles in molten sulphur containing lamp black in suspension, they assume the appearance of bronze, and that they may even be polished without losing their color.

**TO POLISH JEWEL SETTINGS.**—A very good way to polish jewel settings to American watches on brass or gold, is as follows: First turn the setting down to the right thickness, or nearly so, and then grind down to a gray on a ground glass slab with rotten stone and oil; then clean off the oily rotten stone and polish on a boxwood lap with diamantine and oil, which gives a nice gloss. It will also give a nice gloss on steel, only use oil stone to gray steel with instead of rotten stone. The operator should be particular to clean off all the graying powder in each case before using the boxwood lap, and be sure to keep the lap in a place free from grit or dust when not in use; brass watch wheels can be finished in the same way as the jewel settings by the same process.

**DEFECTS IN THE DUPLEX ESCAPEMENT.**—One of the principal causes of the duplex stopping is the enlarging of its holes due to the rapid wear by the necessarily heavy balance, and all of the escapement holes should, therefore, be of choice rubies. The impulse roller will sometimes enter too deep into the scape wheel, whereby it catches the back of the impulse tooth in its return journey. See that all the impulse teeth act correctly on the impulse pallet. Sometimes the roller depth is altogether too shallow, and it is well in this case to leave the drop in its original place. When taking the watch down, first of all examine the condition of the staff holes, which may be worn large; carefully tap the locking teeth and see that they are rounded up in their original position; the cock and potance may then be gently tapped a little nearer to the scape wheel. Should the foot pins be perfectly tight, their holes may be slightly opened a little obliquely; next bend the foot pins a little backward so that they slant and fit into the oblique holes.

**PROCESS OF GILDING.**—Place in a plate leaf gold, add a little honey; stir the two substances carefully together with a glass stopper, the lower end of which is to be very flat. Throw the resulting paste in a glass of water mixed with a little alcohol; wash and leave it to settle; decant the liquid and again wash the deposit. Repeat the operation until the result is a fine, pure and brilliant powder of gold. This powder, mixed with common salt and powdered cream of tartar and stirred up in water, serves for gilding. As another method of gilding, Boutet Mouvel gives the following directions: Dissolve in aqua regia one grain of fine gold, previously rolled out very thin, in a porcelain capsule heated on the sand bath, and concentrate until it is the color of ox blood. Add a pint of distilled water, hot, in which has been dissolved four grains of white cyanide of potassium. Stir with a glass rod and filter the liquid through unsized paper. To gild with this liquid it is heated a little above lukewarmness, and the articles to be gilt are immersed in it, being supported upon a piece of very clean zinc.

**TO MEASURE LENGTH OF STAFF.**—The proper way to measure for the length of staff is, first, to take off both end stones, fit the balance cock properly to the plate (level, etc.), and screw it fast in its place. Then, with the degree gauge, take the measure from the outside of one hole jewel to the outside of the other one, and to this add the amount of end shake the staff is to have, which gives the exact length of the staff between the extreme ends of the pivots. The length should be such that when one pivot rests against its end stone the top pivot shall come level with the outer surface of its hole jewel, and the same when resting on the other pivot. The end shake should be equal to the distance from the outer surface of the hole jewel to the adjacent surface of its end stone when fastened in place. If this distance is neither too great nor small (the jewels must not touch), the end shake will be correct. A safe way for length is to take the outside measure from the surface of the sink in which the bottom end stone fitting rests, to the top surface of the balance cock. Then, having screwed on one of the end stones, shorten up either or both pivots of the finished staff a trifle, to bring the top end of the other pivot level with the surface of its hole jewel as before explained.

## Who is This?

[From the *Milwaukee Sentinel*.]

THERE HAVE been a great many stories told of the reckless daring and abandon of the cowboy. He is an American production, and at the sound of the word cowboy the mind reverts to some Western locality where law and order are unknown and are supplied by a rude set of conventionalities, the non-observance of which means violence without process of trial. The typical cowboy must be fearless, ready to shoot at a moment's warning, wild in his make-up and language, and ready to perpetrate a joke on a "tenderfoot" at any time.

But there is often considerable braggadocio in the cowboy, and a good illustration of this fact was told a *Sentinel* reporter by a station agent who had lived in the West for many years, and who had been in the employ of various railroads in localities where cowboys were numerous.

"I have seen a good many daring deeds performed and coarse jokes perpetrated by cowboys," said the agent, "but I will tell you of a little incident where the wind was taken out of three cowboys by a determined, fearless 'tenderfoot.' It happened only last spring. I was then station agent and telegraph operator for the Northern Pacific Railroad Company at a place near the Montana line. It was not much of a place, as it consisted only of a depot, a house or two and a saloon.

"One morning a traveling man arrived at the depot by stage from up North somewhere. He had a small sample case and satchel. He was below the medium height and rather slight, but was very neatly dressed and wore a silk hat. He was traveling for a New York jewelry house. He was about an hour early for the train East, and he opened his grip on the platform, took out a brush and dusted his clothing and shoes. He then drew out an old newspaper, leaned up against the side of the depot with one foot projected in front of the other and began reading.

"Meanwhile, however, three cowboys had sauntered up to the depot. They all eyed him closely and watched his operations. When he began reading they huddled together and talked awhile in an undertone. Presently one of them—a big six-footer—left the group and began to saunter carelessly about the platform with his head in the air, inspecting the posters on the building and the cornice. When he got around where the traveling man stood, he lifted his big brogan and planted it firmly on the jewelry man's foot. No apology was made. The traveling man merely looked up, drew his foot back a moment, then placed it back where it was. The cowboy passed back to the other two. They all chuckled and joined in the low-toned conversation.

"Soon the cowboy started out again on a similar round, gazing at the roof. When he reached the traveling man he tried to bring down his coarse boot on the extended foot. The traveling man jerked his foot back suddenly, and the brogan came down with a thump on the platform. Another conference and chuckling followed. Finally the cowboy set out on the third round. Just as he was about to raise his foot to plant it on that of the traveling man, the latter looked up quickly and said:

"See here, there is my foot, and its going to stay there. You step on it if you want to, but I want to tell you that before you can get off of it I will kill you."

"Such a volley staggered the cowboy. He looked at the foot and then at the small possessor, finally moving off without stepping on it.

"Another consultation followed. The traveling man calmly read his paper a few minutes, and then took from his satchel three apples. He looked at them a moment, and suddenly threw them a few feet into the air, and then quickly drew a revolver, fired three shots, splitting each apple into a dozen pieces before they reached the ground. He replaced the cartridges in the empty chambers of the revolver and returned it to his pocket.

"The cowboys witnessed the act without saying a word, and soon,

completely cowed, turned and left the depot. The traveling man told me, after they left, that he would have killed the three of them had the fellow stepped on his foot again, and I think he would, as he was quick as lightning. He then showed me a medal he carried which he won as being the most rapid and one of the best shots in New York. The story simply illustrates that there is sometimes a great deal of fictitious valor and daring about the cowboy."

## Trade Gossip.

Tabor Bros. succeed S. H. Tabor, Dallas, Texas.  
 H. Muller & Co. succeed H. Muller, Chicago, Ills.  
 Belt & Watt succeed P. P. Belt, Columbus, Kansas.  
 P. S. Eastman succeeds G. E. Battelle, Calistoga, Cal.  
 Chas. E. True succeeds W. E. Small, Bad Axe, Mich.  
 Wm. Skiff succeeds W. C. Peterson, Lebanon, Oregon.  
 Geo. S. Brooks succeeds A. J. Lawton, Orange, Mass.  
 Pritchard & Owen succeed B. Pritchard, Neosho, Mo.  
 Henry Beekman succeeds A. H. Dauchy, Merced, Cal.  
 A. E. Harlan has moved from Carson to Oakland, Iowa.  
 S. A. Jarvis succeeds the firm of Jarvis Bros., Erie, Kan.  
 E. L. Mosher has moved from Freeport to Sarnac, Mich.  
 O. D. Shide succeeds Shide & Estaque, Manhattan, Kan.  
 E. P. Clark succeeds W. H. DeLamater, Charlotte, Mich.  
 Howard Wilcox succeeds Chas. S. Willard, Catskill, N. Y.  
 S. S. Lowenberg succeeds M. Flanders, Portland, Oregon.  
 James M. Keller succeeds Edwin R. Phipps, Danville, Ills.  
 Geo. T. Mills has moved from Mason, Ills., to Woodstock.  
 A. L. Sargent & Co. succeed E. D. Purviance, Attica, Ind.  
 S. Baunn has moved from Northampton to Holyoke, Mass.  
 Robert J. Riles succeeds John M. Young, Jr., Palatka, Fla.  
 R. Von Dack has moved from Carson City to Dayton, Nev.  
 M. S. Munger succeeds Thornton & Munger, Sturgis, Mich.  
 S. M. Hardman has moved from Ireland to Weston, W. Va.  
 B. N. Stephenson has moved from Douglass to Olathe, Kan.  
 W. Alexander has moved from Clinton to Terre Haute, Ind.  
 Charles E. Hughes succeeds Wm. H. Piutt, Waterloo, Iowa.  
 John W. Ruth & Son succeed J. W. Ruth, Shelbyville, Tenn.  
 J. M. Campbell has moved from Waterloo to Mt. Union, Pa.  
 Charles H. Place succeeds C. F. Huntington, St. Albans, Vt.  
 Thos. H. Mattocks has moved from Clinton to DeWitt, Iowa.  
 J. E. Chappell succeeds Robert H. Armstrong, Buffalo, N. Y.  
 Isaac Gotthelf has moved from Vicksburg to Memphis, Tenn.  
 Levi Hair succeeds the firm of Dinius & Hair, Navarre, Ohio.  
 A. C. Henrich & Co. succeed A. C. Henrich, Memphis, Tenn.  
 Masterman & Davis succeed E. E. Masterman, Elk City, Kan.  
 W. E. Whitney has moved from Des Moines to Jefferson, Iowa.  
 J. G. Lester has moved from Nashua, Iowa, to Watertown, Dak.  
 Charles W. Pratt has moved from Big Rapids to Muskegon, Mich.  
 George M. Bryant succeeds Godfrey & Bryant, Sherburne, N. Y.  
 Robt. S. Gardner succeeds James E. Brierly, Birmingham, Conn.  
 E. E. Brown succeeds the firm of Brown & Rushton, Dalton, Ga.  
 J. O. Nason succeeds the firm of Nason & Barker, Leadville, Col.  
 L. C. Morris has moved from Fairfield, Neb., to Oberlin, Kansas.  
 H. R. Hadrich has moved from East Saginaw to Marquette, Mich.  
 G. Mathien, Jr., succeeds G. Mathien & Son, San Francisco, Cal.

John B. Farrington succeeds B. S. Farrington, Woonsocket, R. I.  
Rudolph & Mahaffy succeed E. C. Dowson & Co., Wilmington, Del.

L. J. Rhoads & Co. has moved from Wansan to Stevens Point, Wis.

Wm. R. Marshall has moved from Kansas, Ills., to Stromsburg, Neb.

Frank Thompson has moved from Jefferson, Iowa, to Gordon, Neb.

George V. Wood succeeds the firm of Wood & Moore, Reidsville, N. C.

Fred. Lauer has moved from New Boston, Ills., to Burlington, Iowa.

W. M. Ream has moved from Monroeville, Ind., to St. Marys, Ohio.

Leon A. Gillett succeeds the firm of Gillett Bros., Lake Linden, Mich.

D. S. Park succeeds the firm of D. S. Park & Co., Colorado, Texas.

Mr. C. D. Peacock, of Chicago, gave us a call during the past month.

Mr. Louis Neresheimer sailed for Europe in the steamer *Ems* on Aug. 19.

Charles Wuersten succeeds the firm of J. F. Sprowl & Co., Warren, Ind.

John R. Harris has moved from Greenville, Texas, to National City, Cal.

McCausland & Co. have removed their New York office to 351 Broadway.

H. Kleinman succeeds the firm of Reinhardt, Kirby & Co., Pittsburgh, Pa.

Wm. Annspaugh succeeds the firm of Annspaugh & Shue, Fincastle, Va.

George O. Hutchinson has moved from Fitchburgh to Cottage City, Mass.

Benjamin F. Miller succeeds the firm of Grey & Collins, Cherry Valley, Neb.

O. B. Dunning succeeds the firm of O. B. Dunning & Co., Vicksburgh, Mich.

The International Jewelry Co. have leased offices at No. 12 Maiden Lane.

John D. Robertson succeeds the firm of Steffner & Robertson, Ashville, N. C.

The firm of Williams & Mix, Bloomington, Ills., is succeeded by Howell & Mix.

Mr. C. B. Guth, of Brookville, Pa., was among the numerous callers at our office last month.

The stock of A. G. Taylor, Springfield, Mass., deceased, has been purchased by F. E. Ladd.

S. B. Dinkelspiel & Co., of San Francisco, have removed their office to No. 116 Sutter street.

The business of Wm. Schofield, Baltimore, deceased, will be continued by Edward C. Schofield.

Allport & Mitchell have opened a jewelry establishment at 50 Church street, Toronto, Canada.

Mr. T. Le Boutillier, of Le Boutillier & Co., returned from his annual excursion abroad on the *Gallia*, Aug. 8.

Mr. Emil Lehmann, of the firm of Waterman & Lehmann, was married Aug. 8 to Miss Hilma Gast, of this city.

Laurel V. Stone has moved from Vermillion to Conneaut, Ohio, where he has purchased the stock of E. H. Hiler.

The Excelsior Sign Co., of Chicago, have introduced this season many novelties in their already attractive line of goods.

Mr. A. J. Lewis, of the firm of George C. Shreve & Co., of San Francisco, arrived from Europe in the steamship *Aurania*.

The American Waltham Watch Company has been awarded a gold medal for its exhibit at Kensington Gardens, England.

Mr. Leo Wormser, New York representative of Julius King, was married in Louisville, Ky., July 15, to Miss Belle Rosenthal.

Mr. A. S. Mermod, of the Mermod, Jaccard Jewelry Co., St. Louis, Mo., gave us a call during the month while in the city purchasing goods.

Mr. A. Webster, of the American Watch Tool Company, of Waltham, recently returned from Europe where he spent several weeks.

Mr. B. Mayer, of 25 John street, will close out his business early in September, to accept a situation with Schlesinger & Mayer, Chicago, Ills.

Watson & Nickerson succeed J. H. Nickerson, Moncton, New Brunswick; they have purchased the business also of S. T. Joudry, of the same place.

A. H. Bradley & Co., of Chicago, is the only house in the west that deals exclusively in American watches, and carry full lines of all grades and all makes.

We tried to say in our last issue that the firm of D. H. Stites & Son had removed to 51 Nassau street, but somebody erred and it was made 51 Maiden Lane.

The firm of Geo. Hay & Co., Attica, Ind., has been dissolved, E. D. Purviance withdrawing and opening a new store, Geo. Hay continuing the old business.

Mr. William Smith, of William Smith & Co., returned from Europe in the *Eltheopia* Aug. 17, much improved in health. His trip abroad covered a period of three months.

Joseph Gaust has moved from Tuscaloosa, Ala., and opened a jewelry store in Minneapolis, Minn.; his business in Tuscaloosa will be continued by E. Gluck as manager.

The Executive Committee of the Jewelers' Security Alliance omitted their usual monthly meeting in August, to permit its members to enjoy their customary vacations.

Mr. Thomas Wilkinson, Jr., who has for several years been a salesman for Wm. Daue & Co., has been appointed to a lucrative clerkship in the Navy Yard in Brooklyn.

L. H. Keller & Co. announce in this issue of THE CIRCULAR that they are the importers of the genuine Jurgensen mainspring, a supply of which they keep constantly on hand.

R. & L. Friedlander have added to their line of tools and material a full assortment of American watches. They have engaged Mr. A. Harris to represent them on the road this season.

The American Waltham Watch Company, for the convenience of the trade, have opened a material department at No. 12 John street, where a complete line of their watch material can be found.

The firm of D. B. Anderson & Co., of Marietta, Ohio, has been dissolved, T. N. De Lamater retiring. The latter gentleman has established himself in the jewelry business at Columbus, Ind.

J. T. Scott & Co., general jobbers, have an unusually attractive line of goods to offer the trade for the fall and holiday demand. Their stock is multifarious in variety and extensive in quantity.

At a recent meeting of the New York Board of Trade, THE JEWELERS' CIRCULAR was chosen as the official representative of that body, an honor which we duly appreciate and hereby acknowledge.

It is reported that a bold thief entered the jewelry establishment of Harrey Legg, Minneapolis, recently, and seized a small tray containing diamond rings and pins valued at \$3,000, and made his escape.

R. Wallace & Sons Manufacturing Company present to the trade this month an illustration of one of their new patterns of silver knives. These goods are, as will be seen, very attractive, and promise to become popular.

At the inventions exhibition in London, the American Waltham Watch Company, of Waltham, has been awarded a gold medal for "improvements in the machinery and process employed in the manufacture of watches."

Allen & Lorsch Co. have imported a large line of fine enameled flowers, ornaments, etc., suitable for diamond work. These goods are very fashionable this season, and the attention of the trade is directed to the same.

Mr. J. W. Tufts, of Boston, silver plate manufacturer, has introduced many desirable goods this season in new designs and styles. He is an enterprising and pushing manufacturer, and always keeps abreast of the requirements of the trade.

The late firm of L. B. Citroen & Co. having been dissolved in consequence of the death of Mr. Citroen, the business will be continued by Mme. Veuve L. B. Citroen and Mr. N. Kauffmann, under the firm name of Veuve L. B. Citroen & Co.

Messrs. C. L. Tiffany, Phillip Bissinger, and W. C. Kimball have been added to the committee for raising the necessary funds for erecting the Grant monument. These gentlemen would be glad to receive any contributions from the jewelry trade.

E. Ira Richards & Co. manufacture a line of gold plated goods from which any dealer can select a full supply of goods of this character. With their usual enterprise they have introduced many new and attractive designs for the fall and holiday trade.

Mr. R. Mitchell, who has traveled for several years for Field & Co., has associated himself with Mr. Fountain, under the firm name of Mitchell & Fountain, and purchased the stock of Wm. Anderson, at St. Paul, Minn., where the new firm will continue in business.

Holmes & Edwards Co., manufacturers of silver plated ware, and the Hartford Silver Plate Company have jointly opened an office at No. 2 Maiden Lane, which will be under the management of Mr. J. B. Spencer, who was for many years associated with Brown & Bros.

The following shows the trade exportations from Switzerland to the United States during the first three months of this year, and the value of the goods:—Watches cased in gold, 111,998 fr.; watches cased in silver, 107,523 fr.; watches cased in other metals, 157,671 fr.

George L. Vose & Co. have removed to 59 Clifford street, Providence, and have now one of the largest and best equipped factories in the east. They are making, together with their line of gold front sleeve and collar buttons, a double lock roller neck chain and bracelet.

Chas. Downs is now making, in addition to his jewelry department, a fine line of gold and silver heads for canes, umbrellas and parasols, in a variety of styles. Mr. Downs desires to notify the trade that all cane heads made by him are stamped with his name and the word "sterling."

S. K. Merrill & Co., Providence, are now making a novelty in the shape of a combination charm and pencil case, or charm and tooth pick, in gold, silver and plate. The pencil or pick is easily removed, and securely held in the charm when returned. They are made in an endless number of styles.

Lissauer & Sondheim have just issued a new price list of American movements and cases, which will be sent to the trade on application. All the travelers for this house report business as improving in all sections of the country, and speak most encouragingly of the future prospects of the trade.

Mr. Samuel Swartzchild, of Chicago, writes us that it is his belief, from the indications he has seen, that the fall trade will be better than that of any season since 1882. He has extensive opportunities for feeling the pulse of business, and is competent to draw sound conclusions from his observations.

The New Haven Clock Company have opened a branch office at No. 21 Franklin street, Boston, for the convenience of the New England trade. This branch is in charge of Mr. William Fenton, who is favorably known to the trade in that section, having been with the company for several years.

Howard & Son, manufacturers of the American lever buttons, have introduced a new collar button, which has an attachment for holding the necktie in place. An illustration of this novelty will be found in their advertisement. Wearers of standing collars will appreciate the convenience of this new device.

The Jewelers' Mercantile Agency, Limited, have secured a temporary injunction against the New York Jewelers' Board of Trade, restraining them from publishing a list of the jewelry trade and a book of ratings. Argument in these proceedings will be heard by the court at an early day during the present month.

L. & M. Kahn & Co. are meeting with pronounced success in the sales of their Siberian ruby, a stone that is claimed to possess properties of the famous Alexandrite stone, but instead of being green and changing to red, is an oriental amethyst color, and changes to a distinct fiery ruby color by gas light or other brilliant artificial light.

Mr. Nathaniel F. Baldwin, of the firm of Baldwin & Co., of Independence, Mo., died in that city of consumption at the age of 49 years. He located at Independence in 1853, and engaged in the jewelry business, where he won the respect of all citizens by his business ability, public spirit and strict integrity. He was confined to his house four months preceding his death.

Leroy W. Fairchild & Sons have been making quite an effort to offer the trade many new and improved ideas in all their specialties. We notice particularly in match boxes one with a concealed flat segar cutter attached; another with a detachable tooth pick, also with a detachable segar piercer; several new imported styles of novelties from Japan and Europe, all of original and very unique design.

The many friends of Mr. James C. Rich will be pained to learn of his sudden death in Chicago, August 19th, in the 46th year of his age. Mr. Rich for many years traveled for Saxton, Smith & Co., and left their employ in 1879 to travel for Alfred H. Smith & Co., and was placed in charge of their Chicago office in 1880. He was a genial, sociable gentleman, and leaves a host of friends to mourn his loss.

Mr. J. J. Sweeney, of the firm of Sweeney & Coombs, of Houston, Texas, was among the buyers in the city last month, and favored THE CIRCULAR with a call. This firm is doing an extensive and prosperous business in the southwest. This was Mr. Sweeney's first visit to New York, and he received a cordial reception at the hands of many who had received courtesies from his firm while traveling in the south.

Mr. S. E. Theus, having dissolved his connection with the firm of J. P. Stevens & Co., of Atlanta, Ga., has made an arrangement with the Gorham Manufacturing Company to travel in their interests through the south. Mr. Theus is an old traveler on the road, having been connected with the firm of Enos Richardson & Co. for nine years, and having an extensive acquaintance in the trade in the south especially.

A Chicago dispatch to the daily press says that Samuel Heyman, a Chicago jeweler, is mourning the disappearance of Bernhard Streicher, his young clerk, and two pairs of ear rings valued at wholesale at \$350. The clerk was sent to an express office with a package of diamond jewelry addressed to Traitel Brothers, in Maiden Lane. Next day the clerk did not appear and his employer became alarmed, and on telegraphing Traitel Brothers he learned that the ear rings had been taken from the package. Streicher is supposed to have gone to New York.

The Hartford Silver Plate Company has recently patented a new form of water cooler which they have christened the "Artic." An illustration of it will be found in their advertisement on another page. As will be seen, it is an entirely new design, handsome, attractive and convenient. It is operated by a simple mechanical contrivance that saves time and labor. It will undoubtedly become popular in the trade.

Grand Chief Bastien, of the Hurons, has achieved wonderful success in fishing for pearls. We lately referred to a splendid specimen as large as a small hazel nut, sold by him to Mr. Seifert, jeweler. He has since sold a number of other pearls to Mr. Seifert, one of which is nearly fifty per cent. larger than that to which we previously referred. Some of these pearls are now on exhibition in the window of Mr. Seifert, Fabrique street.—*Quebec Chronicle*.

C. K. Giles, of Giles, Bro. & Co., of Chicago, Ill., has invented a compact machine, about the size of an ordinary sewing machine, for demagnetizing watches. It is perfectly simple in operation, thoroughly doing the work, and at a cost within the reach of any watchmaker, requiring no extra power or application. It can also be used as a motor to run a bench lathe or an electric light. It requires no systematic instructions to use it. The firm have arranged with William A. Wales, of this city, of No. 16 Maiden Lane, to take the agency of this machine, and also of their anti-magnetic watch case, which is meeting with so much favor in the trade.

"How fast are we going?" is a question often asked, not only on a Pullman "special," but also on the slowest "accommodation," and nearly as often given up as a "chestnut" too hard to crack. In order to meet this inquiry, Messrs. Cross & Beguelin, who are well known to the trade, have lately enlarged the serviceable qualities of their "Centennial" chronograph by the addition of a railroad speed indicator, which answers this universal question promptly without any mental arithmetic. This novel feature will commend itself immediately to all railroad travelers, and caps the good qualities of a watch which is sold at a price which places it within the reach of all.

The wonderful stone known as *Violane du Cap* has long puzzled scientists, having properties that they can hardly understand. Its ordinary color is a very rich violet, but when exposed to artificial light it has a varied hue, and is very brilliant. The body color is a very rich ruby, and when it shades into the violet the effect is startling and very beautiful. Its hardness, as herein shown, gives assurance of a durable gem, and when taken in hand to be placed in the trade by a house with the substantial reputation of H. Muhr's Sons, its popularity is assured. They are now mounting this gem in numerous designs, the sale of which already reaches very large proportions, and promised to become the leader of the moderate priced gems.—*Watchmaker and Metalworker*.

Mr. W. C. Edge, of W. C. Edge & Son, is the inventor of woven and braided gold chains and bracelets, which bear so enviable a reputation in the trade. They now have in their factory at Newark some very fine and expensive machinery, built under his supervision, used in the production of these goods, which have grown in popular favor year by year. They are now being handled by almost every reliable wholesale jeweler dealing in fine goods, and are considered as staple as spool cotton, but much more profitable to sell. They have also introduced a new pattern of chain named the "New Brunswick," which has just been patented by Mr. Edge here and in three European countries. The design is very unique, and the chain is made in rolled plate vests and necks. Another new style of jewelry brought out by this firm has been christened "Stiffened Crazy Patch Gold Jewelry," and is meeting with large and ready sale.

Attention is directed to the advertisement of the old and well known house of The Wm. Wilson & Son Silversmiths Company. The foundation of the present company was laid by R. & W. Wilson, who began in 1812 in a very modest way, but grew year by year, and succeeded in making a reputation to be envied by any business man, not only for good work, but also for the sterling qualities of their ware. During the past summer this company has been steadily at work on many novel productions. They have recently opened a branch office at Union Square in this city.

L. Straus & Sons, who are well known as importers of china, glass ware and art pottery, have lately added another department to their extensive establishment, under the management of Mr. Jos. M. Wulff, formerly of the firm of Wulff, Worms & Co. Mr. Wulff has recently returned from a trip abroad, where he succeeded in securing many attractive novelties in the different art centers of Europe, and their selection of French clocks, bronze, brass and iron goods, metal lamps, and a general variety of ornamental goods, particularly adapted for the jewelry trade, affords an excellent opportunity for making choice selections. In pottery this house shows many unique novelties. The variety is great, and must be seen to be appreciated.

During January last there were imported into Switzerland trade goods as follows:—Watches in gold cases, 2,163, valued at \$182,662; watches in silver cases, 2,371, valued at \$62,902; watches in nickel, etc., cases, 2,229, valued at \$19,347; watch movements finished, but without cases, 482, valued at \$4,185; gold watch cases, 690, valued at \$25,315; silver watch cases, 4,880, valued at \$47,855; nickel, etc., watch cases, 3,474, valued at \$3,971; watch tools and materials, 32 cwt., valued at \$87,551; superior clocks, 526, valued at \$7,150; clock movements, 3,956, valued at \$10,222; musical boxes, etc., 57, valued at \$5,414; gold, silver, platinum coined, unwrought, 20 cwt., valued at \$1,033,887; gold and silver ware, fine and imitation jewelry, 14 cwt., valued at \$212,534.

Every one of our readers should, when in New York, pay a visit to the extensive show rooms of Messrs. Bawo & Dotter, 30 and 32 Barclay street. This firm claims to have the best arranged rooms in the United States, and while there are some houses in the retail line carrying more expensive pieces of bric-a-brac, yet, taken as a whole, for neatness and artistic and convenient arrangement, we think their claim rests on a good foundation. Their collection of art pottery and bric-a-brac is very extensive, and they have for a few years past given especial attention to importing such articles as will work in well with the stock generally kept by the jewelry trade. They inform us that they have had a yearly increasing business in that direction. The firm has extensive china factories in Limoges, France, and in Fischern, Bohemia, in which they manufacture articles for the table, bed room and parlor, in great variety.

Among the buyers in town during the past month we noticed Messrs. C. K. Giles, Chicago, Ills.; J. F. Geiring, Nazareth, Pa.; J. C. Woelfle, Peoria, Ills.; C. Schonberg, Columbus, Ga.; L. Lowengart, of M. Scooler, New Orleans, La.; C. S. Saxton, Springfield, Mass.; N. Loeb, Erie, Pa.; E. Harris, Washington, D. C.; W. Miller, of E. S. Ettenheimer & Co., Rochester, N. Y.; E. H. Hobbs, Selma, Ala.; J. T. Bailey, of Bailey, Banks & Biddle, Phila., Pa.; George Goddard, of Goddard, Hill & Co., Pittsburgh, Pa.; T. E. Thompson, Galveston, Texas; A. Bonnet, Zanesville, O.; G. S. Raymond, Omaha, Neb.; Robert Moore, Williamsport, Pa.; J. Gansl, Minneapolis, Minn.; F. G. Hutchinson, Hornellsville, N. Y.; O. F. Rudolph, Wilmington, Del.; W. S. Stanley, of Stanley & Camp, Milwaukee, Wis.; V. W. Skiff, Athens, Ga.; H. W. Phelps, of Merrick, Walsh & Phelps, St. Louis, Mo.; H. J. Bodwell, Lynn, Mass.; J. B. Rowe, Fair Haven, Vt.; Mr. Crosby, of D. Greenleaf & Co., Jacksonville, Fla., and J. H. Leyson, of Leyson & Turck, Butte City, Montana, who has just returned from Europe.



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## THE JEWELERS' CIRCULAR AND HOROLOGICAL REVIEW

*Official representative of THE JEWELERS' LEAGUE and of THE NEW YORK JEWELERS' BOARD OF TRADE, and the recognized exponent of Trade Interests.*

A Monthly Journal devoted to the interests of Watchmakers, Jewelers, Silver-smiths, Electro-plate Manufacturers, and those engaged in the kindred branches of art industry.

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### Draw the Line Closely.

THE FACT that there are some jobbers in the trade who persistently solicit for retail patronage constitutes one of the crying evils of the day, and demands that a reform in this matter should be effected in some manner. The persons who do this have been appealed to by the retail trade, by the trade journals, and have been threatened with "boycotting" if they did not desist, and as the practice still continues it is imperative that some action be taken by those who have the power to compel them to stop. A jobber who sells all the goods he can to the retail trade, and then deliberately tries to steal away the customers upon whom the retailers rely for patronage, inflicts a grievous injury upon the entire manufacturing and jobbing interests. Retail dealers recognize the jobbers as a legitimate and necessary medium of trade, and are willing to allow them a fair profit; in justice the jobbers should recognize the retail dealers and not trespass upon their domain, which is simply selling goods at retail. We have recently received several very vigorous complaints from retail dealers regarding jobbers, whose names are given. In one instance, the traveler for a certain jobbing house visited a western city and took orders from three different retail dealers. One of these was called upon by a clergyman, before the traveler had left town, who desired to know the value of a watch which he exhibited. The dealer recognized it as coming from the same lot the traveler had exhibited to him, and ascertained that it had been offered to the clergyman for the same price it was offered to the dealer. Of course, the dealer was indignant, and forthwith started out in search of that traveler, who, when confronted with the facts, admitted that he had offered his goods to individuals at wholesale prices. His

excuse was that trade was dull and he was doing all he could to make a good showing on his trip. He was asked if his employers approved of his trying to steal the retail trade away from legitimate dealers, and his reply was that he had no instructions not to do so, but was expected to sell all the goods possible. He also said that his firm filled all his orders, whether the goods were sent to dealers or to private parties. This is only one illustration out of many sent us. Some travelers go into a town, and, after taking all the orders they can from the regular dealers, go about the streets peddling goods from their sample cases to whoever will buy, selling to individuals by retail at precisely the same prices they have charged the dealers. All the time they protest that they sell only to the trade, and if caught in the act, will do more lying about it than would suffice to elect them to Congress. During the depression that has existed in the trade for the past two or three years, more than the usual number of travelers have thus sought to make up a good showing for their trips, filling in private orders to compensate for those lost among dealers.

This abuse is far-reaching in its effects, for, by depriving the retail dealer of his opportunity to sell goods, he is also deprived of the ability to pay his debts to other jobbers, and from a hundred-cents-on-the-dollar man, he becomes embarrassed, cannot meet his obligations and must either get an extension on his paper or compromise with his creditors for a few cents on the dollar. The failure of a respectable dealer is a calamity that is injurious to the trade in general, and whatever is calculated to injure the trade and credit of any retail dealer is worthy of the consideration of the entire trade. We called attention last month to the fact that while the National Association of Jobbers in American Movements and Cases had assumed to designate to manufacturers who were entitled to be recognized as jobbers, it had failed to say that the selling of goods by retail was exclusively the province of retail dealers, and that when a jobber entered into competition with them for the retail trade, they forfeited all rights as jobbers. This is what should be done. Let every man elect which he will be considered, a jobber or retail dealer, then give him such recognition as is due his class, but no favors. If he retails any goods whatever at jobbers' prices, cut him off the jobbers' list and compel him to pay the same prices for his goods that retail dealers as a class are compelled to pay. The National Association cannot afford to bolster up a dealer who is both jobber and retail dealer, and accepts wholesale prices for goods sold at retail. It would be impossible for the association to say that no member should do both a retail and jobbing trade, for there are many legitimate jobbers who carry on a retail business. Their two departments, however, are conducted as separate and distinct enterprises, the jobbing department never selling at retail, and the retail department charging a reasonable advance on wholesale prices. This phase of the business is legitimate and must be recognized; but it is feasible for the association to fix a minimum retail price for goods over which it has assumed jurisdiction, as well as a minimum wholesale price; it is also possible for it to prohibit jobbers selling goods at retail

outside of their legitimate retail departments, where they have such. Let such a rule be adopted, the penalty to be the forfeiture of all privileges accorded to jobbers, and we shall hear less complaint about jobbers stealing away the trade of retail dealers. The association, of course, has jurisdiction only over jobbers in movements and cases, but a dealer once deprived by it of recognition as a jobber because of his retailing goods, would find himself in such bad odor in the trade in general as to affect him in his entire business, and cause other branches of the trade to withhold jobbers' privileges from him. The National Association of Jobbers in Movements and Cases owe this duty to the retail trade, and by adopting such a rule and rigidly adhering to it, it will inaugurate a reform that will entitle it to the gratitude of the entire fraternity.

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### Associated Efforts for Reform.

NEARLY EVERY branch of productive industry has found it necessary to maintain organizations for its own protection. Not only have mechanics and laborers established their trades unions, but proprietors of competing industries have found associated efforts necessary in order to control the commercial aspect of their business. Thus we have associations among woolen and cotton manufacturers, paper makers, etc., for watching the markets, indicating the conditions of supply and demand and regulating competition. Substantially the same work is performed by the stock, produce, real estate and other exchanges. All these prescribe certain rules and regulations for the transaction of the business to which they pertain, thus regulating commerce and preventing many abuses that would otherwise result from excessive competition. These associations are not intended to prevent competition, but to compel it to observe certain rules in its prosecution. In the jewelry trade there are various organizations, each having to do with some particular phase of the business, and each doing its necessary work in a satisfactory manner; but there is no organization broad enough in its scope to comprehend the welfare of the entire trade, and devoted to the general good of all interests comprehended in the very elastic term, the jewelry trade. Retail dealers in particular lack organizations for the protection of their interests, and there is no association in any other branch of the trade that exercises jurisdiction over their affairs. Quite an effort was made a few years ago to form State associations of retail dealers, but either they were not conceived on a broad gauge basis or their management fell into inefficient hands, so that none of them were productive of the benefits that were expected of them. One or two fell into the hands of schemers, who were carried away with the idea that the way of redemption for retail dealers was to organize co-operative manufactories, make their own goods, and so drive from the field the capitalists and experienced men now engaged in manufacturing. THE CIRCULAR opposed these schemes from the first, predicting that they would not only prove failures, but would imperil the existence of the associations themselves. Our predictions have been fully verified, for the co-operative idea fell still born, while the efforts to foster it destroyed the vitality of the State associations, not one of the survivors of them possessing sufficient vigor to make any visible impression upon trade conditions. It was a misfortune to the retail trade that these attempts to secure associated action among retail dealers were misdirected, for there was here the germ of an idea which, properly developed, would have secured the co-operation of a majority of the retail dealers and made them a power for good. All the evils of which, as individual dealers, they now complain, could have been remedied if their complaints had found endorsement by one or more State associations comprising a majority of the dealers in a given section. Any reforms in the methods of conducting the business as between manufacturers, jobbers and retailers, that such associations chose to insist upon would, per force, have been adopted, for the producers could not afford to

ignore the demands of the consumers of their products. The State associations did, it is true, formulate resolutions regarding certain evil practices, but, like the Pope's bull against the comet, there was lacking that power to enforce them that would naturally come with associated effort harmoniously directed. As an instance of the failure of the State associations of retail dealers to secure the co-operation of all who should be members of them, a recent circular issued by W. H. Thorp, Secretary of the Wisconsin Association, the most effective of all of them, says that there are four hundred dealers in that State, and that never has the association had more than one-third that number on its list of members. Of course, an organization that cannot control even a majority of the persons in interest cannot assume to speak for them or claim to represent them; much less can its action influence the objects sought to be controlled. While these weak and inefficient State societies have been formulating their thunderbolts against the abuses to which retail dealers are subjected, the abuses have not abated but have continued to flourish and to breed others. The lack of influence in these associations lay in the fact that the subjects that occupied the attention of these bodies mainly, did not command the sympathy of a majority of the trade—in other words, they were not practical enough to command confidence, and, consequently, failed to exercise that influence upon the trade that they should have done.

It is only through such associations, however, that retail dealers can command that consideration from manufacturers and jobbers that they are by right entitled to. In Wisconsin, for instance, if three hundred dealers, instead of fifty or sixty, echoed the voice of the association and were guided by its action, no jobber or manufacturer could afford to array himself in hostility to them, and the consequence would be that the reforms in practices that were demanded would be accorded. The retail dealers of the country might well study the methods of the fire underwriters. They have a national organization, State associations and in almost every city and village, local boards; the first deals with matters of general interest; the second with sectional questions, while the local boards administer the business in all its details. Until the retail dealers organize for mutual protection they will continue to be subjected to all the unbusinesslike practices that are born of undue competition. They may appeal to manufacturers and jobbers to redress their wrongs, but they will appeal in vain; these gentlemen are too fully occupied in managing their own affairs to pay attention to the distressful cries of those who have not the ambition or the power to help themselves; besides, these gentlemen are the authors of the abuses complained of, and it is not reasonable to look in the enemy's camp for assistance. The dealers must rely upon themselves, and the sooner they organize under intelligent leaders, and for objects that command the unanimous approval of the retail trade, the sooner will they be emancipated from the evils of which they complain. An individual can do little as a reformer, but an association that is thoroughly representative will command respect and consideration.

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### Evil Practices that Become Trade Customs.

THE JEWELRY trade is not, we presume, afflicted with evil practices to any greater extent than other branches of manufacturing and commercial industry, yet its members are prone to believe that they are the victims of unbusinesslike methods to a greater degree than any other merchants or producers. It is a characteristic of human nature for each individual to think that he has a greater grievance to endure than any of his neighbors have. If a man is sick, his sickness is worse than anything anybody else was ever afflicted with; if he meets with an accident, there was never anything like it. One is apt to so magnify the mote in his own eye as to obscure the beam that occupies his neighbor's visual organ,



rather a reversal of Scripture in this particular respect. While there are many vicious practices in the jewelry trade, that are supposed to be worse than any that can be found elsewhere, inquiry will develop the fact that not only are they known in other callings, but that those callings have some grievances that are peculiar to themselves and are unknown in the jewelry trade. Go to the dry goods merchant, the hardware dealer, the boot and shoe dealer, or almost any other representative of a specialty, and you will find him overflowing with complaints of evil practices that threaten ruin to his particular line of business. Yet these industries continue to survive, and those who are identified with them seem to prosper and wax fat in the same relative degree that other business men do. It is a great mistake to assume that any individual or any particular class of persons has a monopoly of grievances, and are the only ones duly authorized to grumble and growl. It is the inalienable right of every American citizen to find fault with things as they exist and to yearn for the impossible.

As a matter of fact, trade abuses are the common property of all lines of business. Free production and active competition compel manufacturers to resort to every possible means to dispose of their products; and, in order to secure customers, each one endeavors to offer them advantages they cannot secure elsewhere. In this way many unbusinesslike methods have been introduced in commercial transactions that have, in the course of time, become common to all lines of business, and are recognized as the unwritten law of trade. Credit is the basis of trade, and in the course of lively competition, the limit of time on credit transactions has been gradually extended, till it has become quite generally recognized that a four months note means six months credit with only four months interest; still further, the six months credit will be extended almost indefinitely if the debtor will only continue to buy goods of his creditor. By this and various other devices for cheapening commercial obligations, the debtor class has come to attach less and less importance to the necessity of protecting his maturing paper. Hence it is a common occurrence for a creditor to receive a notice by mail or telegraph, substantially as follows: "I am unable to meet my note due next week; will pay one-half; please send your check for balance and new note." The check is duly forwarded, which makes the transaction in bank all right, and the debtor signs a new note for a lesser amount. Such accommodation is liable to be asked for several times before the original note is finally liquidated. The creditor is so fearful of losing his customer that he consents to almost anything he asks. Thus the debtor is educated to regard lightly his commercial obligations, and to neglect making requisite preparation for taking up his paper at maturity. But this is not a practice peculiar to the jewelry trade; on the contrary, an exceeding leniency towards debtors has become the rule in commercial transactions to such an extent that running into debt has little terror for the ordinary business man. This works an injury to the debtor as well as to the creditor, inasmuch as it is an entire perversion of sound business principles, calculated to encourage a lax regard for commercial integrity. But the house that should attempt, in these days, to hold a debtor to the rigorous fulfillment of his obligations would soon lose his customers and see their patronage drifting into the hands of their less exacting competitors.

But the greatest evil growing out of excessive competition, is the reckless and uninquiring manner in which credit is extended to almost any one who asks it. Once a man becomes known as a dealer, and he is besieged to buy goods on credit, there seeming to be no limit to the confidence the trade has in him. We know of an instance that occurred in an ambitious western city that will serve as an illustration. A young man having good connections but no capital, being desirous of engaging in business, resolved to open a retail jewelry establishment. He formed the acquaintance of a young watchmaker who agreed to go with him and look after the practical part of the business. To raise money to buy his first stock of goods, the young man made a note for \$5,000 which a wealthy

relative endorsed for him. Getting this discounted he fitted up his store, came on to New York and began to cultivate the trade. It did not take long for him to ascertain that he could get all the goods he wanted, and so he branched out in an extravagant manner. His store was an attractive one, and he soon took the lead in the retail trade of his city. His rich relative continued to lend the use of his name in order to establish the young man, and things went on swimmingly. But this ambitious city was anxious to be recognized as a jobbing center, and the young retail dealer fell in with the craze to become a jobber. So he enlarged his field of operations, increased his stock and undertook to supply the retail trade for hundreds of miles around. One day his rich relative died; soon after some of the young fellow's paper came to maturity and there was a struggle to meet it; more paper fell due, and the struggle to raise money became a continuous one; his creditors gave him extension after extension, and continued to sell him goods, but his local credit began to suffer; finally he could not pay his rent and his landlord shut down on him. Then it was found that this young man, starting without a dollar of capital, had, in the course of five years, incurred liabilities aggregating over \$100,000; his assets realized considerably less than fifty per cent., and his creditors bore the brunt of his failure. The exercise of common business prudence would have shown these creditors that they were not justified in giving him credit to the extent they did. Had he been content with a retail business he might have pulled through and been a safe person to sell to; but when he launched out into a jobbing business without capital to warrant it, his creditors should have taken warning. But they chose to encourage him in his recklessness and paid the penalty, while he, having nothing to lose in the beginning, was no worse off in the end than when he commenced. There should be in commercial transactions some definite relation between capital and credit. The problem as to what amount of credit a given amount of capital entitles a man to, probably will never find a solution that will govern the creditor class. On the contrary, the present reasoning seems to be that any adventurer who may start in business will be safe for two or three years during which time a profit can be made from his patronage; after that, the creditors will take their chances. The instance we have cited is one that would be quickly recognized were we to give the names of persons and places; but it is but a single illustration out of hundreds that might be brought forward, going to show that there is no definite ratio of capital to credit known to the trade; that, in fact, capital is not an essential prerequisite to unlimited credit. But this is not a characteristic peculiar to the jewelry trade; it constitutes an abuse of the credit system that permeates all branches of business, and is a demoralizing and corrupting influence. We see no remedy for it while supply exceeds demand; unhealthy competition spawns an ill-begotten progeny that hangs about the neck of legitimate business like a veritable old man of the sea. Still, this reckless and indiscriminate extension of credit, recognized as an evil, has established itself as a trade custom, and where special indulgence was formerly given as a favor, it is now demanded as a condition of patronage.

Sending out goods on memorandum is another abuse that has grown to magnificent proportions of late years. Originally introduced as an accommodation to buyers, and to relieve them from the necessity of carrying extensive and costly stocks, it has grown to be recognized as a fixed custom in the trade, and is demanded as a right instead of being requested as a favor; the penalty of a refusal to comply with the demand is the withdrawal of patronage. To comply with this oppressive custom, jobbers are obliged to carry very much larger stocks than would otherwise be necessary, for they must be prepared at any time to send out on approval such a variety of goods as may be required by their customers. The chances are that few of them will be sold, but after being held for a time will be thrown back on their hands in a more or less damaged condition; but the evil has grown into a trade custom and its requirements must be fulfilled.

Many other abuses that have grown into trade customs might be cited, but they will readily suggest themselves to every reader. They not only pervade the jewelry trade but all others, and there seems to be no cure for them. The only suggestion we can make in connection with them is, draw the rein as tightly as circumstances will permit in the matter of credits, and be exceedingly careful not to introduce new infractions of sound business practices lest they grow into trade customs, and what is granted at first as a favor come finally to be demanded as a right.

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### Legislation in the Interests of Trade.

AFTER a stagnation in business that has extended over two years, during which every industry has languished, there has come something of an improvement, which, though not as pronounced as all could wish, is sufficiently so to encourage the belief that we have seen the worst and are on the eve of a new era of general prosperity. But we should not delude ourselves by being too sanguine as to the future, nor jump from one extreme to another. The up building of commercial prosperity is a labor that cannot be performed in a few weeks or months, for such prosperity is a creature of slow growth and gradual development. The first condition required to ensure stability is public confidence in the existence of a state of affairs that is going to be lasting; no capitalist will put forth new ventures upon a sea of troubles, or when a speedy change of business conditions is likely to occur. Such confidence is steadily gaining ground, and the result is renewed activity in all branches of business. But the government owes a duty to its citizens which must be performed before trade and commerce will be fully restored to their accustomed activity. Among the things needed is such legislation as is calculated to stimulate trade with foreign countries, thus furnishing new markets for our surplus productions. Inquiries to this end have been prosecuted to some extent by government sanction, and the investigations thus far made public indicate the necessity for legislation by Congress to secure the desired object. The reports of the South American Commission, and of our ministers and consuls abroad, are full of suggestions of importance to our business men, but especially to all manufacturers. They indicate the classes of goods that will find ready sale in foreign markets, how they should be prepared to suit the demand, the means of transportation, etc. The general drift of these reports is to the effect that foreign nations, as a rule, are kindly disposed towards the United States, and would be glad to cultivate more intimate business relations with our manufacturers, provided our laws receive such amendments as will give them equal privileges. There is a mutuality of interest between our producers and foreign consumers that Congress might well study; we are afflicted with a plethora of products which we would be glad to reduce, while foreigners recognize the superiority of our goods and would be glad to buy of us provided we can supply them as cheaply as France, England or Germany does. Here comes in a question of encouragement to American shipbuilding, that American goods can be carried in American bottoms on terms that will permit our manufacturers to compete with their European rivals in all the markets of the world. We do not propose to discuss this problem, but trust Congress will give it due consideration at its next session, which begins in December.

A matter nearer home demanding congressional action in which every business man is interested, is a national bankruptcy law. The necessity for such a law is fully recognized by business men in all sections of the country, and they, through their exchanges and trade organizations, have very generally appealed to Congress for such an enactment. Congress has before it such a bill that has been very generally endorsed by commercial and trade organizations, which will, no doubt, be brought up for definite action this winter. Every influence that can be brought to bear upon that body, or upon its

individual members, should be exerted to secure its adoption at an early period of the session. As yet the jewelry trade has not spoken on the subject. With millions of dollars of capital invested in a business whose ramifications extend into every State and every hamlet, possessing various organizations representing its interests, and feeling the necessity of a national bankruptcy law as keenly as any other industry, the jewelry trade has not yet given expression officially to the general sentiment of the trade in favor of the passage by Congress of such a law. An industry having so much wealth and intelligence within its membership should exercise much influence even in national affairs, and would do so if it chose to exert it. We again urge upon the various organizations in the trade the importance of taking action on this subject, and forwarding to Congress an expression of the views of the members of the trade.

Another subject that will be presented to Congress this winter, in which every business man is interested, is embodied in what is known as the silver bill, the object of which is to repeal the existing law that compels the Secretary of the Treasury to coin \$2,000,000 in silver dollars every month. The money circulation of the country is already embarrassed by the great quantity of this debased coin that has been forced upon it, while the Treasury vaults are overflowing with an accumulation of them for which there is no demand. Still, in obedience to the existing law, the mints must continue to coin them until such time as Congress orders otherwise. As these dollars, so-called, are worth only about eighty-five cents each, there is a clean steal of fifteen cents on every one issued, and this robbery has to be submitted to by the business community, in the interests and for the profit of the owners of a few silver mines in the west. They had influence sufficient to induce Congress to force their product upon an unwilling market, and, having enriched themselves thereby, their influence to retain the law as it is will be more powerful still. Upon this subject also the numerous commercial and trade organizations of the country have spoken, urging Congress to repeal this law which legalizes robbery, but the jewelry organizations have taken no action regarding it. The trade is unanimously in favor of the passage of the silver bill suspending the further coinage of debased silver dollars, and this sentiment should find official expression through the various trade associations.

These are the most important trade matters Congress will be called upon to consider, and as they are of importance to the jewelry trade, in common with all other lines of business, the trade should exert every legitimate means at its command to influence favorable consideration of them.

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### Practical Hints for Rapid Timing.

[By THEODORE DÖHRING, in *Deutsche Uhrmacher Zeitung*.]

*Continued from page 238.*

THE SECONDS hand of a watch, making 18,000 vibrations in an hour, makes 5 forward motions per second; and it is easy to the practised eye and ear to distinguish between differences of one-fourth and one-fifth seconds. The ear is with some good conductor of sound connected with the shop regulator, the timer counts the second, and with the magnifier observes the passage of the seconds hand at the marked place. It is for this reason advisable to choose a correctly divided place on the seconds dial, so that it is possible to judge from the fraction of second by which the hand arrives too late at the dividing lines, when the seconds beat of the shop regulator resounds, of the rate of the watch.

After we have noted down the exact time at which the hand passed the mark, we bring the watch, without interrupting its rate, into the second position, and conduct the observation in the same manner as the first. We have then not alone established the deviation from the shop regulator, but also the rate difference in hanging and lying, and the timer can make his corrections. We will not at present speak

of the manner in which this is to be done, as we propose simply to point out a method in which a watch may be regulated quickly.

When the watch contains no seconds hand, I mark a place with rouge upon the fourth wheel, and commence and end the observation with the moment when this dot arrives at the tooth circumference of the scape wheel. Various watches are of such a construction that this cannot be done, and it then becomes necessary to choose some other point of observation; to lie as close above the fourth wheel as possible, it is in this case only necessary to pay strict attention that the corresponding points are during the observations always regarded in the same angle, otherwise erroneous conclusions might easily be drawn.

III. *Timing a regulator with weight without striking train.*—As was remarked previously, this is the simplest method of timing, and five observations are fully sufficient. I presume, however, that my manner of timing is unknown, it having become developed by me during my experience as timer, as follows:

As is known, the minute hand passes in each minute through 6 degrees, since each circle is divided into 360 degrees. From this follows that the advancement for one second must be equal to  $\frac{1}{10}$  degree. Let us assume the minute hand as radius of the minute circle. Again, let us assume at some place in the dial a line of the minute division continued as straight line as far as the center, then at the advancing of the radius, a moment will occur when the two lines cover each other. If I now seize the line drawn from the minute division, as it were, in the center of the circle, and move it forward a little in a circle to the right around the other end point, then the radius will form an angle with this line. At the advancing of the radius the apex of this angle will move forward with each pendulum beat toward the minute circle, increasing in speed with the acuteness of the angle. In one second the radius advances  $\frac{1}{10}$  of a degree, and we have now a means at hand to render this minute motion more visible to the eye the acuter we draw the angle, the apex of which advances toward the periphery.

Reducing this to practice, I make use of a strip of paper barely as large as a domino block. This I paste with one end upon the dial at right angles to the radius, so that the strip withdraws in an acute angle from the dial, and is somewhat pressed down by the point of the minute hand in its revolution until it suddenly becomes free. I then cut with the scissors the free end about radially, in order that the point of the hand forms with the cut the desired angle, the apex of which moves visibly forward with each pendulum oscillation. It hereby becomes possible to establish the moment of the drop, which can be seen approaching with great distinctness and regularity, to the fractional part of a second. Considering the simplicity of this arrangement, I would ask whether it appears necessary to use an apparatus with seconds construction, which is to be connected in a more or less perfect manner with the watch to be regulated in order to institute exact observations.

The timing itself is performed in the same manner as with mantel clocks, the difference lies only in the manner in which the observations are instituted. If the regulator has a striking train, the timer may also institute his observations a few seconds after full, by using the muffled gong as alarm. For an hourly difference of one second it suffices to turn the regulating nut about  $\frac{1}{2}$  turn, and with a spring regulator about  $\frac{1}{3}$  turn. Whoever will follow my method of regulating will, in a short time, be able to gather sufficient data of the approximate effects of this style of regulating different kinds of clocks. I refrain from publishing my observations more fully for fear of tiring the reader.

IV. *Timing a watch without seconds hand.*—Little in addition need be said about the observation of such watches. After the difficulties of ascertaining any incidental deviation after each full revolution of the minute hand have been overcome by the use of the alarming regulator, care is only necessary to set this regulator correct each time. After having jotted down the difference, we must set the regulator one minute after full at the beginning of the hour necessary

for an observation, so that it will alarm us in the course of 59 minutes. It is also possible to employ with these watches the same process we recommended for large clocks, viz., to use a piece of paper of a corresponding thickness; this however is apt to bring about the difficulty that the elastic hand is retained a little when gliding over the paper, and then bounds forward, whereby an error in ascertaining the precise moment might be caused. If it is more advisable for this purpose, therefore, single out a certain place on the dial. Watchmakers know that dials are frequently far from what they should be concerning the correctness of their division, but it is easily possible to find a place in the minute circle where the hand approaches nearest to the dial, and again, it is quite easy to find a line or a figure which forms the desired acute angle with the end of the minute hand. It is next only necessary to mark this spot, and the timer is able, without any other contrivance, to make his observations to the second. It is evident that an experienced timer can, in this manner, also make observations to the fractional part of a second on a large clock.

V. *Timing a Black Forest clock.*—These clocks must be regulated in a peculiar manner, which differs from the preceding methods in two points. First, the minute hand does not stand in them in direct connection with the train, but is connected with it through the minute wheel depthing with more or less shake. It is necessary, therefore, for the observation to first render uninjurious the tooth shake of the depthing. Fifteen minutes after full the hand will already use by its own weight to use the shake forward, and to be certain that this will take place it may be produced by a gentle pressure upon the hand in the vicinity of the center. The man who does this must have a light hand, however, as too strong a pressure upon the hand would turn the minute wheel upon its arbor forward. The second obstacle consists in that after the lapse of one hour not the same teeth and leaves are in depthing between the minute wheel and canon pinion. If one of the wheels is in the least untrue or unequal in division, a condition which may be assumed to be the case with every Black Forest clock, the minute hand will not be in regular accord with the train, which would be necessary for observing to the second. If the minute wheel has 36 teeth and the canon pinion 24 leaves, the same teeth and leaves will be in depthing again, only after two revolutions of the minute wheel and three revolutions of the canon pinion. For this reason observations to the second must be instituted in periods of at least three hours. In the calculation for the change in the pendulum length millimeters only can be considered, since Black Forest pendulums are rarely regulated with nuts. Should the pendulum be longer than the sliding gauge, recourse may be had that the measurement is commenced from the lower end of the rod measuring up to the upper edge of the bob.

[THE END.]

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## The Manufacture of Repeating Watches.

*Continued from Page 253.*

ADD THE necessary parts for the action of the winding and the setting hands mechanism; these are the winder, the winding or "crown" pinion, the sliding pinion, the spring bar, the buckle, the setting hands spring and the minute pinion. This last is not necessary when there is a push piece to set the hands; the depth of the sliding pinion, with the minute pinion, being regulated by the examiner. But it is indispensable for the other kinds of hand setting, which ought to be delivered by the case fitter entirely in action, and the depth correct.

For the slide: the rack should be put in its place with its bridge and the star carrying the hour snails, to indicate to the case fitter the forward space necessary for the action of the quarter piece in pushing on twelve hours.

There should be no shake in the slide after the rack has been

entirely brought back. It is advisable to ascertain that the watchmaker who has taken down the movement, has marked on the plate in an exact manner the point of return of the rack. For that the barrel arbor of the small train should be put in, the pinion of the rack screwed on the twelve-toothed ratchet, the hammer and the lifting of the hours, that of the quarters of the large hammer, the quarter piece, the long piece or the stopping spring, the rack and the finger which brings it back.

It is easy to find the agreement of the teeth of the rack with the pinion in pushing on one hour, and twelve, as well as the place of the finger which brings, on the barrel arbor; and for the minute pieces the agreement of the toothed semi-circle which carries the pin with the inside teeth of the quarter pieces. The whole being put on, the quarter piece should be brought back, either by the rack or the square, until the stopping has taken place, and then mark by a line on the plate the position of the rack, if this was neglected to be done before taking the movement down.

The watchmaker sometimes orders the case fitter to supply the bells. In this case he will add to the pieces connected with the case work those which are necessary for making the bells according to the recommendations contained in the following chapter.

#### THE BELLS.

After the case work the bells must be made, the two hammers are to be put in, their springs, counter springs, the adjusting screws, which ought to be adjusted without shake in the plate, and act against the counter springs in such a manner that the hammers lift sufficiently when they are screwed to the bottom.

One of the bars (or cocks) should be put on, that is, farthest from the head of the bells, for preference that of the escape wheel, when the screw is near the tail. When the spring bar is placed outside the circumference of the bars without being sunk in the thickness of the plate, it ought to be put in its place. The spring of the bell ought to pass over with sufficient space for the vibrations.

Make sure that the frame fits in the middle part without shake, and that the case screws bind well; they ought to form a right angle with the blocks, so that in screwing and unscrewing they shall not cut them. The plate will then remain well fixed in the band.

Send the piece with the case complete, at all events, with the dome on.

#### EXAMINATION OF THE CASE WORK (*Extracts*).

In hunting cases it should be ascertained that the shoulder of the winder in pushing the lock spring does not catch in the edge of the hole; this is a bad fault which can only be corrected by changing the position of the spring in the band, or stopping up the hole which has been made too large.

Make sure that the head of the spring does not touch the edge of the dial or of the bezel when it is pushed in.

The winder ought not to have more shake with the cover shut than when it is open; and if the shake is considerable the head of the spring must be filed to allow it to follow up to the shoulder of the winder when the cover is shut.

The setting hand spring ought to act freely and bring back the sliding pinion in such a manner that the teeth go to the bottom of those on the crown pinion.

When there is a locking arrangement for setting the hands the spring ought to be firm, and to keep the depth of the sliding pinion with the set hands pinion to the bottom of the teeth, should the former be small, and at a moderate depth, if it is comparatively large.

The opening in the plate should be large enough to allow the winding and sliding pinions to be put in, and taken out, from the dial side.

#### ACTION OF THE SLIDE.

If, in pushing the slide in such a manner that the arm of the rack is just supported against the snail on the twelfth hour, this pressure takes off the freedom of the star; the run of the slide is suffi-

cient to reach over twelve hours. On the return the rack ought to join the line marked on the plate.

The slide ought to be perfectly free and almost without shake, the screw being well home. It should be tried with the band alone and also with the case complete. If it is tight, take it to pieces; and if it is provided with a return spring, ease the steel arm on which it runs. Examine the band with care, and if it has been put out of truth send it back to the case maker to make right. If one of the edges was slightly bent it can be easily made right by the help of a piece of bone or hard wood.

Then put the slide against the band, and if light can be seen, either at the middle or at the ends, it must be made to agree with it by careful bending. The band is often unequal or externally ornamented. It is better in this case to file and stone it in such a manner that the gold exactly adjusts itself against the circumference. The block of the slide ought to have a little shake in every part of its run in the opening of the band. It is a good condition for it to be equally free with the case open or shut.

The piece of steel which acts in the inside of the band being well cleaned, put it in with the slide, taking care to screw it home. Work it backward and forward in order that the steel shall mark the parts where it touches the band, from which the solder should be removed by the aid of a sharp graver of a convenient shape. Then take the slide to pieces and remove with a file all traces of rubbing on the steel, on which should be left no sharp edges; remount it after having well polished and cleaned it, and re-commence the operation until it is completely successful.

It sometimes happens that when the slide is screwed on the gold does not lie close up to the band, although when tried alone it follows the shape exactly. This proves that the block is not filed in agreement with the notch in the steel, or, perhaps, it cannot be screwed to the bottom; it may be that it fits too close in the opening of the band, or that the screws or steady pins being too long, touch the bottom.

To ascertain this, the steel piece and the slides should be screwed together without the middle part of the case, and then examined to see that the screw, the steady pins or the sides of the block do not bind, and in the case where the curves of the steel piece and of the slide are not concentric, this fault should be by filing the part of the block which lays against the steel piece in such a manner that the slide shall agree with the band in its whole length. Freedom ought to be obtained by proceeding in the manner which has now been specified.

The guide of the return spring ought to be put in agreement of height and circumference with the hole in which it works when the slide is pushed, so as not to restrain the liberty of the latter. Pay attention that this spring does not touch the band or the steel of the slides.\*

When a hunting repeater has been cased very closely, the case spring should be filed away as much as possible so as to give sufficient room for the bells. The screws of the latter ought to fairly bind the block or foot on the plate without restraining each other, and the heads ought to be free in their sinks.

When the case work has been thoroughly inspected, the examination of the keyless work can be proceeded with, so that it will not be necessary to return to it. This plan offers the advantage of being able to entirely finish off the bar while the piece is being jeweled. If it is desired to do the hand work and point the dial before sending it to the jeweler, the divisions should be centered from the hole in the center of the plate, after having placed the dial as truly as possible in the circle. Put the canon pinion and the snail at their proper height, also the minute and setting hand wheels; examine if the glass bezel shuts down properly on the dial and on the edge of the hand, and for hunters the height or thickness of the hands should

\* Most English repeaters have a return spring under the dial acting directly on the rack. The gold sides are also sunk in the thickness of the band.—  
TRANSLATOR.

be estimated according to the space comprised between the dial and the inside of the cover of the case.

The jewelery being done, it is expedient before putting a repeater together for springing to make in the plate and the bars the necessary openings, to enable all the parts of the repeating and dial work to be put on without taking off other parts of the movement, and also that they may not be hindered in their action.

The screws of the dial work ought to be shortened, also the rods of the hammers; the finger which brings back will be pinned on, after it has been ascertained if the rack pinion, placed at the bottom of the small barrel arbor, is sufficiently low that the twelve-toothed ratchet may be a little below the plate in order that the rack can never touch it. The square and the pivot of the arbor should likewise be shortened, taking care to make a mark on the square for the pinion. Then the rack should be freed under the bridge. It is important that this can be easily taken off, the piece being in the case; the arm ought not to be bound on any point. The depth in the pinion should be verified, which ought to have a little shake, and then smooth the teeth. In order that the oil may remain in the depth, and that the teeth of the rack do not rub on the plate, a circle should be turned underneath them. The small wheels ought to be perfectly in order before passing to the action of the repeating work; oil must not be neglected to be put to all the pivots and the coils of the spring in the small barrel. When the holes have been attended to the examiner ought to arrange the necessary freedom between the various wheels and the small barrel, in such a manner that there shall be no friction during the running down of the spring.

#### PUTTING THE REPEATING WORK IN ACTION.

The twelve-toothed ratchet will be put in position, as well as the liftings or pallets and their springs; the springs of the hammers and their counter springs and the adjusting screw. The liftings will be put in action, and the springs made of suitable strength in agreement with the weight of the hammers; their blades ought to be free of the plate and the acting parts well smoothed.

The striking of the hours and quarters should be tried to see that the action of the hammers is not hindered by too much lifting. In this case, before going farther, either the cocks or the hammers may be filed as much as is necessary for the piece to strike. Re-mount the rack, the star, the finger which brings back, the quarter piece and the long piece or "locking spring," and then put the frame in the case to make sure that the action of the slide is sufficient for twelve hours, and that the locking piece has space to return in leaving to the slide a little shake with the arm of the rack.

After that, the recoil of the hour snail against the arm of the rack on each of the twelve hours should be verified; note those that will require filing. In the case where it will be too much on the eleventh and twelfth hour, there will be no other resource than to change the position of the snail on the star; and if, after this changing, the arm of the rack does not safely bear against the snail at the first hour it must be hammered out at the end.

Before making the verification of the striking of the hours, the canon pinion should be put in position, on which the quarter snail will be lightly riveted, and the "surprise" freely held by its collet, very nicely adjusted on the canon pinion. The sides of the pallet gearing with the star wheel should be slightly rounded; it ought to pass with certainty at the first hour (or one o'clock) in advance of the hour snail.

The curve of the long piece or "locking" spring, should be adjusted at the commencement in such a manner that the lifting of this piece, produced by the play of the arm against the rack, after that it has touched the snail, shall be equal on every hour.

*(To be Continued.)*

### Electro-Chemical Gold Plating.

THE FOLLOWING recipe comes to us highly recommended, as ranking about among the best methods of gilding known;

1. SOLUTION.—In a glass or stoneware vessel dissolve 2.33 grams ( $1\frac{1}{2}$  dwts.) of fine gold in nitro-muriatic acid, consisting of 2 parts muriatic and 1 part nitric acid. The solution is poured into a porcelain crucible and the acid evaporated, so that a reddish substance of chloride of gold remains, which is dissolved cold with 30 grams ( $19\frac{1}{4}$  dwts.) distilled water. To this solution is added a concentrated solution of cyanide of potassium, stirring with a glass rod until the gold has been precipitated; the fluid is then decanted, the precipitate washed out and a quantity of cyanide of potassium sufficient to dissolve the latter again is poured upon it. This cyanide of gold is next in a sand bath evaporated to dryness, the residue is anew dissolved in cold water and filtered. When about to use it, add enough of boiling water to increase the fluid to about 3 pints; should the bath operate too slowly add a little cyanide of potassium, a small portion only, however, otherwise the anode is attacked, and the precipitation takes a bad color.

2. SOLUTION.—As above stated, dissolve 2.33 grams fine gold in nitro-muriatic acid and evaporate. The residue is dissolved with 30 grams distilled water, and the gold is precipitated with ammoniac, avoiding an excess of the latter. The precipitate is recovered by decanting and washed, after which it is dissolved in cyanide of potassium, evaporated to dryness, and again dissolved with cold distilled water. This fluid is filtered, and enough of distilled water is added to make about 3 pints. Should it be necessary, add a little more cyanide of potassium.

3. SOLUTION.—As in the preceding, prepare a solution of 2.33 gram, fine gold as chloride of gold, and precipitate the gold with sulphide of ammonium. The ensuing black precipitate is permitted to deposit; it is then washed and carefully dissolved again with cyanide of potassium, evaporated to dryness and dissolved in distilled water to form 3 pints fluid.

4. SOLUTION.—In one liter (2.113 pints) of almost boiling water, dissolve 31 grams (19 dwts., 22.4 grains) cyanide of potassium. Pour this solution into a porous vessel, which place into a stoneware dish so that the fluid will in both stand at the same level. Into the porous vessel place a small copper rod, which is by a copper wire connected with the zinc pole of a galvanic element, while a gold plate is placed in the stoneware dish and connected with the copper pole of an element. The fluid in the dish will, after a few hours, be so strongly auriferous that it can be used. With this solution it is necessary to employ an anode of a fairly large surface, and, if required, to gradually add small portions of cyanide of potassium until the gilding makes a satisfactory progress. The solution must be employed at a temperature of  $131^{\circ}$  Fahr.

Roseleur specifies two recipes for gold baths; one for cold gilding small articles; the other, for gilding in heat large articles.

#### 1. Bath for cold gilding:

Distilled water.....10 liters (10.567 quarts);  
Pure cyanide of potassium. 200 grams (6 ozs., 8 dwts.,  $14\frac{1}{2}$  gr.);  
Pure gold.....100 grams (3 ozs., 4 dwts., 7.2 gr.);

The gold, after having been changed into chloride, is dissolved in 2 liters water, and the cyanide of potassium in 8 liters. The two solutions are united, which thereby discolor, and left to boil for one-half hour. The bath is sustained at its strength by adding equal parts of cyanide of potassium and chloride of gold in quantities of a few grams; if the bath is very auriferous, the precipitation becomes blackish or dark-red; if it contains too much cyanide of potassium, gilding progresses slowly and the precipitation colors gray. The anode must be entirely submerged in the bath, and is to be withdrawn when not in use.

#### 2. Bath for gilding in heat:

Cryst'd phosphate of soda. 600 grams (19 ozs., 5 dwts., 19.2 gr.);  
Bisulphate of sodium.....10 grams;  
Pure cyanide of potassium.....10 grams (6 dwts., 10.32 gr.);  
Chloride of pure gold....10 grams.

The phosphate of soda is dissolved in 8 liters (8.45 quarts) water,

and the chloride of gold in 1 liter, after which the two solutions are gradually mixed. The cyanide of potassium and the bi-sulphate of sodium are dissolved in 1 liter of water, which solution is then poured to the first. The bath can be used at a temperature of 122° to 140° F. A platinum anode can be used, and the bath is to be renewed when necessary.

In a bath which contains 1 gram (15.43 grains) gold per liter, about 30 centigrams (4.63 grains) per square decimeter (15.50 square inches) can be precipitated.

Should the deposit enter with difficulty into the deep parts, the article must be scratched with the brush and a little cyanide of potassium is to be added; the bath is then gently stirred with the anode, and a stronger current is used until the deposit enters said deep parts.

For light articles, such as brooches, ear rings, etc., the scratch brush must also be used and the bath be stirred until the deposit has formed thoroughly.

If the gilder has pieces from silver or copper to gild, the process must first take place on the silver, next on the copper.

In order to give a pleasing appearance to the deposit, the articles are to be coated with a paste consisting of the following ingredients (by parts in weight):

Alum .....	3
Potash saltpeter.....	6
Sulphate of zinc.....	3
Table salt.....	3

The articles are coated with this paste, laid upon an iron plate, underneath of which is a bright charcoal fire, and heated until almost black, after which they are washed in cold water.

This paste may also be composed as follows :

Sulphate of copper.....	3 pennyweights
Verdigris.....	7 "
Sal ammoniac.....	6 "
Potash saltpeter....	6 "
Nitric acid.....	31 "

The sulphate of copper, sal ammoniac and saltpeter are pulverized, mixed with the verdigris and the nitric acid is gradually stirred in. The articles are dipped into this mass, and heated upon a copper plate until black. They are then left to cool and treated with concentrated sulphuric acid, after which they assume a handsome gold color.

The colorization of the deposits is produced by suitably mixing the gold solution with copper solution in accordance with whether a red or greenish shade is desired. The greenish deposits are produced in a bath of yellow gold, which contains per liter from 5 to 6 grams (3 dwts., 5.16 grains, to 3 dwts., 20.59 grains) gold. The current is passed through for several hours by connecting the positive pole with a bar of pure silver. As soon as the deposit forming on the negative pole shows the desired green color the operation is checked, and the silver anode replaced by one of green color.

Red deposits are produced by the use of a copper anode.

Very handsome damascening may be produced upon bronze, iron and steel by these gold and silver deposits. Places that are not to be coated are to be protected by a good resist varnish.

#### To Produce a Very Nice Mat upon Steel Parts.

A CORRESPONDENT, who signs himself M. H., says in the *D. Uhrmacher Ztg.*, that he is at present using a new method for producing a handsome mat upon the steel parts of watches with highly satisfactory results. "I have not yet," says he, "seen this method published in any horological paper, and, I presume, it originated with me. As I am highly pleased with the results, I publish the details for the benefit of my fellow workmen :

It is indispensably necessary that the article to be treated must have in the usual manner been ground flat and free from scratches, before the mat grinding can be begun. When the former is as it should be, I take oil stone powder, mix it with the ordinary oil and add a little bluestone powder.

Grinding is performed best upon a composition or iron plate, or else a file of the same material; glass is not as well suited for the purpose.

The main condition is that a large quantity of grinding powder and much oil be used. Nor is it a matter of indifference how hard the object under manipulation is; very hard articles take a good mat grinding with difficulty, and whenever possible it is advisable to anneal them blue.

Do not press too hard in grinding; the small grains of oil stone should assume a rolling motion whereby they will, to a certain extent, wear hollows with their sharp edges in the surface of the steel, all of which together will impart the handsome mat appearance. If too much pressure is brought to bear, and the grinding material is too dry, it will cake on the steel and produce the disagreeable scratched surface so often seen.

The quantity of bluestone necessary for grinding can be scraped off from a large piece, after which the scrapings must be crushed in addition with a knife.

The oil stone powder must not be too fine in grain; it should be of a uniform grain, however; whoever has much of this work of grinding does well if he mixes a quantity at once and stores it in a bottle. The quantity of bluestone powder necessary is most easily prepared by washing. A medium sized piece of bluestone is in some manner crushed or beaten fine, for which a mortar is most suitable; the fine portion is then poured into a dish, a quantity of water is added and stirred with a pegwood or other instrument until it is mixed throughout the water. It is then left to stand for a moment—1 or 2 seconds—after which the water is carefully decanted in another vessel, whereby the sediment, having formed in the first dish and consisting of coarse pieces, remains in it.

The decanted water, which still is full of fine particles of bluestone, is left to stand until all have precipitated. The water is finally decanted with care, and the remaining sediment is dried on a warm place. This gives a very useful bluestone powder, which, when mixed with from 4 to 5 times the quantity of oil stone powder, makes an excellent grinding agent for the purpose named.

## Gossip of the Month.

WHILE the country is considering the subject of our trade relations with other nations, and sending out commissions to investigate the trade opportunities of countries whose restrictive laws render it impossible for American enterprise to obtain a foothold in them, it might be well to ascertain if we cannot do a little more business with the Sandwich Islands, with which we have a reciprocity treaty. According to a description of the inhabitants of those islands furnished by a recent visitor, our manufacturers of jewelry ought to feel an especial interest in developing trade in that direction. He says the natives have a great love for finery and personal ornaments. They do not invest much in clothing, an ordinary cotton garment, similar to a night gown, sufficing for the ladies in that particularly mild climate. He mentions seeing the native wife of one wealthy person, surrounded by every luxury that money could buy, who wore sparkling ear drops, a necklace of gold and precious stones, rich bracelets and many finger rings, whose costume otherwise was made up of a man's straw hat and the inevitable cotton night gown. She was a sample of the aristocracy, but the natives of both high and low degree are remarkably fond of personal decoration. When they cannot afford gold or silver ornaments, they sometimes dig up the bones of their ancestors and convert them into finger rings and dec-

orations for their luxurious crops of thickly inhabited hair. A liberal traffic in cheap jewelry could, no doubt, be developed in that country.

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THE eyes with which a person is born are generally expected to last him a lifetime, but they do not always do it. Accidents sometimes destroy these exceedingly useful organs, but more are ruined from overtaxing or otherwise abusing them. Hence there is quite a demand for artificial eyes, and their manufacture has been brought to such a degree of perfection that it is claimed that they have been known to wink in the most natural manner at the man in charge of the soda water fountain. An optician who deals in artificial eyes said recently that the eye was the worst abused organ in the human anatomy. "From early infancy," said he, "it is treated shamefully. The baby's knuckles poke it, and the lids are frequently forced open that admiring relatives may inspect the sensitive organ behind them. Advancing years bring over study and over reading; the active brain must be supplied with material to feed upon through the medium of the eye. There is the age of novel reading in one sex, resulting in the burning of midnight oil and severe straining to the eye, while the corresponding period in the other sex is devoted to smoking bad cigarettes and piercing the eye with impure tobacco smoke. At maturity comes the use of glasses with all its attendant evils of strained vision. An unserviceable natural eye is worse than none at all. Science has made the deaf to hear and provided artificial means for masticating food, while patented arms, legs and feet take the place of the original corresponding members, and false hair is a commodity known to every woman. The sense of sight, however, once having departed from the eye, no substitute for the damaged optic can restore the lost sense. Still, a modern glass eye is a good substitute for a genuine eye that may have gone astray or that has sustained external injury. Artificial eyes were known to the ancients, but not in the perfect form we have them now. Let me show you some." So saying, the oculist and optician took down a couple of small flat boxes, one of which was labeled "left eyes, assorted," the other, "right eyes, assorted." In these there reposed a hundred or more right and left eyes, so natural in appearance that it gave one a positive shock to see them staring up at him so steadily and with such apparent intelligence. There they lay, of all colors, shapes and sizes imaginable, ready to be transferred to any setting that might be required. Here were eyes for blondes, eyes for brunettes, eyes for mixed breeds, squint eyes, wall eyes, eyes mild and appealing, severe and penetrating eyes, eyes "to go out and see a man" with, eyes to look around a corner, eyes appealing and loving, eyes to match a frown, eyes that you couldn't say no to when the owner wanted to borrow five dollars, eyes for the opera, eyes for the bald headed men who occupy front rows at the ballet, and eyes for one-legged men—in short, there were eyes to fit everybody as pat as if they had been measured for them, regardless of sex, color or previous condition of servitude. Science is doing much in developing the human organism—especially the female portion of it—but science is not quite up to putting the sense of sight into a glass eye, therefore, when the oculist suggested an exchange with us we respectfully declined, preferring to retain those we are used to, to breaking in a new pair.

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THE trade in general should overhaul its New Hampshire business and place it on a new basis, for there has been a regular revolution up there in legislation. The legislature adjourned the last of August for two years, meeting again in June, 1887. It was about as vicious a body as ever assembled to make laws for misgov-

erning an intelligent community. Among its last disgraceful acts it passed a bankruptcy law which upsets the relations sustained by debtors towards their creditors. We have not seen the full text of the law, but from a summary of it that has appeared in the papers, we should judge that it is misnamed, and should have been entitled "An act to prevent other-State creditors from collecting their debts from New Hampshire debtors." The law is violently attacked by many lawyers and business men, who contend that it will be almost impossible to legally collect anything in future from a person who objects to paying. Another law that was passed during the closing hours of the session has driven every fire insurance company out of the State, and it is now absolutely impossible for any property owner to obtain insurance on his property. The law that is so objectionable prohibits any insurance company from removing any suit brought in a State court to the United States Court; it also prohibits the companies from forming associations of any kind for mutual protection and benefit; but its worst provision is that which declares that the sum named in the policy of insurance shall be the measure of damage the company must pay in case the property is destroyed by fire, regardless of the actual value of the property at the time of its destruction. There were fifty-eight insurance companies doing business in New Hampshire, and they gave notice in advance that in case the law passed they would cease doing business in the State. Evidently the legislature regarded this as an idle threat, for it passed the bill and the Governor signed it. Thereupon the fifty-eight companies closed all their agencies, notified the Insurance Commissioner that they would do no more business in the State while the law remained in force, and some companies went so far as to cancel all their existing policies. Property owners are greatly excited over the matter, for they cannot obtain any insurance whatever, except a few thousand dollars in one or two State companies, which is not as a drop in the bucket compared to what is required. Insurance against fire is an important factor in the credit system of the country; a man may be good for his liabilities if he is fully insured, but without insurance his credit is limited to whatever property he may own outside of his business. A fire is liable to destroy every dollar of his property and also that of his creditors. A similar law has twice been proposed in the New York legislature; the first time it passed and was vetoed by Governor Cornell; the second one failed to pass. When an ignorant set of legislators have it in their power to enact laws so disastrous to commercial enterprise, the importance of improving the breed of law makers becomes at once apparent. New Hampshire business men will suffer greatly in pocket and in credit because of these unjust and oppressive laws. The one against the insurance companies was put through by a hotel proprietor whose hotel was burned and who had trouble in collecting his insurance; his property was not worth as much as he claimed it was, and the companies would only pay him the market price. So he took his grievance to the legislature, and the people of the State must suffer for it. As the insurance companies have been losing money in New Hampshire for several years, they are not sorry to have an excuse for withdrawing. The trade should keep a close watch of its New Hampshire customers, and not assume the chances of fire in addition to the usual business hazards.

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A STORY is told at the expense of a society reporter for a Washington paper. He thought it would be a good thing to write an article about diamonds and precious stones, and concluded that by interviewing some of the local dealers he could ascertain something about the gems worn by the distinguished ladies of that city. So he visited various dealers, who showed him their treasures and filled him full of gossip about diamonds, pearls, rubies, sapphires, etc., and he departed in condition to hurl several columns of important information at the heads of the unfortunate readers of his journal.

Shortly after a detective entered the store of one of the dealers and reported that he had just received information that two well known jewelry thieves had left New York for Washington, and he must be on his guard. The description given would fit almost any young man, and the dealer at once remembered the visit of the reporter. "Great heavens!" he exclaimed, "one of them has just been here and I showed him all my best goods. If he hasn't got anything already I'll make sure that he don't." And the jeweler went over his goods while the detective started out in pursuit of the man whom the dealer had more fully described. The entire detective force of the nation's capital was put on track of the unsuspecting and industrious reporter; he was seen to enter several jewelry stores and no other kind; and finally he was arrested and taken to the station house. Here he was obliged to establish his identity, and this finally being done, he was released. The retail dealers breathed more freely when they were assured he was not seeking to sequester any portion of their stock.

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THE pilgrims who have been abroad during the summer buying goods for their respective house, to supply the demand for precious stones, bric-a-brac, etc., report that the condition of trade in most of the European cities has been far worse than it has been here during any portion of the late business depression. In England, especially, trade has been virtually dead, and hundreds of workmen have been reduced to the verge of starvation because of the shutting down of most of the factories. At Birmingham and other manufacturing places, public meetings were called to make provision for the unemployed workmen in the jewelry trade and their suffering families. No other branch of industry was so severely affected by the dull times as the manufacturing jewelry interest. This condition has lasted over a year, but some improvement was going on when the pilgrims left. Possibly the liberal orders they left abroad had something to do with effecting a trade revival. In France, Germany and Switzerland matters were somewhat better, but there was a dullness of trade notwithstanding. There was not so much suffering among the workmen, however, as the conditions under which the work is done are more favorable. England is about the worst place in the world for workingmen in general, for every avenue of industry is overcrowded, wages are correspondingly low, and there are no resources for the workman outside of his own trade. In this country, if a man cannot get employment at his trade, there are thousands of other things he can turn his hand to and so keep starvation from the door.

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BUT speaking of trade depression, the fortunate ones during the past three years in this country or elsewhere, have been those who have had steady employment at fair rates of compensation, and who received their earnings promptly at appointed times. The men who have had their capital invested in business and have assumed all the responsibility of manufacturing and selling goods, have generally been on the anxious seat during this period. There was but little demand for goods at best, while the competition was so great that the margin of profit was whittled down to so thin an edge that it has not always been perceptible. One of the greatest rocks ahead to employers has been the inevitable pay roll that had to be provided for at weekly or monthly intervals. To reduce it was to throw deserving and needy men out of employment, while to meet it imposed a hardship on the employer that frequently put him to his wits' end. However, the struggle is virtually over, and the battle won by the persistent and long-winded. Let us hope that for the

future there will be such a degree of profit in conducting the business that both employer and employed will find their condition improved.

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THE early-closing-on-Saturday movement was so very generally observed during the summer months in this city that it seems somewhat queer to get back to the regular routine of a full day's work on Saturday. Indeed, there has long been a tendency to make Saturday a half holiday as a rule, and trade in some lines has been accommodating itself to such a condition; it would not be surprising if the wholesale and principal retail dry goods and notions houses were to close up at noon on Saturdays in the course of a year or two. But the exigencies of trade are too exacting at present for the jewelers to entertain the idea. When buyers are in the city or there are orders to fill, a half holiday on Saturday is an impossibility. Still, if buyers generally will come round to the idea, as it is predicted they usually, then there will be no occasion for keeping the stores open. But we imagine the trade at large will continue to do all the business it can for six full days out of the seven, and if they do not encroach on the seventh at any time, some of them will be doing better than they have in the past. If, however, they could be guaranteed all the business they could handle in five days, we do not doubt but they would agree to take an entire holiday on Saturday and go to church twice every Sunday.

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WE SOMETIMES encounter a person in a business way who thinks the prices for advertising in THE CIRCULAR are pretty high, and alleges that he can get the same amount of space in some other trade journals for one-half what we charge, or even less. Very likely they can; a man who has anything to sell may be presumed to have a correct idea of the value of the commodity he offers—certainly he can be depended upon not to underestimate it—and if our contemporaries offer advertising space at one-half our prices, it is an admission that they do not regard their property as worth more than half as much as ours is; allowance must then be made for the fact that every man is apt to over value his own wares. But to those who object to our rates, we extend an invitation to compare trade journals one with another, and then judge which is best worthy of patronage, and, consequently, likely to have the widest circulation and the greatest amount of influence in the trade. THE CIRCULAR is the oldest of the trade papers, and fully covered the field before the others were conceived; it has always maintained a high standard of excellence in its columns, and, we venture to say, that it expends more money annually for contributions upon technical subjects among well known practical experts than all the other trade journals combined. Our pages are filled either with original articles prepared by well known writers, or with translations of practical articles from eminent men of other nationalities, the translations being made by a technologist, who is also a linguist, and in our special employ. It has always been the aim of THE CIRCULAR to make its pages instructive, and whoever possesses the complete volumes has text books on watch making and kindred subjects sufficient to afford him a liberal technical education. It is this educational feature of THE CIRCULAR that has given it such a high standing in the trade and such an extended circulation. As we before said, we invite comparison with any and all of our contemporaries, and in doing so we are not egotistical, for as proprietors we claim only the credit of bringing together within our covers the best thoughts and ideas of the technical writers who are our contributors. The character of a business house is something of a criterion as to the quality and value of the goods it handles, and the same may be said of a newspaper or a trade journal. Then, too, the character of the circulation of an



advertising medium must be taken into consideration in estimating the value of its advertising space. The *Daily News* of this city claims, probably with truth, the largest circulation of any daily paper in this country; its terms for advertising are very high. Yet an advertisement for a jewelry house in that journal would be of no value whatever to the advertiser, for the paper circulates chiefly among the mechanics and tenement houses of the Bowery and the east side of the city. Advertisers desire buyers to see their announcements, and one issue of THE CIRCULAR is seen by thousands of buyers to whom the *Daily News* is unknown. The comparison can be extended to cover the case of every other journal. What the judicious advertiser has to determine is how extensively he can afford to advertise, and what medium is the best for reaching the class of persons to whom he desires to sell his goods. After having been in existence some fifteen years, cultivating the jewelry trade in all its ramifications, it would be surprising if THE CIRCULAR did not cover its special field as thoroughly as can be done by any journal. It is because we know the character of our journal, its far reaching circulation and the cost of supplying the thousands of readers embraced in its subscription list, that we have fixed our advertising rates at the figures we have. We cannot make our goods for less money, they are worth what we charge, and we must get our price or do business at a loss. As no one in the trade expects to sell goods for less than they cost him, they should not expect us to do so; if they do they will be disappointed. We expect a fair living profit on our work, and if we cannot get it we shall put up the shutters. Those who desire advertising space in our columns must pay what we know the space is worth. Our rates are not regulated by the prices charged by other trade papers, but by the cost of producing THE CIRCULAR and maintaining its character, standing and influence.

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WE OBSERVE that the "Fashions in Jewelry" department of THE CIRCULAR is very much preyed upon by the editors of our city papers, fashion writers for out-of-town journals, and the items of news are rehashed in the news columns of our ponderous dailies, here and elsewhere. The secret of journalistic success lies in the ability to adapt to your own uses the ideas and labor of others. The man or woman who can steal thunder from others, dress it up in a new garb and palm it off as a genuine home made article will reap fame and shekels. On this basis our fashion writer is contributing liberally to the fame and fortune of more than one journalist. But so far from complaining of this wholesale sequestration of original matter paid for by us, we rejoice to see our contemporaries giving so much attention to jewelry interests, and will do all in our power to make their pilferings even less labroious if they will only apply to us. When we first started this department of "Fashions in Jewelry," we announced that much good might be done if retail dealers would interest themselves to secure the publication of extracts from it in their local papers, and offered to supply advance proofs to such as would apply for them. Many have done so, and express themselves as highly pleased with the idea; they find their local editors eager to avail themselves of these advance sheets, and hence their readers are kept informed as to "Fashions in Jewelry." More publicity might be given the subject if more dealers would send for the advance proofs. Our offer is open to all, and the more who apply the better we shall be pleased. Let the public know what the dealers have to supply, and demand will be stimulated. Try it.

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A MEETING of the National Association of American Movements and Cases was held at Chicago September 9th, at the rooms of the

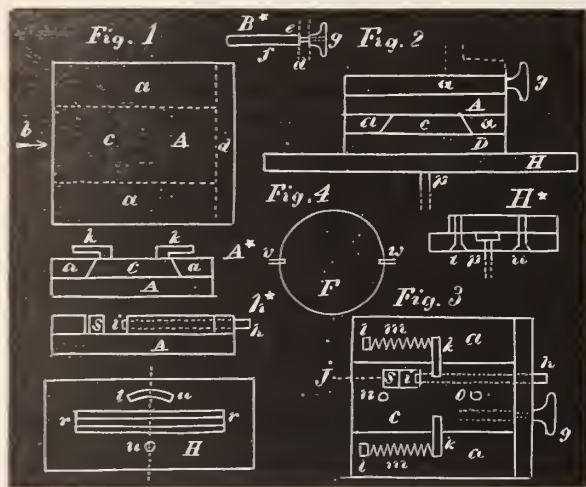
Jewelers' Association. The following delegates were present from out of town:—Messrs. Henry Hayes, David Keller, Ira Goddard, David Marx, Frank Simmons, S. H. Hale and Joseph Fahys, New York; D. C. Percival, Boston; C. D. Rood, Springfield, Mass.; Simon Muhr and T. B. Hagstoz, Philadelphia, Pa.; G. B. Barrett, Pittsburgh; W. H. Hennegen, Baltimore; L. Sigler, Cleveland; Clemens Hellebush and J. C. Dueber, Cincinnati; B. Altheimer, St. Louis. There was great enthusiasm displayed by the members relative to the good work being accomplished by the organization, and the possibilities that lie before it. Action was taken upon several matters of interest, that will be more fully developed in the near future, all of which we can say being in the direction of stimulating business in its legitimate channels, and promoting the welfare of all branches of the trade, each in its respective line. The drift of sentiment, as well as the action taken, was in favor of extending to the retail dealers such protection as the jobbers can throw around them, and by every means possible eliminating the outside traffic in jewelry. The work thus far done by the association has met with a degree of appreciation and encouragement that should stimulate it to renewed effort and additional vigor.

### Problems in the Detached Lever Escapement.

BY DETENT.

THE SLIDES for carrying the device for grinding the teeth of the scape wheel mentioned in former article are quite easily made. First, pieces of heavy (No. 5) sheet brass are got out as follows: 2 pieces  $1\frac{1}{2} \times 1\frac{5}{8}$ , 4 pieces  $1\frac{1}{2} \times \frac{1}{2}$ ; 2 pieces  $\frac{1}{8} \times 1\frac{1}{2}$ . If sheet brass as thick as No. 5 cannot be procured get pieces cast, but the patterns should be thick enough so the pieces enumerated will be  $\frac{3}{16}$  thick after finishing. The best way however, is to get thick sheet brass; it is a necessity in a workshop, at any rate. It is well to explain what we wish to accomplish, it is to make two double slides, one placed above the other, so that the scape wheel to be ground can be moved in two directions, in the same manner as a slide rest. These slides are so mounted as to be slipped from side to side, and turned to any horizontal angle. The pieces  $1\frac{1}{2} \times 1\frac{5}{8}$  are to be gotten out and filed and scraped dead flat; then the two pieces (*c*)  $\frac{1}{8} \times 1\frac{1}{2}$  are gotten out and filed flat; the edges are however filed to an angle of  $60^\circ$  so as to engage with the pieces (*a a*) next to be described. These next (*a*) are four pieces  $\frac{1}{2} \times 1\frac{1}{2}$  made flat, and one edge filed to an angle of  $60^\circ$ ; we will now construct one of our slides. At *A*, fig. 1, is shown one flat bed piece  $1\frac{1}{2} \times 1\frac{5}{8}$ ; this cut shows a top view or plan, and the dotted lines indicate the two guide pieces *a a*, and the slide *c*. At diagram *A\** is shown an end view, seen in the direction of the arrow *b*. The pieces *a a* are secured to *A* by the means of six screws, three in each piece *a*. All these pieces should be nicely fitted, so as to slide easily and yet have no lost motion. It will be noticed that the piece *A* ( $1\frac{1}{2} \times 1\frac{5}{8}$ ) is  $\frac{1}{8}$  of an inch longer than the pieces *a a* as shown at the dotted line *d*; this is to enable us to put a piece on *A* through which a screw will work to move the slide *c*. The pieces *a a* are screwed on to *A*; and it will be well to buy the screws; they can be got for about 50 cents a gross, and it would not pay to make them. In fitting up, the screw heads should be countersunk, so as to be as low or a trifle lower than the slide *c*, fig. 2; this is to prevent friction on the guides *a a*. In fitting up the screws for moving the slides *c* they should be nicely made of Stubs and turned true. One is shown at diagram *B\**, where *f* represents the screw and *g* the milled head or thumb nut; at *e* is a shoulder; the idea of this is, the dotted lines represent the piece which is to go on to the bed *A* as shown at *d*, fig. 1. There is no need of these slides moving back and forth more than  $\frac{1}{8}$  of an inch, as the whole attachment can be moved about before it is secured to the bed of the lathe until it is almost exactly in the right place, thus rendering it necessary only to use the serews for

the finest adjustments. At diagram  $A^*$  is shown an end view of the bed  $A$  shown in fig. 1, together with the slide  $c$  and guides  $a a$ . At fig. 2 is shown an elevation of the two slides as placed one above the other. There is really very little to describe about these two slides, except to say they are very much like the slides to a slide rest. One peculiarity is well to add for the sake of accuracy in the practical working of the attachment: there is a spring device for carrying the slide forward against a stud and stop; the object of this is, no matter how careful we are in working a screw by hand, it is impossible to always exert exactly the same force, consequently the slide and scape wheel is in some cases carried forward farther in one instance than another. To remedy this defect we construct the upper slide as shown in fig. 3, which is precisely like fig. 1, except what is shown in dotted outline, is shown in full line, together with the details of moving the slide. The two guides  $a a$  hold the slide  $c$  in place. At  $g$  is shown the screw for moving the slide; this is made as shown in diagram  $B^*$ , with the screw part  $f$  tapped into the slide  $c$ . At  $n$  is shown another screw, this is also tapped into  $c$ , but with this difference, it is free to move through the stud  $d$ . At  $i$  is shown a slot and stud  $s$ . At diagram  $n^*$  is shown a vertical section of fig. 3 on the dotted line  $v$ . If the screw  $h$  is withdrawn as shown, the stud  $s$  (which is fast to the bed  $A$ ) would permit the slide  $c$  to move back and forth the length of the slot  $i$ , so that by turning the nut  $g$ , the



slide  $c$  would be forced forward; and it will also be noticed that the screw  $h$  could be set so as to stop or arrest the forward motion of the slide  $c$  at any point of the motion allowed by the slot  $i$ . It will be noticed that at  $k k$ , diagram  $A^*$ , are two projections shown also in fig. 3, these projections are connected by two spiral springs  $m m$  to two pins in  $a a$ . Now as these are tension springs, having tendency to draw the slide forward in the direction of the arrow, it will be seen that on relaxing the screw  $g$  the slide  $c$  will move forward until stopped by the screw  $h$ , the object of this last described combination is to prevent the screw  $g$  from being urged forward sometimes with a greater or undue force. The head of the screw  $h$  can be slotted or squared for setting it in place. The circle at  $n$  indicates the position of the foot of the division wheel described in the September number of this journal; the circle  $o$  locates the screw for holding the cock or bridge which supports the upper end of the arbor to the division wheel, also described in September number. We now attach to the lower bed ( $D$ ) of the under slide, a supplementary piece  $H$   $3\frac{1}{2}$  inches long and  $1\frac{3}{4}$  wide, made of the same thickness of sheet brass. An upper or plan view of this supplementary piece is shown in diagram  $H^{**}$ ; and a transverse section on the dotted line is shown in diagram  $H^*$ . At  $r$ , diagram  $H^{**}$ , is a slot  $2\frac{1}{2}$  inches long, in which the attaching screw ( $g$ ) for fastening the device to the lathe works; this slot is recessed on the upper side, to receive the head of the screw  $p$ , as shown in diagram  $H^*$ . The bed  $D$  of the lower slide is attached to  $H$  with two screws, one at  $u$  and another working in the slot at  $t$ , which permits of a rotary motion of about  $20^\circ$ . The slot  $r$  permits the grinding device to be set in almost any approximate position, when the screws working the slides can be brought into

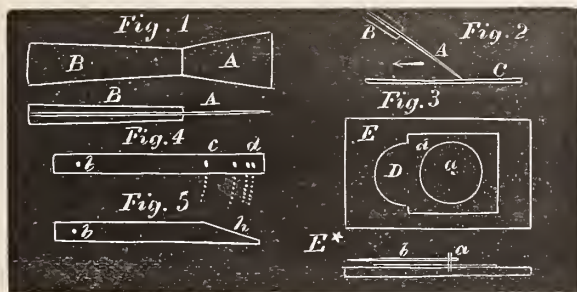
play; these motions in conjunction with the screw device for slightly rotating the spacing wheel described in September number, gives the power of almost absolute perfection. Sometimes in using the device we shall have to change the position of the front to the rear of the diamond lap; I mean by this, we shall have to change as shown in fig. 4, where  $w$  represents the front and  $v$  the rear of the lathe, and  $F$  the face of the diamond lap. In working this device, the diamond lap must work at a very high velocity, and the screw  $g$  advanced very slowly. In our next we shall consider and describe more fully the details, and then give a simpler method of treating brass scape wheels which have been injured; something very useful to those who are so situated as not to be able to procure a new scape wheel on an hour's notice.

### Advice to Watchmakers' Apprentices.

BY A MAN WHO HAS SPENT TWENTY YEARS AT THE BENCH.

REPAIRING clock dials is something which all workmen who are called upon to repair clocks must have been annoyed with. While strictly speaking, it is not exactly in his line, still he is expected to do it, and do it nicely. In the ordinary run of Yankee clocks it is better and cheaper to put on a new dial; but the exceptional cases are the ones which puts the clock repairer to the extreme end of his ingenuity. And it is here, as it is in many other cases. If a man has a job which no other class of mechanic will dare to touch, he takes it to the watchmaker. If a dentist has a case of irregularity of the teeth, and he wants a combination of screws and springs which will pull to the left and push to the right at the same time, he goes to the watchmaker. If a lady breaks her parasol or fan, away it goes to the watchmaker. In this rage for fixing up grandfathers clocks, the clock maker is expected to repair the old dial or procure a new one. Here is a case where we cannot order a new one from a clock Co. We try to get our best sign painter to paint us one; he does paint one and he charges us twice what we think one had ought to be worth, and still he don't get half paid for the time he actually spends on it, and after it is done it has a poor appearance. It is not a difficult job to paint a dial for a clock, for if we use the Roman numerals, the entire thing is purely mechanical. Probably it would be the best on most occasions to get some painter to paint the dial a dead white and rub it down for you; but for those who would do the whole thing, I will describe the manner of painting a dial complete. If you intend using the old dial, to remove the old paint heat the dial until up to about  $600^\circ$  F. or up to the melting point of lead. At this temperature, the old paint can be readily scraped off. A painter's putty knife is the best tool for this purpose. After the paint is scraped off, sandpaper the metal surface smooth and paint it with a coat of the ordinary white lead ground in oil. Enough spirits of turpentine should be added to make the color work easy and also to make the paint dry without a gloss. After your coat of paint is dry, thoroughly sandpaper the new coat off perfectly smooth, and then give it another, repeating the sandpapering for each coat. The painting must be continued until a smooth, white surface is obtained. If the metal is very coarse and rough, it can be plastered by taking some of the usual white lead ground in oil, and adding a small portion of dry white lead. This mixture should be incorporated on your glass slab, after which add painter's japan, say  $\frac{1}{2}$  as much japan as you have of the white lead mixture. The mixture of white lead and japan should be again thoroughly incorporated, and when ready for use is of the consistence of very thick paint, or very thin putty; more like paint however. This mixture is spread over the rough metal, somewhat as a plasterer spreads his mortar in what he terms his putty coat. The position of the putty knife when applying it is shown in fig. 2, moving the knife in the direction of the arrow. No more of the mixture should be applied than just enough to fill up the depression, letting the knife be pressed firmly down.

This composition will dry *bone hard* in 48 hours, when it can be sandpapered to complete smoothness. After this, proceed to painting with white lead and oil as directed above. The last coat of white lead can be rubbed with fine pumice and water, which will leave a surface as smooth as ground glass, smoother, in fact, more like unglazed porcelain; on this is the figures to be painted. Here comes the easiest, and yet what seems to be the most difficult part. To any person who objects to all the bother of puttying and painting, let him employ some carriage painter to prepare the dial all ready for the lettering; then go on as follows: Lay your dial down flat on a board or table and secure it there, and in the center, where the center post comes, insert a bit of strong steel wire, say  $\frac{1}{16}$  of an inch thick, and rising  $\frac{1}{2}$  an inch above the dial. In fig. 3 *E* represents the board or table, and *D* the dial to be painted, and *a* the center pin. We next take some thin strips of wood, (strips cut from an old cigar box is good), say 10 inches long and  $\frac{1}{2}$  inch

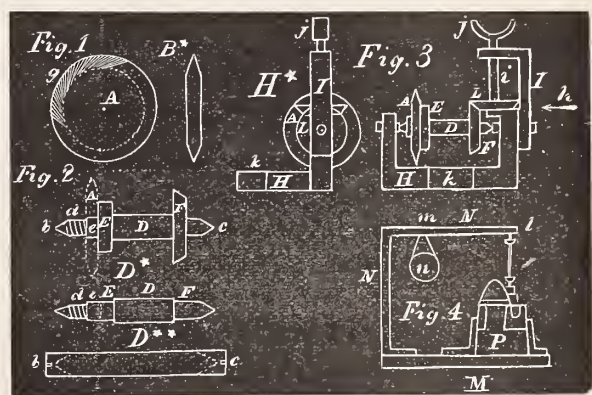


wide, and about  $\frac{1}{8}$  of an inch thick. We will next suppose we have a dial 12 inches across; we take one of our thin wood strips and pierce it with a hole just large enough to slip on the center pin *a*, fig. 3. At fig. 4 such a strip is shown separate; *b* representing the hole which goes on the center pin *a*, the additional holes shown at *c d* are to insert the point of a lead pencil to sweep the four circles shown at the dotted lines; the two outer ones are to show the minute spaces; and the two inner ones, the length of the hour numerals. A slimly sharpened lead pencil point will sweep the guide circles on the rubbed down painted dial as nicely as if it was paper. We next divide the circle at *d* into 12 equal parts, to represent hour spaces, and then again into 5 spaces, to represent minutes. Painting the figures or numbers in Roman numerals is the trouble, or looks to be the difficult part; and yet it is very easily and quickly done. A dial prepared as described, that is, the final coat of paint let to get perfectly dry, and then rubbed down with fine pumice stone and water, can be drawn upon with water colors, with equal facility of drawing paper. If we take what is called a drawing pen, some call it a ruling pen, (it is an instrument all map and mechanical draftsmen use), and fill it with india ink, we can rule a line of any width on the painted surface, as well as we can on paper. Now the idea is, we are going to rule the lines on our dial with water colors, and then go over them with varnish, after which they are to all interests and purposes oil colors, as a dial can be washed equally as well as one painted in oil colors. India ink can be used in the drawing pen, but if it is used, it must be the poorest and cheapest imitation ink you can buy. The best color to use is ivory black, prepared for water color artist's use. This color ground up with water, and filled into the drawing pen is all you need. Set your pen by the screw which closes the blades, so it will rule a line about  $\frac{1}{40}$  of an inch wide, and you are all ready for business. The first thing to do is to take the piece shown in fig. 4 and insert the point of the pen so it will rule the two lines at *d*. The pen is inserted precisely as the lead pencil, using the pen to make the mark instead of the pencil. We next take another piece like the one shown in fig. 4 and cut it as shown in fig. 5. The slanting end at *h* is to rule the oblique lines to such letters as the V's and X's. But we shall have to defer the description until the next issue,

Lathes and Lathe Work.

BY THE MODEL WATCHMAKER.

IN CONVEYING the power for rotating the cutter in the tool post, we must do so with an eye, so to speak, keenly on the lookout for any causes which will affect the work in hand; that is, cause the cutter to change its position from its proper and legitimate course. This is not so easily accomplished as one would at first suppose. We will describe what is wanted and then point out how these results can be attained. It is desirable to convey the power from the countershaft to the tool post in such a manner as to least disturb it (the tool post); any force which has a tendency to draw the tool post forward, push it back, turn it to one side or in any way disturb it, is to be avoided. The plan given below accomplishes this fairly, and by a slight modification will do it perfectly. At fig. 1 is shown a mill for cutting a screw, it is a disk of the best steel, one inch in diameter, made as soft as possible by annealing in a charcoal box, (a process often described in this journal). Great care should be taken to bore the hole *a* in the center, so as to have it at right angles to the plane of the disc, which is established by making one side perfectly flat by grinding. After this is done, it should be bored out and mounted on the arbor on which it is to work. Such an arbor is shown in fig. 2, where *D* represents the arbor, and *A* the cutter in dotted outline. The arbor should be made of  $\frac{3}{8}$  Stubs steel wire, and about 2 inches in length, terminating in two cone bearings, as shown at *b c*. Such an arbor should be turned into a very more approximate shape; and the turning for the screw at *d* done. This screw can be cut with the ordinary stock (moveable) dies, only taking care to leave the part *c* where the mill goes a trifle larger than the screw *d*, so it can have a final accurate fitting by careful turning after all the parts are added. At diagram *D\** is shown the arbor as it should be roughed out. The manner of



doing it is as follows: A piece of steel wire is cut off long enough for the arbor, as shown in diagram *D\*\**; in each end of this a hole is drilled to receive a cone center. It is then put in the lathe and roughed out, as shown in diagram *D\**; after it is in this shape, it is put in the lathe and by means of the back rest already described, the cone points are alternately perfected. The cone points *b c*, diagram *D\**, should be polished quite smooth, when they should be hardened. The hardening of the cones should only be at the ends, and should not extend beyond the dotted lines *ff*. At *E*, fig. 2, is shown a heavy brass collar driven on to the arbor *D*, this is to be ultimately turned off for the cutter *A* (shown at dotted outline in fig. 2) to rest against. At *F*, fig. 2, is shown a bevel wheel, the use of which will be explained further along. After the collar *E* is driven on, and also the bevel wheel *F*, the arbor is put into the lathe and the part at *c* turned with great care, as it is the place where the rotary cutter *A* goes. The face of *E* next to *A* is also turned nearly flat (a little under cut). A nut is now provided to go on *d* to press the cutter *A* firm against *E* and hold it true and steady while at work. The bevel wheel *F* should be  $\frac{3}{4}$  of an inch in diameter, and is best made of hard brass. Such wheels can be bought of any of our leading hardware houses, or can be obtained of Goodnow & Wightman, Corn Hill, Boston, Mass. There will be

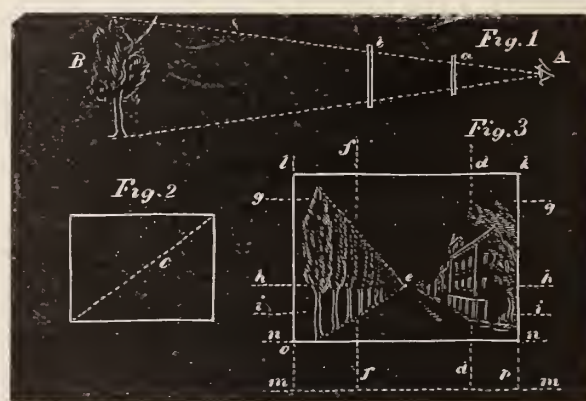
two of these wheels needed as will be explained. The place where the bevel wheel *F* goes can be turned a little taper and the wheel driven on. The blank for the cutter *A* after softening is bored out to fit the arbor at *c* perfectly. It is now put on the arbor, and the nut which goes on the screw at *c* is set so as to hold it secure. The arbor with the rough cutter is put into the lathe, and the cutter turned on the edge until it is shaped as shown at diagram *B\**. After it is turned to the correct form it is taken from the lathe and cut with a graver into a sort of file, by lines as shown at *g*. If such a cutter is carefully cut with a graver, so the metal between the lines come to an edge, and then hardened, it makes a cutter which cuts rapidly and wears for a long time. At fig. 3 is shown the cutter *A* and arbor *D* mounted in a frame for going into the tool post. The view in fig. 3 is as if seen at right angles to the axis of the lathe, and diagram *H\** is as if seen in the direction of the arrow *h*, fig. 3. The frame *H* can be made of cast brass or iron, the first being preferable. The lower part shown at *H* can be cast separate from the part *I*, which holds the upper bevel wheel *L*. The idea is we wish to construct a holding frame for the arbor *D* and cutter *A* in such a way that the power to turn the cutter *A* can be conveyed to it in such a manner as not to interfere with lateral motions of the tool post—that is the feed screw will carry the tool post along in cutting a screw with a mill or revolving cutter, just as if it held an ordinary V-shaped cutter. The bevel wheel *L* is mounted on a perpendicular arbor *i* which has a step for its lower pivot in top of *H*, while the upper end is held in an additional cock *I* which is screwed to *H*, as shown. The top of the arbor *i* terminates in a universal joint, part of which is shown at *j*. The part *k* of diagram *H* is supposed to go into the tool post, and be screwed by the same set screw as holds the tool in ordinary turning. At fig. 4 is shown a part elevation of the table (*M*) on which the lathe *P* is mounted; an iron arm resting from the table or bench *M* to which it is secured, rises above and extends over the countershaft *n*. At *l* is shown a short arbor and grooved pulley; to this arbor is attached a universal joint; this is joined by a short shaft to the universal joint at *j*, fig. 3. On the countershaft *n* is a grooved pulley. A round belt or band rises from *n*, passes over two pulleys on *N* at *m*, thence around the pulley at *l*. By making the pulley at *n* on the countershaft so it will slide on the countershaft, and also make the arm *N* moveable, a continuous screw 18 inches long can be cut with a mill on our lathe. But as we shall seldom want to cut a screw more than 5 or 6 inches long, and if the arm *N* is 12 inches above the cutter, a screw 6 inches long can be cut. We have now got our lathe so we can cut a screw of the most desirable accuracy, and we will next consider the making of a measuring tool, of great use to the watchmaker; first, it measures up to 3 inches to the  $\frac{1}{10000}$  of an inch any wheel, staff, arbor or pinion; and next, will tell the correct distance of all depths; being far superior to any depthing tool. As, for instance, if we have say two jeweled holes in a watch plate, and we wish to know the size of a 60 tooth wheel and an 8-leaf pinion to match, this tool will give it.

## Free-Hand and Mechanical Drawing.

BY EXPERT.

DEFINITIONS FOR the term drawing has been so often given that it seems almost unnecessary to repeat the attempt. In the present instance, we can limit the significance of the word to the sense of the *delineation of objects more or less remote on a flat surface supposed to be at a determined distance from the eye*. In actual practice this delineation of objects on a flat surface is effected by the use of outlines and shadows, the white paper representing the light portions of the picture. These lights toned down in gradations, are the means by which we can express ourselves in drawing as considered in the present papers. I made use of the term "outlines" above; this

phrase, as well as the actual use of such outlines, has crept into the art from a comparative necessity. But in nature there is in reality no such thing as an outline. This should be borne in mind as we advance in our art, although we shall use both the term and the outline in these instructions; still it is to be kept in mind that we use outlines only as a conventional necessity. The further consideration of this portion of our subject will be deferred until we can consider it in cases of actual practice. As I remarked in a former communication, there is really no distinction between free-hand and mechanical drawing, except in the technical methods of expression. If we wished to illustrate and describe the different parts of a watch, no conventional method of mechanical drawing would be superior to photographic views (on an enlarged scale) of the whole, aided by views of parts and sections—by sections here I mean actual parts seen apart and photographed. It is not to be understood I would advise such a course, I am merely trying to disabuse the reader's mind from conventionalities. Mechanical drawing has actually made great advances since the use photography; to anyone who doubts, let him compare the cuts and engravings of illustrated works of to-day with those of forty or fifty years ago. Photography has its defects or imperfections and it is the province of true art to remedy these imperfections. To illustrate, suppose we were photographing a complicated piece of mechanism, some of the parts would be obscured by insufficient illumination, lack of contrast, or other causes; now it is the province of the mechanical draftsman to bring out these details, deepening a shadow here, and strengthening a light there, until the full details are established. This course is as important as that the crude outlines of the conventional mechanical draughtsman should be modified and enhanced by the introduction of lights and shadows. Having thus in a measure defined the purpose and method of delineating objects, either natural or artificial, on a flat surface; we will now consider the *modus operandi* of doing it. No better mode of illustrating the principles involved in drawing than to suppose a plate of glass interposed between the eye and the object or objects to be delineated, as shown in fig. 1, where *A* represents eye and *B* the object and *a* and *b* plates of glass. Now the distance at which the glass is placed determines the size or scale of the object in the drawing; if the drawing is made to correspond to the size seen through the glass plate at *a*, it would be just one-half the size of one made to correspond to



the glass plate at *b*; i.e., an object measuring 4 inches on *a* will measure 8 on *b*. The limit to the size of a drawing or a glass plate, such as we are using to illustrate our idea, cannot exceed  $60^\circ$  as this comprehends the entire visual field which can be readily seen without turning the head. Now as the chord of an arc of  $60^\circ$  is equal to the radius, we can assume that the greatest linear extent of a picture cannot exceed the distance at which the picture is supposed to be taken. To make this better understood, we will suppose that the rectangular figure in fig. 2 is a plate of glass which measures on the dotted line *c* 24 inches. Imagine this plate of glass is placed at 24 inches from the eye, we could see through it all that we could encompass in a picture. Now all the objects seen through the plate of glass measuring 24 inches on the diagonal could be seen through

a glass measuring 12 inches on a diagonal line if placed at 12 inches from the eye. Very few pictures are supposed to embrace a visual angle of  $60^\circ$ , but only a portion of this space or field is represented; as, for instance, in fig. 3 the point *e* is selected as the *point of distance*. This point of distance is an imaginary point toward which all objects seem to diminish, as they are more and more remote from the eye. This point of distance was to the writer an immense stumbling block when he was taking his first drawing lessons. His teacher was a man of no mean practical attainments, and the text book used was the Oxford drawing book, a work pretentious enough in title, and one of really sound merit; but why this point of distance was sometimes to the right of the center of the picture, or sometimes to the left, and again at its proper place in the middle was something I could not understand. And when I asked for an explanation, it was answered, "the point of distance is a point opposite the eye." And so it is, but it should be explained as the supposed center of our pictorial visual extent without turning the head. And if we were looking out on the ocean (or any extended plain), and two or three objects were visible on the horizon, say a steamer, a ship, and a sloop, each of these would be located at the point of distance if the head was turned fully toward it, and  $30^\circ$  measured off on each side to establish a pictorial field of  $60^\circ$  extent. Neither is it of importance whether the picture is round, square, or oblong; its greatest extent should not exceed  $60^\circ$ . At fig. 3 is shown a perspective drawing supposed to embrace a field of  $60^\circ$ , with the point of distance at *e*. Now the extent of the picture as shown by the full lines does not embrace the entire  $60^\circ$  as the lower marginal line *n* is above the true margin line, which would be at *m*. Placing the horizon and point of distance at about  $\frac{1}{3}$  the way up the picture is a mere conventionalism, but accepted in most pictures. Now if the actual margin of the picture extended down to the line *m m*, the point of distance *e* would be in the center of the picture; and the visual angle embraced between *k* and *o*, and *l* and *p*, would be  $60^\circ$ . But in the view shown in the full lines, the lower margin is raised so that we only occupy the full pictorial extent between the points *e* and *k*; and *e* and *l*. We can also diminish the extent of our picture by adopting any of the dotted lines shown as margin lines. As, for instance, if we should establish the line *d d* as a margin line; then the point of distance would be to the left of the center of the picture. But if we used *f f* as a margin line, we should have the point of distance at the right. And so on, we can change the position of the margin lines, but in no way affect the point of distance or prospective vanishing points.

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## Proceedings of the Horological Club.

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### A DISTINGUISHED BODY OF WATCH AND CLOCK MAKERS.

*One hundred and thirty-fifth discussion.—Communicated by the Secretary.*

[NOTICE.—Correspondents should write all letters intended for the Club separate from any other business matters, and headed "Secretary of the Horological Club." Direct the envelope to The Jewelers' Circular Publishing Company, Seth W. Hale, President. Write only on one side of the paper, state the points briefly, mail as early as possible, as it must be received here not later than the eighth day of the month, in order to be discussed and reported in THE CIRCULAR for the next month.

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#### BOOKS ON ENGRAVING.

##### *Secretary of Horological Club:*

I would feel very much obliged if you would be kind enough to tell me if there is any book that tells about how to engrave, and price, and where I can get it.

R. T.

Mr. Clerkenwell replied that our friend could get a good book on that subject by sending \$2 to the Jewelers' Circular Publishing Co. That is the only book which would be of much real use to a learner,

so far as he knew. It was called "Practical Instructions in Letter Engraving." Mr. T. would also find some excellent practical articles on engraving in the back numbers of THE CIRCULAR for this year, by the well known writer, "Expert," which would give him valuable assistance in learning the art.

#### LOOSE JEWEL REVOLVING IN DIRECTION CONTRARY TO ITS PIVOT.

##### *Secretary of Horological Club:*

I feel called upon to say a few words more anent that revolving jewel. Nothing will change my opinion in regard to the particular cases that have come under my own observation, which I hold was produced by the oil, in the manner described in my letter in the March Proceedings.

In one instance I devoted a good deal of time in examining this peculiar action of a loose jewel. It was a  $\frac{3}{4}$  plate detached lever. In running it down with my finger against the edge of the center wheel to check its speed, I noticed that the scape wheel jewel was loose, and took intermittent spells of revolving in the same direction as the wheel; fearing that the pivot would run off, I stopped the watch by increasing the pressure on the center wheel, and oiled all the pivots. On allowing the train to run again, the motion of the jewel, as I at once noticed, was in the opposite direction to the wheel; I then took a piece of blotting paper rolled to a point, and touched the scape wheel jewel with it, depriving it of the oil, when I found the jewel wouldn't move at all, no matter how much speed or in what direction; the jewel remained stationary. On applying oil, the motion was restored, and the jewel revolved always in the opposite way to that in which the wheel went, the speed increasing as the speed of the train was increased, and on reversing the direction, it seemed to take an instant of time before the jewel would start. It seemed to me that it took this short period of time to establish the current of oil which I described in March.

On placing the movement in a vertical position, the jewel would not move, neither would it if you turned it over. I found that it would revolve only when placed in such a position that the jewel would be horizontal and with the flat side down. With this watch I had unusual facility for seeing its action, as the jewels were unusually large and thin. With all due respect to our friend H. L. Loughlin's studying and experimenting, I will say in the most emphatic manner, *the thing can happen*. And I must deny, in the same forcible manner, that it is altogether an optical illusion. I, too, like H. L. L. have been experimenting by loosening jewels, etc., and have not succeeded in bringing the thing about. It is not an easy matter to produce that smoothness in a jewel setting that it will naturally acquire by perhaps years of constant friction of a polished jewel. Does our friend H. L. L. expect to perform this delicate experiment by loosening the jewel with nitric acid, or how? As he has made the subject a matter of study, will he favor us with his course of reasoning on it?

Since this controversy has been going on, a loose jewel has come under my notice under very similar circumstances to others, but, to do my best, with oil, or without, in one position or another, the stubborn thing would not revolve in the opposite way to the wheel. So I conclude that it must be under certain and favorable conditions. But I can fancy our friend H. L. L. chuckling, and saying "fooled again, the jewel was going in the opposite direction all the time, another optical illusion."

M. Moss.

Mr. McFuzee said he was glad Mr. M. had given out so many details. It appeared that at first the jewel revolved in the same direction as the pivot, either because the jewel hole was rough or dirty, or something of the kind. When oil was applied, this was remedied and the jewel revolved in the opposite direction. The phenomenon would seem to be coincident with lessened friction either on the pivot or between the jewel and its setting, apparently the former. And yet, when one makes a sketch of the various parts in position, and tries to study out their motions, it is difficult to see how the frictions can produce any such result. All our correspondents, so far, seem to agree that the pinion arbor must be vertical, and the loose jewel on the top pivot. Beyond that point all is uncertain. Let us hear from all who notice the phenomenon, with as full details as Mr. Moss sends, and we may soon be able to determine the cause of it.

#### THE LOOSE JEWEL QUESTION AGAIN.

##### *Secretary of Horological Club:*

I want to give you my theory of the "loose revolving jewel contrarywise to a revolving pivot." If a boy in his play of rolling the

hoop had, for a stick or propeller one that *revolved*, instead of the *friction* which the rigid pressure would cause there would be comparatively none at all. Now let this revolving pressure be applied to the *inside* of the hoop, a little forward of where the hoop touches the ground; the propulsion would be the same, except that the *pressure* would not cause the revolving *propeller* to revolve in an opposite direction. But let there be some other cause to revolve the "propeller" in an opposite direction, with the *pressure* at the same point; the hoop will move *forward* notwithstanding it can't help itself. Now let this hoop be placed inside another hoop or circle a trifle larger; the revolving propeller will cause the hoop to revolve in this circular enclosure, providing the pressure of the propeller is *greater* than the resistance of friction of the revolving hoop. Place this hoop in an horizontal position, and you have the revolving "loose jewel" propelled by a revolving perpendicular propeller.

This is exactly how the thing struck me at first sight, and I can't get that jewel to revolve *with* the pivot, unless it fits it so tightly, or rests upon the shoulder of the pivot so that it can't help it.

S. B. D.

The Secretary read this letter three times, but the members were unable to understand from the description just what was meant. There seems to be *two* of the parts called "propeller," so that the idea was conveyed too vaguely to make out the meaning. He suggested that Mr. D. should send us a sketch of the parts, in the proper position as he had them in his mind, designate each part by a different letter, and use those letters to designate the respective parts, in his next explanation, and we will then know his exact meaning, and be able to discuss his theory with the rest.

#### HOROLOGICAL LITERATURE—SOME NEWS FOR THE TRADE.

##### Secretary of Horological Club:

I want to collect a library of standard horological works, English books. I don't want anything that is out of date, for I have no time to study old books, and then find that the ways described are abandoned, and I have wasted my time. But I want something I can rely on, being the best, and correct, and the ways such as workmen use now. Please give me a list of such. APPRENTICE.

Mr. Horologer answered that horological literature in English, of the class required by our young friend, was very limited. There are a number of books which may be called "popular," or adapted for reading for general information, but very few which are fitted for "study" by practical workmen desirous of learning about the trade. The very best one is Saunier's great work, "Modern Horology," price \$15, and deals exhaustively with the theory of the subject. It requires careful study and is fully worthy of it. Saunier's "Watchmaker's Hand Book," price \$4, is more practical, and describes tools and machinery for working. Excelsior's "Treatise on the Balance Spring, and the Adjustment of Chronometers and Watches for Isochronism, Positions, Heat and Cold, and Rate," price \$3.50, is the best and only really thorough and practical work on those important branches of watch work. Grossmann's "Prize Essay on the Detached Lever," treats that escapement fully, with detailed instructions for laying it out correctly. These comprise about all that have any real value to workmen of the present day. All of them can be obtained from the Jewelers' Circular Publishing Co., at the prices stated.

### The Size and Weight of the Balance.

IN ONE of the recent numbers of the *Revue Chronométrique* an interrogator asked the question, important to every watch maker, whether a large and light balance be preferable to a small and heavy one? The editor of the journal, the celebrated Mr. CLAUDIUS SAUNIER, answers the question in so instructive and interesting a manner that we translate it.

The highly esteemed author and leading light in horology prefaces his article with the statement that he had instituted many experiments for discovering the laws and practical rules governing the sizes

and weights of balance, and for this reason prefers to answer the query himself.

Even, he continues, if we confine ourself to the import of the question, nevertheless it is necessary to first establish the limits within which a balance may at present be called either too large or too small. It would actually not be necessary to answer this double question, as it has fully been elucidated in the works of Berthoud and Jodin. If, in spite of this, the majority of our modern watchmakers entertain opinions contrary to the old masters as regards proportions of size of balances, they forget to consider that small balances were preferred by the latter, the large by our modern watchmakers.

When comparing the balances with each other we cannot depend upon their apparent diameter, since this does not exactly express the regulating power of the balances.

What is a balance? A mass which has a circular motion. The greatest effect of force, that is, without loss by division of the powers of this mass set in motion, centers in one point where this operates, similar to the center of gravity of a falling body, and the circle which passes through this point is called the effective diameter. The radius of this circle, therefore, is the regulating radius, and if we multiply it with the square of the velocity we obtain the moment of inertia of the balance. All the comparisons of balances of equal bulks which do not have the regulating radius or diameter as initial point, give defective results.

I have in my *Traité d'horlogerie* exhaustively explained this subject; but since I am unable, for want of space, to repeat here what I said there, I will seek to explain the present query as simply and clearly as possible, for the sake of those of my readers who do not possess said work.

Let us at first examine the balances *P* and *G*, represented in figs.

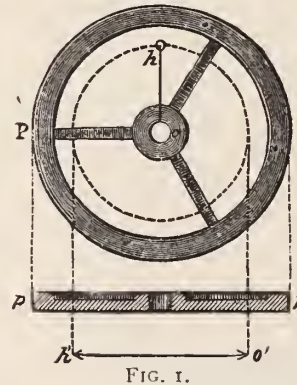


FIG. 1.

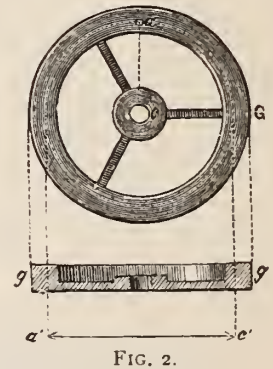


FIG. 2.

1 and 2, as well as their vertical sections through the recesses at *p p* and *g g*. One of these balances is large, the other small, but both are of the same weight, which is differently distributed however.

In *P* the arms are heavy and the central part thick. In *G* the arms and the central part are left just thick enough to possess the necessary strength; at the same time the greatest part of the bulk is in this balance distributed upon the circumference. Hence follows that the effective, that is, the regulating, diameter and radius are in *G* at *a*, and in *P* at *h*. The regulating radii therefore are *a c* and *h o*, and the regulating diameters *a' c'* and *h' o'*. If we compare now the visible diameters *p p* and *g g* with the regulating diameters *h' o'* and *a' c'*, we will see that the large balance *P* in reality is the smaller and the small balance is the larger; that is, the one which, with an equal bulk, possesses the largest sum of the regulating power.

For this reason all conclusions about the weight and the size of balances are of no value and subject to the error, if the active diameter is not taken as initial point, in order to determine therefrom the moment of inertia.

Let us next propound the question, "Is there, then, no theoretical rule, proven as correct by practice, according to which it might be established how heavy and large the balance of a watch should be in order to give the greatest possible regularity in its rate?"

We can safely answer this question affirmatively, and will treat it after we have said a few words on the probable effects of the unsteady

balance vibrations, in consequence of the side shake of the pivots in their holes.

The shake of the pivots in their holes must, with a well proportioned cylinder escapement, amount on an average to  $\frac{1}{8}$ ; with an anchor escapement to  $\frac{1}{8}$ , and a duplex escapement to  $\frac{1}{10}$  of the diameter of the pivots. For an ocular demonstration let us take an anchor escapement and draw the following diagram (fig. 3):

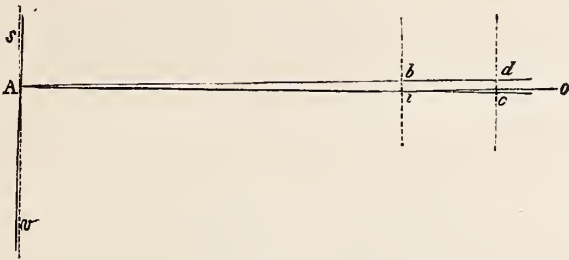


FIG. 3.

The two points *s* and *v*, which represent the two places occupied by the pivots of the balance axes, are upon the vertical line which passes through the center of the pivots, both of which have a diameter of one millimeter.

The size of these pivots is equal to  $\frac{2}{8}$  millimeter; consequently the line, which has been drawn tangentially to the right of one and to the left of the other point, represents the maximum of the vacillation. The line *A d* represents the basis of the balance, and the vertical line, which forms a tangent to the two points, and leads from *A* to *c*, forms, with the first line *A d*, the angle *d A c*, or the maximum angle of the deviation. In proportion to the height of the axis we take, as radius of the small balance, the length *A b*, and that of *A d* for the radius of the large. The vacillation will then be for the small balance *b i*, and for the large *d c*. If we next draw from the point *i* a parallel line to *b d*, therefore the line *i o*, then the vacillation of the two balance rims will be inclosed in the angle *o i c*. This angle, which is here much enlarged, will in *c* measure about  $\frac{1}{8}$  or  $\frac{1}{10}$  millimeter. If it occasions difficulties with so large a sketch as the present to measure the difference with exactness, how much more must this be the case when we deal with the largely diminished size of a watch. It will be rejoined, perhaps, that in many escapements this vacillation is larger than I have represented; to which I answer that I support myself upon principles which have been found to be correct by experience, and which alone should be noticed in the manufacture of watches. Illustrations of this nature should not be culled from inferior productions.

If we consider, beside this, that a watch is generally worn by day and hung up during the night, or laid diagonally in a small stand, and that a vacillation of the balance, it is self-evident, can only occur from a jar; that, again, if the watch lies horizontally the effect of the lifting and the pressure of the scape wheel, in a frictional escapement, is partly neutralized, it will be understood that the cause of the deviations in the rate of the watch cannot be sought for in the increase or decrease, amounting to a few millimeters, of the balance diameter, and especially if the effective or regulating balance diameter has previously not been established.

We have, contrary to the general opinions, given an affirmative answer to the question whether there is a rule according to which the size and weight of balances can be determined, so that their vibrations in the watch attain to the highest degree of regularity, and if our readers will carefully study the following we are satisfied that they will find the proof for it.

In theory, the simple annular balance consists of two ponderous bodies, which are fastened upon a staff without weight, and in the center are suspended upon a thread, equally without weight. If a rotary motion is imparted to the whole it would encounter on both sides an increasing power of resistance, similar to the operation of the power of gravity. If such a balance could be produced it would furnish the proof that it, in order to accomplish the same number of vibrations as a simple pendulum, should have as radius the length of

this simple pendulum. The law governing the motion of the pendulum could thus serve for the calculation of the effective diameter of the balance for the desired number of oscillations in one hour.

Easy though it be to demonstrate by means of a small ball and a thread the correctness of the mathematical law on the motions of the pendulum, and proceeding from the simple pendulum to arrive at conclusions concerning the compound, it will at once become apparent, concerning the above propounded problem, that the theoretical balance, with its weightless arms and its suspension without friction, is only an ideal conception, and that when, with the pendulum proceeding from the simple, we find the composition of the compound pendulum, we must here proceed from the compound balance, analyze it, dismember it from the resistances emanating from the molecular motions, the bulk, the air, the frictions and changes of the balance spring, in order to establish the exact comprehension of the theoretical balance and to find its mathematical formula. We have been engaged in the investigation of this question for a long time, but owing to other duties, and, beside this, want of support from our colleagues, we have been compelled to interrupt the labor at an interesting point, although we hope that we will finish it sooner or later.

The reader will, we hope, not be frightened at this rather lengthy preface, which was necessary in order to elucidate the question both practically and theoretically.

It will be seen from the preceding that the initial point for the determination of the size of the balance rests upon the knowledge of the effective radius or diameter, and that the length of this radius varies according to the distribution of the bulk. This distribution is defined by the law of mechanics thus: "The bulk must be distributed as much as possible upon the rim, and for the arms and center piece only so much is to be used as is indispensably necessary for the strength of the balance." In the course of numerous experiments I have found that, assuming the number 24 as the weight of the entire bulk, it is best distributed in the following proportion:

$$M \text{ (bulk)} : A \text{ (rim)} :: 24 : 20 \text{ (brass balance).}$$

$$M \text{ (bulk)} : A \text{ (rim)} :: 24 : 21 \text{ (steel balance).}$$

We thereby have remaining for a brass balance  $\frac{4}{24}$  parts by weight for the arms and the central piece, and  $\frac{3}{24}$  for a steel balance, this metal possessing greater powers of resistance.

From this we have obtained the correct distribution of the bulk, according to the greater or smaller resistance of the material, but how will we be able now to determine the suitable weight for a balance to be made new? We must thereby start from a known moving power of a weight or spring in a clock.

The weight of a balance stands in direct proportion to the moving power, which is measured upon the circumference of the scape wheel, but not to the motive power, which is perhaps more or less paralyzed or diminished by bad depths, frictions, etc. This theorem might easily be demonstrated by calculation, but we prefer, for the sake of those of our readers who in their earlier life had not the opportunity of studying mathematics, to take as proof an instance from common life. When upon a wagon, with just enough of load to be dragged by one horse, we double this load, we must necessarily also double the team, that is, hitch in another horse to move the load along.

We now know:

1. That with equal bulk that balance is largest which has the greatest effective or regulating radius.
2. That the power of resistance of the metal permits to distribute 20 or 21 parts of the total weight of 24 upon the balance rim, according whether it is brass or steel.
3. That this total weight stands in proportion to the power by which it is moved.

Before we proceed we will still mention a few facts based upon experience. In a cylinder watch the cylinder *C* has, in place of an annular balance, been provided with a flat cross piece *a a*, fig. 4. Upon the two ends of this cross piece are located, with easy friction, two movable arms, each of which carries a weight *m*. As will be

seen by fig. 5, these arms can be turned in such a manner that they assume at first the position  $m'$  and next the position  $m''$ , without disarranging the equilibrium of these actually new balances. It will also be seen at first glance that hereby neither the total weight of the balance, nor the operation of the balance spring, nor yet the friction, has been altered, and yet we have, as it were, three different balances before us (which we will designate as large, medium, and small), which, although they are entirely equal in all their parts, still the distribution of their bulks is different.

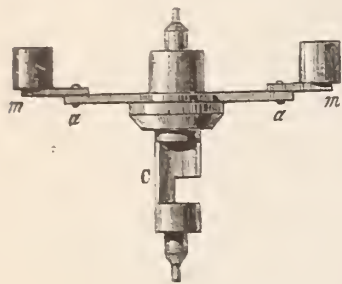


FIG. 4.

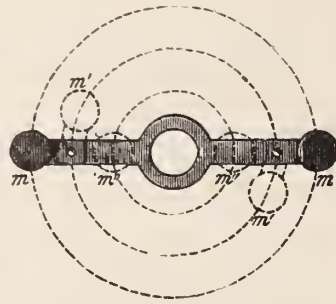


FIG. 5.

Which are now the distinguishing characteristics of the regulating value of these balances of an entirely like weight?

Apparently this criterion consists in their resistance or insensibility against the excess or deviations of the moving power.

So as to institute an experiment with this balance we have fastened upon the arbor of the third wheel a small pulley, upon which was wound a cord provided with a weight. The watch was set in motion under the operation of this weight, and sustained until it had made 8,815 vibrations. The balance arms were thereby spread out fully, so that the weight masses assumed the position shown at  $m m$ , fig. 4. The rate was then noted according to a seconds regulator. The same experiment was then repeated, but with the weight masses in the position  $m' m'$ , fig. 5, and afterward in the position  $m'' m''$ , noting each time the duration of time required for the same number of vibrations.

From this were obtained the following results :

The large balance required 42 minutes 38 seconds, the small 34 minutes 53 seconds, and the medium a length of time between these extremes. These three trials were thereupon repeated with a drawing weight four times heavier, whereby it resulted that the large balance now required only 42 minutes 35 seconds, and the small 34 minutes 44 seconds. The deviation in the rate of the large balance, by the use of the four-fold power, amounted to three seconds, while that of the small balance was nine seconds.

From these trials result the following facts :

1. The smallest balance vibrates quicker (shortening of the effective radius).
2. The angular motion of the small balance is more extended (about  $10^\circ$  upon each side) than that of the large.
3. The present case shows that a quadrupled pressure upon the repose of the cylinder, with a large balance, results in a far greater retardation than with a small.
4. In consequence of the larger angular motion of the small balance the paths passed through by a point of the effective balance circle will not differ materially if the difference of these two circles is diminished in accordance with an ascertained proportion.

Occasion is offered here for still greater elucidations. We will desist, however, since in the continuation we desire to give more practical hints for determining the size and weight of the balance.

(To be Continued.)

certainly been carried to great extremes, and among people in the higher walks of life. In illustration of the desire for something novel may be cited the fact that at the recent marriage of the Princess Beatrice the bridesmaids wore silver jewelry. The object, doubtless, of this remarkable innovation was jewelry of a sort never before worn on a similar occasion. This instance of the royal patronage of silver jewelry has not been without its effect on an already favorite line of adornments, but there was no need of a boom. Leading manufacturers had assured success for their productions by the excellence of the designs and beauty of workmanship produced.

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THE rage for oddities in jewelry, such as a neck pin representing a monkey climbing a ladder, or a harlequin turning a sommersault from a gold pole, THE CIRCULAR is pleased to announce, is nearly at an end, and in its place has come the desire for something unique, not eccentric. In a word, a desire for jewelry that owes its character and its beauty to the fact that it exhibits the goldsmiths' art in its highest perfection. Jewelry that will express at once not only the wearer's social position, but a cultured taste. The tendency in polite society is unquestionably more and more toward originality of design and beauty of finish, regardless of the materials employed, providing always the result is pleasing. In proof of this tendency is the fact that patrons who are willing to pay, say forty-five dollars for the work done on a trinket, and five dollars for the material, are much more numerous than they were a twelve-month ago.

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THE alacrity with which patrons of refinement have picked up the better specimens of art work in silver jewelry is thought by many dealers to be a significant sign of the times, and some of our more progressive workers in precious metals anticipate, in the near future, the revival of such beautiful work as that oldest of all styles of the goldsmiths' art, the Etruscan finish. There appears no reason why ladies who appreciate the fine arts in other directions should not recognize and accept jewelry that represents most thought on the part of an artist draughtsman, and the most careful handiwork of skilled artisans.

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THE so-called "new feature" in gold jewelry this season is, in point of fact, a revival of a very old style—none other than the old English hollow ware in form of coils and knots. These gold coils are both jeweled and plain, and in the short pin provide what dealers now class among brooches. The gold knots and coils are variously finished, there being specimens of burnished, carved, lava, orange, and other rough surfaces.

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A BEAUTIFUL finish in fine gold jewelry, recently introduced, exhibits an opalized surface, a surface covered with a fine mosaic of different colored golds, that gives forth, in a bright light, the opalescence effect which suggested its name. This tessellated surface, with its play of colors, affords an exceedingly unique as well as dainty finish, and makes an admirable background for the display of diamonds and pearls. In this opalized jewelry come new shapes in lace pins and brooches; also a full line of cuff buttons. The new cuff buttons include square, cushion and round shapes, as well as the link buttons; sometimes the entire surface is covered with a mosaic of variegated gold; sometimes there appears a little bright-finished

## Fashions in Jewelry.

A Lady's Rambles Among the Jewelers.

THE *furor* for eccentricities in way of personal adornments has



design in the center, as a leaf or a shield; again, one-half of the button is opalesce and the other half carved or engraved. An attractive effect is produced by a gem set in the center. There are also sleeve buttons with an opalized surface, on which appears an initial in bright gold.

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THE rise and fall of phenomenal stones, stones of little worth except as a sudden demand, born of a fickle fancy, exaggerates their true worth, proves how arbitrary a thing is fashion. Only a few years ago, when cat's-eyes of all varieties and grades assisted in creating the cat's-eye *furor*, the moonstone was classed with other varieties of felspar, that represented to the jeweler but a trifling value. But fashion's wheel, ever revolving, has taken all but exceptionally fine cat's-eyes out of sight, and lifted the neglected moonstone into high favor. The present popularity of the moonstone is due largely to the changing, undulating luster of the stone, and the fact that it can be readily carved and tinted. The idea, by whomever conceived, of transforming plain white moonstones into flesh-tinted faces, with *chatryant* reflection, was an exceedingly clever one, and these moonstone faces, especially when surrounded by little bonnets of brilliants, gained a quick and hearty welcome for the gem that could be so agreeably employed. Now are to be seen not only smiling baby faces, looking up from diamond hoods, but owl heads and other fanciful designs. So popular is the moonstone now, that it is employed not only when tinted and carved, but plain, and showing the pearly white color natural to it. It appears on all articles of jewelry, and promises to be a pleasing fancy for some time to come.

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THE finest moonstones come principally from Ceylon, and are sometimes called Ceylon opals. In olden times considerable value was attached to the Ceylon moonstone, the ancients employing it in their works of art. An opaque and green variety of felspar, which derives its tint from an admixture of copper, comes from Siberia, and is termed the Amazon stone. Then there is a moonstone of inferior color to the best Ceylon opals, called Adularia, from the name of one of the peaks of the St. Gothard, where it is found.

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WHILE there is undoubtedly an increased demand for fine gold jewelry of artistic workmanship, without gems, the demand for fine stones continues undiminished. Gems of rare quality, whether in brooch, pendant, necklace, bracelet or rings, are desired for full dress occasions, and continue to be set with a view to keeping the setting subservient to the stones. Gems of rare color are in great request. Semi-precious stones of desirable hue also continue to find patrons, and are largely employed in jeweled pins and bracelets. Among the more popular of these may be mentioned the moonstone, tourmalines, jacinths, and spinelles.

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SCOTCH pebbles, always more or less affected by English women, are again to the front on this side of the water. These are employed in a harmonious array of colors on the new long and short pins, shawl pins, and on the buckles and clasps at present so fashionable. The term Scotch pebble includes cairngorms, agates, cinnamon, and other deep-colored crystals and water-worn pebbles, whether found in Brazil, Switzerland, Siberia, Germany, Scotland, or elsewhere. These

pebbles are mounted in several ways, but the newest style, and the one attracting most attention, is that in which the pebbles are set in sections, flush with the surface of the trinket. Neck pins thus set are especially attractive in appearance, and present all the forms seen in the gold pins. Some are long, some are short; occasionally there is a straight silver bar with a smooth surface of Scotch pebble blocks bounded by tiny silver threads; again there are crescents of varicolored stones, and yet again appear zigzag squares of silver checkered with divers-colored pebbles. This beautiful marquetry of stones, with polished flush surface and veinings of silver, is equally effective on silver buckles and clasps, and affords an attractive assortment of cuff buttons. This Scotch pebble jewelry, it is believed, will be found especially effective for morning and street wear with the tailor made suits of Scotch home spun and English rough cloths.

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JUDGING from the full and varied lines of cuff buttons out in new designs and finish for the fall and winter trade, it is safe to predict that every lady, no matter how capricious, will find exactly what she wants. In addition to styles not already described are buttons of bright surface, with initial in a rustic letter, composed of different colored golds. The small square or round single button, with or without a gem in the center, represents a style that is affected by a large and desirable patronage.

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CONTRARY to general expectation the lace pin continues to hold a place in fashionable jewelry, though it has been subjected to all sorts of changes and styles of finish. A popular jeweled pin, an outgrowth of the tiny ribbon pin, is similar to but much more pretentious than the scarf pins for gentlemen's wear. It is fanciful in form and design, larger than a ribbon pin, yet smaller than the flower pins, and is mounted on a long gold pin like a scarf pin. Flower pins, by the way, which fasten with a short pin and catch, while no longer new, are out in fresh designs, and continue to find favor. In this connection it may be well to speak of the fine specimens of enameling seen on some of these pins, both gold and silver, and executed in this country. The preferred style appears to be a cluster of two or three flowers of one kind, as pinks or wild roses, though often a single flower only is represented.

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JEWELED pins of every size and description, from the tiny bonnet pin to the brooch, are fashionable. Moonstones, amethysts and other stones, carved into faces and heads, and surrounded with pearls or diamonds, are in great request, whether they borrowed their models from the human family or some of the animal tribes. One sees all kinds, from children faces and Medusa heads to those of monkeys and owls. The horse-shoe, notwithstanding its lack of novelty, is often represented in the jeweled pins. A recent fancy is for a diamond horse-shoe, on which the nails are represented by pearls. The star and crescent, equally old, is also of frequent occurrence. Bug pins continue to find admirers, especially when they exhibit a surface glittering with gems. Nor should be forgotten those very popular and convenient little neck pins, designed to be worn on a black or colored velvet ribbon about the neck. These pins come in all conceivable forms, as buckles, stars, flowers and the like, and are easily transferred from neck ribbon to the bonnet or bodice, as suits the fancy of the wearer.

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THERE appears to be a slight revival of miniature painting on

ivory. Several specimens seen in the show cases of leading houses were imported copies of old French pictures. These little art gems are set as pendants or pins, and encircled with diamonds. It is not expected that these will prove popular, but that they will please an occasional connoisseur there seems not a doubt.

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FOR mourning are furnished all the new shapes and styles to be found in gold jewelry. Onyx in crape finish, elaborately carved, is designed for first or deep mourning. The bright onyx jewelry, set with pearls, is always handsome and always in style.

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ONYX, by the way, set with diamonds, is being worn by ladies of quiet taste, outside of mourning. Hermatite jewelry, also fashionable, is out this autumn in new and pleasing designs.

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COMPARATIVELY few ladies understand the importance of keeping their gold jewelry away from perfumes. Perfumes, sachet powders, colognes and cosmetiques, are all more or less injurious to fine gold jewelry, which they quickly tarnish. And yet it is customary to perfume jewel caskets and cases, in which the most delicately hand-wrought jewelry is closely confined. A piece of delicate gold filigree or Etruscan gold, with a little care, can be worn for years without diminution of its beauty; but laid away in a drawer or case with perfumes will soon tarnish and look like an old article.

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NUMBERED with fancy articles that are sure to attract patronage by their novelty and beauty, are handkerchief bags of silver. These bags are designed for carrying a fine cambric or lace handkerchief, and are composed of a net work of silver, through the meshes of which is disclosed the handkerchief within. The bags are finished at the bottom with tiny silver tassels, and at the top with colored satin or silk, set on to the silver netting with a frill, and gathered on a ribbon at the top, after the fashion of an old-time work bag. It is believed these bags will prove popular, as they are pretty things to carry, and furnish a convenient receptacle for handkerchiefs too fine to be crushed in one's pocket, and too valuable to risk losing by thrusting in the belt or holding in the hand.

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THE silversmiths' art is to be seen on the fine leather goods introduced for the autumn trade. Blotters of seal show corners of silver, beautifully engraved and etched. Then there are hymnals and other books, ornamented with silver trimmings, and card cases of seal and alligator skin with silver corners, no two of which show the same design. These articles suggest appropriate gifts for birthdays, philopenas and the like, to be exchanged between friends who would hesitate to present or receive gifts of a more costly or pretentious character. It is quite the fashion now to have one's autograph appear in letters of fine silver wire, wherever, perchance, a monogram or initials have heretofore appeared. The consequence is that this newer style of marking is of frequent occurrence on the new leather goods. The belt buckles and clasps add new designs to their list

every day, and vie with clasps for the neck of dresses and wraps in the variety and beauty of their decorations.

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THE assortment of novelties in pencil cases and charms is a bewildering one. Very popular among gentlemen have proven the pencils with cases faithfully simulating in size, form and color, cigarettes and half consumed segars. Both sexes are generously patronizing the watch charms containing detachable pencils, as these afford not only a pleasing trinket, but a pencil in convenient form for use. Among pencil charms that are especially tickling the fancy of the public may be numbered tiny swords, Japanese cucumbers and beans, the American baby in long clothes, an old French cannon, and Jack in the box. These charms, it ought to be explained, represent, in their decoration and finish, the same excellence of workmanship that characterizes fine jewelry.

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A CONVENIENT as well as elegant little article, produced in both gold and silver, is a pocket paper cutter, the handle of which, on being drawn out from the blade, proves a detachable pencil. These paper knives are variously decorated with engravings and etchings.

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WHEN beauty and utility are blended in one article, that article is worthy of respectful consideration, and especially so if it represents a subject of universal interest. Everybody is interested in umbrellas, hence the bone umbrella handles, covered with a heavy deposit of silver, are of public importance. These handles, which, by-the-by, also come for canes and parasols, commend themselves. In the first place they are very attractive in appearance, retaining, as they do, the natural shape and peculiar markings of the bone in all their perfection. Then these handles are of a size and shape exceedingly convenient to grasp and easy to hold. And last, but certainly not least, they are strong and enduring. The deposit is so heavy that an equal weight of silver is employed in their manufacture as enters into the composition of the ordinary silver handle, and the bone foundation, of course, prevents the possibility of a dent or bruise, even with hard usage.

ELSIE BEE.

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### Letters to Watchmakers.

[By DR. LEONARD WALDO, Astronomer in charge of the Horological Bureau of the Yale College Observatory.]

THE APPLICATIONS OF ELECTRICITY TO HOROLOGY.

#### *Electro-Magnets.*

*Continued from page 239.*

THE ELECTRICITY which we obtain from the batteries we have described, is not available as a force for actuating clocks except through some machine. We must utilize the battery current for producing another form of the electric energy by making and unmaking magnets. The common magnet will lift a nail from the table, and hold the nail firmly against its ends. The nail might be at the end of a long lever, tied to it, and in that case lifting the nail would work the lever.

Here we have a single lift of the lever. If we could destroy the magnet, the nail would drop; and the lever, falling to its original place, would be ready for a second lift if the magnet were re-made.

The electric current from the battery (or any other source) pos-

sesses a remarkable property of making a magnet of a piece of iron, if it is passed around it. Suppose we try the experiment. Take a large nail or any piece of iron (and it is better to have it as soft as possible), and wrap around it twenty or thirty turns of copper wire which has been covered with cotton or paper, or covered with a thin rubber tube, or otherwise insulated by being varnished or dipped in melted wax. The object of insulating the wire is to prevent the electricity from flowing across from one round to the next where there is metallic contact, and to oblige it to flow the length of the wire. Pass the current from any of the batteries we have described above, through the two ends of the insulated wire wrapped around the nail. Instantly it is found that the nail is made a magnet and will pick up small pieces of iron brought near it. Repeat the experiment by taking a larger piece of soft round iron, say half an inch in diameter and four inches long. Use this piece of iron as a core, put it in the lathe and wind off on it, in even layers throughout its length, several hundred turns of insulated, cotton covered copper wire. Connect the two ends of the wire with the two poles of a battery. In winding the copper wire on the core, it is better to begin at one end of the core, leaving an inch or two of the wire out of the coil, and have the last layer of the coils end at the other extremity of the core from which the winding began.

The poles of the battery are the zinc and copper, or zinc and carbon terminals of the battery which are to be connected with the ends of the coil as described. It will be found that we have quite a powerful magnet when the current is sent through the copper wire. If we made several such coils having the same number of turns around the core and used the same battery, we should find that the strength of the magnet varied according to the size of the wire employed.

If we used the same size of wire and the same battery, but wound a greater or less number of turns around the core, we should then find the strength of the magnet varied with the number of turns of the wire around the core. Again, if we used the same core and wire, and varied the battery power, we will find the strength of the magnet varies.

This core of soft iron which can be made into a magnet at will by passing a current of electricity through a surrounding coil of wire, is the fundamental machine for the utilization of the electric current for doing work. It is extremely important that the battery, the number of turns of wire around the coil, the diameter and length of all the wires used in the circuit should be adjusted to the work in hand. There is no point on which electrical horologists make more glaring mistakes than in proportioning the electro-magnets and the batteries to the work to be performed.

Electro-magnet is the term applied to a magnet which is produced by the electric current passing around a core of soft iron in the manner described. It can be shown by experiment that the following laws hold for electro-magnets, and the clear conception of them will enable the horologist to arrange his electrical power to the best advantage.

First, the magnetic strength of an electro-magnet is proportional to the strength of the magnetizing current (that is to the quantity of electricity that circulates around it). To illustrate this law (whose phraseology is borrowed from Silvanus P. Thompson), suppose that we had a battery which gave a current of one ampere in connection with the electro-magnet. If, now, the battery is increased until a current of two amperes flows through the circuit comprising the coil and the battery, the magnetic strength of the electro-magnet would be doubled. It should be remarked that the strength of current is not necessarily proportional to the number of cells in the battery, because the resistance of the circuit comes in to determine how much electricity flows through it, and the internal resistance of the added cells of battery must be taken into consideration, and in this connection the latter part of the letter at page 169 of the present volume must be referred to. For an example, suppose that the resistance of the electro-magnet and of the wires lead-

ing to it amounted to ten ohms, and suppose that we put in circuit a cell of battery having an E. M. F. of one volt and an internal resistance of ten ohms. We see from the considerations in the letter referred to that the amount of current flowing through the coil of the electro-magnet would be

$$\frac{1 \text{ (volt)}}{10 \text{ (ohms)} + 10 \text{ (ohms)}} = \frac{1}{20} \text{ ampere.}$$

If we add another cell of battery also having one volt E. M. F. and 10 ohms internal resistance, we have for the current flowing through the circuit,

$$\frac{1 \text{ (volt)} + 1 \text{ (volt)}}{10 \text{ (ohms)} + 10 \text{ (ohms)} + 10 \text{ (ohms)}} = \frac{2}{30} \text{ ampere.}$$

or, in other words, by doubling the cells in the battery in this case we have only added one-third to the amount of current, and consequently the magnetic strength of the electro-magnet.

By the same reasoning, however, it will be seen that if the resistance of the circuit and electro-magnet remained the same, but the internal resistance of the cells of the battery did not exceed a few hundredths of an ohm, that the current strength would be almost exactly proportional to the number of cells added to the battery.

The second law is, that if the current is kept constant the strength of an electro-magnet is proportional to the number of turns of wire in its coils. If the coils are wound of coarse wire, so that the resistance of the coils is small, the current will remain practically constant without changing the number of cells in the battery, even though the number of turns in the wire be varied within wide limits. As in the previous case, the right proportion of battery power to the length of wire is to be determined by a consideration of the circuit resistance.

The third law is, the strength of an electro-magnet is independent of the thickness and of the material of the wire with which it is wound.

Whether the wire be brass or German silver, or copper, or gold or iron, is immaterial, so long as it is sufficiently large to carry the same current through the same length in each case. Thus, whether we wind our electro-magnet with copper or iron is immaterial, only in the case of the iron wire we should have to use a larger size, because its conducting power is less.

The fourth law is, that the strength of an electro-magnet is independent of the diameter of the coils. Thus, we may wrap the wire quite closely on the iron core, or there may be some space between the iron core and the coils, or between the coils themselves. It is important in this connection to note that the proportion of the coils ought to be maintained, and that the completed electro-magnet should be at least twice as long as it is broad, and that the iron core should protrude beyond the ends of the coils.

A fifth law as given by Thompson is, that a current requires time to magnetize an iron core to the full extent of its power. This law is not important in electrical horology, because with such electro-magnets and such currents as are ordinarily used the action of the current is practically instantaneous.

So far we have referred to a single core of soft iron, wrapped with coils of insulated wire. As a matter of convenience and increased efficiency, it is customary to make the electro-magnets for electrical apparatus in the shape of a horse-shoe or its equivalent. The long coil is practically divided at its middle, and the north and south poles of the electro-magnet are bent up so that an armature, consisting of a piece of soft iron, can be laid across the two ends at the same time. This is the ordinary form in all telegraph instruments, and every watchmaker is familiar with it. As a matter of convenience in construction, it is customary to make the core in three pieces, consisting of the two iron cylinders around which the two halves of the coil are wound, and a connecting rectangular bar screwed at each end to one end of the iron cylinders. The iron used for this purpose should be the softest Swedish iron. Any trace of temper should be drawn by heating the entire core to a cherry red, and annealing in hot sand or ashes. It is not neces-

sary that the core should be solid. It may be tubular, but the total amount of iron should be considerable.

The wire used should have an insulation of some kind. The object of this insulation is to prevent the wire from touching itself, and thus offering a shorter path for the electric current than if it were obliged to pass around the coil. Ordinarily the insulation is accomplished by using silk or cotton-covered wire. For experimental work, however, if the wire is free from sharp bends and kinks it can be wound on to a core with the lathe, in such a way that the first layer has its coils not touching, but spaced by the feed of the lathe so that there is little space between every separate convolution of the wire. This whole layer of wire may then be shellac'd and the next layer wound on over it. It is better to put a layer of paper between each of the layers of wire, and it is necessary that there be several thicknesses of paper between the first layer and the iron core. The best paper for this purpose is paper which has been dipped in melted paraffine, or such waxed paper as is used by the druggists for putting up powders which they wish to protect from moisture.

It is necessary in winding electro-magnets that we should know the resistance of the wire to be employed before using it, and for this purpose I subjoin a table, originally prepared by W. T. Glover and Company, Manchester, England.

Table Showing the Resistance of Pure Copper Wire, founded on the Experiments of Dr. Matthiessen.

B. W. G. No.	Diameter in inches.	Feet per Ohm.	Ohms per foot.	Ohms per mile.	Ohms per lb.	Area of Section in sq. inches.
0000	.454	19966.5	.000050084	.264443	.000080272	.161883
000	.425	17497.15	.0000571522	.301763	.000104529	.141862
00	.380	13985.04	.000071489	.377465	.000163553	.113411
0	.34	11198.17	.0000893002	.471505	.000255196	.0907922
1	.300	8718.30	.00011470	.60562	.00042102	.070686
2	.284	7813.50	.00012799	.67580	.00052422	.0633472
3	.259	6498.14	.00015389	.81254	.00075786	.0526854
4	.238	5487.107	.000182245	.962256	.0010629	.0444881
5	.22	4688.51	.000213287	1.12616	.0014558	.0380133
6	.203	3991.91	.000250506	1.32267	.0020082	.0323655
7	.18	3138.59	.000318614	1.68228	.00324863	.0254469
8	.165	2637.29	.000379177	2.00206	.00460101	.0213825
9	.148	2121.84	.000471289	2.488405	.00710791	.0172034
10	.134	1739.40	.000574911	3.03533	.0105772	.0141026
11	.12	1394.93	.000716882	3.78514	.0164462	.0113097
12	.109	1150.91	.000868875	4.58766	.0241593	.00933133
13	.095	874.252	.00114383	6.03945	.0418692	.0070882
14	.083	667.338	.00149849	7.91203	.0718583	.00541062
15	.072	502.175	.00199134	10.5142	.126788	.00407151
16	.065	409.276	.00244334	12.9008	.191045	.00331831
17	.058	325.871	.0030687	16.20274	.301355	.0026421
18	.049	232.585	.0042995	22.7014	.59157	.00188574
19	.042	170.879	.0058521	30.8991	1.09596	.00138544
20	.035	149.3915	.00842703	44.4947	2.27254	.000962115
21	.032	99.195	.01008116	53.2285	3.25229	.00080425
22	.028	75.9461	.0131672	69.5230	5.54848	.000615753
23	.025	60.54377	.0165170	87.2096	8.73038	.00049087
24	.022	46.8851	.02132874	112.616	14.5579	.000380133
25	.020	38.748	.025808	136.265	21.3142	.00031416
26	.018	31.3859	.03186124	168.229	32.4863	.000254469
27	.016	24.79873	.0403246	212.914	52.0367	.000201062

The first column gives the Birmingham wire gauge of the wire ; the second its diameter in decimals of an inch; the third the number of feet of wire which would offer one ohm's resistance to the electric current ; the fourth column gives the fraction of an ohm's resistance which one foot of this wire would offer ; the fifth column gives the number of ohms' resistance in a mile of the wire, and the sixth column gives the area of a section of the wire in decimals of a square inch. For instance, we see that the resistance of No. 8 wire is about two ohms to the mile, and that No. 21 wire will carry about four times as much current as No. 27 wire will ; or, to state it more accurately, the resistance of No. 21 wire is only about a quarter of No. 27 wire.

I have endeavored in the preceding remarks to give, in the simplest manner possible, those facts which are most important in the construction of electro-magnets. The very accurate construction of electro-magnets which are the best suitable for any given case involves a knowledge of electro-magnetism not to be obtained from

such articles as these, and I would suggest to any readers who wish to follow the question mathematically, that they consult the little treatise by Th. Du Moncel, on "Electro-Magnets: the Determination of the Elements of their Construction," published by Van Nostrand, New York.

(To be Continued.)

The Rates of Certain Astronomical Clocks.

SOME TIME ago it became of interest to me to ascertain just what degree of accuracy had been attained in the construction of the best astronomical regulators. I found it to be a much more difficult matter than I first supposed. There are very few clocks of precision whose rates have been determined for sufficiently long periods of time, and which have been allowed to run without stoppage or setting, and at the same time have had their errors accurately determined whenever the sky was clear enough to allow an observation of the stars to be taken.

For the benefit of others who may be interested in this question, I give below the rates of a few such clocks which I have obtained from the records of observatories, or through the courtesy of astronomers having them in charge.

The first clock I shall refer to is the standard sidereal clock of the Royal Observatory at Greenwich, which I take from the Greenwich volume for 1877.

During a part of that year the rate of the clock was as follows:

		s.			s.
February	2,	+0.83	May	24,	+0.56
"	10,	+0.64	"	30,	+0.80
"	17,	+0.64	June	6,	+0.73
"	24,	+0.57	"	12,	+0.66
March	4,	+0.78	"	19,	+0.68
"	10,	+1.26	July	4,	+0.40 *
"	17,	+0.92 *	"	11,	+0.52
"	23,	+0.89	"	18,	+0.46
"	30,	+1.02	"	24,	+0.45
April	7,	+0.84	"	30,	+0.31
"	13,	+0.82	August	7,	+0.33
"	21,	+0.80	"	14,	+0.37
"	26,	+0.78	"	21,	+0.27
May	2,	+0.80	"	28,	+0.40
"	8,	+0.81	Sept.	5,	+0.49
"	15,	+0.68			

From an inspection of these rates during periods in which the clock was undisturbed, we note a change of rate between March 30th and May 24th of 0.846—a change which would amount to 3¼ seconds in one week's running of the clock, if it should occur in consecutive weeks. I believe this clock has a zinc-steel combination, with Airy's detached chronometer escapement, and that its performance would be much better if its pendulum did not have to do the work of making and breaking the electric circuit.

The normal clock of the Observatory at Hamburg was built by Tiede of Berlin. This clock has a gravity escapement, mercurial compensation pendulum, and is enclosed in a cylinder of glass with ground top and bottom. It is the finest clock of which I have any record.

The rates, beginning with August 12th, 1881, are as follows:

		s.			s.
Aug.	12, losing	2.05	Oct.	26, losing	2.77
"	15, "	2.11	"	30, "	2.81
"	20, "	2.12	Nov.	8, "	2.86
"	28, "	2.11	"	18, "	3.00
Sept.	1, "	2.09	"	21, "	2.90
"	5, "	2.14	"	25, "	2.95
"	9, "	2.22	Dec.	1, "	2.97
"	15, "	2.22	"	9, "	2.97
"	25, "	2.31	"	18, "	3.13
"	29, "	2.38	"	21, "	3.14
Oct.	4, "	2.36	"	30, "	3.19
"	10, "	2.48	Jan.	3, "	3.17
"	15, "	2.56	"	6, "	3.20
"	24, "	2.64	"	9, "	3.22

\* Clock stopped.

One of the most celebrated clocks in the United States is the standard sidereal clock of the United States Naval Observatory at Washington. This clock was built by Kessels of Altoona, Germany, and has a gridiron compensation pendulum of brass and steel rods, with dead beat escapement. It was one of the most exquisite pieces of horological work ever executed. The effort to make it drive a break circuit apparatus for the observatory chronographs has spoiled it as a first-class timepiece.

The following were its rates for the intervals set opposite the rates the first year or so after it was erected:

Interval in days.		Daily rates. s.
5	losing	0.18
5	"	0.31
4	"	0.05
5	gaining	0.06
4	losing	0.05
3	"	0.08
11	"	0.06
4	gaining	0.05
6	"	0.03
7	"	0.04
5	"	0.01
3	"	0.06

A fourth clock made with considerable care, is the clock made by the American Watch Company at Waltham, for their own use, and which was built under the direction of their mechanical superintendent, Mr. Van Woerd. This clock has a mercurial compensation and a modification of a French detached escapement, called Van Woerd's detached gravity escapement. In this case I shall give the actual errors of the clock, and not the daily rates:

	d.		s.
July	21.2	Fast	3.64
"	23.3	"	3.99
"	25.3	"	3.08
"	31.0	"	1.22
August	2.2	"	0.94
"	4.3	"	1.01
"	8.2	"	0.98
"	11.0	"	1.29
"	13.3	"	1.06
"	16.3	"	0.81
"	27.3	"	0.10
"	29.3	"	0.10
"	31.2	"	0.30
Sept.	6.3	"	0.47
"	9.0	"	0.37
"	12.9	"	0.76
"	17.7	"	0.81
"	20.9	"	1.00

after this date the clock was disturbed.

The above errors were determined by telegraphic comparisons with the standard clock at the Observatory of Harvard College.

The last clock whose rate I have in my note book is the one recently imported from Hohwü of Amsterdam, for the Observatory at Madison, Wisconsin. I am indebted to the courtesy of Professor E. S. Holden for the rates of this clock during September, October and November, 1881. The clock has a mercurial compensation and a dead beat escapement, and is of the highest class of workmanship throughout.

	s.		s.
Sept. 1, daily rate gaining	1.73	Oct. 4, daily rate gaining	1.51
" 4, " " " "	1.45	" 8, " " " "	1.56
" 8, " " " "	1.26	" 15, " " " "	1.62
" 11, " " " "	1.41	" 18, " " " "	1.76
" 17, " " " "	1.49	" 24, " " " "	1.76
" 20, " " " "	1.50	" 31, " " " "	1.61
" 23, " " " "	1.36	Nov. 6, " " " "	1.80
" 29, " " " "	1.28	" 9, " " " "	2.05
Oct. 1, " " " "	1.46	" 14, " " " "	1.98

From an examination of the performances of the above clocks, it will be seen how wild the statements so often made as to the performance of regulators are. No matter what the care bestowed upon the construction of a clock may be, it is, in the best examples of the art at present, liable to unexplained variations of rate, amounting at times to a quarter of a second per diem. In the case of several clocks of the highest grade which I have had an opportunity to study carefully during long periods, I have accumulated material for the study of the causes of variation, which I hope before long to discuss in this journal.

LEONARD WALDO.

### Yale Observatory Watch and Clock Rating.

THE DEPARTMENT of the observatory devoted to the rating of timepieces is just entering upon the sixth year of its existence. When the work first began there was a pretty generally expressed opinion that almost any of the watches sold at prices above \$50 in the American market, would receive class I. certificates, if they were entered for the observatory watch trials. This view has gradually been abandoned by those watch producers who have taken the pains to send watches to the observatory, and obtained the actual figures of their watches performances. The observatory, which has endeavored to give an accurate statement of just what watches will do, has found that its work is not altogether popular with the salesmen of fine watches. It is so easy to sell a watch upon glittering generalities as to smallness of rate under all contingencies, that the observatory certificate as to the actual facts of the case is looked upon as rather an impediment than a help to the sale of a fine watch. It seems to me that it is to the direct interest of the producers of the best watches, to encourage in every way the dissemination of accurate information among watch buyers. For it is only by such knowledge that a market can be maintained for good timepieces which do not differ in outward appearance from watches whose timekeeping qualities are poor. Owing to the almost universal distribution of time-signals from observatories throughout the country, it is now possible for owners of fine watches to determine for themselves how accurately their timepieces are running. Very many of them have discovered that their watches, made by makers of reputation, vary their rates according to the position and treatment from day to day. They are learning that a timepiece is, after all, only a complicated machine, and that no matter what price they pay, there is no such thing as a perfect watch. The foreign makers are alive to the desirability of testing their high grade watches at their observatories. Thus, in 1883, the Geneva Observatory received 589 watches for rating, and in 1884 received 529 watches. The Neuchatel Observatory received in 1883, 503 watches, and in 1884, 346 watches, making a total of 1,967 watches entered at the Swiss observatories for the two years; as compared with 128 watches received at the Yale Observatory during the same period.

The Yale trials during the coming year will be conducted upon the new international system adopted by joint agreement of the observatories at Geneva, Kew, England, and New Haven. This year, therefore, will afford a basis for the comparison of foreign and home-made watches. It is very desirable that the observatory should be supported in its effort to encourage horology, by receiving enough watches per year to make it an object to continue the service. The number of watches received so far has been so small that the cost to the observatory of certifying the watch has been five or six times as great as the fee received for the service. That kind of public service must very soon come to an end, unless the clock and watch companies, and the dealers in the better grade of timepieces, appreciate that what has already taken place in Europe must soon come to pass here, and that the possession of observatory certificates will affect the intelligent judgment of fine watches.

The Yale Observatory has established very complete facilities for doing this work, but it has been, during the past year, seriously handicapped, because of the very few watches entered for trial. So much so, indeed, that several of the senders of fine watches have been disappointed in not having the trials completed during the year.

The observatory will be glad to receive from the watch and clock makers of the country, any communication looking to the rating of a sufficient number of timepieces during the coming year, to give a practical guarantee that its work in this direction is appreciated.

It would be a misfortune to have no observatory this side of the water of acknowledged accuracy in this class of work, to which, on occasion, foreign competitors could be invited to send their products for rating tests, and a little public spirit in the matter, shown by those most interested in entering one or more watches for this year's trials, would give an encouragement to the observatory to maintain its service.

LEONARD WALDO.

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 J. R. GREASON.....Of J. R. Greason & Co.

THE JEWELERS' CIRCULAR is the *exclusive* official paper of the Jewelers' League, and has been selected for the publication of all matters of interest pertaining thereto. Letters or inquiries pertinent to its business or purposes, and which might interest the trade or inquirers, will herein be answered. Address *Jewelers' League, Box 3,444, P. O., New York*, or the office of THE CIRCULAR.

THERE WERE present at the meeting of the Executive Committee held on September 4, 1885, the Chairman, Mr. Bowden, and Messrs. Howe, Hale, Greason and Sexton, also Vice-President Johnson.

Proofs of the deaths of Francis Monk and James C. Rich, of Chicago, and N. F. Baldwin, of St. Joseph, Mo., were presented and ordered paid.

Assessment No. 54 was paid by all the members except two.

There were three (3) applications rejected.

Three (3) changes of beneficiary granted.

The following 12 applicants were accepted:

R. Wilke, Albany, N. Y.; P. L. Dufresne, Brooklyn, N. Y.; C. W. Shuff, Philadelphia, Pa.; J. A. Hardy, Pittsburg, Pa.; C. N. Haucher, Wheeling, W. Va.; T. Lambert, Plainville, Mass.; H. J. Smith, Stewart, Ohio; C. E. Grow, Chicago, Ill.; W. M. Davis, Niles, Mich.; L. Levy, New Orleans, La.; G. Weber, G. S. Simons, San Francisco, Cal.

## Recent Patents.

The following list of patents relating to the jewelry interests, granted by the U. S. Patent Office during the past month, is specially reported to THE JEWELERS' CIRCULAR by FRANKLIN H. HOUGH, Solicitor of American and Foreign Patents, 925 F Street, N. W., rear U. S. Patent Office, Washington, D. C. Copies of patents furnished for 25 cents each.

*Issue of August 11, 1885.*

324,125—Bracelet. T. Lobkuecher, Newark, N. J.

323,927—Jewelers' Findings, Manufacture of. G. H. Fuller, Pawtucket, R. I.

323,985—Watch, Stem Winding and Setting. N. R. Varney, Waltham, Mass.

*Issue of August 18, 1885.*

324,757—Ear Ring. I. R. Dunham, Newark, N. J.

324,553—Finger Rings, Manufacture of. E. E. Hanf, Wilmington, Del.

324,675—Watch Case. E. C. Fitch, Newton, Mass.

324,689—Watch Movement. G. E. Hart, Waterbury, Conn.

*Issue of August 25, 1885.*

325,117—Breast Pin. F. Schroder, New York, N. Y.

324,852—Button, Separable. H. G. Lathrop, St. Johnsville, N. Y.

324,824—Clock, Electric. F. R. Field, Greenfield, Mass.

325,228—Clock Striking Mechanism. H. L. Naramore, Sharon, Mass.

325,111—Clocks, Adjusting Beat of. H. P. Pruim, Grand Haven, Mich.

325,204—Watch Movement Box. A. F. Freeland and C. H. Whitten, Malden and Waltham, Mass.

*Issue of September 1, 1885.*

325,256—Clock Cases, Japanning Wooden. E. Ingrahm, Bristol, Conn.

325,469—Gold and Vulcanite, Uniting. J. H. Wood, Lebanon, Ohio.

325,605—Watch Balances, Manufacture of. C. S. Guernsey, Waterbury, Conn.

325,603—Watch Barrel. C. S. Guernsey, Waterbury, Conn.

325,433—Watch Case. V. Nivois, New York, N. Y.

325,296—Watch Dials, Apparatus for Recessing. E. D. Wetherbee, Waltham, Mass.

325,247—Watch, Stem Winding. A. E. Hotchkiss, Cheshire, Conn.

325,568—Watch, Stem Winding. H. A. T. Reinecke, Assignor to S. Thomas Clock Co., Thomaston, Conn.

325,506—Watch, Stem Winding and Setting. C. P. Corliss, Assignor to Elgin National Watch Co., Chicago, Ill.

325,402—Watch, Stop. F. Fitt, Chaux-de-Fonds, Switzerland.

325,604—Watch Winding Attachment. C. S. Guernsey, Waterbury, Conn.

325,602—Watches, Balance Wheel for. C. S. Guernsey, Waterbury, Conn.

325,536—Watches, Stem Winding Attachment for. G. E. Hart, Waterbury, Conn.

*Issue of September 8, 1885.*

325,854—Watch, Repeating. C. Morlet and E. Dupuis, New York, N. Y.

### The Jewelers' Security Alliance.

*President*, DAVID C. DODD, JR.

*First Vice-President*, AUGUSTUS K. SLOAN.....Of Carter, Sloan & Co.

*Second Vice-President*, HENRY HAYES.....Of Wheeler, Parsons & Hayes.

*Third Vice-President*, DAVID UNTERMAYER.....Of Keller & Untermayer.

*Treasurer*, W. C. KIMBALL.....Of H. F. Barrows & Co.

*Secretary*, C. C. Champenois.....Of Champenois & Co.

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J. B. BOWDEN.....Of J. B. Bowden & Co.

GEO. W. PARKS.....With E. I. Franklin & Co.

J. T. SCOTT.....Of J. T. Scott & Co.

N. H. WHITE.....Of N. H. White.

CHAS. G. LEWIS.....Of Randel, Baremore & Billings.

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*Counsel*, HON. ALGERNON S. SULLIVAN.

For further information, Application Blanks for Membership, By-Laws, etc., Address P. O. Box 3277. 170 Broadway, New York.

THE REGULAR monthly meeting of the Executive Committee was held on September 11, 1885, attended by President Dodd, Vice-Presidents Sloan and Untermayer, Treasurer Kimball and

Messrs. Alford, Bowden, White, Scott, Lewis and Secretary Champenois.

The following applicants were admitted to membership :

W. H. Beck, Sioux City, Iowa ; W. W. Child, Jackson, Mich. ; C. S. Crossman, N. Y. City ; R. S. Gardner, Birmingham, Conn. ; F. J. Hutchinson, Hornellsville, M. Y. ; E. H. Miller, Boston, Mass. ; S. Rider, Braddock, Pa. ; D. J. Sullivan, New Bedford, Mass.

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### Communications.

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NEW YORK, September 10, 1885.

*To the Editor of the Jewelers' Circular:*

DEAR SIR—My attention has been called, from abroad, to an article in your July issue, headed "Barefaced Swindle," in which an isolated case of dishonesty found in a watchmaker's shop of Locle, Switzerland, has been exaggerated to unkind proportions.

In that country where justice is swift and unsparing in its decisions, the mentioned offender was punished with a heavy fine and costs, besides being held responsible for all returned cases. It was found at the trial that the gold watch cases were very light ones, in which solder was ingeniously introduced under a thin cover of gold, so as not to be discovered by the official whose business is to stamp with the Government mark all cases conforming to the standard of fineness required.

It was also shown that this fraudulent practice on these very light cases saved the maker 50 centimes, or ten cents per case.

Sufficient quantities of them were not made by this single manufacturer "to flood foreign countries with this trash," as cited in your article.

Purchasers of Swiss cases find the surest guarantee in the government official stamp, and avoid those that are not properly stamped. Here, we pay knowingly for heavy steel springs and solder. For the rest, we good-naturedly trust entirely in the good faith and honor of our manufacturing casemakers. Some few, I hope very few, do not object to stamp the karat desired by unscrupulous customers, and for this there is neither control nor redress.

Would it not be well for buyers in this market to give more attention to the quality of cases offered to the trade, especially to such where no price is given for "making," the manufacturer contenting himself with the profit derived from the springs included in the chargeable weight, the solder and the quality of gold delivered, all of this not being controlled by any acknowledged authority as in other countries.

May I ask, Mr. Editor, that you will afford me this opportunity to correct the wrong impression which your July article might convey to the purchasers of Swiss watch cases. I remain, dear sir, very respectfully yours,

J. EUGENE ROBERT,  
*Vice-Consul of Switzerland.*

[The paragraph referred was based on information obtained from our foreign exchanges, and they are responsible for magnifying the incident.—Editor THE CIRCULAR].

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## Correspondence.

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### Chicago Notes.

*To the Editor of the Jewelers' Circular:*

To estimate with any close degree of accuracy the volume and probabilities of the fall trade in Chicago and the West is, at the present, a matter of no little difficulty and perplexity. If the rush of business, which in many quarters heralded in the opening of the fall trade two or three weeks ago, had been fully maintained, no one would have doubted that the jewelry trade was on the verge of a

decided "boom," but early indications have hardly been realized, and the individual experience and opinions of many of the most important firms exhibit considerable points of diversity. All allow that there has been some improvement, and with some the increased flow of business has been quite marked, but it is almost impossible to determine to what extent the whole trade has, as yet, benefitted. It is safe to say, at least, that the average is up, and it is quite possible that unrealized expectations have caused some to look at things through rather blue spectacles. Considering the marked improvement in the dry goods and almost all other stable lines of business, and the assurance that the crops generally will afford a better yield than for years, it seems almost inevitable that the jeweler must share in the returning prosperity. There is undeniably on all sides a better feeling. Dealers show that they would like to buy but are still hampered by timidity resulting from the long times of depression. A few opinions given to your correspondent by some of the most conservative and reliable men in the trade will doubtless be read with interest. Benj. Allen, one of the largest jobbers in this city, while admitting that trade is somewhat better, says that the volume of business is not nearly up to his expectations. Travelers, as a rule, had reported rather unfavorably, especially in the States of Missouri and Texas, where next to nothing was doing. From Wisconsin, Iowa, Michigan, Indiana and other States contiguous to Illinois, reports were considerably better, but business in these States was only a trifle better than last year. Collections were still behind, though dealers were promising great things for October. It was harder to get any money out of the Southwest now than any time in the last ten years. Dealers visiting the city from northern Dakota reported very encouragingly of the fall prospects, and said that a good store business was being done. Otto Young reports a general improvement all round and collections fair. Thomas Davies, of Clapp & Davies, thinks the outlook is good and the feeling much better all around. He considers that a decided improvement in the jewelry trade must follow that which has already taken place in other staple lines. There has already been a marked improvement, and the outlook is better than for some time. Collections are still rather slow, but the general tendency of business is upwards. Giles, Bro. & Co. report a steady improvement, and declare the city retail trade to be 20 per cent. better than last month. Cogswell & Wallis have experienced a general improvement both in their city and country business, and report an increased "boom" in their lines of specialties. Samuel Swartchild, who is confining himself to the tools and material department, finds business very active, and says that his travelers are missing very few dealers. Glickauf & Newhouse, while declaring the average of business to have an upward tendency, say that trade has been up and down, and that the flattering indications of the beginning of the month have scarcely been realized. Taking things altogether most jobbers will admit that they have been expecting rather too much, and when they get down to the point, will allow that they have done as much business as they really ought to have expected.

The most important happening here during the month was the session of the Executive Committee of the National Association of Jobbers, and the accompanying meetings of the Sub-Committee of Manufacturers. The sessions extended over the 9th, 10th and 11th of September, and there was a good turnout of members. President Henry Hayes, of New York, was in the chair, and among the well known members of the Executive Committee present were Messrs. Percival, of Boston ; Marks, Simmons and Goddard, of New York ; Hagstoz and Muhr, of Philadelphia ; Hennegen, of Baltimore ; Barrett, of Pittsburg ; Hellebush, of Cincinnati ; Altheimer, of St. Louis ; and Sigler, of Cleveland, O. The results of the conference were in every sense satisfactory, and such as tended to make the bonds of the association stronger than they have ever been before. The "rule of recognition," which is the important binding link between manufacturer, jobber and retailer, was the subject of an important discussion. While there was on some hands a disposition

to relax to some extent the stringency of the application of this rule, its principle was thoroughly vindicated and maintained by a majority vote. Among other important items of business discussed was a number of alleged violations of contract and rules were investigated, but all were satisfactorily disposed of. A number of resolutions on the interests of the trade were adopted. The Sub-Committee, which included Messrs. Joseph Fahys, Bentley, Rood, Cutter, Hale, Otto Young and John C. Dueber, dealt with the admission and rejection of applicants for admission to the Jobbers' Association. A. Butts, the Chicago representative of Joseph Fahys & Co., and J. P. Owen, of Robbins & Appleton, who investigated the books and business of the Chicago applicants, reported favorably on Bryant & Sproehle, Benjamin & Hyman and J. Floersheim & Co., who were accordingly admitted members of the local Jobbers' Association.

At the close of the convention the visiting members were most hospitably entertained by Vice-President H. F. Hahn, Thomas Davies, L. W. Flersheim and C. H. Knights, of the local Executive Committee, and Messrs. Benj. Allen, Otto Young, J. N. Cutter and others. The visitors were treated to a splendid drive on the boulevards, and an elaborate dinner at the Washington Park Club. Every one toasted every one else; New York, Chicago and the other leading cities were all duly honored, and the visitors departed highly gratified with the hospitality and amenities of Chicago.

The annual State Fair and Exposition have been drawing thousands of visitors to the city, and quite an impulse has been given to city trade generally. The jewelers have received their full share of patronage, and no small number of country dealers have combined business with pleasure by filling up gaps in their stock. An attractive exhibition of oddities and rarities in the line of gems and fine stones shown in the windows of Giles, Bro. & Co., has been quite a center of attraction for crowds of the visitors to the fair.

The affairs of Perry Bros., whose failure was chronicled last month, are not yet settled, but it is understood that an arrangement is nearly concluded by which the firm will again resume business.

The month's obituary chronicles the death of James C. Rich, for many years with Sturdy Bros., of New York, and for the last three years Chicago agent for A. H. Smith & Co., the diamond merchants of New York. He was an extremely popular, though quiet and unobtrusive man, and his death is lamented by a large circle of friends. His funeral was largely attended by the Jewelers' Association of the city, and among the lovely floral tributes which adorned the casket, was an exquisite piece from the jewelers, which represented a wide, winding road, along which a finger-board pointed to "Eternity," while in the foreground there was figured out a large watch dial on which the hands pointed to the hour at which the deceased died.

W. A. B.

[Reprinted from the Mineral Statistics of the United States for 1883-1884. Edited by Mr. Albert Williams, Jr. Published by the Geological Survey.]

## Precious Stones.

BY GEORGE F. KUNZ.

*Introduction.*—This paper slightly repeats some of the material of the former one in the 1882 report, but this is scarcely to be avoided. The time allowed for the first paper was scarcely sufficient for consulting the literature to any great extent, and it was prepared from material at hand or from personal observation. The interval of over a year has afforded the time necessary to inquire into and verify the authenticity of this matter. Where the material has been duplicated it is only in part, and fuller or more authentic facts are added in this report. A number of localities are mentioned where, although no gems have as yet been found, the material at times is very nearly good enough for gems; or else from the small amount of development the possibility of gems being found in the future may fairly be

inferred. A few localities are mentioned where specimens unexamined as such have been found, and have a claim on the gem collector, since they are gem minerals; and also where they have been of financial value to the finders, although little or no gem value may be attached to them, as in the case of the Pike's peak amazonstone and smoky quartz, and the Monroe spinels. Many of these are as beautiful, if not more so, in their native form, than they are after having undergone the cutting process, as for example some of the Utah topazes, beryls from North Carolina, and many others, a fact of which almost any one would be convinced by a visit to some of our finer cabinets. The cutting of such material, therefore, for the higher money value, is really vandalism, and should be discouraged by all scientists.

A most important find of gem materials and specimens during the past year was at the Auburn, Maine, locality,\* which from July, 1883, to July, 1884, afforded possibly about \$1,000 worth of tourmaline specimens, and the other minerals netted about \$500 more. These were taken out in one month's work, and since then fully \$500 more has been realized on those taken out by the various persons working the locality.

The tourmalines and beryls found in the last work done by the Mount Mica Mining Company during the summer of 1882 were still in the possession of the company, and were offered for sale in the summer of 1884 at Bar Harbor, Mount Desert, Maine. Some were there readily sold as Maine gems. The cut gems owned by the company in the early part of the summer of 1884 were valued by them as follows:

Tourmalines, from \$10 to \$500 each.....	\$2,683
Beryls and aquamarines, from \$5 to \$50 each.....	1,062

There are about \$400 worth of uncut specimens. No work was done here in 1884.

The beryl locality at Stoneham,† Maine, has yielded fully \$700 worth of gems and specimens to the different workers, one crystal selling at \$75 for gem material. Some very fine blue beryls were found here.

The topaz locality, though it produced no topaz, from other minerals yielded the workers over \$500 by the sale of herderite, columbite, and associated minerals.

Work was suspended by the mining company at Stony Point, North Carolina, at the end of August, 1883, and was resumed for about two weeks during July of 1884. Since July, 1883, perhaps \$500 has been realized from the work done. The work of 1883 brought to light some of the finest crystals that have yet been found for color, but of secondary gem value. The largest of these was about three inches long, and very perfect. The two weeks' work of 1884 discovered a few very fine quartz crystals containing rutile, and some containing asbestos or byssolite(?); also very fine rutile crystals, though no gems. When work will be resumed is not definitely known. The adjoining property is reported to have been purchased with a view to working at some future time. The indications on Mr. John Lackey's property look very well for the class of minerals found in this section.‡

Since October, 1882, the Pike's peak topaz and phenakite locality has been searched to some extent, and the topaz and phenakite taken from it thus far would be valued at fully \$1,500, one crystal of topaz being held at \$100, and one phenakite also at fully this amount. Two topaz gems cut from the stones found here were worth fully the same each after the cutting.

The Crystal peak locality, near Florissant, Colorado, has yielded perhaps \$1,000 worth of topaz, some specimens associated with phenakite and on amazonstone, and a number of fine amazonstone crystals.

A number of stones enumerated here, although below 7 in hardness, and even below 6, may suggest to some that they are too soft

\* See paragraph on tourmaline.

† "Mineral Resources of the United States, 1882."

‡ See paragraph on beryl.



for any gem or ornamental uses. Thus apatite and fluorite are too soft for cut gems, yet beautiful cups, vases, etc., can be made of the latter. Serpentine and catlinite could be successfully worked where apatite could not, because they are opaque and do not show scratches, and an even, good color will always appear. It is only by adapting any mineral to its proper use that it can be made a success.

One of the finest displays of gem minerals since 1876 was the North Carolina exhibit in the fall of 1883, at the Mechanics' Fair at Boston. In this were some of the finest North Carolina quartzes, from White Plains and other localities; remarkably brilliant rutiles from Mitchell and Alexander counties; beautiful amethysts, some of them rutilated; some remarkable Alexander county emeralds, and blue, green, and yellow beryls, and many others that as a rule were quite new to the general public as gem minerals.

*Delusive finds.*—During the past year a number of articles have appeared in regard to the finding of valuable gems, which have proved otherwise on investigation; and as newspaper statements are at times copied into the literature, it may be well to give them notice from some reliable source.

The "Blue Ridge sapphire," or the "Georgia marvel," as it was called by the press, was found nearly two years ago in a brook in Georgia, in the Blue Ridge mountains. It was estimated to be worth about \$50,000 by the owner, who had been assured of its authenticity as a sapphire by two southern jewelers, and arrived at its valuation by taking into account its weight. Anything scratched by a file is sure to be pronounced glass, whether that or really topaz or some equally hard stone; while, on the other hand, the common fallacy may prevail that anything not touched by a file is to be regarded as a genuine stone, even though it may be only glass. In this instance the gem proved to be a piece of rolled blue bottle glass, and its owner could be convinced of this only when he saw a platinum wire coated with a melted fragment of the material.

Another was a stone plowed up by Mr. James M. Smith, of Gibsonville, Guilford county, North Carolina, pronounced a genuine emerald, weighing 9 ounces, by some local expert, who tested it, and with the microscope showed that it contained various small diamonds. Its value was estimated up in the thousands, and \$1,000 was reported to have been refused for it by its owner. As it was believed to be the largest known emerald, it was expected by its owner that it would realize him many thousands. Being, therefore, too valuable to be intrusted to the express company, he put himself to the expense of a trip to New York, where it proved on examination to be a greenish quartz crystal, filled with long hairlike crystals of green byssolite or actinolite, on which were series and strings of small liquid cavities, that, glistening in the sun, led to the included diamond theory of the local expert. As \$5 was the best offer received for the stone, it was returned to North Carolina.

The "Wetumpka ruby," from Elmore county, Alabama, the property of Mr. James W. Thomas, was supposed to be a ruby of 6 ounces weight "after cutting away all the roughness." Owing to its value it was deposited in the Wetumpka bank vault, and on no consideration would be sent to any one on approbation. A small fragment sent to Mr. L. P. Gratacap, of New York, and examined by him, led him to believe that it was only a common garnet, and from its stated quality of no value, even if a ruby. Doubtless it is one of the large rough garnets so often found in the South.

Another is a quartz (?) crystal found by Mr. James Pepper, of Danbury, North Carolina, which was examined and pronounced to be a genuine diamond by the local jewelers, and valued at \$7,000.

The diamond discoveries so often reported are not to be wondered at. In one of the southern States one of the late geologists, who had much to say as to the "immutability of human events that would eventually lead to the finding of diamonds, rubies, sapphires, and emeralds in his State," knew so little of the diamond that he actually sent a common paste imitation to New York to inquire as to its genuineness as a diamond. Yet his remarks have often been copied,

especially a story that a bottle of diamonds that were worth many thousands of dollars was thrown away before they were recognized.

*Utilization of precious stones.*—During the last ten years taste in furniture and decoration in the United States has reached so high a degree that every conceivable new idea which has been or is applied anywhere on the face of the earth has been resorted to. Minerals, as a rule, have been only slightly utilized, owing principally to the want of familiarity with them and the methods of applying them so as to avoid coldness and inappropriateness. In one of the finest pairs of carved rosewood silver-paneled pedestals in this country the dull effect of the rosewood was very much relieved by the insertion of a number of small round cabachon pieces of a dark red Texas agate, these additions really giving all the necessary brilliancy where polished wood was an effect not desired. Our large list of cheap and beautiful ornamental stones, such as jasper, agate, silicified woods, turquoise, rose quartz, and a large number of others, might be introduced with advantage into the inlaid work on clocks, mantels, and fine furniture. The utilization of rock crystal for hand glasses is mentioned further on.

One of the new departures in the United States in the uses made of the common stones, is the introduction by a leading New York firm of a line of American stone goods, similar to the Scotch jewelry, the designs of which will be so improved, and American gem stones used to such an extent in them, that they will undoubtedly find a ready sale, and before the year is closed may be universally sold throughout the United States, displacing many of the cheaper varieties of gold and silver pins. Some of the minerals used are agate, moss agate, jasper of all colors, rhodonite, pyrite, labradorite, Chester county moonstone, and other cheap American minerals. The designs are crowns, knots, thistles, shepherds' crooks, nails, horse shoes, crescents, daggers, keys, spears, umbrellas, and a large variety of others suggested by the variations of forms and colors shown in the kaleidoscope.

The following few items may perhaps be of sufficient interest to entitle them to mention in this report: During the last three years a novelty has appeared in the form of a so-called mineral clock, consisting of a plain wooden case, usually in the form of a house, and completely covered with specimens about an inch square of pyrite, galenite, amazonstone, ores from celebrated mines, and other Colorado minerals. They are glued on, and, as a rule, numbers are pasted on each referring to a list of the minerals on the back of the case. The clock part consists of a Connecticut Yankee clock. They have sold remarkably well since they were introduced—\$15,000 worth in 1882, \$11,000 in 1883, and \$20,000 worth in 1884, to be retailed at an advance of 33 per cent. In addition there are a large number of paper weights, ink stands, and a variety of objects made that have netted several thousand dollars per year more.

*Arrow points.*—Mr. H. C. Stevens, of Oregon City, Oregon, writes that since 1878 he has personally handled 35,000 fine arrow points, peculiar to Oregon, and that fully 50,000 in all have been found by different persons. Before 1878 perhaps an equal number were found. Fully \$3,000 have been realized on these in cash since 1878. At present few are found, except after a heavy freshet and overflow of the river banks, where the greater number have been found. These points at times represent the highest examples of savage stone chipping, and are really so often gem materials that the demand for them as articles of jewelry is not surprising. The prices range from \$1 to \$2.50 each for the finer ones, which are usually made of rock crystal; flesh-colored, red, yellow-brown or mottled jasper, obsidian, or various colors of chalcedony. They are principally sold in the East, scarcely any being sold in Oregon for jewelry. They are not made by the present Indians of Oregon. Fine suites of Oregon arrow points were exhibited by Mr. M. F. Savage at the Bartholdi Loan Exhibition at the New York Academy of Design, December, 1883.

*Trilobite ornaments.*—The trilobites found in various parts of the United States are used, when of the proper form, as charms, scarf

pins, and other ornaments. Perhaps 99 per cent. of those used for these purposes are found in the vicinity of Cincinnati, especially near Covington, Kentucky. The species is *Calymene senaria*, which, as a rule, are found curled up, evidently in dying, and therefore appear either round or slightly oval in form, making very neat charms, and the smaller ones very pretty scarf pins. They vary in size from one-fourth inch to two inches in diameter, and are sold at the locality at from 25 cents to \$5 each, according to beauty or perfection. The casts of the *Calymene senaria*, variety *blumenbachii*, if perfectly flattened out and perfect in form, are worn at times as scarf pins. As they are entirely limestone, the surface, as a rule, is covered by thousands of microscopic brilliant crystals of calcite, the glitter of which is very effective. A number of fine trilobites are sold annually at Trenton Falls, especially the *Ceraurus pleurexanthamus* and *Asaphus gigas* from the Trenton limestone. They are sold, however, more as tourists' mementoes than as objects of ornament. Twenty-five dollars is often asked for large fine specimens of the *Asaphus gigas*.

*Cat's-eye Minerals*.—The following minerals found in the United States, when fibrous or cut across the cleavages in cabachon effect, will show the cat's-eye ray :

**Corundum** : At Ellijay creek, Macon county, North Carolina, Mr. E. A. Hutchins cut a dark brown, almost black, crystal of corundum that furnished a long *en cabochon* gem, two-thirds of an inch across, that shows the cat's-eye ray distinctly.

**Chrysoberyl** : The chrysoberyls of Stow, Peru and Canton, Maine, would cut into poor cat's-eyes.

**Beryl** : The beryls of Stoneham, and some of the North Carolina beryls, especially those from Alexander county, would furnish cat's-eyes, although not fine.

**Quartz** : Quartz filled with actinolite, from Cumberland Hill, Rhode Island, makes a very fine quartz cat's-eye. This is the Thetis hairstone of Dr. Jackson.

**Hornblende** : A fibrous black hornblende from near Chester, Massachusetts, afforded an imperfect cat's-eye.

**Pyroxene** : A white compact fibrous pyroxene from Tyringham, Massachusetts, made a curious white cat's-eye.

**Labradorite** : Some of the Labrador spar, when filled with included minerals and impurities, will show a cat's-eye ray ; this is especially applicable to the mineral found in Orange county, New York, and that also in the northern part of the State.

**Hypersthene, bronzite, and enstatite**, when fibrous and cut across the fiber, produce a cat's eye effect, and are sold abroad for this purpose to a very limited extent.

**Limonite** : Limonite from Salisbury (Connecticut), Richmond (Massachusetts), and other American localities, would at times cut into a gem showing the cat's-eye ray.

**Aragonite and gypsum satin spars** : These both produce the cat's-eye effect.

#### LOCALITIES OF PRECIOUS STONES IN THE UNITED STATES.

*Diamonds*.—Referring to the paper on American gems, in "Mineral Resources of the United States, 1882," containing information furnished by Mr. John H. Tyler, Sr., about the Manchester diamond, having since been enabled to obtain a more complete history of it, as it is possibly the largest diamond really found in the United States, I herewith present the facts. The first record I have been able to obtain is from the New York *Evening Post* of April 28, 1855, which says : "We were shown yesterday, on board the steamship Jamestown, what is said to be the largest diamond ever discovered in North America. It was found several months ago by a laboring man at Manchester, Virginia, in some earth which he was digging up. It was put in a furnace for melting iron, at Richmond, where it remained at red heat for two hours and twenty minutes. It was then taken out and found to be uninjured, and brighter than ever. It was valued in Richmond at \$4,000." This stone was next in the possession of Capt. Samuel W. Dewey, now of Philadelphia, and by him

was named the Oninoor, or "sun of light," though it has more generally been known as the Dewey or Morrissey diamond. It then passed through many hands. It was cut at an expense of \$1,500 by Mr. H. D. Morse, and at one time \$6,000 was loaned on it. This diamond was a slightly rounded trigonal trisoctahedron. Its original weight was  $23\frac{3}{4}$  karats, and after cutting it weighed  $11\frac{1}{8}$  karats. As it is off-color and imperfect it is to-day worth not more than from \$300 to \$400. Exact copies of it in glass, as it was found, and also as cut, were deposited in the United States mint in Philadelphia by Capt. S. W. Dewey, and also at the Peabody museum in New Haven. Electrotypes of it may be seen in a number of cabinets.

The first diamond found in North Carolina was at the ford of Brindletown creek, by Dr. F. M. Stephenson. It is an octahedron in form, and is valued at \$100. Another, in the possession of Prof. Featherstonhough, was found in the same neighborhood by him. A third, observed in Mr. D. J. Twitty's collection by General Clingman, and described by Prof. C. U. Shepard, was found at Twitty's mine, Rutherford county. In form this is a distorted hexoctahedron, yellowish in color. A fourth was found by Dr. C. L. Hunter, near Cottage Home, Lincoln county, in the spring of 1852. It is said to be greenish in color, and in form an elongated hexoctahedron. Another, in the possession of Dr. Andrews, of Charlotte, was found at Todd's branch, Mecklenburg county. It was said to be a perfect crystal, and of a good white color. Dr. Andrews reports also the finding of a black diamond, the size of a chincapin, by three persons, who crushed it, believing a diamond could not be broken. He found that the fragments scratch corundum very readily.

Dr. Genth reports two diamonds from the Portis mine, Franklin county, one of them a very beautiful octahedron. A small diamond was found on the headwaters of Muddy creek, in McDowell county, and diamonds have also been reported in weight frequently from one-half karat up to over two karats, from J. C. Mill's mines, in Burke county. Some of these, examined by Mr. James B. Mackintosh, proved to be quartz, and another supposed diamond, found in some gravel from this mine, in the State collection at Raleigh, I found not to be a diamond, but zircon. The diamonds in North Carolina are usually found associated with gold, monazite, xenotime, zircon, octahedrite, and other minerals. Dr. Genth § says this débris is the result of the old gneissoid rocks, such as mica-schist and gneiss, in which graphite is always found

In a letter to the New York *Sun*, Mr. C. Leventhorpe mentions the finding at his placer mine in Rutherford county of a diamond of bad color, which was pronounced a diamond and placed in the Amherst College collection by Prof. C. U. Shepard. The same article also mentions a fine white diamond, valued at \$400, found in a South Carolina placer by Mr. Twitty, and states that Mr. Twitty has a diamond weighing three grains in his possession, which was taken in White county, Georgia, from a "long tom."

In the cabinet of Mr. Samuel R. Carter, of Paris, Maine, are two small crystals of diamond weighing less than one-eighth karat, which were found in March, 1866, at the Horshaw placer gold mine, Racoochee valley, White county, Georgia, one by Dr. A. C. Hamlin, || of Bangor, and the other by Mr. H. Ashbury. They are opaque and have no definite form. Several stones of fine quality have been found here.

At the May, 1867, meeting of the California Academy of Sciences, Prof. B. Silliman exhibited four diamonds found in California. One, from Forest Hill, El Dorado county, weighing 0.369 gram (= 5.673 grains =  $1\frac{1}{2}$  karats), was of good color with a small cavity and a discoloration on one of the solid angles. This crystal, which was not entirely symmetrical, was found at a great depth from the surface, in a tunnel running into the auriferous gravel at Forest Hill. Another was found at French Corral, in Nevada county, weighing 0.3375 gram (= 5.114 grains =  $1\frac{1}{4}$  karats). It was very symmet-

§ "Mineral Resources of North Carolina," *Journal Franklin Institute*, November and December, 1871.

|| "Leisure Hours Among the Gems," A. C. Hamlin, 1884.

rical in form, remarkably free from flaws, and slightly yellowish, its color having been altered by having been subjected to a red heat. It had been found in the deep gold washings and was thrown out from the cement. The third was the property of Mr. M. W. Belshaw, weighing 0.2345 gram (= 3.619 grains, little less than 1 karat). This crystal is distorted, and has several re-entering angles and cavities. Four others besides this have been found in the search for gold at Fiddletown, Amador county, in the gray cemented gravel underlying a stratum of so-called lava or compact ashes. The other one shown was the property of Mr. George E. Smith, who states that it was found at Cherokee Flat, Butte county, and that he had seen fully fifteen diamonds from this locality; these were all found in the deep gravel washings, and were believed to have come from a stratum 3 feet thick, forming part of a superincumbent mass of material 25 feet thick. Mr. Rémond<sup>¶</sup> is quoted as authority for the occurrence of diamonds at Volcano, which may be the same locality as Fiddletown. Professor Whitney at this meeting stated that diamonds had been found at from fifteen to twenty localities in California, the largest that had come to his notice weighing  $7\frac{1}{4}$  karats, having been found at French Corral.

Prof. B. Silliman\* mentions that platinum, almandine garnet, chromite, epidote, gold, iridosmine, limonite, magnetite, pyrite, quartz, rutile, topaz and zircon are associated with the diamond at Cherokee, Butte county, California.

Mr. W. P. Carpenter,<sup>†</sup> of Placerville, states that while he was assisting Mr. W. A. Goodyear, assistant State geologist, in 1871, they found several diamonds in the hands of persons who did not know what they were. One of these was purchased as a specimen by Mr. Goodyear, who had found some specimens of itacolumite three miles east of Placerville, but had kept them as curiosities. The gravel in the channel is capped by lava from 50 to 450 feet in depth, and of late years is worked by steam cement mills. He says he knows of instances where fragments of broken diamonds have been found in cleaning up the batteries. He gives the following list of the finders of diamonds near Placerville: Charles Reed and Mr. Jeffries, each one; Thomas Ward & Co., three, two white and one yellow (one of these is now in the possession of Mr. Ashcroft, of Oakland, who had it cut in England); Cruson & Olmstead, four, one<sup>‡</sup> of which,  $\frac{3}{8}$  inch in diameter, was sold to Mr. Tucker, of San Francisco, for \$300; Thomas Potts, one small flawed stone, which was sold to Mr. Goodyear for \$15; Jacob Lyon, one light-straw colored, about the size of a medium pea, and several fragments from the tailings of a cement mill at the Lyon mine; A. Brooks, one, small white; E. Brentfeld, one, small yellow, weighing two grains, which had passed through a cement mill; one was found by Mrs. Henderson in some tailings that were washed for gold, and is most probably the one mentioned in the 1882 report as having been found near San Francisco.

(To be Continued.)

## The History of Goldsmithing.

Continued from page 230.

AUGSBURG, also, sustained its ancient reputation. Various pieces of goldsmithing manufactured there can still be seen, dispersed through Germany, France and England. The Louvre at Paris possesses a very handsome water pitcher and basin, dated Augsburg, 1535. The basin measures  $25\frac{1}{8}$  inches in diameter, and the pitcher  $17\frac{1}{3}$  in height. The reliefs of these two pieces are scenes from the conquest of Tunis, by Charles V. The bulge, upon which the emperor is represented on horseback surrounded by his soldiers, is crowded with rich trophies enameled; the upper part of

the pitcher is formed of a woman's bust, to which the handle, formed of two intertwined snakes, is attached.

Two other water pitchers of the same kind, with their basins, are in Europe—one in the collection of the Baron v. Rothschild in London, which represents the history of Orpheus, the other is in the royal treasury chamber at Munich, and pictures the triumph of Amphitritus and a combat of marine monsters.

This same chamber of the treasury contains many other very remarkable pieces of goldsmithing, particularly a large gold vase with white enameled ground, upon which are fruits and leaf work enameled in colors; this piece is dated 1563, and Mr. Laborte attributes it to Henry Reitz, of Leipsic.

Our list of German goldsmiths would be incomplete without mentioning an artist of great renown—Theodore de Bry, who, although born at Liège in 1528, passed the greater part of his life in Germany and considerably influenced the art of his time. A silver table with five gold medallions entwined with arabesques, to be seen in the Grüne Gewölbe, at Dresden, is attributed to him; but Theodore de Bry is better known as an engraver, and he left to the engravers of Germany and France a valuable collection of models.

As regards England, it appears that Norwich was, in the 16th century, one of the principal centers of manufacture, and from the *Gilda Aurifabrorum* we take the following names of the English goldsmiths of the 14th, 15th and 16th centuries.

Sir Drugo, or Dru, Barentyne, goldsmith, was twice mayor, 1398, 1408, sheriff in 1393, M. P. for the city of London, 1394. He lived in Foster Lane. He built the second Goldsmiths' Hall in 1407. In 1395 a singular grant was issued to Margaret, Countess of Norfolk, and Drugo Barentyne, goldsmith, of London, licensing them to melt down groats, half-groats, and sterlings or pennies to the amount of £100, and to make thereof a silver vessel for the use of the said Margaret, notwithstanding the statute. It is not easy to ascertain the object of this grant, for it is scarcely possible that there was not a sufficiency of bullion in another form to be readily obtained. "He gave fair lands to the goldsmiths," according to Stow, "and dwelled right against the Goldsmiths' Hall, betweene the which Hall and his dwelling house he builded a gallory thwarting the streets, whereby he might go from one to the other."

In Riley's "Memorials of London," we find the particulars of a present of plate from the city of London to Edward, the Black Prince, on his return from Gascony in 1371, from which we quote two items as an example of the manner of expressing weight and value in the 14th century of the Tower pound, which was given at the Mint in coined money in exchange for the bullion received by the Mint in *Troy* pounds, a profit thereby accruing of three-quarters of an ounce in the exchange of each pound weight converted into money, which was the King's prerogative until the Tower pound was abolished in 1527. "Bought of John de Chichestre, goldsmith, 48 esqueles (ecuelles) and 24 salt cellars, by goldsmiths' weight, £76, 5s., od., adding six shillings in the pound with the making, total, £109, os., 9d.; also 6 chargers' weight, £14, 18s., 9d., which amounts with the making to £21, 7s., 2d.," etc.

In 1399 John Mayhew "paid for a stone of adamant, ornamented and set in gold, xl li." 1st Henry IV. The stone of adamant was a loadstone—frequently worn about the person as an amulet against maladies—set in metal.

Walter Prest and Nicholas Broker, in 1400, executed in gilt metal the effigies of Richard II. and Anne of Bohemia, in the Confessor's Chapel, Westminster Abbey, in the beginning of the 15th century. In the Kalendar of the Exchequer, 18th Richard II., is a copy of the indenture for the construction of the tomb of Richard II. and his queen in Westminster Abbey, between the king and Master Yevele and Stephen Lote, stonemasons (latomos), for a marble tomb for Anne, recently Queen of England, and the said lord king; also an indenture between the king and Nicholas Broker and Walter Prest, "coppersmiths," of London, to make two statues (ymagines) in the likeness of the king and queen, of brass and laton gilt upon

<sup>¶</sup> "Geology of California," Vol. 1.

\* *American Journal of Science*, Vol. 6, 1876.

<sup>†</sup> Second Report of the State mineralogist of California.

<sup>‡</sup> Mentioned in Whitney's "Auriferous Gravels of the Sierra Nevada."

the said marble tomb ; with other clauses contained in the indentures, also a design or model (patron) of the likenesses of the king and queen, from which model the said work was to be completed. This tomb was placed in the Abbey before the king's death, his body being subsequently removed from Pontefract Castle and placed under his effigy by Henry V., the son of his murderer.

In Riley's "London Life" we read under date of 1382, of one John Frensshe, goldsmith, "One mazer cup, bound with silver gilt, value xs., another value vs., stolen from John Frensshe, goldsmith."

One, Sir John Pattesley, or Paddesley, goldsmith, was Master of the Mint, 1434, sheriff, 1432, mayor in 1440-1, son of Simon Pattesley, of Buray St. Edmunds. In the privy purse expenses of Henry VII. (1437), "Fyrste delivered by your gracious commandment and appointment to send to Queen Katerine for her yerisgifte on New Year's Day, she being at Bermondsley, j tablett of golde with a crucifixe garnized with sapphires and perles, weyng aboute xiiij unc of golde, and was bought of John Pattesley, goldesmyth, for the some of xl *li*."

We next find in the privy expenses of Henry VII. (1437), "Item delivered by your said commandment to send that same day to my Lady of Gloucestre a nouche maad in manner of a man, garnized with a faire gret balay, v gret perles, i gret diamond pointed, with three gret hangers garnized with rubies and perles, bought of Redmonde, the goldsmythe, for the some of xl *li*."

John Sutton, goldsmith, was one of the sheriffs of London in 1440. Among the epitaphs in St. John Zachary's Church,\* Stow gives the following: "Here lieth the body of John Sutton, citizen, goldsmith and alderman of London, who died 6th July, 1450. This brave and worthy alderman was killed in the defense of the city, in the bloody nocturnal battle on London Bridge, against the infamous Jack Cade and his army of Kentish rebels."

German Lyas, a foreigner, was admitted into the franchise of goldsmiths of London, to use the same craft as a freeman, for which privilege he paid to the Almesse of St. Dunstan £8, 6s., 8d. In 1452 this same German Lyas was brought before the Wardens for various offenses, and particularly for selling a "tablet of gold" which was dishonorably wrought, being two parts of silver. On deliberation it was awarded that he should give to the fraternity a gilt cup of 24 ounces weight, and "lowly obey himself on his knees." This he did, bringing into the Hall a "cuppe chased with a sonne" (sun) weighing 26 ounces and he was pardoned.

Under date 1439 we read of one William Austin, of London, Flaxman, in describing the monument of Richard Beauchamp, Earl of Warwick, at Warwick, describes the figures as being natural and graceful, the architecture rich and delicate, and that they are excelled by nothing done in Italy of the same kind at this time, although Donatello and Ghiberti were living when this tomb was erected in 1439. He says: "The artist was William Austin, of London." We insert his name among the goldsmiths, although we have no positive record that he was actually a worker in the precious metals; but the arts were so nearly allied, the sculptor having so frequently received instruction in the workshop of the goldsmith, as in the case of Ghiberti, of whom we spoke in a recent number of THE JEWELERS' CIRCULAR, that we may be excused in thus recording his name in the list as an English artist and goldsmith.

William Hede, goldsmith, being liveryman of the Goldsmiths' Company, and his wife, both made complaint to the Wardens of their apprentice, William Bowden, "who irreverently, shamefully and of frowwinesse" had beaten his said mistress. His punishment ordered by the Wardens, was that he should be "had into the kechyn of the Hall and there stripped naked, and by the hand of his master beaten until such time as he raised blood upon his body, in likewise

as he did upon his mistress, and that he should there be made to ask his master and mistress of grace and mercy, naked as he was betyn."

Sir Hugh Bryce, son of Richard Bryce, of Dublin, goldsmith, was sheriff of London in 1475, and mayor in 1485, after which Governor of the Mint in the Tower, and Keeper of the King's Exchange. The Goldsmiths' Company, like many others, had a rich pall or herse-cloth, which is thus alluded to in the minutes: "The Wardens showed the company the goodly and rich herse-cloth which was made with the goods of Sir Hugh Bryce, Dame Elizabeth, his wife, and Dame Elizabeth Terrell. It was agreed that the said cloth should not be lent to any other persons than a goldsmith or a goldsmith's wife; that whenever it was used, the company assembled should pray for the said two donors' souls, as well as the soul of said Dame Elizabeth Terrell, and that the beadle should have for his safeguard and attendance twelve pence at the least."

Thomas Wood, sheriff in 1491, was an opulent goldsmith, and built Goldsmiths' Row in Cheapside, London, where most of the goldsmiths resided. Stow states: "It containeth in number ten fair dwelling houses and fourteen shops, all in one frame, uniformly built, four stories high, beautified towards the street with the goldsmiths' arms, and the likeness of woodmen, in memory of his name, riding on monstrous beasts, all cast in lead, richly painted and gilt; these he gave to the goldsmiths, with stocks of money to be lent to young men having these shops," etc.

The wardrobe accounts of King Edward IV. contain the following item: "To Selys, goldesmythe, for mlij (1,052) ageletts of silver and gilt, weyng CCclxxj (271) unces iij quarters, and for Clv (155) unces grete and small spanges of silver and gilt, cont in all CCCcxvj unc and iij quarters, price of every unce, vjs=Cxxvij *li* vjd. These were afterwards given out to Martyne Jumbard for embrowdering and setting of them in the garnysing of vj coursour harneys, and a hoby harneys of grene velvet."

The next date is 1480, when we come to Matthew Shore, goldsmith, of Lombard street, husband of the notorious Jane Shore, who died at an advanced age in the reign of King Henry VIII. His shop was called the Grasshopper. Concerning his wife, we find in the Pepys collection an old black letter ballad entitled, "The woful lamentation of Jane Shore, a goldsmith's wife in London, sometime concubine of King Edward IV." "In Lombard street I once did dwelle, As London yet can witness welle; Where many gallants did beholde, My beauty in a shop of gold. . . . I penance did in Lombard street, In shameful manner in a sheete."

By drawing on the old minutes of the Goldsmiths' Company and other records, we could unnecessarily prolong these accounts of English goldsmiths and their doings; we shall close them, however, with Robert Amades, goldsmith to Cardinal Wolsey, in 1518, keeper of the jewels to King Henry VIII., who gives an account of his treasures with the weight and cost annexed, such as: "An image of our Lady, 300 ounces in sterling silver; six great candlesticks made at Bruges, with leopards' heads and cardinals' hats, chased and gilt, weighing 298 ounces; three 'charglours,' 197 ounces; twenty-five plates, 968 ounces; twenty-two dishes, 451 ounces; a cup of 'corone' gold, 64 ounces." According to Cavendish, the Cardinal's biographer, "There was at great banquets a cupboard as long as the chamber was in breadth, with six deskes in height, garnysed with guilt plate, and the nethermoste deske was garnysed all with gold plate, having with lights one paire of candlesticks of silver and guilt, being curiously wrought, which cost 300 marks. This cupboard was barred round about that no man might come nigh it, for there was none of this plate touched—there was sufficient besides."

Of the goldsmiths living at Norwich, Peter Peterson enjoyed great renown under Queen Elizabeth. The city corporation of Norwich still possesses several specimens belonging to that epoch, one of the most interesting of which is a large cup of silver gilt, standing upon a very short foot, bearing his name, two other cups of the same kind and a chamberlain's mace presented by Elizabeth to the city, a very

\* Jewelers and goldsmiths appear to have a great fondness for maidens. Our Maiden Lane here in New York is the headquarters of jewelers, and this old church of St. John Zachary stood in Maiden Lane, near Goldsmiths' Hall; it was destroyed in the great fire and not rebuilt.

handsome water pitcher made in London in 1595, and various other pieces of a subsequent date.

The mace, consisting principally of rock crystal, mounted with exquisite taste in chasing and jewels, terminates in a sovereign's crown, surmounted by the globe and cross. Besides this, it is ornamented with shields bearing the arms of Edward VI. and Elizabeth, supported by lions and dragons.

The water pitcher is very handsome, and of the kind generally used at that time on gala days for sprinkling rose water. It is chased all over. Upon the bulge are represented in groups marine gods, tritons, nymphs and little gods of love mounted on dolphins; above this are seen the winds, allegorically expressed by cherubims with puffed out cheeks, and upon the foot, marine monsters. The handle is formed from the half figure of a woman supported by a dragon.

The basin is decorated in a similar manner. The principal subject is the victory of Neptune and Amphitritus, surrounded by their usual appendage. Jolly little gods of love playing with marine monsters complete the decoration. But some one with more religious fervor than taste has, at an unknown period, introduced a medallion of "Christ washing the feet of His disciples" into this pagan group.

As we said at some previous time, and designated the causes, old specimens of goldsmithing are in England very scarce, and principally found only in possession of its wealthy guilds and corporations and we will desist from describing them, but hasten onward to begin with

## CHAPTER VII.

### MODERN PERIOD (SEVENTEENTH AND EIGHTEENTH CENTURIES).

#### I. France (seventeenth century).

The fifteenth century ended the mediæval age. The sixteenth closed the Renaissance, and in order to close our long review of these past ages, we will, in the following chapter, examine the modern history of the art of goldsmithing.

This modern period, embracing more particularly the seventeenth and eighteenth centuries, is in certain respects not without its great works of art; when compared to those of the preceding ages, however, we will at once be struck by a plainly noticeable retrogression.

The intrinsic art of goldsmithing constantly declined, due to the inordinate love of jewelry, as we said some time ago in a former chapter. This desire commenced about the beginning of the seventeenth century—in fact, we may say, in the middle of the preceding, to judge from the accident which befell Marie de Medicis. For the day of baptism of her son she had caused to be made a gala robe studded with three thousand diamonds and three thousand two hundred other precious stones. The robe was made, but was found to be so heavy that she could not wear it, and she was obliged to put on something else—another sad case of "Nothing to wear."

(To be Continued.)

### The New York Jewelers' Association.

THE New York Jewelers' Association held its eleventh annual meeting Sept. 8, in their room, 310, in the old Mutual Life Insurance Co.'s building, 142 Broadway.

The officers elected for the ensuing year are: *President*, Wm. R. Alling, of Alling & Co., 170 Broadway, 2d term; *Vice-President*, Geo. C. White, Jr., of Rogers & Brother, 690 Broadway, 2d term; *Treasurer*, Aug. K. Sloan, of Carter, Sloan & Co., 15 Maiden Lane, 4th term; *Secretary*, H. Olmstead, is an appointee of the Executive Committee and has held the office since April, 1878. *Executive Committee*: F. T. Douglas, of Shafer & Douglas, 7 Maiden Lane; Alfred H. Smith, of Alfred H. Smith & Co., 182 Broadway; C. H. Brahe, of Seth Thomas Clock Co., 20 Murray street; H. B. Dominick, of Dominick & Haff, 860 Broadway; R. N. Peterson, of Peterson & Royce, 189 Broadway. *Finance Committee*: B. H.

Knapp, of Smith & Knapp, 182 Broadway; C. G. Lewis, of Randel, Baremore & Billings, 58 Nassau street; John A. Riley, 860 Broadway; H. C. Hardy, of H. C. Hardy & Co., 30 Maiden Lane; C. E. Breckenridge, of Wilcox Silver Plate Co., 6 Maiden Lane. *Membership Committee*: J. C. Aikin, of Aikin, Lambert & Co., 23 Maiden Lane; J. G. Bacon, of Meriden Britannia Co., 46 E. 14th street; W. S. Hedges, of W. S. Hedges & Co., 170 Broadway; T. G. Brown, of Thos. G. Brown & Sons, 860 Broadway; F. H. Mulford, of Mulford & Bonnet, 21 Maiden Lane.

The affairs of the Association are in a prosperous condition, with a well organized collection department, of which the members to a good extent avail themselves, to secure troublesome and annoying accounts.

### Dissolving and Precipitating Gold.

TWO PROCESSES frequently occur in goldsmithing and electroplating, viz., the solution and precipitation of gold, and the operator often meets with difficulties or is in doubt; so valuable a material as gold cannot be treated with levity.

As regards the dissolving, the nitro-muriatic acid is generally used in too concentrated a state. The workman most generally goes by guess work and takes as much as he considers about right, now nitric acid, then muriatic acid, and finally he is in difficulties to remove the excess of acid, especially nitric acid. How easy it would be for him to compound an *aqua regia* according to the following formula:

4 parts by weight of crude muriatic acid,  
1 part by weight of nitric acid,  
5 parts by weight of pure water.

Of this mixture generally will suffice 10 parts to 1 part of gold.

It is enough if the gold is in a passable state of division. With thick pieces a little more mixture is subsequently to be added, until a perfect solution has ensued. It is well to weigh also the subsequently added portion.

The writer performs his solutions in a weighed porcelain dish or glass retort in a water bath, and is not in any manner troubled by the evolving of red vapors. That the solution takes place can be seen from the outside by the yellow color of the fluid and the bubbles arising from the gold.

A water bath is easily made; take an iron or earthen pot, upon the rim of which the dish or the glass retort rests, fill this pot with water and heat it. The gold hereby receives simply the heat necessary for effecting of the solution from the arising steam, and no fear need be entertained that something may go wrong. One-half of the solution having evaporated, which can be ascertained by weighing—for instance, you used 10 grams gold and 100 grams *aqua regia*, there must be left 50 to 51 grams; dilute this solution to 100 or 200 grams and you will have a solution, each gram of which contains  $\frac{1}{10}$  or  $\frac{1}{20}$  gram of gold.

The writer always found such a solution to be free from nitrate, and it may safely be used for every recipe.

*The Precipitation of Gold.*—The gold from galvanic baths is easiest precipitated with the galvanic current upon a smooth copper plate; the gold which does not precipitate as a powder is scraped off and purified, as well as that which precipitated as powder. Impure gold, which chiefly consists of gold, however, is dissolved in the indicated proportions in the *aqua regia* specified above; it is then evaporated to one-half, diluted with water, filtered and washed out with large quantities of water. This washing is continued until the escaping fluid is water, clear and no longer colored by sulphate of iron.

Meanwhile a solution of handsome crystallized sulphate of iron has been prepared, as follows: To 10 grams (6 dwts. 10.32 grains) sulphate of iron, 100 grams water and 10 grams muriatic acid.

For precipitating the gold suffices the  $4\frac{1}{2}$  fold quantity of crystallized green copperas of the impure gold used.

In order to precipitate the gold, pour its solution into the copperas

solution. The gold will very quickly fall down in this diluted fluid; decant the clear liquid, and first wash with water acidulated with muriatic acid, afterward simply pure water. Collect the gold in a porcelain dish, drain off the wash water as closely as possible, and let it dry in a moderately warm place.

### The Clock at Jena.

THIS CLOCK, which was made in the fifteenth century, is still in existence, and is of famous notoriety. Above the dial is a bronze head, presumed to represent a buffoon of Ernest, Elector of Saxony, who died in 1486. When the hour is about to strike, the head which is so remarkably ugly as to have given the clock the name of "the monstrous head," opens its very large mouth; a figure, representing an old pilgrim, offers it a gold apple at the end of a stick, but just when poor Hans (so was the fool called) is about to close his mouth to swallow the apple, the pilgrim suddenly withdraws it. On the left of the head is an angel singing (the arms of Jena), holding in his arms a book, which he raises towards his eyes, whenever the hours strike, and with the other he rings a hand bell.

### How Ladies Adorn Their Pets.

THE COSTLY JEWELS WORN BY DOGS WHICH DON'T APPRECIATE THE HONOR.

SHE SAILED like a saucy yacht before a half gale into a well known up-town jewelry store. She carried under her arm a bunch of hair, which, being placed upon the glass counter in front of a shrinking, timid youth, showed signs of life, and let out a spiteful yelp that could only come from the throat of a disgusted dog. After adjusting the wrinkles in her face so that a fair-sized scowl appeared, she turned right about and looked the light-haired clerk square in the face, while a gleam of spite and anger shot from her steel-gray eyes. "Did not I tell you, sir, to be extremely careful about the size of the ring that you measured for my little Zip? Look at that, you double-dyed villain," as she pointed to a small inflamed spot upon the dog's left leg. "That's all your work, and woe unto you, sir, if my poor little treasure is kept awake any more at night by your horrid stupidity. You are sure the ring was all right and that my darling has probably got the mange? Well, sir, that settles your case. I was not going to make any further complaint. Now I'm off for headquarters," and she doubled up her skirts, seized her "darling" and started double-quick for the main office. In a few moments she came out of the office with the manager, and he walked with her to her carriage. The wrinkles were pushed aside, an ancient smile faintly glimmered through her drug store complexion, and the oil of contentment had been poured upon her outraged feelings.

"What was the trouble with your customer?" the manager was asked, as he walked into the store. "Was she one of the crank species?" "Well," said the manager, "if you can call a person a crank who thinks more of a dog than a child, then she is one, and the class of which she is a fair specimen is by no means small. The whole trouble arose from a mistake made in measuring her dog's fore leg for a bracelet. After the animal had worn it a few times it became tight, and in removing it the skin was slightly abraded. Why do I say that she thought more of her dog than her child? Well, my judgment is based upon a commercial transaction. She came in here about two weeks ago with one of the prettiest children I ever saw and bought a ring for the little one. It cost \$2.75, while she paid \$28 for a bracelet for that yelping cur."

"Is there much of a trade in animal ornaments?"

"Well, yes, though at present there is not much doing, because the people who buy these things are out of the city. Just before the opening of the summer resorts our trade had a wonderful boom, and it would have surprised one who had not been initiated to see the valuable ornaments that were ordered for pets. The trade, however, has not been as good this year as it was last, probably because the

line of jewelry worn by each animal was full. This business began six or seven years ago, and jumped into full swing when, at one of the annual dog shows, a pug was exhibited with a beautiful pair of bracelets upon its fore legs. The ladies were overcome by the gnawings of envy, and hastened to adorn their pugs in the same way. Some even went so far as to have the ears of their dogs pierced and dainty little ear drops suspended therefrom. A philanthropic spirit started the story that this practice interfered with the dog's hearing and was a mild method of torture, and it has now fallen into disuse.

"However much the owners may admire the appearance of their bespangled pets, I have yet to find the dog that feels elated when jewelry is put on him. Dogs usually try to tear these things off with their paws or gnaw them off. These ornaments are not confined to bracelets, but include collars—plain, jeweled or with artistically engraved monograms—expensive blankets and embroidered wraps. They are ordered for dogs of every size and species, but more frequently for dogs that might be termed pets. The prices paid are various, but are always high, because nearly every order provides for a special design, and the patterns and settings, if jewels are used, have to be specially prepared. I know of one lady who owned a fine pug and terrier. She had a fancy that they would look well in double harness, and ordered a set to be made after a pattern that she had drawn on paper. It was an elaborate affair, studded with gems, and a model of beauty when complete. She counted out \$250 for it without a murmur.

### A Scientific Watch Case Engraver.

MANY OF our honored readers are Swiss, and are deservedly proud of their distinguished countryman, Prof. Dr. A. Jaccard, who was the President of the Society of Naturalists recently in session from Aug. 10th to 13th, at Locle, of whom the following episode comes to us fully vouched for:

It was in the beginning of the decade of 1840, when one Sunday morning, a gentleman encountered a 12-year old boy in the vicinity of Villers-le-lac, near Locle, whose behavior struck him.

"What are you doing there, my boy?" he asked.

"I am picking up pebbles."

"What kind of pebbles?"

"Pebbles of peculiar shapes and colors."

"Nonsense, stones are stones, one is like the other (*cailloux est cailloux.*)"

"Pardon, Monsieur, *ce ne sont pas des cailloux; ce sont des pierres.*"

The boy finally explained that he was hunting for "match" pebbles—one to be like the other, and stated that he had a whole box full of them at home. The gentleman was struck by the intelligence of the boy, and said:

"If I tell you the name of every one of these pebbles, and what they are, and where they come from, if you will show me the box full you have at home, will you then point out to me every place of interest around here?"

The boy joyfully assented; both services were rendered, and the gentleman, who was Dr. Campiche de Saintes Croix, one of the most eminent geologists of Switzerland, who was at the time engaged in studying the chalk and tertiary formations little known until then around Locle, took an interest in the boy and introduced him to several eminent geologists in the neighborhood. The boy, the son of a watch case engraver, and apprentice to his father, commenced the study of geology in his leisure hours, and by the help of books and assistance from his geological friends, he progressed, becoming one of the most eminent geologists of Europe; he lately received a call as Professor to the Academy at Neuenberg, and was made Honorary Doctor by the High School of Zurich. But he has not quitted his profession, and the visitor at Locle may see a simple pasteboard sign at his door with

AUGUSTE JACCARD,  
*Graveur et guillocheur.*

## Foreign Gossip.

**WANTS TO BE IN TIME.**—A watchmaker, living in Manchester, England, intends to be in time; from February 2, 1885, he has been advertising watches, chains, rings, etc., "suitable for Christmas gifts."

**ORIGIN OF THE DECIMAL SYSTEM.**—The decimal system was first taught in the Academy of Madura, East India, in the 8th century, and was exclusively used by the scientists. The existence and use of the system was carried to Europe by Arabian writers.

**TOPAZES.**—Large quantities of topazes have been discovered in New South Wales. A portion of a large, bluish-green crystal of the weight of several pounds, found at Mudgee, is at present in the Colonial Museum. Several crystals, 2 and 3 inches long, were found at Uralia. A topaz weighing beyond 11 ounces was found at Gundugai, and another, of 18 ounces in weight, at Gulcong.

**LARGE DIAMOND.**—The cutting of the largest diamond in the world was commenced in Amsterdam, in the establishment of J. Metz; the diamond weighs 475 karats and was found in South Africa. A separate shop was put up so that the cutting might proceed undisturbed. As stated, it is the largest in the world, and excels all the lesser competitors in purity of water and brilliancy.

**GOLD AND SILVER IN THE STREET.**—It is a well known fact that there are towns in California and other gold countries, in the streets of which gold has often been found, because the ground on which the town is built is auriferous; the case is different with Pforzheim, Germany, in whose streets chemists have lately discovered gold dust which was carried out of the shops by the workmen. A careful analysis of different places around the doors of the shops is to be made to see whether it will pay to extract the gold.

**THERMOMETERS.**—It has been noticed that thermometers experience great changes when they are subjected to great heat for a long time. In printers' ink factories, in which the oils are for several days maintained at a great heat, the most precise thermometers will frequently deteriorate and deviate 10 degrees and more. The hydrometers in sugar factories, which work with the osmose process, are for several days suspended in the fluid at a temperature below the boiling point; nevertheless it is quite sufficient to ruin the instruments, and to make the glass so soft that inexactness is produced thereby.

**A COSTLY TOILET.**—At an audience lately accorded to a high dignitary by Queen Victoria, the gentleman wore the following costume: A tunic of blue velvet richly embroidered with gold, silver and pearls. The lower seam was strung around with a row of large diamonds. Around the waist he wore a belt of purpur velvet, with roses of silver, the calyxes of which were formed of large pearls. Upon his head he wore a skull cap, ornamented with a peacock of jewels, its spread-out tail glittered in all its native hue of jewels to correspond. The personage was no other than the Maharadjah of Jahore, East India. The jewelry he wore was superficially estimated at one million dollars.

**UNEXPECTED FIND.**—Some time ago a tumulus was opened in the old graveyard at Taylow, near Maidenhead, where Sarah Milton, the mother of the celebrated poet, lies buried, and in it was found a large collection of ancient objects of the Anglo Saxon period. Among other things, a gold buckle set with jewels, a gold fibula, silver arm bracelets and bronze joint rings, a bronze shield, a coat-of-arms and helmet of the same metal, an iron sword and spear, a bronze bucket, two drinking horns with metal rims, two glass vessels, unique specimens of the manufacture of glass among the Anglo-Saxons, and other objects of minor importance. Portions of a skeleton, showing no traces of fire, were also found, and to judge from the above mentioned utensils the corpse must have been buried with great honor. The body lay with its head to the east.

**NEW GOLD MINES.**—The district geologist, Jack, of Queensland, Australia, reports that a very rich gold deposit has been discovered near Mount Morgan, 20 miles from Rockhampton, on the Fitzroy river. The Mount is an isolated cone rising up from the level prairie, and its apex contains a number of hot geyser-like springs, the courses of which are all very rich in gold, while the rock of the Mount gives from  $\frac{1}{4}$  to 10 ounces of gold—choice rock as high as 85 ounces—per ton. The mint at Sydney received in a few months 10,000 ounces from this source. It is singular that this gold contains no trace of silver; it assays 99.7 per cent. gold, the balance copper and iron. The wildest kind of estimations are made of the richness of these diggings—the one before us places their value at about £135,000,000.

**LILLIPUTIAN STEAM ENGINE.**—A correspondent from Louisville, Ky., writes us that a German watchmaker, Mr. A. Miller, has manufactured a miniature steam engine, which of its kind must be a real work of art. The entire machine is made from the one-third part of the metal of a 5 cent nickel and a sewing needle No. 3, its total weight being only  $1\frac{1}{2}$  dwts. The dimensions of the boiler are  $\frac{3}{8} \times \frac{1}{16}$  inch, and it is fed with  $2\frac{1}{2}$  drops of water; the diameter of the fly wheel is  $\frac{1}{2}$  inch, and the machine can run for 4 minutes. It may be imagined what difficulties Mr. Miller must have had in the construction of his engine, when it is considered that the entire machine is composed of 135 pieces, among which are 47 screws. A part of these, as well as the different wheels, are so small that they had to be made by hand, because no cutting and rounding machine could cut them small enough. The machine is so perfect that it will run backward as well as forward. The constructor has worked on it for years during his leisure hours.

**DELICACY.**—Tourists who have seen the admirable treasures of mediæval jewelry in the Grüne Gewölbe, of Dresden, will concur with us in saying that the collection is unexcelled. The pieces are kept under glass cover and no one is permitted to touch or handle them; this was adopted as a safeguard on account of the following occurrence: As late as eighty years ago the pieces lay exposed, and any one who bore the written permission of the King of Saxony could inspect and handle them. One day a small party of the highest aristocracy was conducted about by the gray haired superintendent, and his quick eye noticed to his dismay that a young countess made a diamond ring of a fabulous sum disappear. The experienced man acted as if he had not observed it, but when he stood at the place of exit, he begged the noble company to tarry one minute as a trifling formality had to be complied with before departing. He disappeared for a moment in the small cabinet, and immediately afterward returned with a dish full of wheat bran and asked every lady to wash her hands in it. "This is an old custom," he apologetically remarked, fixing his eye upon the young countess; "once upon a time the cabinet was inspected by a company of noble ladies, and one of them took so great a fancy to a most valuable diamond ring that she purloined it. The superintendent had witnessed the theft, but, out of kind feelings for the young lady, he forbore from exposing her before the company, and the idea of washing in the bran prompted itself to him, which he explained to be an old custom. The young lady understood the hint and let the ring drop in the bran; by this ruse the superintendent saved his position, which he would undoubtedly have lost, the ring and the honor of the young lady at the same time." Laughingly all the ladies present submitted to the funny old custom, and when the superintendent received the basin back from the last lady—the thief, he found the ring in it, and with it he received such a look of gratitude that he was repaid for the exercise of his delicacy. Ever since then the treasures are kept under glass cover.

## Workshop Notes.

**TO COVER SMALL PIECES OF STEEL WITH BRASS.**—Plunge them into a solution of 6 grains of sulphate of copper and 6 grains of chloride of tin in a quart of water.

**RUBY PIN.**—If it is necessary to tighten a ruby pin, set it in asphaltum varnish. It will become hard in a few minutes, and be much firmer and better than in gum shellac as generally used.

**PIVOT HOLES**—A pivot hole is always broached from the inside until the pivot fits; then use a chamferer upon the plate to give the necessary shake. If the underlay in riveting was a nicely polished anvil, and the shake suffices, it is not necessary to chamfer. Then make the oil sinks from the outside.

**TO TEMPER STEEL.**—Steel tempered in oil is not as hard as when tempered in water; softer in tallow than in oil; softer in sealing-wax than in tallow. Small drills hardened in sealing-wax require no annealing; very thin ones may be tempered by drawing them with a quick motion through the air; they, too, need no annealing.

**BENZINE FOR CLEANING WATCHES.**—Only the purest of benzine should be used for cleaning watches. The commercial kinds are not thoroughly purified and still contain a certain per cent. of hydro carbon. Pure benzine must evaporate completely, and when you have dipped a plate into it every smell must have left it in the course of one minute. If it is still perceptible, throw the benzine away. Any material house in New York keeps the best quality, and when ordering be sure to say "prepared benzine."

**TO FROST WATCH PLATES.**—Watch plates are frosted by means of fine brass wire scratch brushes fixed in a lathe, and made to revolve at great speed, the end of the wire brushes striking the plate producing a beautiful appearance; or, sink that part of the movement to be frosted for a short time into a mixture of nitric acid, muriatic acid and table salt, one ounce of each. On removing from the acid, place it in a shallow vessel containing enough sour beer to nearly cover it, then with a fine scratch brush scour thoroughly, letting it remain under the beer during the operation. Then wash off, first in pure water and then in alcohol. Gild or silver in accordance with any recipe in the plating department.

**TO CLEAN ELECTRO-PLATE SILVER.**—The gas and multitudinous other emanations of a city will unconditionally tarnish all kinds of silverware. The tarnish on electro-plate goods may be removed by immersing the article from one to ten or fifteen minutes, or until the tarnish has been removed, but no longer, in the following solution: Rain water, 2 gallons; potassium cyanide,  $\frac{1}{2}$  pound; dissolve and put into a stone jug or jar and cork tightly. After immersion, the article must be taken out and thoroughly rinsed in two or three waters, then dried with a soft linen cloth, or if frosted or chased work, with fine, clean sawdust. Tarnished jewelry may be speedily restored by this process; but make sure work of removing the alkali as it will corrode the goods.

**BURNISHERS.**—The surface to be burnished must be free from scratches which the burnisher would not remove, but render more distinct by contrast, and the burnisher must be kept highly polished, for the surface burnished can never be smoother than the burnisher. Burnishing polished pivots with the glossing burnisher preserves them from wearing. Very little, if any, of the metal is removed by burnishing in the ordinary way, although watchmakers sometimes use what are called cutting burnishers to form pivots. The cross section of these burnishers matches the outline of the pivot it is desired to form, and they are roughened by rubbing on a lead block charged with coarse emery. The pivot is finished with a smooth burnisher of the same form as the cutting one. Silversmiths use burnishers of agate.

**FRICITION OF THE TRAIN PIVOTS.**—It is very important to reduce the friction of the wheel pivots to a minimum quantity, and to make it constant so that the motive power be transmitted with the greatest possible uniformity to the pendulum, which is necessary to enable the latter to maintain its arc of oscillation of the same magnitude. The friction of the pivots is due to the pressure of the motive power and the weight of the wheels. The wheel work nearest to the motive power must have strong pivots so that they possess sufficient resistance, neither wear the pivot holes to one side nor enlarge them, by which the friction would be increased and at the same time alter the true point of engagement. In tenor with the distance of the wheels from the motive power, the thicknesses of their pivots must decrease because these latter sustain less pressure, and are subject to a greater velocity than the first parts.

**TO BLACKEN BRASS.**—Dissolve copper wire in nitric acid, diluted, by adding, say, three or four parts of water to one of acid. The article to be blackened is made hot and immersed into the solution; it is then taken out and heated over a Bunsen burner or spirit lamp. When the article is heated the green color of the copper first appears, and as the heat is increased the article becomes of a fine dead black. If a polished surface is desired, finish with a coat of lacquer. This process is the very best for fine work, although articles soft soldered cannot be safely subjected to it. For such, and rough work generally, the following, which is generally applicable to zinc and other metals, may be substituted: Mix lamp black on a stone with gold size; if a dull black is desired, make it to a very stiff paste; if a more polished surface, then use more gold size. Add turpentine to thin it, and apply with a camel's hair brush.

**CONCERNING PIVOTS.**—Pivots must be hard, round and well polished; their shoulders are to be flat, not too large, with ends well rounded off so that they do not wear the cap jewel. The jewel holes must be round, smooth and not larger than is requisite for the free motion of the pivot which is surrounded with oil. Their sides must be parallel to those of the pivots, so that they sustain the pressure of the pivot equally at all points of their length. The holes, if of brass or gold, must have been hammered sufficiently hard, so that the pores of the metal are closed to prevent too rapid a wear. It is well if the oil-sinks are of a size that they accommodate a sufficient quantity of oil, which, if too little, would soon dry out or become thickened with the worn-off particles of the metal. The under turnings of the pinion leaves are conical, but in such a way that the thicker part be nearest to the pivot, because by this disposition the oil is retained at the pivot by attraction, and does not seek to spread into the pinion leaves, as is often the case, especially with flat watches in which this provision is frequently slighted.

**CYLINDER ESCAPEMENT.**—The correct proportions of a cylinder escapement are: The escape wheel has fifteen teeth, and the outside diameter of the cylinder shell is made equal to  $13^\circ$  of the circumference of the wheel. The thickness of the shell is equal to  $1^\circ$ . This fixes the length of the tooth, which, if made  $11^\circ$ , just fills up the inside of the cylinder and allows the cylinder to turn between two teeth without drop, of which there should be very little. The teeth are formed so as to give the impulse to the cylinder during from  $18^\circ$  to  $28^\circ$  of its vibration each way. The lower angle is used with large and the higher angle with small sized watches. The blades of the wheel teeth diverge from a radial line about  $15^\circ$  to give the cylinder clearance. The cylinder should be placed so that a circle drawn through the middle of the impulse planes of the wheel passes through its center. The acting part of the shell of the cylinder be  $\frac{5}{8}$  of a whole circle, with the entering and exit lips rounded, the former both ways and the latter from the inside only. This rounding of the lips of the cylinder adds a little to the impulse beyond what would be given by the angle on the wheel teeth alone. The diameter of the escape wheel is usually half that of the balance—rather under than over.



## Trade Gossip.

- L. Fields & Son succeed L. Fields, Chilton, Wis.
- John H. Voss has moved from Ames to Boone, Iowa.
- Ott & Livingston succeed D. W. Ott, Riverside, Iowa.
- A. H. Johnson succeeds C. Halverson, Syracuse, Neb.
- C. E. Fuller & Co. succeed C. E. Fuller, Olean, N. Y.
- Kennedy & Beatty succeed O. C. Kennedy, Ada, Ohio.
- Fisher & Dumond succeed H. Dumond, Spencer, N. Y.
- E. E. Lyday has moved from Newton to Knoxville, Iowa.
- F. D. Whipple succeeds D. N. Chadsey, Colebrook, N. H.
- Collins & Pullin succeed Talmadge & Collins, Athens, Ga.
- Ferguson & Hall succeed Chas. E. Ferguson, Stockton, Mo.
- W. H. McDowell has moved from Jasper to Crockett, Texas.
- N. Tosseland has moved from Norway, Ills., to Huxley, Iowa.
- E. W. Pampel has moved from Pennville, Ind., to Crestline, O.
- Merritt Barnes succeeds the firm of Barnes Bros., Avoca, Iowa.
- G. J. Garland succeeds J. S. Garland, deceased, Woburn, Mass.
- J. H. Grove has moved from Springfield, Ohio, to Hanover, Pa.
- Webster & Moulton succeed John B. Webster, East Jordan, Mich.
- J. F. Jeffords succeeds the firm of Jeffords & Kites, Wymore, Neb.
- Seth Rhodes has purchased the business of Tilman Bros., Urbana, Ills.
- Hall & Farnsworth succeed the firm of Webb & Hall, Janesville, Wis.
- Mahan & Reeves succeed the firm of Stanford & Son, Florence, Kan.
- Ijams & Sparks succeed the firm of H. B. Sparks & Co., Garnet, Kan.
- F. A. Patterson succeeds the firm of Patterson Bros., Hicksville, Ohio.
- Frank H. Pardon succeeds the firm of Zinn & Pardon, Anita, Iowa.
- Le Gryns & Son succeed the firm of Le Gryns & Worth, Cambridge, N. Y.
- Frank S. Ring succeeds the firm of C. F. Wood & Co., Detroit, Mich.
- F. C. Kinney succeeds the firm of Sandford & Kinney, Mazeppa, Minn.
- Bennett & Co. succeed the firm of Bennett & Cook, Cadillac, Mich.
- C. R. Wardell succeeds the firm of O. Wardell & Son, Detroit, Mich.
- A. C. Grue has moved from Ogden City, Utah, to Eagle Rock, Idaho.
- J. C. Freeman, of the firm of J. P. Stevens & Co., Atlanta, Ga., is dead.
- Charles M. Bailey succeeds the firm of Hallowell & Kulp, Oberlin, Kansas.
- Harry Harmon succeeds B. A. Harmon, deceased, Mitchell, Dakota.
- L. W. Loomis succeeds the firm of Loomis & Villinger, Carrollton, Ills.
- W. H. Summer succeeds the firm of Evans & Summer, Gainsville, Ga.
- Lewis Bros. have purchased the business of John E. Putman, Lima, O.
- J. B. Williams succeeds the firm of Williams, Mix & Co., Rockford, Ills.
- Adolph Bitterman succeeds the firm of Bitterman Bros., Evansville, Ind.
- Mr. E. D. Barnum, late of Chicago, has made an engagement with Miller Bros.
- G. W. Enslow has purchased the business of M. C. Fitzer, Alexandria, Neb.
- Ayres, Frelove & Co. succeed the firm of Duffy, Ayres & Co., Sterling, Col.
- Jacob Pepperman, of Montgomery, Ala., has gone out of the jewelry business.
- Andrew Jackson has purchased the business of L. M. Spaulding, Duluth, Minn.
- Packard & Kennedy succeed the firm of J. D. Packard & Co., Lexington, Ills.
- O. B. Bridges & Co. succeed the firm of M. A. Bridges & Co., Bonham, Texas.
- Benton & Frost succeed the firm of W. A. Murphy & Co., Whitehall, Mich.
- Griswold Bros. succeed the firm of Griswold Bros. & Vaughn, Hornellsville, N. Y.
- Edwin F. Kent will continue the business of Wm. H. Robinson & Co., Providence, R. I.
- C. H. Haney has purchased the jewelry business of George W. Collins, Belleville, Kan.
- T. J. Holdridge has purchased the business of Jackson & Cradick, Anthony, Kansas.
- Lissauer & Sondheim have a full line of gold cases for the new six size Elgin movement.
- D. J. McKelvey has purchased the business of Mrs. F. M. Van Allen, Grand Island, Neb.
- Rufus J. Anderson has purchased the business of L. W. Rima, Spokane Falls, Washington Ter.
- Mr. James M. Linsley, of Griswold, Iowa, was married Sept. 3 to Miss Emily S. Shank, of Red Oak.
- Mr. Elmer Rich will succeed Mr. James C. Rich, as agent in Chicago for Alfred H. Smith & Co.
- The firm of O. B. Marsh & Son, Binghamton, N. Y., has been dissolved, O. B. Marsh continuing.
- The Longines watch received the gold medal and diploma of honor at the Antwerp World's Exhibition.
- E. A. Polley, Seward, Neb., has purchased the interest of his partner, Mr. Davis, who retires from the firm.
- W. A. Moore, manager of the Dueber Watch Case Mfg. Co., spent several days in town during the past month.
- Mr. J. Gansl, formerly of Tuscaloosa, Ala., has located at Minneapolis, Minn., where he is engaged in the jewelry business.
- Edward A. Potter has purchased the stock, tools, etc., of J. H. Hodges & Co., Attleboro, Mass., and will continue the business.
- P. S. Bartlett and E. E. S. Fielden, under the firm name of P. S. Bartlett & Co., have opened a jewelry establishment at Elgin, Ill.
- F. O. Lodwick retires from the firm of Lodwick & Nolting, Cincinnati, Ohio. The business, however, will continue under the old style.
- W. E. Major, importer of optical goods and dealer in chains and jewelers' findings, 42 Maiden Lane, New York, has been succeeded by Major & Carson.
- Charles S. Crossman, formerly of No. 12 John treset, has moved to No. 61 Nassau street, where can be found a general stock of watches and jewelry.
- The E. Howard Watch and Clock Company have just introduced a thoroughly practical twenty-four hour dial which can be applied to their clocks when desired.

Maurice L. Powers, for many years past with Kossuth Marx & Co., has made an engagement with Adolf J. Grinberg, and will hereafter represent him on the road.

General George H. Ford, of New Haven, and wife, returned from Europe in September. Mr. C. Taylor, of Taylor & Bros., 860 Broadway, recently returned from a business trip abroad.

In consequence of their largely increased business this season, Messrs. Stern & Stern have been compelled to add an extension to their building, and to employ considerable additional help.

On Sept. 3d, Santomme Diolot, of the firm of Haack & Diolot, of this city, committed suicide by shooting himself with a pistol. Business troubles are supposed to have deranged his mind temporarily.

John A. Riley, 860 Broadway, has just introduced for the fall trade new designs in the latest styles of embossed, nugget and Roman gold finish. Also chain link bracelets in artistic designs, with and without jewels.

Mr. Chas. Schlag, of 175 Broadway, has patented a safety clasp for gold and silver chains which he has named the "Supreme." The device is simple and ornamental, and in its application to chains is security itself.

Albert Lorsch & Co. have imported a large line of fine enameled flowers, ornaments, etc., suitable for diamond work. These goods are very fashionable this season, and the attention of the trade is directed to them.

Attention is directed to the trade mark of H. Muhr's Sons which appears in this issue of THE CIRCULAR, in order that the trade may become familiar with it, and be able to distinguish it from others of a similar character.

Mr. A. B. Morrison, of Portland, Me., has purchased the stock and fixtures of D. F. Davison, of that city, thus enlarging his business facilities. Mr. Davison goes to California to engage in the jewelry business in that State.

The failure of Kossuth Marx & Co., wholesale jewelers of this city, was announced Sept. 5th. A meeting of creditors was called for Sept. 29th, which was too late in the month for us to obtain the result arrived at in time for this issue.

The co-partnership heretofore existing between C. I. Richards, Brown & Co., of Providence and New York, having expired, Mr. Richards will continue the business of the firm, S. F. Brown & Co. acting as his agents at No. 202 Broadway.

A full line of Scotch pebble jewelry, on exhibition at the Gorham Manufacturing Co., is attracting general attention by the novelty of its setting and finish. This jewelry includes lace and shawl pins, brooches, cuff buttons, bracelets and slides.

The new building erected by Charles Knapp, Nos. 41 and 43 Maiden Lane, will be ready for occupancy Oct. 12. Several jewelry firms have already secured offices in the building which is specially designed for the accommodation of the trade.

Mr. John C. Dueber learned of the terrible cyclone on the 8th inst., at Washington Court House, O., and at once telegraphed from Chicago The Dueber Watch Case Mfg. Co. to forward one hundred dollars for the benefit of the sufferers in that city.

In noticing last month the death of Nathaniel F. Baldwin, of the firm of Baldwin & Co., of St. Joseph, Mo., we inadvertently located the firm at Independence. The paragraph, error and all, appeared in the columns of a western contemporary, and a correction is deemed desirable.

Aikin, Lambert & Co., are closing out their eight size Agassiz watches, and offer them in Wheat, and full 14k. cases at reduced prices. These watches are well and favorably known as accurate and durable time pieces, and dealers will find it to their advantage to seize this opportunity to get a good article at a low price, especially at this season, when the supply of ladies watches usually falls short of the demand.

"What are you doing here?" demanded a policeman of a suspicious looking character who was prowling about at a late hour of the night. "I am quietly attending to my own business." "And what is your business?" "Jewelry business. I think some of opening a jewelry store."

Amasa Lyon, manufacturer of umbrellas, parasols, canes, cane heads, etc., offers an extensive assortment of novelties in his line of goods. Among these are many unique patterns in cane heads in gold, silver and other material, many of which are ornamented in a highly artistic manner.

The Whiting Manufacturing Company exhibit many new and beautiful designs in silverware, in addition to their full lines of standard goods. Their stock is very full and attractive, and buyers should not fail to give them a call at their extensive establishment in 16th street and Union Square.

Mr. T. M. Avery, President of the Elgin Watch Company, gives a strong endorsement of the anti-magnetic watch case manufactured by Giles, Bro. & Co., of Chicago. His letter will be found in our advertising pages. This case has been adopted by several of the leading railroads of the West.

A singular and unprecedented occurrence took place lately at the Kew observatory. Out of nine Longines watches sent there for trial, each and every one received the highest certificate. These watches all bore consecutive numbers, and it is claimed that a result such as this has never before happened.

The Morgan & Headly Optical Manufacturing Company direct attention to the eye-glasses offered by them known as the "Royal," made of an alloy in imitation of gold and warranted not to tarnish. These goods are stamped with three stars, as their trade mark, and are sold by the jobbing trade generally.

The Dueber Watch Case Company have been compelled to increase their manufacturing facilities by the addition of a three story addition 30x60, to their already large factory. Mr. Dueber represents the August sales of their goods as having been the largest of any month since they have been in business.

Rogers & Bro. call attention to an unusually full line of attractive novelties in electro silver plated goods, embracing leading patterns in flat ware; also to their preserve dishes and casters in canary and marine glass. This well known firm has exhibited its customary enterprise in preparing for the fall and holiday trade.

The Hartford Silver Plate Company have prepared and now offer some new and beautiful designs in their quadruple plated hollow ware. They also present for the inspection of buyers a full line of plated flat ware. This company's New York office is now at No. 2 Maiden Lane, where a full line of their goods can be seen.

Dealers in fraudulent jewelry are liberal advertisers in the religious weekly papers and other publications that sell space at low rates. Advertising agents take contracts to place these advertisements at wholesale in cheap and trashy papers. The game is as bad as the sawdust swindle, for the goods offered are absolutely worthless.

One hundred and eighty-seven jewelers in Wisconsin have asked the Elgin, Waltham and two Springfield companies to protect them from the sale of movements by jobbers at retail. This action was taken through the medium of the Wisconsin Retail Jewelers' Association, circulars having been sent out for signature with the result indicated.

A visitor to the watch factory at Waltham, describing some minute screws, says: "A small heap of grain was shown to us, looking like iron filings or grains of pepper from a pepper caster—apparently the mere dust of the machine which turned them out—and these, when examined with a microscope, were seen to be perfect screws, each to be driven to its place with a screw driver. It is one of the statistics of Waltham, worth remembering, that a single pound of steel, costing but fifty cents, is thus manufactured into 100,000 screws, which are worth \$11."

Harry Hirsh, who has acquired so much notoriety as a thieving watchmaker, has been tried, convicted and sentenced to 2 years in county jail for stealing from Mr. P. Boylen, Chester, Pa.

A. S. Mathey, of the firm of Mathey Bros. & Mathez, has returned from Europe after an absence of several months. This firm makes a specialty of all kinds of complicated and timing watches, and carry a fine and large assortment of them. In addition to their regular goods, they have received for the holidays an exquisite line of ladies' small watches.

Le Boutillier & Co. offer an endless variety of imported French clocks, and novelties in pottery, faience, cameo and stained glass, bric-a-brac, etc. Mr. Le Boutillier was abroad through the summer searching the markets of Europe for novelties, and as a result has secured an assortment of fancy goods and articles of use and ornament seldom equalled.

B. & W. B. Smith, show case manufacturers and interior fitters and decorators, present in this issue of THE CIRCULAR two illustrations of the elegant establishment of M. S. Smith & Co., of Detroit, the interior work of which was done entirely by B. & W. B. Smith. This firm has acquired a deservedly high reputation for the artistic manner in which they have fitted up and decorated many of the leading jewelry houses of the country.

Mr. Jerome A. Clark, of Batavia, New York, died in that city Sept. 7. For half a century Mr. Clark was engaged in the jewelry business in Batavia, and has been recognized as one of the leading citizens, a Christian gentleman, and one of the strictest integrity. He was highly esteemed by the entire community. In his youth he learned the trades of watchmaking and chain making, and during his entire life spent more or less time at the bench. He left a widow and four sons.

Among the callers at our office during the past month were A. Wittich, Columbus, Ga.; H. Rowlands, Albany, N. Y.; F. H. True, Merrimack, Mass.; J. N. Bell, Jr., Washington, North Carolina; Thomas E. Thompson, Galveston, Texas; C. L. Ruth, Montgomery, Ala.; M. W. Galt, Washington, D. C. It gives us great pleasure to greet our friends from different sections of the country, and enjoy a friendly chat with them regarding the condition of business in their respective localities.

Washington Court House, Ohio, was in the line of the cyclone that recently visited that State. Messrs. Furtwangler & Hudson, of that place, have sent to us a small piece of the bark of a tree in which are imbedded two short pieces of straw that had been hurled against the tree with such force that they are driven into the bark as though they were a couple of nails. When such a fragile thing as a piece of straw can acquire such force, some idea can be formed of the power of the wind that propelled it.

Mr. F. W. Gesswein, No. 39 John street, has an extensive establishment filled with machinery and tools designed for jewelry and watchmaking establishments. Everything in this line that may be desired can be found in his stock, his aim being to keep the best of everything adapted to the uses of the trade. Mr. Gesswein has a factory at Paterson, N. J., where he manufactures all the files required in his extensive trade, and as they are made under his personal supervision, he guarantees them all.

The Middletown Plate Company, of Middletown, Conn., manufacturers of electro-plated silverware, have an extensive line of novelties to offer the trade at this season. Their goods are so well known that it is only necessary to say that in addition to their lines of standard articles of use and ornament they have introduced many new designs in form and finish that are attractive, and promise to become popular. This is an enterprising, pushing company whose pride it is to keep fully abreast of the progress of the times in the production of goods that will catch the public eye. They have recently issued a supplement to their extensive catalogue for 1885 which should be in the hands of every dealer.

We direct the attention of the trade to the advertisement in this issue of the Bradley & Hubbard Manufacturing Company, 21 and 23 Park Place. This company manufactures bronzes, bric-a-brac and ornamental goods, lamps of every description and style of ornamentation. They employ over one thousand workmen exclusively in their ornamental metal department, while their assortment of lamps, plain and decorated, is unequalled in variety and attractiveness. The line of goods manufactured by this company is highly desirable for retail dealers who desire to diversify their stocks and make their establishments attractive.

Colonel Bennett W. Ellison, formerly of the firm of Ellison & Vester, who has been in the jewelry trade for half a century, more or less, has just been appointed Secretary to the Board of Dock Commissioners of this city. Mr. Ellison has been prominently identified with various organizations in the jewelry trade, and also an officer in some of the veteran organizations of soldiers, notably of the Grand Army of the Republic. He officiated as Grand Marshal at the last Decoration Day parade, and held also a conspicuous position in the Grant funeral procession. The many friends of Mr. Ellison will be glad to learn of his appointment to so lucrative a position.

Mr. James W. Tufts, of Boston, manufacturer of fine silver plated ware, has introduced some new and beautiful designs in plated ware this season. Some of these in *repoussé* and relief are especially worthy of attention. A special feature of his goods is the elaborate and artistic engraving which forms the ornamentation of some of the pieces. In staple goods his line is very complete, and the holiday novelties more varied and attractive this year than ever before. The style, finish and general character of the products of Mr. Tufts' enterprise are second to none in the market, while the individual characteristics of some of his goods are to be highly commended.

Mr. J. T. Bonestell, of Levison Bros & Co., San Francisco, was in the city last month, on his annual pilgrimage to the seashore. He has become thoroughly familiar with the trials and tribulations of a buyer for a large jobbing house, and as all Coney Island resorts are closed for the season, he has no refuge from the peripatetic salesmen who haunt the streets wherein jewelers most do congregate. Mr. Bonestell has been buying with his usual good judgment and discrimination. None of the salesmen who have come in business contact with him have occasion to complain of his treatment of them. He represents the business outlook on the Pacific coast to be promising and highly encouraging.

Since the excitement over the yacht race set in, marine jewelry has come largely into vogue. In the jewelers' cases all varieties and qualities of ornaments with a suggestion of the sea about them are displayed. Turk's head knots are made up into handsome ear rings with a gem in the center, and anchor ear rings and pins, plain and with jewels, are exceedingly popular. Little canoes and yachts with enameled sails are also made into pins for ladies and gentlemen. A very pretty and original scarf pin is a sextant, done in gold, and another a compass box, such as is smuggled into the binnacle, in silver. Different kinds of knots such as old salts are skillful in turning are made up out of gold cord into clasps for bracelets and necklaces, the rest of which are worked to imitate cable chains or hawsers.

A despatch to the daily press from Raleigh, N. C., Sept 25th, is as follows: "Judge Meares, of the Wilmington criminal court, has just rendered a decision as to the drummers' tax that is of general interest. W. R. Kenan, a merchant, was indicted and charged with drumming without license. The law requires a drummer from another State to pay a State tax. A resident drummer is also required to pay the same drummers' tax, but the law of 1885 gives a rebate to the resident drummer of the amount of his purchase tax for the same time. The court held that the effect of this law is too discriminative against the non-resident drummer, and is an attempt by the State to regulate commerce between the States and is therefore unconstitutional. The State derives \$100,000 revenue from the drummers' tax."

Mr. C. H. Jacot, of the firm of Jacot, Juillerat & Co., has obtained a patent for a safety check in musical boxes. It is well known to our readers that musical boxes are operated by powerful springs, which are controlled by a series of wheels and pinions connected with a fly wheel. Now, if this wheel be broken or removed, the cylinder will revolve with lightning rapidity and break the pins on the cylinder and teeth of the comb, and probably ruin the instrument. By the action of a pawl and ratchet wheel Mr. Jacot prevents such a catastrophe from ever occurring, and as the pawl acts instantaneously on the ratchet wheel, no great amount of damage can ever occur from displacement of the cylinder, to any instrument provided with this safety check. The patent is dated Sept. 22, 1885, and Mr. Jacot can be addressed at 37 Maiden Lane.

The eleventh annual convention of American Bankers brought together in Chicago, Sept. 22d, over 500 representative bankers from all parts of the country. Among other things considered was the silver question, regarding which the president, Lyman J. Gage, of Chicago, in his address, said: "You are all aware that the issue between gold and silver as the ruling money of account in our domestic trade and exchange cannot be much longer delayed. The course of government action in the continued coinage of silver is carrying us rapidly toward the silver basis. In fear of this result, enterprise hesitates to embark in new undertakings; business languishes, and the expectant or waiting attitude is everywhere observable. A wise lawyer once said that the wisest acts of legislation had been those which repealed some previous act of legislation; and I, for myself, do not hesitate to affirm that the immediate repeal of the Silver Coinage Act would be a most timely illustration of the truth of his maxim."

A correspondent sends us the following account of an experiment made a number of years ago by a scientific man, to ascertain whether or not a diamond was capable of retaining light: It was before the days of electric light, and the only resource was a powerful battery belonging to the city of Boston and used for fire alarm purposes. Two points were arranged so as to produce almost a constant stream of electricity. In the evening the diamond was placed within two or three inches of this strong light for ten or twelve minutes, and then the light was shut off leaving the room in utter darkness, but the diamond remained illuminated almost like a white heat, but gradually fading, until after some ten or fifteen minutes it became invisible. There was no apparent heat communicated to the diamond by contact with the electric light, as it was held in the fingers the whole time the experiment was being tried. Our correspondent desires a scientific explanation of how or why the diamond possesses the power of *retaining light*.

Early in the past month several well known travelers for jewelry houses chanced to meet in Chicago, and Monday evening, Sept. 7, were entertained at a private dinner by Mr. John Jackson at his residence in that city. The entertainment, including an elegant dinner, was enjoyable in every respect, doing credit to the social and hospitable characteristics of the host. Among those present were F. J. Gardner, B. L. Hall, E. Eaton, Geo. Parks, Harry Scofield, G. C. Booth, B. S. Freeman, Jr., Wm. Stowe, C. C. Offerman and Mr. Caleb Clapp, of the firm of Clapp & Davies, of Chicago. The "boys" enjoyed themselves hugely, and it is safe to say that their contribution to the host's enjoyment was full compensation for the hospitality they received at his hands. The "boys" were in fine voice and rendered their specialties in a manner that would have done credit to professionals. Subsequent to the entertainment Mr. Jackson was invited to the hotel and presented with an elegant alligator skin bag by those who had been his guests. This exchange of courtesies between a prominent citizen of Chicago and the "boys on the road" formed one of those pleasant oases in the desert of their daily duty and dreary routine of travel that will be long cherished in the memories of the participants.

We print in this issue of THE CIRCULAR, the first instalment of a new work, by Mr. Kunz, on the precious stones thus far discovered in this country. This is the most important work contributed to the literature of the jewelry trade for many years, giving, as it does, a complete record and description of every variety of precious stone that has been found upon our soil, together with a sketch of the locality where found, and a scientific description of each stone and the circumstances attending the "find." Mr. Kunz is one of the most expert mineralogists of the day, and his classification of precious stones, and his contributions to science on this subject, have been recognized in all parts of the world. Mr. Kunz has made many valuable contributions to our columns in the past and will continue to do so in the future. The publication we begin this month is from the advance sheets of the mineral statistics published by the United States Geological Survey, edited by Albert Williams, Jr., kindly furnished us by Mr. Kunz.

There was a noticeable improvement in trade during the month of September, and orders came in with a freedom not experienced before in a long time. Of course, the expectations of the more sanguine were not met, but those conservative members of the trade, who have looked for improvement to come gradually rather than in the way of a "boom," were satisfied with the month's transactions. Retail dealers are evidently feeling their way, ordering goods only in small quantities, preferring to wait for a legitimate demand for goods to overloading their stocks. Travelers report a better feeling in all sections of the country, dealers being hopeful, and predicting a good average trade for the fall and holiday season. Manufacturers and jobbers are ready with many novelties, and will be only too glad if the demand warrants them in employing their full capacity in men and material in producing goods. They are alive to the improving conditions of trade, keenly active and pushing, and will lose no opportunity for supplying the market. A conservative course, however, is the safest to pursue to avoid overstocking the trade.

Among the buyers in town, during the past month, we noticed: Messrs. F. P. Allen, Poultney, Vt.; M. Hendelman, Towanda, Pa.; L. Roberts, Bristol, Conn.; R. H. Galbraith, of Duhme & Co., and A. Steinan, Jr. Cincinnati, O.; A. Hubbard, of Cowell & Hubbard, Cleveland, O.; L. S. Stowe, Springfield, Mass.; Chas. Van Zandt, Davenport, N. Y.; J. H. Hollister, Detroit, Mich.; Mr. Fowler, of J. H. Pollock & Co., Winnipeg, Man.; J. M. Murphy, Saugerties, N. Y.; A. M. Hill, New Orleans, La.; Mrs. O. Klappenbach, New Braunfels, Texas; E. D. Vosbury, Binghampton, N. Y.; W. R. Beel, Murfreesboro, Tenn.; Mr. Rawls, of Chamberlain & Rawls, Tarboro, N. C.; L. J. Wyatt, Marion, Ala.; H. Prim, Grand Haven, Mich.; S. Tripp, Millerton, N. Y.; Chas. E. Galt, Washington, D. C.; W. W. Wattles, Pittsburgh, Pa.; D. H. Buel, Hartford, Conn.; T. E. Thompson, Galveston, Texas; J. Fricker, Danville, Va.; Geo. W. Banks, of Bailey, Banks & Biddle, Phil., Pa.; Mr. Houston, of J. E. Caldwell & Co., Phila., Pa.; L. Rubin, Ithaca, N. Y.; V. C. Place, Silver City, New Mexico; Wm. Mitchell, Amsterdam, N. Y.; T. P. Wentworth, Bradford, Pa.; K. H. Clarke, of Clarke & Andrews, St. Joseph, Mo.; F. Rave, Plymouth, Pa.; J. O. Watts, Goldsboro, N. C.; Ernest Schall, Hartford Conn.; Otto Stoelker, Montgomery, Ala.; T. C. Tanke, Buffalo, N. Y.; J. Wendell & Son, Oswego, N. Y.; F. H. Bosworth, LeRaysville, Pa.; F. L. Mix, Albany, N. Y.; C. Summerfield, Durham, N. C.; J. B. Capron, New Milford, Conn.; A. Shaw, Newport, N. Y.; R. H. Dunbar, Westerly, R. I.; J. T. Bonestell, of Levison Bros. & Co., San Francisco, Cal.; A. Wittich, of Wittich & Kinsel, Columbus, Ga.; Mr. Thomas, of Carrington, Thomas & Co., Charleston, S. C.; Mr. McOsker, of Allen & McOsker, Rome, Ga.; A. M. Murphy, Tyler, Texas; L. Krower, of J. Lazarus' Sons, New Orleans, La.; J. A. Henneman, Spartenberg, S. C.



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## THE JEWELERS' CIRCULAR AND HOROLOGICAL REVIEW

*Official representative of THE JEWELERS' LEAGUE and of THE NEW YORK JEWELERS' BOARD OF TRADE, and the recognized exponent of Trade Interests.*

A Monthly Journal devoted to the interests of Watchmakers, Jewelers, Silver-smiths, Electro-plate Manufacturers, and those engaged in the kindred branches of art industry.

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### Return of Substantial Prosperity.

THE CIRCULAR has been a persistent and consistent believer in the proposition that the resources of this country were too great, and the indomitable energy and enterprise of our people too pronounced to permit of a prolonged period of commercial depression. That we are afflicted with periodical seasons of financial stringency and consequent dullness of trade, is due to the fact that we lose sight of the elements of permanent and substantial success, and are led away by that will-o'-the-wisp, speculation. About once in ten years a speculative mania seems to seize possession of our people, and at that time the wildest schemes for accumulating riches suddenly are the ones that receive the greatest amount of attention. The plodding channels of legitimate business are deserted, and the capital required in industrial enterprises is withdrawn and invested in visionary speculations that promise sudden wealth, but which prove to be the merest bubbles whose final bursting carry disaster to thousands. After such a period of wild speculation come reaction and depression, during which time all business interests suffer. We have just been passing through such a period of depression; during the speculative era of a few years ago fictitious values were given to purely speculative properties, and millions upon millions of dollars were diverted from legitimate business enterprises and turned into the whirlpool of speculation. When the collapse came, the depreciation in values, amounting to hundreds of millions of dollars, was greater than followed the panic of 1873. But the substantial resources of the country were such that this enormous shrinkage of values was met without creating a panic, but general stagnation followed in all lines of business. The reaction from this condition has

at last set in, and a season of substantial prosperity may now be looked for. How long it will last is dependent upon the length of time the people can control the desire for the sudden accumulation of riches, abstain from gambling speculations and be content to confine their energies to the prosecution of legitimate business.

The general revival of business is visible on every side. It is no ephemeral "boom," whose ebb is ever as sudden as its flow, nor is it in any degree the effect of combinations to force temporary advances in values. It is the natural, logical returning tide of business prosperity that has its foundation in the productive wealth, the enforced frugality and the unquestioned solvency of the country at large. Seldom in the history of the country have industrial circles been as conservative as they are to-day; seldom have the economies of life been so rigidly enforced, and seldom have the relations between the debtor and creditor classes been so nearly on terms of equality as they now are; liquidation was never so nearly complete as at present. The business revival the country has fairly entered upon bids fair to be substantial and enduring because it has the broadest and safest basis on which to rest—the resources of a most prolific country from which the speculative spirit has been to a great degree eliminated. The balance of trade is well maintained in our favor, our exports exceeding our imports in value, and in all our seasons of prosperity the conditions have never been more favorable for a prolonged period of success than they are at present. The crops of the North and West furnish an immense surplus for the markets of the world; the staples of the South are in excess of the average yield by many millions of dollars of value; all industrial enterprises are quickened by the increasing demand for their products; while skilled labor is again in demand at fair rates of compensation, capitalists are finding uses for their surplus accumulations in promoting the productive enterprises of life. In short, there is not an enterprise of industry, commerce or trade that is not materially stimulated by the general and healthy improvement of the times.

While congratulating ourselves upon the betterment of business conditions, we should not fail to consider the present situation of that section of the country that was so recently devastated by war, and has since been undergoing a complete revolution in its social, industrial and productive resources. The wonderfully improved condition of the South is one of the most potent factors in our national prosperity, and should not be overlooked by the producers of other sections who are seeking profitable markets for their products. According to the latest revised estimates, the cotton crop this year will exceed by a million bales the crop of any previous year, and this alone will give the South some \$50,000,000 of revenue in excess of what she has heretofore enjoyed; the yield of corn is estimated at fifty million bushels in excess of the average crop, and a large increase in the production of rice, tobacco, sugar, fruits, etc., is reported, making an aggregate of productions exceeding the productions of any previous year by at least \$100,000,000. A very large proportion of this vast aggregate will find its way into the hands of northern manufacturers, for the lessons of adversity have

not been lost upon our brethren of the South, but from them they have learned that their prosperity lies in the development of their national resources, while the abolishment of slavery has forced them to put to practical uses their own enterprise and energy. The realization of such magnificent results from the labor of the past few years will do more toward bringing to the front the industrial resources of the South, than did the previous century under the old system of slave labor. This increasing prosperity of the South will tend to make new markets for northern enterprise to supply, and a larger interchange of the products of the two sections will tend to lighten the burdens of all, and secure that permanent prosperity that should be ours at all times.

Let us hope that there will be no returns of fictitiously prosperous seasons, such as prevailed from 1861 to 1873, when speculation ran riot through the land and actual values were ignored in general business transactions; when the public mind was debauched by an inordinate desire on the part of almost every one to accumulate sudden wealth. The return to honest industry and legitimate business enterprise has been attended with heavy losses and great privation, but if these losses and privations have taught us that the only sure and permanent prosperity comes from honest industry, the lesson will be worth all it has cost. We must, as a business community, become more modest in our ideas of wealth; money will probably never again command the rates of interest it has in the past, and incomes will be reduced correspondingly; a fortune, or even a modest competence, cannot be amassed in a day or a month, but must come as the result of persistent plodding. With the passing away of the speculative mania, passes also the possibility for unscrupulous adventurers to impose upon the public with fraudulent enterprises, watered stocks and worthless bonds based upon intangible speculations. Legitimate business is the only safe and sure road to financial success. The industrial demands of the country open up so many avenues for honest enterprise that no one need suffer for lack of opportunity, while each can be made a channel of prosperous thrift, contributing its share to the general prosperity of the nation. If the energy and enterprise of the masses are honestly devoted to the development of our natural resources, and speculation of all kinds renounced, there need never again occur to us a period of financial depression and such a burden of business stagnation as we have been struggling under for the past three years.

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#### Goods on Memorandum.

**N**OW THAT the trade has begun to feel, to a greater or lesser extent, the impetus of the general improvement in business, a few words about the memorandum abuse will not be out of place. Manufacturers and jobbers are naturally inclined to extend to the retail trade every courtesy and accommodation that is practicable; it is to their interest to do so, for everything that tends to build up and strengthen the retail dealers strengthens themselves. But the retail trade should not lose sight of the fact that what is an accommodation to them is necessarily a tax upon those who accommodate them. There are no favors in business that do not include corresponding burdens that some one must bear, and seldom is this fact more clearly demonstrated than in the practice that has become so general, of requesting goods to be forwarded on memorandum—to be paid for if sold or returned if not disposed of. This practice has been tolerated by wholesale dealers because it was a help to retail dealers, enabling them to exhibit samples of goods for which they had incurred no liability, and giving them an opportunity to offer customers a better opportunity for selection than they could otherwise afford. But this courtesy has grown into an abuse of magnificent proportions, and instead of being accepted by the retail trade as an accommodation has come to be demanded as a right. Some retail dealers are in the habit of sending in this manner for samples of all new goods that are brought out, demanding that a full line be sent them on memorandum—not that

they have purchasers for them in view, but that they may see them themselves, display them for a time as new stock and an indication of their enterprise, and then return them after they have become shop worn. The wholesale dealers, in order to supply this demand for memorandum goods, are forced to carry a much larger stock than they would otherwise do, for they must have a stock on hand as well as a stock traveling about the country unsold and liable to be turned back on their hands at any moment. We could cite instances where retail dealers have ordered goods on memorandum in the course of a year whose value was three times greater than the aggregate of their purchases during that time—in other words, for every dollar's worth of actual purchases, they have had four dollars' worth of goods to operate with. The wholesale trade feels that this is a burden imposed upon them for which there is no necessity. They do not object to sending out memorandum goods in reason, but such heavy drains upon them as are now made is an abuse of courtesy that demands curtailment. If retail dealers would but remember that there are thousands of them in the business, and consider that each expects such favors, they would readily see the necessity for limiting their orders for goods on memorandum to their absolute requirements. Retail dealers are sometimes required to send out an article on approval, but they are seldom deprived of its use for more than twenty-four hours, whereas the wholesale dealer is fortunate if the goods he sends out on memorandum are returned to him in thirty days. In many cases the goods are so injured while on their travels that they have to be sent at once to the factory to be restored to a salable condition. Then the express charges to and fro are frequently left for the jobber to pay, so that he is subjected to actual pecuniary loss in his efforts to oblige his customers. The very least the retail dealers can decently do is to pay all charges on memorandum goods, send them back promptly and see that they are safely packed when returned, so that they may be in marketable condition when they reach their owner.

There really seems to be but very little necessity for requiring goods to be sent on memorandum. Manufacturers and jobbers use every available means to keep the retail trade informed regarding new styles of goods; they advertise in the trade journals, send out special circulars without limit, issue illustrated catalogues, write personal letters, and are under heavy expense to maintain an army of competent travelers to exhibit their goods and take orders for them. Every retail dealer in the land should, through these means, be familiar not only with all standard goods, but regarding all novelties that are introduced. If he does this, and is as familiar as he should be with what is going on in the trade, there is no necessity for his ordering goods on memorandum except it be to comply with the actual wants of a customer. If limited absolutely to such cases, the demand for memorandum goods would neither be onerous nor objectionable. The profits of the wholesale trade lie in duplicating orders, and it is expected that every bill of goods sent out will bring an order for more of the same kind. If the goods are returned, he who sent them out is disappointed, for instead of the sale he expected he must take them up again as stock on hand. Possibly during their absence he has lost the opportunity of selling them, and this fact will add to his ill-humor, and tend to still further disgust him with the memorandum practice. The wholesale trade does not desire to entirely abolish this practice, but they ask the retail trade to exercise greater consideration in the matter, limiting their requests for such accommodation to their actual necessities. After the long period of comparative stagnation through which the trade has passed, it should be the aim of every member of it to do all he can to promote the general good and aid it in its struggles to secure substantial and permanent prosperity.

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#### A Word for Makers of Fine Goods.

**O**UR DUTY as journalists, seeking to promote the best interests of the jewelry trade in all its branches, compels us so frequently

to denounce deceptive goods and fraudulent practices, that we feel sometimes as though we had degenerated into a common scold, and might convey the impression that there is no virtue left in the trade. We have at all times sought to make a just discrimination between the true and the false, but it requires so much more effort to put down the false than it does to sustain the true, that we may possibly be accused of neglecting the honest manufacturers and dealers in our zeal to expose those who are less scrupulous. But we regard every word we print in opposition to dishonest practices as an effort to sustain legitimate trade, and so have not thought it necessary to sound the praises of those who are earnestly striving to maintain the well earned reputation of American gold and silversmiths. As a matter of fact, the trade has never been so well supplied with fine goods, remarkable as well for their intrinsic value as for the artistic elegance of their design, workmanship and ornamentation. The sporting proclivities of our people, who have of late years developed a wonderful fondness for out-of-door sports of all kinds, has created a demand for elaborate examples of the goldsmiths' art in the way of prizes to be awarded to the victors by sea and by land in the various contests for supremacy that are of such frequent occurrence. Championship cups, services of plate, medals and other articles of value afford abundant opportunity for the display of the artistic fancies of designers and the skillful workmanship of expert artisans. But there is a constantly growing demand for gold and silver plate and articles of virtu as well as of personal decoration. The number of persons who can afford the luxuries of life and to indulge their refined tastes is constantly increasing as the country grows older and adds to its wealth. To supply this growing demand for fine goods requires the employment of a large army of designers and skilled workmen, wherein is to be found many who have no superiors in their particular lines. A prominent characteristic of American goods is their originality. Our workmen are no longer dependent upon the older countries for their designs any more than they are for the mechanical skill that gives them shape and form, and some of the most elaborate examples of artistic metal work produced of late years are purely American in conception and elaboration. In fine goods for personal decoration the same element of originality is to be found, and never was there so little copying done as at the present time. There are many houses in the trade that have earned enviable reputations for the standard quality of their productions, who will never put their name to an article that is not fully up to the highest standard of workmanship and intrinsic value. Whatever they offer is made upon honor, and with them a stamp "18-k." means eighteen karats fine, and the word "sterling" correctly represents the intrinsic value of the article so marked.

The same degree of integrity characterizes a majority of the manufacturers of the cheaper grades of goods. They make plated goods and sell them as plate, not as pure gold or silver goods. For such goods there is a legitimate demand, and he who supplies it honestly is as legitimate a manufacturer or dealer as he who deals in the genuine goods exclusively. Such men make up the majority of those engaged in the jewelry business, and it would be as manifestly unfair to say that the jewelry trade is a fraudulent one, because a few unscrupulous dealers impose base goods upon the public, as it would to say that we are a nation of murderers because some one is assassinated every few days. But as murderers and their doings occupy considerable space in the public prints and in the public attention, so it is but natural that we should chronicle in our columns the doings of the fraudulent manufacturers of jewelry. It is always the moiety of evil in a community that is conspicuous rather than the virtue that predominates. The jewelry trade has always been reputed as one of the most honorable callings, and its members have been among the most esteemed citizens of any community. They have lost none of their prestige in this respect in modern times, but have added great skill and intelligence to the prosecution of the business. As a class no business men are more honored by public confidence, and as individuals they are enterprising, pushing, intelligent, capable

business men of honesty and integrity. By their enterprise they are advancing all branches of the art and business to which they are devoted, while the inventive genius to be found in their ranks is the marvel of the world. If we at any time omit to give proper credit to virtue in the trade it is because we are so intent upon exposing the few unscrupulous men who seek to prostitute it, and because, further, we fully believe that "virtue is its own reward" and needs no special commendation.

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### Sacrificing Quality to Price.

WE HAVE at various times entered a vigorous protest against manufacturers sacrificing the quality of their goods in order to meet a demand for lower prices. The jewelry trade is not one to cater to cheapness; it deals in precious metals and stones, in articles of refinement and luxury, and its aim should be to advance the standard of quality, rather than to degrade it. There can be no objection, of course, to making goods of different grades, but manufacturers should resist any pressure that may be brought to bear on them to induce them to degrade the quality of one grade in order to make it fill the place of goods of a lower grade. The maker of gold goods should not degrade his metal, for the purpose of entering into competition with the manufacturer of plated goods, nor should the latter degrade his standard of quality in order to comply with a demand for cheaper goods. It should be the aim of every one in the business to "step up higher," by improving the style and character of his goods instead of seeking to lower the standard of his own work by catering to those who demand everything at a little lower price than the manufacturer can afford to sell. Every such bid for cheap patronage must be made at the expense of quality; the people need no education in cheapening their purchases, but they do need to be educated to a better appreciation of that which is artistic and beautiful. The more this can be cultivated the greater will be the demand for the better grades of jewelry. We are aware that manufacturers are besought by the retail trade to give them low priced goods; the cry comes up constantly "give me something that looks genuine but that I can sell cheap." There is a constant pressure brought to bear on the manufacturer to reduce his standard of quality to meet this demand for cheap goods, but the retail dealers make a great mistake when they become parties to it. Very little more effort is required to sell first-class goods than to dispose of those which are classed as "cheap and nasty," and the profit to the dealer is proportionately greater. He can afford to take a little more trouble to sell an article on which his profit is \$2 than he can to sell a cheaper article on which his profit is \$1. But he will frequently have to sell half a dozen cheap articles to as many different customers to realize as much profit as he would by the sale of one genuine article of jewelry, the price of which would not be greater than the aggregate of the half dozen cheap articles. The time consumed in selling the six customers could be better employed in educating the one customer up to appreciate and buy the one article. A man who has been persuaded to buy one genuine article of jewelry will not be content with trashy stuff thereafter, but will crave that which will correspond with what he has, and thus one sale helps on another. The retail dealers are the last persons who should encourage any cheapening of the quality of the goods they handle.

Not only does this cry for cheap goods react to the injustice of the retail trade, but it encourages the manufacture of fraudulent goods. Unthinking dealers want goods that have the appearance of being genuine—as to their intrinsic value they care little—but insist that they shall be supplied to them at a price below what they know the genuine goods would cost. So the manufacturer is tempted to make 14-k. goods out of 10-k. gold, in order to meet the dealers' wishes and at the same time give him the margin of profit he must maintain. This is a deliberate, premeditated swindle of the public, to which the dealer

is accessory. In selling such goods he knows they are not what they are represented to be, because he knows the price he paid for them was less than what genuine goods are worth. Both he and the manufacturer could be prosecuted for obtaining money by false pretences, and we are surprised that purchasers who have been deceived have not sought this legal remedy.

If there is no other incentive to induce the trade to preserve the quality of its goods, policy alone should be sufficient to influence them. Degraded quality tends to bring the trade into contempt, to make mere hucksters of those engaged in doing it, and is calculated to bring cheap goods into use in preference to those of the higher grades. The profits of the trade do not lie in the number of articles sold, but upon the aggregate amount received from sales, and it may be safely said that the fewer articles required to make up the aggregate the greater the profit to the seller. The best manufacturers in the trade are constantly striving to elevate its character by improving the quality of their work, and maintaining the intrinsic value of their goods; their efforts are being better appreciated year by year, as is shown by their increasing sales. The public is always ready to recognize true merit, and to reward it. This is a reason why fine goods sell better in hard times than the cheaper grades; they appeal to a class that can afford to buy at any time, and the purchase of goods of absolute value is often looked upon as a safe investment. A fine gold watch or a genuine gold ring, to say nothing of the precious stones, is always good collateral security if a man wants to borrow money, when a cheap article of jewelry would not count in such an emergency. Our friends of the "three balls" know the difference between the genuine and the bogus, and many a purchaser of jewelry has "his uncle" in mind when investing in personal adornments. Laying aside entirely the fact that it is the duty of every man to elevate and improve his calling to the full extent of his power, as a mere matter of policy and profit, every jeweler in the land should do what in him lies to maintain a high standard of quality in the goods he handles, but, above all, he should discourage and denounce every misrepresentation of quality or attempt to palm off fraudulent goods upon the public. Dishonesty is dishonesty under whatever guise it may be concealed—and is no more to be tolerated in an article of jewelry than in a barrel of flour.

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### Protecting the Retail Trade.

VERY MUCH has been said of late about manufacturers and jobbers being desirous of protecting the retail trade, and the National Association of Jobbers in Movements and Cases was organized ostensibly for that purpose—at least, its promoters have been solicitous from the first that retail dealers should be informed that the Association would use its best efforts to guard their rights and interests in whatever action it might take. The standing in the trade of the gentlemen composing this Association precludes the idea that they are acting otherwise than in good faith, and it is therefore to be assumed without question that they are honest and sincere in their desire that the retail trade shall be protected. The chief grievance of the retail dealers is that jobbers, and even manufacturers, contribute largely to create and maintain an unhealthy competition in the retailing of jewelry, even going so far as to enter the retail field themselves and selling their goods to outsiders at the same prices they sell them to the regular dealer. So long as this complaint is true there must continue to be a feeling of hostility towards the wholesale dealers on the part of the retailers. Unfortunately, the Association is not broad enough in its scope to include all persons who are wholesalers of jewelry, but, as its title indicates, is limited to those who handle movements and cases. But even these are not prohibited by any act of the Association from selling goods at retail. The retail dealers have noticed this omission, and those of Wisconsin have united in asking the manufacturers of movements

to refuse to recognize as jobbers those who claim to be such yet persist in selling at retail. But the retail dealers should not stop here; let them report to these manufacturers the names of the offending jobbers and furnish the evidence for the manufacturers to act on. The latter cannot watch every jobber they sell to, nor can they hunt up evidence to convict them of violating the terms of their agreements, but if the proof is submitted by those who are injured by the practice, the manufacturers stand pledged to refuse to further recognize the offender as a jobber, and to cut him off from all the privileges accorded to jobbers. But the retail dealers must do something towards protecting themselves, and not fold their hands and supinely wait for the manufacturers or jobbers to enforce their rights. It is a very easy matter for men to complain and ask others to set the world aright, and to still further grumble if they do not do it, but the surest way to obtain help is to help yourself. Put your own shoulder to the wheel, and then, perhaps, Jupiter will aid in getting the wagon out of the mire. The National Association promises protection to the retail dealers, and if the latter doubt its sincerity, let them make a test case of the first one of its members they detect trying to rob them of their trade.

But, as we have said before, this Association is not broad enough in its scope to include all the manufacturers and jobbers with whom the retail dealer is brought in contact, or, in fact, to discipline its own members for offenses committed regarding any other classes of goods than movements and cases. A member of that organization in good standing may with impunity violate every recognized business principle in the trade so long as he does not include movements or cases in his transactions. This is no fault of that organization, for it was not intended by its promoters to include other branches of trade, but simply to remedy some evils from which they especially were suffering. It is well enough that special lines of industry should have such organizations, but there should be another one comprehensive enough to include the manufacturers and jobbers in all those lines of goods that are recognized as standard by the jewelry trade. Such an organization might give in full that protection to the retail trade that the other promises in part. Whether the varied interests involved can ever be brought into one harmonious organization for the good of the trade is a problem that will only be solved when the attempt is made to do it. Retail dealers might contribute materially to this end if they would organize in a practical manner for the purpose of redressing their grievances. It is in their power, by concerted action, to secure anything they may want that is reasonable and fair, but so long as they are unorganized they offer themselves as victims to all the bad practices that are begot by excessive competition. Such organizations as they have attempted heretofore have failed because they were not devoted to objects of a practical nature, but were led astray by the impractical propositions of visionaries and schemers. There is no question but many of the complaints of the retail dealers are well founded, and that they are the victims of trade abuses to a considerable extent, but they will never correct these evils by wailing and wringing their hands and calling upon the wholesale trade to protect them. The best protection they can get is that of their own providing. But the fact that they are not, as a class, self-helpful and aggressive, does not relieve the wholesale trade of its moral obligation to protect its best customers, nor give it license to undermine those customers by following unbusinesslike methods. When a person announces himself to be a jobber in jewelry and seeks the patronage of the retail trade on that basis, he has no moral right whatever to seek a retail trade, for by so doing he is undermining the business of his own customers whose trade he has virtually promised to protect. The very announcement that he is a jobber implies an obligation on his part that he will not sell goods at retail; under such promise, positive or implied, that he will not enter into competition with them, he asks the patronage of the retail dealers. For him to sell at retail, or offer inducements to outsiders to buy his goods in order that they may compete with the regular dealers, is such an unbusinesslike transaction that it might



well be characterized as dishonorable. This evil is one of great magnitude and has done more than any other one thing to demoralize the jewelry trade. Retail dealers are made to compete not only with outsiders, who have no further interest in the trade than what they can make out of it, but with the very men of whom they buy their goods. The practice cannot be denounced in too vigorous terms, nor can the measures adopted for remedying the evil be too vigorously enforced. Any jobber who sells goods to persons outside of the trade at wholesale prices should be summarily stricken from the list of jobbers, and deprived of all the special privileges accorded to such. This is the most effective way of protecting the retail dealers, and they should combine among themselves to secure that punishment of those who undermine them and rob them of their trade.

[Reprinted from the Mineral Statistics of the United States for 1883-1884. Edited by Mr. Albert Williams, Jr. Published by the Geological Survey.]

### Precious Stones.

BY GEORGE F. KUNZ.

*Continued from page 289.*

MR. H. G. HANKS visited Cherokee Flat with the intention of studying the celebrated diamond localities, and was informed by Mr. A. McDermott, of Oroville, of a diamond the size of a pea and quite round, which had been sent to him in 1862. They are found in cleaning up the sluices and undercurrents. The first notice of a diamond being found here was in 1853. The largest one, now in the possession of Mr. John More, weighs  $2\frac{1}{4}$  karats, 9 grains. Fifty to sixty stones in all have been found here, of which some were rose-colored and yellow, and others white, and all were associated with zircon, platinum, iridium, magnetite, gold, etc.

Microscopic diamonds were reported from the platinum sands of the Trinity river by Prof. F. Woehler, of Gottingen, with similar associations as at Cherokee. In all the northern counties of California drained by the Trinity river, in the vicinity of Coos bay in Oregon, and on the banks of Smith river, Del Norte county, diamonds may be looked for in the flumes and sluices.

A fine diamond from the Spring Valley mine at Cherokee, Butte county, was presented to the California State museum by Mr. G. F. Williams, superintendent of the mine. Two diamonds from here, one cut and one uncut, are in the possession of Mr. and Mrs. Harris, of Cherokee. Mrs. W. C. Hendricks, of Morris Ravine, near Oroville, has also a fine Cherokee diamond set in a ring. A diamond found in 1861, weighing 6 grains ( $=1\frac{1}{2}$  karats) is now in the possession of Mr. John Bidwell, of Chico. It was from a locality  $1\frac{1}{2}$  miles northwest of Yankee Hill, Butte county, and has been cut in Boston.

Mr. C. G. Yale furnishes the following notes on the California occurrences: "For a period of more than thirty years the placer miners of California have occasionally picked up small diamonds. The hydraulic washings at Cherokee, Butte county, have been the most prolific. The diamonds are usually found by the miners when cleaning up their sluices or while washing off the bed rock, though in some few instances they have been picked up on the surface. As a general thing the gravel in which they occur is mixed with lava, ashes, or other volcanic matter; zircon, platinum, iridium, magnetite, etc., being associated with the diamonds. While many of these stones have been of good color, brilliant and perfect, none weighing over  $3\frac{1}{2}$  karats have been found in the State. In size they have ranged usually from about half a karat down to stones of microscopic dimensions, the latter being numerous in a few localities. So far as known, \$500 is the highest price for which any California diamond in the rough has been sold, though large numbers have found purchasers at prices ranging from \$10 to \$50, and not a few at as much as \$100. The stones have been of all colors, white, yellow, straw, and rose, and many of good water. A few small diamonds have been found also in the placer diggings of Idaho, being of about the

same quality and occurring under the same conditions as in California. In neither region have diamonds been made the object of special search, those found having been picked up by miners while washing gravel for gold. Fragments of diamonds have been noticed in the tailings from the quartz mills, being the remains of stones which have been broken under the stamps."

Since February, 1884, numerous notices have appeared in the press of the finding of diamonds under very peculiar circumstances. A jeweler of Milwaukee purchased from a lady customer for \$1 a stone which he represented as being a topaz. The stone was reported to have been found eight years before at Eagle, Waukesha county, Wisconsin, having been thrown out from a depth of 60 feet while excavating a well. Two small stones are also reported to have been found here, each weighing less than one-half karat, the larger one first found weighing about 15 karats. One of the smaller stones I examined. All three stones are said to resemble those found at the Cape. The 15 karat stone is slightly off-color, and would, therefore, be worth only about \$300 at the outside on its merits as a diamond. It has been offered at \$1,000, owing to its being the first diamond found in Wisconsin, and it was supposed by the owner that it would be purchased for the State cabinet. Having carefully examined a quantity of the gravel sent to different persons, I have failed to find anything but the regular débris from glacial drift, and, as remarked by one gentleman, believe if the box were to be filled with the drift material from New York City the owner would not discover the difference.

In the latter part of 1883 a diamond was reported to have been found at Nelson Hill, near Blackfoot, Deer Lodge county, Montana. This stone is described as being colorless, and in form dodecahedral, with triangular markings, but is more likely a trigonal trisoctahedron with curved faces. Its specific gravity is said to be about 3.5; its weight about 12 grains. It was pronounced by an old diamond dealer of New York as really a diamond. The person now owning it came into its possession through a Chinaman, who panned it out and handed it to him, and he thinks he has seen many similar stones in the mine.

Mr. J. D. Yerrington, of New York, informs me of a brown diamond weighing 1 karat, and yielding when cut a gem weighing one-half karat, which was found near Philadelphus, Arizona. Two pieces of blue bottle glass that had been rolled so as to lose all form, were naturally supposed by the finder to be sapphires, being in the same locality with the diamond.

To insure the finding of diamonds in a new district one of the best methods is to familiarize the searchers with the luster principally, which can be readily accomplished, as once partly carried out by Mr. Dwight Whiting, of Boston. He suggested selling to the miners small imperfect diamond crystals (bort), mounted in a very inexpensive manner, so as that the entire ring or charm could be sold at from \$5 to \$10. Several thousand searchers thus prepared would soon ascertain whether diamonds really existed, and the crystal would also serve for testing the hardness of the stone as well as the luster. One of the minerals most likely to be mistaken for the diamond is a form of small quartz crystal found principally at Santa Fé and Gallup, New Mexico; Fort Defiance, Arizona; Deadwood, Dakota; and Shell Creek, Nevada. They range in size from 1 to 5 millimeters, and the prism is nearly or entirely obliterated. In addition to this, as a rule, the surface is slightly roughened, and by an inexperienced person is easily mistaken for an octahedron, which is almost universally considered to be the only diamond shape.

The well known "Arizona diamond swindle" was an adroit one, and the locality could hardly have been better selected; but it should not have received so much credence, since gem minerals are so readily recognized by means of their local characteristics by gem-collecting mineralogists.

#### SAPPHIRE GEMS.

*Corundum.*—In North Carolina many corundum localities have been opened, and the material found is often of a very fine color even

if not of gem quality. It was first found in the State by Gen. T. C. Clingman, who came upon a large dark mass of the cleavable variety 3 miles below Marshall, in Madison county. Later on it was found by Dr. C. L. Hunter in reddish and bluish masses at Crowder's mountain, and also at Chubb's and King's mountains, Gaston county.

The largest deposits of the finest material, however, are those in Macon county, near Franklin (see "Mineral Resources of the United States, 1882," page 485). A very interesting variety from here, in addition to the gems, is a white and blue banded form which would afford curious gem stones. The Culsagee or Corundum Hill vein is from 10 to 14 feet thick. Other Macon county localities are Jacobs & Haskett's mine, on Ellijay creek; Robinson's mine, Sugartown Fork; Houston's mine, and Moore & Higton's mine.

At the Jenks mine, at Franklin, was found probably one of the finest known specimens of emerald-green sapphire (oriental emerald). It is the transparent part of a crystal of corundum 4 by 2 by 1½ inches, from which several gems could be cut that would together furnish from 80 to 100 karats of very fine, almost emerald-green gems (not too dark, as the Siamese), the largest possibly fully 20 karats in weight. As this gem is one of the rarest known, it makes this specimen a very valuable one. It is now in the fine cabinet of Mr. Clarence S. Bement, with a suite of the choicest crystals found at this mine, and its value is over \$1,000.

From near Franklin\* a curious brown variety was found which shows a distinct asteria in sunlight or artificial light when the stone is cut *en cabochon*. Similar crystals have recently been found near Franklin by Mr. E. A. Hutchins, and more recently Dr. T. M. Chatard, at a locality 12 miles from Franklin, found a fine dark brown variety with bronze-like reflections.

In the Hogback mine, Jackson county, on the feldspar hanging wall, sapphire is met with in crystals; at the Cullakenee mine at times a deep ruby-red corundum is found, and also at Penland's on Shooting creek, in Clay county. Two miles northeast of Pigeon river, near the crossing of the Ashville road, in Haywood county, and 2 miles north of this on the west fork of Pigeon river, at the Presley mine, are found some of the finest colored specimens of blue and grayish-blue corundum. Twenty miles northeast of this, at the Carter mine, fine white and pink corundum is found in crystals and in a laminated form.

Blue, bluish-white, and reddish corundum is found at Swannanoa Gap, Buncombe county.

Mr. J. A. D. Stephenson found fine hexagonal prisms of a pale brownish corundum at Belt's ridge, and more recently some very fair colors from several new localities near Statesville, North Carolina.

A very fine black corundum crystal is in the Vaux cabinet at the Philadelphia Academy of Natural Sciences, the locality given being Buncombe county, North Carolina. This cabinet has also a fine ruby-colored corundum from Buck's creek, Clay county, and another from Hogback, Jackson county.

The gravel deposits of Burke, McDowell and Rutherford counties contain small grains and crystals of corundum usually altered into damourite.

Mr. E. A. Hutchins, who is doing much to develop the corundum properties of North Carolina, has some very fine opalescent and deep indigo-colored corundum from near Franklin and elsewhere in Macon county.

One of the principal Pennsylvania localities is near Black Horse, near Media, Middletown township, Delaware county; the cleavage plains of the crystals show a bronze luster, and the crystals have usually fixed asterias shown by Dr. Isaac C. Lea† to be produced by included crystals. They are here found in a feldspathic rock. Near here are also crystals, found loose in the soil, at times 4 to 6 inches

in length. After sinking a 60-foot shaft fully 50 tons were mined here, but work has been abandoned.

Mineral Hill, near Media, has furnished large brown and altered crystals.

Near Village Green, Ashton township, Delaware county, large brown crystals have often been found with the brown luster. Dr. Genth mentions a small mass of grayish and blue corundum with good cleavage in the vicinity of the chrome mines, Lancaster county, Pennsylvania.

In Chester county, near Fremont, West Nottingham township, and 2 miles south of Oxford, corundum has been observed with albite. Near Unionville, Newlin township, are several localities of interest, also 1½ miles north of this locality loose crystals 3 to 4 inches in length were found in the soil.‡

Mr. W. W. Jefferis described a new locality on the south side of the Serpentine ridge, in Newlin township, Chester county, and fully 500 pounds of massive blue corundum had been taken out.

Mr. Louis Zimmer, of New York, possesses a fine large crystal of corundum of a deep blue color, found by him 40 miles north of Richmond, Louisa county, Virginia.

Professor Wilson, of Chicago, is reported to have found a large deposit of corundum at Lone mountain, Pennsylvania. Good blue corundum has been found on Sequale creek, Georgia.

Prof. C. U. Shepard§ mentions specimens of asteriated sapphire from Litchfield, Connecticut, lacking, however, the transparency requisite to a good gem.

Hoffmann|| mentions impure columnar corundum in fragments nearly 1 inch in diameter from Silver Peak, Nevada.

In Dr. F. A. Genth's suite of corundums are some that would afford opalescent stones with fixed stars, and other interesting forms from North Carolina and Pennsylvania. Many fine examples of corundums that would afford mineralogical and interesting gems from Pennsylvania are in the cabinets of Mr. W. W. Jefferis, now of Philadelphia, Mr. Lewis Palmer, of Media, and Dr. Cardesa, of Claymont. Specimens from Pennsylvania and North Carolina are to be found in the cabinets of Mr. Clarence S. Bement, Col. Joseph Wilcox, and Dr. Isaac Lea, and in the W. S. Vaux cabinet at the Philadelphia Academy of Natural Sciences. At present, however, the finest of the sapphires for the gem trade really all come from near Helena, Montana, collected there by the miners in the sluice boxes of the placer mines. These are rolled crystals, rarely over one-quarter to one-half inch long, and the colors are pale but brilliant. In the gravels of the upper Missouri river, in Montana, corundum is also found in placer mining.

The largest known crystal of sapphire¶ is the one found at the Jenks mine near Franklin, Macon county, North Carolina, about 1872. It weighs 312 pounds and is both red and blue (ruby and sapphire) in color. It is now in the Shepard collection at Amherst College, and escaped the disastrous fire of 1882, which destroyed so many of the fine objects there.

*Chrysoberyl* has been found at Stow,\* Maine, in masses weighing 5 pounds each, and also in single distorted crystals 3 by 5 by 1 inches, of an opaque color; these may in part furnish very poor chrysoberyl cat's-eyes. Large masses have also been found at Canton, Maine, of a somewhat similar character; and recently, perfect, small, and very distinct crystals of no gem value have been found in fibrolite at a new locality in Stow, Maine. Peru, Maine, has also afforded some crystals, though this locality is now exhausted. Mr. N. H. Perry found one small, very perfect crystal at Tubbs' Ledge, Maine, and it has also been observed at Speckled mountain, and at Stoneham,

‡ Proceedings Mineralogical Section Philadelphia Academy of Natural Sciences, 1879.

§ "Report on Minerals of Connecticut, 1837," page 64.

|| "Mineralogy of Nevada."

¶ See paper on corundum, *Popular Science Monthly*, Vol. XXII., page 452, February, 1874.

\* Transactions New York Academy of Sciences, January 22, 1883.

\* Transactions New York Academy of Natural Science, March, 1884.

† Proceedings Philadelphia Academy of Natural Sciences, May, 1869.

Oxford county, Maine, near the Stow line, by Professor Verrill; also at Norway.

Rev. Frederick Merrick stated that he had collected fifty years ago some crystals that he believed would furnish gems, but perhaps not of the finest quality, at Haddam, Connecticut, an old and well-known locality, now exhausted. The Greenfield locality, 1 mile north of Saratoga Springs, New York, afforded many beautiful crystals, but is now also exhausted. It was also found in New Hampshire in granite, at the deep cut of the Northern railroad at Orange Summit. None of these localities, however, have furnished a fine gem. The most promising localities are those near Stow, Peru, and Canton, Maine, and gems, if found at all, will be likely to be found here. The alexandrite variety of chrysoberyl has not been observed at any American locality.

*Spinel.*—Mr. Silas C. Young, who has collected minerals in Orange county, New York, for over twenty years, writes that in the past he has collected small ruby spinels, also others of a smoky and purple tint sufficiently clear to cut, and that the locality at Hamburg, New Jersey, was discovered by his father over fifty years ago. The region of granular limestone and serpentine in which spinels abound is from Amity, New York, to Andover, New Jersey, a distance of 30 miles. Monroe, Norwich, and Cornwall (New York), and Vernon, Sparta, Franklin, and Hamburg (New Jersey), are well-known localities. The locality known as Monroe, New York, which furnished the monster spinel crystals so well known to collectors of twenty years ago, is really somewhere between Monroe and Southfield. Its exact location was known only to two persons, Mr. Silas Horton and Mr. John Jenkins, both mineralogists, who worked it for some years by moonlight for secrecy, and from it took crystals that realized over \$6,000. The locality furnished many fine crystals that were ruined in blasting and breaking out. Since the death of the former miners the position of this most wonderful locality has been unknown. All this region has afforded an occasional gem stone.

The gahnite from the Deak mine, Mitchell county, North Carolina, is of a very dark green color, translucent on the edges, and appears to be compact enough for cutting. The localities of Franklin and Sterling, New Jersey, have afforded some of the finest known crystals of this mineral, which would cut into mineralogical gems. At the lead mine at Canton, Georgia, some fine ones were found on galenite. Dr. F. A. Genth mentions in his "Contributions to Mineralogy" large, rough crystals 9 centimeters long from the Cotopaxi mine, Chaffee county, Colorado. Mr. William Tatham, of Philadelphia, sent me a specimen of gahnite from some lead mine in New Mexico; the crystals were from one-eighth to three-eighths inch across, bright polished octahedrons embedded in galenite. This most interesting and curious association was accompanied with massive garnet. The crystals were translucent on the edges. This locality may rightfully be regarded one of the most interesting for this variety, and it is to be regretted that more exact information cannot be obtained regarding it. At none of these places has this material been found sufficiently fine to make a good gem.

*Topaz.*—The Platte mountain topaz locality, near Pike's peak, described by Rev. R. T. Cross† and by Mr. Whitman Cross,‡ has been prospected very extensively during the last fourteen months, and many fine crystals of topaz have been found, some of them yielding cut stones from 10 to 193 karats each in weight, and in color ranging from colorless to a rich cinnamon brown, and entirely free from flaws. One of the larger ones, belonging to the cabinet of Mrs. M. J. Chase, weighs 125 karats, and is as fine a gem as America has produced of any kind. These crystals are equal in quality to many of the finest of the same size from Siberia, and one fragment of good color but flawed has been found here which weighed 2 pounds. The crystals found in this locality, over one hundred in all, during fourteen months, have sold for nearly \$1,000, at a valua-

tion of from 50 cents to \$100 each. At Crystal peak, near Pike's peak, on large amazonstone crystals, topaz is found of a slightly different type, with phenakite, and also different in form, from the Pike's peak variety. Some occur over 1 inch long and quite thick. Prof. J. E. Clayton, of Salt Lake City, visited the locality mentioned, and it was also visited by Lieutenant Simpson in 1847. Here the topaz occurs in some isolated mountains west of the Sevier lake, and 140 miles southwest of Salt Lake City by the road. The rock is an eruptive overflow of trachyte full of amygdaloidal cavities, in which the topaz crystals are found; they are also disseminated through the body of the rock. The crystals are usually small, from 1 to 100 millimeters long, and from 5 to 8 millimeters across. The wine color, yellow, and blue are very uncommon, the general color being limpid white; they are very brilliant and of remarkable transparency, closely resembling the Durango, Mexico, and the Chaffee county, Colorado, varieties, especially the latter, which in the same rock is associated with small fine crystals of garnet. In the scarcity of water the locality presents almost insuperable obstacles, but will no doubt be revisited in the near future. The Stoneham, Maine, locality has furnished scarcely a fair crystal during the year. Genth and Kerr§ mention that the Crowder's mountain topaz is very doubtful, proving on examination to be kyanite. Pycnite occurs in fine columnar aggregations of a yellowish and brownish-yellow color, associated with garnet, near White's Mills, Gasten county, North Carolina.

*Diaspore.*—Possibly the finest known diaspores are those which were found at the corundum locality near Unionville, in Newlin township, Chester county, Pennsylvania. The crystals were from one-half to 1½ inches in length, and one-quarter of an inch in thickness. The color varies from a white to a fawn color inclining to a topaz, while others are at times of slightly brownish tint. They closely resemble topaz in appearance, and would afford gems as fine as any yet obtained. The finest of these are in the cabinets of Dr. Isaac Lea and Colonel Joseph Wilcox, of Philadelphia.

The emery mines of Chester, Massachusetts, have produced a few small crystals which might be cut into minute cabinet gems.

Mr. John C. Trautwine, of Philadelphia, obtained some minute acicular crystals in a cavity of massive corundum at the Culsagee mine, North Carolina. General T. C. Clingman also observed the mineral associated with blue corundum near Marshall, Madison county, North Carolina.

*Beryl and emerald.*—Prof. Parker Cleveland|| mentions having seen several emeralds from Topsham, Maine, of a lively beautiful green color, scarcely, if any, inferior to the finest Peruvian emeralds; also two¶ rose-colored beryls as having been found at Goshen, Massachusetts. The finding of an emerald at Haddam Connecticut, of a deep green color, an inch in diameter and several inches in length, is mentioned in Bruce's *Mineralogical Journal*, Vol. V., 1, as belonging to Colonel Gibbs' cabinet.

As no true emeralds are in existence from Haddam or Topsham, these may really refer to very dark green beryls.

Of emerald specimens some of the finest in color, though of little gem value, were found during the summer of 1883 at the Stony Point mine, in North Carolina. The finding of fine beryls and emeralds of pale color collected by Mr. J. A. D. Stephenson on the property of J. O. Lackey, 1 mile southwest of the Stony Point deposit, and a short distance from the Lyons property, on which the same mineral was found by Mr. Smeaton, of New York, shows that the deposit is evidently not accidental, and that there is encouragement for future work in this region. Beryl is found in greenish-yellow and deep green crystals, resembling the Siberian, in the South mountains 9 miles southwest of Morganton, Burke county; in the Sugar mountains at Shoup's ford, Dietz's, Huffman's, and Hildebrand's, and in

† *American Journal of Science*, October, 1883.

‡ *American Journal of Science*, October, 1882.

§ "Minerals and Mineral Localities of North Carolina," page 53.

|| "Mineralogy and Geology," by Parker Cleveland, Boston, 1822, page 341.

¶ "Mineralogy and Geology," by Parker Cleveland, Boston, 1822, page 344.

smaller crystals in Jackson county. One fine blue-green crystal in quartz was found at Mills' gold mine, Burke county, and one fine transparent green crystal from near here is now in the cabinet of Mr. M. T. Lynde, of Brooklyn. Fine blue-green aquamarine occurs at Ray's mine on Hurricane mountain, Yancey county, North Carolina. Clear green beryls have been found at Balsam Gap, Buncombe county; Carter's mine, Madison county; Thorn mountain, Macon county; E. Balch's, Catawba county; Fort Defiance, Caldwell county, and at Wells, Gaston county. Some crystals 2 feet long and 7 inches in diameter, that would cut into gems with small clear spots, occur 4 miles south of Bakersville creek, and still others, larger, at Grassy creek, North Carolina.

The Stoneham, Maine, beryls have flocculent centers, with fibrous appearance, and some of these may cut into beryl cat's-eyes.

(To be Continued.)

## Lives of Celebrated Horologists.

DR. ROBERT HOOKE.

THERE STAND, perhaps, very few names upon the list of celebrated horologists who have contributed more to the advancement of horology and scientific pursuits in general than the person whose name heads this article—Dr. Robert Hooke, of England.

The invention of the balance spring exercised so great an influence upon, and proved to be of so powerful an incentive to, the advancement of civilization, that henceforward a new era commences, and the old scientific theories of the past based upon mere presumption, are forced to give way to those obtained from observations, by the assistance of correct time. The astronomer, with the aid of his telescope, sweeps the boundless space of the heavens, and determines the path and revolution of the planets by means of his pendulum and balance spring; the mariner, after weeks of tossing on the maddened billows of the ocean, at the first gleam of the sun seizes his quadrant and consults his balance spring, and knows exactly the locality whither the sport of the waves have drifted his frail bark; the engine driver, assisted by his balance spring, moderates the speed of his prancing steed, that it shall neither run into the trains preceding him, nor slow enough to be overtaken by those following, and thus the lives of his passengers are as safe as at their homes. There is not a branch of industry which does not, directly or indirectly, rely upon the correctness of the balance spring.

An old saying teaches that "given the necessity for an important invention, beneficent to the human race and adapted to its wants, the genius will soon be found to make it." We will be struck with the truth of this observation when we scan the inventions which have resulted as beneficial to mankind, and it was also again verified in this instance.

Robert Hooke was born July 18th, 1635, at Freshwater, Isle of Wight, the most attractive part of England. His health was in the first seven years of his youth so delicate that his father, who was the curate of the town, was forced to instruct the boy at home. He destined him for the church, but the study of Latin was so unfavorable to his health, causing him the most violent headache every time, that his parents resolved to desist from their intention. Left to his own inclination, young Hooke made a wooden clock, which in a rude manner indicated the time of day, and his parents concluded to article him with a watchmaker; his father's death, however, prevented the execution of this plan.

The boy also evinced a talent for painting, and he was entered as pupil of Peter Sely, the celebrated court painter of King Charles II., but his health very soon gave way, and he was compelled to give up painting. His family next concluded to send him to the Westminster school, at that time already one of the best schools in England.

He here made rapid progress in Latin, Greek, Hebrew and other Oriental languages; and with as great a zest he studied Euclid, and invented thirty machines for flying in the air.

In either the year 1650 or 1653, Hooke went to the University of Christ Church, Oxford. In 1655, he was introduced in the Philosophical Society of this place, and was called on to assist Dr. Dillius in his chemical experiments; later on, he continued to work with Boyle for another few years in this science. Dr. Seth Ward, a celebrated teacher of astronomy at Oxford, taught him this science.

In consequence of the study of Ricciobus' *Almagest*, the loan of which he obtained from Dr. Ward, he invented in the years 1656, 1657 or 1658, the balance spring, or perhaps the greatest invention auxiliary to the art of horology made since the invention of the latter. Credit for this invention is sometimes unjustly given to Abbé Hautefeuille or Huyghens, but the latter did not publish it before 1674, and it is an equally incontrovertible fact that the former published his ideas only long afterward.

It is, therefore, established beyond a question that Hooke was engaged with the thought of the balance spring at least fourteen years prior to the others. Dr. Hooke made his invention known to Boyle, who, again, laid it before several other notable scientists, who became so thoroughly imbued with its value, that they formed a company, to take out a patent. The agreement was signed in the year 1663, in which it was stipulated that of the first £6,000 received, Hooke should have three-fourths; of the next £4,000 two-thirds, and of all future receipts one-half; a few of the stockholders, however, had a clause inserted, whereby any one of them, upon an improvement of any kind made on the original invention, should have all the profit had by reason of said improvement.

About the same time, Hooke invented the circular or conical pendulum, which was in 1663 shown in the Royal Society, the invention of which, however, is generally accredited to Huyghens. The organization of this society materially assisted in the diffusion of Hooke's reputation. He published, in the year 1650, a short dissertation on the rising of water taking place in narrow tubes, due to the attraction of capillarity, in which he demonstrated that the height of the water stood in a definite ratio to the width of the pipes. A dispute that occurred on this subject in said society, resulted so decidedly in favor of Dr. Hooke, and earned for him the esteem of the other members to so high a degree, that he was commissioned, in 1662, to institute further inquiries on this subject. In 1663, he prepared a list of problems, still to be solved, for the use of those who should have occasion to visit Iceland or Greenland. They were very numerous; among others, he required to know, "whether there be spirits; and, if so, how they would appear, in what shape, what they would say and do, etc."

In January, 1664, the Royal Society gave him an annuity of £30, for his work as director of experiments, and in the same year he was appointed successor to Dr. Dacres, as professor of geometry, in Gresham College. In 1665, Dr. Hooke submitted to the Royal Society a very small quadrant, which could be used for taking the minutes and seconds. It is irrelevant to detail at large his many inventions.

In the year 1687, he experienced a heavy loss by the death of his brother's daughter, Miss Grace Hooke, who had for several years conducted his household affairs, and another grief was caused him by a lawsuit with Sir John Cuttler, for the payment of his annuity, and when he won it in 1696, he was so supremely happy that he entered in his diary: "I was born July 18th, 1635, but God has permitted me to begin a new life. May I never forget this beneficence, and praise Him as long as I breathe."

Beside the aforesaid inventions, we also owe to Dr. Hooke the invention of the hydrometer, leveling instrument, a recoil escapement, the use of the screw for dividing astronomical instruments, the cutting and rounding machine for watchmakers, and many others. With the view of causing him to finish a few of his inventions, the Royal Society, in 1696, offered him to do it at their expenses, but

his uncertain state of health prevented him from accepting the offer. It is said that for the last two or three years of his life he was seated night and day at his table, so much engrossed at his inventions that he never either undressed or went to bed. In a terribly worn down condition he died, March 3d, 1702, in Gresham College, and was buried in St. Helen's Church, on Bishop's-gate street, London. His funeral was attended by all the members present of the Royal Society.

He was a man of extraordinary inventive genius, and has justly been considered as the greatest of philosophical mechanics; the wonderful sagacity, nay, almost intuition, he showed in deducting correct general laws from meager premises has never before or since been equalled. There was no important invention by any philosopher of that time which was not in part anticipated by Hooke. His theory of gravitation subsequently formed part of Newton's; he anticipated the invention of the steam engine, and the discoveries of the laws of the constrained motions of planets. Among his own completed discoveries are, the law of the extension and compression of elastic bodies, "*ut tensio sic vis*," the simplest theory of the arch; of the balance spring of watches, and the anchor escapements of clocks; the permanency of the temperature of boiling water; the quadrant telescope and microscope are also materially indebted to him.

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### To Replace a Broken Cylinder Plug.

**I**N ORDER to replace an old, worn or broken cylinder plug, do as follows: First take out the old plug, and for this use a punch, the hook of which is as short as possible, and has no sharp, but round corners. Beside the shape of such a punch, also the care expended in hardening and annealing contributes greatly to its usefulness. For hammering out, use also a piece of soft steel sheet, about 3 millimeters (0.08 of an inch thick) in which the holes, Nos. 54 to 70, English gauge, are drilled and numbered. These holes are almost imperceptibly countersunk, and from below enlarged funnel-shape, to about one-half the thickness of the plate.

Next try through which hole the cylinder will closely pass, and then place it upon the next following smaller hole so that only the cylinder shell will stand upright, and the plug to be driven out cannot lodge in it. If in doing this the gauged plate is laid upon a large anvil or other block of iron of considerable weight, it will be possible to drive out very obstinately fixed plugs, which cannot be removed in the ordinary manner, with a slight tap of the hammer. The job is made still more easy if the plug was previously rubbed with a little oil, both outside and within. The plug having been driven out in this manner, immerse the cylinder in benzine for a few minutes, to clean it from the adhering grease and filth.

Then begin with the making of a new steel plug. It is generally turned; this is a very delicate and tedious job, however, as many a watchmaker will have found out to his cost. It is far better, if a small piece of round steel, No. 54, English gauge, or correspondingly thinner, from 0.79 to 1.18 inches long, is hardened, annealed grayish blue, and fastened in a small hand vise, fitted in by filing it thinner upon the filing peg, taking pains to make it imperceptibly tapering. It is evident that this work requires a file of the finest cut. If the steel was taken one or two numbers thicker, the job will not be inferior to a turned pivot. Special care must be had in the hardening of the steel not to heat it beyond red, as it becomes brittle and cracked thereby, and generally breaks when the pivot is turned on or polished.

When the plug fits with tight friction into the shell, shorten it so much that, when driven in, it fits firmly, and is neither too short nor projects inside. A little practice and experience are necessary to hit this point. It will seldom fail, however, if the shape of the plug has been made very little tapering. The lower the cylinder is, the greater the attention to be paid to this matter. Now measure, to ascertain what height the cylinder must have from one pivot end

to the other, and according to this determine the approximate length of the plug. Then cut it off at the proper length, fasten it in a true running tongue of the screw head polishing tool, grind flat and polish first its lower end, and then file a center for the upper end, after having previously flattened it, constantly revolving the tongues upon the screw head polishing tool. Then hammer the plug in the known manner fast into the cylinder. A heavy support will here again offer excellent services. In order not to damage the center in hammering, use a brass hammer.

Then begin with the turning of the pivot. The cylinder shell, to keep it from breaking, is to be strengthened with shellac. This is done by quickly moving it to and fro through a small alcohol flame, paying attention that beside the piece of shellac laid upon, also the cylinder will become sufficiently warm, whereby a more intimate connection is effected, and it becomes more capable of resistance. With a little care, no annealing of the cylinder need be anticipated, a fairly high degree of heat being necessary for this. Small cement chucks are generally used for turning a short cylinder. They are mounted by heating; for large cylinders small screw chucks can also be used; they must be lined with brass, so as not to injure the polish. Turn the plug about two-thirds thinner, then let the cylinder revolve in a hole of the round truing-tool, and take off the center point by gently holding a fine file against it. The height of the cylinder must be considered hereby, which still must be one-half line more than the actual measure.

It is important, when doing this job, that the shoulder of the cylinder shell runs with easy friction in the lathe, in order that the arbor projects through the hole of the round truing tool, so that with a sharply ground graver the flattened end can be turned pointed again. It is clear that the cylinder must hereby run true. After the round truing tool has been taken off, and, between two ordinary centers the undercutting, as well as the arbor, shoulder, and pivot have been turned as smooth and thin as possible, correct the length and thickness of the latter according to the jewel hole, by polishing and rounding upon the polishing tool.

All cylinder pivots should be of a conical shape, since they are then much stronger, and their making does not require more time and skill than ordinary cylindrical pivots. They are made with a three-cornered pivot polishing file, the edges of which are correspondingly ground off. The file must be well sharpened, to be done with medium fine emery upon a flat piece of lead.

It depends generally upon the number of the emery, to give to the burnishing steel a gently cutting sharpness, and this is of a great importance. Workmen who attach no importance to the frequent sharpening of their polishing files, must dearly pay for it by long continued work and frequent breakages, because a dull polishing file generates a glass hard film upon the pivot, and requires an inordinate pressure. It must not be neglected that the polishing file, during its use, must repeatedly be moistened with oil, and that the bearings of the polishing tool must often be cleaned from the collecting steel dirt. For taking off the chuck, heat the cylinder a little, and place it in alcohol, which is to be warmed, for the purpose of cleaning, so as to accelerate the dissolving of the shellac. The remaining thin, resinous film upon it is removed by careful rubbing with a pegwood saturated with alcohol.

If above directions are attended to, the repairer will, with a little skill, only in rare instances fail to turn out a faultless pivot.

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### The Manufacture of Repeating Watches.

*Continued from Page 267.*

**T**HE PASSAGE of the lifting of the hours with the teeth of the twelve-toothed ratchet, corresponding to each of the twelve steps in the hour snail, should then be verified; for that, the slide should be lightly pushed exactly to the point to make the

quarter piece unlock from one to twelve hours. In the case where it sounds one hour too little *on every hour*, the excess of the lifting of the long piece should be taken off, by filing at their point of contact the arm of the rack or the small movable lever, or else the said lever at its point of contact with the unlocking spring. In the case where there should not be an excess of lifting, the end of the arm of the rack should be filed, that is to say, the part which rests against the steps of the snail.

If, in pushing very lightly, it strikes an hour too little on certain steps of the snail, these should be filed to bring them in agreement with the others, and the excess of the lifting of the long piece should be corrected by means of a pin fixed in the plate, against which the said piece will be stopped at the moment of unlocking. The arm of the rack might also be hammered, so as to diminish its play against this, after the moment that it has touched the snail.

If, in pushing the slide with a certain force, it strikes an hour too much *on every hour*, the arm should be hammered, so as to diminish its play against the rack, or else at the part which rests against the snail.

If this part of the arm is found to be already weak, the first process is preferable; nevertheless, if in diminishing the play of the arm against the rack, it prevents it from striking an hour too much, this alteration diminishes on the other hand the lifting of the locking piece, produced by the small movable lever; and if the unlocking should not be able to be effected, when even it is pushed very strongly, then the quarter piece or the long piece should be filed to diminish the amount of the locking, until the unlocking shall have taken place with certainty.

Then, if, in pushing the same to the bottom, it strikes an hour too much on some hours only, the other steps on which it strikes correctly should be filed, to put them in agreement with the first. The snail being equalized, it will strike an hour too much on every hour; this should be corrected by one of the means previously indicated.

When the arm of the rack rests on the step of the twelfth hour of the snail, it is necessary that the inside of the high part of this latter, corresponding to the first hour, is sufficiently taken back, so that, when the star-wheel is turned until the snail is stopped by the arm, the point of the tooth of the star-wheel may have gone beyond the shifting point, so that the arm cannot touch against the high part of the snail before the star has shifted on one hour.

After this overhauling, it should be ascertained that the piece strikes with regularity, that nothing hinders the complete lifting of the hammers, that the quarters or five minutes are not too quick after the hours, and that in the minute pieces the quarters and minutes are in harmony with the striking of the hour.

The "overswinging" of the lifting of the hours should be verified, the quarter-piece being pushed right up, and in making the hours strike without the quarters, it is necessary to examine if the pin of this lifting touches the quarter-piece. When this defect exists, if the lifting overswings more than is necessary for the passage of the twelve-toothed ratchet, the part can be filed where the pin touches the quarter-piece; otherwise the diameter of the quarter-snail should be reduced as much as it can be done with safety, to prevent the contact of the lifting of the large hammer with the tooth of the quarter-piece.

In striking one hour and three-quarters, the finger which brings back ought to be unlocked in such a manner as to permit the quarter-piece to fall to the bottom of the snail.

The examiner may be called upon to increase the lifting of the hour hammer, when the equalization of the hour has already been done. To avoid hammering the tooth of the lifting of the hours, it is possible to close it, after having tempered it, by putting an arbor in the hole and striking it on the side, in order that it may be brought nearer lengthwise to the part which acts against the pin of the hammer; this plan is very efficacious and produces much effect, without deranging the striking of the hours, the lifting or pallet not being lengthened.

In order to obtain harmony, it is sometimes necessary to increase the lifting of the hammers for striking the quarters. Do any means exist for doing it without hammering the teeth of the quarter-piece?

If it were possible to close the liftings by hammering the part which acts against the pins of the hammer, it would be easy to obtain the desired effect, but this procedure is not always practicable, for the part to hammer is often very weak.

To surmount the difficulty, the point of the teeth of the quarter-piece in the center of the movement should be stretched, by fixing the piece in two tongs, the one placed by the pipe, and the other on the three teeth acting on the large, or on the small hammer, that it is necessary to stretch; the steel included between the two tongs should be heated until it changes color, in the meantime exercising a horizontal pressure with the tongs. It is only necessary to stretch the points of the teeth a very little to considerably increase the lifting; in heating to a violet the effect should be obtained. This method requires care to be taken not to twist the quarter-piece; if this happens, it can be easily set square on a piece of lead.\*

These operations will be terminated by the examination of the star, and of the snail or the quarters or five minutes. In the first place, it should be verified if the division of the plate is exact, and a hand should be placed on the canon pinion, or at the end of the set arbor, so that the differences of the jumping of the star before or behind sixteen minutes may be divided. When the teeth are sharp at the points, a burr will sometimes partly correct the differences; they should be made correct at the last by being bent at the ends, at the part where the pallet or *bouton* of the "surprise" does not touch them; if the ends of the teeth are thick, those which jump too late should be filed on the side opposite to the way of the rotation of the star, without touching the part with which the pallet of the surprise gears.

The hand should afterward be placed in agreement with that notch of the quarter snail which is the most distant comparatively to the others, in such a manner that the quarter, or five minute piece, falls just at the moment where the hand arrives on the point of the division corresponding to this notch. Note should be taken of the difference shown by the hand on each of the notches, in like manner as that of the jumping of the star with the sixteen minutes' point, and the notches should be equalized from the one that is the deepest. Before finishing this operation it will be well to make sure that the arm of the quarter, or five minutes' piece, is filed very squarely, and disengaged from the side where it escapes from the corner of the notch to fall on the following quarter.

Afterward, the jumping of the star should be put in agreement with the quarters, or five minutes, in the case where it should jump too soon; the passage behind the "surprise" should be increased by filing the opening where the pin passes which is fixed in the snail. If, on the contrary, it jumps too late, the point of the jumping of the star should be put out of the center in the opposite way to its movement of gyration.

After the "jumping" on the hour has been put in agreement with the quarters or five minutes, the snail should be removed, the "surprise" being placed behind against the pin, so that when the quarter, or five minutes, piece has fallen on the three-quarters, or on the eleventh notch of the five minutes snail, the hand placed on the canon pinion can nearly pass the sixteen minutes point, in making it pass until the snail touches the arm of the quarter of five minutes piece resting on the snail.

After the adjustment of the star and of the snail are finished, the forward play of the "surprise" should be sufficiently increased, so that at the same moment that the jumping of the star is just going to take place the pallet may be disengaged from the pressure of the tooth which it is has pushed forward.

If the concentric part of the surprise was not prolonged below the snail, so as to allow the forward play to be increased, without having

\* This appears to us to be rather a ticklish piece of business.—TRANSLATOR.

an interruption between the snail and the surprise, the back of the pallet where the star touches immediately after the jumping should be filed, without, however, diminishing the breadth of the pallet too much at the points where it gears with the star to make it jump backward and forward.

For minute pieces the same course should be adopted, by taking for the starting point of the examination the first notch of the minute snail corresponding to one minute. After having carefully verified the divisions of the dial, the hand should be placed exactly in agreement with the first division after each quarter, and after the jumping of the twelve teeth of the star has been separately equalized by the points, and that of the four quarters by the *talons* of the surprise, the jumping of the star and that of the surprise will be put in agreement on the hour, and on the quarters with the first minute by their two pieces (*sautoirs*). It should be equally ascertained that the hand passes the points of the four quarters when the canon pinion is turned forward, the minute piece resting on fourteen minutes.

If the hand does not pass the point at the moment when one of the four arms of the minute snail is just stopping against that of the minute piece, the examiner should file as much as possible before each of the arms of the snail, and the part of the arm of the minute piece with which it is in contact, well concentric to its center of movement.

It may, perhaps, happen that the screwed stud on which the quarter and minute pieces act, has been placed by the repeating maker in such a position that, even in filing as much as possible the arm of the minute snail and that of the minute piece, the watch stops at the moment that the jumping of the surprise is going to take place, and the hand is going to reach the point on each of the quarters, the snail being just resting against the arm of the minute piece before it is entirely brought back by the train. In this case the piece must be struck rapidly and made to jump on the four quarters, a fifteenth of a minute before the points.

When the hour is struck at the moment that the star is going to jump, the arm of the quarter-piece which falls on the three-quarter notch ought not to touch before the quarter snail, and when it is struck immediately after the jumping of the star, the snail, which is advanced before the surprise on which it is fixed, ought to pass the width of the arm which is resting on the high part corresponding to the *zero* quarter.

On each quarter, in making it strike at the instant where the surprise is going to jump, the arm of the quarter-piece ought, in falling on the snail, to rest its full width on the edge of each of the notches, and immediately after the jumping, the arm being narrower than the space passed over by the surprise, will fall on the following notch without touching on the preceding one.

It is important that the quarter snail is so filed that the arcs of the circle described from the center are rigorously followed, in order to avoid the movement produced by the fall of the quarter-piece, since, at the moment that the surprise is on the point of jumping, it is only held, as well as the quarter-snail, on which it is screwed, by the weak pressure of its spring against its circumference.

It often happens that the notches of the quarter-snail are too far back, that is to say, that the arm of the quarter-piece is on the point of escaping from the edge of the notch when the surprise is ready to jump. As it is not easy to hammer this snail, if the notches were not farther back than half the breadth of the arm, the examiner should be able to correct this defect in the following manner:

The hand being always placed on the first division after each quarter, in agreement with the one-minute notch of the minute snail, the star and the surprise of the minutes shall be made to jump about the third of a minute before the points, and that by their two springs; afterward the jumping should be confirmed just on the points by increasing the play behind the surprise and the snail, by the opening in which the pin of the minute-snail acts. It will be understood that as the quarter-piece is more than the third of a minute behind,

at the moment of jumping, it falls fuller on the notch when the piece is made to strike some seconds before the jumping.

It should, however, be ascertained, that just on the hour the arm of the quarter-piece falls again with sufficient safety on the high part of the snail corresponding to the *zero* quarter, and if, immediately after the jumping of the star, the arm does not rest in all its width on the snail, the examiner ought to be able to easily hammer it, first taking care to temper it.

In the minute-pieces, there is less room than in those striking only quarters or five minutes to obtain sufficient play before the surprise to disengage the pallet from the pressure of the tooth of the star, which produces, aided by the push, and in spite of a sufficiently strong burr on the center arbor or the canon pinion, a forward movement of the minute hand each time that the star jumps on sixteen.

In effect, the talon of the surprise cannot pass the edge of the snail where it finds the zero minute tooth, for the arm of the minute-piece, which is disengaged to the end, should be able to act between the talon and this tooth; in making it strike at this moment, the piece should have given the hour and one minute before the hand has reached the first division after sixteen.

After that the examiner has increased as much as possible the forward play, if he notices that the pallet of the surprise receives the blow of the tooth of the star, he should reduce it behind, at the part which the tooth touches again, immediately after the jumping.

The equalization and adjustment of the hours and quarters being finished, the verification of the minute snail now remains to be done. After having set in order the end of the arm of the minute-piece, which ought to be filed square, entirely sharp on the inside, and disengaged so that the fall of one tooth to the following may be fairly made, the spring of this piece should be put to a suitable strength; it ought to touch very lightly on the surface to keep it up to its place, and when it is disconnected from the slide and the train, it ought to descend the scale successively on each of the thirteen notches after each quarter agreeably to the manner in which the snail is turned.

The hand being always placed in agreement with the first minute, the notches should be noticed which are too far back. Those minutes can only be retouched which are backward in striking; if some are given too soon, they should be left so; for the remainder, the difference is never very considerable, and as the minute hand advances while the hours, quarters and minutes are striking, it is preferable, in all cases, that the following minutes shall be given before, and not after, that the hand has arrived on the division.

The important point is that the center wheel should be perfectly upright, and the divisions of the dial equal from the center.

In making the minute-piece descend the scale, it should be ascertained that the lifting does not remain over-swung, retained by the point of the preceding tooth; when on the four quarters it remains caught on a large number of teeth, it is sufficient to fill the extremity of the arm of the minute-piece, for it would be too much work to file the notches of the snail. When it only touches on a small number those notches may be touched up.

Sometimes the first of the fourteen minutes is too near to the third quarter; this defect may be corrected by lengthening the two arms of the hook pivoting on the quarter-piece, to hinder its descent in the cutting of the minute-piece. This plan ought not to be resorted to unless the fourteenth minute strikes before the locking has taken place.

(To be Continued.)

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### A Rare Old Watch.

A CORRESPONDENT of the *Deutsche Uhrmacher Zeitung*, who signs himself Beta, says in one of its numbers:

Your correspondent lately came into the possession of an English verge escapement with automatic striking and repetition, which, by

reason of its peculiar construction, excited the curiosity of many watchmakers, and thinking that a description might at least be interesting to those of my colleagues who have not been able to see it, I am so free as to append it.

The movement is in a very good state of preservation, and of so elegant a construction as will not often be found in the best of our modern watches. The richly damascened hands, the handsome dial, and the faultless, brilliant gilding, all contribute to make a first-class impression. It had, unhappily, been stripped of its case, which, I presume, must have been in keeping with the elegance of the movement, and doubtless fell a prey to someone's cupidity, and went into the crucible.

The peculiarity of this watch consists in its construction. While the diameter of the plates is only about 15 lines, the height of the movement from the hand square to the upper verge cover is 11 lines.

If, next, we take into consideration that the watch does not strike upon gongs, but upon a small silver bell (which is still present), furthermore, that the movement is covered by a dome, generally found in the better grade of English watches; beside this, the case and the necessary spaces between the movement, dome, bell and case, and between crystal and hands, we have every reason to conclude that the thickness of the watch must have almost been twice its diameter, and must have closely resembled one of the famous "Nuremberg eggs." Much of this thickness is due to the dial, which does not lie upon the lower plate, but is carried upon four pillars, similar to a mantel clock, and it is also fastened in the same manner. Thereby is created so large a space between plate and dial that a medium thin lady's watch can be shoved between. This space, however, is filled out by the minute work, which is of little breadth, but of considerable height.

The going train is arranged in the manner as we generally find it in English watches. This, however, possesses two peculiarities such as I have never yet found. First, the verge runs in jewel holes, apparently sapphires; and, next, as the balance occupies about three-fourths of the upper plate, the winding post of the going train is situated within the arc of its vibration. Owing to this reason the balance is of a peculiar shape, its arms stand close together, so that it can make always three-fourths of a vibration. The winding post answers in place of the banking pin, as it limits the arc.

The striking train consists of a very large barrel, built similar to that of a Vienna mantel clock, 5 small gilt running wheels, and a neat fly. The spring is twice as long and broad as that of the going train, and calculated for 8 revolutions; there is also a nicely-worked stop work. The minute work is altogether different from those generally used. I will try to approximately describe it. The largest running wheel carries on the dial side a largely-prolonged strong pivot; upon it is firmly fastened a steel wheel provided with canon, its teeth are like those of a ratchet wheel. Upon this wheel sits a second, which can be turned freely upon the canon, however, and is connected with the first by a delicate clickwork. The teeth of this wheel are similar to those of the first wheel, twelve of it are intended to set into motion the hammer for the full hour stroke, and six to move the two hammers of the quarter stroke. Beside this, a 12-leaf pinion is upon the upper side.

Into this pinion seizes a 12-toothed rack, the hind end of which strikes on a small snail, similar as by a regulator. In the vicinity of this rack is a lever, the front end of which carries a pin, that projects through an opening of the plate, and, in a state of rest, prevents the motion of the fly, the hind end strikes against the quarter snail situated upon the canon pinion. This lever has still a third arm, which reaches into the vicinity of the pinion upon the upper steel wheel. This arm is movable around a pivot, but is retained upon one side by a pin, while a feeble spring continually presses it against the pin. Three pins are drilled into the upper steel wheel at varying distances from the center, in a diagonal line, and it depends upon the position of the quarter snail, from which also results the position of the lever,

up to what pin the lever reaches. When, now, the wheel is in motion, this pin carries the lever around sufficiently far it meets with the fly, whereby the striking train is placed into a condition of rest.

The unlocking of the striking train takes place in the following manner: In the vicinity of the quarter pinion and steel wheel is situated a movable steel collet with two projections. The longer one reaches as far as underneath the quarter canon, in which five pins are drilled in from below, one is for the purpose of pushing the snail farther along, and four to unlock the striking train every quarter of an hour. The second projection reaches almost up to the teeth of the lower steel wheel, without actually touching them, however. A spring always keeps the collet in the correct position. As previously said, the lower steel wheel is, by a fine clickwork, connected with the upper, but it contains at the same time another ingenious arrangement, to wit, if the lower steel wheel is pressed backward a little, the clickwork becomes inactive, and the upper wheel is thereby liberated. The rack, which hitherto was kept in tension by a spring, now forces the upper wheel sufficiently far back until the snail sets a limit to this motion. The steel collet is lifted a certain quantity each quarter of an hour, and, at the time of springing back, one of the projections strikes upon a tooth of the lower wheel, the upper wheel is thereby forced back at the same time, the lever also is disengaged now which holds the fly; it strikes against the quarter snail and the watch commences to strike.

The number of the full strokes is determined by the snail, which takes place in the following manner. If the snail stands in such a position that the rack strikes on the outermost part, then the upper steel wheel, which might also be called pin wheel, is only led only so far back until the first part of the tooth intended for the full stroke stands before the hammer lever. The watch then strikes only one and the quarters. But if the rack strikes on the inner part of the snail, the wheel is led back so far until all the teeth stand before the hammer lever. The watch then strikes twelve, and the quarters. About the same state of affairs occurs with the quarters. If the watch is to strike three-quarters, the proper lever butts on the innermost part of the quarter snail, the one arm of the lever stands therefore far back, and only the last pin in the steel wheel reaches it and conducts it onward, so that the watch can strike out its strokes. With the first quarter the lever butts on the outer part of the quarter snail, the lever arm stands far forward so that even the first pin reaches it and guides it onward, and after the first quarter stroke also the lever has reached the fly, and in this manner forces the striking train to stand still. In order to let the watch strike at any desired time, a push-button is introduced to unlock the movement in the same manner. The hammer levers are precisely of the same shape as those of a repeating watch. The bell was most probably fastened to the hind bottom of the case, the movement itself not containing the slightest indication that the two ever belonged together. I repaired the movement, and it goes excellently, only the striking train stops sometimes.

Two questions may be asked. First, to what age does the watch belong, and, second, is the very peculiar construction of the minute work due to the force of circumstances, or to the whim of the maker? Concerning the age of the watch, it might be considered pretty old, to judge by its shape; this view, however, is contradicted by the jewel holes in the verge bridge, and the entire appearance of the movement. Considering everything, it may have been constructed at the beginning of this century.

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#### Tool for Straightening Bent Balance Springs.

A HANDY TOOL for improving balance springs that are bent upwards is shown in the cut, and consists of a round brass disc, of the size and thickness of a watch barrel. The round brass plate, which must have been ground nicely flat, is provided with a handle;



it has a hole with thread in the center for receiving a screw, underneath which is located another small, flat-ground brass plate.



After the balance spring has been duly taken down, place it between the two plates and fasten it with the screw. Then heat the whole uniformly above a small alcohol flame, until the previously polished screw assumes the blue or violet color of the spring; let it cool off, and, after taking off the upper plate, the spring will be found to be nice and flat; if not, again repeat the process.

## Sight.

WHAT THE OPTICIAN SHOULD KNOW ABOUT OPTICS.

Based upon an extensive hospital experience in Austria, Germany, England and New York. By C. A. BUCKLIN, M. D., New York. Author of Detection and Correction of Visual Imperfections, Cause and Cure of Cross Eyes, Effects of Color on Distance, and Monograph on Astigmatism.

### ASTIGMATISM.

SEE no reason why any optician should find difficulty in comprehending astigmatism, but as a matter of fact they usually fail in either comprehending the nature of this defect or the nature of a cylindrical lens.

In attempting to adapt cylindrical lenses to the eyes they become confused, and appear to have lost all the sound judgment that years of experience in overcoming mechanical difficulties entitles them to possess. The first thing necessary to comprehend the subject is a knowledge of the nature of a cylindrical lens as compared with spherical lenses. King, a practical dealer in optical goods, demonstrated very beautifully the difference in the effect of cylindrical and spherical lenses upon light by filling a long box with smoke. One side of the box was glass; at an opening in the end light from a candle was admitted, and as the rays of light passed through a spherical or cylindrical lens they passed into the chamber filled with smoke. The box being in a dark room, the luminous path of the light can be seen very distinctly.

If a convex lens is placed at the opening the rays which pass into the smoke chamber form a perfect cone, the point of which is at the focus of the lens, and the base is at the lens.

If a convex cylindrical lens is placed at the opening the rays of light form, as they enter the smoke, a perfect wedge, the base of which is at the lens.

It will immediately be seen that the light has been acted upon only in one plane. If we place two cylindrical lenses at the opening, with their axes at exactly right angles, the light which passes through them into the smoke forms a perfect pyramid.

It will therefore be seen that spherical lenses act upon the light in every possible meridian, while cylindrical lenses, combined with their axes at right angles, act only upon the light in planes at right angles to their respective axes, and all other rays of light which fall in other planes or meridians are not acted upon.

Having thus seen the effect that these lenses have on the light, it is our next duty to inquire into the shape of a piece of glass which will produce this effect.

A plane of glass ground to fit the concavity of a section of a hollow sphere gives us the *plain convex* lens, while a plane of glass ground to fit the concavity of a hollow *cylinder* of the same diameter as the sphere gives us a convex cylindrical lens of the same strength as the simple convex lens.

If concave lenses are required of the same strength, we have simply to grind a piece of glass to fit the convexity of a sphere of the same diameter as the hollow sphere, and we have a simple concave lens of the same strength as the convex lens.

By grinding a piece of glass to fit the convexity of a cylinder of

the same diameter as the hollow sphere, we obtain a *concave* cylindrical lens of the same strength as the convex cylindrical lens which we obtained as the result of our former experiment.

In *convex cylindrical* lenses the light is acted upon in a plane which passes through the two *thin* edges of the lens, and is not acted upon by the light passing in any other meridian or plane.

In *concave* cylindrical lenses the light is acted upon in a plane passing through the thick edges of the lens, and is not acted upon in any other plane.

The eye is a simple camera, the lens system of which is about one inch. When the diameter of the eye is too short simple hyperopia, *far-sight*, exists. When the lens becomes so stiff in old age that its shape can no longer be changed to accommodate for near objects, we have *old sight*. When the diameter of the globe is too long we have simple near-sight.

At birth it frequently happens that the *cornea* is not a perfect spherical surface; thus a section made in one meridian would show a much sharper curve than a section at right angles to this meridian. Here lies the cause of all congenital cases of *regular* astigmatism. This form of astigmatism always remains about the same.

Irregular astigmatism is caused by the faulty curve not being a regular one, that is, one half of the curve is sharper than the other. This defect produces a visual defect which cannot be corrected by lenses, while the regular form of astigmatism can be corrected. The lens of the eye is the usual seat of irregular astigmatism. During the last ten years the correction of astigmatism has been very much overdone. A cylindrical glass should never be ordered till you have thoroughly convinced yourself that a common spherical glass will not answer the purpose equally well.

The person having simple astigmatism only usually has his acuteness for distant vision reduced. The lines of the astigmatic fan do not appear equally dark. He refuses all convex or concave lenses. Cylindrical lenses produce a magical improvement in vision.

Those having simple astigmatism are only improved by cylindrical lenses, while persons having hyperopia or myopia are improved by cylindrical lenses, but do not receive as much benefit as they do from the same number of spherical lens. The simple reason for this is that it is better to have a sharp focus in one meridian than not to have a sharp focus in any meridian.

*Case I, Mr. B., age 25 years*—Has had trouble with his eyes as long as he can remember; always requires a very strong light to see anything fine. He reads at 20 feet the line marked LXX on distant visual test with each eye, consequently his distant vision is indicated as  $\frac{2}{7}\%$ . We first try convex lenses, each of which make distant vision less distinct. We next try concave lenses, none of which improve distant vision. We next try convex cylinders, at all degrees of the half circle, and every one is pronounced unsatisfactory. We next place concave cylinders before the eye, commencing with the axis horizontal, or  $180^\circ$  each, and every one produces great increase in the improvement of distant vision, and the improvement continues up to No. 16, after which an increase in the strength of the lens does not improve the distant vision. We therefore give concave 16 cylindrical, axis  $180^\circ$ , to each eye, and the individual from this day is delighted with his new existence.

*Case II.*—Convex cylinders improved distant vision, and No. 10 produced the greatest improvement with the axis at  $90^\circ$ .

*Case III, Mr. E., age 50.*—Distant vision  $\frac{2}{3}\%$ —24 cylinder, axis  $180^\circ$ , brings out distant vision; all other lenses rejected for distant vision. Now, there are two ways of giving this patient a reading glass. If we give him a +24 cylinder, with the axis at  $90^\circ$ , or at right angles to the concave cylinder, he will probably be pleased with the glass for reading, as he has in reality with this glass a magnifying power of  $\frac{1}{2}\frac{1}{4}$  in all meridians.

Others will leave the —24 cylinder, which brings his eye normal in all meridians, and then correct his age by placing a simple convex 24 before the — cylinder. The only way to determine which is the best method is to experiment in each case, and if the simple +24

cylinder is as good as the combination it is a much cheaper and easier lens to grind.

In determining the axis of cylindrical lens we allow the patient to face the clock dial, and 9 o'clock  $0^\circ$ , 12 o'clock  $90^\circ$ , 3 o'clock  $180^\circ$ . The intermediate portions of the dial being divided into degrees. This is now the universal method of expressing the position of the axis of cylindrical lenses.

When it is possible to combine convex lenses with convex cylinders, do so rather than combine them with concave cylinders. Never use a concave cylinder where a convex cylinder will answer, for the individual is simply made hyperopic (far-sighted), and he must strain his accommodation to overcome the hyperopia. This mistake is one which the experienced blunder into occasionally. Never use a cylindrical lens unless you can convince yourself that it decidedly improves vision, as they will not be satisfactory. You will seldom find a workman who can set a cylindrical lens at the axis required exactly, except the axis named be  $180^\circ$  or  $90^\circ$ . You will probably have to tilt the frame a little, either up or down, to obtain the exact position required. They set more lenses wrong than right, has been my experience.

Correspondence on practical optical questions will be answered through this journal. Please express, in the clearest possible language, just what you wish to know.

### A New Thermostat.

THERE ARE many institutions, for instance, hospitals, hot houses and aquariums, where an excess of heat, amounting to a few degrees even, may do a great deal of mischief, and it therefore becomes an urgent matter to keep the temperature to a certain degree; this, however, depends entirely upon the intelligence or care of the attendant, who may watch, or not, the thermometer at his disposal. This is frequently honored, rather, "in the breach than in the observance," and inventive genius has for some time been engaged in seeking to devise ways and means for accomplishing what man will not, and electricity has been called to aid. Such an instrument is the accompanying diagram of a new thermostat, which can be regulated to one degree; if the temperature exceeds this, a gong or bell is sounded either in this or the next room, to proclaim that something is wrong, and that the attendant had better mind his business.

The accompanying diagram, (the scale of which being taken from the German, is divided into centigrades), represents the principles of

the construction of such a thermostat; *a* is a bulb with tube *c*, which is filled in the ordinary manner with mercury. Into this bulb is melted a platinum pin *b* which stands in connection with the open circuit battery *g*. If, now, the signal shall be given at, say,  $20^\circ$ , then at this place in the tube *c* is melted in a second platinum pin *d*, which stands in connection with the electrical vibrating bell *h*. The other pole of the battery *g* is also connected with the bell. When, now, the mercury rises up to  $20^\circ$ , the pin *b* is in metallic contact with *d*—as is known, mercury is a good conductor of electricity—and the vibrating bell resounds. These thermostats are ordinarily constructed in such a manner that with a simple degree changing switch, or, as is shown in the sketch, a stopper current switch (*i*), the signal may be made to resound from  $5^\circ$  to  $5^\circ$  or  $10^\circ$  to  $10^\circ$ , etc. The diagram shows beside the regulator at  $20^\circ$  (*d*), another at *e*, at  $30^\circ$ , and still another at *f*, at  $40^\circ$ . If the thermostat is regulated at  $30^\circ$  or  $40^\circ$ , a simple fire alarm is constructed at the same time, since at the breaking out of a fire it is

evident that the temperature will rapidly rise; it soon attains to the desired height and sounds the alarm.—[*Deutsche Uhrmacher Zeitung*.

## Recent Patents.

The following list of patents relating to the jewelry interests, granted by the U. S. Patent Office during the past month, is specially reported to THE JEWELERS' CIRCULAR by FRANKLIN H. HOUGH, Solicitor of American and Foreign Patents, 925 F Street, N. W., rear U. S. Patent Office, Washington, D. C. Copies of patents furnished for 25 cents each.

### Issue of September 15, 1885.

- 326,292—Clock, Pendulum Escapement. W. Hart, Kirksville, Mo.  
326,135—Ear Rings, Ear Wire Catch for. S. F. Merritt, Springfield, Mass.  
326,477—Jewelry Pins, etc., Catch for. C. E. Carpenter, Horseheads, N. Y.

### Issue of September 22, 1885.

- 326,606—Bracelet. F. F. Tingley, Providence, R. I.  
326,825—Clock Striking Mechanism. F. Witherspoon, Paris, Tex.  
326,602—Clock Works, Manufacture of. C. Stahberg, Waterbury, Conn.  
326,710—Watch Case Spring. G. W. Blakeslee, New York, N. Y.  
326,677—Watch, Stem Winding. A. Sandoz, Neuchatel, Switzerland.

### Issue of September 29, 1885.

- 327,116—Button, Sleeve. J. Stadlmeyr, Newark, N. J.  
327,245—Charm, Watch. C. H. Davis, Pittsburg, Pa.  
327,431—Finger Ring. J. Bulova, New York, N. Y.  
327,426—Gold, Silver, etc., Composition for Cleaning and Polishing. O. W. Young, Chicago, Ill.  
327,359—Watch Barrel. L. Van Bemmel, Maestricht, Holland.  
327,078—Watch Case. W. H. Fitzgerald, Chicago, Ill.

### Issue of October 6, 1885.

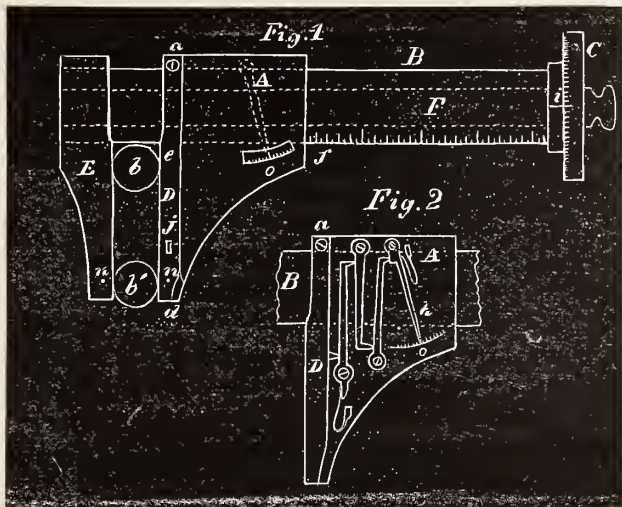
- 327,897—Clocks in Series, Electrical Attachment for Winding. C. H. Pond, Brooklyn, N. Y.  
327,898—Clock Movement, Secondary Electric. C. H. Pond, Brooklyn, N. Y.  
327,558—Jewelers and Engravers, Holding Tool for. A. Kuder, Jersey City, N. J.  
327,919—Watch Stand Alarm. J. Burmann, Bienne, Switzerland.

## Lathes and Lathe Work.

BY THE MODEL WATCHMAKER.

IT MAY not be amiss to add that the arrangement for carrying the rotary cutter described in last article can be used to run an emery grinder, only the velocity of the arbor carrying the emery wheel (the one which did carry the rotary cutter) must be increased at least ten fold; but we will speak of this when we come to the details of making our measuring instrument we mentioned in October number. This instrument may be briefly described as a cylindrical bar 5 inches long by  $\frac{3}{4}$  of an inch in diameter, flattened on one side, on which a slide is moved by a screw  $4\frac{1}{2}$  inches long and  $\frac{3}{8}$  in diameter, with 20 threads to the inch. On this screw is mounted a wheel  $1\frac{1}{2}$  inches in diameter, divided into 500 graduations, consequently showing measurements of  $\frac{1}{1000}$  of an inch. A noticeable feature in this measuring instrument is the arrangement of the movable jaw, which has a loose piece so arranged that in any piece measured there is constantly the same force applied. This feature is a great improvement in microscopic measuring tools working with a screw. The trouble has been in measuring small pieces with an instrument

delicate enough to show  $\frac{1}{10000}$  of an inch; if the screw acted directly, and a very little extra force on the screw was exerted, a difference of several degrees could be read according to the force applied. It will be seen on examination of the details of this instrument that this defect has been remedied almost perfectly. At fig. 1 is shown a general view of such a gauge of one-half the size. In this view *B* represents the bar on which the head *A* slides. At the dotted lines *F* is shown the position of the feed screw. At *E* is shown a fixed head to which is attached one of the jaws of the callipers. The opposite jaw shown at *D* is jointed on a screw at *a* and made slightly movable, and by means of a spring (*c*, fig. 2), this piece *D* is pressed forward, say,  $\frac{1}{1000}$  of an inch. Now, it will be seen that the forward end of *D* at *d* will be thrown toward *E* more than the lower



part (of *D*) at *c*. If, now, we insert a piece of known size, say,  $\frac{1}{2}$  inch, at *b*, between the jaws *D E*, and we turn the graduated wheel *C*, which, by means of the screw *F*, moves the head *A* until we can move the piece *b* back and forth from the two positions of *b*, shown at *b* and *b'*, fig. 1, and the jaw or piece *D* does not move, it indicates that the jaws of *D* and *E* are perfectly parallel. In order to determine this condition perfectly we institute the series of levers shown in fig. 2 which magnifies the motion of *D* a thousand times. These levers are adjustable, so we set the hand at *o*, fig. 1, where the piece *b* can be moved back and forth and the hand *h* shows no variation. The wheel *C* can be loosened from the screw *F* and set so as to read *o*. On the bar *B* are graduations which show inches and twentieths. We will suppose, to illustrate, that we wish to adjust our measuring tool; we proceed as above moving the screw *F* until the hand *h* shows perfect parallelism, we set the hand *h* at zero and the wheel *C* at zero. We read from the scale at *f* the half inch. We next wish to measure a piece which is a trifle over half an inch; we open the jaws *D* and *E* by means of the screw *F* and insert the piece to be measured. We close the jaws gradually by means of the screw *F* until the piece to be measured is grasped; we keep on turning the screw *F* until the hand *h* indicates zero; we move the piece we are measuring back and forth (as from *b* to *b'*) and see *h* still indicates zero. We now remove the piece and read off the size. From the scale at *f* we find  $\frac{1}{2}$  of an inch over the half inch and a portion of another twentieth gone; we next look to the wheel *C* and see how many graduations have passed the zero mark *i*; here we read 75. Now, to find the size of one piece in ten thousandths of an inch—well, the half inch is equivalent to  $\frac{5000}{10000}$ , and the one-twentieth to  $\frac{500}{10000}$  and the 75 are of the ten thousand scale; consequently we read  $5,000 + 500 + 75 = \frac{5,575}{10,000}$ , or, as a decimal expression, 0.5575 of an inch. If the screw *F* is correct, the adjustment to any one size ensures the accuracy of all measurements. It is not the writer's intention to go into all the details of construction in this article, but rather to give a general idea of the range and power of the instrument, and then in subsequent communications give the complete details. Underneath the jaw *D* is a screw *j* by which the jaw *D* can be brought to parallelism (indicated by *h*) for

the purpose of depthing wheels. At *n n*, in the jaws *E D*, are two holes about  $\frac{1}{100}$  of an inch in diameter; these holes are known to be exactly  $\frac{1}{10}$  of an inch apart when the jaws *E* and *D* are closed together. For the present both jaws are rigid, except *D* is moved by the screw *F*. We will now explain the use of our new measuring tool for correction of the depth of wheels. We have a pair of dividers of peculiar construction with which we determine the exact distance between two pivot holes. (These dividers will be minutely described in subsequent articles). It would be better to say the dividers do not give the measure of the distance apart of the two pivot holes in question, but they enable us after being set to the two pivot holes in the watch to be brought to our new measuring tool; the points of the dividers inserted in the two holes *n n*; we now turn the screw *F* until the dividers indicate the same distance apart as the holes in the plates of the watch, and we read from our new measuring tool the exact distance apart the holes in the plate are after adding the  $\frac{1}{10}$  of an inch by which the holes *n n* are separated when the jaws are closed. The advantage of this system is the workman is not left to mere judgment and experience for correct (or rather approximate) depths. The old style sector would measure a wheel and give the size of pinion to match; this was all right for watchmaking by hand, when the wheel and pinion was selected by the sector, and the wheel and pinion put in a depthing tool, and the depthing tool marked the place to drill for pivot holes. But the watch repairer is differently situated. He has the two holes which are probably jeweled, to which he must match a wheel and pinion. This instrument, by the aid of very simple calculations, gives the correct size of both wheel and pinion, and then measures both wheel and pinion to extreme exactness. And again in case of a bad depth. We will suppose a depth appears shallow, and the real condition of the thing is the wheel is disproportionately large for the pinion; if we should stretch this wheel and round it up we should only increase the difficulty. If we took the distance of the holes apart and made our calculations for the correct size of wheel and pinion, we should collar the offender and correct the defect by putting the wheel in the rounding-up tool and slightly reducing the diameter. Here we would not guess but measure to the  $\frac{1}{10000}$  of an inch, and put in a new pinion of the right size instead of the one too small. We will give the rules for all these calculations, and they are much simpler than the rules for calculating the interest on a note for years, months and days. See the advantage if material men and workmen both had correct standard gauges like the one described, we could order a wheel or jewel and be sure it would fit. The day for such tools and competent men to use them are coming—must come.

## Gossip of the Month.

WE GATHER from Bradstreet's report that the number of failures that occurred in the States and Territories during the three months ending Sept. 30, numbered 2,317, the actual assets of the insolvents were \$10,909,393, and their liabilities \$22,405,853. The total number of failures during nine months of this year was 8,423, as against 8,302 for the corresponding period of the preceding year. Since July there has been a remarkable falling off in the number of failures, which gives good reason to hope that the total number for the year will be less than for 1884. Already 1885 has the advantage in the amount involved, for the liabilities in the failures for the first nine months of last year aggregated \$195,951,000, and for this year the total is \$90,976,000. Comparing the failures of the third quarters of the two years, we find that there were in 1885, 2,317 failures, with \$22,405,000 of liabilities, against 2,858 failures in 1884, with \$71,846,000 of liabilities. This indicates that there has been a steady improvement in business conditions going on during the present year, and that the older the year gets the more marked is the improvement. These figures agree with the experience of dealers in the jewelry

trade, who find their business growing more active and the number of failures decreasing. Thus far the promise of a better year's business have been fulfilled, and no reasonable man can doubt but the fall and holiday trade will be larger than has been known in several years.

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A PROMINENT hotel proprietor said in our hearing the other day: "Why is it that the manufacturers of plated ware do not furnish us with knives that will cut? The ordinary plated knife found on tables in general has an edge so blunt and dull that one might slide down hill on it without fear of injury. The consequence is that guests find it difficult to cut the meats served to them, and charge the hotels with furnishing tough meat. Frequently guests return their plates with a request for meat that they can cut, when the fault does not lie in the meat served but in the knife. Of course, we cannot sharpen plated knives without spoiling them, so we have to take the grumbling. Sometimes when I am down town I go for lunch to an English chop house that has a reputation for serving tender, juicy mutton chops. The secret of their special tenderness lies in the fact that the proprietor has the good sense to furnish his tables with steel knives, and they are kept sharp and serviceable. When a guest is served with a chop he finds his knife goes through it as easily as it would through butter, and he at once praises the meat for its tenderness. But let him haggle at it for awhile with a plated knife, and he would be willing to make affidavit that the same chop was tough and indigestible. We cannot use steel knives at the hotels without offending the fastidious tastes of our guests, most of whom care more for a handsomely furnished table, bright with plated ware and snowy linen, than they do for the food served them—at least, they will turn up their noses at the food unless it is handsomely served. If we could get elegant knives that were serviceable also, we would be relieved of half the complaints now poured out upon us. Is there no manufacturer who can invent a knife that in appearance will be fit company for our other table furniture, and at the same time perform satisfactorily the duty for which it is designed?" This is a conundrum submitted to the trade by a landlord who has had twenty-five years' experience in business. For ourselves, we are morally certain that fully one-half of the indigestion and dyspepsia that characterize Americans, to say nothing of their domestic unhappiness, comes from dull knives. Being unable to cut their food with the knives provided, they bolt it, expecting the stomach to do duty for proper knives, teeth, etc. A reform in table knives will work a reformation in the temper of the nation.

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IT is reported that the Post Office department at Washington has over \$2,000,000 that it has acquired from unclaimed postal orders and registered letters. This shows how extremely careless business men are at times, for these unclaimed letters have not only been incorrectly addressed, but they contained no clue by which the sender could be traced. No doubt a fair proportion of this unclaimed money belongs to the jewelry trade, but it is not likely ever to realize a dollar of it. Never mind, \$2,000,000 is not much to a jeweler, and if the government has the benefit of it there may follow a reduction in taxation.

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THE new special postal delivery system, in accordance with which a letter that has an extra ten cent stamp upon it is to be delivered immediately by special messengers, went into effect Oct. 1. Thus far it has not demonstrated its ability to supply the wants of the

business community, which is a means of quick communication within the limits of the carrier system. It took two hours recently for a letter to come from Bleecker street to Maiden Lane by the special Post Office delivery; an office boy would have brought it down in fifteen minutes, and it would not have been necessary to put a ten cent stamp on him either. If that letter had been addressed to Harlem or Brooklyn it would, at the same rate of speed, taken about two days to reach its destination. The gentleman who received the letter referred to sent his answer by telegraph, and subsequently ascertained that it was delivered in fifteen minutes from the time it left his office. Uncle Sam will have to get around a little more lively if he expects to fill the requirements of the business men of this day and generation.

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SEVERAL diamond robberies have been reported within the past few months, the victims being regular dealers and the victimizers confidence men. It was the old story of misrepresentation to obtain possession of the goods, after which they were disposed of and no accounting made. If credit is to be given without tangible security, it is difficult to see how transactions of this kind are to be prevented. Dealers are always anxious to sell their goods, and if an acquaintance represents that he knows where to dispose of some diamonds or other articles satisfactorily, it is quite natural that he should be entrusted with them "on approval." The thing is done every day by even the most cautious of dealers, and while occasionally a fraud is committed as indicated, many important sales are made in this way. But there is a way in which the dealer can protect himself, and that is to require the broker, or middleman, to give a fidelity bond when he is trusted with valuable goods "on approval." There are several companies in good standing that make a business of guaranteeing the fidelity of individuals to the extent of \$5,000, and whoever can give satisfactory references can obtain this insurance, which would at once give him a claim to credit. Should dealers exact such a bond from brokers, the onus of investigating the character and antecedents of the person whose fidelity is in question is transferred to the insuring company. A dealer holding such a bond may safely entrust goods on approval to the value of the face of the bond to almost any one, and if the individual decamps, the insuring company is liable to the limit of the sum named in the bond. Banks, trust companies, railroad companies, etc., require such bonds of all employees who have control of funds, and many private firms and individuals require fidelity bonds of their cashiers and bookkeepers. Fidelity insurance might be more generally used in business transactions, as it forms a substantial basis of credit.

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ACCORDING to a recent decision of the Supreme Court of the State of New York, a person has no right to use the name of a previous employer as an endorsement or recommendation to business patronage. For instance, John Jones has no right to print on his business signs, cards or advertisements, "formerly with John Smith," for thereby he makes use of the name and reputation of Smith to help him (Jones) in his business. The case presented to the court was that of Van Wyck vs. Harowitz. Van Wyck is a jeweler and Harowitz was employed by him; subsequently Harowitz went into business for himself and became a competitor of his former employer in the same lines of goods. He put upon his sign and his business cards the words: "Late with James P. Van Wyck," and Mr. Van Wyck obtained a temporary injunction restraining him from such use of his name. After argument upon a motion to make the injunction perpetual, the court held:

The defendant has no right of property in the name nor in the reputation of that

business which he seeks to use with his own name and business so as to give his own prominence at the expense of the other. If the defendant had been a stove blackener, or hostler, or an errand boy in the employ of the plaintiff, or a clerk discharged for want of fidelity or competency, he could with just as much truth advertise himself as "late with James P. Van Wyck." The extreme supposed cases are put to illustrate the danger of the counsel's position. It cannot be that a man who has sustained any position toward or had any employment for a well known individual, that thereby he obtains the right to use that name in connection with his own, so as to advertise himself and his business at the expense of his former patron and employer, and to do it in a manner which is likely to, and often must, deceive as to the nature of the relations to him. The motion to continue the injunction must be granted, because—First. The defendant is, without authority, using the plaintiff's name, which is the use of another's property, for his own benefit and to the injury of its owner. Second. He is attempting to transfer to himself a part of the reputation of the store and business of the plaintiff, which also belongs to the plaintiff as really and as truly as his name or his personal property, of which he is the actual owner. Third. The mode and manner of the use by the defendant of the name of the plaintiff, are such as oftentimes to deceive, and because liable to deceive and thus benefit the defendant at the expense of the plaintiff, such use must be held to be unlawful.

Usually an employer will not object to having himself advertised by a former employee, but there are cases where the use of his name would work serious injury to him. For instance, where a man has long been employed by a house, and becomes familiar not only with their line of business but with their customers, and, on going into business for himself, seeks to turn this knowledge against his old employer; his purpose unquestionably is to let the patrons of the old house know that he is dealing in the same lines of goods, and to invite them to transfer their custom from his late employer to him. If this is not the object, of what use to him is the coupling of his late employer's name with his? Yet it seems unfair to employees that they can be deprived of the privilege of announcing where and with whom they learned their business. Artists of various kinds and degree, make a strong point by announcing that they are, or have been, pupils of some famous master, but this is not calculated to rob the teacher of patronage unless the pupil comes out as a rival teacher. There are many persons whose chief stock in trade consists of the fact that some time they have been accidentally associated with some famous individual. There are scores of newspaper men, editors and reporters, for instance, who like to boast that they received their training under Horace Greeley, when, in fact, they may never have exchanged a word with him, but were simply employed by *The Tribune* when Mr. Greeley was at its head. It would be unjust to hold him responsible for all the employees of *The Tribune* during his time. To what extent a person has a right to use the name of a former employer as an endorsement or recommendation in business, is a delicate question of ethics; the law, however, is clear that a name cannot be so used against the wishes of the owner of it. We call attention to this decision for the reason that it is a common practice in the trade for salesmen and others to use the names of their former employers. It would be just as well for them to first obtain permission to do so; such permission might be sometimes reluctantly given, but it would seldom be refused.

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WE ARE pleased to note that one of our commercial exchanges records the fact that the fall trade in San Francisco shows a decided improvement over that of 1884, and the outlook is encouraging. There has been an active demand for California products of all kinds, and the crops have been unusually abundant. Canned goods, which comprise an important item of the coast trade, have met an unusually large demand, and the transactions have been in excess of any previous year. Wheat was a good crop, while fruits of all kinds were exceedingly abundant, with a good market. Grapes are a staple product, many of them being converted into raisins. We note the enormous yield of over sixteen tons of grapes, best quality, to the acre; all of which are sent to market in the form of raisins. The general good feeling in trade on the Pacific coast extends to the

jewelry industry, and our reports from that section show a present briskness in sales, with promises of increased activity as the season advances. California did not feel the hard times of the past year or two as seriously as the Atlantic States did, but nevertheless her business men will not be sorry to see matters livened up somewhat, and we congratulate them on their present business prosperity and the bright outlook for the future.

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SOMEBODY recently took possession of the ground floor of a *World* reporter's ear, and through that medium filled him full of romance in regard to "the lane," meaning Maiden Lane, and the wildest exaggerations as to the wealth piled up in the vaults of the jewelers. Thereupon the reporter broke out into a half column of hyperbole, which, for inaccuracy and extravagance, has seldom been rivalled by any "History of Maiden Lane" yet published. Among other things he says:—"It has been ascertained, after a careful calculation, that there is more gold, in the form of watches and jewelry, in Maiden Lane and John street, than there is to-day in the possession of the United States government." He ought to have added that the government is negotiating with the jewelers for the redemption of all United States currency in gold, including the eighty-five cent silver dollars! Having such a superfluity of wealth, the jewelers are deliberating whether they had better redeem the currency or pay the national debt out of their abundance!

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AN ANXIOUS inquirer submits the following proposition of law:—"A firm fails, owing a certain sum for the proceeds of goods consigned to it but disposed of before the failure. Has the consignor a preferred claim against the insolvent's estate over that of other creditors?" Under the New York code a person receiving goods on consignment is regarded as the factor or commission agent of the consignor; he holds the goods in a fiduciary capacity, and is liable in a criminal prosecution for breach of trust or embezzlement if he fails to pay over the proceeds when demand is made. The law relative to trusts is very rigid in this State. But when consigned goods have been sold, and the proceeds placed in the general fund or business of the consignee, in case of their failure it would be a difficult matter to identify and trace those particular proceeds. Unless the money belonging to the consignor could be so traced and identified, the assignee would not be justified in giving preference to his claim. As a rule the consignor would be compelled to fall in line with the other creditors and take his chances with them, but would still have a case against the consignee for misappropriation of funds, if he chose to prosecute it, or send good money after a bad debt.

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THE RECENT trouble with the street car drivers in St. Louis was a serious inconvenience to the residents of that city, who suddenly found themselves dependent upon the means of locomotion provided them by nature. The time taken for the strike was when the State Fair was open and the city full of strangers, so that the inconvenience and actual loss was greater than it otherwise would have been. That rioting and loss of life accompanied such a demonstration were almost inevitable. But the worst feature of the outbreak lies in the fact that it indicates that the laboring element is dissatisfied, and that it relies upon force and oppression to right its alleged wrongs. Such uprisings may come upon any locality, from any industrial interest at any moment, and life and property are unsafe under such circumstances. When a strike occurs among workmen of any particular class, there is no predicting to what extent it will spread. During the railroad troubles at Pittsburgh a few years ago the worst rioters were not strikers, but tramps and adventurers, who had nothing to lose but everything to gain by mob violence and terror-

ization. In St. Louis the one man killed was not a striker, but simply a rioter, while some of those injured while engaged in acts of violence had never been car drivers. Their instincts led them to join any movement directed against law and order. When any public disturbances occur, whether from labor strikes or other causes, they should be dealt with summarily and vigorously, lest by delay the disorder spreads, the dissatisfied growing into a mob, and the labor demonstration into a riot. Mr. C. A. Pillsbury, one of the great flour mill owners of Minneapolis, has hit upon a plan for preventing strikes in his mills, and in attaching to him the best employees in that line of business. Two years ago he announced that thereafter he would set aside a certain portion of his profits, to be divided among those workmen who remained in his employ five years and upwards. Last year he divided \$20,000 among them, and this year the sum reached \$27,000. By this means every employee becomes identified with the business, studies its interests, and does all in his power to increase its profits. Men so interested will not be found among strikers, nor are they likely to aid in the destruction of property. The surest method of preventing labor outbreaks is to make the workmen interested in the success of their labors. To cure a communist and a rioter, make him a property owner. The worst among them can thus be made the most conservative. There is in the course pursued by Mr. Pillsbury a hint that every employer might profit by. Labor *vs.* capital is growing into a case of importance, promising to enter largely into political life, as it now does into commercial and industrial economy. It is a question that has two sides to it, as viewed from one or the other standpoint, and every thinking man should ponder it and decide what are his duties in the case. Capital can ordinarily be trusted to care for itself, but to workingmen, of whatever class or capacity, we would say that a strike is the poorest investment a poor man ever put his money into. It means idleness, debt, suffering and want to the honest laborers who have to bear the brunt of the burden, while the wild, reckless spirits are the only ones who can possibly gain anything from bidding defiance to employers. Peaceful and intelligent arbitration will always accomplish more than bluster or force. The latter may triumph temporarily, but in the end the right will win, whether it be upon the side of capital or of labor.

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### Letters to Watchmakers.

[By DR. LEONARD WALDO, Astronomer in charge of the Horological Bureau of the Yale College Observatory.]

THE APPLICATIONS OF ELECTRICITY TO HOROLOGY.

*Methods of Making and Breaking Circuits.*

*Continued from page 282.*

THE PREJUDICE which exists in the minds of most watch and clock makers against electric clocks is founded on their observation that after running for several weeks or for several months they generally stop. If they do not stop, they begin to lose irregularly, and the watchmaker reaches the conclusion that the winding of a clock once a week is of far less consequence than a liability to an unforeseen stoppage which is sure to annoy a customer when he thinks a clock is of most importance to him.

Electricity is just as certain to act in accordance with its laws, as the force of gravity in the falling clock weight, or the uncoiling of its mainspring. The reason for the failure of the electric clock is to be looked for in some interruption to, or failure to properly interrupt, the steady flow of the electric current, and we shall consider in detail therefore some of the best means which have been proposed for the purpose of making or breaking the circuit for long periods of time.

In all electric clocks which are directly actuated by the electric current, it is necessary that the circuit should be made or broken

sharply at regular intervals. Generally there is very little spare force in the clock train to be used for such a purpose, and the problem is to devise some very light and easily worked interruptor which shall be a part of the clock.

One of the oldest and simplest methods is to attach, say to the pointer of the pendulum bob, a piece of platinum wire which, when the pendulum is at rest, has its end dipping into a little globule of mercury. This globule may be a little mercury poured into a little wooden cup or into an iron screw whose end had been cut off, and a hole bored into it longitudinally. A copper wire runs down the pendulum rod, and is connected with a platinum tip, and another copper wire ends in the mercury of the wooden cup or is attached to the iron of the iron cup. The wires will then be part of a circuit, and so long as the pendulum is vertical the circuit is complete. If the pendulum is set swinging it is evident that each time it passes its vertical position, and the platinum point comes in contact with the mercury, that the circuit would be completed. Copper could be used instead of the platinum, but in this case it is better to amalgamate the copper point, which can be easily done by first dipping it in a little nitric or hydrochloric acid, and, after wiping, dipping it into a little mercury.

This is the form of make-circuit at first generally used on clocks, particularly astronomical ones. In the form described, however, it cannot be considered permanent. If we look at the mercury in a dark room a little spark will be noted at the instant the pendulum point leaves the mercury at each beat. After a week or so the mercury is covered with a scum, and after several weeks of continuous use we find that the clock no longer makes the circuit when the pendulum is vertical.

The cause of this is as follows: Whenever the little spark is made a small amount of mercury is burnt or oxidized. The oxide of mercury thus formed is a very poor conductor of electricity, and after a time it is formed in such quantities (and re-dissolved in the mercury) that not enough electricity flows through the mercury to accomplish the object in view. The oxygen in the air contributes very largely to this result, and, to get rid of the effect of the oxygen in the air, two means are resorted to. The mercury may be covered with a layer of glycerine so that the spark is formed in glycerine. This answers very well for very small currents, but a better plan is to cover the mercury with a mixture of say equal parts of glycerine and alcohol. Glycerine is rather a good conductor itself. The addition of the alcohol makes the mixture a poor conductor besides acting as a reducing agent for the prevention of the formation of the oxide of mercury.

In using the mercury, covered with such a liquid protector, it is desirable to make some different device than a point at the end of a pendulum, such as making the pendulum work a bent lever for converting the horizontal swing of the pendulum into a vertical dip.

Quite a favorite way of using the mercury make-or-break is by means of closed glass tubes in which the two ends of the circuit terminate. Obviously if we used a U-shaped tube attached to the pendulum it would be possible to so arrange the ends of the wires which go down the two sides of the U that when the pendulum is vertical the wires would be just in connection with the mercury. If the pendulum swings to either side, one wire or the other would be out of the mercury and the circuit flowing through them would be broken. If the two ends of the U are sealed up, after putting in a little glycerine and alcohol, this arrangement is admirable in practice.

Another arrangement is to use a short piece of straight glass tubing with a little ridge blown in the middle. A little mercury poured into this tube (and the ends stopped) will be divided into two portions by the glass ridge in its middle. If now one end is raised, the mercury from the raised side will flow over the ridge and connect with the mercury on the lower side. If the two wires have been connected with the two ends of the glass tube so that they go through the tube, and are in contact with the mercury on each side of

the ridge, it is clear that so long as the little tube is out of level and the mercury flowing over the ridge there will be an electric current flowing through the wires and the mercury, which will continue until the mercury is divided by the ridge. The length of time during which the circuit is made depends upon the amount of mercury, the height of the ridge, the size of the tube and the inclination. In this arrangement, the mercury is always in contact with the wires, and the circuit is broken between the particles of mercury. This device may be attached to the pendulum rod.

All of the mercury devices have the great merit of working with very little friction. With proper precautions their action is certain. No dirt destroys their efficiency. As the necessity for these qualities becomes more apparent to electrical horologists, mercury is apt I think to become the most important means of establishing cheap and sure connections.

In working with mercury care must be taken in pouring and handling it not to get the small particles around the work bench. It amalgamates with all the metals except iron, and one of the little globules, no bigger than a pin-point, will spoil the beauty of a gold watch case brought in contact with it. It is a good plan either to have a separate table for working with mercury, or some kind of a glazed dish over which mercury is always handled.

To bend small glass tubes for experimental work of this kind fill them with sand and bend them after heating in the flame of an alcohol lamp, or Bunsen burner. To insert platinum wire in a small glass tube: Heat the tube in the blow-pipe at the point where the wire is to be inserted to a bright red heat. Push the wire into the glass, and pull the red-hot glass out into a fine tube. Break the fine tube off at its juncture with the main tube. Round the edges of the hole off with a file, insert the wire in its place through the hole, and then melt the glass around the wire with the blow-pipe.

If we take the two ends of copper wires in a circuit and bring them together, we find that the circuit will flow when the wires are clean, and are pressed together with considerable force. A little dust, or a bit of thread, or grease between the ends of the wire prevents the electric current from flowing, if the current is a weak one such as we ordinarily find in electric clocks.

The "sparking" of two wires or two pieces of metal used to close a circuit by contact with each other soon produce a thin coating of the oxide of the metals and thereby prevents a current flowing between them, or else the metal is fused at the points of contact, becomes roughened, and the current will only pass to a small fraction of its total amount required between the roughened points of contact.

To get rid of the spark therefore is of the first consequence in all arrangements in which the circuit is made or broken between solid metals. It is to be observed that the spark only occurs when the circuit is broken, and not when it is made, and that its amount varies with the metals in contact, with the strength of the current, and with the resistance and number of turns in the coils of wire used in the electro-magnets of the circuit.

The usual method of avoiding the spark between the ends of the wires is to use what is technically called a *shunt*. When a circuit is shunted it means that the whole of the current is made to flow through a channel which before shunting carried only a small part of it. Suppose, for instance, we have a current flowing through a line which has a resistance of one ohm. If we stretch another line between the two terminal points whose resistance is ten ohms, the current will flow through both of them and in a ratio inversely proportional to their resistances. Suppose the new line to have a resistance of ten ohms, the current will now divide and flow through both lines, only in the case of the one ohm line the current will be ten times in amount that flowing through the ten ohm line. If we break the one ohm line the current will have no other path to follow but the ten ohm line which it will immediately follow. Now if the current is not too large the one ohm line can be broken without making a sensible spark at the break, under these conditions. This arrange-

ment of parallel lines is called a shunt. We shall call the line of resistance *the shunt* in writing in this connection. The shunt absorbs current, and it is necessary generally that the shunt should have as high a resistance as possible so that as little of the current may go through it, and as much through the main line as the other conditions of the main circuit will allow without too large a spark. Generally the shunt is made of a coil of German silver wire, and has a resistance of from three to ten times the resistance of the electro-magnet coils in the main line. It is attached at two points of the main line on the two sides of the break circuit apparatus.

Another method of getting rid of the spark is by means of a condenser. A condenser is really nothing more than a large Leyden jar in which waxed paper takes the place of the glass in the ordinary school room form. It can be made simply as follows: Take a hundred sheets of waxed (or paraffined) paper, and, say, forty sheets of tinfoil about six inches square; lay the sheets so that the first layer will consist of several sheets of paraffined paper, then a sheet of tinfoil projecting over the first layer about one inch to the right, then a sheet of waxed paper exactly over the first layer of paper, then another sheet of tinfoil projecting an inch to the left, then a sheet of paper exactly over the other paper, then a sheet of tinfoil projecting to the right as at first, and so on with alternate layers until the material is used up. We then have a package in which no two consecutive sheets of tinfoil touch each other, and in which the alternate sheets project to the right and left of the waxed paper. The waxed paper should be half an inch wider than the tinfoil, so that there is no danger of the leaves of tinfoil touching at the two ends. Now, fold the edges of tinfoil around a brass or copper strip on the two sides, and screw two press boards together in such a way that the metal strips will project and the layers of paper and tinfoil be subjected to a pressure by the two boards which project beyond, and in whose edges the screws are inserted. After it is completed the whole thing ought to be thoroughly shellac'd. It is connected in the same way as a shunt, and is more efficient without any loss of current. In choosing the paper for a condenser each sheet must be examined to see that there are no pin holes in it. If there is any contact between the alternate sheets of tinfoil, we should have a short circuit in the condenser, which is, of course, to be avoided.

In making or breaking a circuit it is preferable that the separating surfaces should be either platinum, or one platinum and the other gold. Experience has shown that the spark is less and the smoothness of the surfaces preserved longer than in any other combination of metals. It is advisable to have a rubbing contact, if possible, so that particles of dust coming between the metals may not keep them apart, but may be rubbed or brushed aside. Thus it is not unusual to see the circuit made by a wheel in which the spaces between its teeth have been filled with hard rubber. A platinum brush, consisting of several pieces of fine platinum wire banded together, forms one end of a circuit of which the other end is in the wheel. As the wheel revolves the teeth and the hard rubber spaces alternately come in contact with the platinum brush and make the circuit. This is an admirable arrangement, and is substantially the form which Mr. Lund employs in the London system of synchronized clocks.

Another form uses a principle which was first applied to telegraph keys, and in which the circuit is made through a small wheel attached to the minute hand arbor of the clock, and which, therefore, makes a complete revolution once an hour. This presents a fresh surface to the little metallic hammer which falls upon it and through which the circuit is made. In telegraphers' language this is the periphery contact wheel used in some forms of keys.

In other forms of contact apparatus a conical point slides against a flat spring, such as in the Trippen electric clocks of Philadelphia.

In Spellier's clock a rocking bar is attached to the pendulum rod in such a manner, that at one end of the arc of vibration it is against a contact point on one side, and when the pendulum swings to the

other extremity of its arc of vibration, the rocking bar falls against another point of contact on the other side. The little blow thus given acts to free the points from dust and makes a good contact.

(To be Continued.)

On the Isochronism of the Best Modern Watches.

IN SEPTEMBER of the present year I had a number of watches rating which were presumably types of the best watches now made. Of the eight following, all of them had either received Class A certificates or were entered for them, and had consequently been adjusted for isochronism, temperature and in five positions. I think, therefore, that they can fairly be considered as indicating the success now attained in adjusting going barrel and fusee watches to isochronism, and I have prepared these results for publication as an aid to adjusters interested in this question.

The following table gives the more important particulars concerning the movements:

Designation and Place of Manufacture.	Curves of Hair Spring.	Balance.	Going Barrel or Fusee.	Escapement.
A. Denmark.....	Single Breguet	Ordinary Comp.	Going Barrel	Lever
H. United States.	"	"	"	"
J. Switzerland....	"	"	"	"
K. United States.	"	"	"	"
F. England.....	"	Auxiliary	Fusee	"
G. England.....	"	"	"	"
X. England.....	Vertical Spiral	Ordinary	"	Chronometer
Y. England.....	Double Breguet	"	"	Lever
C. England.....	Vertical Spiral	Auxiliary	"	Chronometer

C is a box chronometer.

It will be observed that A H J and K are going barrel lever watches, while F G X and Y are fusee watches, X having a chronometer escapement.

The watches were observed in 6 hour periods in the position of dial up (lying) for two days, and then for one day in the position pendant up (hanging). The watches had been running for several days previous to the rating, to allow the watches to take up their rates. The temperature for the periods was as follows:

1st 6 hour period, dial up,	69.°5
2d " " "	69.°0
3d " " "	68.°5
4th " " "	68.°0
5th " " "	68.°0
6th " " "	68.°0
7th " " "	68.°0
8th " " "	72.°0

For the day pendant up the temperature was 72°.

The watches were all compared by means of a recording chronograph, and depend directly upon the mean rates of the mean time standard clock of the observatory, whose errors were known from star observations on the days of comparison. In the following tables the watches' rates are for 6 hour periods, and are freed from the corrections for the rate of the standard clock. The watches were wound at the beginning of the 1st and 5th periods.

	Period.	Rate. S.	Period.	Rate. S.	Mean Rate. S.
Watch A.	1	+0.9	5	+1.0	+0.95
	2	+1.2	6	+1.2	+1.2
	3	+1.9	7	+2.0	+1.95
	4	+2.0	8	+1.6	+1.8

Watch H.	1	-1.1	5	-1.3	-1.2
	2	-0.9	6	-0.9	-0.9
	3	-1.0	7	-0.9	-0.95
	4	-0.5	8	-0.8	-0.65

Watch J.	1	0.0	5	0.0	0.0
	2	+0.3	6	+0.6	+0.45
	3	+0.4	7	+0.6	+0.50
	4	+1.1	8	[+3.2]	+1.1
Watch K.	1	+0.9	1	+1.0	+0.95
	2	+1.2	2	+1.2	+1.2
	3	+1.9	3	+2.0	+1.95
	4	+2.0	4	+1.8	+1.90
Watch F.	1	+0.6	5	+1.2	+0.9
	2	+0.5	6	+0.5	+0.5
	3	+0.6	7	+0.4	+0.5
	4	+0.2	8	+0.1	+0.15
Watch G.	1	-0.2	5	+0.4	+0.1
	2	-0.3	6	+0.1	-0.1
	3	-0.3	7	-0.1	-0.2
	4	-0.3	8	-0.6	-0.45
Watch X.	1	-2.6	5	-2.7	-2.65
	2	-2.7	6	-2.8	-2.75
	3	-2.7	7	-2.6	-2.65
	4	-2.7	8	[-1.1]	-2.7
Watch Y.	1	-1.0	5	-0.9	-0.95
	2	-0.8	6	-0.7	-0.75
	3	-1.0	7	-0.6	-0.8
	4	-0.9	8	-1.2	-1.15
Chronometer C.	1	+0.2	5	-0.2	0.0
	2	+0.2	6	+0.5	+0.35
	3	+0.3	7	+0.4	+0.35
	4	-0.1	8	+0.1	0.0

I have put the rate for the 8th period of watches J and X in brackets, and have not used them for the reason that they seem to have been affected by some unknown cause for irregularity. Examining the other mean rates we see that for all the going barrel watches (A H J K) there is a steady though small acceleration of rate for the four periods, amounting in

S.  
 Watch A to 0.9  
 " H to 0.6  
 " J to 1.1  
 " K to 1.0 } between the first and fourth quarters of a day's running.

And examining the mean rates of the last four fusee watches (F G X and Y), we find the changes to be smaller, and, where they exist, they show a retardation. The changes amount in

S.  
 Watch F to 0.7  
 " G to 0.5  
 " X to 0.0  
 " Y to 0.2 } between the first and fourth quarters of a day's running.

The mean change for the going barrel and fusee watches is 0.59 and 0.4 respectively, whence I conclude that the fusee watch still possesses an element of accuracy for equalizing fractions of a day, not possessed by the going barrel watches, though the relation between the spring and the fusee does not seem to have been well enough adjusted in watches F and G to very much improve on the going barrel watches.

LEONARD WALDO.

How to Express the Temperature Variation of a Watch.

IT MIGHT happen that a watch on being rated at extremes of temperature was found to be very nearly adjusted at the extremes,



and yet in the mean be very considerably "out." In comparing watches, therefore, it is important that some rule be established which will take account of the variation in the mean, as well as of the good, running at the extreme temperatures.

It is impossible from three observations to determine what the rate of a timepiece will be at intermediate temperatures. The variation of rate is not proportional to a variation of temperature, nor is there any method of prediction except it be founded upon a series of observations at different temperatures.

It is seldom that time is afforded for any such series of observations, however, and we have in practice to judge of temperature effect by the rates in (1) a cold box which is generally at 40° to 45° Fahr., (2) the ordinary living room which may be assured to be at 70°, and (3) a hot box whose temperature ranges from 95° to 100°. From these three observations it is proposed to furnish a statement of the "variation for ±1° Fahr."

The most satisfactory method of expressing this which has come under the writer's observation, is that adopted at the Geneva Observatory and which will be used at Yale during the coming year. It is best illustrated by an example: Suppose an adjuster finds the following rates for his watch:

	S.
At 40° gaining	+3.8
" 72° "	+6.4
" 98° "	+2.1

How shall he express the temperature variation for 1° F.?

We find the mean of the temperatures to be 70°.0, and the mean of the rates to be 4<sup>s</sup>.1. If we subtract the temperatures and rates from these means we find:

Deviation of Temperature.	Deviation of Rate.
	S.
-30°	-0.3
+ 2°	+2.3
+28°	-2.0

Now we have here three deviations of temperature from the mean which correspond to three deviations of rate. If we take their sums, without regard as to whether the separate differences are + or -, we can find the mean deviation by simple division. Thus we have:

Sum of the temperature deviations	±60°
" " rate	±4 <sup>s</sup> .6

from hence we find:

$$1^\circ \text{ Fahr. corresponds to } \pm 0^s.077$$

which may, therefore, be called the "variation for 1° Fahrenheit."

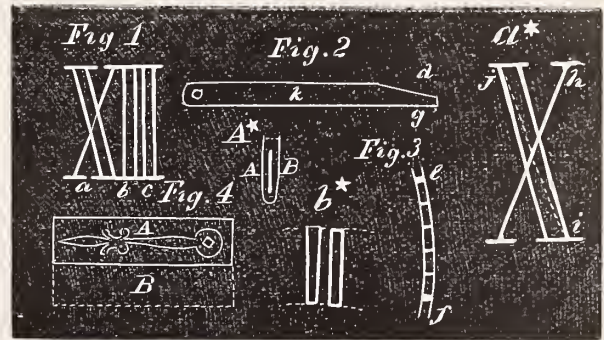
LEONARD WALDO.

### Advice to Watchmakers' Apprentices.

BY A MAN WHO HAS SPENT TWENTY YEARS AT THE BENCH.

LEFT the description of how to paint a dial at the point where we were prepared to rule on the lines with water color, as directed in last article. The circular lines for the minute spaces are ruled as shown at fig. 3. These lines should be about  $\frac{3}{16}$  of an inch apart, and each line should be about  $\frac{1}{4}$  of an inch in width. The heavy marks at *e f* are for hour marks. Although the whole of the work is done mechanically, still it requires nice judgment to get the machine to work elegantly, as, for instance, in the XII in fig. 1. Here the letters are shown in skeleton outline, and at first glance it would seem as if it was all easy enough to take the ruler as shown in fig. 2, and with the straight edge at *g* rule the I's, and with the bevel side *d* rule the lines for the X. Now this course, which seems so possible, will not do. At diagram *a\** is shown an X enlarged. We will suppose the bevel side of the ruler, *k*, fig. 2, corresponds to the angle which would rule the hair or fine line, *h*, diagram *a\**. If now we turn the rule over, *i. e.*, reverse it on the center pin, it would rule

a line corresponding to the dotted one extending from *i* to *j* (diagram *a\**), which would not be correct; consequently, for ruling the full lines, we must make a compromise edge to our circular ruler *k*, which will rule lines corresponding to the full lines *i* and *j*, diagram *a\**. Now, to rule the figures on our dial we will need one to rule the I's, two for ruling the X's, one for ruling the V's. In ruling for the I's the sides of the rule should not be exactly radial, but be shaped so the letter ruled will be the same size from one end to the other, as will be understood from inspection of diagram *b\**, where *m* shows an I which tapers on radial lines, while *l* shows an I made as it should be. The way to proceed is to lay off your letters from the hour spaces, and then take the rule for, say, the right side of the I's, and rule all the lines around the dial which require to be ruled with this rule; then turn the rule over on the center pin (described in former article) and rule the lines for the left side of the I's. I suppose it is hardly necessary to say the ruled lines should be permitted to dry perfectly before the rule is passed over for the second ruling. There is no definite rule for the width of the broad bars of the letters or the spaces between them. About as good a way is to take some



dial and measure the letters, and make yours in proportion. If you copy from a six inch dial to a twelve inch, double the size all through; if you take from an eight inch dial for a twelve, add one-third, and so on. After the outlines are all ruled, as directed, the face of the broad lines can be filled in with a brush, the clear, sharp outline making the letter look perfect. The filling-in can be done with the same kind of ink, or with oil color. After the water-color lines are dry a coat of clear varnish will make the letters water proof. The varnish should be some white kind, like white copal or demar. Of course, any fancy work, like a landscape, marine view, or a moon, would require a hand which had had some artistic training. But men who can do a decent job at this kind of ornamental work are much plentier than those who can do really nice lettering. To recapitulate: The method of repainting a clock dial is, in a nutshell: if the dial is an old one, first remove all loose, old paint; then fill up the cracks with a putty made from white lead ground in oil, to which a little dry white lead and painters' japan is added, to give consistency; after which it is painted with white lead and oil, allowed to dry perfectly, then rubbed down to a perfectly smooth surface with, first, sandpaper, then fine pumice stone and water; this surface will permit the use of water colors. We rule on our outlines, and fill in with the same color to get broad lines, and finally varnish to make the letters permanent.

Another job one is sometimes called upon to do in the clock line is to make steel hands and blue them. The material used should be sheet steel, and not iron, as iron will never take a fine color. Scraps of sheet steel can be procured of the sawmakers of almost any thickness, and are very handy about a workshop for many other purposes; and if they are properly annealed in a charcoal box can be cut with the ordinary jewelers' saws into any shape. After the steel is softened the form is laid out, then with a jewelers' saw saw the hand out into shape. The hand or hands are now to be filed into the proper form and rounded on the front, in fact, made as perfect as possible with files and emery paper. We next proceed to harden them. This can be best done by taking a piece of sheet iron large enough to fold together, as shown in fig. 4. Suppose we have a hand to harden six inches long, we would take a piece of sheet iron seven inches long

and three inches wide, and fold it together so as to form a box open on one side, as shown in diagram *A\**, which is transverse section of *A*, fig. 4. At the dotted outline *B* is shown the part which folds under *A*. The hand is placed in the recess, as shown at *n*, diagram *A\**, and the space between the box *A B* filled in with sal tartar, *carbonate of potash*. The box and hand should now be heated red hot and plunged into cold water. The hand will come out white, being protected by the sal tartar from scaling.

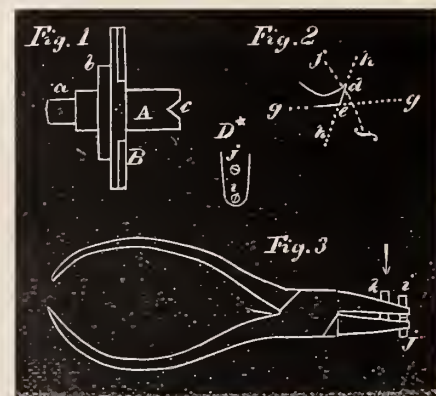
The hand is now as hard and nearly as brittle as glass, and it should be reduced in a sand bath to a violet blue. A sand bath is simply a box of sheet iron, in this instance about seven inches long, and say three inches wide by one and a half inches deep. This box is filled with sand and heated equally from end to end. Stirring the sand also has a tendency to equalize the temperature. The reason of first bluing the hand after hardening was to temper and toughen it, so it can be polished. The hand is now polished with fine emery until all deep scratches are removed, then it is to be polished with Vienna lime or diamantine and alcohol. The hand should now be washed thoroughly, to remove all traces of oil or grease, as the least trace of either of these substances will prevent an even color. In finishing up such a hand considerable taste and skill are required, as it is not desirable to finish the face of the hand dead flat, but round the face off so it will present a graceful appearance. This rounding is first done with files adapted to the conditions imposed, and then emery paper, until all file marks are obliterated. A very useful tool to watchmakers is a small iron wire scratch brush, used by dental tool makers. They are made of fine iron (really a mild steel) wires, no larger than a hair, and about two inches in diameter. There is a wood center an inch in diameter, leaving the length of the wires about half an inch. Such a brush is used with emery cake, a composition of flour of emery and tallow. In using such a brush it should be allowed to run only in one direction, so as to permit the wires to bend or curve only in one direction, which produces a kind of licking action, which, in conjunction with the emery and tallow, produces a smooth gray surface ready to be polished. The hand should be well washed after being worked with soft bread crumb to remove the emery. The polishing should be done with Vienna lime or diamantine, after which it is ready for the final bluing, which is done in the sand bath. To get a fine, high color the process should be conducted slowly.

### Problems in the Detached Lever Escapement.

BY DETENT.

IN CONSIDERATION of the fact that fully three-fourths of the watches a watchmaker in this country is called upon to repair are of American make, we shall devote a very considerable space to such problems as are involved in the escapement used in these same American watches. The escapement used is universally the detached lever, of the club tooth form, with brass scape wheel, and now almost without exception exposed pallets. The principles involved in the club tooth lever escapement have been duly considered in former articles. But it will do no harm if we reconsider some of the factors involved. I believe that, without exception, the rule of  $10^\circ$  of pallet action have been adopted by all the American factories; but the roller action has been modified and changed in some instances to the extent of 10 or more degrees. Whether this is or is not the better will not be considered now. The question at present which we are discussing is how to repair the escapement of such American watches as come to our hands. It is well to disabuse the reader's mind of the idea that every American watch (or for that matter any make of watch) has perfect escapements, for there are degrees of excellence, from that which will just do up to the nearly perfect. The greatest errors in the club tooth escapement lie in the scape wheel. No matter how perfect the machinery for cutting the teeth, error will

creep in; and these errors are much more difficult to detect than with the ratchet tooth. Still, there are advantages for the club tooth which hold it in favor. The abstract consideration of these questions are not of the importance to the every-day watch repairer as the how to make the watch run and have a good motion. What the practical man wants to know is, first, the correct form of the parts in an escapement; then to detect errors, and either remedy them or so arrange the parts that the errors will tell to the least advantage. We frequently find an escapement in which the roller will not permit the fork to be banked up to  $10^\circ$  pallet action. In such cases we can generally change the set of the pallet stones so the available pallet action will not be materially impaired, while the roller action will be much improved. The problem we propose to consider in this communication is one to which the exposed pallet is peculiarly subject, and this is the loosening of a pallet stone. This loosening may extend to either pulling out or its being turned to one side, so the scape wheel has only one pallet to engage. The result is the teeth are stubbed up, and the putting in of a new pallet stone is not going to remedy the trouble—a new scape wheel will also be demanded. Now, it is a stubborn fact that all scape wheels, from the same factory even, in the same grade of watch, are not of the same size and action, but vary a little. And not only this; a large portion of my readers cannot afford to keep a stock of American scape wheels to select from; consequently, any means by which the old scape can be restored, so as to be available, should be of great advantage to the average workman. For the skillful repair of American watches we need to keep in stock only a moderate number of scape wheels; but a big lot of rollers, or roller tables, as they are frequently termed, is necessary, as often we get watches that a mere change of rollers will work a seeming miracle in the motion. But it is only by a thorough knowledge of the adaptation of the parts taken as a whole, and their relation to each other, that success can be obtained in the repair of watches. And for these reasons the writer of these articles has sung and shouted the praise of a working model of magnified proportions of the detached lever escapement. With one of these models, properly studied, one can make even a very imperfect escapement perform satisfactory. We gave in our last communication an attachment for grinding scape wheel teeth. We propose now to give a simpler one adapted for brass scape wheels, either ratchet or club tooth. The object of this device is to enable a workman to perfectly true up a scape wheel after the teeth have been bent or stubbed up. This device has a division wheel, made precisely as the one described in August number of 1885 of this journal, with this difference: the division wheel in the present instance is mounted on a chuck, which goes into the lathe spindle. Such a chuck is shown in fig. 1, where



*A* represents the chuck and *a* the threaded part which goes into the chuck for wax chucks. *B* represents the division wheel; *b* is a collar, driven and soldered on *A*, against which the division wheel *B* is screwed. The chuck *A* is merely a common wax chuck, with hollow cone at *c* for receiving the lever pivot of the scape wheel pinion. The idea is this: We set the pinion in wax, precisely as if we were going to turn a top pivot, truing up by the pivot. After the pinion runs perfectly true we are ready to use the appliances for restoring the teeth to their original form. At fig. 2 is shown a mag-

nified form of a club tooth. In cases mentioned above, where one of the pallet stones are lost or broken out, the tooth will become stubbed off at about the dotted line  $f$ , the angle at  $e$  being seldom injured. Now what we want is to restore the point of the tooth at  $z$ . To do this we must flatten the tooth, making it thinner, which is no detriment, as the process of flattening the tooth will harden it. At any rate there is plenty of wear left in it if reduced one-third in thickness. The probabilities are the tooth was of the right size and form when originally put in the watch, consequently it must be our aim to restore it as near as possible to the original form. To do this we must preserve a mechanical record of the tooth before flattening on the dotted lines  $g$   $h$ . We shall not have space in this article to describe appliances (which are very simple) for doing this, but we give the manner of flattening the teeth. In making such restorations it is impossible to get the measurement from the old tooth as it stubbed up, but we can measure another and perfect scape wheel for our guide. And it is safe, as a rule, to let our teeth which we are fitting up have a very appreciable more extent on the impulse than the average of the new wheels, because generally, if we manipulate the pallet stones a little, we can escape closer than is usually done, except with the finer grades of watches. A cheap pair of pliers, such as shown in fig. 3, softened at the nose so as to be drilled, are the best device for flattening the teeth. Close to the end of the nose of the pliers is drilled a hole in each jaw, as shown at  $i$   $j$ ; into these holes are screwed pieces which serve as little stakes, between which the teeth are grasped and squeezed until the stop screw  $k$  prevents further action. Diagram  $D^*$  is a view of the nose of the pliers as seen in the direction of the arrow in fig. 3. After the scape wheel is trued up in the wax the chuck should be removed from the lathe and held in the hand; but this should not be done until the measurements are taken for the angle at  $e$ . But the manner of taking this measurement will run into a subsequent number.

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## Proceedings of the Horological Club.

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### A DISTINGUISHED BODY OF WATCH AND CLOCK MAKERS.

*One hundred and thirty-sixth discussion.—Communicated by the Secretary.*

[NOTICE.—Correspondents should write all letters intended for the Club separate from any other business matters, and headed "Secretary of the Horological Club." Direct the envelope to The Jewelers' Circular Publishing Company, Seth W. Hale, President. Write only on one side of the paper, state the points briefly, mail as early as possible, as it must be received here not later than the eighth day of the month, in order to be discussed and reported in THE CIRCULAR for the next month.]

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### BACK NUMBERS OF THE CIRCULAR FOR SALE.

The Secretary stated that he had been notified by Mr. E. B. Dabney, of Council Grove, Kansas, that he had 9 volumes of THE CIRCULAR for sale, from 1876 to 1884. This would be a good opportunity for our numerous correspondents who wish to get Excelsiors "Practical Hints on Watch Repairing," and whose inquiries we are so seldom able to answer. The volumes do not contain the first series of those articles (which has been republished in book form by The Jewelers' Circular Publishing Co.), but they comprise the whole of the second series which has not been republished, and to which our correspondents more particularly refer in their letters, as they can now be obtained only by securing back numbers of the papers.

In addition to those well known articles, the volumes offered for sale also contain excellent practical articles by other able writers, among whom may be mentioned "Expert," "The Model Watchmaker," "Detent," "A Man who has Spent Twenty Years at the Bench," etc., besides others who write on subjects not directly relating to practical work at the bench, but to the scientific, artistic, commercial and other branches of the business. Besides all this,

there will be found selections from foreign trade journals and translations of many standard books—the whole constituting a storehouse of information impossible to secure in any other way. Such information hardly ever gets out of date—a large share of it, at least—and back numbers of THE CIRCULAR will always be valuable.

### LOOSE JEWEL REVOLVING IN DIRECTION CONTRARY TO ITS PIVOT.

#### *Secretary of Horological Club:*

Having read the discussion in your Proceedings upon the revolving of a loose jewel in an opposite direction to that of the pivot, I take the liberty of illustrating its cause.

A rapidly revolving wheel, not perfectly poised, has the tendency to give its pivots a crank motion, and will take this motion if the pivot or jewel has freedom. The jewel being loose, this motion causes the jewel to roll on its edge in its setting in the same direction as that of the pivot, which will impart the opposite revolution to the jewel.

Supposing the jewel to be much smaller than its setting, if we insert a pointed tool in the pivot hole of the jewel, and give it a crank motion in one direction, pressing outward to cause the jewel to roll (not slip) in its setting, it will cause a backward motion of the jewel.

The comparative rapidity with which this jewel would revolve backward under these conditions would depend entirely on the difference in the circumferences of the inside of the setting and of the edge of the jewel. For instance, if the circumference of the setting be one-twentieth larger than that of the jewel, you will be obliged to roll this jewel in its setting twenty times around to complete one backward revolution.

C. W. R.

#### *Secretary of Horological Club:*

I am satisfied that the peculiar backward motion of the jewel is possible. This effect can be obtained by placing a point in the jewel hole, and pressing (thereby rolling) the jewel around in its setting, the track of which is longer than the distance round the jewel. The jewel loses that difference in distance during every complete roll it makes around its setting. And if it is but a hair's breadth each trip, it would move quite fast if we could secure enough trips per minute. As this is a losing race on the part of the jewel, you will find it gradually losing ground or creeping in the opposite direction to the pressure or rolling of the jewel.

This, of course, is a simple practical fact, and to account for the jewel rolling in that direction, so you can understand me, without being able to use a practical test, may be beyond my descriptive power. When a tooth first strikes a leaf of the pinion, it must throw the pressure quickly in the direction that tooth is moving, carrying the loose jewel in that direction until it strikes its setting. Then the friction between the tooth and pinion leaf is so much greater than the pivot friction, that it forces the jewel to roll, always touching its setting directly opposite the point of friction, in pinion and wheel tooth, crowding to center, causing the jewel to roll in the direction the pinion is going, thereby losing ground.

My theory is worked out on a slow practice, of tooth by tooth, on their respective pinion leaves, and would not in itself accomplish the end without force of irregular speed, caused by friction of pinion all through the train.

The wheel in question I understand to be going at a high rate of speed, with little or no friction beyond its own to carry.

The tendency of each tooth, as it bears near the center of the pinion, is either to increase its speed or retard the speed of the wheel driving it, the leverage being different. This wheel, having nothing beyond it to carry, will yield to that tooth's demand for increased speed at this particular point, while the wheel back of it is kept more or less steady by friction of its own pinion.

This wild wheel may be thrown round by striking each leaf, and leaving that tooth where the demand for increased speed stops, and on being thrown around in this manner would naturally follow the pressure of the jewel all the way round in the circle started, although forced only a quarter of the way, or perhaps less, and if it does roll round from this cause it must run backwards as described.

C. H. H.

#### *Secretary of Horological Club:*

I have been a somewhat attentive reader of the loose jewel question (although my name was Thomas), but up to this time (Oct. 8) I have not met with an opportunity of testing the matter. To-day, on taking down an ordinary Swiss cylinder, I let it run with considerable force. The scape wheel jewel being quite covered with fine lint, I noticed that the jewel was loose, and revolving rapidly in the contrary direction to the wheel. After watching it and satisfying myself that there was no illusion about it, I removed most of the lint,

thinking perhaps that might deceive the sight some way, but the jewel continued to rotate in the reverse way to the wheel. I then slackened the speed of the train, and the jewel stopped turning and quivered violently for a second or less, then commenced to revolve with the wheel. On applying more speed the jewel would stop and quiver as before, then start in the contrary way, and every time I tried the experiment the result was the same. I then removed the bridge, took out the jewel, freed it and the setting from every particle of oil with benzine, and made them as clean as possible; also cleaned the pivots and replaced them, and found that the jewel revolved just as it had with plenty of oil. I then oiled the pivot *only*, and the jewel revolved with the wheel. I then oiled the setting and the jewel revolved in the contrary way to the wheel as it had done at first. Now, I cleaned all the oil from the pivot and hole, and the jewel revolved in the contrary way to the wheel. The jewel was the top scape wheel hole. One feature in my trials appears to be new: the jewel would revolve with the movement *either side up*—vertical or oblique—the different positions not appearing to make any difference in the action of the jewel. The jewel was an extra thick one, with thick edges, only fairly finished. The hole appeared to be round and nicely polished.

W. D. M., London, Ont.

Mr. McFuzee, in closing the discussion, summed up the general sentiment, stating that the preponderance of opinion seemed to be in favor of the theory that the backward motion of the jewel was due to the difference in the circumferences of the jewel and of its seat in the setting, when the jewel was caused to roll around against its setting. If the wheel was very much out of poise, so that its excess of weight on one side would cause the pivot to press toward that side all the time—as would be the case if the speed was considerable, and the centrifugal force resulting therefrom correspondingly strong—then the jewel, in rolling once around the inside of the setting, would have passed over more space than its own circumference, and a given point on its circumference would touch the setting before it reached that point of the setting from which it started. It would consequently not be in its original position at the end of its first round, but as much back of that as the difference between the two circumferences, and at every round it would be so much further back—causing the backward revolution under discussion.

But if the wheel was not sufficiently out of poise to ensure constant contact between the jewel and its setting as described, but only intermittent contacts took place, as explained by Mr. H., this backward motion would only take place during the continuance of the contacts, and the revolution would be slower.

This theory, however, is somewhat shaken by the statements of Mr. M., who gives us the most complete account of the action which we have yet received. When the parts were dirty, he says the jewel went backwards. This is consistent with the foregoing theory, as the friction in the setting would be greater than that on the pivot, causing the jewel to roll in the setting, and, of course, to move backwards as before explained. When he slackened the speed, the centrifugal force was less and the contacts were intermittent instead of constant, the jewel shook about or “quivered” until the speed became greater, then the jewel went backward again. He then cleaned all the parts and the jewel still went back, as we would expect—the general conditions being the same as when dirty. This is again Mr. Moss' theory of a current of oil being the cause. He then oiled the pivot only, leaving the setting dry and clean, when the adhesion of the oil caused the jewel to go with the pivot. But when he oiled the setting also, causing greater adhesion between it and the jewel than between the jewel and pivot, he restored the original conditions, and the action was the same as at first, *i. e.*, the jewel went backward. Then he cleaned the pivot and hole, but not the setting, and, as we would expect, the jewel still went back.

All this is conformable to the contact and friction theory. But now he tells us something which is rather inconsistent with it, *viz.*: the jewel would move in the same way, whether the movement was held one side up, or the other side up, or held edge up. It has been supposed heretofore that it was necessary that the pinion should be vertical, and the loose jewel on the top pivot in order that there should be sufficient freedom of the parts for this action to take place.

But if it will do so even when the movement is reversed, so that the weight of the wheel is on the jewel, and the jewel actually carries the wheel around with it while it is running around the inside of the setting, then we must suppose that the wheel is so much out of poise that this onesidedness and the centrifugal force were strong enough to overcome the weight of the wheel in *any* position. A direct test of this would be to *take out the wheel and poise it* until no difference of weight can be detected between different sides of it. We would recommend every one who finds a case of this phenomenon to apply this test hereafter, and see if it does not stop the backward motion of the jewel.

If it does not, then that theory is disposed of together with that of the currents of oil, and we must come to either Mr. H.'s theory of the wheel being shaken about by the changing pressures of the teeth and pinion leaves, in different positions of their action, or some other than has yet been suggested. If we suppose that the escape wheel naturally falls toward the fourth wheel, but is thrown away from it by every tooth in some of its positions, then it may be thus shaken about, as Mr. H. supposes, and cause the backward motion of the jewel. But if so, this to-and-fro motion of the pivot and jewel should be discernible by the eye. Here is another point to be observed: While the jewel is revolving backward note carefully its action, to see whether it is shaken *to and fro* in its setting or is *carried around* in the setting as if by a constant outward pressure by the pivot. Apply both this test and the poising test when all the parts are clean and free from oil, if possible. One careful experiment in this way will soon settle the matter, and we hope our readers who may be so fortunate as to come across a case of the sort will not begrudge the time necessary to make it, and to send us a full and accurate account of the tests and results.

### Mummy Eyes for Jewelry.

[Read before the New York Microscopical Society, October 2d, 1885, by  
GEORGE F. KUNZ.]

THE SUBJECT which I take the liberty of presenting to you this evening was brought to my attention by a number of articles that recently appeared in the daily papers. In these articles it was stated that a necklace was being made by Messrs. Tiffany & Co. of petrified human eyes; that arsenic had been used in the preparation of these eyes, and that three workmen who were engaged on the necklace had been made suddenly ill by the deleterious poison, and refused to resume work on such dangerous material. Through the kindness of Mr. W. E. Curtis I was enabled to bring the material with me to-night, and on inquiry at headquarters the facts were elicited, which I shall present to you. An explanatory letter from Mr. Curtis was likewise loaned to me by Mr. C. Hanford Henderson, and this, with the information gleaned from Messrs. Tiffany & Co., has enabled me to give a true and satisfactory account of the matter. Mr. Curtis writes that “mummies are very common in Peru, so common, in fact, that they can readily be obtained at \$4 or \$5 apiece.” The writer himself recollects that some years since they were sold as low as \$11 each at Leavitt's, in this city. Mr. Curtis continues, “that, having learned from a young lady in New York that they were sometimes used in jewelry, he determined to procure some for a necklace. This he did without difficulty, most of the eyes being obtained at Arica, Peru.”

Prof. Baird also informs me that the so-called mummies' eyes are well known, and that the first he ever saw were brought to the United States from Peru by Lieut. Gillis about thirty years ago. Professor Baird adds that they are, without question, the crystalline lenses of the eyes of a species of cuttle fish (squid). This view is corroborated by Prof. Verrill, who says there is a large squid, very common on the Peruvian coast, the lens of the eye of which is about as large as these so-called mummies' eyes.

Some of the lenses from the eyes of these cuttle fish measure only 5 mm., but the majority of them are 12 mm. in diameter, and some as much as 18 mm. The color, really only the result of age, is a dark amber yellow or golden bronze externally on the convex side. In all cases they are nearly opaque, and have the appearance of an onion skin or any other sack-like concretion. On the flat side, however, the color is much lighter, and a little play of light is noticeable. The surface is rough, as if an exudation had hardened on it. The structure of the lenses is like that of a pearl, an aggregation of successive enveloping layers, which are marked on the surface by sets of concentric rings. It is also plain, from these rings, that the lenses are sections, constituting only about one half of the original lenses of the fish, the intention undoubtedly being to produce additional luminous effect by this series of hemispherical reflectors.

The crystalline lens of a human eye would not be so large as even the medium sized lens exhibited here this evening, and is so exceedingly delicate that it can only be preserved at all by the greatest care.

In many fishes, and especially the cuttle fish (squid), the lens of the eye contains so much solid matter that it will dry up in a short time, and with very little contraction, into a hard, transparent mass, which would probably be durable.

On the contrary, Prof. Raimondi, the most eminent ethnologist of Peru, believes these eyes to be human, and Dr. Tschudi, of Vienna, is said to support him in this theory.

The region where these mummy eyes are found is rainless, and the mummies were dried in a sitting posture in the salty sand or the nitre beds, often thousands of them at one place. This being the case, they must have been exposed to the public gaze, and the embalmers would naturally wish to make the appearance of the dead as attractive as possible. Hence it is probable that the cuttle fish eyes, which were inserted into the empty sockets, were cut into two nearly equal parts, in order to obtain greater luster and give a natural brightness to the eyes of their dead.

The three workmen who were engaged in polishing these eyes were all affected soon after working on them. The sawing and polishing were done at different times, and in each case the same result followed, so that the workmen are confident that their illness was caused by the inhalation of dust during the sawing. The youngest, a boy of 16, was taken sick after working only a few hours. His illness consisted of headache, billiousness, and vomiting, and lasted for one day. Another workman, a strong, hearty Frenchman, about 45 years of age, and weighing nearly 200 pounds, reported that he was taken sick with nausea, sick headache and vomiting, and noticed a disagreeable, metallic taste in his mouth during his entire illness, which lasted four days. The other, a German lapidary, about 40 years of age, was affected shortly after working at the eyes with an eruption of small pimples over his entire body, and when any of the affected parts were rubbed a swelling immediately arose. This rash was perceptible for over a month. From the fact that these three cases occurred in one workshop, and soon after work was commenced on the eyes, the men very naturally reasoned that the eyes were the cause of their sickness, and expressed a desire not to resume work on them.

In response to inquiry, Prof. Baird writes that he never heard that poisonous qualities were inherent in the eyes. If they are really poisonous, it surely cannot be from any preparation used to preserve them, for no preservative was necessary, as would have been the case if they were human eyes. It has been observed, however, that in this case certain alkaloids may be generated by the decomposition of the organic constituents of the eyes. This matter will soon be determined pathologically by myself. The United States survey chemists are also examining the lenses, to see what alkaloids, if any, are present.

As ornaments these eyes are truly beautiful when the exudation on the cut surface has been removed, and they are finely polished. They vary in color from a light yellowish amber tint to a dark yellow,

yellowish brown, or rich amber brown, similar to that from Catania, Sicily. In some cases the colors are found in alternated bands, as in the Mexican fire opals from Queretera. Although the reflections lack the play of colors found in the opal, the tints are warmer and more pleasing. The luster on the uncut rounded sides is pearly. With a proper gold mounting these eyes would give a very beautiful effect in jewelry, although moisture would be likely to injure the polish.

## Fashions in Jewelry.

### A Lady's Rambles Among the Jewelers.

THE goldsmiths of to-day have within their grasp wonderful possibilities which, with judicious development, require but a little time to become certainties. Neither designer or artisan are hampered with close drawing lines, prohibiting this or that class of work because out of date. The truth is, the autumn of 1885 finds nothing out of date that ever boasted of an artistic origin. Dame Fashion is now most lenient in jewelry as in silverware. She grants the widest of licenses in regard not only to form and design, but style of decoration and finish. There is but one restriction; the thing produced must be one of beauty artistically considered; in a word, it must be worthy of the name of art work.

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THE demand is growing all the while for personal ornaments that will not only represent an intrinsic value in dollars and cents, but an art value before which the worth of the materials employed sink into insignificance. When a lady's gold brooch shows, from the conception of its first formation to the touching finish of its decoration, originality and beauty, it will become a matter worth having and holding, and for which patrons of cultivated tastes will pay a remunerative price, just as they pay now for art work in other directions.

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FORMERLY in the making of jewelry, worthy conceptions were distorted or entirely obliterated in the attempt at production, because the fashion of the period rigidly observed certain forms and conventional decorations, outside of which the articles introduced was pronounced "not in style," a fiat that rendered it of service only in the melting pot. But all this is changed, and an artist may, without fear or trembling, have carried out a design in gold or in silver with absolutely no restrictions, but employing with free hand any mode of decorative finish that best meets the requirement of his idea.

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THE silversmiths have been quick to take advantage of this freedom, which, by the way, is unknown to the English manufacturers, who are of necessity influenced and handicapped in their work with very stubborn prejudices on the part of their patrons. The English woman demands an exact copy of some antiquated heirloom. The American woman craves something never before seen, and which her neighbor cannot possibly have duplicated. Then, too, our silversmiths enjoy the advantage of many labor-saving devices and modern improvements and conveniences unused by the English artisans.

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THE fact that American silversmiths have dared to go out of the

old beaten track after original ideas, have dared select the best from all time-honored methods and adopt them, one, two, three or more differing styles in one article if need be, accounts for the wonderful progress made in American silverware, and the honor with which the country's art work is everywhere received. The fact that the table ware and decorative pieces for the house beautiful in the United States and the countries south of us is made at home, is all the tribute any reasonable silversmith ought to ask for. All the same, even reasonable silversmiths feel an additional glow of pride when visitors of celebrity from the other side select, as souvenirs of this country, articles in silverware of an entirely American character—a custom which is growing every season.

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IN SUBSTANTIATION of the above statements, one has but to inspect the silverware of any trustworthy manufacturer to see the great freedom of form expressed in everything, from a tea set to a soup tureen cover, to see that all styles of decoration and finish are employed; the hammered, the *repoussé* and appliqué, plain surface, Japanese bright surface, dull surface, oxidizing, etching, engraving, etc., etc. Nor is this all; often a number of methods are combined in one piece. For instance, the central feature may be *repoussé* or applied work eked out by etching, or hammered work shaded by oxidizing. An illustration at hand is a cup of unique shape recently seen; one-third the way up the piece was hammered, the strokes becoming fainter and fainter toward the last, until the idea was finished out in etching on a peculiar dull surface some few manufacturers know how to get. The hammered band at the bottom, it ought to be explained, received the required effects of light and shade by oxidizing judiciously applied. The disposition for less chasing and more plain surface is observable on some of the silverware exhibited this autumn for the first time.

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THE round pin, the reappearance of which THE CIRCULAR predicted a twelvemonth ago, is now among leading new fashions shown by retail jewelers of any note. The revival has been made, as was also foretold, in very beautiful and unique patterns. These round pins, or brooches as they will sooner or later be christened, are not necessarily round in shape; on the contrary, they exhibit a variety of irregular forms, all of which, however, make a short or brooch form of pin; hence the name round pin in contradistinction to the long bar pin. These new pins are the natural outgrowth of other styles of neck pin, and are, in consequence, largely represented by modifications of designs that have figured on lace, flower and other long pins. Occasionally these pins are round in form, in instance of which may be cited the pretty French enamel medallions surrounded by a framework of pearls or diamonds. An artistic example of a round gold pin seen, was a circular background of red gold, overlaid with an appliqué work composed of fine wires of yellow gold and platinum. A popular form of round pin is of English hollow ware in a coil or knot. These coils and knots present a diversity of finish, some being quite plain, others are carved, and others, again, show the nugget finish studded with gems. Flowers furnish the design for many of the new pins, an apple blossom or a daisy of natural size being often seen. A pretty little brooch is that consisting of a plain gold disc with a pearl or diamond in the center. Very unique are the thin square plates of metal with irregular edges, and decorated with enamel and small colored stones in floral designs, after the Japanese. A bow knot of gold is a comparatively new design in neck pins that is having a little run.

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LAST month was noted a slight disposition toward sets in jewelry,

and new goods seen recently, especially among the French importations, make it appear that the tendency is growing slowly but surely toward two or three articles of jewelry that shall match in design and finish. One case seen at an up-town house with an exclusive retail patronage, disclosed a little brooch composed of a miniature painting of a celebrated beauty in Louis XV. time, bordered with diamonds. The ear rings were similar in form, but smaller than the brooch, and the painted medallion on each represented a different face. Then there was a gold hairpin on which appeared a fine miniature painting bordered with diamonds. An example of home work indicating a return of sets in jewelry, consisted of a double knot pin of gold hollow ware, with plain hoop ear rings.

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IN THE rage that has existed the past few years for small and fancy stones in gold jewelry, colored stones of all grades have found a place on every article made by the goldsmith that could possibly be set with gems without being a matter of ridicule. In this gem decoration, therefore, it is of little wonder that so popular a subject as a lady's thimble should have taken on a jeweled garniture. The band of the thimble being the only available place for decoration, it is on the band, of course, that the gems occur. Thimbles there are with heavily chased bands set with small diamonds; then there are thimbles with enameled bands that serve as a background to the gems. An attractive decoration is that which simulates with enamel and gems a border of flowers and their foliage. Small turquoises, rubies and sapphires, as well as diamonds, appear in the decoration of thimbles. A word of caution about thimbles. It does not pay to buy a gold thimble less than fourteen karats fine, and it ought to be of good medium weight to wear well. Many of the handsomer thimbles are of eighteen karats and these wear well, though dealers interested in the sale of inferior goods will assure patrons that eighteen karats makes too soft a metal to prove durable.

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SEAL charms and seal rings are naturally on the increase and will remain popular so long as fashion requires that the envelopes to letters and notes be closed with wax, not mucilage. Seal rings are worn by both sexes, and are smaller in size than were those of former years. The seal is cut in crest or cypher in place of the monogram, which is out of style. Popular stones for seals are sards and bloodstones, both of which take on a fine polish and are particularly adapted to the purpose, because they deliver easily from the heated wax without destroying the impression. The most beautiful specimens of liver-colored and brownish-red sards are found in India and in Arabia.

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THE bloodstone, or heliotrope, as it is also termed, was greatly esteemed during the middle ages for its supposed medicinal and magical virtues. Like most other stones, this one, with its minute blood red specks disseminated throughout its dark green color, had its tradition. The tradition was to the effect that at the crucifixion the blood which followed the spear thrust fell upon a dark green jasper lying at the foot of the cross, and from this circumstance sprang the variety.

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Now that the English fashion of wearing costumes of wool fabrics on the streets, and reserving silks, satins and velvets for house and evening wear, has been adopted by New York ladies, there is a

demand for two distinct classes of jewelry ; that which accords with the street suits, and that which is fitting to be associated with costly fabrics and rich laces. Naturally, with the appearance of the rough cloths of Scotch and English manufacture, American ladies are taking kindly to the Scotch pebble jewelry described last month, and so well suiting these popular fabrics. The better class of silver jewelry also finds an appropriate combination with the present style of promenade dress and dress for morning wear. Fine gold jewelry of artistic merit and gems quite as naturally find their place among the velvet and silken fabrics and gossamer laces that go toward forming full dress and reception toilets. The tailor made suits for ladies' wear, of rich hued *frisé* cloth or *bouclé* fabrics, seem to require the addition of some striking metal garniture, which accounts, doubtless, for the increased demand for silver belt clasps and buckles of antique pattern with dog collar ornaments to match.

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IN CONNECTION with the Scotch pebble jewelry, it may be well to mention that jewelry is being made of American minerals as well. This American stone jewelry, while a comparatively new industry, is already represented in a variety of designs, among which occur knots, horseshoes, crescents, stars, daggers and other popular subjects. The minerals employed in its manufacture are jasper of all hues, agate, moss agate, moonstone, pyrite, rhodonite, turquoise, etc. The petrified woods, known as tiger eye, are also utilized with good effect, especially in silver settings.

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A NUMBER of new trinkets recently introduced have borrowed their designs from the nut trees. Small bunches of hazel nuts with leaves of gold, and acorns with diamond set rims, are represented in gold jewelry. The plebian peanut has also appeared as the ornament on scarf pins, and it is confidently expected, by people who ought to know, that the chestnut will soon follow.

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TRANSLUCENT enamel is effectively employed on brooches and ornaments for the hair, in floral designs mounted with calix and leaves of clustered diamonds. Pretty flower pieces in gold jewelry are those surrounded with frosted gold foliage. Floral decoration, in which the natural hues of the flower simulated is copied in enamel and gems, is exceedingly popular.

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NOVELTIES in bracelets seen during the past month include some coin ones from Gautemala. The coins of which these Gautema bracelets are composed are South American ones, and are linked together in a very curious manner. A "Spanish bit," in other words, a broken Spanish coin, swings from the bracelet for a bangle. A novelty among imported bracelets is the Egyptian bangle, consisting of one or more fine circlets of gold or silver, to which is suspended an amulet of oblong shape. An attractive bracelet is one showing alternate links of engraved gold and fine enamel.

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THE old spring bracelet is numbered with the good things that do not go out of style. It remains a popular pattern in fine gold goods although it has been largely copied in plated ware and in low grades

of gold. These spring bracelets, as a rule, are finished either with cylinder, bead or cube ends.

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CHAIN bracelets afford a great variety of pattern and represent a favorite style. Often the bracelet consists of a tiny chain, finished with a swinging ball or cube, after the fashion of the Queen chain. Sometimes there are four or more slender chains held in place by little gold nugget slides set with gems. Another favorite bracelet consists of a gold or silver coin, finished on top with a sailor knot.

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IN WHAT is termed the popular trade, padlock bracelets and bangles of various kinds remain good selling articles ; the demand for these sorts does not appear to be affected by the newer and later styles.

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LITTLE jeweled and fancy pins, made in a bewildering variety of shapes and patterns, have become a necessity to every lady. Young and old alike wear them, and they are found, too, in the jewel cases of rich, medium and comparatively poor people, for one of these little pins may cost anywhere from one dollar to one hundred dollars. They are worn as fancy or convenience dictates ; as a scarf pin in the pretty scarfs now worn by ladies with tailor made suits, as ribbon pins on the new broad bonnet ties, as a neck buckle on a velvet about the neck ; in a word, wherever an ornamental pin is required. There is no limit in either the designs or finish of these little ornaments, but the crescent, the star, the horseshoe and the cross are all popular, especially when gems are used. There has been no diminution in the employment of flowers and insects for these pins; indeed, they are, if possible, more popular than ever, and are simulated not only in form, but color, with enamel and small gems. A pretty fancy in pins for the bonnet ties or for holding lace about the throat are little ones connected by a gold chain as a tiny lock on one pin and a key on the other ; a star and a crescent, an anchor and a coil, or a sextant and a compass.

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A NEW old style now exhibited in watches for ladies' wear, is a Louis XIV. design; in a word, a fac-simile of the watches carried during that period by the court beauties. These watches show oval faces and are decorative in effect ; some have gold faces with enameled numerals and ornamental hands; others present blue enameled faces with silver numerals and gold hands. These watches are open faced, but are provided with full cases, so that a lady can please herself as to whether she wears the one or the other, for the cases are easily adjusted. Some of these revivals show rows of jewels in their decoration. For jeweled watches there is always more or less of a demand, hence these are to be found in the show cases of all houses with an exclusive fine trade.

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LADIES still have the choice of the short vest chains or the Queen chain, with a ball, locket, viniagrette or other single charm attached. The Queen chains are most fashionable as well as most popular ; these have had a run beyond the most sanguine hopes of the manufacturer. While there is, therefore, nearly nothing absolutely new

to report in regard to ladies' watch chains, prospective purchasers are advised to see the newer productions in this line before making selections, as there are any number of pleasing variations added to the summer season's stock in way of decoration and finish.

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FAVORITE ear rings are solitaire diamonds or other single stones set in a manner that best exhibits the beauty of the gem. An entirely new setting, as yet employed more especially for solitaire ear rings, has just been introduced to the trade. By this new arrangement the stone is mounted in a setting with a double ring, one of which is hollow while the other contains an iridium needle. This needle with its constant vibrations serves two purposes. It adds greatly to the apparent value and brilliancy of the gem, which catches and reflects new lights as it quivers with the never ceasing movement of the needle; it also insures safety to the stone, for the movement of the iridium needle being that of the point of a compass rather than of a pendulum, it does not wear the ring. It is claimed that the risk heretofore run in setting rare gems as pendants has been obviated by this new setting, which, in time, will doubtless be applied to all gems set so as to swing.

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THE extreme fashion in gentlemen's attire demands that the broad expanse of white exposed by the low cut evening dress be furnished either by a plaited shirt bosom or one of pique embroidered in dots. Naturally these elaborate fronts call for more than one stud, hence three studs are again the correct style for evening dress. With this increased demand have come some changes in the fashion of the studs themselves, the very newest style being represented by moonstone buttons set in slender gold rims. Very æsthetical young men are permitted to have a choice between white pearl and pink pearl studs. For a large conservative class remains the white enamel studs that give the linen finish. Of course, sleeve buttons worn with evening dress correspond with the studs, and where fashion is carried to greatest extremes, the collar button is set with the same stone, although supposed to be concealed from view.

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THE very newest thing in watches for gentlemen is a medium sized watch in a perfectly smooth gold case of bright finish. These new watches are not only diminished in size as regards their circumference, but are as flat as is compatible with the works inside, hence they are of exceedingly convenient form to carry. As has been intimated the cases are devoid of decoration, indeed do not even indicate the locality of the hinges, but present an unbroken smooth surface. It is permissible to have etched or engraved on the case the wearer's initials, but the extreme style is the uninterrupted smooth surface. A novelty in gentlemen's watches is of Louis XIV. design, with a gold dial and blue enameled figures. Occasionally one sees a beautiful specimen of carving on gentlemen's watch cases, but this and similar decorative effects are counted only as fancies that suit an occasional patron.

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THE short vest chain, either of gold or gold and platinum, very light and unobtrusive in effect, is patronized more largely by gentlemen than is any other sort; in a word, is considered by ultra-fashionables as quite the correct thing. The Charles Dickens or

double chain, however, remains a favorite with many who find it too convenient and useful to put aside for other patterns.

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SCARF pins for gentlemen run largely to fanciful designs and show as great a variety of subjects as do ladies' bonnet and ribbon pins. Many of the scarf pins are of nugget finish and set with a gem. The moonstone, in its natural color, tinted, carved and plain, is of frequent occurrence, now, in scarf pins. The yacht race excitement brought to the front a number of designs suggestive of the subject, hence there appears this month an unusual number of marine designs, such as sailor knots, tiny gold yachts, twists of cable chain, and brightly enameled yacht pins giving the different signals of storm, danger, fair weather, etc. These signal pins, it may not be amiss to state, have found some favor with sentimental school boys and girls, who find them a pleasant change from the flower language. Grasshoppers and ants are recent fancies for the scarf pins worn by both sexes. A black enamel ant carrying a single large pearl by its antennæ, is one among several new designs.

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GENTLEMEN are wearing fine intaglio rings, and occasionally one sees a ring with a suitable antique coin in antique setting. A ring popular among those who wear gems is a head of carved or nugget finished gold with a gem imbedded in it.

ELSIE BEE.

### The Size and Weight of the Balance.

*Continued from page 278.*

WHEN it is necessary to put a new balance into a watch, that is, one which possesses the capacity of regulating the rate, and to equalize to a certain extent an excess of the motive power, satisfy yourself before attempting any work whether the movement is constructed in accordance with the laws of mechanics and the rules established by experience.

First examine the motive power—the mainspring.

The actions of a spring in a wound and in a run-down condition naturally vary, but this inequality of the motive power is not as injurious to a correct timing as the adhering of the coils of the spring to one another, or to its scraping upon the bottom or cover of the barrel, which occurs alternately in a stronger or feebler degree. To the latter defect contribute the interior faces of the barrel, if they are not parallel with each other, or a badly made spring of unequal thickness of coil. It is evident that this must produce an uneven development of the spring, whereby its tractive power becomes alternately stronger and weaker, and this source of error must first be remedied. In order to prevent the scraping of the spring both the interior faces of the cover and bottom of the barrel are to be turned down until they stand parallel to each other; then turn with a slightly rounded-off graver, little medium-deep furrows from the center to the rim, and turn the inner barrel shoulder funnel-shaped.

We have at different times performed this job with different watches, and have seen some of them in which the oil was still fluid after a lapse of three years.

Great care is necessary in the choice of a spring. After having found a good and closely fitting one, test it first in the following manner: When the spring has been wound into the barrel and the cover sprung on, wrap around the barrel a thin cord, which must be at least  $4\frac{1}{2}$  times as long as the circumference of the former. To the pendant end of this cord fasten a scale, and close to this a gauge or ruler with graduation. Then place upon the scale so much weight that four coils of the spring are stretched. The weights cor-



responding to each of the four coils of the tested springs are jotted down, and it will be seen by comparing these weights, which of the number of springs tested has shown to do so with the greatest regularity as well as the least deviation in its power.

After having thus found a suitable spring, proceed to the investigation of the transmission of power—the depthings. No uniformity of rate can be expected without good depthings; and this is so incontrovertible and so well known that we need not enlarge upon it. We also forbear at this place from entering into the theory of depthing, which will be found fully discussed in all manuals of horology. We simply state the theorem that the diameters of the wheels are in accordance with the decrease of the motive power and must stand in proportion to the resistance offered to their motion; this is applicable especially to the last wheels, which move with great velocity.

This rule, applied in the drafting of a caliber, will produce a favorable influence upon the transmission of the energy and at the same time establish the diameter of the scape wheel, (for instance, of a cylinder watch) and the diameter of the cylinder.

Summing up the preceding we now have :

1. A known motive power with a uniform development.
2. The transmission of this energy under the condition established by theory.
3. We furthermore know the length of the lever arm (radius of the cylinder) which receives the impulse and sets into motion the moderating and regulating part—the balance.

4. We also know the weight of this regulating part (balance) must stand in proportion to the propelling power and its size be measured according to the diameter of the active circle.

5. And, finally, we know that the experiments for the purpose of ascertaining the resistance of the material (brass or steel) for a balance have shown that, in order to obtain the greatest active diameter, ten-twelfths of the total weight of the mass must be distributed upon the rim of the balance.

From the above points results that it is very easy to ascertain, in a practical manner, as well the suitable weight as the diameter of the balance for a certain watch.

C. Frodsham deduced his tables of balances from the cubic contents of the barrel. Although his figures are very exact in many cases, nevertheless they may in general be considered only as approximate values, because it is very evident that although barrels of the same cubic measurement may inclose springs of similar size but of dissimilar energy.

Let us, as first test, take the empirical rule, which says: "the size of the balance is determined according to the diameter of the barrel cover."

Many careful observations have resulted in showing that modern watches, the proportion of which in their trains, etc., differ from one another only in minor details, can be timed easily if the diameters of cylinder and balance stand in the following proportion :

$$\text{Cylinder : balance : : 1 : 16 or 17.}$$

We hereby obtain a second test.

If the two ascertained sizes are in tenor to above we then obtain the diameter of a correct balance, if, however, they differ from each other we must take the average size of both.

It is easy in material stores to find a balance corresponding to this average size, but in preference take one rated heavier than lighter; that is, one somewhat heavier in the rim. When the chosen balance has been firmly mounted upon the cylinder collet and the balance spring has been fastened, mount the cylinder in the movement and slowly wind the spring one coil, then another, but always slowly, without violence. The balance must commence to move with the winding of the second coil; that is, the watch must begin to go with this state of spring tension. If it begins before this then the balance is too light, and would, in this case, be a play ball of the motive energy. If the balance only starts at the fourth coil then it is too heavy, and the danger may be anticipated that the watch stops

whenever the oil begins to thicken. In the first case make the balance rim heavier in a suitable manner, and in the second make it lighter. When the balance starts at the indicated tension its correct weight in proportion to the motive energy has been found.

It next remains to ascertain in a practical way whether the balance found as above is sufficiently insensible against the differences and deviations of the propelling force for the first moment as well as when the resistance of the friction is increased by the thickening of the oil. We have also to take into consideration the deviations in rate produced by the changes of position. Starting from these two points we must not alone establish the proportions of the correct balance to the propelling force, but also its regulating properties, which it must possess if both size and weight are correct.

When, for this purpose, the watch is wound an overlight balance will at once start at its greatest, that is, its normal amplitude of vibration; such a balance will be the play ball of the motive force. If, on the other hand, the balance, on the winding of the watch, attains its full amplitude only gradually after a number of vibrations, then it is too heavy; its vibrations will become dead as soon as the oil thickens, and it suffers strongly under the influence due to changes of position.

In order to institute a practical test we first make upon the balance a dot *c*, fig. 5, when the balance spring stands in a position of rest opposite to the dot *a* upon the plate. We then wind the watch entirely and let it go for a few seconds until the balance has attained its normal amplitude. We then mark the extent of the vibrations with a little rouge by means of the two points *b* and *d* upon the plate. We next stop the balance with the point of a pegwood, lead the point *c* upon it back to the point *a* upon the plate, carefully withdraw the pegwood and count the number of vibrations made by the balance until it again attains to the amplitude marked by the two points *b* and *d*. Anyone who has had a little practice can easily learn to estimate this difference with great precision.

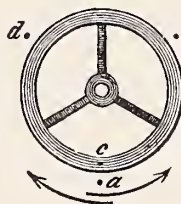


FIG. 5.

We know from prior experiments that the insensibility of the balance, as compared to the difference of the motive energy, stands in direct proportion to the magnitude of its active diameter or radius.

Let us in practice reiterate these experiments, wind the watch to be observed one coil, fasten it in a vertical position and set the hands truly correct according to a seconds regulator. We then let the watch go for one hour and carefully take down all occurring differences of rate from that of the standard clock. We then wind up the watch entirely and repeat these observations. If the balance showed a greater sensibility to the difference of the motive energy it then is too small or the division of its mass is defective.

It is true that in order to institute these tests successfully it is necessary to previously study well the manipulations with well-timed watches, in order to be capable of judging with certainty what limits of sensibility of the balances are permissible for the deviation of the motive energy.

In order to execute these tests with precision the operator must have previously practiced with well-timed watches, so as to be able to know with certainty the limits of sensibility within which any deviations of the motive power are permissible. Above explained tests may also be performed in such a manner that the movement, whose barrel has been previously taken down, is fastened in a frame, and in place of the hand post a turning arbor with pulley, on which a thread is fastened, is put in. By suspending small bodies of different weights to this, the deviating actions of the spring are ascertained.

In order to perform and study the timing of a watch in hanging and lying, and to ascertain to what degree the weight of the balance influences timing, let the watch go first in a horizontal position and then hang it up and repeat it in the two positions—the above described double tests. If the differences found are only trifling,

leave "well enough alone," but should they be large, then the main cause must be sought for either in an unduly heavy balance or else in the pivot friction. This latter is frequently larger in the one than in the other position, and is due to unduly thick or untrue pivots, or else to jewel holes, which are either too thick, badly polished or not sufficiently rounded off. But if none of these defects are present, we have the proof, that although the weight of the balance stands in correct proportion to the motive power, still the balance is too large, as far as the timing in the positions is concerned, and that in this case, as previously specified, we must slightly diminish the weight and use a somewhat feebler spring.

For doing this we go to work in a way contrary to the one above specified. We there determined the weight of the balance in proportion to the given power, while here we must, in order to comply with the requirements of timing in the positions, decrease the weight of the balance, and anew ascertain the energy proportioned to this weight. In this case, also, we have as surest guide the experience gathered in a previous study with watches that preserved their regular rate in all positions.

When all parts of a watch are well made, and the balance spring—in length as well as breadth—is well adapted to it, we will, by observing the rules given for the size and weight of the balance, produce an exactness of rate perfectly satisfactory for watches of civil use.

[THE END.]

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*Second Vice-President*, HENRY HAYES.....Of Wheeler, Parsons & Hayes.  
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*Counsel*, HON. ALGERNON S. SULLIVAN.

For further information, Application Blanks for Membership, By-Laws, etc., Address  
 P. O. Box 3277. 170 Broadway, New York.

A MEETING of the Executive Committee was held on the 16th inst., attended by Vice-President Untermeyer, Treasurer Kimball and Messrs. White, Parks, Lewis and Secretary Champenois.

The following firms were admitted to membership:

O. E. Armstrong, Coudersport, Pa.; C. J. Fuller, Phoenix, N. Y.; P. N. Leese, Denison, Iowa; Henry Voigt, Baltimore, Md.; Williams & Stevens, Macon, Ga.

### A Donation to the League.

A YEAR or two ago, when portions of Ohio were devastated by terrible floods, Mr. John C. Dueber interested himself in behalf of the sufferers, obtaining liberal contributions from the jewelry trade for the benefit of those engaged in that industry who had lost their property. Mr. Dueber and his wife were active in the distribution of this fund, relieving every necessitous case brought to their attention to an extent their judgment deemed necessary. When the relief work was done, it was found that there was a surplus on hand, and Mr. Dueber consulted the donors as to what should be done with it. The suggestion being made that the surplus should be presented to the permanent fund of The Jewelers' League met general approbation, and Mr. W. A.

Moore, of the Dueber Watch Case Company, was selected to make the transfer. On his recent visit to New York he presented himself at the rooms of the League and paid over to the treasurer the sum of \$2,363.08, the balance of the flood fund, and took the necessary vouchers therefor. Opportunity was taken to entertain Mr. Moore at a private lunch, at a quiet down-town restaurant, at which there were present Mr. Henry Hayes, president, and Wm. L. Sexton, secretary of the League, W. C. Kimball, J. P. Snow, E. S. Smith, C. G. Lewis, J. B. Bowden, J. R. Greason, ex-president G. T. Woglom, and a representative of THE CIRCULAR. During the entertainment the health of Mrs. and Mr. Dueber were given and appropriately responded to by their deputy, who was also called on for a few remarks. Mr. Hayes referred to the good work done by the League among the members of the jewelry trade, and was rejoiced to see that the permanent fund was, by the liberality of the trade, reaching a magnitude sufficient to provide for all probable contingencies. Remarks were made by ex-president Woglom and others present. The affair was an informal one, and heartily enjoyed by all who participated.

### The Jewelers' League.

*President*, HENRY HAYES.....Of Wheeler, Parsons & Hayes.  
*First Vice-President*, JAMES P. SNOW.....Of G. & S. Owen & Co.  
*Second Vice-President*, ROBERT A. JOHNSON.....Of Colby & Johnson.  
*Third Vice-President*, Wm. C. KIMBALL.....Of H. F. Barrows & Co.  
*Fourth Vice-President*, AUG. KURTZBORN.....Of L. Bauman Jewelry Co. St. Louis, Mo.  
*Secretary and Treasurer*, WILLIAM L. SEXTON.....Of Sexton & Cole.

#### EXECUTIVE COMMITTEE.

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 E. S. SMITH.....Of Smith & Knapp.  
 S. H. HALE.....With Robbins & Appleton.  
 J. R. GREASON.....Of J. R. Greason & Co.

THE JEWELERS' CIRCULAR is the *exclusive* official paper of the Jewelers' League, and has been selected for the publication of all matters of interest pertaining thereto. Letters or inquiries pertinent to its business or purposes, and which might interest the trade or inquirers, will herein be answered. Address *Jewelers' League, Box 3,444, P. O., New York*, or the office of THE CIRCULAR.

AT THE regular meeting of the Executive Committee, held Oct. 2, 1885, there were present Vice-Presidents Kimball and Snow, and Messrs. Smith, Greason, Lewis, Bowden, Howe and Sexton.

Communication received from J. C. Dueber, inclosing a donation of \$2,363.08, the unexpended balance of the Jewelers' Relief Fund of Newport, Ky., which amount was voted placed in the Permanent Fund.

Nine changes of beneficiaries were granted.

Two applications referred.

Ten applications accepted as follows:

W. H. Candee, J. F. Hickman, A. A. Janicke, W. T. Sherman, New York, N. Y.; O. E. Heineman, Allegheny, Pa.; F. Jefferson, Little Rock, Ark.; P. H. Nefflen, Keyser, W. Va.; J. Ruff, Atchison, Kan.; C. E. Russell, Kansas City, Mo.; E. Vanderwerken, Stamford, Conn.

Meeting adjourned at 6 o'clock P. M.

NEWPORT, KY., Sept. 19, 1885.

THE JEWELERS' LEAGUE OF NEW YORK:

*Gentlemen*—On the 3d of July last the following circular was sent to all contributors of the Jewelers' Relief Fund of this city:

"NEWPORT, KY., July 3, 1885.

It has been suggested that the balance of the fund contributed to the flood sufferers in February, 1884, by the jewelers of the United States, now on hand and unexpended, should be turned into The Jewelers' League of the city of New York.

We have sent a circular similar to this to all contributors to said fund, and would like an expression of opinion from them if such action would be satisfactory.

If no reply is received from you within thirty days from date, we

shall consider such a disposition of the balance of this fund is agreeable to your wishes.

Yours respectfully,

JOHN C. DUEBER."

As nearly ninety-eight per cent. of the contributors of the above fund have signified their approval of the disposition of the balance on hand according to the terms of the circular, it gives me pleasure to transmit herewith my check for \$2,363.08 (two thousand three hundred and sixty-three  $\frac{8}{100}$  dollars), which is the entire amount of said fund unexpended.

I am, very respectfully yours,

JOHN C. DUEBER.

NEW YORK, Oct. 13, 1885.

MR. JOHN C. DUEBER :

*Dear Sir*—In making formal acknowledgement of receipt from you of \$2,363.08, the balance of the Relief Fund of Newport, Ky., I am instructed by the Executive Committee of The Jewelers' League to convey to you, and through you to the subscribers to the Relief Fund, the thanks of The Jewelers' League.

This handsome sum, which, through your thoughtfulness and kindness, has been placed in the treasury of the League, will be invested as a part of the Permanent Fund, and thus in time will be used as a relief fund, although in a different manner than intended by the original subscribers.

Yours respectfully,

WM. L. SEXTON, *Secretary*.

## Correspondence.

### Chicago Notes.

*To the Editor of the Jewelers' Circular:*

October, generally speaking, has been one of the dullest and most uneventful months of the year. The anticipations awakened by the activity early in September have not as yet materialized, and jobbers, as a rule, admit that they had taken too roseate a view of the prospects of the fall trade. Considering the decided improvement that has already shown itself in the dry goods, hardware and other staple businesses, it seems rather unaccountable and somewhat discouraging that so little of the returning wave of prosperity should as yet have found its way in the direction of the jewelry trade. Jobbers, who two or three months ago were predicting wonderful things of the fall trade, are now beginning to admit that it has proved to be more talk than business, and are quietly settling down to the belief that their main expectation for this year is in the holiday business. Some large jobbers experienced quite a rush of business in the early days of October. Retailers, who bought freely in the beginning of September on the strength of things lightening up, having found sales not nearly so brisk as they were led to expect, are holding back, and trade is at present pretty much of a hand-to-mouth character. A large part of the dependence of trade in the Northwest is based on the corn crop, and all reports go to show that there will be an exceptional yield of that cereal. As, however, at least another month must elapse before that grain will begin to be generally moved, jewelers and others must possess their souls in patience. Although a decided briskness has already manifested itself in other lines of business, in none has anything like a "boom" yet developed itself. There seems, therefore, some reason to believe that the jewelry trade may receive in a slump what is being dealt out to other trades in lagging instalments. Looking at the situation all round, it is fair to predict that the trade will find a satisfactory compensation in the holiday and winter business for the unrealized expectations of the fall trade.

Benj. Allen's estimate of the state and prospects of trade, as published in last month's issue of THE JEWELERS' CIRCULAR, is almost universally conceded to have been a just and unbiased statement of the actual condition of affairs, and other members of the trade are expressing their opinions more freely. As regards the month of

October, Benj. Allen does not think business so good as it should have been in proportion to the reports from other staple lines of business. Collections were still unusually slow, and in the interior parts of the Northwest especially, the jewelry business did not seem to catch on. Retailers were promising great things about remittances in November and December, and everything seemed to indicate that towards spring there would be an easier financial feeling and collections would be much better. Mr. Allen added that he was selling as many goods as he ought, considering the way that collections were being made, and that it would not be judicious, in present circumstances, to have any larger sales. There were no specially encouraging reports from travelers in the West and Northwest, but the holiday business promised to be at least ten per cent. better than last year. Kearney & Co. report business rather slow and collections showing no very decided improvement. They did not, however, look for great things in October, and, in proportion to the goods usually marketed at different seasons, expected a better winter than fall trade. Stein & Elbogen think the business outlook fair, and are having satisfactory collections. They look to a good holiday business. Thomas Davies, of Clapp & Davies, experienced a distinct falling off in the balance of business in the beginning of October, but reports that things began to pick up towards the middle of the month. The amount of business done for the month was pretty much the same as last year. Travelers reported that a very good holiday business was going to be done, and there seemed every likelihood that trade during the next few weeks would materially compensate for the dullness of the year. Cogswell & Wallis are also in anticipation of a good holiday trade. They find collections still rather slow, and travelers' reports scarcely so encouraging during the last two or three weeks as earlier in the season. C. K. Giles, of Giles, Bro. & Co., says that there is generally a better tone in trade. Business has been good all through the month and collections have been fair. Jobbers were generally getting through talking about things getting worse, and things were finding their level. There would be no great rush, but everything pointed to a good holiday business in December. The country trade was rather quiet, but business all over was quite as good as could have been expected.

Manufacturers whose business in the West has been in rather a lagging condition for some time are hopeful that trade is picking up, and several think that the business of the next two months will materially bring up the year's average. Many large conditional orders have already been given by jobbers for delivery about the beginning and middle of November, when they anticipate a considerable rush of business, and the feeling among manufacturers is consequently good. Stocks are so depleted all over the country that it appears inevitable that there must soon be heavy buying.

Samuel Swartchild, who is pushing business so successfully in the tools and material department, reports that trade has been quite brisk with him since the middle of the month. His jewelers' desk, which has been advertised in THE JEWELERS' CIRCULAR, is having quite a "boom." Mr. Swartchild is at present engaged on a new catalogue, which he threatens will beat anything out West. It may be looked for in January. Giles, Bro. & Co. are still having a big run for their anti-magnetic shields. Their de-magnetizer is attracting many enquiries from all parts of the country. It is being manufactured in strong, substantial shape by the firm's own workmen, and its claims will shortly be brought prominently before the trade.

The affairs of Perry Bros, which have been hanging for some time, are now pretty nearly straightened up. Most of the large creditors have signed papers agreeing to a settlement of 30 cents on the dollar, and it is understood that Mr. Richmond, of the Richmond Ring Company, Providence, has bought up most of the claims. A few of the smaller creditors are still hanging out, but Mr. Richmond is expected in Chicago shortly, and it is believed that an arrangement will be made by which the firm will get its men out on the road and carry on business as before. It is pretty generally understood in the trade that everything is virtually settled.

Large numbers of country buyers have been in Chicago during the past month. Their orders, though light, have been well distributed among the various jobbers, and created a more hopeful feeling.

I desire to make a correction in my report of the meeting of the National Association of Jobbers in Cases and Movements published in the October number. I failed to notice among the delegates present Mr David Keller, of New York, who acted as Secretary of the meeting.

W. A. B.

## The History of Goldsmithing.

*Continued from page 291.*

WE ARE therefore compelled to record another well authenticated instance of "nothing to wear."

As far as the industry of goldsmithing is concerned we are glad to state that it could without much trouble maintain its position in spite of the caprices of fashion. Gold and silver both are materials which luxury cannot well dispense with, and although the economical Henry IV., who was very simple in his personal requirements, as well as his son, the morose Louis XIII., neither one or the other loved the glitter and pomp of circumstance, they were forced at least to extend a certain kind of protectorship over the skillful masters of their times.

Henry IV., to whom pertains the honor of having united the Tuileries with the Louvre by a beautiful gallery, which has not its equal in Europe, conceived the idea which did him all honor, "of parceling off the buildings in such a manner that it would comfortably lodge a number of the best workmen and the most skillful masters to be found, as well in painting as in sculpture, goldsmithing, watchmaking, intaglio gem cutters and many others, to constitute, as it were, a nursery of workmen from which, under the instruction of such capable masters, there should be raised up a body of workmen who, dispersed throughout the kingdom, should with credit serve the public." These are the very terms of the letters patent under date of Dec. 22, 1608, which the king caused to be published far and near, to make known the purpose of his useful and liberal foundation. He set apart the middle story of the large gallery, which was devoted to this purpose during nearly the whole of the seventeenth and eighteenth centuries.

This lodging in the Louvre was to the tradesmen in general and the goldsmiths in particular a highly appreciated favor, and, in the beginning, various important immunities were attached thereto. It was claimed, and various trades succeeded in establishing, that the guests of the king should be considered as being withdrawn from the jurisdiction of the guilds and corporations to whom they belonged. The guild of the goldsmiths, however, simply ridiculed the idea that the king, in matters of guilds, should be superior to it; it fought the question with energy, and, being very powerful, carried the day.

The first goldsmiths of the seventeenth century recorded as having lodged in the Louvre, are the brothers Masbraux, of Limoges, who had made two handsome medals as large as a dinner plate, with the portrait of the king, which were presented to Louis XIII. on his entry into Bordeaux.

But, beside its favors, the trade of goldsmith had also its expenses, for the goldsmiths of Paris, at least. One of the oldest customs of the corporation was the "May offering," in the shape of a tree with roots freshly dug out, which was, each year on a certain day, planted with great pomp and ceremony before the portal of Notre Dame. For many years this May offering had dwindled down to a simple green branch, fixed upon a wooden pillar, on which were suspended all manners of figures or images of a religious purport. Next morning it was carried into the church before the altar of the Holy Virgin, and, finally, the several votive offerings were carried into the chapel of St. Anne, which was the seat of the fraternity of this name. This custom finally began to be oppressive, and [it was resolved to sus-

pend to the "May" three paintings per year. After a few years (1609), this May itself was suppressed, and the corporation agreed to give each year to the church a large painting of a religious character about twelve feet high. This custom was kept up till 1707, and the church of Notre Dame collected a large number of pictures of the best French painters. Quite a number are still in existence.

But this is enough of the customs of goldsmiths. Let us next inspect their works.

Under the ministry (we almost wrote "under the reign") of the Cardinal Richelieu (who frequently used to remind himself that he was a churchman), it appears that goldsmithing enjoyed a certain favor. Thus, in 1630, we see that a goldsmith of Paris, Pijard, was ordered to make a large brass shrine, of more than one yard long, to be placed upon the main altar of the holy chapel of the palace. This shrine (very few of them were constructed in those days) weighed 280 marcs, and cost 13,060 livres—money of the period.

A little later, in 1636, the great minister, at that time all-powerful, presented to Louis XIII., his master, "a gold chaple"—"*chappelle d'or*" (thus was called the collection of pieces composing the garniture of the altar). The one presented by Richelieu to the king consisted of a cross, a ciborium, a chalice with paten, two burettes, two statuettes (the Holy Virgin and St. Louis), and two large chandeliers. The lot was ornamented with 224 rubies and 9,000 diamonds.

Richelieu, as will be seen, could be an ostentatious man at times. The church of Sorbonne, which he had erected and which still contains his tomb, also enjoyed a great share of his generosity. He presented it with a monstrance valued at more than \$20,000.

Louis XIII. and his mother, who in nothing ceded to the Cardinal, as far as devotion was concerned, had made, after the designs of the sculptor Sarrazin, a large silver angel, carrying between his hands the figure of the Dauphin of France, who soon after became Louis XIV., and presented it as a votive offering to the church of Loretto.

Profane goldsmithing, if we may be allowed to call it thus, thrived at the same time. It is true we only possess a few specimens, but, at least, those to-day in the collection of the Louvre, are choice specimens.

The reign of Louis XIV. proved to be a long period of prosperity to the art of goldsmithing. When Louis, who was crowned in the cradle, became king, he, of course, commenced playing with dolls. All the small boys of the lower rabble sigh for leaden soldiers; such base metal figures, it is evident, are too vulgar for the amusement of a royal boy, and since he loved to play with such toys, a whole army of soldiers, horse, footmen and dragoons were made for him of silver, and it may be expected that his infantile majesty enjoyed himself hugely in knocking about the common food for cannons. They were made by one Merlin, who, when his royal patron became older, was engaged by him in making two reliquaries for the church of Notre Dame of the Victories.

The Cardinal, Mazarin, who inherited, if not the genius, at least the power of Richelieu, was, as is well known, a fastidious prelate. He kept a goldsmith of renown, one Pierre Lescot, of whom, beside his name, we know nothing.

As for the king himself, he constantly kept employed one Ballin, who had learned the art of chasing from the celebrated sculptor Sarrazin, and Louis XIV., being lavish without stint in times of prosperity, gave him plenty to do. Ballin made for the young king the first sword he wore, and soon afterward he made by his orders a gold mirror of very beautiful workmanship for Anna of Austria, beside many other pieces for her drawing room. But, alas, nothing has come down to us from so recent a period, and we must simply rely on contemporaneous history that these pieces ever existed at all.

"There were," says Perrault, in his quaint old French, in his *Hommes illustres*, "there were tables both sculptured and chased, both executed so admirably that the material (silver) from which they were made constituted only about one-tenth of their value. There were torch bearers or stands from eight to nine feet high; large ves-

sels in which to put oranges, and large fruit baskets in which to carry them to those desiring them; basins, chandeliers, mirrors, all of magnificent workmanship, the elegance and exquisite taste of which exceeded anything heretofore seen in the kingdom—all of which gives a just appreciation of the grandeur of the prince who ordered them made."

This was only a small part of the treasures which Louis XIV. had collected at Versailles. Another of his goldsmiths, Alexis Loir, and his associate, Duteil, executed for him, from 1667 to 1682, a large number of other pieces of goldsmithing, basins of all shapes, large chandeliers, balustrades for the bed, borders for the tables, etc., of a value of more than two hundred thousand livres.

Loir was one of the first goldsmiths lodged in the Gobelins, where Louis had conceived the noble idea of establishing a kind of normal school for the industrial arts. In it a large number of the most skillful artisans: upholsterers, goldsmiths, cabinet makers, etc., worked jointly under the omnipotent direction of Lebrun, for the glory, or, at least, for the splendor, of the king's reign. Many critics have decried against this, but France owes its unbroken fame of being considered the leading nation in matters of art for the term of two hundred years to the establishment of this school.

While the king was wasting the people's money with lavish hand, he was seized with a fit of indignation at the sumptuousness of the lower classes, and the royal hypocrite, in his edict dated April 26, 1672, declares that "his heart is broken at the bad use made of gold and silver in private families; this profusion, he declares, absorbs the better part of the fortunes of said families. And basing upon this, he forbids all the goldsmiths, excepting those who work for the king, to make a piece of table ware exceeding the weight of twelve marcs, absolutely prohibits the manufacture of gold vessels," etc. It is evident that he considered himself to be the sun, and did not desire to be eclipsed by the satellites revolving about him.

Owing to this order, goldsmithing declined. In 1685, the revocation of the edict of Nantes caused the emigration from France of a large number of the most skillful artisans, who went to England, Germany, Switzerland and America. Among this number was the celebrated jeweler, Gilles Légaré, who, rather than renounce his faith, preferred to retire to the new colonies of America, where his descendants still live, honored by their fellow citizens.

It is not strange that the finances, on account of this unbounded royal prodigality and endless wars, were reduced to nothing.

Louis XIV., it must be said to his honor, bore with dignity the bad fortune of the country. He had even the courage to make sacrifices, but, unhappily, they were of the most senseless kind, and he thereby struck a blow at French goldsmithing, the effects of which are still keenly felt.

"The king," says Dangler, "desired that, in his kingdom, there be melted and the bullion carried to the Mint, all the silverware hitherto used in the bedchamber, and, in order to set a laudable example, he has himself ordered to be smelted all the beautiful silverware, regardless of the cost and beauty of work. He has had melted even the filigree work; the toilet articles of the ladies will also be treated in the same manner, not even excepting those of Madame la Dauphine."

It must assuredly not have been without regret that Louis XIV. resolved to thus annihilate at a single blow the most beautiful articles of gold and silver made during his reign, and with which he loved to surround himself. The intention of the sacrifice was laudable, but clearly it would have been well to first ascertain whether and how the actual and comparative values agreed. He had counted upon more than six millions francs, while the things barely netted three millions, and by this senseless sacrifice he robbed futurity of an inheritance of masterpieces impossible ever to be replaced. Articles of French goldsmithing of the seventeenth century, with very few exceptions, disappeared almost entirely by reason of above senseless resolution. Even if the king had seen fit to do away with his own treasures, he should, at least, not have relied on the co-op-

eration of his subjects. Paul Mantz calls this ordinance "the revocation of the edict of Nantes applied to goldsmithing."

Among the pieces of religious goldsmithing of the end of this century we must mention the handsome reliquary which the monks of St. Germain-des-Prés had made about 1685 from the design of Le Brun. It was intended to receive a rather large piece of the true cross, and several other relics willed by the princess of the Palatinate to the abbey, see fig. 43. Two large angels sustained the original

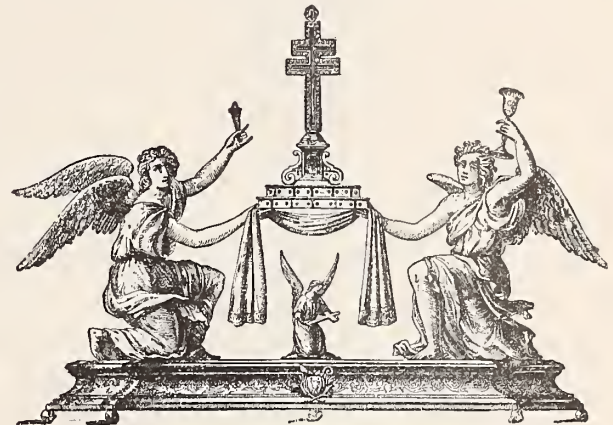


FIG. 43.

relic, holding between them the cross made from the sacred wood, upon which was engraven a Greek inscription proclaiming that it once had belonged to the Emperor Manuel Commenus. But, O shame, the platform which supported the angels was only copper gilt.

## 2.—France (eighteenth century).

The eighteenth century did not commence much better than the preceding one had finished. It is well known that the concluding years of Louis XIV.'s reign were very dark; it had lasted too long, and many waited for the end with impatience. It appeared to them that the transmission of the kingdom from a dotard to a child would, in some manner, rejuvenate the court.

At last the hoped-for, impatiently-awaited moment arrived; the infant mounted the throne, and at a sudden great changes, as far as men are concerned, took place. The change of affairs moved more slowly, and the sumptuary law, enacted by the old king, was not alone confirmed, but rendered more effective, and more rigorous measures were adopted until 1721, when the quantity of the gold and silver prescribed for goldsmiths to be employed in the manufacture of vessels was increased somewhat.

These restrictions and sumptuary edicts, however, never applied to goldsmithing either for royalty or the church. One of the best known pieces belonging to this period is the monstrance presented in 1708, by the Canon De la Porte, to the church of Notre Dame of Paris. This monstrance, five feet high, had as support the figure of an angel sustaining the Book with the Seven Seals of the Apocalypse, with the Pascal lamb. Above it raised a large "Glory," the center of which contained the crystal box to receive the Holy Eucharist. Cherubim's head disported between the rays of the Glory, and below were four figures of old men. This important piece had been constructed, after the designs of the architect Colte, by Ballin, the king's goldsmith. It may be considered as the type of the religious goldsmithing of this epoch, and shows that a very pernicious mannerism had completely usurped the pure form of religious sentiment.

Suns of this kind became very fashionable for these purposes. About the same time, the able goldsmith, Thomas Germain, made two others, one for the cathedral at Rheims on the occasion of its consecration, the other, entirely of silver, for the church of Notre Dame. It was invariably the same Glory, embellished with heads of cherubims; the only change made in the latter was the substitution of sheaves of wheat and bunches of grapes—two symbols of the Holy Eucharist—in place of the Book with the Seven Seals.

We only know of the existence of these pieces by the description

left of them by contemporaneous writers. In order to give a good idea of their form we copy the drawing left by D. Bouillart, in his



FIG. 44.

history of St. Germain-des-Prés. It is a sun of silver gilt, surmounted by a cross ornamented with diamonds and jewels, which Mlle. de la Rochefoucauld de Marsillac, in 1709, presented to this celebrated abbey.

Of the principal pieces of religious goldsmithing of this epoch of decadence, we will only mention the large cross and the candlesticks of St. John of Lyons, by Ballin, the gold chalice made by Th. Germain for the Elector of Cologne, and the chalice of the Cardinal of Noailles at Paris, the finely chased foot of which was ornamented with four figures of angels, bearing the instruments of the Passion, and the bowl of which represented in bas-relief different episodes from the life of the Holy Virgin.

The three best goldsmiths at the commencement of the eighteenth century were the elder Delaunay, the son-in-law of the old Ballin, and the heir of his fortune rather than of his talent; next, Ballin, the nephew, he who made the sun for Notre Dame; and finally, Thomas Germain, son of Pierre.

Delaunay lived until 1727. In 1722 we read of him as being charged with the making of the toilet articles for the infante, or, at least, supervising it.

Ballin was an excellent goldsmith. As far as the style of his works is concerned, it had necessarily to comply with the taste of his epoch—which taste was the most perverted ever conceived. The straight line, the plane surface, the regular curve, the symmetry, the regularity in all its forms were absolutely proscribed. Nothing that could be resolved into a mathematical formula was ever admitted into this baroque style, called "Rococo," the endless, inexpressible and uncouthness, twisted forms of which fatigue the eye as much as its use wounds the hand. A few skillful artists, a few good chasers certainly treated the naked human figure with grace, but this grace itself was mixed with so much affectation that it constituted a proof direct of the general perversion of taste.

It is doubtless true that Thomas Germain appears to have been a true artist. Although he had lost his father in early youth, and could therefore not profit by his teachings, he studied hard, traveled in Italy, and learned to model under the able sculptor, Legros. After having wrought a number of vessels for the church, Germain directed his attention to profane goldsmithing, and in a short time enjoyed a European fame. He excelled particularly in a specialty to which the frivolity of the age attached much importance; he made articles for the toilet of an incomparable taste. It is well known that

ladies of this singular period had no secrets for any of their adorers, and held private levees while making their toilets.

Germain left us the nomenclature of all the utensils constituting a toilet set. They were the wash basin, the water pitcher, the mirror, the goblet, the flacons, the powder box, the paste box, the handkerchief box, the knife for removing the powder, the square, the lock-box in which to inclose the roots and powders for the teeth, the glove box, the trinket box, the candlesticks, etc.

(To be Continued.)

## Communications.

SAW MILL CORNERS, HOP-BOLE CO., WIS., Oct. 15, 1885.

Mr. Editor of *Schulers Zirkeler*:

I dalked the odder tay mit our sculmeister of this down, and he dold me dat no man is a citissen of America before he has had a fite, belonged to a milidairy or feuer companie, ran for alterman or Konkress, or rites to a noosebaber. As I was so bizzie all de dime mit mein watschwurk, I had no dime to bodder mit dem foolishnesses, as I dount like fiding, because the odder feller aint allways vas verrry sick, and milidairy or feuer man dount suet me adoll. Den mein weife said I vas to fad, and de only ding dey wood use me fur is fur a hed lite in a nite prussion; and wen I asket her wei was dut, she put her one finker on my noze. I wuz awful mad ride away. And wen you want to be a alterman or a Konkressman you must do so meny dings befour elekshen dat I was a liddle diskuraged in dat way also; den de onla ding dat is blessend in a polidical cambaine is drinking lager bier and eading the frie lunshes wen some under feller bays for dem, but it gots to much fur a brobrietor of a sheulery schtore, and rebairing dun in de best steile. I gess dat is the reeson wei all de fellers dat are elected due so liddle after the eleckshen, becose dey have to wurk so hard befour the elekshen. So I doht as I was a fust klass watchmeker, den I lerned mai drete dorohly for 7 yeers at Glasehitte, bui Dresden in Saksen. I wud ask yoo eff you hed any ruhm in your beber to meke me your regeler correspondance fur dis blaze. I dount want do rite about the zientifick bart of the drate, but rebort strictlie of such dings dat inderests the drate in sheneral, and ef yoo will will brint mai ledders I will communigate to yoo regelar efery mond. Dis is all fur to-day, and I hobe dat you will helb me to be a reel citissen uf dis cundry, and aboint me a regeler correspondent.

Yours exbectintly,

JOHANNES SILINDERAD.

P. S.—You can shudge by mai riding dat I am a fust glass English rider.

[We print the above exactly as received, and should be pleased to hear from our correspondent again and often.—ED.]

## To Test Silver.

THE TESTING of silver is far more difficult than that of gold; an experienced eye and a steady hand are necessary for doing it. By laying bare a spot with a scraper an expert will easily distinguish whether the silver has been alloyed with white metals, such as nickel, cadmium, aluminum, bismuth, zinc, etc., which are generally employed for the purpose, or whether it was alloyed with copper, in which case the fineness is easily ascertained by the use of a test-needle upon the touchstone. The easiest test for distinguishing silver from silver-like metals, that can be employed even by a layman, is by scraping or filing a place of the article rather heavily, so as to remove the coating, for fear that it might be silver plated, and then to moisten the spot with nitric acid; if, after wiping it off again, a dirty white ground has formed, it is silver; if no essential alteration of color has ensued it is a base metal.

## Foreign Gossip.

**THE MOTOR OF THE FUTURE.**—Very successful results were recently instituted in England with boats driven by electricity.

**SMART—VERY.**—It has been proposed by some geniuses, in order to set limits to the exorbitant charges made by watchmakers for repairing watches, to introduce again the old fashioned sun dials, which, in absence of the sun at night, are to be lit up by electric light.

**MORE GOLD.**—A very rich deposit of gold ore was some time ago found on the top of Mount Morgan, near Stockhampton, in Queensland. The happy prospector, who speedily secured his "right, title, and interest," has every prospect of becoming several millions of dollars richer in the near future.

**COMPASSION REWARDED.**—Marie Toppe, a German servant girl in Lewistown, Me., lately saved the life of a young man whom she found senseless in the street, by taking care of him and sending for a doctor. Her ward, who happened to be the son of a millionaire, out of gratitude married the girl, who is said to be of a prepossessing appearance.

**NEW PATENT.**—There are many articles of every-day life that cannot be improved, for instance, scissors, knife, fork, thimbles, etc., and if inventive genius succeeds in doing it, we are compelled to say that the particular genius is of a high order. A German lady has managed to perform this wonder to the common thimble—more especially the tailor's thimble, which is lined with lead or brass. She replaces this metallic lining with guttapercha or India rubber, the preferences of which are palpable without being specified.

**A RARE HONOR.**—We forgot at the time to mention the centennial birthday of the great German astronomer, Bessel, held last July, in Königsberg, Prussia. Early in the morning, his statue, at the entrance to the observatory, was handsomely decorated with wreaths and flowers by astronomers and societies, and at 10 o'clock, Mrs. Bessel, ninety years old, the wife of the deceased, received the homages from many societies and celebrated persons. Professor Luther delivered an oration in the observatory. Truly, this is an honor which occurs only once in a life time.

**DISCOVERY OF AMERICA.**—The city of Genoa is at this early day making extensive preparations for a large centennial festivity, to be held in 1892, in honor of the discovery of America, by Christopher Columbus. The governments of France, Spain, Portugal, and the majority of the South American republics have promised their full co-operation. The municipal council of the city of Genoa has resolved to celebrate the centennial by a large exposition of American country and industrial products and by opening a general museum of American history. It is evident that the details of this future centennial have not yet been arranged.

**A FABRIC FROM GLASS.**—A few years ago, a Pittsburgh glass manufacturer discovered a method of spinning so delicate a thread from glass, and at the same time so supple, that it could be woven into a fabric for the manufacture of ladies' wearing apparel. This fact was doubted on many sides, and a foreign scientific journal, which had published this item with laudatory comments, saw itself compelled to apologize for deceiving the public in its next issue. The manufacturer, thereupon, sent a piece of the glass cloth to the editor, with request to notify its reception. The demand to see this piece of cloth was so great that the editor received hundreds of letters from distant parts of the country, asking for the price, which was \$20 per yard. The manufacturer had a very handsome dress made from it and exhibited in a dry goods store, but it was returned to him some time ago, because it attracted too great a crowd, and as unsalable, because too dear. The thread, according to the present method, cannot be spun cheaper, but there is every reason to believe that some cheaper process will be discovered ere long, and the cloth become more reasonable in price.

**ALAS, FOR GREATNESS**—Shakespeare wrote an "o'ertrue" sentence, when he said: "Uneasy lies the head that wears a crown." The route taken by the Czar of all the Russias to Cremsier, and the precaution taken for his safety, are leaking out, little by little. On his trip through Poland, he made use of six railway lines; Warsaw was not touched. All the trains likely to meet his, were stopped at the stations, several of them for 2½ hours, neither conductors or passengers knowing why. The latter were forbidden, under pains of exportation to Siberia, to leave their cars, to either wait outside or see the Imperial train pass by. At a town suspected to contain a society of nihilists, the cars were moved over to another track, and during the time surrounded by military, so that a soldier stood sentinel before each window. Who would not be the Czar of Russia?

**A LARGE PIECE OF AMBER.**—The sum of \$7,000 has in vain been offered to the owner of a very large piece of amber, at present exhibited in some small German museum. It is said to be the largest and most faultless piece of a large size in existence and weighs eight pounds. Frederick the Great paid the like sum for a piece of 13 pounds, at present in the Mineralogical Museum at Berlin. It has several cracks and holes, however. The owner of above mentioned piece was formerly a painter, who ruined his eyesight by painting, after which he applied himself to cutting articles *de luxe* from amber. The art of amber carving, a few centuries ago, was quite an artistic branch of industry; two excellent specimens are preserved in Berlin—one a flute, once belonging to Frederick the Great, and the other a tobacco pipe, with the carved portrait of Frederic William III.

**A HANDSOME PRESENT.**—One of the royal gifts to the Princess Beatrice, on the occasion of her marriage, was a fan of exquisite workmanship, executed by a student of the British School of Art. The painting is executed on white silk, and consists of a spray of orange blossoms, while in a sunny sky above appear a number of young loves gaily sporting and announcing the happy event, while others are suspending in mid-air, with a golden ribbon, the Princess's Coronet. In the distance is a view of Osborne House, the loved home of Princess Beatrice and the Queen. On the reverse side of the fan is painted a stand of bee-hives, with bees approaching another spray of orange flowers. The frame work of the fan is of finest ivory; the protecting mounts are in silver wrought in *repoussé* work, interspersed with diamonds; the outer edge sloping to the ivory is fastened in a light lace-like pattern in finest silver cord, after the etruscan fashion. The main features of the inner design are boldly marked by raised edges, accentuated at short intervals by fine diamonds of the purest water. Within these borders the orange blossoms and myrtle are wrought in *repoussé*. A superb ivory box, with initial devices, lock and key, incloses this superb work of art.

**PRECIOUS METALS.**—As shown by the annual report of the Statistical Bureau, in Washington, for the year 1885, the production of the precious metals of the Pacific coast has largely decreased in the course of time. The greatest yield of California occurred in the year 1859, when it amounted to \$50,000,000. In 1869 it was only \$22,500,000; 1875, \$17,753,000; 1876, \$16,900,000; 1877, \$16,000,000; 1878, \$17,634,000; 1879, \$20,000,000; 1880, \$18,800,000; 1881, \$18,950,000; 1882, \$17,645,000; 1883, \$15,580,000, and 1884, \$16,600,000. Nevada's yield of precious metals in 1869 was \$14,000,000; 1871, \$22,000,000; 1872, \$25,548,000; 1873, \$32,254,000; 1874, \$35,452,000; 1877, \$44,000,000; and 1877, \$47,676,000. Since that time, however, it has largely diminished. In 1879 it was \$21,560,000; 1880, \$15,700,000; 1881, \$9,310,000; 1882, \$8,750,000; 1883, \$7,950,000; and 1884, \$9,000,000. Oregon's greatest yield of gold was in 1869, in which it amounted to \$3,500,000. It has constantly sunk since that time, and in 1884 it was only \$680,000. The Territory of Washington, in 1880, showed a yield of gold and silver amounting to \$410,000, but, in 1884, it was only \$86,000. The total yield of all the precious metal mines on the Pacific coast together, footed up, in 1884, to a total of \$26,466,000.

## Workshop Notes.

**SOLDERING FLUID.**—Sufficient zinc is dissolved in pure muriatic acid, until this is completely saturated, after which the solution is filtered through linen. It can also be diluted with water for use.

**SMELTING THE STONINGS.**—Red-heat the stonings well, to burn out all organic matter; then take twice as much flux, consisting of a mixture of two parts calcined soda (60 per cent.) and one part borax. Apply a strong heat for smelting, and do not hurry the work.

**TO DRILL ENAMEL DIALS.**—You may have to drill or broach holes in enamel dials. For this purpose use a flat ended drill or conical broach of copper, into which diamond powder has been hammered. A graver kept moistened with turpentine is sometimes used. The edges of the holes in dials may be trimmed with corundum sticks, to be obtained at material shops.

**TO DRILL GLASS.**—One of our readers, an optician, recommends the following as being excellent for drilling glass: A drill heated to white heat, is first dipped into mercury, which tempers it well, after which it is sharpened. If next the drill is dipped in a saturated solution of camphor and oil of turpentine, keeping the drilling place fairly moist, glass may be perforated like wood.

**EXCELLENT CEMENT FOR PETROLEUM LAMPS.**—C. Pusher recommends a very adhesive cement for fastening brass upon glass, which is also well suited for cementing the brass rings upon petroleum lamps, it being impenetrable to petroleum, does not break off in heat, and is only superficially attacked by water. Boil one part of caustic soda and three parts colophony (bright rosin) in five parts water; a soap like emulsion is produced hereby, which is kneaded together with about one-half of its weight of plaster of paris. The cement hardens in one-half to three-quarters of an hour.

**TO DISTINGUISH AMBER.**—Amber may be distinguished from its imitations by the following characteristics: Copal is yellow and always of a uniform color, while amber is generally shaded and striped or cloudy, and, when rubbed with the palm of the hand, it evolves an aromatic odor, which is not the case with copal or artificial amber. Amber, when coated with tallow, and held over the fire for a few minutes, may be bent, while its substitutes remain rigid. It is crushed with difficulty, cannot be abraded or scratched with the finger nail; it can be cut, filed, sawed and polished, but it cannot be welded, like copal or artificial amber.

**TO GOLD OR SILVER PLATE METALS.**—A more satisfactory result is obtained in galvanic gilding or silvering by wrapping a zinc wire around the article, and dipping it into the gold or silver bath, then by the process with the battery. The forming layer of gold or silver adheres perfectly. If this layer is to be of a sufficient thickness, it is true that the operation is rather more tedious, but recourse may be had to a battery after the first deposit has been formed. The battery alone will never give as adhesive a layer. For this operation, the bath must be stronger than a battery bath, but nothing is lost, and the costs of a battery are saved.

**ALUM CEMENT FOR POROUS ARTICLES.**—It is something very difficult to cement porous articles, and a broken meerschaum pipe simply ridicules all endeavors to patch it together. This is quickly and well done by taking an ordinary quantity of common crystallized alum and heating it moderately in a porcelain crucible; the mass soon begins to fuse, and, when in this condition, it is applied upon the fractured parts, it forms an excellent binder; it becomes hard and thoroughly adhesive in a very short time. Crystallized alum contains about 50 per cent. water, and this escapes in melting, so that the actual material only fuses. Upon cooling, a certain quantity of water is taken up again, so that the mass, no longer having sufficient water to reassume a crystalline condition, forms a porcelain-like cement.

**A NEW POLISHING AGENT.**—French manufacturers of the metal industries have for some time used an old polishing agent—oxide of iron—prepared in a new manner. Pieces of old iron are laid into a vessel and moistened with water. When a sufficient quantity of rust has been formed in this manner, it is collected by washing, and, after it has settled, it is dried and calcined in a crucible. The hardness of the grain depends upon the duration of the calcining. With a very high temperature, the oxide becomes partly reduced, its color changes more into green, and the grain becomes too hard for polishing. The violet oxide is well adapted for polishing steel. After having been withdrawn from the crucible, it is crushed and pulverized.

**AMALGAMS FOR DIFFERENT PURPOSES.**—An amalgam for ordinary mirrors consists of: 70 parts tin, 30 parts quicksilver; for curved mirrors: 4 parts tin, 1 part quicksilver. For covering the inside of glass balls: 80 parts mercury and 20 parts bismuth. For cushions of electrical machines: 2 parts quicksilver, 1 part tin, 1 part zinc. The process for amalgamating plane mirror surfaces is: A perfectly smooth marble table, constructed for this purpose, is covered over with pure tin foil, mercury is poured over this, and the mirror glass is then slid upon it in such a manner that all the excess of the mercury is pushed away. The glass plate next is sufficiently loaded to expel all excess of mercury, and the amalgam will remain adhering to the glass.

**COLD SILVER PLATING.**—The following can be used for silvering either brass clock faces or any other metallic parts that are not subject to much handling: Get one-quarter ounce of nitrate of silver (to be had at any drug store), dissolve in a tablespoonful of water, and then add one-quarter pound of cream of tartar, and three-quarters pound of common table salt; thoroughly mix these ingredients together with a wooden stick, adding sufficient water to make a thick paste. Put this by in a glass-stoppered bottle for use as required, and it will keep any length of time. This is the silvering powder, and, before applying it to the brass, this must be made quite clean and bright. Get a piece of chamois leather, and fold it up small enough to be handy, and with this rub on the silver paste thoroughly all over, till by the appearance of the brass work you judge the silvering to be properly effected. Now wash the article quite clean, finally polishing off with a little whiting; this will finish as far as the silvering process is concerned; but to make the coating last under atmospheric influences, it must be protected by a coat of varnish. Any colorless spirit varnish will answer for this. The more silver powder is rubbed on, of course, the thicker becomes the coating, and it will stand good for years.

**SOLDERING WITH GALVANISM.**—Soldering by galvanism has the advantage that a union of two pieces is effected without it becoming necessary to employ alloys of different metals, which is of great service, as the soldered metal is afterward to be exposed to the action of fluids. Again, the metal does not become warped and twisted thereby, which frequently takes place by soldering in the common manner. For instance, two pipes, from sheet copper, are to be united; their respective edges, freshly cut, are brought together without coming into actual contact, and they are kept in this position by hempen thread or brass wire, which is wrapped around the pipes; their outside is then covered with a layer of varnish or wax, except the rims, which are to be united. The pipes are now dipped into dilute nitric acid, to thoroughly cleanse the rims, and thereupon are placed in the sulphate of copper solution; they are now connected with the zinc of the galvanic battery, and a thick brass wire is pushed into them which is connected with the copper of the galvanic battery; a metallic contact is prevented by wrapping unsized paper around the brass wire. The galvanically deposited copper will in very short time fill the space between the two rims, and, after a few touches with the file, unite the two pipes into one. This process has frequently been employed with good results, and is often easier than the ordinary way of soldering.



## Trade Gossip.

- L. Doederlein succeeds L. Saling, Warrenton, Va.  
 D. B. Hills succeeds C. C. Calor, Plainville, Conn.  
 J. Ryberg succeeds A. C. Morris, Gibson City, Ills.  
 Lucas & Bishop succeed C. H. Lucas, Canton, Me.  
 Mace & Berry succeed S. R. Mace, Moulton, Iowa.  
 E. M. Burton succeeds J. R. Carr, Portland, Oregon.  
 S. Rider has moved from Clearfield to Braddock, Pa.  
 B. F. Carter succeeds S. Brambaugh, Arcanum, Ohio.  
 L. Cobb succeeds Frank W. Bartlett, Fredonia, N. Y.  
 J. Omev Esau, Claire, Mich., is succeeded by E. Sias.  
 E. J. Tyler succeeds Tyler & Hilton, Galesburgh, Ills.  
 Buxton & Togle succeed B. D. Buxton, Mt. Gilead, O.  
 F. Knell & Co. succeed Mrs. A. M. Knell, Perry, Iowa.  
 F. F. Barss & Son succeed F. F. Barss, Placerville, Cal.  
 W. H. Avery has moved from Merrillon to Barron, Wis.  
 E. B. Miner has moved from Starkville to Durant, Miss.  
 N. A. Floyd & Son succeed N. A. Floyd, Carthage, Mo.  
 A. W. Avery succeeds Luther C. Hull, Plymouth, N. H.  
 John H. Bee has moved from Rochester to Big Run, Pa.  
 H. L. Lilius has moved from Selma, Ala., to Milton, Fla.  
 Henry St. John, Milford, Mich., succeeds O. H. St. John.  
 B. Starcke & Son succeed B. Starcke, Junction City, Kan.  
 D. O. Waid has moved from Craig, Mo., to Superior, Neb.  
 R. L. Deming has moved from Randolph to Rootstown, O.  
 S. T. Horne, Brodhead, Wis., is succeeded by J. H. Horne.  
 E. Fisher, Fostoria, O., has admitted his son to partnership.  
 A. L. Clark has moved from Manistique to Imlay City, Mich.  
 A. J. Dunham has moved from Long Prairie to Canby, Minn.  
 Snider & Greer succeed S. M. Snider, Greenville C. H., S. C.  
 L. P. & J. B. White succeed J. B. White, West Carlisle, Ohio.  
 Lafayette Cornwell has moved from Silver Cliff, Col., to Salida.  
 W. F. Hinerman, Lincoln, Kan., has sold out to J. A. Johnson.  
 Harvey Leonard has moved from Silver Lake to Mentone, Ind.  
 George Oliver has moved from Bristol, Pa., to Burlington, N. J.  
 Hiram Allen has moved from Scotia, Neb., to Edgerton, Minn.  
 J. W. Cudworth has moved from McGrawville to Oxford, N. Y.  
 J. T. Smith has moved from Harrodsburgh to Bloomington, Ind.  
 D. A. Curtis has moved from Port Byron, Ills., to Knoxville, Iowa.  
 J. F. Ingalls has moved from Waukegan, Ills., to Long Pine, Neb.  
 John Koetting has moved from Dauphin, Mo., to Evansville, Ills.  
 Moses Kahn returned from Europe Oct. 10 in the steamship *Ems*.  
 Emanuel Lovell has moved from Moline to Conway Springs, Kan.  
 A. L. Dorman has moved from Dubuque to Scranton City, Iowa.  
 Cooling & Peutzer succeed A. A. Cooling, Wilton Junction, Iowa.  
 A. W. Luckhardt has moved from McKeesport to Johnstown, Pa.  
 Wm. P. Morris has moved from Nevada to Bowling Green, Ohio.  
 K. S. Buck has moved from Crystal Falls to Iron Mountain, Mich.  
 S. M. Liles succeeds the firm of Liles & Lawrence, Morven, N. C.  
 W. S. Brannum succeeds the firm of C. Q. Shull & Co., Montpelier, Ind.  
 Jarrett Watkins succeeds the firm of Watkins & Milligan, Rogers, Ark.  
 F. J. Alexander has moved from La Salle, Ills., to White Lake, Dak.  
 Theo. Ernst succeeds the firm of Ernst & Bauck, Fort Madison, Iowa.
- O. Kneedson has moved from Eau Claire, Wis., to Valley City, Dak.  
 Springfels & Weil succeed the firm of F. Springfels & Co., Buffalo, N. Y.  
 George Lampman has moved from Ironton, O., to Greensboro, N. C.  
 F. P. Grimes has moved from Independence, Iowa, to Sturgis, Mich.  
 J. T. Hord, Phoenix, Arizona Ter., is succeeded by J. T. Hord & Co.  
 A. W. James & Co., Detroit, Mich., is succeeded by Samuel E. Bolles.  
 C. B. Carleton has moved from Saxton River, to North Bennington, Vt.  
 W. W. Hutchins has purchased the business of B. E. Shaw, Newport, Vt.  
 W. C. Williams has purchased the business of M. A. Libby, Elk City, Kan.  
 The firm of Pratt & Wheeler, Fremont, Neb., is succeeded by Pratt Bros.  
 George W. Prescott & Co. succeed Charles A Fowle & Co., St. Louis, Mo.  
 Martin & Thomas succeed the firm of Woodmancy & Knox, Macedonia, Iowa.  
 Henry J. Levy has purchased the business of O. Davis, Battle Creek, Mich.  
 M. R. Erlanger, Baltimore, Md., is succeeded by the firm of M. R. Erlanger & Co.  
 O. B. Loose, Lexington, Va., continues the business of Loose & Lang, dissolved.  
 M. D. Miller & Co. have moved from Siloam Springs, Ark., to Springfield, Mo.  
 Wm. G. Lytle has purchased the business of O. M. Campbell, Humboldt, Neb.  
 The firm of Warren & Pond, Sycamore, Ills., is succeeded by Pond & Meeker.  
 S. J. Henderson, Cassville, Mich., recently burned out, will not resume business.  
 Pritchard & Owen, Neosho, Minn., is succeeded by the firm of W. P. Owen & Co.  
 John A. Maurer has purchased the business of Newbury & Co., Pilot Point, Texas.  
 The firm of Smith, Schweppe & Co., Parker, Dakota, is succeeded by H. L. Schweppe.  
 The city of Savannah, Ga., has finally abolished the license tax on commercial travelers.  
 Robinson & Rush, Evansville, Ind., have dissolved; S. Robinson will continue the business.  
 M. Miesch continues the business of the firm of Rombach & Miesch, Clarksville, Texas.  
 George Limbach will continue the business of Geo. Limbach & Co., Delphos, O., dissolved.  
 Ekblad, Eberhardt & Goodholm succeed the firm of Nelson & Eberhardt, Lindsborg, Kan.  
 The firm of Shaffer & Booth, Altoona, has been dissolved, L. O. Shaffer continuing the business.  
 Stoddard & Colvin, Cynthiana, Ky., have dissolved, C. M. U. Stoddard continuing the business.  
 W. A. Pfeister & Co. have purchased the business of Casper Pfester, deceased, at Shebogan, Wis.  
 The firm of Story & Barnard, Tonawanda, N. Y., have dissolved; A. W. Story will continue the business.

The firm of Duncan & Brillbeck, Syracuse, N. Y., has dissolved; John B. Brillbeck will continue the business.

The firm of Conley & Hoffmann, East Saginaw, Mich., have dissolved; M. C. Conley continues the business.

J. F. Ingalls has succeeded E. S. Burbank, of Long Pine, Neb., and Mr. Burbank has moved to Dow City, Iowa.

H. G. Chase, Fitchburgh, Mass., has admitted his son to partnership under the firm name of H. G. Chase & Son.

The firm of Burdoin & Blackstone, Orrville, Ohio, has been dissolved, George R. Burdoin continuing the business.

Mr. Simon Goldsmith, of 194 Broadway, is the agent for the Solidarity Watch Case Co., (co-operative) of Brooklyn.

Mr. C. H. Dewey, formerly with Kossuth Marx & Co., has made an engagement with N. H. White, of No. 11 Maiden Lane.

W. H. Heater has purchased the business of W. H. Hamilton at Pt. Paris, Ohio, and will continue business at the old stand.

The annual dinner of the New York Jewelers' Association will take place at the Hotel Brunswick on the evening of Nov. 12.

E. D. Vosbury & Co., of Binghamton, N. Y., have fitted up a new store, and filled it with a large and well selected stock of goods.

Mrs. A. Epstein has moved from Chicago, Ills., to Davenport, Iowa, where the business will be under the style of Epstein & Smith.

The firm of Samuel Joel & Co. has been dissolved by mutual consent, Mr. Joel succeeding to the business, Mr. Franklin retiring.

Pforzheimer, Keller & Co. call attention in their advertisement in this issue of THE CIRCULAR to their new ladies' silver seaside watches.

Mr. D. A. A. Buck, inventor of the Waterbury watch, has resigned his positions as superintendent and director of the Cheshire, Conn., Watch Co.

D. B. Waite has retired from the firm of Waite, Smith & Co., Providence, R. I. The firm continues under the style of Waite, Thresher & Co.

B. & W. B. Smith, the well known show case makers and interior decorators, are fitting up the interior of the new store of M. Scooler at New Orleans.

George Brownecker has been admitted to partnership in the firm of Knight & Berry, North Attleboro, Mass.; the style of the firm is now Knight, Berry & Co.

Julius King, optical goods, has engaged Edwin Beckwith to represent him in New York, Pennsylvania and New Jersey, and Geo. A. Page will represent him in the New England States.

Kossuth Marx & Co. are progressing satisfactorily with their settlement, although, in consequence of the size of the estate, it will be some time yet before the settlement will be completed.

The firm of W. H. Harris & Co., of Detroit, Mich., has been dissolved by mutual consent, Mr. W. H. Harris retiring. The business will be continued under the firm name of E. B. Pelltier.

Mr. Michael Lang, formerly connected with Oppenheimer Bros. & Veith, has recently made a new departure, and started in business for himself at No. 8 Maiden Lane as a dealer in diamonds, watches, etc.

Sinnock & Sherrill present in this number of THE CIRCULAR examples of many of their new designs of rings introduced this season. The "Princess" is as popular as ever, and the demand this season is unusually large.

We are pleased to note the nomination of William P. Sedgwick, of Bath, N. Y., for member of assembly. Mr. Sedgwick was born in Hammondsport in 1837, and when four years old removed to Trumansburg with his family. When 18 years old he came to Bath where he has since resided. He spent five years in learning the watchmaker's trade, and in 1864 bought his uncle's jewelry store and has continued in the business to the present time.

Albert Lorsch & Co., importers of diamonds, are constantly receiving additions to their stock of the latest novelties in enameled flowers suitable for diamond jewelry. They have, also, a complete stock of precious and imitation stones.

W. F. A. Woodcock, formerly in the jewelry business in Cumberland, Mo., a thoroughly practical man, will represent the new Philadelphia wholesale jewelry firm of Hirst, Moore & White, and will visit their customers in different localities.

The new building of Mr. Charles Knapp, Nos. 41 and 43 Maiden Lane, which has been thoroughly overhauled for occupation by jewelers, was formally opened Oct. 23. Many of the very handsome offices are already taken by members of the trade.

Jersey City is to have a new watch company, and it is proposed to erect a new factory in that city. The movement they propose to make is said to operate on the screw principle and to require but three wheels. Where is our old friend Aristarchus Plumbago?

Mr. L. H. Guernsey, for several years past with Clapp & Davies, Chicago, has formed a co-partnership with Mr. L. G. Goodspeed, well known throughout the West and Northwest, under the firm name of L. G. Goodspeed & Co., 125 State street; they will handle tools and materials.

Fahys' patent dust band for all styles of regular silver watch cases is claimed to effectually exclude all dust and moisture from the movement and also to strengthen the case. The dust band completely encircles the movement and extends from the front to the back of the case.

We understand that some jobbers have advertised to prepay express charges on all packages above a certain value, but as this is said to be a violation of contract, the notice will undoubtedly be promptly withdrawn by all dealers who have thus inadvertently gone beyond the limits.

Send for advance proofs every month of the articles on "Fashions in Jewelry," and have the items printed in your local papers. Keep your customers informed regarding the latest fashions and novelties and it will help your trade. We will send advance slips to any dealer who will send for them.

Among the gentlemen in the city recently and favored us with pleasant calls were Messrs. T. & E. Dickinson, Buffalo; A. L. Lovejoy, Boston; O. E. Zadek, Mobile; H. Ginder, New Orleans; E. W. Smith, of M. S. Smith & Co., Detroit; G. A. Shealey, Detroit; J. H. Heim, Sunbury, Pa.

Mr. H. C. Haskell offers special inducements in cameo and intaglio rings, having new designs which are attractive. He also has a desirable line of diamond goods, garnets, collar studs, buttons, lace pins, etc., and a choice line of sterling silverware. Their holiday stock is full and desirable.

Frank Townley, with J. T. Scott & Co., recently caught one of the largest black bass that has been taken this season by any one in the trade; weight said to be over 5 pounds, but there are no accompanying affidavits, which is unnecessary, as Townley's reputation for truth is too well established.

The English crape stone jewelry manufactured by Fowler Bros. is constantly growing in popularity, and is now recognized as the standard mourning jewelry. They are now mounting it in real onyx and solid gold, thus giving it rank as fine jewelry, and presenting a class of goods suitable for the most fastidious trade.

Harry Hirsh, a tramp watchmaker, was recently convicted of stealing from Mr. Boylen, of Chester, Pa. Rowe Bros., of Chicago, feel a special interest in this individual, and will pay a suitable reward for evidence that will convict him of other thefts; also for information that will lead to the recovery of any of the following named watches: Paul H. Mathey, No. 11,256, hunting case, Blauer maker, with heavy 14-k. chain; Chas. Tissot Faire, No. 36,339, 18-k S. W. hunting case, 14-k. curb chain; Am. W. Co., No. 1,484,644, 14-k hunting case.

Attention is directed to the advertisement in another column of the opportunity offered for the purchase of a jeweler's stock and good will at Batavia, N. Y. It is offered by the estate of the late Jerome A. Clark, and is represented to be a fine business opportunity for a jeweler having a small amount of capital.

Mr. John Holland, of Cincinnati, manufactures the most approved styles and the latest novelties in pencil cases, pen holders, pencil charms, etc., and also a full line of standard gold pens and pencils. He has many new designs in staple goods and novelties, which are fully shown in his catalogue, which can be had on application.

Taylor & Brothers, 860 Broadway, call attention to a new and extensive line of French clocks, traveling clocks, etc., their fall importations having arrived and offering unusual opportunity for selections. They also carry a large stock of diamond goods, watches, bronzes and the latest novelties in English, French and German fancy goods.

The New York Jewelry Store, of which C. A. Grove is manager, at Portland, Oregon, carries an excellent assortment of goods, and a local paper gives them credit for displaying them in an attractive manner. Their establishment has just been newly fitted up in a rich and elegant manner, with attractive show cases and handsome interior decorations.

A large fire occurred in San Francisco. The upper story of one of the buildings was occupied by Geo. C. Shrieve & Co., jewelers, as a manufactory. Their loss is \$30,000, which is believed to be fully insured. Schweitzer, Sachs & Co., jobbers in fancy goods on Sansom street, lose heavily from damage by water. The origin of the fire is a mystery.

J. P. Wathier & Co., of Chicago, make a specialty of fine watch repairing for the trade, and are prepared to execute orders promptly, having every facility for doing the work in a skillful and workmanlike manner at short notice. Attention is directed to their advertisement of their patent self adjusting hair spring index, which has received strong endorsement from the trade.

Le Boutillier & Co. have received a large and extensive assortment of ornamental and fancy goods, including a large and full line of royal Worcester goods, embracing many novelties in form and style of decoration. They also have full lines of cameo and sanded glass ware, imitation bronze groups, statuettes, fans, candles, opera glasses, etc., and, in fact, an almost endless variety of fancy goods and bric-a-brac.

Mr. G. T. Woglom has been discussing the prohibitory question in *The Yonkers Gazette*. His theory is that it is the drinker and not the dispenser of liquor who should be licensed. The idea is an excellent one, but not likely to become popular—among drinkers. When a barkeeper is required to demand a sight of the license to drink issued to the customer who demands his morning cocktail, there would be trouble ahead for some one.

The Pivot Diamond Setting Company has recently introduced a new setting for diamond ear rings calculated to display the beauty of the gems to the best advantage. The stone is suspended by an iridium point, so arranged as to be extremely sensitive, and imparts to it an unceasing vibratory motion, the slightest movement causing the stone to scintillate and throw out its dazzling rays incessantly. It makes an attractive setting for diamonds, displaying them in any light to the best advantage.

The annual meeting of the stockholders of the Aurora Watch Factory was held recently at the company's office. Directors were elected for the ensuing year. The directors held a meeting and elected as officers for the ensuing year, A. Somarindyck, President; M. Huffman, Vice-President; E. W. Trask, General Manager and Treasurer; T. H. Day, Secretary; G. F. Johnson, Superintendent. The officers and directors are all solid business men, and with the exception of Mr. Huffman, of Quincy, are residents of this city. The success of Aurora's watch factory is an assured fact.

The balance of the Lancaster watch movements remaining in the market, some 8,000, have been purchased by S. F. Myers & Co., who are offering them at inducing prices, as the goods cannot be duplicated. We would call attention to their advertisement elsewhere in this issue of THE CIRCULAR. This firm carries full lines of all kinds of goods desirable for retail dealers, including jewelry, watches, clocks, silver and plated ware, etc., so that a dealer may obtain his full stock in their establishment.

The Tissot watch, of which J. T. Scott & Co. are the agents, has just received the first medal at the Exposition recently held in Antwerp. This watch is highly esteemed for its time-keeping qualities; J. T. Scott & Co. carry a full line of them. This firm has also a more extensive stock than usual of jewelry and American watches. They have many new and attractive novelties which are controlled by them, suitable for the holiday trade. They have also this season an extensive stock of fine diamond mounted goods.

"I see that some one has invented a watch that winds itself up while the owner is walking. I should like to have one, for I forget to wind my watch quite frequently," remarked Mr. Smith to his wife. "Does the wearer have to walk in order to wind the watch?" asked Mrs. Smith. "Certainly, my dear," replied Mr. Smith. "Well, then, you have no use for it, John." "No use for it? Why?" "Because the men who carry you home drunk would forget to wind your watch for you just the same as they do now."

American watchmakers are making continuous progress in the improvement of their products, and thus keep in the front rank of horologists. The latest improvement is a stem setting movement, introduced by the American Watch Co., of Waltham, recently, which is followed by a similar movement made by the Elgin Company. Silver case makers have readily fallen in with the idea, and are now making cases to fit either mode of setting. Dealers should bear this in mind, for the stem set movement is already in demand, and is, no doubt, destined to become the popular movement of the future.

Howard & Son, manufacturers of the American lever sleeve buttons, have recently added to their already very large assortment of designs a line of sterling silver sleeve buttons which, from their novelty of design, are meeting with unusual success, as they are a departure from the antique heads which have been so long in the market. Among them we noticed several mythological subjects, comical Japanese heads, also designs of general interest, such as a correct representation of the well known yacht Puritan, a perfect likeness of Puck as he appears on the title page of the popular comic paper bearing that name, etc.

Mr. Frank H. Richardson, of Enos Richardson & Co., with his wife has been spending some weeks at Greenwood Lake. They spent much of their time fishing, and on their return to the city brought with them four of the finest small mouth black bass exhibited this season. Mrs. Richardson caught the largest, weighing five pounds, and a smaller one weighing three pounds. The other two were caught by Mr. Richardson, weighing four pounds and fourteen ounces, and four pounds and six ounces respectively. This is not a fish story, for photographs of the length, breadth, thickness and weight of the fish can be seen on application to the parties implicated.

The New Haven Clock Co. have just completed and erected for the Mackay-Bennett Cable Co., at the corner of Wall and Broad streets, this city, a magnificent clock which will be run by electricity. The clock is in the form of a globe, (gilt) three feet in diameter, standing on a column fourteen feet high, the whole surmounted by a gilt eagle. On the globe is outline maps of the continents, showing the prominent features of each. The globe or clock has three dials, two showing New York City or standard Eastern time, and the other London standard time. This clock will be appreciated by a large portion of our business men who do business in that portion of the city. The New Haven Company have also produced their usual large line of new and attractive goods for the coming holiday season.

Much has been said about the wonderful collection of paintings, works of art, bric-a-brac, orchids, etc., costing millions, which belonged to the late Mrs. Mary J. Morgan, but it is not so generally known that Mrs. Morgan was also the possessor of a most wonderful and costly collection of gems, diamonds, black, white and pink pearls, rubies, sapphires, etc., in the collection of which a lifetime has been spent, and good taste combined with excellent judgment used. Time and space prevent us from entering on the subject more fully, reserving this for a later occasion. For the present our readers will be interested to know that this most unique and rarely equalled collection is in the possession of the well known firm of Philip Bissinger & Co., who are offering them for sale at their office, No. 22 John street.

The following circular was issued by the Jewelers' Association Oct. 27: "We have the pleasure to announce to the members of the Association and the trade generally that one of our old friends, Mr. E. Bissinger, has been appointed U. S. Consul at the important port of Beirut, in Syria, by the President of the United States, thus not only recognizing the merit and worth of one who was for many years in the trade, but the influence exerted by the trade when used unitedly in a worthy cause. The application for Mr. Bissinger's appointment was signed almost universally by the jewelry trade, and to this endorsement of business men, rather than to any political influence, Mr. Bissinger attributes his success in securing the appointment. Mr. Bissinger has expressed to us his sincere appreciation of the kindness and courtesy shown him while his petition was in circulation, and the readiness with which the same was signed by so many of the houses in the jewelry trade, and desires to thank them through this medium for their consideration and kindness in the matter.

For more than a year the National Clock Co., incorporated in New York and located in Brooklyn, has been prosecuting preliminary work in a very important branch of horology interests. While it is not the purpose of the organization to enter our markets as a direct competitor with other clock companies, it has made a place so important that upon beginning its second year it was found necessary to greatly increase its facilities. Looking to this end its capital has been increased, and a site for a new factory of its own has been selected at Attleboro, Mass. Other steps have been taken that betoken exceptional prosperity for a new company. Among the following list of officers it will be seen that the names of many well known and wealthy jewelers of New York, Attleboro and Providence appear, giving the best assurance that the National Clock Co. will lack neither capital nor intelligent management. Its officers are: Mr. Wm. M. Fisher, of Wm. M. Fisher & Co., New York and Providence, President; Mr. Marshall E. Hunter, of Brooklyn, Vice-President and General Manager; Mr. J. W. Duxbury, Superintendent of Providence Telephone Co., Secretary; Mr. W. J. Luther, civil engineer, Attleboro, Treasurer. Its directors are: Mr. R. M. Pulsifer, of Boston *Globe*; Mr. Eugene F. Phillips, of Providence Electrical Works; Mr. H. B. Lytle, of New York Electric Time Company; Messrs. B. F. Watkins, W. L. Robinson and B. S. Clark, of New York city; Mr. C. H. Pond, inventor and patentee of the Pond electrical clock; Mr. Gideon M. Horton, of Horton & Angell, Attleboro; Mr. J. L. Sweet, of R. F. Simmons & Co., New York; and Mr. Geo. H. Richardson, of J. W. Richardson & Co., of Providence. The National Clock Company will manufacture all the clocks, dials and fittings of the New York Electric Time Co.; and since this company is the parent and lessee of the local time distributing companies of Boston, Providence, Wooster, Pittsburg, Cincinnati and other cities of the Union, it will be seen that it has plenty of work at hand.

An old subscriber in Indiana writes us an amusing incident that occurred in his business. Some years ago he sold to a young gentleman a solid gold ring, to be used as an engagement ring. The initials of the lady and gentleman were duly engraved inside the precious band of gold, and it was formally delivered to the expectant bridegroom. About two months later he called again to say that he and the lady had fallen out, and he offered the ring, which she had returned, in exchange for other goods. I made the exchange, and a few days later while polishing the ring, after having erased the lettering, another young gentleman dropped in to buy an engagement ring. I at once sold him the one I was polishing, and then ascertained that it was intended for the identical lady for whom it was originally purchased. She did not change her mind again, but was duly married to the second gentleman, and still unknowingly wears the ring that was presented to her on two different occasions by two different lovers.

Among the dealers in New York during the past month, we noticed Messrs. Thomas, of Carrington, Thomas & Co., Charleston, S. C.; Stephen Thomas, Jr., of Stephen Thomas, Jr., & Co., Charleston, S. C.; J. A. Henneman, Spartansburg, S. C.; J. K. Lemon, Louisville, Ky.; Lyon & Hall, Skaneateles, N. Y.; F. G. Smith, Parkersburgh, W. Va.; C. L. Byrd, Memphis, Tenn.; R. C. Green, Pottsville, Pa.; J. C. Harrington, Columbus, O.; L. W. Bruce, Hinton, W. Va.; L. C. Berneys, Little Rock, Ark.; O. B. Rudd, Ilion, N. Y.; Mr. McOsker, of Allan & McOsker, Rome, Ga.; J. W. Eddy, Kewanee, Ills.; C. M. Turck, of Leyson & Turck, Butte City, Montana; S. Nordlinger, San Francisco, Cal.; H. W. Curtis, Knoxville, Tenn.; W. Fischer, Chatanooga, Tenn.; F. Morck, Warren, O.; J. G. Dutton, Wheeling, W. Va.; L. Sunderlin, Rochester, N. Y.; J. Allan, Charleston, S. C.; J. J. Freeman, Toledo, O.; Mr. Crosby, of D. Greenleaf & Co., Jacksonville, Fla.; M. Judd, Toledo, O.; J. R. Reed, Pittsburgh, Pa.; W. A. Chamberlain, Towanda, Pa.; J. T. Little, Williamsport, Pa.; H. C. Ebersole, Logansport, Ind.; J. A. Wetherell, Parkersburgh, W. Va.; J. Tibbitts, Bangor, Me.; Frank Wells, Lansing, Mich.; R. Brunt, Chester, S. C.; A. J. Rose, Canton, Ohio; S. P. Hamilton, Savannah, Ga.; J. W. Mussina, of Bower & Co., Williamsport, Pa.; E. Harris, of Harris & Shaffer, Washington, D. C.; Smith & Powers, Youngstown, O.; Mr. Straw, of Straw & Lovejoy, Manchester, N. H.; F. E. Marvin, Walton, N. Y.; M. Rosenberg, Phila., Pa.; J. Gansl, Minneapolis, Minn.; Jacob Shaw, Washington, D. C.; Mr. Crankshaw, of Freeman & Crankshaw, Atlanta, Ga.; P. M. Yonlin, Hoosic Falls, N. Y.; L. E. Higley, Hobart, N. Y.; R. S. Gardner, Birmingham, Conn.; S. G. Brooks, Boston, Mass.; F. A. Robbins, Pittsfield, Mass.; A. G. Stone, Montpelier, Vt.; W. C. Wright, Tarrytown, N. Y.; Mr. Oswall, of Oswall & Cromwell, Sing Sing, N. Y.; E. M. Munger, New Haven, Conn.; Mr. Taintor, of Taintor & McAlpine, East Hampton, Mass.; Taber & Chapman, Holyoke, Mass.; C. F. Mathey, of Mermod Jaccard Jewelry Co., St. Louis, Mo.; R. B. Gray, San Francisco, Cal.; T. & E. Dickinson, Buffalo, N. Y.; L. Braverman, San Francisco, Cal.; M. May, Trenton, N. J.; F. Wheeler, Rutland, Vt.; A. Townsend, Mattewan, N. Y.; Mr. Wise, of La France & Wise, Elmira, N. Y.; G. C. Allis, Birmingham, Conn.; J. Lomberg, Ansonia, Conn.; P. H. Nefflin, Keyser, W. Va.; F. W. Letmate, Washington, D. C.; H. Z. Rhoades, Lancaster, Pa.; Mr. Crossman, of Bettys & Crossman, Auburn, N. Y.; H. L. Chapin, Denver, Col.; A. E. Hathaway, Williamsburg, Mass.; Mr. Bingham, of Bingham & Walk, Indianapolis, Ind.; A. C. Konarson, Scranton, Pa.; J. R. McMillan, Marr, Pa.; C. T. Hockridge, Madison, N. Y.; Wm. Carrington, of Carrington, Thomas & Co.; L. B. Jacquermune, Helena, Montana; Moses Wineberg, Utica, N. Y.; J. C. Watts, East Saginaw, Mich.; Mr. Bristol, of P. M. Whitman, Beaufort, S. C.; Mr. Hall, of Hall & Farnsworth, Janesville, Wis.; G. H. Hall, La Fayette, Ind.; T. C. Parker, Wilkesbarre, Pa.; Mr. Hebbard, of J. B. Storer & Co., Akron, O.; D. Schopperle, Oil City, Pa.; D. Harman, Phila., Pa.; Mr. Atkinson, of Atkinson & Bro., Phila., Pa.



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## THE JEWELERS' CIRCULAR AND HOROLOGICAL REVIEW

*Official representative of THE JEWELERS' LEAGUE and of THE NEW YORK JEWELERS' BOARD OF TRADE, and the recognized exponent of Trade Interests.*

A Monthly Journal devoted to the interests of Watchmakers, Jewelers, Silver-smiths, Electro-plate Manufacturers, and those engaged in the kindred branches of art industry.

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### A National Bankruptcy Law.

CONGRESS will re-assemble in a few days, and one of the measures likely to come up for early consideration is the Lowell Bill, providing for a national bankruptcy law. It is not necessary to apologize to our readers for again referring to this subject, for it is one of such vast importance to all business interests that it becomes the duty of every journalist to discuss it. The Lowell Bill has been before Congress during two of its sessions, but has not been definitely acted upon, probably because our statesmen at Washington are so engrossed with political matters that they have little time to devote to the consideration of subjects of vital importance to the commercial and industrial interests of the country. In the absence of a national bankruptcy law, prescribing a uniform code of proceedings in insolvency cases, the creditor class is at the mercy of State legislation and local prejudice. In some of the States the laws relating to insolvent estates seem to have been framed for the express purpose of enabling local debtors to defraud their creditors in other States, and with local courts to administer these laws, the road to the collection of honest debts from a bankrupt's estate has been a hard one to travel, and so beset with obstructions that creditors have rarely had the courage to pursue it. The old national bankruptcy law was defective in many particulars, but it nevertheless so hedged about the debtor that there was comparatively little opportunity for fraud, at the same time that it allowed honest men a reasonably fair opportunity to protect themselves. When that law was repealed and insolvents' estates relegated back to the jurisdiction of State laws and State courts, a premium was virtually placed on dishonesty and fraud. This is

shown by the steadily increasing number of failures; in 1880 there were 4,330 failures with an aggregate liability amounting to \$57,120,000; in 1884 there were 11,620 failures and liabilities aggregating \$248,740,000. Such an immense sum as nearly two hundred and fifty millions of dollars is too important an item in the commercial transactions of this country to be left like a foot-ball to be kicked about by local legislation or made the sport of dishonest men. Credit is the corner stone of business in this country; every failure that occurs is a blow tending to weaken credit, and the more discreditable the failure, the more disastrous must be the effect of the blow. It is even more essential to the honest majority of the debtor class that bankrupts' estates should be honestly administered than it is to the creditor class, for the latter can protect themselves by refusing credit, while the former must have credit or cease doing business. It is to their interest that the credit system shall be surrounded with such safeguards that every creditor will get his just dues and thus be induced to continue the system.

The Lowell Bankruptcy Bill has received the endorsement of the principal business organizations of the leading financiers, and of the representatives of the more prominent industrial enterprises, yet, unless active measures are taken by those interested, Congress may fail to take action on it at this session as it did last winter. But what is everybody's business is extremely liable to be neglected, and it is therefore important that every trade organization should take measures to impress upon Congress the necessity for passing the bill at an early day. Resolutions to that effect should be adopted by every association of business men, and a suitable committee appointed to see that they are properly laid before Congress. Every man has more or less influence, and when business men are associated together in organizations for mutual benefit and protection, there is concentrated an aggregation of influence that cannot but have weight in whatever direction it may be turned. We therefore repeat our suggestion heretofore made, that every association in the jewelry trade should adopt resolutions urging Congress to promptly pass the Lowell Bankruptcy Bill, and to place those resolutions where they will do the most good. To have their effect such resolutions should be adopted without further delay.

### Itinerant Auctioneers.

WE HAVE received several letters lately from country dealers complaining of the injury that is being done the trade by the itinerant auctioneers, who go from place to place selling the cheapest and most worthless imitations of silver plated goods, jewelry, etc., and asking us to expose and denounce them. We have done so repeatedly, and if local dealers would make proper use of the suggestions and material we have given them, they could create a sentiment in the public mind that would be fatal to the success of these swindlers. One correspondent suggests that we should obtain

samples of goods which these itinerant warrant as the "best triple plate," strip it and expose its quality. This has been done repeatedly, and the sawdust swindle has been exposed, and "bunco steerers" have been sent to prison, but the sawdust swindle is still perpetrated, "bunco steerers" find fresh victims daily, and the bogus auctioneers encounter their "Mrs. Toodles" in every turn, who fancy that everything offered at auction is a bargain. The trouble is that those most interested in putting down these frauds are indifferent—those who suffer from them do not expose them to others who are likely to be victimized. Suppose our friend who writes to us—who is a sufferer at the hands of mock auctioneers, by reason of his business being injured—instead of asking us to obtain some of the fraudulent goods and expose them, should attend one of these auctions; when the auctioneer guaranteed an article to be triple plate, let the dealer buy it, and he then has the positive evidence on which to convict him of obtaining money by false pretences; have him arrested and prosecuted on such charge, and that particular individual would probably be sent where he would be unable to compete with honest merchants. This is a practical way of meeting the difficulty; such an exposure would be a benefit to the community, and the dealer would improve his standing by making such a vigorous campaign against systematic swindling.

It is a well known fact that there are persons backing these itinerant auctioneers whose business it is to make fraudulent "skin" goods to be disposed of in this manner exclusively. In some instances they have bought the tools and plant of some insolvent maker of respectable goods, and having the patterns, machinery, etc., they turn out these "cheap and nasty" goods for the auction trade without the slightest effort to give them any intrinsic value whatever. If they will only stand packing and present a fair exterior, quality is a matter of no concern to them. Plated ware of this description will look bright and attractive when first unpacked, but exposure to the air soon tarnishes it, and the first attempt to clean it cuts through the alleged plate and exposes the base metal. Gold goods are made in practically the same way—all that is required is a taking pattern, a fair exterior, and a composition of metals in the making of which gold is an unknown quantity. A glib-tongued auctioneer completes the outfit, and this individual is generally selected from the broken down members of that calling, the only requirement being that he shall not be burdened with a conscience, and will not scruple to make any statement calculated to sell the "skin" goods.

The wonder in this business is that respectable persons can be found to buy the stuff offered under such conditions. The very manner in which the itinerant auctioneer parades himself should be sufficient not only to excite suspicion, but to prevent purchasers going near him. He comes among them a stranger, without recommendation or endorsement; he pays no taxes; does not contribute a dollar for the good of the community, but carries away every dollar he can get hold of to spend elsewhere; his language is so extravagant that every listener knows it to be false, yet they buy his goods and apparently have faith in his representations and guarantees. They do not find their customers among the intelligent and refined, for they are too familiar with such impostures, but among the uneducated and poorer classes, whom it is all the more shame to rob of their hard earnings. This class of persons is apt to be caught by glitter and impudence, and to have little regard to the value of an article provided it is showy and attractive looking. They want things which their neighbors will envy, not because they are either useful or valuable. This is the same class that furnishes the victims for nearly all the confidence games that are played. We question very much if many of them are or could be made patrons of legitimate dealers in jewelry, but nevertheless it is our duty, and the duty of every good citizen, to protect them from imposters and swindlers if possible. It ought to be generally understood by the public by this time that legitimate manufacturers do not resort to auction rooms to dispose of their products. Occasionally a bankrupt stock

is of necessity sold at auction, but when this occurs the auctioneer is a person of known character, and the history of the goods and cause of the sale are made public in such manner that the facts are known to all. Responsible persons are connected with the sale, and there is no deception about it. With the itinerant auctioneer the case is entirely different; he stands without god-father or god-mother to endorse his statements, has no vouchers for his goods, is a self-confessed falsifier, and neither he nor his wares entitled to any confidence whatever. So long, however, as there are fools anxious to part with their money, bogus auctioneers and other confidence operators will continue to exist and thrive upon the gullibility of human nature.

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### Watchmakers' Work.

THE WORK that falls to the lot of the watchmaker to perform is of the most delicate character, and demands a high degree of skill to execute in a satisfactory manner. It requires more than mere mechanical knowledge, for some intimacy with the science of horology is needed to make the successful watchmaker. This term, watchmaker, has come to be something of a misnomer in this country, since the majority of watches are made by machinery, and the work of most of the skilled watchmakers is confined mainly to repairing watches. In nearly every jewelry establishment in the country the repairing of watches is made a special feature of the business, and workmen, more or less expert, find constant employment at job work of this kind. Unfortunately, all those claiming to be watchmakers are not proficient at the business, but contrive to botch most of the work entrusted to them. The demand for good, skillful watchmakers exceeds the supply, and the deficiency is made up with half-fledged journeymen who have picked up what they know about watchmaking while serving as shop boy somewhere, or who have, in some other way, obtained a superficial knowledge of the inside of a watch. The number of fine watches that have been ruined by botches calling themselves watchmakers cannot be estimated. It is a frequent thing to hear a man say: "My watch was a splendid timekeeper until I had it repaired, and now I cannot rely on it at all." Probably the same persons would have grumbled had a first-class watchmaker charged him what his skill and labor were worth for repairing his watch in a skillful manner, and would have sought for some one to do the job at a less price. Men who pay high prices for watches are very apt to find fault if they even get out of order, and to object to paying a reasonable price to have them made as good as new. The mechanism of a fine watch should not need repairing for a long time, but it is but mechanism after all, and is subject to become deranged like any other machinery from constant use and "ordinary wear and tear." Comparatively few wearers of watches know how to take care of a fine movement, but subject it to rough usage, neglect and thoughtless handling. Then when it gets out of order they take it to the repairer who will work the cheapest, so that it is not surprising that a watch becomes untrustworthy after it has been repaired. Owners of watches are largely responsible for this, but watchmakers themselves are somewhat to blame. As a rule they work too cheaply, and cannot afford to give the time and attention to their work that they ought to; then, too, competition enters largely into their business, so that they are tempted to do five dollars' worth of work for three, and are then fearful that some rival will get the job at two and a half. Watchmakers do themselves as well as their customers an injury every time they do a job of repairing for a less price than is fair compensation for the time, labor and skill bestowed upon it. The time a man spends in learning his trade should not be lost sight of when the bill is made out; it is the ability to do the work as well as the mere doing of it that should be paid for. Physicians, lawyers and skilled artisans generally charge for the trained intelligence that makes them competent to do the work required of them; if the physician charged simply for the pills he

compounds he would starve to death. If "the workman is worthy of his hire," the skilled workman is not only worthy of full compensation for his labor, but also for the skill which enables him to perform that labor satisfactorily. If special training is to pass for naught, why cobblers and blacksmiths should turn watchmakers.

It is unfortunate that there is not a schedule of rates for watch repairing in universal use by watchmakers, and religiously lived up to. Attempts have been made in some localities to introduce such a schedule, and, as a rule, such efforts have resulted in the obtaining of better prices for watch repairing in those sections; if they were only lived up to universally the improvement in rates of compensation would be more decided. But there are always some "guerrillas" hanging on the outskirts of every calling, ready to sacrifice its best interests at any time to suit their own ends, and these are willing to cut the rates whenever, by so doing, they can injure a competitor and secure the proffered job for themselves. But such men can usually be circumvented if the regular dealers will organize for their own protection and stand by any compact they may enter into. Good faith, however, is the essential element of every compact, and unless those who enter into it are prepared to abide by the agreement it had better not be made. If the regular dealers in every community will lay aside their petty jealousies, and, for the betterment of their business, form a local association for the protection of their interests, the cutting of prices for watch repairing, and numerous other evils from which they now suffer, might be overcome. Let them insist upon good prices for good work and the public will sustain them. Another thing we would suggest as conducing to that end, and that is not to make so much of a mystery of your work; when a customer brings a watch to be repaired, carefully point out to him what the trouble is, and when he understands the character of the work to be done he will be more willing to pay a reasonable price for it. Take your customer into your confidence and you will find your reward in so doing.

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### Competition, Honest and Otherwise.

NO MAN has a monopoly of any particular line of business; all the avenues of trade and industry are open to whoever chooses to enter them; yet there are many persons established in business who feel personally aggrieved if another adopts the same pursuits and enters into competition with them, and will use every endeavor to crush him out. This is a growing country, and its population is becoming exceedingly thick in some localities. As it is our greatest honor that here every man earns his living, there being no discredit, as there is in some older countries, attaching to honest industry, it naturally follows that there must be keen, active business competition in the older and firmly established business enterprises. Not only do the newcomers seek the new business born of an increasing population, but they jostle the old established houses in pursuit of the trade already developed, hoping to divide the orders for goods, regardless of the fact that they are enticing away the patrons of older firms. But this is the way of the world, and has been since the increase in Adam's family made more mouths to feed and added to the number of persons to be clothed and housed. The old firms that complain of the upstarts of the present day are seemingly oblivious of the fact that it is but a few years since *they* were the upstarts and were elbowing and hustling the "old fogies" of *their* day and generation. The new blood that is constantly being infused into trade and commerce as a younger generation steps into the arena, puts new life and vim into the arteries of commerce, introducing new methods of conducting business and stamping every transaction with the seal of progress. It is hard work for some of the old conservative houses to keep pace with the rush and whirl of the bold young spirits that are to-day our leaders in the marts of trade,

and some of them sit down and content themselves with sighing for "the good old times" familiar to their youth. This is a useless waste of time; being in the stream they must go with the current or expect disaster. To refuse to go forward is to invite dry rot, a disease always fatal. The remedy is new blood. Bring in the sons, nephews, or cousins, trained in the business methods of modern times, and surrender to them the reins of management, and content yourselves in the enjoyment of your dreams of past achievements and the substantial results derived therefrom. It is inevitable that youth should usurp the place of age, and that as the number to be provided for is steadily on the increase, competition should grow more active and aggressive. Young men are not responsible for being here, but having been tossed upon a sea of trouble, and it being ordained that each must look out for himself, they propose to go ahead and make the best fight possible for existence. They have but little respect for old trade traditions, but strike out boldly new paths to tread, and seek to turn the old channels of business in new directions. They fear no one in competition, but count it as an especially creditable thing if they can encroach upon the business of some old established house.

Competition, keen and aggressive, is a necessary element in our business conditions; to competition legitimately pursued no one can reasonably object. Unfortunately, however, the methods resorted to by many are not such as are to be commended, consisting largely of deliberate misrepresentation, detraction and some methods that partake of the nature of fraud. Young men engaged in business are too apt to think that the quickest way to build themselves up is by endeavoring to pull some one else down, and so, with premeditated malice, they seek to undermine some competitor in the estimation of his own patrons. In the jewelry trade there is a great deal more of this detraction of competitors than is healthy or desirable. Young Jones aims to secure the trade heretofore enjoyed by the old established house of Robinson, and so never lets slip an opportunity to sneer at the business standing of Robinson, to cast slurs upon the quality of his goods, to criticise their workmanship, and to bring his integrity under suspicion whenever occasion permits. Instead of expending his energies extolling the merits of his own goods, he spends his time disparaging those of his competitor. His traveling representatives are instructed to make special war on "old Robinson," and to steal away his customers by any means that will accomplish that end. He will even copy the styles and designs of his goods, perhaps make them of inferior metal, and undersell him at every opportunity, thus holding Robinson up as one who is exacting exorbitant profits from the dealers. Such practices are neither fair, legitimate nor honest, nor can they fail ultimately to react upon the head of him who indulges in them; they are unmanly and dishonorable. They tend to demoralize the business, to excite distrust and to destroy confidence; they are more far reaching in their effects than their author contemplates, for they are undermining the integrity of our industries and our commercial transactions. This is not competition—it is rascality. Competition should excite emulation and an ambition to raise still higher the standard of our manufactures, but detraction leads to dishonest practices and the degradation of our industries. In legitimate competition men and goods stand upon their own merits, but by the other method falsehood is made to take the place of merit. In the nature of things, competition growing more active every year, the profits to be derived from industrial and business pursuits cannot be expected to be so great as they formerly were; men must be content to work harder and get less; but this fact should stimulate them to greater effort, not to trickery and dishonesty. Misrepresentation has no place in honest competition or in the practices of honorable business men. While we never expect to see it entirely obliterated from business methods, we feel impelled, from circumstances that have come under our observation, to throw in a word in favor of that good old truism, "Honesty is the best policy." Not only is it good policy to be honest, but there is sweet solace to one's conscience to feel that

he is following out the injunction embodied in the Golden Rule, which comprises a whole code of morals and is an epitome of sound business principles.

### Annual Dinner of the New York Jewelers' Association.

THE ANNUAL dinner of the New York Jewelers' Association was enjoyed on Thursday evening, Nov. 12, by the members and their guests at the Hotel Brunswick. This is an annually recurring event in the trade that is always looked forward to with great interest and delightful anticipation, for it is an occasion when leading members of the trade, laying aside all business cares and formalities, come together for social enjoyment solely, to talk over the pleasant features of the business, to revive old acquaintances and to make new ones, and, in short, to get as much enjoyment as it is possible to crowd into one evening over a good dinner and a fragrant cigar, with witty speakers and good music interspersed throughout the entertainment. During the year the Association performs an excellent work in the trade, more directly for the benefit of its members, but the indirect influence of which is felt by every manufacturer and dealer. It is a busy, active body, working throughout the year with machinery systematically arranged to accomplish the ends sought, and it is fitting that at each recurring anniversary there should be a lifting of the work-day business mask, and that for a few hours, at least, the social natures of the members should predominate. It would be better for our business men in general if they paid more attention to cultivating the human social side of humanity, and confined their business cares exclusively to business hours.

The annual dinners of the Jewelers' Association have always been noted for their elaborateness and elegance, as well as for the excellence of the after-dinner speeches that have been made at this festive board. Some of the most famous humorous speakers the city can boast of have achieved a goodly portion of their reputations at the jewelers' dinners. The dinner of this year, the eleventh in the annual series, marked another success, both as a gastronomic event and for the brilliant flow of oratory that fell from the lips of well known popular speakers. Mr. William R. Alling, President of the Association, presided with that dignity and suavity of manner that are characteristic of him; the celerity with which he carried out the programme, and the appropriateness of his remarks when introducing the speakers and at other times, giving additional illustration of his executive ability and pleasing address. Among the distinguished guests and speakers were Judge Noah Davis, of New York; U. S. Senator O. H. Platt, of Conn.; A. Q. Keasby, United States District Attorney for New Jersey; Rev. Robt. Russell Booth, J. Seaver Page, Noah Brooks, David C. Dodd, Jr., Hon. Algernon S. Sullivan and others, whose names will be found in our full and detailed report of the proceedings. The banquet provided by the proprietors of the Brunswick was elegant in every respect; the dining room and table were artistically decorated, and the music furnished was far superior to that which ordinarily accompanies festivities of this character. The dinner and the entire entertainment were most enjoyable in every particular and constitute an oasis in the desert of daily routine and drudgery, that all participants can look back upon with both pleasure and profit, the only regret being that it is a thing realized and not a prospective delight.

Elsewhere we give a full report of the proceedings, speeches, etc., made expressly for THE JEWELERS' CIRCULAR by our own stenographer, the only one specially invited to attend. No apology to our readers is necessary for giving up so much of our space to this report, for THE CIRCULAR is a chronicler of news and current events of interest to the trade, and an annual social re-union of gentlemen so prominent in its various branches, cannot but furnish material for a report in the reading of which all persons identified with the jewelry interest will take pleasure.

## Gossip of the Month.

THE holiday trade has set in with much activity, and manufacturers and jobbers have seen busier times during the past few weeks than they have known in many months before. There is a better feeling among all classes than has prevailed for three years, and returning confidence has given an impetus to trade in all lines that is especially welcome after so long a period of comparative stagnation. Increased activity for the holiday trade had been confidently anticipated by most persons, and the jewelry trade expressed its confidence by preparing to meet it. During the dull summer months manufacturers elaborated new designs and patterns for goods, with a view to presenting many novelties and especially attractive goods to please the fancy of purchasers of all classes. As a result, a more varied assortment of new goods, rich in original designs and the best workmanship, has seldom been offered purchasers at this season of the year. At holiday times purchasers usually seek to combine the useful with the ornamental when making their customary presents to their friends, and in this respect they can be abundantly satisfied with the thousands of beautiful things offered them to select from by the jewelry trade. Standard goods in new designs are to be found in every stock, while ingenious and desirable novelties without end are to be met with on every hand. The famous jewelry establishments of London and Paris do not present the numerous attractions in rich and artistic goods that are to be found in similar establishments in New York. About many of these there is a daintiness of design and workmanship that is not equalled by the workmen of Europe, who favor the massive styles, rather than delicate and artistic, that ladies so greatly admire. Elaborate engraving and fine tracery are conspicuous in the ornamentation of new goods, and many beautiful pictures, gems of the engravers' art, characterize many of the pieces designed for holiday goods. Manufacturers are entitled to the greatest amount of credit for their holiday productions, and for the confidence they displayed in preparing to meet an increased demand long before visible manifestations of such demand were apparent.

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THE retail trade in general has already supplied itself with holiday goods, but there are always some eleventh hour men who put off their purchases till the holidays are close upon them. To such we say, lose no further time; the jobbing trade is now busily engaged filling orders, and those who would be served promptly should send on their orders at once. First come first served, is the motto of all jobbers at this season of the year, and the dealer who has put off ordering till the last moment is apt to receive his goods too late to supply his holiday customers. The special holiday trade comes but once a year, and the dealer who has failed to prepare for it has missed his best opportunity for profitable business that occurs in the twelve months. Those who have so neglected have still an opportunity to partially redeem themselves, by a display of alacrity in forwarding their orders, even at this late day. Fortunately, the manufacturers and jobbers generally always count upon a few eleventh hour men, and so are prepared to supply goods even up to the first peal of the Christmas chimes. But dealers must make allowance for delays in shipping, transportation, delivery, etc.; and if necessary, in order to get the goods, they should make free with the telegraph, thereby gaining some hours, if not days. It is essential to keep the fact in mind that the jobbers have many hundreds of customers to serve at one time at this season, and cannot give one precedence over another. Orders are filled consecutively, and the man who is late with his order will be very sure to bring up the rear of the procession in the rush to the express offices.

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IT is estimated that during the past fifteen years about \$200,000,-



000 worth of rough diamonds have been taken from the diamond fields of Africa, cut and set, and disposed of in the marts of the world. Their value after being cut and set is estimated at about \$500,000,000, which seems to us to be an excessive valuation to put upon the product of this one field of operations. Can any one give a fair approximate valuation of all the diamonds in use or known in the world? What an extraordinary demand there must be for these precious gems, when \$500,000,000 worth can be added to the visible supply in the course of fifteen years without making any material reduction in prices. But an admiration for diamonds seems to be inherent in human nature; everybody covets them, and those who can afford to do so are pretty sure to possess them in some form. From the earliest days, and among all nations, diamonds have occupied the first place among precious stones, and as they are seldom lost, the value of those in existence must be something enormous. When we read of one individual possessing a million dollars' worth or more of these gems, we can readily imagine that there is a fabulous amount of wealth treasured up in diamonds among all the peoples of the earth.

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THE discussion of the silver question still goes on with unceasing vigor. A determined effort will be made to induce Congress to repeal the bill providing for the coinage of \$2,000,000 a month of silver dollars, but an equally determined effort will be made by those mine owners who have silver to sell to retain the law as it is, and so make the government one of the largest purchasers of the products of their mines. The friends of honest money do not yet appreciate the strength of the position occupied by the friends of the silver dollar. They are entrenched behind the law of the land, and flanked on every side by the political influence wielded by the "bonanza kings." Their money and influence secured the passage of the bill, and as they have grown richer and stronger by reason of it, they will not scruple to use money and influence even more freely to maintain the law as it is. The intrinsic dishonesty and the practical uselessness of a silver dollar, that is worth but eighty-five cents or thereabouts, are now very generally appreciated; but is the sentiment of opposition sufficiently well organized to defeat the machinations of those who profit by this dishonesty? Boards of Trade and business exchanges have resolved in favor of the repeal of the silver bill, but unless the sentiments expressed in these resolves take on the form of actual personal protest, they are not likely to exercise any decided influence upon Congress. To be made effective, these sentiments, expressed by resolutions, should be followed up by active committees, made up of prominent business men, directed to present the subject embraced in them before Congress, in such shape that they cannot be ignored. If at the coming session of Congress a general move of this kind could be made by representatives of the best business elements from all parts of the country, there would be some hope that the silver bill would be repealed; but to go on passing resolutions and precipitating them into space, is not a practical way of meeting the intrigues of the rich and wily men whose profit lies in maintaining the law as it is.

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A PRACTICAL result of the injury inflicted upon the industrial elements of the country by the enforced coinage of the depreciated standard silver dollar, may be witnessed at the banks any Saturday. A manufacturer goes with his check to the bank to draw money with which to pay his workmen, and is met by a placard at the paying teller's window: "No small bills." Small bills are a necessity in making out honestly the amounts included in the pay-roll, but if they cannot be obtained the depreciated silver dollars must be used as a substitute. So the manufacturer must draw his money from the

bank in fives and tens, and then "shin" around to split them into fractions so as to satisfy his employees. With the withdrawal of small bills from circulation we are being overwhelmed with a deluge of cumbersome fraudulent silver dollars, which are as inconvenient and embarrassing as they are fraudulent. But so long as the government has millions of them piled up in the Treasury vaults, and is compelled by law to make \$2,000,000 a month in addition, it is necessary to force them into circulation, and as a means to accomplish that end the small bills are withdrawn. The United States government ought not to be made a *particeps criminis* in swindling the people for the pecuniary profit of a clique of silver mine owners.

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AT LAST the City Council of Savannah, Ga., has repealed the tax on commercial travelers, heretofore enforced in that city in defiance of the decision of the Supreme Court of that State declaring it to be unconstitutional. At a meeting of the Council held in the early part of last month, an amendment to the ordinance was adopted which effectually repeals what is objectionably known as the "drummers' tax." That the gentlemen interested may know precisely their status when visiting that city, we give the language of the amendment, which is as follows:—"That any transient person transacting or offering to transact any of the kinds of business mentioned in this ordinance, selling or offering only to resident dealers or manufacturers in the specific article or commodity sold or offered for sale by him or her, and not bringing into or keeping in the city any stock for purposes of dealing, shall not be required to pay any tax or license fee."

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IT is a short-sighted policy in any community that, for a few dollars to be obtained from licenses issued to commercial travelers, imposes restrictions upon mercantile transactions within its corporate limits. Mr. J. Monroe Brown, a commercial traveler, has made an estimate as to what the merchants of Charleston lose because of the license fee charged traveling salesmen. Of the 210,000 commercial travelers of the United States, he says that 20,000 "make" Southern territory, and that at least 15,000 would stop at Charleston twice each year were it not for the tax. The lowest estimate of his expenses for the two days he would have to stay each trip would be \$9. At this rate they would leave \$270,000 in the city during the year. Mr. Brown says that the tax puts the retail dealers to great expense, because they have to go to New York to buy goods instead of having the representatives of mercantile houses call for their orders. The repeal of the tax would save two trips and \$150 to the retail dealer, who now has to buy his goods from out-of-town houses. As an offset to this the city probably collects \$200 or \$300 a year in license fees, extorted from the few travelers whose business compels them to stop there. But the good work of obliterating these obnoxious and discriminating laws is progressing favorably, and it will be but a few years before commercial travelers can visit every city and village in the country without being specially taxed, like a circus or menagerie, or classified with peripatetic auctioneers and local gin mills. Such laws or ordinances are a disgrace to the civilization of the day, and an insult to the business men of the country.

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A PECULIAR question has been raised regarding the method adopted for lighting the building at Nos. 41 and 43 Maiden lane, recently remodelled by Mr. Charles Knapp, for the special occupancy and convenience of persons in the jewelry trade. The building is lighted by what is called "The Improved Open Light Court," a new

device for which a patent has been taken out. It is a most ingenious and unique invention. The space above the two stores on the ground floor is divided by an open light court, which is twenty feet wide on the roof, and does not descend to the lower stories in uniform width, but grows narrower from story to story, until its width on reaching the second story is reduced to eight feet. There are three glass-covered projections on the north side, all arranged with a practical regard to the law of optics, and admitting a flood of bright daylight into every part of the building. The value of this new device consists in securing not only an abundance of light, not attainable by previous methods, but also in saving by the glass projections a considerable amount of valuable space which, prior to this, had been a dead waste. The question is raised whether or not this device is patentable, and whether other architects and builders may not adopt it in defiance of the patent. The law of the United States authorizes the issuing of a patent for "any new and useful art, machine, manufacture or composition of matter, or any new and useful improvement on any art, machine, manufacture or composition of matter." The fact that others wish to appropriate the idea of the "Open Light Court" is an admission that it is an improvement on any means heretofore adopted for lighting the lower stories of buildings from the roof, and consequently entitled to the protection afforded by a patent. But the honorable way to treat this or any other patent is to give the inventor the benefit of any doubt that may arise as to its validity, and if he has brought forward a good thing give him credit for it by cheerfully according him all the honors and the profit that may attach to it.

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THERE seems to be a limit in improvements to the telescope beyond which art and science combined cannot go. Up to 1882 America rejoiced in the most powerful telescope in the world, its disc being twenty-six inches in diameter. In that year, however, Austria succeeded in obtaining one with a twenty-seven inch refractor. Thereupon America ordered one made with a thirty-six inch disc, but up to the present time the attempts to make it have been unsuccessful. The manufacturers to whom the order was confided are still struggling with the problem, and their persistence gives hope of ultimate success. Recently the English admiralty, possibly jealous of Austria in the matter of telescopic capacity, ordered a new instrument for the Royal Observatory with a twenty-eight inch refractor. Thus the nations go each other one inch better every time, and the makers encourage the friendly strife. When America, however, succeeds in obtaining her thirty six inch disc the discovery of new constellations in the heavens will probably be a matter of daily occurrence.

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THE business men in New Jersey, which class constitutes the borrowers of money, will ask the Legislature this winter to reduce the legal rate of interest from six to five per cent. Such a bill was introduced last winter, but was defeated. The borrowers claim that when State bonds and municipal and corporate securities command but four or five per cent. interest, it is a hardship upon them that they must pay capitalists six per cent. for the use of money. Louisiana is the only State that has fixed the legal rate of interest at less than six per cent., and while five per cent. is prescribed as the legal rate, eight per cent. is lawful where the rate is specified in the contract. Twenty-four out of the forty-seven States and Territories have fixed upon six per cent. as the legal rate, and in the others the rate ranges from five per cent. in Louisiana to twelve per cent. in Wyoming. In nearly all the Pacific coast States the legal rate is ten per cent., while in eleven of the States and Territories there is no limit to the rate that may be exacted under special contracts. In all

but thirteen a penalty attaches to usury. In New York State usury forfeits absolutely any contract tainted with it, and the offender incurs a penalty of \$1,000 fine and six months' imprisonment. In New Jersey the penalty is a forfeiture of the interest only and the costs. With but one State doing business on a nominal basis of five per cent., but an actual basis of eight, the precedents are not favorable to those citizens of New Jersey who are desirous of reducing the legal rate. Any discussion of the interest question invariably brings up the query, "Why should not the loaning of money be controlled by market rates, and not require the protection of legal enactments?" This is a problem that has puzzled political economists since the first days of Christianity, and no solution satisfactory alike to the debtor and creditor classes has ever been reached. Persons are apt to respond to such financial conundrums from the standpoint of their individual interests. That's human nature.

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AT THIS time of the year, as in years past at this season, all sorts of catch-penny advertising schemes are brought to the attention of the trade, and the members thereof are importuned with the greatest pertinacity to patronize them. We have warned the trade against them in years past, and we renew that warning now, in view of the fact that we have received information that various canvassers for advertising are going through the trade, and, wholly ignorant of its methods, requirements and customs, are making many and various misrepresentations. Every business man must, to be successful, advertise to a certain extent. It seems to us that such person has but to ask himself two or three questions regarding each scheme presented to him, to enable him to make up his mind regarding its advantages. First—Will this medium reach the persons from whom I expect patronage? Second—What guarantee have I that the representations made by its representative are to be trusted? Third—Is the standing and character of the publication such as to entitle it to my confidence, or the confidence of others in the trade? When all sorts of devices for entrapping advertisers are resorted to, and business men are besieged by solicitors, glib-tongued and persistent, they should adopt some rule for their guidance. Unless they use discrimination and good sense they can readily squander a large amount of money in advertising from which they will reap no benefit whatever. Manufacturers and jobbers in the jewelry trade cannot improve their business by promiscuous advertising; they deal with the jobbing or retail trade, and whatever reaches the largest number of jobbers and retail dealers, is the best medium for circulating their advertisements. To advertise promiscuously in all sorts of papers, magazines, fancy calendars, directories and cheap periodicals, will work more evil than good, for the retail dealers accept it as an indication that the advertiser is seeking business through channels outside of the regular trade, and are forthwith prejudiced against him. There are journals within the trade that cover the entire field that legitimate manufacturers and jobbers seek to cultivate; they go direct to the jobbing trade and to the retail dealers. The advertiser having dismissed the idea of promiscuous advertising, and resolved to limit his patronage to the trade journals, has solved half the problem, and there is nothing left for him to do but to compare the merits of the various trade journals, and give out his advertisements as his judgment shall dictate. But we warn the trade against being deluded by fraudulent advertising schemes that are so abundant at the holiday season. We could give the names of many firms in the trade that have been deceived and swindled by them in years past, but such firms would not appreciate such gratuitous advertising. The questions each advertiser must decide for himself are—"Does this medium of announcement cover the field I am working, and is it trustworthy?" Careful consideration of these points, and action consistent with the decision reached,

will save advertisers many dollars that are now absolutely wasted on visionary schemes, manipulated by speculative adventurers.

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SOME most excellent business practices crop up over in Canada occasionally that might well be imitated by business men this side of the line. For instance, in one line of trade in Toronto the dealers have an organization that holds monthly meetings for the discussion of matters of interest to the members. The active principle of this organization lies in one of the regulations, which provides that "no member shall fill orders upon credit for any one who, upon reliable information, he knows to be indebted to any other member, such indebtedness being past due, demanded, and unpaid." At the monthly meetings full reports are submitted regarding "lame ducks," and such as are decided to be incurable are placed on a black list, and thereafter can obtain no credit from any member of the association. How would such a plan work in the jewelry trade in this city? Under existing methods a partial record is kept of the standing of dealers throughout the country, the Board of Trade sending out notice whenever one permits his paper to go to protest, or is guilty of any other unbusinesslike practices, but those receiving such notices are under no obligation to refuse credit to the derelict dealer. Under present conditions a dealer may shirk his indebtedness to Jones, yet go across the street to Thompson and get all the goods he wants on credit. He then feels in no particular hurry as to settling his past-due transactions with Jones, but will continue to buy of Thompson till he exhausts *his* patience, and then he will transfer his valuable patronage to some one else, till he has gone the rounds of the trade. Anything that constitutes an act of insolvency on the part of any dealer should not only be published to the trade, but should debar the delinquent from obtaining goods under any conditions until he has reinstated himself in a solvent position, thus showing by his acts that he means to do an honest business.

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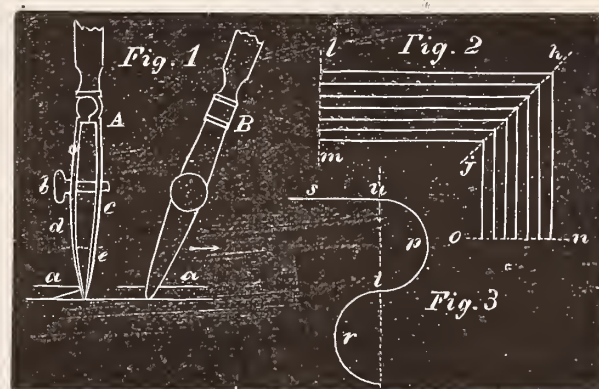
IT is an admitted fact, that the selling of goods is a more difficult operation than to make them. Manufacturers can pile up goods without limit, but he is an enterprising man who can sell them when there is no demand for them. But the manufacture and sale is not all there is to disposing of goods satisfactorily; the matter of collection sometimes involves an expense equal to either of the other operations. We are told of a jobber who sold goods to a dealer in a Southern city quite liberally; had, in fact, carried him for two or three years, till his account amounted to \$2,100. Then the debtor transferred his patronage to another jobber, and "hung up" his old friend for all he owed him. Jobber No. 1 used every means in his power, in vain, to get a settlement, and finally sent the claim to a lawyer residing in the same city as his debtor, with instructions to collect. After the lapse of a few months the lawyer reported that he had made the collection, and closed the account by remitting \$500 and retaining \$1,200 as compensation for his services! Just how much profit the jobber made out of that customer we are not informed, but have no doubt he would gladly have swapped profits with the lawyer. Possibly the lawyer and the debtor "put up a job" on the creditor, paid \$900 of the debt, and divided the rest between them. While this is an extreme case, the matter of collecting bills due is not always the easiest branch of the mercantile business.

### Free-Hand and Mechanical Drawing.

BY EXPERT.

THE FIRST and simplest efforts to make in mechanical drawing is to produce a straight line. This is done with the so-called drawing or ruling pen already described and a ruler. The method

of rubbing up and preparing the India ink has also been described. Even the use of a drawing pen requires a certain skill, especially in the use of India ink as thick as is now used so much for photographic reproduction. The great secret in using ink ground thick enough to produce perfectly black lines lies in having the skill to work *rapidly*. Ink which would dry and clot in the pen of a novice would, in the hands of an experienced person, work perfectly. To resume the instruction for the proper use of a drawing pen. Grind your India ink as directed, and with a quill tooth pick take up enough ink to fill the pen up to the dotted line at *c*, fig. 1. Even the filling of a drawing pen is a matter of cavil among experienced draughtsmen, but the use of a quill tooth pick will answer every purpose; the point with which you take up the ink should be cut somewhat in the form of a pen, but it need not be split at the point to form nibs. If there is any tendency to clot and dry in the pen, the point of the quill can be passed between the blades of the drawing pen to remove it; but the quill should be wiped on a bit of cloth to remove the bits of dry ink before it is used to fill the drawing pen again. One of those ink cells of Keuffel & Esser will permit the quill to lie inside, and consequently not dry up. In fig. 1, at *B*, is shown the position of the pen in using it, *a* representing the ruler—the pen is moved in the direction of the arrow. Great care should be exercised to not press the pen too hard against the edge of the ruler, as it has a tendency to close the blades and diminish the line—*only let the pen touch the ruler enough to guide it*. In regard to the matter of paper I have said nothing, for the simple reason it is of the least importance. A fair weight of paper with a tolerably smooth surface is all that is required at first, and we will be led to speak of such paper as the work in hand requires, as these articles progress. For a drawing board, one 15 by 20 inches is ample for the beginner. A simple piece of smooth inch pine board of the size named is all that is required. It is well to give the board several coats of shellac dissolved in alcohol; the shellac solution should be quite thin so it will



penetrate the wood well. The shellac coats should be sand papered off until the surface is smooth and flat. In attaching the paper to the board a little gum or glue applied at the corners is better than the so-called drawing tacks. The only objection to the use of gum or glue is, it necessitates the mutilation of the corners of the paper in removing it from the board; but if you use paper a trifle larger than you intend your drawing to be, you can easily cut a clean sharp margin; this is especially true in patent office drawings. It is not necessary in practicing to become skillful in use of the drawing pen to draw any specific thing, but, on the other hand, it is better to practice drawing such lines as require skill to produce. At fig. 2 is given a sample of line practice; they are simply straight lines meeting at an angle; to make them, space off with your dividers spaces on the pencil line *h i*, to guide the parallel lines ruled in both horizontal and perpendicular directions. The skill lies in making the lines perfectly parallel, and in having the angles on the line *h i* clean and sharp. This mere drudgery of making lines some may say is nonsense, let me draw something. This is all true enough; but first learn how to express yourself—learn the use and management of the material you are using. In using a drawing pen learn to use it rapidly and with certainty, commencing at a certain point with a definite

positive touch and leaving the paper with precision. As, for instance, in the examples at fig. 2 the lines shown as dotted are intended to represent pencil lines, and for such a purpose a very hard pencil should be used and it should not be pressed too hard on the paper; the idea is to make with the pencil a fine distinct line which can be easily erased, and even if it is not entirely erased, the strong contrast of the full India ink lines will render the pencil line so faint as not to be noticed except by the closest scrutiny. In drawing and practicing the example in fig. 2, commence on the line *l m*, and be sure you commence exactly on the line, and leave off precisely on the line *h j*, so that when the parallel lines are all complete the ends will present an even front and not appear broken, *i. e.*, the lines come precisely to the pencil lines, not some extending over and some falling short. After the lines extending from the pencil lines *l m* to *j h* are complete, then rule those extending from *j h* to *o n* are made. The ruling or drawing pen which goes into one of the divider legs and used for drawing circles should also be practiced with in the same manner, learning to break and connect the lines in a clear, sharp manner. At fig. 3 is given an example; the dotted line is again supposed to represent a pencil line. The curves *p* and *r* are swept with the dividers set the same for both curves, and the point in the lesson is to make the joinings at *t u* clean and perfect, so it would be impossible for the eye to detect where the joinings were except by the change in direction; in one case from a curve in one direction to a curve in another, and in the other from a curve to a straight line. In using your dividers learn to use them lightly, only puncturing the paper in the slightest possible manner. This is one advantage for the pupil in using light weight paper, he soon learns the thin light paper will not afford sufficient hold for his compass points so he can grind around with his drawing point as he pleases. If the pen point is in good order and it merely touches the paper, it will do its work perfectly and with greater precision than if applied more forcibly. We would impress it strongly on the pupil the necessity of such preliminary practice; it may seem dull and dry, but it is of the greatest possible importance, this preliminary practice, to acquire the technical skill. The pupil need not confine himself to the mere examples given, let him devise such examples as will embrace the critical points to be overcome, such as parallel lines, using care about their parallelism and in having their commencing and ending precise. In practicing with circles, parallel circles gradually diminishing in size are excellent, as they learn the pupil lightness of hand and to guard against wearing the delicate hole where his divider point rests at the center. This communication has been entirely devoted to mechanical drawing, but it is the writer's intention to mix the lessons along in such a manner as to keep pupil equally advanced in both free hand and mechanical drawing. One of the most discouraging things to the pupil of free hand drawing is to get the form and proportions of such objects as he wishes to delineate. We will give in our next a simple mechanical device by which the pupil can acquire not only the outline, but work in his shadows. The writer would not insist that this is the best way ultimately for an artist, but he would say it is a great help to the pupil.

### The Tradesmen of the Past Century.

BEFORE US lies an interesting and rare old volume issued at Dresden in the year 1792, whose author's name is v. Römer. Until we took it up we had always entertained the idea that the decay of the trades in general was only a thing of the present epoch, but we very soon found out that complaints about hard times were, if anything, greater in the past century, and it has always been the same, no matter whether the tradesmen were gathered into guilds or enjoyed a perfect liberty to pursue any vocation they chose, the poor tradesman always had his ups and downs, and it is an erroneous idea to imagine that a trade could flourish only under a rigorous rule or

guild. It is true that such an organization has its good sides, but it has also many that are decidedly objectionable and is nothing but a matter of form, which exerts no actual influence on the welfare of the workman, who is entirely dependent upon the demands of the market for the goods he manufactures. The many strict requirements of the guilds were still in full force during the last century when this book was issued, but we do not see that the situation of the workman was any more favorable—in fact, times were worse than they are at present. We said that the volume was very interesting, because furnishing us with precise data on the situation of the tradesman. The author is a friend of liberty of trades, and he answers the question frequently asked at that time, "Why so many German cities are doomed to decay," about as follows:

"The chief reason is due to the absence of a sufficient number of civil branches of industry. There is no lack of hands who can and will work, but work, for which a suitable remuneration is paid, is frequently wanting. The day's laborer, the tradesman, the artist, it is true, will always find *something* to do, to earn, but this *something* is not enough to pay for their actual wants. (And how is it to-day? TRANSLATOR). If they are anxious to work they are required to do it for a mere pittance, so that they barely can pay for the dry bread which they and their families consume."

"The true decay," v. Römer says in another place, "of the industrial branches is principally due to the low rate of wages paid for labor. And this circumstance is hardest to that class of tradesmen who have to purchase the materials for their works in small lots—in keeping with the small sums of money they can scrape together. The tradesman of more means buys his raw materials at a proper time with cash, and in larger lots, and is therefore enabled to buy cheaper. He is supported by the quantity of work which he can manufacture, with the assistance of his journeymen and apprentices, even if the profit per piece is very small. If, now, the less favorably situated seeks work, he must be satisfied with the same rate of payment, or, what is oftener the case, he must work as journeyman with the better favored master. To this is to be added another circumstance, that there are many trades subject to the wild fluctuations of fashion. The whim of fashion can, in a short time, ruin any number of diligent tradesmen."

"Tradesmen contend with another great evil; it will often be found that in a town, for instance, only one-half as many tailors are found as there are required for the wants of the place, but twice as many shoemakers, and it is utterly impossible that all of them can find work."

Another well-founded reason he urges to be the disturbances in the circulation of money. He says: "The greater the wealth of few individuals, and the smaller the number of the middle class in a city or town, the greater will be the disturbance in the circulation of the ready money." Is not this the case at present? Cash is by no means wanting, but its division is very unequal; wherever it is found it lies in large heaps. The present tradesman and artist has generally barely sufficient to purchase his materials, etc.; he is forced to do so on credit, which is to be purchased only with a part of his income. In this manner one poor man prevents the other, while both might mutually assist each other. The rich man depends upon his cash, by the power of which he is able to make favorable bargains and contracts, which leave to the poor workman barely sufficient to purchase his daily bread.

Then, as now, the workman constantly complained of the increasing botch work, insufficient instruction of the apprentices and journeymen, etc., and in order to complete the picture, the author scolds the workman of his time for their inclination to pleasure; for instance: "The workman's principal study every week is how to gratify his pleasures; it is his imagined necessity to be found every day behind the beer mug; both the business and its cares are forgotten thereby. Those hours which he spends playing cards could far better be devoted to superintending his journeymen and apprentices in the shop. One evil brings about the other. The eternal

striving toward a higher grade, so injurious to his calling, has seized on all classes of society. Everyone desires to be higher in rank and apes the manner of the higher grades; the small boy commences at an early day to become a dude, in place of learning the manipulations of the trade which is to support him," etc.

These scoldings, apart from the points not quite true, contain others that are very applicable, and may still be heeded by the tradesmen of to-day.

### Nickel Plating on Zinc.

[By Prof. H. MEIDINGER, in *Badische Gewerbe Zeitung*.]

SUCCESSFUL electro plating in general depends upon three conditions: on the qualities and properties of the metallic solution (the bath), on the strength of the current and its relation to the surface of the pole which determines the thickness of metal deposited in a unit of time (rapidity of precipitation), and on the nature of the surface of the pole on which the metal is to be deposited. If the pole is metal and is to be inseparably united with the deposit, as is the case with silver plating, the surface must be perfectly clean and free from oxide or grease. If the surface is dirty the precipitate peels off. It will not adhere at all to non-metallic substances, but merely incloses it.

It is a fact worthy of attention that under otherwise similar conditions many metals do not take certain deposits well. In some cases the deposit is streaked, powdered or of bad color, and in others it peels off afterward when polished. Iron in its different forms (steel, wrought iron or cast iron), zinc, lead and tin, cannot be readily silvered or gilt in the cyanide bath, although it works first rate on copper and its alloys, and is generally used for that purpose. But of the copper alloys German silver causes more difficulty than brass. Copper, brass and iron are easily plated in the nickel bath; zinc, on the contrary, is not. In some of these cases the metal to be plated acts directly on the solution itself, as, for example, zinc acts on silver and nickel solutions, and this circumstance may affect the properties of the whole deposit; this does not happen with iron.

If a metal cannot be nicely plated in a bath, it is customary to cover it first with some other metal of better quality in this respect. Thus iron, tin and zinc are easy to silver and gold plate after they have been copper plated, and zinc can also be nickel plated under these conditions.

To unite the deposit as firmly as possible with the object, it has been found in many cases advantageous to slightly amalgamate the surface of the metal to be plated, especially in giving a thick coating of silver to instruments. The method is extremely simple, for it is only necessary to dip the articles for a short time into a mercurial solution and then rinse them with water.

The quantity of mercury used is insignificant; in fact, a heavy amalgamation must be avoided as it would make the metal brittle. A mercurial solution serviceable for this purpose is made with the commercial mercuric nitrate or chloride (corrosive sublimate). The solution must be very dilute, about one, five, or, at most, ten parts of the dry salt in a thousand parts of water; to this solution some sulphuric or chlorhydric acid is to be added until the liquid is perfectly clear. The stronger solution gives up more mercury in a given time than a weaker one, and this must be taken into account in amalgamating. With practice it is easy to tell from the change of color when enough mercury has been deposited. Iron does not alloy, or only very badly, with mercury, and hence it cannot be subjected to the process just described.

Within the last decade nickel plating has reached an extraordinary development. At first it was limited to iron, then it was gradually extended to brass and German silver, and now is increasing in favor for coating zinc. As this metal takes the nickel from ordinary baths very badly, it has been proposed to copper plate it in the cyanide

bath. But this is a nuisance. The use of the poisonous cyanide bath should be avoided as far as possible, and limited to cases where it cannot be dispensed with; in nickel plating cyanides are not absolutely necessary, even if an intermediate layer of copper is desirable in thick nickel plating. The cyanide of copper (and likewise brass) bath has a disagreeable property of only working when certain conditions are exactly observed; it also decomposes easily. As the nickel wears off by use the red shines through, which is worse than if the white zinc itself were laid bare. Experience also showed that coppered zinc, when it came into the nickel bath, at once turned black and could not be plated.

There is not yet any literature on amalgamating zinc for the purpose of nickeling it. On many sides objections are heard against the deficiencies of the customary process of nickel plating, and it seemed to me worth while to make some experiments in this direction. The experiments were satisfactory. I amalgamated a sheet of zinc, and then had it nickel plated by an operator. The nickel adhered well, united perfectly, and took a fine polish. I think it is not improbable that the nickeled sheet zinc of commerce is prepared in a similar manner. This supposition receives support from one of the properties of this zinc, to which my attention was called by some one who has used a good deal of it in his factory.

It is rather brittle in comparison with pure sheet zinc. I cannot explain this brittleness in any other manner than due to amalgamation. The alloys of mercury with solid metals, called amalgams, exhibit this property, that the mercury dissolves off small quantities of the metals to form a thicker liquid; with a larger excess of the solid metals the alloys are solid, but fragile and brittle. This character remains, but grows gradually less. When a sheet of metal is amalgamated, it depends on the quantity of the mercury combined with it and the depth to which it penetrates, whether it will cause a perceptible change in the strength of the metal.

Copper must remain in contact with mercury for a long time until it has penetrated a considerable depth; with zinc this takes place very rapidly. A sheet of zinc one millimeter in thickness, thoroughly cleansed in acids, only needs to have metallic mercury poured over it so that it forms a bright mirror to make it so brittle that it will not stand bending. Zinc carries this peculiarity into its alloy with copper, so that brass and German silver are much more sensitive to mercury than copper. If zinc is immersed in a mercurial solution it will depend upon the time it stays in whether the mercury will be merely deposited upon the surface or will penetrate more deeply into the zinc. A concentrated mercurial solution will make a sheet of zinc one millimeter thick brittle in a few minutes.

The quantity of metal necessary for nickel plating will have an imperceptible influence on its strength if the zinc is thick; but if it is thin, it may show a perceptible difference which makes it difficult to work the zinc. Special care must be taken to prevent too much mercury being deposited on the zinc by leaving it in the solution too long. The exact quantity can only be determined by experiments that are simple and easily carried out.

When one metal is deposited on another by the galvanic current, we cannot speak of them as alloys if they are inseparable, for they are only held together by adhesion. Hence there can be no change in the characters of the two metals; neither a harder nor a more brittle product results from electro plating. If the latter is observed, even in a slight degree, it is easy to conclude that there is mercury in it.

Pure zinc has a different action on nickel solutions from amalgamated zinc. The former soon turns yellow and brown, and the deposit can be rubbed off with a piece of paper. If a feeble current is employed this chemical action preponderates, and hence we obtain a poor deposit. If the current is very strong, the zinc will be more rapidly coated with nickel by electric action than it would by the chemical action of zinc on the solution, and a good deposit can be obtained. It is only by observing these precautions that it is possible to nickel plate zinc directly, and yet this is frequently incon-

venient. If amalgamated zinc is dipped into a nickel solution, after a long time a feeble action will begin. The mercury, although there is so little of it, protects the zinc against the action of the liquid, like zinc in its alloy with copper, brass, etc., is protected against the attacks of different liquids, copper sulphate, sulphuric acid, etc. Yet in all these cases the protection is incomplete; after a while a slight action is observed. In nickel plating zinc, slight amalgamation will suffice to secure a good deposit with a feeble current.

It has been observed that some kinds of German silver take nickel badly; previous amalgamation may, perhaps, be an advantage here too.

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### Swiss Watchmaking.

IT IS, AS nearly as possible, three hundred years since the greatest of Swiss manufacturing industries began. Like the Swiss Reformation it took its rise in Geneva, where the trade of the watchmaker was established in 1587, and spread thence to the neighboring cantons of Neuchatel, Berne and Vaud. It is stated, however, that the first watch actually made in Neuchatel was an imitation of an English one, which had somehow found its way into the country, and the constructor was an ingenious blacksmith. In Geneva itself the new industry spread with such rapidity that within a century of its introduction as many as one hundred master watchmakers had been established in the city, and 5,000 watches were annually turned out as the result of their united efforts. It was only about forty years ago that machinery began to be employed in Swiss watchmaking, although it had been introduced in America fifteen years earlier. It is not easy to ascertain to what extent it is in use at the present day. The Swiss like to have it understood that they prefer the handiwork of the craftsman, as of superior excellence. It is, no doubt, used to a considerable extent notwithstanding.

An interesting report was last year published by the English Foreign Office, and prepared by the Secretary of the English Legation at Berne, in which an attempt is made to give an account of the present state of the watchmaking industry in Switzerland. The materials do not exist, however, for a complete and perfectly accurate statement, either as to the number of watches produced, their value, or the number of persons employed in the manufacture. This is no doubt a misfortune for the manufacturers and their work people themselves, and has possibly something to do with the frequent crisis in the trade. There is, in fact, no means of ascertaining the actual state of the market and of regulating production accordingly. The figures given may probably, however, be taken as approximately correct. According to Professor Thury who wrote, five years ago, a pamphlet with the title of "Historical Notes on Swiss Watchmaking," the number of hands employed in the manufacture in 1866 (why no later date is given is not explained) was in Neuchatel 13,706, turning out yearly about 1,000,000 watches of the value of 50,000,000 francs; in the Jura Vaudois 2,700, and in the rest of the canton 5,000. In Berne there were about 1,300 workmen producing watches valued at about 30,000,000 francs yearly. The manufacture is not carried on in other parts of the country to any large extent.

The Swiss watchmakers appear to hold their own very creditably in Europe. At the Vienna Exhibition of 1873, there were 76 Swiss exhibitors to 22 French, 7 English and no Americans. Germany and Austria sent no watches but only clocks. From other countries there were only a few occasional horological eccentricities, such as one from Turkey, which consisted of a cabinet showing a carved clock with the inscription: "This clock, once set in motion, will go for ten years." Lastly, at the Paris Exhibition of 1878, the Swiss watchmakers again did well. The principal competitors against them were the makers in the Department of the Doubs, which sent 184 exhibitors against 163 Swiss; all the rest of France contributed but 169. The manufacture in the Doubs, however, is of Swiss origin, having been established by political refugees from Neuchatel in 1848.

The estimated number of watches produced annually ten years ago in the whole of Switzerland was 1,600,000, the value being 88,000,000 francs, and the number of workmen employed in the production, 37,969. About one-third of the workers are women. According to Dr. Adolph Hirsch, the able director of the Neuchatel Observatory, who is responsible for these figures, about ten per cent. should be added to bring them up to the present day. As already stated, however, the returns lay no claim to more than approximate accuracy. This gentleman thinks that Switzerland may fairly claim the first rank among the watch producing countries, and may be regarded as at least the equal of England in respect of chronometers.

The importance of the industry is recognized by the governments of the cantons in which it is established, by the institution of horological schools for the instruction of young watchmakers. The first of these was founded sixty years ago at Geneva. In 1843 it was constituted a municipal institution. It is directed by a committee of watchmakers, and includes both theoretical and practical classes. The theoretical course lasts four years. The fees for Swiss students is five francs a month. There are other similar schools at Chaux-de-Fonds, Locle, Neuchatel and Fleurier, as well as two in the canton of Berne, at St. Imier and Bienne. Besides these schools, there are different societies whose special object it is to promote the efficiency of the watch manufacture, and the Society of Arts at Geneva has its section d'horlogerie, which publishes an excellent monthly journal, long ago known to our readers by the copious extracts made from it from time to time, *Le Journal Suisse d'Horlogerie*, which is now in its eleventh year under the editorship of H. Georg, Geneva. This society last year issued the prospectus of a competition for chronometers as regards their regulation for varying temperatures. The observation is quoted of the English manufacturer, Mr. Dent, that a chronometer can be regulated for *two* temperatures, but that *between* these two temperatures it will gain, while, above or below them, it will lose. The object of the competition was to find some means of correcting this irregularity, but only Swiss instruments were permitted to compete. It is, however, to the public observatories of Switzerland, particularly those of Geneva and Neuchatel, that the Swiss watchmaker is mainly indebted for the precision which he has been enabled to reach. The Geneva Observatory was built in 1773, and restored in 1829, and since the latter date special arrangements have been made for testing and regulating the chronometers brought there for inspection. This observatory communicates by electricity the exact time to all the watch factories in the city. The observatory at Neuchatel, which was founded in 1858, lends assistance of a similar kind to the watchmakers of the town and district. A yearly competition of chronometers is held in each of these observatories, when prizes are given either by the Society of Arts or by the government.

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### Precious Stones.

BY GEORGE F. KUNZ.

*Continued from page 306.*

BEAUTIFUL transparent beryls have been found at Streaked mountain, Norway, Lovell, Bethel and Franklin plantation, Maine, and very good ones also at Mount Mica and Grafton, Maine. The best locality, however, is the one at Stoneham, mentioned in the last report.\* Here some perfect gems over 1 inch long were cut from the material, and the work during the last year has yielded aquamarines of a good blue color, the aggregate values of which amount to over \$700.

At Albany, Maine, Mr. N. H. Perry has recently found beautiful transparent golden yellow beryls that would cut into perfect gems of over 2 karats each. One fine-cut light sea-green aquamarine beryl

\* "Proceedings American Association for the Advancement of Science," 1883

from Sumner, Maine, in Mrs. Merchant's cabinet, weighs about 7 karats.

One remarkably fine deep blue gem from Royalston, Massachusetts, weighing over 10 karats, is in the United States National Museum, and in the same collection is one weighing 14 karats from Portland, Connecticut, equal to almost any from Brazil for depth of blue color. Both of these localities have at times afforded fine clear material. Some very clear white stones are obtained at Pearl hill in Fitchburg, Massachusetts, and are sold by the local jewelers. Dr. A. C. Hamlin owns a very fine golden yellow beryl of 4 karats from this locality.

Fine crystals of beryl of almost emerald green color, also beautiful yellowish green and bluish beryls, are found in Deshong's quarry, near Leiper ville, Pennsylvania; the crystals are at times 12 inches long, of a yellowish green color. At Shaw & Ezra's quarry, near Chester, at Upper Providence, and in Middletown, Concord and Marple townships, fine specimens have been found. Fine beryls also have been observed at White Horse, 3 or 4 miles below Darby, Pennsylvania. Bluish green and blue beryls occur in the vicinity of Unionville, Newlin township, and on Brandywine battlefield, in Birmingham township. One crystal, of a dark tourmaline green tint, over one-half inch long, in the cabinet of Mr. Michael Brodley, of Chester, Pennsylvania, is from Middletown, Delaware county, and would afford a fine gem. Some of the gems from here, especially those from the John Smith farm, have much the appearance of bluish emeralds. The finest American golden yellow beryls are found at the Avondale quarries, Delaware county, Pennsylvania. A 20 karat gem is in the cabinet of Mrs. M. J. Chase, and material for another is in the cabinet of Mr. Clarence S. Bement. Mr. B. B. Chamberlain has lately found six fine yellow beryls, 1 to 2 karats each, in Manhattanville, New York City.

The variety of beryl found at Goshen, Massachusetts, and called goshenite, occurs in pieces transparent enough to afford gems.

*Phenakite*.—About fifty crystals of phenakite have been found during the last year, of which fully one-quarter would afford gems, some over 6 karats in weight and absolutely pellucid; the largest crystal found was 3 inches across; the finer ones are equal in quality to the Siberian. They have been observed at the locality near Pike's peak,† and also near Crystal peak small ones on amazonstone. At the topaz locality at Florissant, El Paso county, Colorado, phenakite‡ occurs in small but very interesting crystals implanted on microcline amazonstone. They are rarely over 5 millimeters in size, and are very transparent and colorless and would afford minute gems.

*Euclase*.—Only one mention is made of euclase in the United States.§ In this case several crystals were reported as found at the residence of Mr. Morrill, Mill's Spring, Polk county, North Carolina, by Gen. T. L. Clingman, in washing the gold sand at this locality, and Dr. F. A. Genth says this mineral was *not* euclase.

*Zircon*.—At a locality near the Pike's Peak toll road, due west from the Cheyenne mountains,|| zircon is found in a soft yellow mineral in a quartz rock. The crystals found here are the most beautiful ever found of this mineral, nearly always brilliant and often transparent; in color generally a rich reddish brown, although at times pink and honey yellow; some few emerald green crystals also having been found. They are rarely over one-eighth inch in diameter, as a rule not over one-tenth, and yet some of them would furnish very interesting small gems. Opaque zircon is found at several localities in the Pike's Peak district, in one case associated with amazonstone and in another with astrophyllite, also with a flesh colored microcline in the same region and in a quartz rock. No gems have been found in these localities. Zircon is abundant in the gold sands¶ of Polk, Burke, McDowell, Rutherford, Caldwell, Mecklen-

burg, Nash, Warren and other counties in North Carolina, in nearly all the colors peculiar to Ceylon; yellowish brown, brownish white, amethystine, pink and blue. They have many planes, but are too minute to furnish gems of any value. Gen. T. L. Clingman, in 1869, obtained within a few weeks 1,000 pounds of the well known brownish crystals from Buncombe County, North Carolina. They occur in equal abundance at Anderson, South Carolina. The latter are readily distinguished from the North Carolina crystals, being much larger, often 1 inch across, and the prism is nearly always very small, the crystal being made up often of the two pyramids only.

Fine crystals of this mineral have also been found in Lower Saucon township, Northampton county, Pennsylvania, and three-fourths of a mile north of Bethlehem. The gravels of the Delaware and Schuylkill rivers contain considerable quantities of very minute nearly colorless crystals of zircon. Some fine ones over 1 inch in length have been found at Litchfield, Maine, and all through the cancrinite and sodalite rocks near them. In the Canfield cabinet are some of the finest known black zircons, perfect crystals over 1 inch long, which were found near Franklin, New Jersey.

*Andalusite*. The andalusites of Upper Providence, Delaware county, Pennsylvania, described by Prof. E. S. Dana,\* are worthy of mention from the fact of their remarkable size, one of the crystals weighing 7 pounds, although not fit for gem purposes.

Andalusites of a fair pink color not entirely perfect, but still of a quality to produce mineralogical gems, were found to some extent at Westford, Massachusetts,† some of the crystals being 2 inches long and one-fourth inch across.

No new crystals have been found at the Gorham, Maine, locality,‡ of which a brief mention was made in the last report.

Andalusite has been found on the slope of Mount Wiley, Standish, Maine, by Mr. Lucien Holmes, of Standish; the crystals are fully one-quarter to three-eighths of an inch in diameter and of a good flesh-pink color; they would cut into very fair mineralogical gems. While collecting on the Dresser farm, back of the Lucien Holmes farm, I found some crystals similar to the above, equally as transparent, associated with crystals of pyrrhotite in a quartz ledge. The locality associations being identical at the three places, although 6 miles apart, would lead to the inference that this mineral must occur in some abundance in this vicinity, and that these are only outcrops of the same rock, which may yield some fine gems if the proper amount of work be expended there.

Prof. W. P. Blake§ first observed that in Mariposa county, California, in the drift of the Chowchilla river, near the old road to Fort Miller, chiastolites are found in great abundance in fine crystals, showing the dark crosses on a white ground in a remarkably perfect and interesting manner. They are also found in the stratum of conglomerate which caps the hills above the streams, and these were doubtless all originally in place in the slates a little higher up the river. Smaller and less perfect "macles" are found in the slates at Hornitos on the road to Bear Valley. The Mariposa, California, crystals, are rather the finer.

The interesting and well known illustrations in Dana's "System of Mineralogy," page 372, well indicate the endless variety of markings that may exist in this mineral and the beautiful ornamental effects that could be produced, serving also purposes of personal adornment.

Lancaster and Westford, Massachusetts, have produced many of the finest "macles" ever found.

*Schorlomite*.—The schorlomite of Magnet Cove, Arkansas, as a rule is penetrated by white crystals of apatite, but at times is very free from all foreign matters and very compact, breaking with a very bright conchoidal fracture. Its superior hardness impressed me enough to try and see the effect in gem form. It proved on cutting to yield a dead black stone of not quite as metallic a luster as rutile, but rather

† W. Cross, in *American Journal of Science*, October, 1882.

‡ Identified by Mr. W. Cross in December, 1884.

§ "Minerals and Mineral Localities of North Carolina," 1881.

¶ *American Journal of Science*, October, 1882.

|| "Minerals and Mineral Localities of North Carolina," 1881, page 44.

\* *American Journal of Science*, III., Vol. IV., December, 1872.

† School of Mines cabinet, New York.

‡ "Proceedings American Association for the Advancement of Science," 1883.

§ W. P. Blake: "Mineral Localities of California," 1866.

a modification between it and black onyx. As it occurs in sufficient quantity we have here material that will form a new and fine mourning gem; stones can be cut of any size to perhaps over 20 karats, as the mineral occurs to fully this size. The first stone cut was over 6 karats in weight. It is the only gem of metallic luster over 7 in hardness.

*Staurolite*.—The staurolite of Fannin county, Georgia, 12 miles southeast of Ducktown, Tennessee, first described by Prof. E. S. Dana, has furnished some of the finest known twinnings of this material. From their beauty these have found a sale abroad as ornaments and charms, and are more highly regarded than those found at Bretagne, France, which the superstitious believe were dropped from Heaven, according to the legend. They occur twinned in single and double crosses, and large quantities were found in decomposed rock, of which perhaps one-tenth were perfect crystals. They usually require a certain amount of scraping and cleaning when found.

Some fine brilliant crystals are found at Windham, Maine, some of the twins forming fine crosses. Occasionally crystals are found here that would afford small mineralogical gems if cut. Their use for natural ornaments is exceedingly limited abroad, and here they are used scarcely at all.

Staurolite is found also at Franconia and Lisbon, New Hampshire, in mica-slate; on the shores of Mill pond, loose in the soil; at Grant-ham; at Cabot, in Vermont; at Chesterfield, Massachusetts; at Bolton, Litchfield, Stafford, Tolland and Vernon, Connecticut; on the Wissahickon, 8 miles from Philadelphia, in abundant reddish brown crystals; and at Canton, Georgia, at the lead mine.

It is also found at the Parker mine, Cherokee county, North Carolina, in fine twins; also on Persimmon, Hanging Dog and Bear creeks, Madison county, and Tusquitee creek, Clay county. At the latter localities it is found in argillaceous and talcose slates.

Some staurolite macles similar to chiastolite are described by Dr. C. T. Jackson from Charlestown, New Hampshire, which by insensible shades pass into andalusite macles.

*Iolite*.—The late Dr. Torrey possessed a fine seal made of a cube of iolite from the albite granite of Haddam, Connecticut, that displayed its dichroitic properties to the greatest perfection, the blue being remarkably fine. Though this locality promised well, the supply of gem material was scant. It has been found near the Norwich and Worcester railroad, between the Shetucket and Quinnebaug, where the gneiss has been quarried for the road. At Brimfield, Massachusetts, on the road leading to Warren, it occurs with andalusite in gneiss, and also near Norwich, Connecticut. It is found also at Richmond, New Hampshire, with anthophyllite in a talcose rock. No gems are being found at present.

*Tourmaline*.—One of the remarkable tourmaline localities of the world is Mount Apatite, on the Hatch farm, Auburn, Androscoggin county, Maine, the locality first discovered by Mr. S. R. Carter. It was worked by Mr. N. H. Perry, who first found the true vein in 1882, and obtained probably one thousand five hundred crystals. They are usually colorless, light pink, light blue, bluish pink, light golden, and sections show the characteristic variety of color, such as blue and pink, green and pink, when viewed through the end of the crystal. Some of the faintly colored crystals afforded gems that were considerably darker after the cutting.

During the last summer the north side of this locality has been worked by Mr. G. C. Hatch and Mr. T. F. Lamb, and much darker material has been found, especially the green colors, some of which equal anything found at Mount Mica. Rude black crystals were observed here 8 inches in diameter and 12 feet long, and at times inclosing quartzite. Several specimens were almost emerald color, and would afford gems. This promises well to afford fine gems for some time to come, as well as the Mount Mica locality.

Mr. Lucien Holmes, of Standish, Maine, found crystals of green,

red and blue tourmaline on the Hussey farm, but they were not of gem quality, although very good as crystals. As little work has been done, this locality might improve by development. The specimens at Bates College, Lewiston, labeled "Baldwin," are supposed to have been found at this locality.

During the last year Mr. E. G. Bailey and Dr. A. C. Hamlin have opened the Mount Black locality at Rumford and Andover, Maine. The indications here are quite good for gems, and a quantity of rubellite, a great quantity of lepidolite, spodumene 3 feet long, cookite, amblygonite and other minerals similar to those of the Mount Mica were taken out, none however of gem quality.

The tourmaline mentioned in Hamlin's "Tourmaline," page 72, was found about 1860, by Augustus Lane, at Welcome's Corner, on the Boutelle farm. This specimen was first recognized by Dr. Hoar. The locality is about half a mile from the Hatch farm, and the indications were found by Dr. Hamlin on working, in 1860 and 1862, to be the same as at the Hatch farm.

The localities in Maine that have furnished fine tourmalines are Mount Mica at Paris, two localities at Auburn, Hebron, Norway, Mount Black in Andover and Rumford, as well as the Standish locality; the two latter have furnished no gems.

Some of the finest of the cut rubellites and green tourmalines are in the possession of Prof. C. U. Shepard and members of his family. One of the most magnificent known green tourmalines is one, the color of which is described by Professor Shepard as of a chrysolite green, and having a blue tinge, while less yellow and more green than chrysolite. It is 1 inch long,  $\frac{3}{4}$  inch broad and 1 inch thick, and finer than any of the Hope gems. One fine rubellite of two-thirds this size and equally fine, one pink topaz one-half this size, and one remarkable rubellite the size of the large green tourmaline, are also in possession of this family.

The Hamlin cabinet,\* the first crystal of which was found in 1820, contains many hundred fine rubellites, indicolites, achroites, and fine pink, green, yellow and other colored tourmalines, mostly from Paris, Maine. It is the finest tourmaline collection in the world, and really would furnish full suites for a dozen cabinets. One wonderful dark gem of 28 karats, 1 inch long, one achroite of 23 karats, and many fine stones of nearly every known shade of color of this gem are found in this cabinet.

The DeKalb, New York, locality of white tourmalines afforded a few fine crystals. The choicest of these, in the cabinet of Mr. Clarence S. Bement, is over 1 inch long, and would cut into a gem weighing over 10 karats, that for light yellow color would be equal to that from any American locality.

Dr. Genth† mentions beautiful light yellow, brownish yellow, and at times white crystals, at Bailey's limestone quarry, East Marlborough, Pennsylvania; yellow crystals at Logan's limestone quarry, West Marlborough; brown, light yellow, at times transparent, at John Nivin's limestone quarry, New Garden township; and green tourmaline in talc has been found near Rock Spring, Lancaster county. Very beautiful crystals of black tourmaline are found in Delaware county; near Leiperville it is found in crystals of 5 inches in length and  $1\frac{1}{2}$  inches thick, and well terminated; also in Marple township, terminated with two low rhombohedra. These are about as fine as black crystals are ever found. Bluish and brownish green tourmaline is found in fine crystals, penetrating damourite and diaspore at Unionville, Newlin township.

The brown tourmaline found near Amity and called xanthite, Mr. S. C. Young informs me he has observed transparent enough to cut into gems.

A small, well terminated, transparent green tourmaline‡ was found by Colonel Mills, on Silver creek, Burke county, North Carolina; also a black crystal 4 inches long, inclosed in a green beryl crystal.

*Garnet group*.—Although the garnets found in the diamond mines

\* See "The Tourmaline," by A. C. Hamlin.

† "Preliminary report on the Mineralogy of Pennsylvania," page 96.

‡ "Minerals and Mineral Localities of North Carolina," page 52.

‡ *American Journal of Science*, Vol. XI., May, 1876, page 385.

¶ *American Journal of Science*, Vol. XXVII., April, 1884. "Proceedings American Association for the Advancement of Science," 1883.



at the Cape of Good Hope, the so-called Cape rubies, are larger in size, and perhaps equal to those of Arizona, New Mexico, etc., by daylight, yet there is undoubtedly no finer garnet found that looks better in the evening than those from the garnet regions of the United States. The dark color in Cape garnets remains by artificial light, whereas with the American garnets nothing but the clear blood color is visible. They are of fine quality and plentiful on the Great Colorado plateau. Hoffmann mentions good though small crystals of garnet from Black Cañon, Colorado river, Nevada. Fine small almandine garnets are also found in the trachyte of White Pine county, Nevada. Some very fine crystals of garnet have been found during the summer at Round mountain, Albany, Maine, by Mr. Edgar D. Andrews. The large dodecahedral and trapezohedral garnets, coated externally with a brown crust of limonite, but usually on breaking showing a bright and very compact material, are often as fine in color as the Bohemian gem material, and should find a ready use for watch jewels and other like purposes. Some of these crystals weigh 20 pounds, and would afford large dishes or cups measuring from 3 to 6 inches across. Some have been cut into very fine gems. They are found in Burke, Caldwell and Catawba counties, North Carolina. A very large quantity has been found about 8 miles southeast of Morganton, in Burke county, and also near Warlick, in the same county. Another good locality is 4 miles from Marshall. Many of them are very transparent, varying in color from the purple almandine to a pyrope red. Many tons have been crushed to make "emery" and the sandpaper called garnet paper. The peculiar play of color is often due to the inclusions. In these, as well as those from Stony Point and elsewhere, at times nearly one-quarter of the entire crystal is taken up by cavities of fluid, acicular crystals, etc.

Pyrope of good color has been observed in the sands of the gold washings of Burke, McDowell and Warren counties, North Carolina.

The Avondale, Pennsylvania, quarry has furnished some of the finest known crystals of common garnet as specimens, one of them measuring  $2\frac{1}{2}$  inches across (in a piece of quartzite), in color a rich purplish red, with beautiful natural polish and remarkably sharp angles. It is, perhaps, as fine as it is possible for this mineral to occur in crystal form, and is in the cabinet of Mr. C. S. Bement.

Iron-alumina garnet is found in Concord township, at Deshong's quarry, Shaw & Ezra's quarry, and at Upland, near Chester; also in Darby, Acton, Lower Providence, Haverford and Radnor townships, Pennsylvania. A dark red variety, similar to pyrope in color, is found in the bed of Darby creek, near the Lazaretto, in Delaware county. Some peculiar garnets of a deep blood-red color have been mistaken for pyrope, but an analysis made by Mr. C. A. Kurlbaum proved them to be true garnets. Many garnets have been cut by collectors from both Chester and Delaware counties, and some of these were of very fair quality. At Acworth, Grafton and Hanover, New Hampshire, garnets of gem value have often been found. At Russell, Massachusetts, a vein of garnet, very dark in color, and called there black garnet (not melanite), was opened during the last two years and many fine crystals have been taken out, partly by Mr. Daniel Clark, of Tyringham, Massachusetts. These have been sold as specimens only or exchanged for minerals, and were valued at fully \$1,000 in all.

Beautiful transparent essonites one-fourth inch in diameter have been found at the Avondale quarry, Pennsylvania. They are entirely transparent and quite flat, being usually found between plates of mica. A few have been found equal to the Ceylon essonites. Essonite has been found of good quality at Milton plantation, and at the Carter, Perry and Wild properties, Oxford county, Maine. Very fine essonites, red and fine yellow, were formerly found at Phippsburg, Maine. Mr. George W. Fiss, of Philadelphia, found some of the most beautiful natural gems of microscopic yellow garnets in the cleaning out of a small cavity at the microlite locality near Amelia Court House, Virginia. In the cabinet of Dr. Isaac Lea are some crystals of a rich, dark, oily green grossularite, trans-

parent, from 1 to 5 millimeters long, that were found at the Good Hope mine, California. Some very fair crystals of a rich green grossularite, from 1 to 5 millimeters in diameter, are found at Hebron and West Minot, Maine.

The colophonite from Willsborough, New York, although of a beautifully rich, iridescent color, has never been utilized, owing to the small size of the grains and the friability of the large masses. At Franklin, Sussex county, New Jersey, immense crystals of the different varieties, melanite, polyadelphite, colophonite, etc., have been found, but rarely in crystals that would afford a gem.

The beautiful and rare garnet, ouvarovite, was first described as occurring in this country by Prof. C. U. Shepard,§ as having been in minute nearly transparent emerald green crystals one-tenth inch in diameter at Wood's chrome mine, Lancaster county, Pennsylvania. The ouvarovite from Oxford, Canada, adjoining Newport, Vermont, on Lake Memphremagog, is found in large quantities, at times in masses over 1 foot across. The crystals, however, are very small, being rarely over one-sixteenth inch across, though usually of a good color. The white garnet from here, described by Dr. T. Sterry Hunt,|| although not in crystals, is identical with the fine crystals found at Wakefield,¶ Canada, and has been cut into white gems. The Wakefield ouvarovite is much finer than the Oxford crystals, some one-fourth inch across having been found, one of which is now in the cabinet of the late Mr. John G. Miller, of Ottawa, Canada.

(To be Continued.)

#### New York Jewelers' Association's Annual Banquet.

THE ELEVENTH annual dinner of the New York Jewelers' Association took place at the Hotel Brunswick on Thursday evening, November 12. The members and guests assembled in the parlors of the hotel at 6.30 o'clock, and they sat down to dinner a little after 7 o'clock. This annual dinner is regarded as one of the great social events of the season in New York. The previous ten dinners were held at Delmonico's, but it was deemed an expedient and favorable change to hold the banquet this year at the Hotel Brunswick, and the result, as expressed by members and guests, confirmed the good judgment of the committee of arrangements having the affair in charge. The banquet hall is in some respects superior to Delmonico's, and the members were generally satisfied with the change on this occasion. Previous dinners have been uniform successes, and that given this year was no exception to this favorable experience.

In the banquet room six tables parallel to each other were occupied by members and their guests, and the President's table at right angles to the others was occupied by the guests of the Association invited to make the speeches of the evening. W. R. Alling, the popular President of the Association, presided at this table. At the head of the first table was George E. White, Jr., Vice-President of the Association. The next table was presided over by ex-President D. F. Appleton, the third by Edward Holbrook, the fourth by ex-President Thomas G. Brown, the fifth by Seth E. Thomas, and the sixth by Aaron Carter, Jr. Henry Olmsted, the faithful Secretary, and Augustus Sloan, the worthy Treasurer of the Association, were omnipresent, and devoted their attention to looking out for the comfort and pleasure of everybody.

A noticeable feature of the banquet was the elaborate and costly decorations furnished for the table by the Gorham Manufacturing Company. The pieces altogether were valued at \$20,000, and included solid silver candelabra, epèrgnes, compotiers, bouquet vases and other ornamental pieces of the same precious material, and exquisite lamps of copper with *repoussé* decorations. The entire

§ *American Journal of Science*, 2, XLI., page 216.

|| "Geology of Canada," 1863, page 496.

¶ "Proceedings American Association for the Advancement of Science," 1883.

absence of flowers and plants of any description (except some fine cut flowers on the President's table) tended to give increased effect to the solid silver decorations of the Gorham Company. Certainly no banquet is given in this country where it is customary to make such elaborate display of fine silverware as at the jewelers' annual dinners.

The music that was provided by the Brunswick Hotel to please the ears of the banqueters was exceptionally good, and the performers were repeatedly encored. Several xylophone solos brought forth the especial applause of the diners. The cuisine afforded by the Brunswick was excellent, and the dishes and wines served were scanned from a very pretty menu, which was arranged as follows:

MENU		
Huitres—Blue Point		HAUT SAUTERNES
	<i>Potages</i>	
Consommé Rachel	Crème St. Germain	SHERRY
Variés	<i>Hors d'œuvre</i>	Variés
	Bouchées à la Reine	
	<i>Poisson</i>	
	Saumon du Kennebec, Royale	
	Pommes Hollandoise	
	<i>Relevé</i>	
Filet de Bœuf piqué aux champignons		PONTET CANET
	<i>Entrées</i>	
Côtelettes d'Agneau, Signora		
Croquettes de ris de Vieu, Parisienne		
Fonds d'Artichaut, Dubarry		
Coquille St. Jacques		MUMM'S CORDON ROUGE
	<i>Légumes</i>	
Pommes Duchesse	Haricôts verts à la'Anglaise	
Petits Pois au beurre	Tomates farcies, créole	
	—	
	SORBET A L'AFRICAINNE	
	—	
	<i>Roti</i>	POMMARD
Perdreux au cresson	Canvas-back Duck	
Salade de Laitue	Celery Mayonnaise	
	<i>Entremets Sucrés</i>	
Pouding Diplomate	Gelée Mandarine	
	—	
	Glaces Fantaisies	
	—	
Petits fours	Assiettes volantes	
	—	
	Pièces Montées	
	—	
Roquefort	Brie	Gruyère
Mottoes	Fruits & Desert	
	Café	LIQUEURS

The following is a list of the members and their guests who were present:

LIST OF MEMBERS AND GUESTS.

Geo. A. Paillard, Albert Wittnauer, J. G. Bacon, D. C. Wilcox, Geo. C. White, Jr., D. B. Hamilton, A. J. G. Hodenpyl, George H. Hodenpyl, E. G. Webster, A. A. Webster, W. H. Atwater, Dr. C. A. Woodward, R. N. Peterson, F. S. Douglas, Irving H. Smith, Thos. LeBoutillier, Geo. M. Heard, (President Chatham Bank), J. B. Bowden, W. C. Kimball, Jas. W. Miller, Isaac M. Miller, Eugene G. Miller, E. C. Breckenridge, H. B. Beach, Jas. C. Aikin, Henry A. Lambert, B. H. Knapp, George N. Wilcox, N. H. White, Henry C. Ostrander, Jas. P. Snow, John R. Greason, H. C. Hardy, E. J. Scofield, Joseph Fahys, W. S. Ginnel, A. B. Lounsbury, Wm. S. Hedges, James Hedges, William A. Bryant, James A. Smith, George A. French, Henry B. Dominick, Leroy B. Haff, Alexander Dominick, E. S. Newell, C. Picksley, Alfred S. Smith, H. B. Smith, Logan C. Murray, James M. Bloomfield, Charles F. Green, Thomas G. Brown, Thomas B. Brown, Herman Marcus, Win. E. Marcus, S. E. Thomas, C. H. Brahe, George P. Rowell, W. T. Woodruff, Otto Zenke, W. R. Alling, Horace Alling, J. B. Alling, Ralph Hyde, H. S. Cozzens, George H. Squire, Frank M. Welch, E. Holbrook, W. C. Spencer, Geo. H. Houghton, A. B. Bray, Chas. Coon, W. N. LeCato, A. Carter, Jr., A. K. Sloan, C. E. Hastings, Geo. B.

Jaques, W. T. Carter, Hon. Algernon S. Sullivan, D. F. Appleton, Henry Ginnel, F. R. Simmonds, Louis C. Nash, Chas. H. Fellows, A. O. Jennings, Fred. Jennings, Mr. Tillinghast, N. Y.; J. J. Hunker, (U. S. Navy); A. O. Headley, Louis Lelong, George R. Howe, Newark, N. J.; H. D. Hotchkiss, Member of Assembly-elect, James H. Hart, Brooklyn; Danford N. Barney, Farrington, Conn.; Samuel H. Cowell, Cleveland, O.; Walter C. Camp, Gen. Geo. H. Ford, New Haven, Conn.; H. S. Woodbury, John H. Scott, William F. Mitchell, H. B. Houston, J. Albert Caldwell, Samuel Biddle, C. Weaver, R. A. Kettle, Philadelphia, Pa.; C. A. Shafer, Henry Semken, Washington, D. C.; W. P. Shreve, C. S. Cook, C. H. Taisey, Geo. H. Richards, Jr., F. T. Bemis, Boston, Mass.; Henry Tilden, W. H. Thurber, Providence, R. I.; James Grogan, Pittsburgh, Pa.; D. H. Buell, Hartford, Conn.

The following is a list of the guests of the Association:

A. Q. Keasby, of New Jersey, United States District Attorney; Noah Davis, Chief Justice of the Supreme Court of New York; U. S. Senator O. H. Platt, of Connecticut; Reverend Robert Russell Booth, D.D.; Noah Brooks, of the Newark *Daily Advertiser*; J. Seaver Page, David E. Dodd, Jr., and Mr. Seth W. Hale.

When the coffee and cigars had been served, President Alling rapped for attention and began the speaking of the evening. He addressed the assemblage as follows:

ADDRESS OF W. R. ALLING.

*Fellow Members of the New York Jewelers' Association:*

We have assembled to enjoy our eleventh annual banquet, and I must congratulate you on the prosperous condition of our Association. Since our last annual meeting we have lost our honored member, M. G. Baldwin, who was the first President of this Association. I will not attempt to pronounce any eulogy on him, as his worth and good counsels were so well known to all of us.

During the past year we have moved to our elegant rooms in the Mutual Life Building, and, being so well located, we can safely expect an increased membership and a larger sphere of usefulness.

Man has always, after satisfying his animal wants, turned towards the gratification of his artistic desires, his personal adornment being paramount, and to satisfy that craving we can attribute the calling into being of our profession.

Our art, which we flatter ourselves is nearly perfect, has not made much progress when compared with the wonderful samples of the jewelers' handicraft which have been unearthed at Pompeii, and also found in the ruins of more ancient cities.

Still we may take an honest pride in the specimens of our workmanship which are now displayed in the many jewelry palaces of this country, although some of them bear a striking resemblance to ancient art.

I wonder if the jewelry artisans of those ancient days had an Association, and an annual banquet as well supplied with all the creature comforts as have been furnished us this evening by our hosts of the Hotel Brunswick.

They undoubtedly had their Demosthenes and Cicero, but I question if they were any better after-dinner speakers than our guests on my right and left.

Now, gentlemen, without more ado, I will ask you to listen to wiser heads and smoother tongues than mine. (Applause).

Gentlemen, I will ask you to listen to the first regular toast:

*"The President of the United States."*

And I will request you to fill your glasses and rise and drink to the health of Grover Cleveland.

The toast was drunken, and three cheers were given for President Cleveland.

THE PRESIDENT—I will give you the next toast:

*"The United States of America; with all that the name implies; at peace with all the world, and the envy of all nations."*

Now, I am going to call on one of our old friends to answer that toast. I think if the members of our Association were to choose a patron saint, that man would be Judge Noah Davis.

Judge Noah Davis responded to the toast as follows:

ADDRESS OF JUDGE NOAH DAVIS.

*Mr. President and Gentlemen of the New York Jewelers' Association:*

Your President undoubtedly, speaking of a saint, had that old distich in mind which ends, "The devil a saint would be." The toast he has given me is certainly a pretty difficult one to respond to in an after-dinner speech, because of the vast amount of territory covered by the United States.

When we reflect that the United States, longitudinally, is so great that San Francisco is the nearest city to its center, you can imagine what a task it is to speak to such a topic.

I am exceedingly gratified at being here to-night on the initiation of your dinners in a place to which you have not been accustomed to meet annually. I can only say that after eating such a dinner, this is the time for rest and reflection, rather than speaking. I was too full for utterance even before the canvas-back came in. (Laughter). I can say in respect to this dinner, also, that if this Association ever gave a better one they left me out. (Laughter and Applause). This toast—The United States of America—contains something that needs correction. I think that to declare that the United States is the envy of all nations is not quite true, I have been sitting here by the side of Mr. Keasby, and I know that New Jersey does not envy the United States. (Laughter.) In my experiences abroad I have found it to be true that we are not envied, but, on the contrary, all other nations seem to think that each itself is the cynosure of the world. (Laughter). I recollect that in Dr. Livingston's account of his travels in Africa, he came at one time to a place where he was introduced to a king sitting upon a lion's skin, with nothing about him except a robe around his loins; and after conversing with Livingston through an interpreter, the first thing that the king asked was—"What do they say in England about me?" Now that same thing is true of all nations. I shall not undertake here, to-night, to establish that all nations are envious of us, except that they are envious, undoubtedly, of the manufactures of the Jewelers' Association; and well they may be, for I doubt if there is anywhere in the world a more splendid display than right here to-night of the skill of our artisans.

As to the other part of your toast, we are, fortunately, at peace with all nations except the Chinese, and we are at peace with them unless we find them here, in our own country, seeking to earn an honest livelihood. It goes abroad that we are not at peace with them in our Western country, and it is a disgrace to us to know that that is so. (Applause). We have reason to be proud of our own country, and of its institutions. We are growing year after year into most magnificent proportions. Compared with foreign powers, I think it may be justly said, and without fear of contradiction, that the people—all classes of our citizens, but more especially the laboring classes of our country—are far happier in life here than in any other country. If we look even in our own mother country, we find a condition of things which tends to confirm that fact. And we are the most extraordinarily placed nation in the world, too, because we draw to ourselves a large share of poverty, misfortune and crime from the whole earth. I once heard an eminent policeman say, speaking of our own city, that whenever a criminal graduates in London, he immediately emigrates to New York, and that is practically the truth. And so we are receiving with open and liberal hand—and in some respects altogether too liberal—we are receiving the poor, the humble, the lame, the impotent, and, to a large extent, the criminal classes of the rest of the world. But we are so situated that we can do well for these persons if they will come to us with a determination to make America their home. And that is the greatest glory of our nation. It offers to all humanity a refuge. It holds out to foreigners more protection under the Constitution of the United States than it gives to you or to me. This is the true glory of our country. (Laughter and applause). It seeks—whether it always accomplishes it or not—it seeks to do justice to all mankind; to place the whole human family amongst us upon terms of perfect equality under the law; and it offers equal opportunity of establishing each one in life as the faculties of each will permit. That state of things does not exist to the same extent anywhere else upon earth. That is a fact that makes America the foremost nation upon the earth, and promises to make it the highest, the most important, the most happy nation of the globe.

Now, gentlemen, as American citizens our duty is to see to it that this status of things goes forward rather than backward. We must do nothing to alter the standard of universal freedom. (Applause). Nothing should be done to take from the laboring man the protection that the law affords him; nothing that will tend to beggar labor in our midst. Everything that will give to labor encouragement adds to our dignity. The protection of our laboring classes can best be produced by the maintenance of that system which enables them to receive that amount of wages for such labor as they perform, and as will secure to each one, and to his family, the enjoyment of the necessities, and, to a certain extent, the luxuries of life. We must protect our laborers against the poor laborers of other portions of the earth. It is as true as any other known fact, that by a system wrapped in its progress, the old world is becoming able to supply itself with the necessary provisions of life from other sources than from their own country. I say the laboring classes here should be elevated, and enabled to earn a good living to furnish labor. A market should be furnished to the products of the

United States within its own borders. We must frame our laws, so manage our action with the rest of the world, that we may bring a market to our own shores and feed our own products to our own people. We must find our subsistence here, and to find it here we must introduce the artisans, the laborers, the toilers at all trades, into our midst, and we must secure to them not merely the blessings of American citizenship, but all the abundant things that surround that position in life. And to aid that should be the aim, I think, of all right minded people in the country. America is our country. We have the right to make it, if we can by fair competition, superior to any other nation on the earth, and in trying to do that we are only obeying the behests of the Almighty God, who has given us such a grand country. (Applause). Because we are rapidly attaining that position, the grandeur of America is growing so widely, and to such extent, that we are becoming greater and greater. What a change you and I have seen in our relations with other powers, and especially with the English nation. How long is it since that people, the strongest on earth, with a great government, and living in a country little larger than the State of New York, but controlling an empire—how long is it since American genius, American manual production, was looked upon with scorn by them? Is it so now? No! Instead of that we are becoming, to a certain extent, the envy of all nations, inasmuch as we are showing, by tendering to all in our midst equal opportunities, by supplying labor wherever we can, by paying wages adequate to the support of the laborer and his family. It is in this way that we are becoming the envy of the world, and in the course of time may become the envy of New Jersey. (Laughter).

Now, gentlemen, I have had no set speech to make, but I wish simply to say that you should see to it that our laws, as they exist in respect to protection, are maintained, so that we can go on as we have gone on in the last quarter century.

I was glad to hear those cheers given a few moments ago for the President of the United States. He was not my choice, I admit, but when he was elected he became my President. (Applause). When he was selected he became, by force of the Constitution of the United States, the supreme executive officer of our country, not of a party, not of a faction of a party, but of all American citizens, bound by the oath, which he took under the Constitution, to maintain that sacred instrument, and to see, so far as was in his power, that justice was administered to us all. And while he accords with the views, so much as I think he has, and looks to the interest of the people, so long he shall have my hearty approbation and support. (Applause.) It is a peculiar and beautiful feature of our system of government, that whenever the people, speaking in favor of the choice of any candidate as their servant, elect such a man, then he becomes the servant of the people, bound to look only to the interests of the people, and to forget those alliances which connect him with mere parties and factions; and I do say Grover Cleveland has done that to a greater extent, so far as his individual action is concerned, than I anticipated and expected, and I rejoice that he has so done. It is the true dictate of patriotism to stand by the wishes of the people who have chosen him to be their servant. I trust that at the coming meeting of Congress some of the views that he has expressed may be carried out by that body. I do not want his views to be put down as he has expressed them on the silver bill. (Your silver bill will be considerable for this dinner). (Laughter). But I mean the other silver bill before the country. I would be right glad if President Cleveland stands erect upon that proposition. And I am glad also that he has taken so high a stand upon the great question of civil service. I do not believe him responsible for the many violations of civil service, but I accord to him sincere approbation so far as he has stood by his pledges. And now, gentlemen, what we have to do, as citizens, is to endeavor with all grace to maintain those laws which now exist, that will be for the benefit of the nation at large, and will give protection to the citizens and laborers of this country in competition in any way with the productions of the old world. Remember that America is for Americans; that we should control the introduction of any raw material, whether it be in the form of human beings or in the form of injurious laws against protection, impairing the standing of the laborer in our country. We have a most important question to decide, growing out of such a large introduction of the foreign element into this country, who are inspired by feelings, sentiments and ideas that do not concur with our own. Let us bear in mind that labor should be given greater dignity, and the laborers happiness for themselves and for their families. (Applause).

THE PRESIDENT—Gentlemen, I will read the next toast:

*"New England; the Birthplace of Ideas."*

I believe we are honored with the presence of one of the United

States Senators, Senator Platt, of Connecticut. He will respond to this toast.

ADDRESS OF SENATOR O. H. PLATT.

*Mr. President and Members of the New York Jewelers' Association :*

It strikes me that this is scarcely the proper place for a man to speak as a New England man likes to speak. It is the New York Jewelers' Association I see before me, and whenever a New England man speaks he likes to glorify New England in the presence of New England men only. The New England Society dinner is the place where a New England man likes to speak, for there he likes to insist upon it that men of the east are bigger than anybody else, and the whole society falls in with the idea. (Laughter). But I understand why I was honored to speak for New England as the birthplace of ideas. I wonder if we take away Connecticut on the one hand, and New Jersey, that independent nation, on the other hand, what jewelers would be left here? Now, this sentiment to which I am called to respond seems to call for some definition: "New England, the Birthplace of Ideas." It used to be supposed that New England was composed of six States. But New England has grown, and as I understand it, it now embraces New York, New Jersey and several other States. (Laughter). At Washington, in the National Legislature, I have been made to feel at times that New England was a mighty small place on the map. Those men who represent the Pacific slope affect to despise New England because it is so small, and I have felt often as if we were a great deal nearer Labrador, and so when they are taunting us with our smallness and our Yankee notions, I have been compelled to call on our big brother New York to come and help out New England. New York and New England have one common impulse and one common destiny. So I think that when we speak of New England, we speak of something more than the six New England States, and this is true, also, when we speak of her as the birthplace of ideas. For what separate ideas do we have? I remember in the Bigelow papers, our poet, who has recently been minister to the Court of St. James, says that Anglo-Saxon ideas are breaking to pieces, and the idea is that each man does just as he damn pleases, and I imagine that wherever we find an American citizen he likes to do this. (Laughter).

New England ideas mean those ideas which revolutionize the face of nature, which revolutionize and build up governments, and which have made this country what we are always proud to have it. Such ideas bring a result like the vision of the prophet who spoke of those wheels likened unto the spirit of the living creature, filled with activity, that go on and on. I think that in New England we have four diamond ideas: first of all the idea of religious liberty and of religious freedom; second, the idea of social liberty; third, the idea that education is an element that enters into the problem of progress; and fourth, the idea born on New England shores that work and labor constitute the only true condition of permanent prosperity and success in a nation. (Applause). Those four ideas have made this country what it is, they having always been carried out in their consistency. In religious freedom we have not always lived up with the idea, but nevertheless, that grand idea of religious liberty that a man may worship God as he pleases—that idea has been working in this country, until now we have got the largest and the grandest system of religious liberty in the whole world. As to civil liberty, I know that we have limited civil liberty; but that grand idea first enunciated in the cabin of the *Mayflower*, that all men have a right to prosper in their own government—that idea has been working in this country until it has made us what we are. It blossomed in the Declaration of Independence, and it will go on and on until it revolutionizes all governments in the world. Then, as to this educational idea, we all know that education brings strength. What does industry amount to without education? Mechanical skill has been well defined as nine-tenths thinking and one-tenth dexterity. It requires education to lay the foundation of all undertakings. It is the thinking man, the reflecting man, the man of ideas, who accomplishes most in business and in manufacturing. No country can enjoy civil and religious liberty—no country can go onward in its destiny in fitful triumph without universal education, and that idea is a New England idea. It has given us our colleges and our common schools. Wherever a New England man has gone he has carried that idea of education with him. And then comes the other idea that work is the true condition of success in this world. I want to indorse every word that Judge Davis has said in the relation of labor. The men who came to New England in the *Mayflower* proposed to conquer this nation by working for it—they proposed to cultivate this land by their own exertions—they proposed to accumulate wealth by laboring for it. But in another section of the country the idea was different. I refer to the South. They proposed to have somebody else to work and earn their living for them. The idea of working for one's self has built

up the moneyed institutions, the railroads and other great corporations and imbues our business character. A man is only entitled to such property as he works for. You can not acquire property without earning an honest equivalent of some sort—without working for it. People have no respect for property which is gotten by means that are dishonest, and the moment that a man has acquired property by means that are unfair, there is bred a disrespect for all property thus accumulated. And very largely those socialistic movements which are to be deplored, and which seem at times to threaten the property interests in this country, are to be traced to the fact that there is an idea that many men have been acquiring large fortunes by means which cannot be defended by law or morals. (Applause).

But this is a trade dinner, and let me say one word about ideas as affecting trade. Commercial strength is what makes a nation strong nowadays. It is not mighty navies and armies which secure a nation the greatest power, but it is a commercial spirit which makes it great. That nation which has the noblest commercial spirit is the noblest nation of the earth, and I maintain that the United States by this test stands out as the strongest and the greatest nation of the globe. (Applause). But we have been told that New England enterprise was waning—that New England manufactures are a thing of the past—that we no longer have a monopoly of manufacturing in New England, and that all the conditions of manufacturing are so much better in other portions of our country that New England is really in a very bad way. Now, my friends, do not have any fears on that score, for so long as New England is true to these principles which I have suggested she will take care of herself. We can at least keep ahead of this nation in ideas. Governor Andrew said, after the close of the war, in addressing the people of his own State, that while they could no longer expect to maintain a monopoly in manufacturing, yet the production and diffusion of ideas forever remained their strength. And he exhorted them to bring forth new ideas for the orderly arrangement of knowledge, the power to search out the hidden things of nature, the practical application of ideas to the wants of daily life, were most important considerations. That is just what New England has been doing since the war. She will make better things hereafter than we have—she will find out what the people want. If other portions of the country surpass her in any particular branch of manufacture, she will seek out some new branch of manufacture, and so it will come to pass that New England, by the excellence of her manufactures, by finding out what people are going to want, will be able to fully maintain her position in the future.

My only regret in closing, my friends, is that hearing this speech you will never invite me to another Jewelers' Association dinner. (Applause, and three cheers were given for Senator Platt).

MR. ALLING—Gentlemen, the first toast was to the United States and the next to the Eastern States. Of course, you all know what comes next. I am going to offer the toast:

*"New Jersey; As a Blessing to her Neighbors."*

All of you Jerseymen please to remain seated. There is one of our honored New Jerseymen present. He was appointed District Attorney by President Lincoln, and this position he has filled to this day with honor. I have the pleasure of introducing to you the Honorable A. Q. Keasbey.

Mr. Keasbey responded as follows:

ADDRESS OF HON. A. Q. KEASBEY.

*Mr. President and Gentlemen :*

I was asked to respond to the toast as a neighbor of the United States, and I think I have been flouted a little to-night as a foreigner. I consider it, however, a great privilege to have the pleasure of sharing in the festivities of this Association for the first time. And when I heard the striking remarks of the President on the subject of the antiquity of the craft of the jeweler, I began to think how modern is the business of dealing with the laws as compared to the business of providing for the personal adornment of mankind. I cannot trace my occupation back further than the time of Moses. I believe that the name of lawyer is not mentioned in the Old Testament anywhere, and it is in the New Testament only because men are told to beware of them. (Laughter). But you can find in Genesis and Exodus a list of jewels. It is true, as the President says, that the jewelers' business goes far back into the dawn of history. Before men began to settle their controversies, except with the fist, the jeweler was plying his craft. Dr. Schlieman, in excavating the ruins of Troy, has brought out lots of jewels of great antiquity, and I remember that in the ruins of parts of Egypt jewels were found in catacombs among the relics of the very earliest days. We read that Nero fished with golden hooks, and something is said of

Tiberius and his relations with the jewelry craft. What a modern business is the law compared with your craft! What upstarts are all these judges and politicians, and even the priests and the doctors compared with the jewelers! Why, actually when I think of the antiquity that the President has spoken of, I feel a sense of awe in addressing an association which is a lineal descendant of one of the nine guilds mentioned by Plutarch.

But I remember that I am called upon to respond to the toast of New Jersey as a blessing. I did feel competent to say something about the immense blessing and benefaction that New Jersey affords compared with other nations. (Laughter). There she lies between the two great States of New York and Pennsylvania. In the first part of my life I lived on the east bank of the Delaware near Philadelphia, and for the last half I have lived where in the morning I can see the towering spire of Trinity and hear the morning gun at Governor's Island. I feel, therefore, that I know what a blessing New Jersey has been to the cities referred to—how she has been indeed, the very salt and savor of the life of these two great cities, and preserved them from the fate of Sodom and Gomorrha. Now, do you think that is an exaggeration? (Laughter and applause, and cries of "No"). "Blessings brighten as they take their flight," and also blessings that you have around you are apt to be disregarded. Now, let me remind you just for a few minutes, of the manner—some of the manners—in which New Jersey has proved a blessing to her neighbors. In the first place just think what a beautiful path she affords from one State to the other. She lies there between the Hudson and the Delaware. If it were not for this beautiful tract of land, where would be your outlet to the great West? Where would be all your railroads and your railway pools? They would all dry up. (Laughter). Where would be the commercial supremacy of this metropolis? I must appeal to you to be thankful for New Jersey. (Laughter). Webster said, in his great speech speaking of Massachusetts, "Massachusetts," he said, "there she stands let her speak for herself." I say, New Jersey, there she lies, let her speak for herself. Suppose you had had New Hampshire with the White Mountains between New York and Philadelphia instead of New Jersey. If you had the whole country to cut and carve out of and to fill in, where would you find a piece to put in between the Delaware and the Hudson better than New Jersey.

Then let me refer to some of the moral considerations of New Jersey. Just think of New Jersey as a refuge! (Laughter). When you consider the manifold forms of wickedness in New York that Judge Davis has depicted—when you consider that you are absorbing all the rogues of the great world, just remember what a handy thing it is to have a retreat like New Jersey near at hand. It is just about eighty-one years since a New York lawyer, then the Vice-President of the United States, wanted to kill Alexander Hamilton, the greatest statesman of his age. They could not fight in New York, so they took the ferries and went to do it up at Weehawken. And in modern times Jersey has been found useful in this respect. When that great manipulation in the Erie took place and when so many things had to be done, they could not be arranged in New York, and they carried all the papers into New Jersey where they found Taylor's Hotel, across the river, just as good as a fort. And there they fixed up everything snug and managed the whole thing. And then, I remember that Tweed, when things began to look dark in New York, found a refuge in the Palisades until he got off to Spain. But I suppose, gentlemen, you have had experience of your own, and you know how it is yourself. (Laughter). The value of New Jersey as a field for certain metropolitan pursuits that cannot safely be carried on here is very great. There is one thing I have observed particularly. What a splendid field New Jersey is for "shoving" your counterfeit money. An instance occurred to me the other day that struck me as a fine illustration of the way New Jersey is resorted to. Only last week a young man who had an honest business in New York, decided to add to it a confidence game branch. It was not safe on Broadway, and so he concluded to try New Jersey, and he put a little advertisement in *The World* and *The Sun* to this effect, in the name of the Rice Manufacturing Company: "If any one will send ten cents in a letter to the address below, he will receive by return mail fifteen samples with full directions how to carry on a business from which he can make much money, etc." His entire plant and stock in business consisted of a Post Office box in Hoboken. He sent in reply to the letters received a letter containing fifteen recipes for making pills, but he got arrested and he found that there are some drawbacks to such a business. We produce an article in New Jersey called Jersey justice, and thereby a man can get imprisoned, if guilty of crime, very quickly.

But I have not left myself time to be serious in declaring to you in all soberness and truth the great advantages of New Jersey, and what great blessings she has poured out with her institutions, civil, political and edu-

catational—our strict adherents to obligations—and our facilities for aiding the great industries which are concentrated in the two great cities. It seems to me when I consider that the President of this Association is a Jerseyman, the old joke that New Jersey is out of the Union should die, and it should be declared that she is a very precious jewel of the Union. In the language of Benjamin Franklin, New Jersey is a cider barrel tapped at both ends; she is packed with good things, and she has been continually sucked by these great cities at both ends. You should give thanks for the nourishment and blessing that you have drawn from New Jersey. (Laughter and applause).

The President read letters of regret for not attending the banquet from William M. Evarts, Chauncey M. Depew, Joseph H. Choate, Abram S. Hewitt, William Walter Phelps, and others. Mr. Phelps, in closing his letter, said—"And what makes it worse, is that you have picked out for your guests a list of men, each of whom is an old personal friend, from genial Dr. Booth, who gives grace, down to my wicked Democratic friend, Sullivan, who gives sin, and always delightful sin, to any place he is brought."

PRESIDENT ALLING—The next toast in order is:

"*The Press; The Press spreads ink on one man's thought, and makes a million think.*"

I have the pleasure of introducing the Hon. Noah Brooks to reply to this toast.

ADDRESS OF HON. NOAH BROOKS.

*Mr. President and Gentlemen of the New York Jewelers' Association:*

When I heard the distinguished Senator from Connecticut, I thanked God that I was from New England, and when I heard the honored United States District Attorney from New Jersey, I was very glad I was from New Jersey. (Laughter). We have heard of the wonders of these States and the ability of their inhabitants, and we have much regard for knowledge as represented by the various professions in the world; but when it comes to good, sound sense, give us the newspaper. Therefore I am glad that I am not only a New Englander and a Jerseyman, and not a President of the United States, but a newspaper man; and when I hear that the Press spreads ink on one man's thought and makes a million think, I am glad to know it spreads it out to all of you, and that we even spread sometimes too much over all the land. It is a way we have, however. We are obliged to do it. We are sorry, but it is in the line of duty. (Laughter). There was a time, you know, in the Roman Republic, when an officer called the Censor held sway over the opinions of men. The Censor has disappeared, and the Press is now the censor. What the newspaper man does not know is not worth knowing, and where his hand is I do not know. Where it is not, I know. We have our fins in every man's business. The Press has a way of advertising everybody and everything but itself. (Laughter). It is only once in awhile, when we are invited to a jewelers' dinner, that we have an opportunity of saying anything for ourselves. We are known for our modesty. We are not in the habit of proclaiming ourselves. But when we do get an opportunity we try to embrace it. Therefore I say that while presidents, ambassadors and potentates have their share in managing the world, after all, when we come to real influence, give me the newspaper. I have been very much interested in the reference made by Mr. Keasby to the antiquity of your craft, and to the evidences of your art found in the Egyptian catacombs. Mr. Keasby seemed to think it a great thing that jewels had been brought out of ancient caves, and that the jewelry craft was older than the law. I do not suppose that he imagined that with those jewels was brought out a newspaper called the Papyrus.

I say that I do not generally sound my horn, because it is not often that I get a chance to make a speech outside of the newspaper. When we say in the newspaper a good word about our neighbors; when we say those things we say them with pure love; we say them of you because we love the truth, and you are the truth. When I have an opportunity to say anything, as I do sometimes for the newspaper press, I am always glad to say of a newspaper that there is nothing in it that is not genuine or truthful. There is nothing about us, gentlemen, that partakes of the quality that I have sometimes seen advertised in the windows as Parisian diamonds. (Laughter and applause). We are always genuine. Therefore, as I said when I first got up, I am in the first place glad that I am a New Englander; in the second place glad that I am a New Jerseyman, and in the third place glad that I belong to the newspaper conclave, that never sounds its own horn. (Laughter).

And I know that you, too, are genuine. I do not know of any craft, from the time of Tubal-Cain down to the present, that is older than yours or

mine. You talk of ancient jewelry, but you forget there was a man who said, referring to my profession—"Oh, that mine adversary had written a book." He referred to the newspaper press, of course. When Job said that, he probably did not imagine for a moment that the time would come when some of his descendants would also be Jobs in another way, on account of the newspaper, when running for office. (Laughter).

But there is a wider scope, in all seriousness, that I trust the newspaper press shall fill. And that is, to tell the truth, regardless of whom it concerns. I hear a great deal about the imperfections of the newspaper press. It is very true that we do and say a great many things that we are sorry for afterward. But after all, when you consider that the newspaper is the perfect flower that blossoms for only twelve hours; when you consider that in all the ranks of the newspaper profession there are unnumbered thousands who are unknown, whose names are never heard; when you consider these things—how much such men have to suffer, how much they have to endure—you will be surprised, and proud and glad to know how much they do for themselves, for their profession, and for all humanity. I often wonder, as I look around and see how trivial you treat newspaper results, I consider how little you think of the toil that is devoted to the newspapers, of the long, weary hours that are put upon it. The editor's name is forgotten to-morrow.

Looking around here to-night, I see one man whom I once thought that I would like to be. He is a jeweler, a member of your Association. I called upon a man who was very near death some years ago, and I met his daughter, and she said, as I introduced myself—"I am very glad to meet you; you have been so good to my father." And I said—"No, I guess not, for I have not been here before." "You are Mr. Holbrook, are you not?" said she. And then I wished my name was Holbrook and not Noah Brooks. It was Mr. Holbrook who had been masquerading in my name. (Laughter).

In closing, let me remind you of this simple truth, that wherever you find a genuine man he is, like the standard of excellency in your own trade, pure gold.

THE PRESIDENT—Our next toast is:

*"Education and Religion; Essential factors in successful business."*

I have the pleasure of introducing to you the Rev. Robert Russell Booth, D. D.

The Rev. Mr. Booth responded as follows:

ADDRESS OF REV. ROBERT RUSSELL BOOTH.

*Mr. President and Gentlemen of the Association:*

Preachers are said to be long-winded, but I shall not attempt to merit that reputation in what I say to-night. So much has been said already to-night, by those that have spoken before me, applicable to the subject matter of this toast, that very little remains to be said. We have had education discussed, we have had religion introduced in its various phases, politics and political economy have received their attention, and at this late hour, therefore, perhaps you will permit me to pass over much that I had intended to say, and simply to express to you my gratification and cordial congratulation for this anniversary, which is so signal and so conspicuous in respect to the dinner which we have enjoyed. I remarked a few moments ago to your President that it might be very hard for the gentlemen present, after partaking of the banquet to-night, to come down to a twenty cent dinner to-morrow, but President Alling assured me that these gentlemen all dine the same way every day. (Laughter).

I belong to that class of your fellow-men who are accustomed to look at the promised land from the spirit of business, but cannot participate in the good things resulting. The young man said to his girl, when she asked him to buy for her some of your art displayed to advantage in a window, that he would willingly pass "by," and that is what we are content to do.

I have been impressed with what was said by Judge Davis in respect to this country, its laborers and its new hereafter. He spoke of the danger of competition from those that wait upon American enterprise and American trade, referring to the fact that this country was regarded as the envy of other nations. From my observation I consider that the threatening of competition is a most serious question. Look at the petroleum trade. Within five years time that product, as an export, will be greatly diminished by preparations that are making for flooding the whole Mediterranean seaboard with petroleum from abroad. We have an immense competition to meet in connection with the introduction of Russian petroleum. And if you take account of the several items or staples, I think you will find that there is reason to realize that the outlook is not so bright for our commercial future as it has been in the past. Business men, gird up your loins, adjust your

armor, and strive for best results, and strive for the highest prices for your products.

I had intended, gentlemen, to vindicate the jewelers' trade this evening. In some respects it needs a vindication. I wanted to remove that barrier and admonition of St. Paul in respect to the decoration of woman; also the views long ago held by the Puritans, who protested against all forms of earthly vanity. I had intended to vindicate you in this light. The Puritan was a noble feature in our early history, but the Puritan is not to be the model of American citizens. The American citizen has reason and cause to occupy a broader sphere than the New England Puritan. Christianity, as I understand it, is not only a religion, a salvation—it is a civilization; and everything that tends to make life more beautiful, everything that copies the wonder-work of the Creator's art, everything that embodies the great principle that it is proper to have a greater and fairer civilization, and such as we are building on these shores, is consistent with Christianity.

Gentlemen, I will now have the grace to set a good example, and, in concluding, I will give you, as worthy to have as a sentiment, those lines that Emerson has written:

The hand that rounded Peter's dome,  
And groined the isles of Christian Rome  
Wrought in a sad sincerity;  
Himself from God he could not free,  
He builded better than he knew—  
The conscious stone to beauty grew.

Your work, that has its consummation in the jeweled beauty of the New Jerusalem, is worthy of the attention of every one. (Applause).

THE PRESIDENT—Gentlemen, we have heard a great deal this evening about ancient art. I find among my papers a memorandum that calls to mind a more recent display of the art of our craft. Many of us remember the Paris Exposition of 1878; some of us were there, and the impression made by the metal workers of the United States, American watches, clocks, and silverware, were especially noticeable for their superior workmanship, design and finish, and carried away with them many, if not all, of the prizes.

We have an honored guest with us to-night, one of the representatives of American industry at that Exposition—Mr. Herman Marcus, whom we should like to hear from.

Mr. Marcus responded as follows:

ADDRESS OF MR. HERMAN MARCUS.

*Mr. President and Gentlemen of the New York Jewelers' Association:*

It would seem like sacrilege for me to speak in the presence of so many distinguished speakers. However, I have a few words to say in honor of our country, and especially about the American jewelers and silversmiths of this land. It affords me great pleasure to meet so many gentlemen, representatives of the jewelers' craft, especially as this privilege is accorded to me for the *first time*.

I have long felt that I should like to have an opportunity of expressing to the jewelers of my adopted country the gratitude I entertain for America, its noble institutions, and the liberal spirit with which she welcomes all comers from foreign lands. But I regret that till now my yearning remained unfulfilled. You will probably understand me when I mention that this feeling of deep gratitude found its best expression in the year 1878, when I volunteered to represent the United States at the World's Exposition in Paris, where I labored assiduously in order to bring honor to my beloved adopted country.

My most sanguine hopes were realized when the highest honors were placed upon the brow of fair Columbia.

You can imagine the emotion when, on the day of distribution of awards at the Palais d'Industrie, in the presence of fifteen thousand distinguished people, representing all the nations of the earth, and in the presence of crowned heads and ambassadors, the American flag, which was carried in the grand procession, was greeted with one universal cheer from the assembled multitude, as a recognition of the glory of the United States.

Tears ran down the cheeks of brave American men and women, who felt proud to call themselves Americans at that touching moment. It seemed the highest tribute that could have been bestowed upon our country, and, let me say, it was accomplished principally through the noble craft of the workers in precious metals, the gold and silversmiths of America, and I, as an adopted citizen, had the privilege of being the humble instrument in winning so great a victory.

"My yearning was satisfied, and my most sanguine wish was fulfilled."

These recollections have never been described in words, but I deem it

worthy the occasion of bringing the memorable episode of 1878 as a trophy to the jewelers' dinner of 1885.

Thanking you, gentlemen, for your kindness, I will take my seat and make way for others.

PRESIDENT ALLING—Here is a most important toast and interesting subject:

*"The Ladies; Our Especial Partners and Constituents; their diamond eyes, golden hair, teeth of pearls, ruby lips, coral ears and silver tongues, require all the jewelers' art to match and to mate."*

I take great pleasure in calling upon Mr. J. Seaver Page to respond to this toast.

ADDRESS OF MR. J. SEAVER PAGE.

*Mr. President and Gentlemen of the New York Jewelers' Association:*

It is a very pleasant and very clever thing to throw a fellow overboard and tell him to swim out. It seems to me as if your President had done this with an amazing *sang froid* to-night. You believe, of course, that I have come here loaded with many beautiful things to say. But I was not forewarned and no toast was given me in advance. Your honored President came to me a few days ago and asked me to come to this dinner. I told him that I was happy to say that the prospect of my going West was not so imminent, and that I should probably accept his invitation. "Well," said he, "Mr. Page, the toast intended for you, 'The Ladies,' has been taken from you by Judge McCarter, of Newark, but, of course, you will be ready upon any other subject. If you choose you can just write a toast to suit yourself." This is what he told me, but you see after all how beautifully this arrangement has been carried out.

The waiter has just given me a motto and I propose to read it, as it seems singularly appropriate to the "sugar sweet sentiment" with which this toast has been announced, and may remind you, gentlemen, of the youthful game of pillows and keys:

Her voice, whate'er she said, enchanted,

Like music to the heart it went,

And her dark eyes—how eloquent!

Ask what they would, 'twas granted.

You are all married men, and, no doubt, you go home and tell your wives what a splendid time you have had, and try to tell them what beautiful speeches you listened to, and how such a speaker made you roar at the banquet. She might say in reply, as a little woman whom I know is accustomed to say: "Yes; *you* can enjoy these beautiful things, but you must remember I have not had any of your champagne, your Burgundy and sauterne, etc., and therefore I cannot appreciate the beauties in your description as well as you who were there." (Laughter).

I cannot do better at this late hour than to relate to you a little yarn that I heard the other day told by that celebrated impersonator, Dixie:

"The story is told of a couple of Irishmen who were sailors, and were sailing along one wet and rainy night; one was starboard watch and the other larboard watch, and both were soliloquizing upon their fate. Said one to the other: 'We were damn fools, anyway, when we left the ould "Dart;"' but the other answered: 'Let us get up a cilabration to relave the monotony. We'll bring the cannon from below and have a grand discharge.' 'Ah, hould yer tongue!' said the other, 'don't yer know if we make a noise we'll both be discharged with the cannon, too.' 'Look at that now,' said the other fellow, 'you have no edication. Couldn't you go ahead with a bucket of straw and catch the ball, and thin we'd have the cilabration without the noise.' So they brought the cannon up and the larboard watch goes ahead with a bucket of straw to catch the ball, and the starboard watch stays behind to touch off the cannon; and, just as he was about to apply the match, larboard watch screams out: 'Touch it off aisy; don't wake the captain.' 'Ah, never moind,' said starboard watch, 'hould up yer bucket o' straw to catch the ball.' And, with that, he touches off the cannon. Well, you know the result. Larboard watch didn't stay there very long, and the captain comes rushing up from below to see what is the matter. Before he reaches the deck the starboard watch throws a tarpaulin over the cannon and resumes his pace. The captain comes up crying 'Starboard watch!' 'Aye, aye, sir!' 'Larboard watch!' No answer. 'Larboard watch!' Still no answer. 'Starboard watch, where is larboard?' 'Begorra, sir, he's gone ashore with the bucket.' 'Will he be back soon?' says the captain. 'Well, if he comes back as soon as he wint, he will be here damn soon!'"

I fear before I get through with the serious undertaking which has been assigned to me that my condition may be as bad as the larboard watch.

Mr. President and gentlemen, I am called upon to say a word in behalf of the ladies, our especial partners and constituents, etc., etc. This toast properly belongs to your honored guest, the Chief Justice of the Supreme Court, who, as you know, is in duty bound to look after the widows and the orphans, or perhaps to the United States District Attorney of New Jersey, who has already told you how carefully he looks after the "foul" New Yorkers that fly to that foreign shore, and that he would be much more happy to speak for the "fair" ones who remain at home.

The toast of the ladies is more or less vested with a bit of humor, but let me say that there is no subject more serious to me. I'll confess at our home we occasionally have a struggle in the effort to see who shall be speaker of the house. (Laughter). And no doubt some of you can say Amen, Amen.

But in all seriousness, I know of no reason why, upon any convivial occasion, this toast should be received with a laugh. What would have become of this great land in many times of suffering and misfortune were it not for the angel ministering of woman? What would have become of those in the South when the people of that land were stricken with the fearful ravages of the fever, if the women of the land had not offered their tender services to assuage the suffering of the smitten people? Can you tell me what message of friendship and patriotism we have clearer than that from the ladies of the North, East and West who offered their lives to bring back our southern people to health, happiness and prosperity? Mr. President, I have been sorry to change so convivial an occasion with so serious a thought. Yet it seems that a protest should be entered against the customary manner of treating the subject matter of the toast, and I can say that I know of nothing that can inspire one more than to remember the quiet devotion, the earnest self-sacrifices, the unswerving love for our country which our women have so often shown. You may remember the words of the wounded Irishman on the battlefield, when assisted and encouraged by a ministering woman. She offered him water to cool his parched tongue and throat, which brought this question from him: "My good lady, what does they pay ye for this?" and he was surprised to receive the modest answer from her: "Only 'thank you,' sir;" and is it not true my fellow men that this is about all the ladies get in life? It is only thank you, and let us on all such occasions remember the modesty, the gentleness, the devotion which characterizes women, and be sure to give them the well deserved "thank you" which they have so richly earned. (Applause).

PRESIDENT ALLING—I may mention as an incident in my visit to Mr. Page, to which he has alluded, to get his promise to attend this dinner, that when he agreed to come he made a solemn promise also not to paint the Hotel Brunswick red, and set it all ablaze. (Referring to Mr. Page's connection with F. W. Devoe & Co., the great paint house).

The next toast in order is:

*"Our Guests; Always welcome, may we see and hear more of them in the coming year than in the past."*

I look around to see whom I shall call on, but I see so many customers that I am somewhat embarrassed as to whom I should ask to respond. There is one gentleman who has not had an opportunity to speak to us yet to-night, and whom we would all like to hear from. I refer to Algernon S. Sullivan, Esquire, the "great sinner."

ADDRESS OF HON. ALGERNON S. SULLIVAN.

*Mr. President and Gentlemen:*

He would be very insensible, indeed, of an act of courtesy, being a guest of such an assembly, did he not have it in his heart to make a most graceful acknowledgement, whether he did utter it aloud, or whether he had to do it by simple remarks to those about him. I may not be able to express, in a way satisfactorily, the pleasure I have had in this entertainment. But I feel like saying a few things, and first to speak to the guests. I wish to call their attention to the thoughtful provision which has been made by the committee of arrangements having this banquet in charge. They, perhaps, are not aware that when the arrangement was made with the proprietors of the Brunswick, they stipulated that the portraits of the leading jewelers of this city should be frescoed on the walls of this banquet hall. I want to disclose that it has been communicated to me by one of my neighbors that there was a special secret meeting of the Association, in order that they might pose before the leading artists of the Academy of Design, and there was a great effort at variety. (Laughter). I am told they were not able to say in what style the frescoing should be made, but there was one subject on which they all agreed, and that was depicting plainly, in spite of the great sentiment against the nude, and the artists were made to understand

that one and all of the jewelers voted that the artists must go to the bottom of things. (Laughter).

Now, gentlemen, you have no idea what a delightful impression, by this generosity, you have made upon us, your happier guests, and we will never forget it. I have been able to pick out, according to that power by which a dyer's hand bears the color of the fabric that he dyes—I can tell who it is that makes sterling silver and who it is that makes plated ware. I can tell who it is that knows best how to display stones. (Laughter).

Gentlemen, it seems to me that at this entertainment this evening the addresses have all been arranged on the progressive principle of a beautiful symphony. We have had the toast to the United States responded to and amplified upon in that learned and solemn way which characterizes the Chief Justice of the Supreme Court; we have heard about the beautiful and the wonderful things which characterize New England; we have had one of New Jersey's favored sons set forth the advantages which New Jersey furnishes as one of the factors of trade in the progress of the United States; we have had my right reverend friend, Dr. Booth, give some beautiful admissions; we have had some commendable references to the women of America from Mr. Page; we have had a graceful recognition of one of the great factors that mark the progress of the United States from my friend Mr. Marcus. All those things were very properly referred to as indicating the progress of the United States at this time. They have entered into the prominent functions of the people of the United States, the opportunities and advantages furnished to its toilers, the great levers of the country, and everything that has contributed to our progress has been mentioned. But what has this all tended or led up to? This is all true in this year of grace 1885, when the principle of Democracy is triumphant, and the land has been made happy and prosperous, and when we Democrats are able to point to the best administration since the days of Washington, under Grover Cleveland. (Applause). But, party man though I am, when any reference is made to that dark hour in the history of this great country, and mention is made of the good deeds of Mr. Lincoln, I feel a throbbing and a swelling in my heart, to say that there are times, and there are recollections of names, when every man who has running through his veins real American blood, is impelled, in spite of himself, to forget that there are party lines, and to remember that there are sentiments looking beyond mere party success, and that look to the broad interests of the country, and to the glory of the country, and in a generous spirit recognize true honor—that which is entitled to the veneration of every citizen, without regard to party. And I can say my partisanship—my allegiance—having been alluded to to-night, I can say that, although I have made my heart beat with the tribute that I have paid to Grover Cleveland, that on my way home this night, when I shall pass in Union Square that silent statue of Lincoln, I shall do as I have done a thousand times before—touch my hat in reverence to his character, as one of the names that shine in American history as the bright jewels that give glory to this land. (Loud applause).

THE PRESIDENT next called on Mr. David C. Dodd, Jr., an honored ex-member, who was present as one of the Association's guests. Mr. Dodd spoke as follows:

ADDRESS OF MR. DAVID C. DODD, JR.

*Mr. President and Gentlemen of the New York Jewelers' Association:*

It is too late for any remarks from me. The doxology has been sounded, the hour of dispersement has arrived. We have listened to the eloquence of distinguished men from the Bench, the Bar, the Press, and the State. You should not expect from me any words of entertainment for the gentlemen who sit here. It is a claim upon their patience, and it would be an unsuccessful effort on my part to attempt that which would be unreasonable. It may be true that on every occasion, and whenever opportunity has offered, I have been called upon to make a speech, but I cannot take advantage of this at such a late hour of the evening; for, as my friend Page has said, your wives are expecting you, and I will not attempt to make a mutual admiration affair of this occasion.

You may smile when I say it, but this is the first intimation that I had had that I should be expected to respond as a guest, and with preparation I might have occupied your attention for the whole time that has been taken up by listening to the eloquent gentlemen that have preceded me. My friend Page claims—not, perhaps, with the justice that I do—that he did not know anything about the toast to the ladies. But, nevertheless, the speech he made has been said a hundred times before (laughter); and I may say he can make as good a speech on any other subject. But during his whole time to-night he was drinking champagne, and recalling the subject-matter of his address. I know another thing about him. You know the clever and complimentary things he said about the ladies, showing his

thorough mastery of the subject. He certainly has been well trained. He knows that his speech will be reported in THE JEWELERS' CIRCULAR, and he knows that his wife will read it. (Laughter).

If you will give me more time to prepare a speech I will address you at greater length on another occasion. Let me take advantage of this chance to thank you for your kindness and courtesy on many other occasions as well as to-night. I have been accustomed to sit at the lower tables, where I have mingled with the members and their guests, and, as I have said before, I do not believe you can gather a better looking set of men together than the jewelers, and I know that Judge Davis will agree with me in the opinion that they are a good-looking and cultivated assembly. (Laughter and applause).

JUDGE DAVIS—Yes; and I know that none of them are better looking than you are.

MR. DODD—That is just what my wife has often said. (Laughter). Mr. President, allow me to thank you again for your kind invitation to be present here this evening, and to wish every individual member of this Association prosperity, happiness and success. (Applause.)

MR. ALLING—The gentleman who has just sat down said that the doxology has been sung. I have not heard it, but it is certainly time, and we will close our festivities with calling on Mr. Semken, as the representative of the trade from Washington, to say a word before we say good-night.

Mr. Semken said:

ADDRESS OF MR. HENRY SEMKEN.

*Mr. President and Gentlemen of the New York Jewelers' Association:*

I am not in the habit of speaking to an assembly like this. There are several gentlemen here who could fill this place with more honor than I. I was invited here to be a guest and I have certainly enjoyed the festivities as much as any of you. I have seen a great many faces that I have not seen for a year. Our craft is certainly well represented in this assembly. Thanking you for your kindness in the name of the invited guests, I assure you that they have all enjoyed the evening. (Applause).

Gen. George H. Ford, of New Haven, was called for in different parts of the room, and was led to respond as follows:

ADDRESS OF GEN. G. H. FORD.

*Mr. President and Gentlemen of the New York Jewelers' Association:*

By the courtesy of my friends and the kind hospitality which has always characterized the Jewelers' Association, I have been able to be at these annual dinners for many years, and I would extend sincere thanks for the trade for the pleasant occasions that you have always afforded your guests. I am reminded of an occurrence down East not long since, in connection with the thought that I imagine that many of you might suppose that I am out of the trade because I have done so little of late, and that I am hardly entitled to an invitation here. A man who had been absent for twenty years from his native place and his home, returned very suddenly one morning, and, as he came near to the old homestead, he saw a woman in the yard by the wood pile whom he recognized as his wife. He approached her very quietly, and coming on her suddenly, kissed her very affectionately. As soon as she recovered herself she remarked: "I am not accustomed to such treatment. I do not know who you are, sir, but you will always find me here every morning at the same place." (Laughter). And, gentlemen, as long as your invitations are extended you will always find me here. I thank you for having called upon me, and in closing my remarks I can only express once more the old sentiment: May you live long and may you prosper. (Applause).

When General Ford concluded his remarks the band struck up a good night refrain, and the company departed for their homes.

## The Gravity Clock Escapements of Mr. Richard F. Bond and Professor C. A. Young.

THE VERY great merits of the dead beat escapement are more and more recognized as efforts are made to improve it. It is probably true that the best clocks so far made have been made with this escapement, and it probably will always retain its deservedly high place in all those clocks in which the train has nothing to do but to drive the pendulum, and is free from any demands on it for



actuating electrical apparatus. Taken in connection with a more perfect lubricant than we now possess, the errors of this escapement can be made less even than they are now, and the old idea that the amount of friction on the dead faces of the escapement was a serious drawback has gradually disappeared in the light of the comparative results obtained with gravity clocks where the incidental friction of the escapement is much less than in the case of the dead beat escapement.

It is now conceded that clocks for the highest accuracy must be carefully protected from atmospheric and temperature changes, and that also it is desirable in most cases the clock should register its indications by means of some electrical connections upon a more or less distant chronograph or telegraph sounder. When this is the case, the additional work imposed on clock trains renders the use of a gravity escapement desirable. Of the gravity escapements proposed, that of Mr. Denison (Sir Edmund Beckett) has found the widest acceptance, owing to several excellencies. It is not difficult to make, it will not trip unless the driving weight is out of all proportion to the train, and the only difficulty which I personally have found with it is that with ordinarily good gear cutting it requires a heavy driving weight to be sure that the impulse arms are always promptly lifted.

Since the train starts from a state of rest at every impulse and must attain a considerable velocity in the interval between each impulse, the addition of a break-circuit apparatus is very apt to afford that slight resistance necessary to stop, or, rather, to keep from starting with a sufficient velocity, the gravity escapement train. I think, therefore, that the free introduction of friction rollers at the acting faces of the Denison escapement would be an improvement upon it as ordinarily made, and there is no more important caution to be observed in making this escapement than the one Mr. Denison somewhere gives of being sure to arrange the escapement in such a manner that the train may have a little free run before it begins to lift the gravity arms, or, I may add, do any electrical work.

Since Mr. Denison's contribution there have been two other important but more expensive escapements suggested by American students. Both of these are improvements on the Denison escapement, when we consider their application to the very highest grade of clocks. The first was invented by Mr. Richard F. Bond, whose accomplished work marks him as the ablest horologist the United States has yet produced. He described it at length in a scientific journal long since discontinued, and which has become so rare that the reader will pardon my transcription of Mr. Bond's account of this escapement from the journal as he himself wrote it. (It may be found in "Brunnow's Astronomical Notices" for October, 1860).

He says, referring to the illustration, and calling it an "isodynamic escapement:"

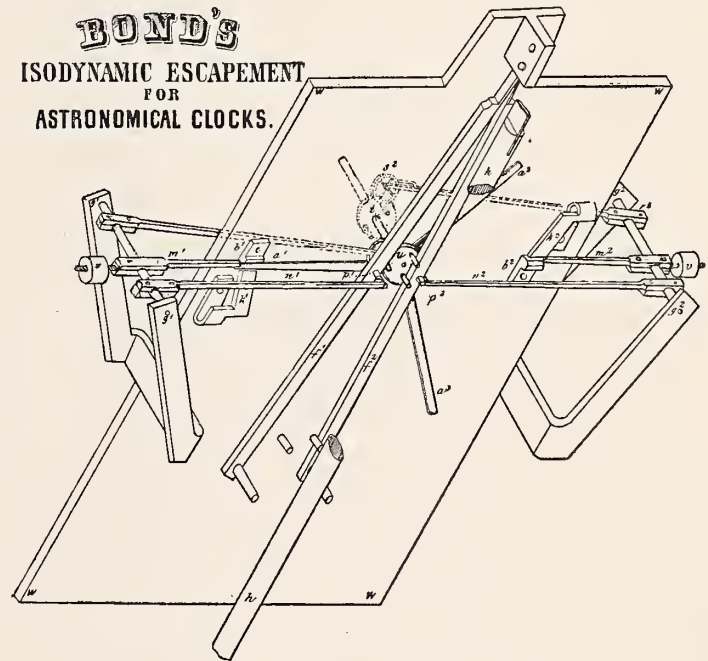
"The Isodynamic Escapement, recently invented, overcomes entirely the difficulty of the varying power transmitted by the wheel work, and thus obviates most of the objections to other escapements. In comparing it to previous ones, I refer only to Denison's and Graham's, they combining to a greater degree than any others the various requisites essential to a good escapement.

"Besides the difficulties already enumerated, which are to be overcome in making a perfectly reliable gravity escapement, there is one which has been exceedingly troublesome, namely, the necessity of guarding against what is called *tripping*, or the danger of two or more teeth of the escapement wheel passing the pallets at once, when one only is intended to; this causes the hand of the clock to gain by jumps, and, of course, in a most unreliable manner, while the pendulum may be vibrating with perfect regularity. Mr. Denison, in his book on 'Clock and Watch Work,' speaks of guarding against this difficulty as first among the essential mechanical conditions. Even in his own gravity escapement, to which I have already referred, the possibility of *tripping* still exists, though rendered reasonably slight by the introduction of a fan upon the escapement wheel, but in the

Isodynamic Escapement, it will be seen that this danger is completely removed.

"The following cut will assist in explaining the action of this contrivance:

"*w, w, w, w*, is the back plate of the clock.  $a^1, a^2, a^3$ , are radiating arms of very thin steel, easily bending in towards the plate of the clock when they meet the inclined planes  $k^1$ , or  $k^2$ , though inflexible in the plane of revolution; these arms from the escapement wheel, which is placed outside of the clock plates, instead of between them, as is generally the case. With a pendulum vibrating seconds, it requires six seconds to perform an entire revolution.  $b^1, b^2$ , are two blocks screwed to the plate of the clock, projecting just so far as almost to touch the arms of the escapement wheel when in their natural position.  $r^1, m^1$  and  $n^1$ , are arms all connected firmly together through the arbor  $g^1$ , having corresponding arms,  $r^2, m^2, n^2$ , on the



other side of the clock similarly connected.  $r^1$  has a small friction wheel at its end, which is alternately depressed and allowed to rise (being slightly overbalanced), as the pins upon the cam  $t$  revolve.  $r^2$  is also acted upon by the cam as will be readily seen. In the position shown in the cut, the cam has raised the arm  $n^2$  so that a pin through its end is a little above the jewel  $p^2$ , not touching it.  $m^2$  is also raised in readiness to keep the arm of the escapement wheel from springing entirely out from the block  $b^2$  as will be described. The pin of  $n^1$  is prevented from rising up by the jewel  $p^1$ .  $f^1, f^2$  are the pallets.  $h, h$ , is the pendulum.  $k^1, k^2$ , are inclined planes along which the arms of the escapement wheel slide before resting upon the blocks  $b^1, b^2$ .  $v, v$ , are balanced weights.

"Suppose the parts to be in the position represented in the cut. The action will then be as follows:—the pendulum  $h$  moving towards the left strikes the pallet  $f^1$ , carrying the jewel  $p^1$  free from the pin at the end of the arm  $n^1$ , thus allowing  $n^1$ , which is overbalanced by the counterpoise  $v$ , to escape upwards; this carries with it the arm  $m^1$ , which is attached to the same arbor  $g^1$ ; this unlocks  $a^1$  and allows it to spring out from the fixed block  $b^1$ . The escapement wheel being now free makes one-sixth of a revolution, and in doing so brings the cam into such a position as to allow the pin of the arm  $n^2$  to fall upon the jewel  $p^2$ . In revolving, the arm  $a^2$  slides down the inclined plane  $k^2$ , which bends it, as it advances, slightly inward toward the plate of the clock so that it falls upon the block  $b^2$ ; when, no longer influenced by the inclined plane, it springs out to regain its natural position, but is met and prevented from entirely leaving the block by the arm  $m^2$ , which keeps its position so long as the arm  $n^2$  is prevented from falling from the jewel  $p^2$ . The pendulum now vibrating to the right, moves the pallet  $f^2$  so as to allow the arm  $n^2$  to drop, carrying with it the arm  $m^2$ , thereby releasing the arm of

the escapement wheel  $a^2$ , which again makes one-sixth of a revolution, and is stopped by  $a^3$  passing up the inclined plane  $k^1$  and being held upon the block  $b^1$  by the arm  $m^1$ , as  $a^1$  is shown to be in the cut. The same operations are repeated with each vibration of the pendulum.

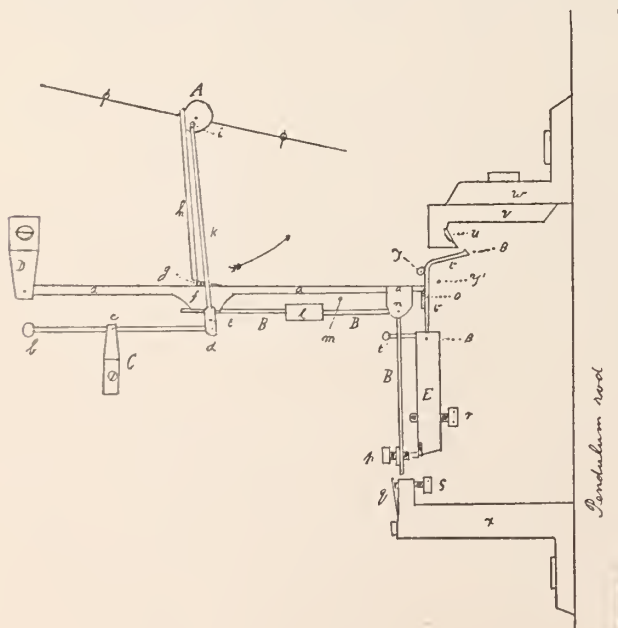
"In this escapement the cam plays a very important part in replacing the detent arms,  $m^1$ ,  $m^2$ ,  $n^1$ ,  $n^2$ , in the proper position to be again unlocked by the pallets as the pendulum vibrates. The only two places where any friction which influences the pendulum occurs are upon the jewels  $p^1$  and  $p^2$ . Practically, however, the amount is so trifling as to be almost inappreciable, being found by actual experiment to be less than one-twentieth of that which takes place in a marine chronometer, and incomparably less than in any other clock escapement of which I have any knowledge.

"The chief excellence of this invention consists in this friction, slight as it is, being constant, and entirely uninfluenced by the wheel work; indeed, the power may be increased to a hundred times the amount necessary to drive the clock, supposing the machinery capable of sustaining the weight, without in the least increasing the friction of the pendulum or in any way interfering with the extent or time of its vibration. After a long and careful trial I am satisfied that this is a more reliable and accurate escapement than any that have been made public.

"After this escapement had been perfected, I found that by a very simple addition I could secure a magnetic break-circuit entirely free from the danger of oxidation, and which would not in any way influence the pendulum or disadvantageously impede any of the other mechanism of the clock, hitherto the chief drawbacks to all other break-circuits. It is sufficient proof of its certainty to say that it has been in operation for a year past without adjustment or alteration, never having been known to fail in any one instance."

The second escapement referred to was designed by Professor Young, now of Princeton College, and has been embodied in several clocks made by the Messrs. Howard. I do not know that Professor Young has anywhere described this escapement in print, but he has described it in a manuscript which has circulated so freely, that I am quite sure he would have no objection to my giving it to the readers of THE CIRCULAR. Following is the description, bearing the date of February, 1877:

The object of the contrivance is to give the pendulum an impulse at the center of its arc, by gravity alone independent of the force of the train, while leaving the pendulum absolutely free from all resistance or interference during the remainder of its vibration.



The accompanying figure is intended to show the principle of the escapement rather than the details of construction. It is drawn on an enlarged scale, and no particular pains has been taken to observe

the best proportion of parts. The observer is supposed to be standing behind the clock.

In the position represented, the "locking lever,"  $a a a$ , pivoted at  $D$ , locks the scape wheel  $A$  (which makes one complete revolution for each impulse) at  $g$ , and is itself locked from falling at  $o$  by the "tripping lever"  $t t$ , which is delicately pivoted at  $B$  and rests against the adjustable banking pin  $T$ .

The pendulum is represented as approaching the vertical from the left. The "passing piece"  $u$ , precisely analogous to the passing spring of the ordinary chronometer escapement, is just about to engage with the hook  $\theta$  at the extremity of the "tripping lever." As the pendulum moves on the "tripping lever" will be pushed to the right and then released; but before it is released, the "locking lever"  $a a$  will be unlocked at  $O$  and will drop upon the banking pin  $m$ .

As it falls it will carry with it the "impulse lever"  $B B$  which is pivoted at  $u$  and weighted at  $l$ . The "safety spring"  $g$  on the arm  $x$  is so adjusted that the lower extremity of the impulse lever, as it descends, will come down to the left of  $g$ , just barely clearing it; and as soon as the screw  $p$  slips off the jewel at the lower end of the fixed stud  $E$ , the lower extremity of the impulse lever will immediately move to the right under the action of the weight  $l$ , and pressing against  $g$  will give the pendulum a push or impulse lasting until the lower arm of the "impulse lever" brings up against the adjusting screw  $r$ .

At the moment when  $p$  is disengaged the scape wheel tooth  $h$  is unlocked at  $g$ , and the wheel begins revolution. The fly is so adjusted and proportioned that the revolution shall occupy somewhere from one-half to seven-eighths of a second.

As the wheel turns, the crank pin  $i$  first depresses for a moment the connecting rod  $k$  and the pin  $E$  at its lower end. This pin passes underneath the "impulse lever"  $B B$ , and by the time the impulse is completed it will begin to rise and will act upon the end of the lever. It will first raise  $l$  until  $p$  is drawn back far enough to clear the stud  $E$ , and then when  $e$  reaches the edge of the projection  $f$  on the locking lever  $a a$ , it will act on  $a a$  and will raise it (carrying with it the impulse lever and its attachments) slightly above the position represented, allowing the tripping lever  $t t$  to reassume its position. When the crank pin  $i$  passes its upper dead point, it will then gently lower  $a a$  upon the locking jewel  $o$ , and the scape wheel will continue its revolution until  $h$  again locks at  $g$ , and everything is replaced in the position represented in the figure. The counterpoise lever  $b c d$  guides the lower end of the connecting rod, and the weight  $b$  is so adjusted as nearly to equalize the work done in the two halves of the scape wheel revolution.

As the pendulum returns to the left, the "passing piece"  $u$  will glide over the extremity  $\theta$  of the tripping lever without appreciable resistance and the cycle will be complete, the pendulum being absolutely free during its whole swing except for a moment as it passes the vertical.

In a letter to the writer, Prof. Young further points out that a long pendulum with its slow motion is favorable to the performance of this escapement, since it gives more time for the cycle of operations to be performed. He suggests, also, that the retarding fly should be made to move in a horizontal position, by beveled gearing, perhaps, so that it could be made abundantly large to allow for an easy and certain adjustment of the time of the escapement. When the fly is too small, in some cases the impulse may be cut short a little; and if the weight is diminished so as to avoid this difficulty with certainty, then it may fail to replace the parts after the impulse is given.

LEONARD WALDO.

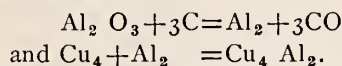
### The Use of Aluminum Bronze in Horology.

FOR MANY years chemists and metallurgists have been seeking some economical method of getting the pure metal aluminum

out of the common clay with which it is ordinarily combined in large quantities.

The splendid qualities of pure aluminum made it certain that it would be used to an unlimited extent—so soon as it could be furnished at any price which approximated that of steel. With a weight of only one-quarter of that of iron, as strong as steel, it will not tarnish in the air, will not blacken as silver does, is not easily attacked by acids, except hydrochloric (muriatic) acid, and would be the ideal metal for the moving parts of all clock and watch trains could it be had cheaply. Pure aluminum is *not* now to be had at any less price than at about \$14.60 per pound; but there have been certain remarkable improvements in the process of obtaining aluminum alloys made within the past year, so that it seems highly probable that pure aluminum will soon be in the market at a low price, as the aluminum bronzes already are.

It has been found possible, by means of the intense heat of the electric current, to fuse copper into an alloy with aluminum under the following circumstances: The electrodes from a powerful dynamo machine (in the experimental plant at Cleveland referred to, this dynamo is of 30 horse power and will produce about 5 pounds of contained aluminum in one day's work) are made of carbon cylinders, and are imbedded in a mixture of pulverized carbon (charcoal), copper and corundum, which is an oxide of aluminum. The action of a powerful electric current in this mass seems to be as follows: first the corundum is made to give up its oxygen to the carbon present, and then the free aluminum unites with the fused copper present to form an alloy of copper and aluminum. Or, expressed in chemical symbols,



In arranging the furnace care is taken that the fused copper does not unite with itself to short circuit the current, otherwise the heat would be insufficient to fuse the contents of the electric furnace. When the contents are removed there is evidence that the aluminum has been in a free state before its union with the copper. Considerable masses of fused aluminum, more or less impregnated with impurities, are found in the upper layers of the charcoal, and with more or less evidence of fusion with the carbon itself. The bulk of the furnace product, however, is a brittle crystalline alloy with the copper, and subjecting this alloy to repeated treatment with carbon the percentage of aluminum in the product may be rapidly increased.

The cost of the copper alloy is now about \$3.80 per pound for the contained aluminum, and is furnished to the trade at about \$5 per pound for the contained aluminum. The process has been brought out and perfected by the Messrs. E. H. & A. H. Cowles, of Cleveland, assisted by Professor Chas. F. Mahery, of the Case School of Science. A company has been found in Cleveland for marketing these products, and their price list for October, 1885, quotes 10 per cent. aluminum bronze at 60c. per pound, and 5 per cent. aluminum bronze at 36c. per pound in ingots.

The 10 per cent. bronze indicated above is very hard, flexible, easily worked, comparatively light, and would be an admirable substitute for brass in scape wheels or for steel in the escapement itself of watches and clocks. Its freedom from corrosion is greatly in its favor. It is highly probable that in contact with the acids of oils it would prove to be the best bearing known with the exception of jewels.

Aluminum bronze may be tempered, forged at a brown red heat and hammered until cool without flawing. As with copper it is made more ductile by plunging into cold water when hot. It is very malleable, and may be easily worked in the lathe and vise. It does not clog and may be soldered as follows:

For fine work, hard solder for 10 per cent. aluminum bronze,

Gold,	88.88	part	by	weight
Silver,	4.68	"	"	"
Copper,	6.44	"	"	"

Medium hard solder for 10 per cent. bronze.

Gold,	54.40	parts
Silver,	27.00	"
Copper,	18.00	"

And a soft solder may be made by using brass (composed of copper 70 parts and tin 30 parts).

Brass,	14.30	parts
Gold,	14.30	"
Silver,	57.10	"
Copper,	14.30	"

The specific gravity of aluminum 10 per cent. bronze is 7.68, and the weight of 1 cubic inch is 0.276 pounds. Its tensile strength is about 32 tons to the square inch.

I am not aware of any experiments as to its use for hair springs or mainsprings. It would be free from all magnetic influences, and in the case of mainsprings its freedom from rust would probably make it more satisfactory than steel for durability and certainty of action. For these and other spring uses, such as the suspension of pendulums, it is yet to be determined whether we have not a much better material than steel. Perhaps a silicon bronze may be even better than an aluminum bronze—and the silicon bronze is prepared in the same way.

LEONARD WALDO.

## Fashions in Jewelry.

### A Lady's Rambles Among the Jewelers.

NOTWITHSTANDING the general depression pending in all lines of business, jewelers and silversmiths anticipate a holiday trade that will show a decidedly marked improvement over that of last year, the retail dealers, almost without exception, claim that their sales for October and November, while far from satisfactory, were very much better than were the sales for the corresponding months of 1884. While everybody is convinced there is a decided improvement, manufacturers have been wise enough to understand this does not mean a boom that justified the production of unusually extended lines of untried goods. On the contrary, the manufacturers have been, if anything, rather more cautious than usual, and contented themselves with bringing out for the holidays such articles as the present fashions demand and are likely to meet with a ready sale. In a word, few have made new ventures outside of such articles as they are sanguine will, in the nature of things, take well. Following is a description of some of the newer styles and more popular objects in gold, silver and gems, which promise to be picked up by the great army of holiday shoppers in quest of Christmas gifts.

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THAT great high priestess of dress, the Princess of Wales, did the American women a wonderful favor when she encircled her own fair throat with a band of velvet ribbon held closely in place by a little diamond ornament in the form of a buckle, and thereby gave the precedent for some sort of collarette to shorten the effect of a long thin neck. American women, almost without exception—and in *decollete* dresses especially—require the addition of neck ornaments to conceal or mitigate a lack of plumpness that is almost unknown to English women. The average American, although more beautiful than her English cousins, alas seldom exposes a neck that does not absolutely require the aid of collarette and pendants to foreshorten the long-drawn-out effect produced by a low-cut corsage and conceal the hollows that almost invariably accompany an attenuated neck. It is superfluous to add that among other welcome fashions introduced by the Anglo-mania is, that of, narrow, velvet neck ribbons fastened

in front with a jeweled ribbon pin or buckle. The growing popularity of this style of neck ornament is attested to in the prolific and varied array of ribbon pins to be seen in all the leading stores.

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THE growing importance of necklaces in this day and generation of *decollete* bodices, renders the possession of gem necklaces a necessity to every lady of fashion, hence a point or two as to the prevailing styles abroad may be welcome. To begin with the very *creme-de-la-creme*, a pen sketch of two or three necklaces among the many included in the list of royal presents to the young Princess de la Tremouille at her recent marriage, will not come amiss. First in order, as in splendor, was the diamond necklace presented by the royal mother-in-law, and consisting of a row of single diamonds from which were suspended six immense gems of the purest water, so arranged as to be detached and worn in form of a brooch, a hair ornament or decoration to a bracelet. The offering of the bride's own mama was a superb necklace of pearls, set in Roman gold fringes, with bracelets and shoulder clasps to match. Then there were a number of gold collarettes closely encircling the throat and studded with colored gems of one kind or another, and this brings to mind the fact, that the gold necklaces in prospect for other young ladies will be of the character of a collarette, with them a loose ornament, falling low. In a word they will closely encircle the throat.

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GOLD necklaces of etruscan fashion are not only stylish ornaments but are exceedingly becoming and much worn in Paris. One seen the other evening around the throat of one of New York's well-known ladies of fashion, consisted of a fringe of pointed gold drops finished off with barley-corns, the latter being represented by tiny gems. An attractive collarette employing enamel and small gems in its decoration, represents olive leaves set in couples, with hanging bunches of berries. A picturesque necklace consists of two tiny chains of gold, hanging in festoons, on which are placed four engraved gold bars, entwined with chains finished off with little gold drops set with turquoises.

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BEFORE leaving the subject of neck ornaments it ought to be told that dog collars are often made to match the belt buckles, and that there is a combination bracelet and necklace affair, worthy of consideration. The latter is, in point of fact, a pair of bracelets which, upon being interlinked, forms a necklace. These come not only in silver but the new Scotch pebble ornaments that have proven so acceptable for day wear with the handsome tailor suits of English and Scotch fabrics. This Scotch pebble jewelry, by the by, has revived so much favor in form of lace pins and sleeve buttons, that brooches have been demanded, and these are in process of manufacture.

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WRITING of brooches, recalls the fact of the steadily increasing production and demand for this form of ornament. The show cases of every leading retail house exhibits these as the newest form of neck pin, and their popularity is but a matter of short time. As has before been explained, the modern brooch is confined to no limitations in regard to size and form, except that it be compact in shape, not long and narrow. The brooch therefore, includes, besides the horse shoe, crescent and star, all favorite designs, a flat hoop set with

stones, (one of the newest styles) anchors decorated with brilliants and sapphires, and roses in bright or chased finished gold, with a gem in the center. A beautiful flower brooch seen recently with petals of diamonds and a heart made of small gold beads to simulate the pollen of the bloom, was only one of the many exquisite productions known under the name of brooch. The imported miniature paintings on ivory alluded to last month, are employed with artistic effect in brooches. A charming illustration is that of a diamond crescent inside of which rests one of these painted gems, in irregular shape at the top, to accommodate a quivering diamond of lemon color, that hangs like a star from one point of the crescent. In hollow ware the gold coils and knots continue to find favor, especially such as are embossed or engraved, and set with gems. The snow-ball is being copied with pleasing effect in brooches, some of which exhibit an encased flower true to nature not only in form but color; again the snow-ball is of gold and set with tiny diamonds or pearls.

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APPROPOS of miniature paintings on ivory, are the little round ones about the size of a ten cent piece set in gold and surrounded by diamonds, and designed for wearing as a pendant to the Queen chain in place of the usual ball or cube. Queen chains are almost the only sort now worn with watches by ladies of fashion, and naturally the manufacturers have been conjuring their brains to produce these in attractive styles for the holiday trade. The newer productions show the same delicate light short length of chain, the changes having been brought about chiefly in the decoration of the ball or in substitutions for the ball. Among the latter are little lockets of crystal set in rims of gold and showing a tiny forget-me-not or other flower done in enamel. Sometimes a crystal ball is worn. Again there is a gold charm in form of a basket, a little gold safe, an etruscan fan, or an oval medallion crossed by a fern pond in diamonds. Little viniagrettes are also a popular appendage to the Queen chain.

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PLATINUM is being employed on some of the newer Queen chains with pleasing effect. There are chains of alternate links of platinum and gold, with a gold viniagrette overlaid with fine threads of platinum. There are chains composed of alternate blocks of gold and platinum, with a ball or cube of hermatite attached. Hermatite, by the way, has made an enviable place for itself, and is much used in jewelry designed, not only for mourning, but for people of quiet tastes. Some very attractive brooches and bar pins have appeared in which hermatite is associated with diamonds.

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THE sign-board pins consisting of a rod and swinging plaque whereon is inscribed the christian name or the wearers initials, has found no favor here, although it appears to have gained some ground in Paris. The double-bow pins, however, have proven more fortunate, and are to be seen in a variety of styles. These represent a ribbon of gold tied in a double-bow knot; sometimes they show the bright finish, but oftener they are chased, and not infrequently set with little stones. A very pretty effect is gained in this style of pin with the opalesce finish described in the October number of THE CIRCULAR. This finish produces a surface covered with a fine mosaic of different colored golds, that gives forth, in a bright light, the opalesce effect which suggested its name. The subject of neck pins and brooches would hardly be complete without a mention of the large insect pins, composed of gems and in which beetles, butter-

flies, grasshoppers, blue bottle flies and spiders all play leading parts.

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FROM out the animal kingdom the serpent has again appeared as a model not only in silverware but in jewelry. A gold serpent with jeweled eyes, coiled into a spiral becomes at one and the same time a brooch or a holder for a *bouquet de corsage*. Buckles for belts are also composed of two or more twisted serpents in gold or silver.

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THE little jeweled pins known as bonnet pins, that made their appearance in the world of fashion in an unobtrusive manner, or as two at a time in ladies bonnet strings, are now worn *ad libitum*, and regardless of their original use; grouped sometimes at the side, on the shoulders, or in front of the dress bodice; in fact, wherever milady decides she wants a little ash of color and glitter. This fancy admits of a lady wearing her entire collection at one time, consequently one often counts as many as twelve or fifteen of these pretty trifles stuck, here and there, in a handsome gown. This display, it is needless to explain, represents a wondrous medley of subjects, such as horse shoes, trifolds, crescents, flies, bugs, bees and flowers composed of an equal medley of gems, fancy stones, enamels and gold coils, twists and knots. This wholesale grouping of bonnet pins is doubtless but a passing caprice that will not outlive the season that introduced it, but it betrays the reviving taste for that glitter and color to be gained only through gems and fine jewelry, a style of decoration in keeping with the prevailing fashions in ladies dress.

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THAT the bar or the lace pin continues to be popular, with so many newer styles claiming patronage, is a remarkable proof of its convenience and usefulness. It has been brought out this season in a number of fresh designs, among which is noted the revival of the old scroll pattern. Probably the most popular form of bar pin at the present moment is the knife edge bar, with a gem set in the center.

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THE buttons and buckles used on fashionable dresses to-day give the silversmith opportunities for the display of beautiful workmanship. Sometimes these are of bronze or old silver cut in classic shapes, in high square relief; again they are of the chased gold in rich dead shades, and yet, again, they are of carved bog oak with silver trimmings.

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THE furore for belts, which appear to be worn with all sorts of dresses, regardless of the old law that once confined a girdle to a dress with a "round bodice," has brought out for the holidays a decided novelty in sterling silver ones about one and a half inches wide. Some of these belts are quite plain; others are beautifully etched in floral designs, securing the additional effects of light and shade by oxidizing, while some receive their ornamentation in embossed work. Leather belts are finished with either gold or silver buckles, as the costume chances to demand. Antique gold belt clasps and buckles, set with brilliants, Rhine stones, or ornaments

made of iridescent enamel, inlaid with semi-precious colored gems, in floral patterns, find their place not only on elegant costumes of satin and velvet, but also on handsome suits of rich-lined bouclé and tricot.

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COUNTED with new things in mourning jewelry, are Queen chains of enamel and gold, with an onyx ball; or, an onyx charm in form of a viniagrette and showing the satin or dead finish. A chain attracting deserved attention, is one with sections of onyx, finished on one side bright and on the other a satin surface, with a ball intersected by gold threads. The satin or dead finish is much employed now on onyx jewelry, even when it is set with pearls and diamonds.

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So long as tailor-made suits remain fashionable the demand for collar buttons and cuff buttons will remain unabated, for linen collars and cuffs must perforce be worn, a frill of lace or tulle being quite out of the question. There are no special changes to record in either class of buttons. Those for the collar are small in size. While gentlemen are patronizing largely the link buttons, ladies find the single button best suited to their purposes. The embossed or chased finish is taking the place of the nugget on many of these buttons. One is confined, however, to no special finish, but has the choice of an infinite variety including bright, plain, Roman, opalized and other surfaces.

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FOR gentlemen's wear the link is often a combination of one round button with another to match of an elongated or bean shape. The white enamel studs continue to be worn, a variation of this style is represented in a linen enamel stud with a gold rim flush with the surface. Among fancy vest chains for gentlemen's wear are those with a sliding seal that may be shifted to any position, but which is usually worn from the center of the chain.

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BRACELETS are one of the best selling articles in the jewelers' trade. These ornaments are by no means confined to what is known as a popular patronage, but are fashionable among the *creme-de-la-creme*, both at home and abroad. *Porte-bonheur* bracelets remain in favor, and figured by the by, among those same royal wedding presents to which reference has already been made. One was set with a single large ruby, another with an equally fine sapphire, and a third with a pearl; these were designed to be worn together. Novelties in bracelets introduced for the holiday trade are those composed of graduated links, the larger of which form the top of the ornament. Some of these are quite plain; others are embossed and further decorated with gems. A bracelet deserving of special mention, not only because of its novelty, but its grace and beauty, is a graduated lace-chain bracelet. The snow-ball bracelet is another attractive sort. Very pretty, too, are the bracelets that simulate a narrow ribbon tied on top in a double-bow knot.

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THE decorative influences of the "Mikado" are seen in some of the new things. There are paper cutters with silver blades and

ivory or wood handles, that exhibit decidedly Japanese styles of ornamentation. Pencil charms show Japanese figures, while Japanese fans and parasols lend models to neck and scarf pins. Of course there are paper weights on which are depicted "three little girls from school."

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FOR evening wear and full-dress occasions solitaire gem ear rings remain the correct style, and not a few fine gems are being remounted in the new setting with the double ring and iridium needle, described last month. It is claimed that the sensitive scintillating motion imparted to a stone by this new pivot device adds wonderfully to the effect of even the finest gems over the old mode of setting.

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IN gold and silver ear rings, the demand for which comes mostly from misses and little girls, favorite patterns appear to be the balls and pear shaped drops, and the flower designs, as a tiny daisy or forget-me-not.

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THERE is little that is new to say about rings for either sex. The demand continues for what are termed fancy rings; rings to be worn on the little finger. In these rings has appeared a demand for small but fine single colored gems, as a ruby or sapphire. There is a fancy too, for what are termed fly rings; little gold wire circlets surmounted with a fly composed of rose diamonds. The trefoil, of small diamonds, is also popular in these rings. Seal rings continue to be worn by both sexes.

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THE tendency to an association of fine glassware and silver, noticed in THE CIRCULAR some months ago, has developed into a number of exceedingly pretty novelties which promise to have a popular run during the holiday season. Lemonade ewers, claret jugs and water pitchers of glass, with an applied silver decoration, are instances at hand. A beautiful example is a crystal pitcher of antique shape overlaid with silver open work representing wild roses and their foliage. This piece, in point of fact, is a silver pitcher, if you please, with a glass lining. Very pretty, too, are Bohemian glass salad dishes and bowls set in silver standards and edged around the brim with silver.

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THIS silver work applied to glass shows very pleasing results in pocket liquor flasks carried so as to present a concave side that "fits" nicely in the breast pocket of one's coat without the inconvenient and tell-tale bulging out, common to the ordinarily shaped flask. The upper side of these new flasks is decorated in the old English chasing that has appeared on so many of the newer toilet articles, while the concave or under side shows a plain surface in bright or satin finish and designed to be cut through to the glass, in the initials or full name of the owner. This insures a silver flask marked with letters cut intaglio and colored with the rich hue of the liquor contained in the inside glass bottle.

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SILVER plating on glass has rendered it possible to produce in

silver some very beautiful viniagrettes, in which may be carried aromatic vinegar or smelling salts without fear of corrosion, as the inner glass bottle is fitted with a glass stopple that prevents the salts from coming in contact with the silver covering. The little glove viniagrettes continue popular both for salts and perfume extracts. Medium sized cologne bottles of cut glass with gold or silver caps, are also carried, as are the silver cologne bottles.

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PIPES with meerschaum bowls and silver plated stems, and pipes with silver plated bowls and stained ivory stems, are put up in decorated cases along with a cigar holder showing silver trimmings, for the holidays. Cigar cases in all the approved forms and some that are not, are out in silver, so are smoking sets, sealing sets and the like. Handles of bone covered with a deposit of silver have appeared in umbrella and cane handles. Quite new are the carved silver cane and umbrella heads, representing old men or women with peaked caps that form a sort of crutch.

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IN silverware, toilet articles will doubtless find a greater sale as holiday gifts than any other line of goods. The number of articles represented cover everything required by the most fastidious, and these are finished in such a variety of ways as to give an immense assortment to select from. Single articles, as a shoe horn, a button hook, a brush, a broom, a nail file or a hand glass can be purchased alone; or, two, three or fifty articles can be bought in a set. The sets are, of course, arranged in attractive boxes and cases. In the sterling silver toilet articles, the old English chasing prevails to quite an extent, though not to the exclusion of other styles of finish.

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A NOTEWORTHY example of art work in silver, now on exhibition at a leading up-town house, is represented in a water pitcher formed by the intertwining of two silver serpents. One of these coils itself in a spiral which produces the tall slender body of the pitcher; while the other twists and loops its length around the neck and base of the piece so as to form the handle and lip of the pitcher. The delusion is carried out in the finish of the piece by the simulation of the color and texture of the serpents' skin. Such examples, it need hardly be added, must be seen to be appreciated.

ELSIE BEE.

## Recent Patents.

The following list of patents relating to the jewelry interests, granted by the U. S. Patent Office during the past month, is specially reported to THE JEWELERS' CIRCULAR by FRANKLIN H. HOUGH, Solicitor of American and Foreign Patents, 925 F Street, N. W., rear U. S. Patent Office, Washington, D. C. Copies of patents furnished for 25 cents each.

Issue of October 13, 1885.

328,142—Clock Escapement. C. M. Rhodes, Malden, N. Y.

328,154—Finger Ring, Device for Severing. J. H. Thomas, Newark, N. J.

328,112—Timepiece Dial. C. F. Dietz, New Orleans, La.

328,289—Watch Case Pendant. D. H. Church, Waltham, Mass.

328,190—Watch Plate. G. E. Hart, Waterbury, Conn.

328,412—Tray, Jewelers' Watch. C. A. Kron, New York, N. Y.

Issue of October 20, 1885.

- 328,583—Bangle for Jewelry. C. Gosling, Brooklyn, N. Y.
- 328,565—Button or Stud. G. H. Bowerman, Newark, N. J.
- 328,869—Clock, Electric. F. R. Field, Greenfield, Mass.
- 328,592—Clock for Machinery, Speed. W. H. Lord, New York, N. Y.
- 328,791—Watch Case. J. Lamont, Sag Harbor, N. Y.
- 328,848—Watches, Device for Testing the Balance Wheels of. F. F. Ide, Springfield, Mass.
- 328,847—Watches, Testing Balance Wheels of. F. F. Ide, Springfield, Mass.

Issue of October 27, 1885.

- 329,078—Clock. H. L. Phillips, New York, N. Y.
- 329,207—Cuff Fastener. J. V. Pilcher, Louisville, Ky.
- 329,018—Tray, Finger Ring. T. S. Coffin, Boston, Mass.
- 329,285—Watch Crowns, Apparatus for Corrugating Cores for. A. C. Dalzell, Newport, Ky.
- 329,284—Watch Crowns, Apparatus for Making Cores for. A. C. Dalzell, Newport, Ky.
- 329,361—Watch Guard. C. F. Bauer, Newark, N. J.

Issue of November 3, 1885.

- 329,455—Clock Alarm. A. O. Jennings, Southport, Conn.
- 329,611—Watch, Stem Winding. L. Aeby, Madrestch, Switzerland.

Issue of November 10, 1885.

- 330,230—Jewelry, Manufacture of Imitation. F. J. Hafner, Philadelphia, Pa.
- 329,916—Watch Balances, Apparatus for Testing and Grading. J. Logan, Waltham, Mass.
- 330,228 and 330,229—Watch Case. C. K. Giles, Chicago, Ill. 2 Patents.
- 330,273—Watch, Stem Winding and Setting. R. L. Taft, Springfield, Ill.
- 329,915—Watches, Testing and Grading Balance Wheels of. J. Logan, Waltham, Mass.

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THE JEWELERS' CIRCULAR is the exclusive official paper of the Jewelers' League, and has been selected for the publication of all matters of interest pertaining thereto. Letters or inquiries pertinent to its business or purposes, and which might interest the trade or inquirers, will herein be answered. Address Jewelers' League, Box 3,444, P. O., New York, or the office of THE CIRCULAR.

AT THE regular monthly meeting of the Executive Committee, held Nov. 6, 1885, there were present President Hayes, Vice-Presidents Johnson and Kimball, and Messrs. Bowden, Howe, Greason, Lewis and Sexton. Dr. Wilbur also present.

- 13 changes of beneficiary were granted.
- 2 applications for membership rejected.

One application was referred for correction.

The following nine (9) applicants were accepted:

- B. H. Blank, A. Kaufman, J. C. Rising, New York, N. Y.; A. N. Rea, Brooklyn, N. Y.; S. P. Nichols, Palmyra, N. Y.; T. F. Thomp-

son, Newark, N. J.; H. A. Rolant, Phila., Pa.; R. E. Freeman, Norfolk, Va.; G. Mallet, New Orleans, La.

A special committee of three was appointed to consider any change of the Constitution that may be deemed advisable.

Dr. Edwin J. Howe was appointed Medical Examiner in Newark in place of Dr. Staehlin.

All proposed amendments to the Constitution should be presented to the Executive Committee by the next meeting on December 11, 1885.

Correspondence.

Chicago Notes.

To the Editor of the Jewelers' Circular:

The most important happening in the trade here for the month has been the organization of the National Association of Watchmakers and Jewelers. This is distinctively a retailers' movement for self protection, and is receiving the warmest endorsement of most of the leading jobbers. For years there has been a steadily growing under current of dissatisfaction among retailers at the indiscriminate way in which some jobbers were retailing at wholesale prices, and so driving them out of the market by dealing directly with the consumer. Appeal and remonstrance having proved futile, protection has been attempted by organization. Over one hundred and twenty retail jewelers gathered to the meeting at the Palmer House, at which the organization was perfected. In the early part of the meeting it was pretty clearly pointed out by several speakers that jobbers would sell and retailers buy where most to their interests, regardless of regulations to the contrary. Although the constitution of the new organization has not yet been issued, it is known that one of its leading provisions is an article binding members to buy of jobbers belonging to the association, or eligible to its membership. Some jobbers against whom retailers have harbored suspicions of doing quite a large retail trade at wholesale prices are among the warmest friends of the association. Both jobbers and retailers identified themselves with the movement, and officers were elected as follows: President, E. R. P. Shurly; Vice-President, J. J. Altpeter; Secretary, M. H. Berg; Treasurer, J. P. Wathier. Executive Committee: Otto Young, M. Ellbogen, C. H. Rowe, C. B. Shourds, L. F. Hussander. The association will concern itself with the rectification of all abuses that may have crept into the trade, and will make strenuous efforts in the direction of having the jewelry trade confined to jewelers proper, and not passed around to dry goods and hardware merchants and auctioneers.

It must not be thought for a moment that the action of this association is designed against such firms as Giles, Bro. & Co., who carry on both wholesale and retail departments. It is well known that Messrs. Giles keep their two departments entirely separate, doing no retail business in their wholesale department, and charging such prices in their retail department as are a protection to other retailers in both city and country. The practice observed by not a few city jobbers of retailing to consumers at the same price as they sell to country retailers had long been felt to be a serious injustice which cut directly at the roots of the country retail business. The patron of a country retailer in visiting the city would often be able to buy from a jobber at a much lower figure than the country merchant could afford to sell at. The countryman would naturally jump to the conclusion that his local jeweler was overcharging him and withdraw his patronage. If, however, jobbers abolish retailing to consumers altogether, and the latter were compelled to buy at such retail stores, for instance, as Giles, Matson, Rowe and other first-class retail houses, they would find that they were charged such prices as would make it no gain to pass by their local dealers.

At the close of the meeting of the National Association of Watch-

makers and Jewelers, Otto Young invited all present to sign a petition to the watch companies which would meet Nov. 13, asking them to sell only to jewelers employing a watchmaker and those engaged exclusively in the business, and to refuse to do any business with those who carried on an auction trade. The petition was largely signed, and Otto Young intimated that copies of the same had been largely signed throughout the country. It is understood that several of the watch companies have already signified their approval of the constitution and design of the new association.

Not less important to the trade at large was the meeting of the Sub-Committee of Manufacturers. The meeting was called specially to consider the matter of the Dueber "Champion" watch case. Mr. Dueber was perfectly willing to submit the matter to the committee, which, after consultation, designated a satisfactory list price for same. But the most important parts of the committee's work were two decisions that will regulate for the future all such matters as that of the Dueber case. The Association decided in the first place that no new article of manufacture shall be placed on the market by any member of the Association without the consent of the Association; and, secondly, they established their authority to fix the prices of all new articles. This action commends itself to manufacturers generally, and receives the heartiest endorsement of all branches of the trade.

A case of considerable interest to the trade at large was tried before Judge Smith in the Superior Court two weeks ago. Joseph Herzog, of New York, was plaintiff in a suit against Lapp & Fler-shem, of this city, with regard to a consignment of jewelry to W. T. Carinder, of Kansas City, which the defendants seized on account of a claim of their own against the consignee. The question at issue was whether the jewelry had been sold outright, or merely consigned to Carinder to be sold on commission. The jury decided that the goods were either sold, or at least so treated as to induce creditors to believe that they had been sold to Carinder, and gave their verdict in favor of the defendants.

W. A. B.

### A Magnificent Collection of Diamonds and Precious Stones.

THE LATE Mrs. Mary J. Morgan, wife of Charles Morgan, of Morgan steamship fame, was not only a great lover of diamonds and precious stones, but was a connoisseur in the matter of choosing them. Being blessed with abundant means to gratify her refined tastes, she succeeded during her lifetime in making a collection of rich and elegant gems that is scarcely excelled in magnificence and intrinsic value by any private collection in the world. Various importers and dealers in precious stones were, for many years, under instructions to secure certain gems for her if they were attainable, and, as a result, at the time of her death her collection was valued at about one million of dollars. In settling up her estate, the executors have found it necessary to dispose of the greater portion of this collection—indeed, it may be said that the whole of it is to be sold, for only a few articles of her jewelry have been retained by members of the family on account of the associations connected with them. They have been placed in the hands of Philip Bissinger & Co., of No. 22 John street, who are instructed to dispose of them by private sale in lots to suit purchasers. It seems a pity that a collection selected with such rare taste and judgment, containing so many gems of great value, some of them possessing historic interest, should be broken up and scattered, but, as it is hardly probable that any individual buyer will take them all, it seems inevitable that the treasures that have so long borne each other company should now be separated. The gems are now in the custody of Bissinger & Co., and will be cheerfully exhibited to intending purchasers.

It is not our purpose to give a catalogue of the gems that form this collection, but simply to call attention to a few of them. Some of the

most valuable diamonds are unset, and, as they sparkle among their wrappings, they are dazzling to gaze upon, and calculated to make the bosom of the observer swell with envy. There is one diamond in the form of a parallelogram, weighing over thirteen karats, an old gem of the first water from the Golconda mines called the Queen Catharine. It is most artistically cut, whereby it is given the appearance of greater size and weight than it actually possesses. Another unset old mine gem of dazzling brilliancy weighs thirteen karats, and still another twenty-five karats. There is a pair of exquisite Brazilian blue stones, very fine and desirable, an old Indian stone of great brilliancy, and various other unset gems of different sizes and shapes, that it would be impossible to duplicate. Nearly all of them are old mine stones of the first water. Among the gems in settings are a pair of diamond ear drops weighing thirty karats, uniform in size and of perfect luster; there is a lace pin consisting of a gold bar studded with small diamonds, pendant from which is a magnificent brilliant weighing twenty-five karats; a heart-shaped locket is simply a mass of diamonds, front and back, each side having a good sized gem in its center; another mass of diamonds is arranged in the form of a bow knot; there is one necklace of graduated diamonds, all large stones of the first water, that originally cost \$124,000; another necklace consists of a row of large diamonds of uniform size and shape, outside of which are rows of smaller diamonds; this necklace cost \$18,500, and the selection and matching of the stones was the work of years; an antique pin, in imitation of old lace, is composed of white gold and diamonds. Almost all the forms conceivable for personal decoration have been worked out in precious stones and are seen in this collection. One of the most elegant of these ornaments is an opal set, consisting of a central large opal oval in shape, surrounded with brilliants; pendant from this are three pear-shaped opals, also set in diamonds. These opals are all of large size and of the finest quality. There are ruby bracelets, where a large rich stone is set off by small diamonds, or a cluster of smaller stones gathers brilliancy from the association of gems; a large spider possesses a body made of a bright ruby and a rich brown diamond, while its legs are bespangled with small brilliants like drops of dew. Diamonds play the most important part in the collection of gems, in some instances being the most prominent feature of the article, while in others they are made subordinate to a giant ruby, sapphire or pearl. Mrs. Morgan showed an exquisite fancy in pearls as well, and in the collection there are necklaces of beautiful white pearls, artistically arranged and mathematically graded, bracelets, pins, ear rings and ornaments for the hair and neck as pure and chaste as innocence itself. In contrast with these there are necklaces of massive black pearls, rich and lustrous as they are massive, shining from their surroundings of sparkling diamonds like the face of an Ethiop maiden peering out from the folds of her turban. There is one complete set of black pearls, consisting of necklace, pin, ear rings and bracelets, in all of which a great lustrous black pearl is the central gem, to which small diamonds of dazzling brilliancy form a foil or background, to throw their merits conspicuously into the foreground. An attractive article is a small toilet hand glass beautifully enameled; around the glass are set a great number of pear-shaped carnelian cat's-eyes of exquisite beauty. But without further enumeration of special gems in this collection, we can truthfully say that it is unique, both in its intrinsic value and the grouping together of such an array of precious stones of such variety and elegance. Many of them could not be duplicated at any price, while the labor of matching some of them has extended over the greater part of a lifetime. It is safe to say that there is not in the world to-day another collection of such value and possessing so many rare gems that is for sale. This is an opportunity that connoisseurs should not miss. The executor of Mrs. Morgan's estate has left the matter of selling these gems entirely to the discretion of Messrs. Bissinger & Co., a firm well known in both Europe and America as dealers and experts in precious stones of all kinds. A better selection of agents to dispose of the collection could scarcely have been made.



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 CHAS. G. LEWIS.....Of Randel, Baremore & Billings.

EXAMINING FINANCE COMMITTEE.

JOS. STERN.....Of Stern & Stern.  
 CHAS. F. WOOD.....Of Chas. F. Wood.

*Counsel*, HON. ALGERNON S. SULLIVAN.

For further information, Application Blanks for Membership, By-Laws, etc., Address  
 P. O. Box 3277. 170 Broadway, New York.

THE REGULAR monthly meeting of the Executive Committee was held on the 13th inst., attended by Vice-Presidents Sloan, Hayes and Untermeyer, Treasurer Kimball, Mr. N. H. White and Secretary Champenois. The following applicants were accepted as members:

Atkinson Bros., Philadelphia, Pa.; Atkinson Bros., Baltimore, Md.; R. H. Ryer, Concord, N. H.; T. D. Bradley, Carbondale, Pa.; H. F. Legg & Co., Minneapolis, Minn.; Samuel Myers, Schenectady, N. Y.; W. W. Rudisill, Altoona, Pa.; P. J. Smith, Cumberland, Md.; Andrew E. Veon, Brainerd, Minn.; F. F. Ward, Mt. Vernon, Ohio.

Proceedings of the Horological Club.

A DISTINGUISHED BODY OF WATCH AND CLOCK MAKERS.

One hundred and thirty-seventh discussion.—Communicated by the Secretary.

[NOTICE.—Correspondents should write all letters intended for the Club separate from any other business matters, and headed "Secretary of the Horological Club." Direct the envelope to The Jewelers' Circular Publishing Company, Seth W. Hale, President. Write only on one side of the paper, state the points briefly, mail as early as possible, as it must be received here not later than the eighth day of the month, in order to be discussed and reported in THE CIRCULAR for the next month.

WATCH REPAIRS BOOK.

Secretary of Horological Club:

The "Proper way to Number Watches in the Book of Repairs," considered by the Horological Club in September, attracted my attention, and, as I have been a subscriber and reader of THE JEWELERS' CIRCULAR for eight years, and have not, during that time, expressed any ideas through your columns, allow me to do so now if you think it will be for the benefit of the fraternity. My way of keeping a record is as follows: In the first place I buy small sheets of paper done up in pads of 100 sheets for 3c. per pad. One of these pads is always on the bench. On examining each watch carefully, I record on the pad the condition of each part of the movement (or case) that is out of order, then tear off this sheet and put it on file until the day's work is over, when I copy all the examinations from these sheets into an examination book which keeps the record permanently. My record book is more complete than any other I ever saw or heard of, and is ruled as follows: Job No., Date Received, Name of Owner, Description of Movement, Maker of Movement, Movement No., Description of Case, Maker of Case, Case No. These columns take up a page 10 inches wide. On the opposite page are the following: Date Repaired, Work Done, Examination Book No., Warranted or Not, Charges, No. When Last Repaired, To Whom Delivered, Date Delivered. This makes a very complete record. I then mark with a fine point, under the edge of back case of watch, the initial B, followed by the number of the job as recorded. I have been subpoenaed three times within the last four years to identify watches, which I do by *my own number and mark in the case*, though the remaining description as recorded would be thought sufficient by any reasonable jury.

Some of the brotherhood may think it too much trouble to keep a

record of this kind, but my experience is that it pays well, if only used to protect one's self against unprincipled people for whom you have executed some slight repairs. Every watchmaker knows what this means without my enlarging on the subject.

I may, some other month, write you a few of my methods of job work, etc., and in the meantime thank you for the space occupied.

Yours truly, CHAS. H. BARKER.

Mr. Clerkenwell said that Mr. Barker's method of recording work was about the most thorough and complete he had heard of, and he could heartily endorse all Mr. B. had said about its value, except about the copying of the examinations. The majority of men would not care to do any more writing than they were really obliged to, and he would suggest, instead of copying those examination slips into a book, that he file and preserve the original slips as long as he might think it desirable. He could first, with a shoemaker's punch, punch a hole through the whole pad at the top, and, when writing the examination, each pad could be numbered and dated, then strung on a wire ring for preservation. As they would be thus filed in numerical order it would be very easy to find any number or date desired.

His own way of dispensing with such slips was to put in the repairs book not only what was done, but also to record [in brackets] repairs which were *needed but not done*. For instance, if a customer wanted a mainspring and nothing else, the workman should inform him of any other parts injured or out of order, and that he would *only warrant the mainspring*, but leave the customer to take his own risk of the other points causing the watch to stop. Then record it: "New mainspring." [Watch very dirty; upper balance pivot badly bent; upper balance cap jewel broken]—or whatever the trouble might be. Then, if the customer came back complaining that his watch did not go, show him that you told him it needed other repairs but he had declined to have them done. If candidly and pleasantly talked to, he would probably now have the watch cleaned and repaired. In whatever way it may be done, the things that *ought* to be repaired but *are not* should always be put on record for the workman's own safety. It will "pay well," as Mr. B. says. We hope to receive the promised notes on job work, and shall always be glad to receive such items from all who have new and superior ways of doing work, handy tools and attachments, or information on any points of interest to the trade.

LOOSE JEWEL REVOLVING IN DIRECTION CONTRARY TO ITS PIVOT.

Secretary of Horological Club:

I must bow my head in humble submission to Mr. Moss, and humbly ask his pardon for disputing his word on the loose jewel question. I am myself afflicted with the disease of *optical illusion* that I accused him of a short time ago. I have now in my possession a watch with a loose jewel which actually turns backward when the train is running down rapidly. It is a Swiss cylinder escapement watch, the loose jewel being over the escape wheel pinion. The watch came into my hands in the way of trade about three years ago. I took it a few days ago to repair and fix up for sale, and when taking it apart for repairs I found the jewel of the escape wheel on top to be loose in its setting. I instantly thought of Mr. Moss' theory, and concluded to try the experiment even at the risk of breaking a pivot. So I wound the spring up to its full extent, then let loose the train and watched for the result while running down, when, to my great surprise, I saw the loose jewel actually turning backwards. So I tried and tried again with the same result, and this, too, without any oil on the pivot. I then put some oil on and tried again, when the jewel seemed to move a little faster than before. All this time the plate of the watch lay horizontal on the bench. I then took it and tried it at every conceivable angle up, from horizontal to perpendicular, and then rolled it over in its vertical position, all around, the train still running rapidly, but the jewel moved backward in every position in which I placed it. I then took off the bridge and steeped it in benzine to take away the oil I had put on. When the oil was all off I put the bridge back to its place and tried it again, still with the same result. As near as I can observe, the jewel moved backwards about four times in a second, while the escape wheel was running forward at least five hundred times or more in the same time.

I also observed by winding the spring up to its full extent (the stops are not in the watch), and letting it run down at full force, that

in one instance the jewel turned backward sixty-one times during the time the train was running down, at another time seventy two times, and at a third trial seventy-four or five times, as near as I could note its movements. I also took the watch and held it over my head, and looked up at the jewel while the train was running down; the jewel moved the same as in the other positions. I noticed that the side shake of the pivot is pretty large, and I think the hole in the lower jewel is not round but a little oval, as if worn by the pivot. The elongation of the hole is in the same direction as a radius drawn from the center hole in the plate through the jewel hole to the circumference. I have been thus particular in describing the conditions in order to give the Club full details so as to find a cause of this effect, for there certainly must be some cause, whatever it may be. If it be an optical illusion it is indeed a very remarkable one. I have applied all the rules and laws of mechanics, including the laws of the composition and resolution of forces to the solution of the problem without any satisfactory result.

I will hold on to the watch to show to any of the craft who may come along to see it for himself.

H. L. LOUGHLIN,  
Cheraw, S. C.

Mr. McFuzee inferred, from the date of Mr. Loughlin's letter, that he had not received the November number of THE CIRCULAR, containing our discussion of this question, in which it was recommended to make two tests—one, of the poise of the scape wheel, the other, of the manner in which the jewel moves in its setting. In the present case, with the scape wheel revolving at the rate of "at least 500 times" per second, it would be difficult to see any such shaking motion of the jewel. But probably the jewel would move backward even if the train did not run down quite so rapidly as just described, and slowly enough to allow of seeing whether the jewel was shaken backward or forward, from one side of the setting to the other and *vice versa*, or was rolled around the inside of the setting.

Mr. Loughlin says that the jewel revolved backward from 60 to 75 times while the fully wound train was running down. Allowing that the movement would run for 30 hours or thereabout, that would be two turns of the jewel to one turn of the center wheel (corresponding to one hour of time), which would require several hundred revolutions of the escape wheel for two of the jewel. This would rather be unfavorable to the supposition that the jewel was rolled around in constant contact with the inner surface of the setting, as there would probably be more difference between their circumferences than this speed of the jewel would indicate. If the jewel was even moderately loose in its setting, we might suppose that it would be so much smaller than the setting, that it would make one backward turn to every twenty or thirty times rolling around in the setting—whereas, it required at least ten times that number. Mr. Loughlin could easily find how many times the jewel must be rolled around in the setting in order to move backward one turn, by trying it with a fine needle point in the jewel hole. We can double this number to allow for slipping, etc., and if that product is not something near the number really observed, then we must begin to doubt the rolling theory and incline to the supposition that the jewel is *shaken* or thrown about in the setting by the action of the rapidly revolving fourth wheel upon the pinion of the escape wheel.

He had hoped to receive another note from Mr. L. before the meeting, giving us the results of the tests suggested during our last discussion, especially as to whether the escape wheel was greatly out of poise or not. If it was not we would probably have to abandon the rolling contact theory, at least so far as regards a continuous contact all around the setting. He trusted we should hear from him before our next meeting, with full particulars on all these points. We would also like the views of any of our readers who may have some theory different from those already put forward.

#### DEMAGNETIZING WATCHES.

##### Secretary of Horological Club:

I see notices in THE CIRCULAR of movements with anti-magnetic shields, to protect them from being magnetized. But can you tell me what to do with an ordinary movement which is already magnetized—some simple way that I can do myself?

W. G. R.

Mr. Electrode said there was no "simple" way of taking the mag-

netism thoroughly out of the steel parts of a movement. If it is a valuable movement, it had better be sent directly to Mathey Bros. & Mathez, 16 Maiden lane, New York, or to Giles, Bro. & Co., Chicago, who will remove the magnetism by a special machine for the purpose.

He had heard a "simple" method of demagnetizing watches suggested at a meeting of the New York Electrical Society, by the use of a "dynamo." As watchmakers do not keep dynamos in stock, or use them around the store (at least they don't if they know what is good for them), this cure is not so simple as it seems. It was to suspend the watch at the end of a string, twist the string up tightly, let the watch hang near the poles of a dynamo, let go the string, and while it is untwisting, and the watch is whirling rapidly, gradually remove it from the dynamo.

No doubt this will make a watch "go," which was so badly magnetized that it could not keep any time at all, but as for really *removing* the magnetism, so that it would be entirely freed from that obstacle to good time-keeping, he thought it doubtful. But as there are electric light plants now in so many cities and towns, whoever has a bad case, that is "dead" or might as well be, can try this "remedy" if there is a dynamo handy. But he must remember that holding the watch near the poles of the machine will magnetize it thoroughly, and if the medicine should not happen to cure it, for any reason, it will be as "dead as a door nail."

The theory of the operation is, that when the watch is held in one position near the dynamo, the steel parts of the movement all become magnetized in the same direction, viz.: If held near the South pole of the machine the steel parts will have the ends next to the machine all magnetized North, and the further ends will be South poles. Now, if the position of the watch is reversed, so that the side which was away from the machine is brought nearest to it, the magnetism of all the steel parts will be reversed—the former North poles will become South, and *vice versa*. Of course, there is no gain in that. But if the watch is moved a little away from the machine at the same time that its position is reversed, its magnetism in the second position will not be quite so strong as it was in the first. All the little partial magnetizations in the various steel pieces of the movement were overcome, and all the pieces were magnetized in the same direction while in the first position. This magnetism was practically wiped out and replaced by an opposite and weaker magnetism in the second position, and at every reversal of position the magnetism is reversed and weakened by withdrawing the watch from the machine, until it gets beyond the influence of the machine, when it is supposed to be practically free from magnetism.

In the case of the string cure, the string must be warranted to keep twisting at a 2.40 gait until the watch gets a rod or more away from the dynamo, for if it should get out of breath and stop to rest while the watch was only a yard or two from the machine, the operation would be a failure. On the other hand, the watchmaker must not carry it off too rapidly, for if the watch is moved too far between the first and second positions spoken of, the first magnetism will not be entirely removed during the reversal of the watch, the effect of each subsequent reversal will be imperfect, and the job will be only partially done, and must be all done over again. This slow removal is most important when nearest to the machine. He should start away to slow music, about as if he expected his mother-in-law or the butcher's bill was waiting for him at the door, gradually increasing his speed in arithmetical progression, until he gets to a safe distance from the machine, when he should make tracks for the shop. If there are any more dynamos in buildings or under sidewalks on his route, he would do well to take to the middle of the street, so as to keep out of their influence. Also, keep away from electric light men, lightning rod peddlers, and everybody afflicted with "personal magnetism," until the watch is securely locked up in the safe, whence it should only be removed for winding and regulating.

This "personal magnetism" is not said for a joke, for it is really the case that many people have magnets about them, and the watch-

maker should particularly guard his own person against such a fault, which would be a very serious matter in his business. Before going to the dynamo he should remove every article of iron and steel, such as keys, knife, chain and swivel, suspender buckles; buttons, spectacles, etc., etc. Even the spring in his hat rim or in the instep of his boot is dangerous. If he neglects this precaution every such article will be strongly magnetized, and he will become a veritable walking battery of magnets, contaminating every steel thing he approaches. The effect of such a collection of magnets upon the running of a watch in a man's pocket can easily be imagined. This is the only "personal magnetism" that can affect its running, but it is much more common than is supposed, and the evil is daily increasing as electrical apparatus are more widely introduced. Electricity is a "big thing," but it is going to play the dickens with the watches. In fact, it can already be clearly foreseen that the watch of the future must either be provided with means for protecting it from magnetism, or else it must be so constructed that it can neither be magnetized nor disturbed by magnetism. It is not likely that the coming man will be any less precise and particular about the accuracy of his timekeeper than is the *genus homo* of to-day, and it is certain that the present styles of watches are absolutely worthless for timekeeping purposes in any place where modern electrical apparatus are common. Manufacturers would do well to take these things into consideration, and prepare for the change.

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### The Cleaning of a Watch.

**M**ANY METHODS and agents: Benzine and alcohol, cyanide of potassium, etc., are used for cleaning watches, and the horological press occasionally publishes a batch of new ones, so that the practical workman has every reason to look forward to the time when the movement need no longer be taken down, but is cleaned, lubricated and burnished up while the customer is waiting in the shop. But while we anxiously await the invention or discovery of this new method, let us meanwhile discuss, perhaps, the oldest and unexcelled—the washing in soap and water. The washing with a soft brush, warm water and an easily foaming soap is unsurpassed for the gilt parts, as well as the mat ground steel parts of a watch. After washing, the parts are only rinsed in pure alcohol, which dissolves all the particles of soap still adhering, and they are finally dried in sawdust. The original luster is hereby restored to the gilding, and it is necessary merely to lightly dab the pieces with a clean brush and to clean the holes.

Some of our readers will rejoin by saying that this method is too tedious; this is true of shops where the several agents necessary are not at disposal. Every shop should contain a wash table, with alcohol lamp and a small light copper kettle in which to heat the water over the flame. Cold water can also be used, but this will not take off the old oil.

The steel parts are most suitably cleaned in benzine and dried in sawdust. Polished brass parts must previously be retouched with the buffstick.

When all the parts have been taken out of the sawdust, they are finally cleaned in the order in which to be mounted in the movement, so that each cleaned part is at once located in its place upon the plate.

The pinions must be thoroughly cleaned with the pegwood. The burr created by the riveting must be pushed through with the broach so that the pinion can be ocularly inspected to see whether it is clean or not. The cylinder, also, is rubbed off with the pegwood both from within and without.

The wheels, and more especially the delicate parts, must, after cleaning, be scrutinized with the magnifier so as to be satisfied that

no brush hair or other disturbing element has lodged anywhere. A hair is apt to lodge itself in the slit between the plate and the lower cylinder bridge, and, when transparent, it is easily overlooked. When this hair comes in contact with one of the escapement parts, it naturally will give rise to a very injurious disturbance.

When the plate has been cleaned and the cap jewel plate screwed in place, I clean first the fourth wheel, screw the bridge on, and satisfy myself of the correct end shake and the perfect freedom of the wheel; the third and center wheels are then mounted; the pivots of the latter wheel is lubricated, the center staff is put into the canon and the canon pinion is broached.

Some workmen will, after the fourth wheel, mount the scape wheel, and, if the fourth wheel is without seconds pivot, they begin the mounting with the cylinder scape wheel, as the freedom of this wheel is of great importance.

I think that my method is preferable, because it will happen that after the fastening of the canon pinion a pinching of the center wheel will occur. Such a pinching is, in the absence of the scape wheel, far more easily seen and changed. An accidental trembling of the center staff, also, is more easily corrected.

When the scape wheel has been mounted, and its shake found correct, investigate the smooth action of the train in different positions, by occasionally exerting a slight pressure against the center wheel.

The cylinder bridge is then put together, and the cylinder, with spring, is fastened to the bridge. These parts are put together without oil, and examined whether everything is in thorough order. Only when the cylinder shake, the balance spring, and the drop has been arranged, put oil into the sinks. If too great a quantity is applied, so that it overruns the jewel, the oil will, by capillary action, draw away from the spot where it should be.

When putting together the barrel parts, never forget to lubricate the clickwork, more particularly that of the going barrel, as the injury occasioned thereby would soon show itself. The mainspring is to be lubricated only slightly. The stopfinger should always be fastened with a steel pin; it is more securely retained thereby. The barrel is mounted in the plate, and the spring is wound a few teeth to apply oil to the escapement.

I am of the opinion that it is best to apply a small portion of oil to each cylinder wheel pivot, while other workmen prefer to place a small drop of oil in the cylinder.

The oil placed in the cylinder draws at once to the surface of the plug, and outside of the cylinder up to the collet. It therefore may happen with long cylinders that the teeth receive little or no oil. With short ones it is immaterial in which manner the oil is applied to the escapement, as it will in every case draw upward, because the wheel teeth come very near to the plug surface.

Before the movement is set into the case this must be well cleaned within, because even new cases contain particles of dust and remnants of crocus. The case springs must invariably be taken out and cleaned; a large quantity of filth will often be found round about and behind them, which, if not removed, would fall into the movement. Do the same with the push button.

Only when the movement has been fastened in the case do I apply oil to those pivots which still can be reached. The minute wheel pinion, also, must be slightly moistened, because the pinion runs upon a steel pivot; therefore two steel parts lie against each other, which is apt to engender rust. A spreading spring will generally be necessary for the hour wheel, if the correct shake is not produced itself by the minute work or the hands themselves.

When the hands have been mounted the watch is ready for service, and only requires timing. With a cylinder watch it is well not to put the regulator entirely on "fast," because every such watch, after the course of a few months, has an inclination to lose, and the regulator must stand so that a subsequent difference of rate can be corrected.

The timing of a watch requires so much expert skill that we omit describing it.

## Foreign Gossip.

**PRECISION.**—In a discourse lately delivered by an Irish Wesleyan preacher, he informed his congregation that in future their annual collections would be taken up quarterly.

**FREAKS OF LIGHTNING.**—During a severe thunderstorm a flash of lightning struck the steeple of a church in Glauchau, Germany, deliberately destroyed the quarter-stroke arrangement, because it was too noisy, perhaps, and then passed into the ground without doing further damage.

**SCENE IN A JEWELRY STORE.**—"What kind of a chain would you like?" Customer—"Well, I don't know, hardly. What kind of a chain do you think I ought to have—that is, what style would you think would be the most becoming for a young man who carries groceries to some of the best families in town?"

**THE WASHINGTON TELESCOPE.**—The second largest telescope in the world is the one standing in the Marine Observatory of the city of Washington. The precious instrument, however, stands underneath a cupola of wood and pasteboard, which may during any little storm be demolished, and fall upon the instrument below and destroy it.

**DEATH OF A WEALTHY MAN.**—The wealthy silver manufacturer of Moscow, Chlebnikow, who suddenly died while traveling in a separate railroad car from St. Petersburg to Moscow, has been murdered, according to the autopsy. He was seen with a large sum of money the day before his death, and when found dead he had only 100 roubles about him.

**ONE OBJECTION TO THE 24-HOUR DIVISION.**—The division of the dial into 24 hours is all well enough, and perhaps appropriate to the age which, with ruthless hand, tears down all the old cobwebs hanging around fossilated "old time," but when a slow-striking steeple clock reverberates the 24th hour of midnight upon the stilly midnight air, with six seconds between each stroke, the plan looks to us rather objectionable.

**LARGE VALUE FOR A GLASS.**—A foreign art collector, says an exchange, lately offered the enormous sum of 70,000 francs for a Venetian chalice-glass of the 15th century, and belonging to the celebrated collection of Wallraf, exhibited in the museum of Cologne. According to the testamentary provisions of Mr. Wallraf, the sale of any one piece belonging to this collection is prohibited, and the testamentary executors, in view of the great value of this glass, as well as of various other articles, have concluded to enclose it at night in a burglar proof safe.

**THE OTHER SIDE OF THE QUESTION.**—A philosopher propounds the startling query—"What objections can really be urged against criminals, say burglars?" This class of useful citizens, he says, gives, until caught, employment to innumerable telegraph operators, policemen and detectives, frequently, also, to coroners and physicians. When apprehended, what an array of lawyers, judges, jurymen, turnkeys, sheriffs, and newspaper reporters, all of which earn their living by reason of the presence of said light-fingered gentry. Really, the criminal confers more benefit than injury on mankind, and should be rewarded.

**BLACK FOREST ART WORK FOR CHINA.**—Lamy Sons, of Furtwangen, have lately placed on exhibition a complicated specimen of Black Forest handiwork, in the shape of a clock, ordered by a Chinese mandarin. Two birds are enclosed in a tower at the foot of the dial, one of which sings at the half-hour, the other at the full. Two other birds roost in a tower above the dial, one of which sings at one-quarter, the other at three-quarters of an hour. The full-hour bird warbles a Chinese air. The train contains a quarter-hour work, which effects the unlocking of the birds. The mechanism works to a charm, and the whole clock is painted in the Chinese colors.

**SLANDER.**—Foreigners, in spite of the rich harvest they gather every year from our sight-seers on the continent, with more money than brains, seek every opportunity to ridicule them. The following is from the Paris *Figaro*:—"A Yankee (every American is a Yankee in their eyes) visits his sick friend in the hospital, and his first question naturally is, 'How do you find yourself?' 'Very bad, my dear Tom; I feel very sick. The doctor tells me if I were to attempt to turn upon my left side it would kill me at once.' 'You want to fool me.' 'No; really, Tom, you may believe me.' 'It cannot be possible.' 'What! do you not want to believe me? I bet five dollars that it is true.' 'Done.' When the money is deposited the sick man says—'Well, see for yourself,' turns over on his left side, and dies on the instant. The visitor deposits the five dollars lost on the counterpane, and sorrowingly goes away."

**EYESIGHT OF WATCHMAKERS.**—It is popularly supposed that the use of the magnifier is very injurious to the watchmaker's eyesight. This erroneous supposition is not correct, however. The oculist, Dr. Hermann Cohn, of Breslau, in 1869 examined 73 watchmakers, and ascertained that barely 5 per cent. were short-sighted. The same oculist lately examined another 50 watchmakers, working in Becker's factory, at Friburg, who use no magnifiers, and for a number of years already work the fine parts of the watches, and found only two short-sighted among them, who nevertheless possessed a fair degree of acute sight (0.5 and 0.75). Upon the strength of these results, Dr. Cohn thinks that he is justified in concluding that horology is not injurious to eyesight. Among students he found 56 per cent., type setters 51, and lithographers 37 per cent. of short-sighted persons. It therefore appears that reading, writing, and drawing are more injurious to the eyesight than the scanning of near immovable objects.

**GOOD GRAVERS.**—To a question asked, the Austro-Hungarian *Uhrmacher-Zeitung* answers as follows:—"We have been informed by an undoubted authority that the best gravers for turning tempered steel articles are manufactured by Jacques LeCoultre aux Sentier, Vallée de Jaux, Vaud, Switzerland. It is said to be next to impossible to obtain anything from this manufacturer, as his gravers are in universal demand all over the country, and the material houses have to wait in their turn until their orders are filled. At the time of writing this we have before us three of his gravers, and, to judge of them from external appearances, they are, to say the least, of an uncomely shape, and any one not knowing their character would consider them to be the refuse of the market—the work of an apprentice who is learning the art of filing. But test their edge on glass or hard steel, and you will at once arrive to the conclusion that you are dealing with an extraordinarily good article, one that will cut the hardest of steel as easily as if it were wood.

**CURIOSITIES OF COMMERCE.**—Roughly estimated, perhaps two-thirds of everything manufactured is for the comforts of our women, God bless them. Among the "curiosities of commerce," none, perhaps, is more curious than that the major portion of the produce exported from South Africa is simply used for the adornment of ladies. Out of a total value exported of £7,500,000, ostrich feathers and diamonds account for £5,000,000. Twenty years ago all known diamonds had come to Europe or the United States from immemorial Eastern stocks, or from the scanty produce of mines in Brazil and elsewhere, which was calculated to yield not more than £50,000 worth in the year. To-day, situated in the midst of a wide, stretching plain, affording at all points a sea-line horizon of flat "veldt," we find this town of Kimberley, with a large European population of wealthy and well-to-do people, and a large native population earning every year more than £1,000,000 in wages. And from this mining oasis in the agricultural desert has been sent in the last fifteen years something like £40,000,000 worth of diamonds in the rough, which, with the cost of cutting, setting and selling, must have taken from the pockets of consumers something approaching £100,000,000.

## Workshop Notes.

**TO DRILL GLASS.**—M. Gougy, of Paris, recommends that a three cornered saw file be sharpened in the usual way, but with one corner taken off, so that the cross section of the drill near the point is that of a truncated cone, and the end of the drill is of a narrow chisel shape.

**TO CLEAN CORALS.**—The following is an efficacious way for cleaning corals: First soak them in soda and water for some hours; then make a lather of soap, and, with a soft hair brush, rub the corals lightly, letting the brush enter into all the interstices. Pour off the water and replace with clean. Finally dry in the sun.

**PASTE OR GLUE FOR PAPER LABELS.**—It is said that the following preparation is very useful for making a first-class mucilage for gumming large sheets of paper, which may be kept on hand ready for use. When wet they will stick well on glass: Starch, two drachms; white sugar, one ounce; gum arabic, two drachms; to be boiled with a sufficient quantity of water.

**OILING ANCHOR ESCAPEMENT.**—Never oil the fork of the lever. Oil on this part will do more harm than good, especially if it is correctly poised. The lever pallets require it sometimes, if of a low grade watch; those of finer movements should not be oiled. It is a matter of judgment for the intelligent watchmaker; if he thinks that a little oil will improve these parts, let him do them very slightly, barely perceptible with the glass.

**SOLDERING FLUID.**—The ordinary "soldering fluid," or "acid," used by tinsmiths and others, answers a very good purpose in preparing small articles to be electro-plated or plated. In spite of the best efforts of the amateur, the work will sometimes "strip" or peel off. But if the article, after having been cleaned, is washed over or dipped into this "acid," the coating applied will be found to stick as effectually as it does in soft soldering.

**TO HARDEN CASE SPRINGS.**—In order to harden case and other pressure springs, they should first be heated, then rubbed over with soap, next heated to a cherry red (not a white, because the steel would burn), dipped quickly in petroleum and annealed light blue; in place of oil rub them over with tallow, let it smoke off and cool on the annealing sheet. The tempering and smoking off are best done outside the workshop as a bad smell is created thereby.

**TO REMOVE SOLDER STAINS.**—The removal of solder stains, to a certain extent, depends on the nature of the article you are soldering. If you are soldering gilt metal, German silver or silver, you may scrape it off. If you use pickle you will leave a stain that will require to be polished off. If you are soldering bright gold you can use pickle rubbed on with a cork. With colored gold it would be better to use a little color. Pickle is merely nitric acid and water in the proportion of half a gill of acid to a pint of water.

**TO LAY A BALANCE SPRING.**—Many of my comrades will often have lost their patience when laying a balance spring, a piece of work generally done upon a sheet of white paper. The shadow of the spring will hereby invariably be right underneath the spring and assist in confusing the watchmaker. A far better plan is to take a flat watch glass and upon this lay the spring. The shadow will hereby fall to one side and the contours of the spring will be clearly visible. I have used this method for some time and am fully satisfied with it.

**CENTER OF GYRATION.**—That point in a rotating body in which the whole of its energy may be concentrated is called its center of gyration. A circle drawn at seven-tenths of its radius on a circular rotating plate of uniform thickness would represent its center of gyration. The moment of inertia or the controlling power of balances varies as their mass and the square of the distance of their center of gyration from the center of motion. Although not strictly accurate, it is practically quite near enough in the comparison of balances to take their weight and the square of their diameter.

**TO TEMPER A COILED SPRING.**—The country watchmaker, more so than his city confrère, is sometimes called on to temper a soft spring. This can be done by preparing a lead bath, that is, a quantity of lead in an iron pot, raising it to such a heat that the lead is red. Into this plunge the spring, and keep it therein for a sufficient length of time; then, when hot enough, quickly plunge into cold water or lard oil. It next becomes necessary to give it the right temper, which is done by dipping the spring in a small vessel of boiling linseed oil for a few seconds, and then in cold oil.

**TO PUT A DUPLEX INTO BEAT.**—A duplex may be gotten into beat by noticing when the balance is at rest that the notch in the ruby is about half way between the line of centers and the locking tooth; I say about half way between, because the duplex, like all other escapements, varies considerably in construction, but this rule is near enough for most kinds, as the operator may soon tell by listening closely to the ticking of the watch and altering the balance spring either way. When the balance is started from its rest, it will have to move about ten degrees before the locking tooth is brought into action.

**REMOVING THE BALANCE SPRING FROM STAFF.**—The best method of removing the balance springs and collet from the balance staff without injury, is to take them off with a pair of long-nosed diagonal cutting pliers, having the jaws run out pretty well from the handles, and at their ends no thicker than a pen knife blade. The jaws are placed under the collet, which is lifted off by bringing them together, aided by a slight wiggling of the handles. But the ordinary cutting pliers with thick jaws are entirely unfit for this purpose. It would be better to pry the collet off with a thin knife blade, used alternately on different sides, so as to raise it equally and keep it level, to avoid springing it apart and making it loose.

**THE TIERS-ARGENT (ONE-THIRD SILVER).**—This alloy is much employed in the factories of Paris for the manufacture of silverware. As is indicated by its name, it consists of one-third or 33.33 per cent. silver, and 66.67 per cent. aluminum, and is worked to great advantage, both by reason of its cheaper price (the kilogram [43 ounces, 3 dwts.] costing about 90 francs) and its superior hardness; at the same time it is more easily pressed and engraved than the silver-copper alloys. If our inventors should ever be so successful as to discover a practical method of manufacturing aluminum, its general introduction is unquestionable, and its alloy with silver will enter into everyday use for household and table utensils.

**TO RESTORE THE COLOR OF A NICKEL MOVEMENT.**—A correspondent in the *Journal Suisse d'Horlogerie* recommends the following method for restoring the pristine beauty of a nickel movement: Take 50 parts of rectified spirits of wine, 1 part of sulphuric acid and 1 part nitric acid. Dip the pieces for about ten or fifteen seconds into this bath, then rinse them in cold water and throw them in rectified spirits of wine. Dry them with a piece of fine linen or in sawdust. Nickel, and the majority of other metals which are liable to tarnish, may be restored to their original color by dipping them in the following bath: Dissolve in a half a glass of water 6 or 7 grains of cyanide of potassium; plunge the pieces in this solution and withdraw them immediately. As the cyanide mixes well with the water, it is sufficient to rinse them at once in the latter to destroy any traces of the cyanide. After this, dip the pieces in spirits of wine, and dry them in boxwood dust in order to keep them from rusting. The balance, even with the balance spring, may be subjected to this operation without any danger. If the pieces to be restored are greasy, they must be cleaned in benzine before being dipped in the cyanide, because it will not touch grease. Cyanide of potassium being a violent poison great care must be exercised, and the operation should be performed in a well ventilated place. The same bath, preserved in a bottle, may be used for a long time.

## Trade Gossip.

A. B. Rees & Co. succeed N. B. Rees, Lincoln, Kan.

A. J. Green has moved from Grafton to Oxford, Neb.

Kloster & Tosseland succeed N. Tosseland, Huxley, Iowa.

J. C. Lee succeeds Mrs. J. M. Reynolds, Gouverneur, N. Y.

David Ford succeeds the firm of Bosser & Ford, Strong, Kan.

H. L. Rost succeeds the firm of H. L. Rost & Bro., Columbus, Ind.

Wm. H. Just, New Britain, Conn., has retired from the jewelry business.

Chas. O. Rhoden succeeds the firm of Rhoden & Hansen, Sioux City, Iowa.

Mortimer J. Vincent succeeds the firm of P. Dower & Co., Syracuse, N. Y.

Mr. M. A. Raunbolt has removed from Harrodsburgh, Ind., to Shelbyville, Tenn.

The firm of Walker & Vaughan, Los Angeles, Cal., is succeeded by Hawkford & Co.

James H. Fairbanks has purchased the business of H. E. Woodberry, Gardner, Me.

J. C. Miller, Marshalltown, Iowa, has admitted his son to partnership under the firm name of J. C. Miller & Son.

E. Ira Richards & Co. have introduced for the holiday trade a very fine line of Queen vest chains in rolled plate.

The Brooklyn Watch Case Co. and Joseph Fahys & Co. have jointly opened an office in Cincinnati at 175 Vine street.

A new line of white stone goods with registered trade mark "Crown," will contain a new white stone called the "Crown Diamond Cut."

Mr. James J. Fisher, 695 and 697 Broadway, keeps a full line of watchmakers' and jewelers' material, and will promptly attend to job work for the trade.

Mr. Sylvester Hogan, Cleveland, O., prominently known in the trade for many years, has determined to retire from active business, and is now engaged in closing up his affairs.

Messrs. Hecht & Muller, opticians, have removed from Newport, R. I., to No. 295 Fifth avenue. Mr. Hecht was formerly a partner in the firm of Levy, Dreyfus & Co., of this city.

Mr. August Oppenheimer, of Oppenheimer Bros. & Veith, sailed for Europe in the steamer *Eider* on Nov. 18. H. S. Oppenheimer accompanied him and will remain abroad for two years.

Mr. S. M. Griswold, of No. 18 John street, will represent the Third Senatorial District of Brooklyn in the Legislature this winter, he having been elected by a handsome majority at the recent election.

Keller & Untermeyer have leased offices in the new building No. 41 and 43 Maiden Lane, just erected by Charles Knapp. They will not move, however, from their present location, No. 9 Maiden Lane, until after January 1.

The trade will find a complete stock of goods manufactured by the New Haven Clock Co. in their several stores, 31 Washington street, Chicago, Ills., 21 Franklin street, Boston, Mass., and 16 to 18 Park Place, New York.

Mr. Charles L. Abry continues to represent in this country the Vacheron & Constantin watches manufactured at Geneva. These watches have been in the market a number of years, and are well and favorably known to the trade.

Mr. Frank S. Ogilvie, with John W. Steele, has composed a waltz called "Golden Cord," dedicated to Mrs. A. W. Tenney, wife of the ex-U. S. District Attorney, of Brooklyn. It is said to be an excellent composition and creditable to its author.

Austin & Prescott have purchased the stock and fixtures of Jerome A. Clark, deceased, of Batavia, N. Y. They were both employees of Mr. Clark, the former being in his employ for twenty years and the latter over ten.

The jewelry factory of Rothschild Brothers, corner of Mulberry and Chestnut streets, Newark, was robbed of 26 unfinished gold lockets Nov. 12. An employee who left the factory suddenly was suspected of being the thief.

The establishment of Mr. H. A. Brahe, of Augusta, Ga., has been purchased by Mr. William Schweigert, of that place. The new proprietor is refitting and improving the place, and proposes to make it one of the most attractive jewelry houses in the South.

Pforzheimer, Keller & Co. have purchased from the American Watch Co. all their 8 size "Riverside" adjusted movements, cased in fine engraved and decorated gold cases, which they offer with their other specialties for the holiday season at reduced prices.

Mr. Bennett W. Ellison, formerly of the firm of Ellison & Vester, long and favorably known in the trade, was married Nov. 10 to Miss Mamie R. Dowling. Congratulations from members of the trade were showered thick and fast upon the happy couple, to which we beg to add our own.

J. W. Ruth, of the firm of J. W. Ruth & Son, of Shelbyville, Tenn., was recently elected Mayor of that city by a handsome majority. We congratulate Shelbyville on having secured so excellent an executive, and extend to Mr. Ruth our condolences for the thankless task he has assumed.

Among the gentlemen who favored us with a pleasant call recently were C. A. Shafer, of Harris & Shafer, Washington; F. W. Brooks, of Ithaca; N. Brigham Hall, Treasurer of the Cheshire Watch Company, of Cheshire, Conn.; C. P. Eldred, of Honesdale, Pa.; J. H. Crosby, Jacksonville, Fla.; and J. P. Stevens, Atlanta, Ga.

Mr. J. P. Stevens, of Atlanta, Ga., has sold his interest in the firm of J. P. Stevens & Co. to David N. Freeman and Mrs. Fannie Iverson, who will continue the business under the firm name of Freeman & Co. Mr. Stevens has leased the store No. 47 Whitehall street, and will continue business with an entire new stock which he recently purchased in this city.

Last spring a salesman named Vernon C. Clark, in the employ of B. F. Norris, Allister & Co., of Chicago, was suspected of having appropriated a number of articles of jewelry of the value of about \$2,000. He left hastily for Canada, but was recently discovered in Philadelphia and arrested. Requisition papers were applied for to secure his return to Chicago.

A tramping journeyman, giving the name of Daniel Green, so worked upon the sympathies of Mr. J. G. Dillon, of Wheeling, West Virginia, that he gave him work. After a day or two the man disappeared, so did a \$150 diamond. The stone was found in the hands of a person to whom it had been pawned for \$20. Green had left town, heading towards Pittsburgh.

E. P. Roberts & Sons, of Pittsburgh, Pa., have recently built an annex to their large store, giving them an entrance on both Fifth avenue and Market street. They have furnished their new store with elegant fixtures, and stocked it with a large line of solid silver and silver plated ware. Mr. Steele Roberts, of the above firm, is at present in the city, and favored us with a call.

The social fiat against diamonds does not seem to affect Denver. Denver is full of diamonds. They flash everywhere; in the dining-room, at parlor receptions, on the streets, in the business walks of life. Everybody wears them; even the hack-drivers have for them a fondness. In most circles a girl who cannot boast a diamond is of no account. In other cities they may be regarded as vulgar, and their constant display in bad taste, but here it is different. A man with a hole in his coat, or shoes with a pasteboard sole, will cling to his diamond, and if he parts with it at all it is when hunger is getting in its starvation pang.

The Providence Manufacturing Jewelers' Board of Trade has selected for its Secretary Mr. George E. Emory, who has been for many years an attache of the Providence office of R. G. Dun & Co.'s Commercial Agency. Mr. Emory has a large circle of business and personal friends, and possesses ability and intelligence that promise to make him a valuable acquisition to the Board of Trade.

An express messenger named Russell Green, employed by the National Express Company on the route between New York and Montreal, was recently arrested on a charge of smuggling diamonds, jewelry and optical goods across the border. Diamonds valued at \$10,000, and various other articles, were seized by the customs officers. It is reported that two or more jewelry houses are implicated in these smuggling transactions.

Announcement was made November 11th of the death of Mr. James Schliesser, a Hungarian by birth, who has been identified with the jewelry business in this country for twenty years or more. He was formerly with the firm of Freund, Goldsmith & Co., but latterly had been traveling for Falkenau, Oppenheimer & Co. He was a gentleman of high culture and excellent literary attainments, and was highly respected by all who knew him.

We have information that a man, representing himself as from the Elgin Watch Company, is taking orders for watches and clocks in Ohio, to be delivered by first express, to be sold on commission five months. His plan is to sell what jewelry he can for cash. He gives the address as Elgin Watch Company, 27 State street, which number does not exist. The man is a fraud, and the company would be glad of any information that will enable them to identify and stop him.

In the suit of J. Herzog, a manufacturing jeweler of New York, against Lapp & Flershem, jewelers of Chicago, the jury found for defendants. Suit was brought to recover the value of \$18,000 worth of jewelry, which was from time to time consigned by Herzog to the Chicago firm, as he claimed, to be sold upon commission. It was charged that the goods were illegally assigned to other persons. Lapp & Flershem showed that they had made an out-and-out purchase of the goods, and as bona-fide owners they had a right to sell them.

We have received information of the death of Mr. L. L. Woolley, formerly agent of the Elgin National Watch Co., which occurred on Saturday, Nov. 21. Mr. Woolley became associated with the Elgin Co. in 1875, and was in their employ for nine years, or until May 1, 1885. His health began to fail some two years ago and he rapidly grew worse, until in consequence he was compelled to retire from active business. His disease was *lacomoto artaxia*, and it was only of comparative recent date that its serious nature was known. After severing his connection with the Company he paid close attention to try to regain his health but without effect, as he rapidly grew worse until some four months ago he became bereft of reason. He died in Philadelphia where he had been taken for treatment. His age was 43 years. He leaves a wife and three children, the oldest of whom is a son about 20 years of age, the others being daughters about 10 and 12 years.

A daring attempt was made recently by two men to rob Dickinson's jewelry store in Buffalo. The men called at the store and were shown diamonds valued at \$10,000 or \$15,000. One of the men selected about \$8,000 worth and ordered them sent to room 9 of the Tiff House. Young Mr. Dickinson took the package, going with the men in an open buggy. At the door of the hotel, which has entrances on two streets, the men explained that the lady for whom the diamonds were intended was sick, and that Mr. Dickinson could wait while the gems were submitted for approval. Mr. Dickinson said he would take them up himself, and was informed that the lady was Mrs. McIntyre, in room 9. Suspecting something wrong, Mr. Dickinson first walked into the hotel office and inquired about room 9. Seeing him do this the conspirators fled. There was no woman in room 9, but a confederate named Kennedy, whose part it is believed was to seize Dickinson and chloroform him. Before leaving town the crooks robbed a fur house of two sealskin sagues worth \$500.

Men, women and children appreciate a good umbrella, and few things are more appropriate for holiday gifts. Mr. Amasa Lyon calls attention this month to a new and attractive stock of goods in this line; also to his new designs in canes, cane heads, parasols, etc. It is almost inconceivable the variety of styles, shapes, patterns and designs goods of this character can take on, each seeming to be better than the other. Dealers who have neglected to order these goods for the holiday season should hasten to make good the omission.

Professor James Warren is announced as the inventor of a new process of reducing ores by the aid of electricity. While examining a piece of gold bearing quartz the Professor accidentally let it fall into one of the dynamos, which was in motion at the time. On looking for the piece of quartz next day he found it in the dynamo, and to his surprise the gold in the quartz had melted and had run to one side of the rock, forming a beautiful button. He immediately instituted a series of experiments, and succeeded in evolving a process by which gold, silver and copper can be instantly smelted from concentrations by a powerful electric shock, almost equaling in intensity a stroke of lightning. The successful application of this process to other ores, as lead and antimony, is also expected.

Preliminary steps have been taken in Chicago and Cleveland for the organization of a Retail Jewelers' Association, for protection against existing abuses that are cutting into their business. They complain of jobbers and manufacturers supplying auctioneers and peddlers with goods, with selling to outsiders at wholesale prices, and stimulating unwarranted competition in a variety of ways. This is a course that THE CIRCULAR has repeatedly advised the retail dealers to pursue. They have the power in their own hands to remedy the abuses from which they suffer, but it needs organization to concentrate that power and make it effectual. We shall watch the proceedings of these organizations with interest, and take pleasure in recording their proceedings when they "get down to business."

The following named gentlemen have been appointed to solicit subscriptions from the jewelry trade for the Grant Monument Fund, viz.: Messrs. C. L. Tiffany, Philip Bissinger, Chester Billings, W. C. Kimball, J. B. Bowden, Joseph Fahys and F. H. Mulford. Mr. W. C. Kimball, of H. F. Barrows & Co., 1½ Maiden Lane, is the Treasurer of the Committee. The following donations have already been received: Tiffany & Co., \$500; Randel, Baremore & Billings, \$250; D. & M. Bruhl, \$100; Theo. B. Starr, \$100; Dennison Mfg. Co., \$100; Dominick & Haff, \$50; G. & S. Owen & Co., \$25; F. Henle, \$10; T. B. Bynner, \$10; L. H. Keller & Co., \$10; Morris Prager, \$5; Fred. Pfaelzer & Co., \$5; Saxton, Smith & Co., \$5; C. F. Wood, \$5; J. A. Riley, \$5; E. E. & A. W. Kipling, \$5; E. Newhouse, \$1.

On the evening of November 1st, about sixty of the apprentices and the foremen of Messrs. Carter, Sloan & Co., sat down to three long tables in an upper room in the factory, at Mulberry and Park streets, Newark. The occasion was a supper given by the firm in honor of the 44th anniversary of the establishment of the business by the senior partner. After supper Mr. Carter arose and explained that this was a repetition of a similar scene two years ago. As a result of the former supper, a drawing class of some thirty or forty of the apprentices had been formed, and for two years had been instructed in free-hand drawing at the rooms of the Essex Art Association. This movement had also given a fresh impetus to the Technical School, now in successful operation. He gave some interesting statistics of the business, and told the boys that his success in business was owing to his determination to rise. He advised the boys who heard him to resolve to rise in their work and their lives. He then introduced Noah Brooks, editor of the Newark *Daily Advertiser*, who spoke admirably in a strain of alternate wit and pathos. He was followed by the Rev. Dr. Spellmeyer in a happy talk. Several foremen also made remarks. The occasion was a gratifying success.

Appreciating the growing importance of the western trade, The E. Howard Watch & Clock Co., has leased the offices formerly occupied by the American Watch Co., No. 170 State street, Chicago, Ills., which is now being refitted ready for occupancy Jan. 1. The trade will then find in Chicago a full assortment in stock of the Howard watches, as well as a complete line of their clocks and regulators. This step on the part of the Howard Co. will be appreciated by the trade in that section as well as the West and Northwest. The office will be under the management of Mr. Harry E. Howard, assisted by Mr. E. D. Clerque, both of whom have been in the employ of the company for several years, the former in the New York and the latter in the Boston office. This company has removed its Boston office from 114 Tremont street to 378 Washington street.

In our issue of last month we advertised a description of the watches that had been stolen from Rowe Brothers, of Chicago, by a watchmaker named Hirsch. We are in receipt of a letter from Mr. C. H. Rowe in which he says that the advertisement "did the business. We recovered two of our watches from Elmira where they had been sold by Hirsch, and also got evidence that will convict him on our charge after his present term in jail has been served." If those who lose their goods by robbery would follow the example of Rowe Brothers and advertise them in THE CIRCULAR they would stand a good chance of recovering them, for THE CIRCULAR is read by the trade in general. Rowe Brothers deserve much credit for their determination to make an example of this thief, who, while working for them, improved the opportunity to steal their goods. It has cost them more than the value of their goods, but the thief was landed in jail.

The calculating machine invented by Professor Thomson appears to excel in its ingenious adaptation to a variety of results, even Babbage's wonderful apparatus. By means of the mere friction of disc, a cylinder and a ball, the machine is capable of effecting numerous complicated calculations which occur in the highest application of mathematics to physical problems, and by its aid an unskilled person may, in a given time, perform the work of ten expert mathematicians. The machine is applicable alike to the calculating of tidal, magnetic, meteorological and other periodic phenomena; it will solve differential equations of the second or even higher powers or orders, and through this same wonderful arrangement of mechanical parts, the problem of finding the free motions of any number of mutually attracting particles, unrestricted by any of the approximate suppositions required in the treatment of the lunar and planetary theories, is done by simply turning a handle.

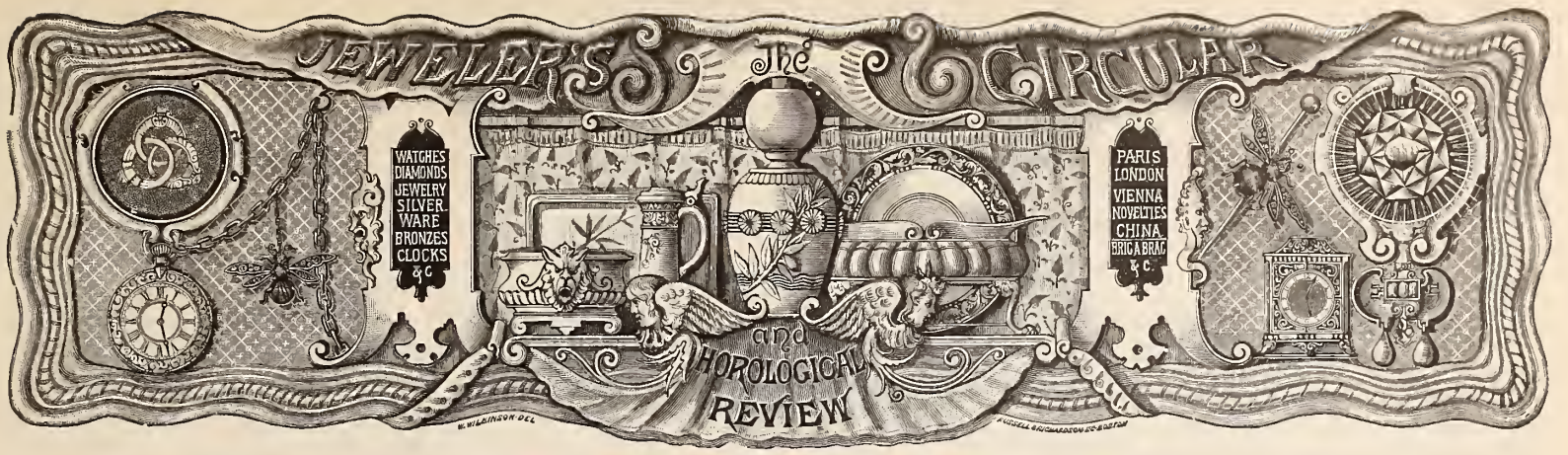
Two failures of a rather peculiar character have occurred during the month. The first was that of Albert Hunter, of Kansas City, Mo., who commenced business in August, and made a statement at the time to the Jewelers' Board of Trade, claiming that he was worth, net, about \$3,000. His *modus operandi* seems to have been to get goods from every possible source on memorandum. At the Board of Trade forty-six inquiries have been made, and to all of these parties he had sent orders for selection packages. Those who were unfortunate enough to let him have goods on selection say that he kept the whole, and they were unable to get any report or return from them. This seems a good case in which to test the rights of creditors in cases where goods are sent on approval. The second failure of note is that of C. R. Wardell, of Detroit, Mich. This person was an auctioneer, and according to a Board of Trade report, written in September last, was utterly unworthy of any credit. He, however, gradually gained the confidence of the trade by paying promptly for small purchases, until he finally succeeded in getting a large credit, and then he failed. The lesson to be derived from this is, that when credit is extended to parties not in the regular trade, it must be regarded as more than an ordinary business risk, and dealers must take their chances of getting their money. The bulk of Wardell's indebtedness has been, it is said, incurred during the last three weeks.

In our issue of last month we noted the fact that a new watch factory was to be erected in Jersey City, for the manufacture of a new and simplified watch movement, for which patents have recently been secured. It is announced that Mr. R. C. Clay is President of the company that has been organized; Mr. W. C. Roberts, Vice-President, and L. K. McKenna, of the American Loan and Trust Company, Secretary. The company will be known as the Standard Watch Company. Work on the factory, on Woodward street, is progressing satisfactorily. It will occupy nine city lots, and afford working room for five hundred hands. It is 100 x 30, four stories high, with a clock tower, and is of brick, with cut stone trimmings. The company proposes to include the manufacture of clocks with watchmaking. Rumor says that the stockholders are prepared to provide whatever capital is necessary to place the new movement on the market, and have it fairly tested by the public.

Several meetings of retail jewelers were held in Chicago last month to consider matters of interest to them. The result was the formation of an organization, to be called the National Association of Watchmakers and Jewelers, the membership to embrace manufacturers and dealers in watches, jewelry, and kindred goods. A constitution and by-laws were adopted, which, after providing for the management of the Association, set forth its objects as follows:—"No manufacturer or wholesale dealer shall sell goods to any one who is not eligible to membership in this Association. All retailers, members of this Association, pledge themselves to trade with such manufacturers and wholesale dealers who are members of this Association, or whose mode of doing business comes under the rules of this Association, whenever it is not detrimental to their own interests." The following named gentlemen were chosen as officers for the current year:—E. R. P. Shurly, President; J. J. Altpeter, Vice-Pres't; M. H. Berg, Secretary; J. P. Wathier, Treasurer. Executive Committee—L. F. Hussander, Otto Young, C. H. Rowe, Max Ellbogen, Clayton B. Shourds.

The Mayor of Wheeling, West Virginia, is Jacob W. Grubb, a member of the jewelry trade, who enjoys the respect and confidence of all who have had business transactions with him. When he entered upon the duties of his office he undertook to secure some reforms in the city, and commenced prosecutions against the gamblers and keepers of vile resorts. They in turn abused the Mayor most shamefully, attacking not only his official acts, but his personal character, in a most scandalous manner. The Chief of Police finally preferred a long string of charges against him, and these have recently been officially investigated, resulting in the complete vindication of Mr. Grubb of all charges except one. This was a charge to the effect that he had issued licenses to peddlers without charging the license fee provided by city ordinances. The damning fact stood forth in all its nakedness, and was even admitted by the accused that he had granted privileges to peddle knick-knacks to a blind man, a one armed soldier and a little girl who had a sick mother to support. It was also shown that unless these persons were permitted to earn a living in this manner they would become a charge upon the city. Mayor Grubb pleaded guilty to the horrible offense of permitting these persons to peddle, and added to the enormity of his offending by declaring that he would repeat the offense in deserving cases so long as he was Mayor! Suffice it to say that he was not only honorably acquitted of the slanderous charges made against him, but was elevated many degrees in the estimation of the respectable and law-abiding citizens of Wheeling, who propose to sustain him in his efforts to drive out of their midst the disreputable characters who have so long been a disgrace to it and apparently enjoyed police protection. Mayor Grubb now proposes to have some redress for the slanderous publications that have been made regarding him and telegraphed broadcast over the country, and certain publishers will be obliged to make retraction or appear as defendants in libel suits.





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## THE JEWELERS' CIRCULAR AND HOROLOGICAL REVIEW

*Official representative of THE JEWELERS' LEAGUE and of THE NEW YORK JEWELERS' BOARD OF TRADE, and the recognized exponent of Trade Interests.*

A Monthly Journal devoted to the interests of Watchmakers, Jewelers, Silversmiths, Electro-plate Manufacturers, and those engaged in the kindred branches of art industry.

### SUBSCRIPTION:

To All Parts of the United States and Canada,

**\$2.00 Per Annum; Postage paid.**

To Great Britain, France, Switzerland, Germany, the West Indies, Mexico, the Republics of South America, and Australia, \$3.00 per annum. Postage paid.

*All communications should be addressed to SETH W. HALE, President, THE JEWELERS' CIRCULAR PUBLISHING Co., 42 Nassau Street, New York.*

*Advertising rates made known on application.*

### A Few Words of Personal Mention.

THIS ISSUE of THE CIRCULAR brings to a close its sixteenth volume, and with our next number we shall celebrate its seventeenth birthday. During these years THE CIRCULAR has enjoyed the confidence and support of the jewelry trade to an extent that could not but be flattering and encouraging to all connected with it, and for which the present proprietors express their deepest gratitude. The success of our publication is not a phenomenal illustration of the requirements of special industries, nearly all of which have their representative journals, which they support liberally. It is a necessity of the times that special industries should have their own mediums of communication, for the dissemination of trade news, and to enable the seller to reach directly his constituency of buyers. The daily press has outgrown its usefulness as a medium of announcement for those engaged in commercial pursuits; their circulation is so general as to be of little value when a certain class only is destined to be reached, and hence trade journals, that thoroughly cultivate one particular field, are of far more value to the workers in that field than the daily press. THE CIRCULAR came into existence seventeen years ago, and its advent was greeted with satisfaction by the jewelry trade; its founder was experienced in journalism, and realized that to make his new venture successful he must supply what was wanted. To this end he engaged, from time to time, the best technical writers that could be found, put life, energy and enterprise into his work, and soon made THE CIRCULAR invaluable to the trade. With its growth he enlarged and improved it from year to year, until it was recognized as the handsomest trade journal in the world. Its present proprietors have endeavored not only to sustain its well earned reputation,

but to improve its character in various ways. Nor have they neglected those measures necessary to extend its circulation, thus increasing its value to its patrons as an advertising medium, and it is safe to say that there is scarcely a jeweler in this country that does not know THE CIRCULAR, while its circulation in foreign countries is something of which we are justly proud. At home and abroad it is recognized as an authority in trade matters, and is largely quoted from by its contemporaries. This is the natural result of persistent effort in a single direction. THE CIRCULAR undertook to cover the field necessary to make it a useful and successful trade journal, and this it has done in a most thorough manner. In bringing to a close its sixteenth volume its proprietors flatter themselves that THE CIRCULAR is a useful and creditable representative of the jewelry trade, and has at all times been deserving of the confidence reposed in it.

As to the future we make no resounding promises, but prefer to be judged by our work as it appears from month to month. We may say, however, that our engagements with the experienced writers on various technical and general topics, whose names are familiar to our readers, extends into the new year, and their contributions will continue to appear in each issue. Additions to our corps of contributors are anticipated, and no effort will be spared to keep our columns filled with valuable and interesting articles, from both a technical and commercial standpoint. Our business department will be, as heretofore, represented by gentlemen well known and long identified with trade interests, who will lose no opportunity to extend the influence of THE CIRCULAR in the best interests of the jewelry trade. With a brighter outlook for business in general, THE CIRCULAR wishes every member of the trade an unequalled degree of prosperity during the present year, and will do what lies in its power to secure the realization of this wish.

### Retail Jewelers Organizing.

IN OUR issue of last month we noted the fact that the retail jewelers in Illinois and Ohio had begun the work of organizing with a view to correcting some of the abuses of which complaint has been so general for a number of years past. We are glad to see reform ideas taking practical shape; the retail dealers have it in their power to compel a reform in commercial practices if they but act as a unit, and demand that the irregularities and unbusinesslike methods shall cease. No manufacturer or jobber can stand against them if they unite to maintain their rights and are true to themselves. State organizations are well enough if properly managed, but past experience teaches that they are unwieldy and the membership too numerous to be effective. Where an association has several hundred members, representing many different localities, so many subjects are brought forward that it is impossible that each should have proper consideration. If the State organization was composed of representatives from subordinate organizations in the different cities

and towns of that State, each representative acting as the mouthpiece of those who sent him, more work of a practical nature could be accomplished. If the jewelers in each community would lay aside their petty jealousies and organize for mutual protection, carefully consider their situation and requirements, they could submit these to the State association, and, if approved, would have the added influence of all similar subordinate organizations to secure their enforcement. If the jewelers of Peoria suffer from any particular abuse they are the ones to demand redress, and Joliet jewelers, who know nothing of Peoria's troubles, cannot be expected to take the initiative in the matter of righting them; they would probably be willing to co-operate to that end, but what is Peoria's business is not the business of Joliet. City and town organizations, it appears to us, should form the basis of all State organizations, for the men composing them would be the practical men in the trade, who come in direct personal contact with the abuses they wish redressed. State associations are usually controlled by a few ambitious men who do not give the lay members much of an opportunity to be heard; the proceedings run according to a cut-and-dried programme, and anything not set down on the programme is ignored. If the membership of a State association was restricted to one representative from each subordinate organization, there would be some chance for each of the latter being heard. A committee on grievances could speedily consider every complaint submitted, and the sense of the representative members soon be ascertained regarding it. Peoria's troubles would receive consideration and Joliet's grievances could be redressed through the united action of the State association. But in an association where the membership is unlimited, and every member has something to say or some suggestion to make, it is the rule that little effective work is accomplished. Those organizations that exercise the greatest influence over industrial and commercial interests, consist of subordinate societies working through a central association that speaks authoritatively for the members as a body. The Masons, Odd Fellows and fraternal societies generally, maintain their power and influence by means of central organizations that carry out the wishes and instructions of the subordinate branches. In the jewelry trade it is the individual dealer who, over his own counter, experiences the evil effects of trade irregularities; what hurts him injures his competitors in the same community; if they will come together and make common cause against the perpetrator of the evil he will cease his depredations at once. The power is with the local dealers who are the sufferers; if they choose to invoke the co-operation of their fellow dealers through a State organization, they increase their power by so much as the action of that State association is carried out in good faith. We believe in organization—in unity of action—to carry forward reform measures in any field of enterprise, but the ones who suffer from existing abuses are the proper persons to give practical shape to reform work; they know what is required, and if they co-operate in good faith to secure a desired result, they cannot fail of success.

One of the most prolific causes of complaint among retail dealers is that jobbers sell goods by retail to outsiders at the same prices they sell them to the dealer, thus robbing them of patronage and profit that of right belong to them. Suppose the dealers of Peoria ascertain that a certain firm of jobbers have sold goods in this way to citizens of Peoria; a simple way to prevent a repetition of such irregularity would be for the Peoria dealers to come together and resolve unanimously that they would buy no more goods of the offending jobbers; then let them report the facts and their action to the State association, and, if there is any virtue in such organization, those jobbers would find themselves "boycotted" all through the State of Illinois, and their business in that section utterly destroyed. It would take but one or two such examples to cure this evil entirely. We are not in favor of what is popularly known as "boycotting," and dislike the use of the word in connection with affairs in the jewelry trade, but the term has achieved popularity and is exceedingly expressive. But the action we have indicated cannot be properly

termed "boycotting" in its offensive sense; it is simply a measure of self protection adopted by retail dealers to prevent their trade being stolen from them by the jobbers whom they patronize; it is not an aggressive measure but a defensive one. By the practice referred to, the jobbers declare war upon the retail dealers and need not be surprised if the hostilities recoil upon themselves. An individual dealer can do little towards correcting this or any other irregularity that is so general, but by association they become masters of the situation. While we are pleased to see the movements for the formation of State associations, we are convinced that these will become more influential and accomplish better results if they are made the representatives of subordinate organizations composed of the local dealers in different cities and villages. When a great good is to be accomplished individuals should lay aside all their prejudices and jealousies, born of business competition, and in good faith unite to secure the desired result.

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### Mutuality of Interests Between Capital and Labor.

MANY PERSONS are apprehensive that the impending crisis between labor and capital is about to culminate, and that a struggle will be the result that may lead to serious consequences. In various industrial pursuits there have recently been prolonged strikes by the workmen either for higher wages or against some regulation established by their employers or some person employed by him. In several instances hundreds of working persons, male and female, have abandoned their work benches and gone on strike in obedience to the orders of the trade organization that claimed their allegiance. A favorite method adopted by the strikers to enforce their point is to "boycott" those employers who refuse to accede to their terms, and also all persons who have dealings with the "boycotted" firm. How far this spirit of discrimination against offending parties may be carried came under our observation recently. In a suburban village near New York where there are many hat shops, a manufacturer of hats was "boycotted" by the hatters' trade union; all the merchants of the place were forbidden to trade with him under penalty of being "boycotted" themselves; his milkman was ordered to stop serving him, and when he refused, his other customers were warned that they must not buy milk of him, and the threat of "boycotting" was held over them if they did not heed the warning. The strike of hatters extended to Philadelphia, and one manufacturer incurred their displeasure because he refused to discharge men who had learned their trade in his factory and were valuable hands. This employer was noted for the liberal manner in which he treated his workmen, having always paid full wages and having expended many thousands of dollars in providing for the comfort of his employees. Yet, because he refused to discharge faithful and trusted workmen, the order went forth to "boycott" his goods, and his customers were notified to buy elsewhere or the penalty of "boycotting" would be extended to them. Among the strikes reported recently was that of the workmen employed by the Derby Silver Plate Company, of Birmingham, Conn. The men took advantage of the busy season preceding the holidays to demand higher wages, and, their request being refused, a strike was ordered. This lasted some weeks when, the Company having failed to come to terms, the order to "boycott" was issued. Four merchants who had either refused aid to the strikers or had sold goods to the men who took their places were also "boycotted," and all who have dealings with them are liable to fall under the ban of the workmen at any moment. A large firm of tobacconists in this city recently closed their establishment, discharging four hundred employees, for the reason that they found their goods were "boycotted" in other States. This modern idea of ruining the business of men who are inimical to trades unions or to their arbitrary methods, is a weapon that can be made to cut both ways, as was illustrated by the action of the tobacconists we

have cited; the workmen destroyed the market for their goods, and in return they closed their labor market, whereby four hundred dependent working men and women were thrown out of employment. How much more disastrous this would have been had the employers been organized for their own protection, and all closed their factories when any one of them was "boycotted" can be imagined. Instead of hundreds of persons being deprived of the privilege of earning a living, there would have been tens of thousands thrown out of employment. But this is what it will come to if the workmen continue much longer to press their arbitrary demands with such high-handed injustice. Employers will be driven to meet organization by organization, and to retaliate in kind when "boycotting" becomes the order of the day. Suppose the silver plate manufacturers were organized to resist the encroachment of labor, and should agree that when trouble occurred in one factory all of them would close their establishments; when the Derby Silver Plate Company's workmen struck it would have been the signal to all the other companies to discharge their employees, and many thousands of workmen would have been deprived of the opportunity to earn a livelihood for themselves and their families. Extreme measures are pretty sure eventually to recoil upon the heads of those who originate them; the working class is the most numerous in this country, and their sufferings will, consequently, be much greater if employers are driven to combine for the enforcement of measures of retaliation.

Very different from the action of the striking hatters and silver plate workmen was that of the shoemakers of Lynn, Mass. Boot and shoemaking is the principal industry in that city, and nearly every resident is directly or indirectly interested in it. There have been some prolonged strikes there heretofore, entailing a great amount of cost and suffering. This year the workmen felt that they had a grievance, but instead of abandoning their work, they asked the employers to appoint a committee of conference to meet a like committee of workmen to adjust the points of disagreement. The committee of arbitration thus constituted met like reasonable, sensible men, and the difficulty was speedily adjusted in a satisfactory manner, and not a manufacturer suffered any in his business nor did a workman lose a day's employment. Arbitration is the proper course to resort to in all misunderstandings between employees and their employer. There are always two sides to a quarrel or misunderstanding, and the intervention of a disinterested person as arbitrator will often prevent a serious disagreement. It was General Grant when President who introduced arbitration as a means of settling points at issue between nations, and the Joint High Commission, chosen at his instance, to adjust our claims against England on account of the depredations of rebel privateers fitted out in her ports in violation of international law, resulted in the payment by England of many millions of dollars into our treasury, and a war with the mother country was doubtless averted. The same principle applied to differences that so frequently arise between employers and employed, if carried out in good faith, would undoubtedly prevent labor strikes and the loss of many millions of dollars to workingmen. Strikes are costly luxuries to indulge in, for not only does the striker sacrifice what he might have earned, but his expenses run on the same as though he were at work, and he has no income with which to meet them.

There can be no objection to organizations of working men for their own protection or for the improvement of their condition; the trouble with them, as experience shows, is that their management usually falls into the hands of reckless, impracticable men, who delight in excitement and agitation, and who have everything to gain and nothing to lose by an upturning of existing conditions. It is seldom that the staid, substantial men of families, good workmen and respected citizens, are found among originators of strikes; when they become participants, it is with reluctance that they leave their employment, and they only do so because of the terrorism exercised over them by their fellow workmen in the trade organization. The faithful, competent, trustworthy workman can always make satisfac-

tory terms with his employer, and there is no occasion for him to strike. But here again the trades union interferes with his individual rights by fixing a scale of prices that shall apply equally to all workmen in the trade, thus putting the most incompetent and unreliable men on the same footing with the best workmen and those who are trustworthy. If the labor organizations would be content to fix a minimum rate of compensation adequate for the average workman, and then let the better workmen make their own terms with employers, they would do less injustice to their own members. The most frequent cause of strikes of late appears to have been the attempt of trades unions to dictate to employers whom they may or may not employ. This is an interference with the rights of the individual, employer and employee alike that is in contravention to the spirit of the age and is also in violation of law. Combinations of workmen to prevent others from taking the places they have voluntarily relinquished are recognized in law as conspiracies, and the participants are liable to imprisonment. Open defiance of the law may be successful temporarily, but it inevitably returns to plague the author of it.

We are not among those who are apprehensive of serious trouble to come from the agitation of the labor question. This agitation is as old as the human race, and, while a fruitful source of annoyance, has never yet assumed such proportions as to threaten the conditions on which society is based. We have too much faith in the intelligence and sound practical sense of the working classes to believe that they are willing to precipitate a conflict that would imperil their own lives and property as well as those of the employing class, or to believe that they will go so far as to provoke that class to adopting retaliatory measures. Arbitration is the panacea for all misunderstandings or grievances between employers and the employed. When practical, sensible, reasoning men sit down quietly and without prejudice to consider interests common to both and upon which each is dependent, but regarding which there is a diversity of opinion, the conference will inevitably result in an agreement that will be mutually satisfactory. To quarrel is to sacrifice the interests of both parties, while an amicable adjustment of the points at issue is promotive of the general good. To reach such an adjustment mutual concessions are usually necessary, and there will follow an intelligent understanding of existing conditions. Threats and coercive measures simply arouse active antagonism which only needs pressing to become aggressive. Trade interests can best be promoted from every standpoint by imitating the policy laid down and so successively carried out by General Grant to avert war between nations—the submission of the mooted points to disinterested parties for arbitration and adjustment.

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#### Debased Silver Dollars.

THE MESSAGE of President Cleveland, so far as it treats of the currency question, is all that the friends of an honest circulating medium could ask. It embraces every argument available against the coinage of silver dollars that are fraudulent on their face, and shows what must be the logical result if the government continues paying out gold for silver, and spending large sums for making it into delusive dollars that no one wants and which have to be stored in the vaults of the Treasury department, because the most strenuous efforts of the government do not suffice to push them into circulation. The records of the department show that there have been coined under the act of 1878—which requires the government to purchase and coin into silver dollars worth eighty cents \$2,000,000 worth of silver a month—upwards of \$215,000,000. The largest amount of these that has entered into the circulation of the country, even under the pressure following the withdrawal of small bills, has been \$50,000,000, leaving about \$165,000,000 stored up in the Treasury doing no one any good. As these silver dollars are by law made legal tender for payment of customs duty, it was found that

when the Treasury department forced their circulation, they were immediately returned through the custom houses in payment of duties. It has been satisfactorily demonstrated that the commerce of the country prefers bills of small denominations to silver currency, that it may absorb \$25,000,000 or thereabouts if pressed, of silver dollars worth par in gold, but that it does not want a delusive dollar worth only eighty cents, but spews it out in disgust at every opportunity.

The experience of the Treasury department to force silver into circulation should convince every one that it is a currency medium not required in business transactions even when honestly coined, and that when it is depreciated in intrinsic value, the country will not have it. Yet, under the existing law, the government is compelled to buy silver at the rate of \$2,000,000 a month, paying gold for it, and to coin it into debased dollars to place on storage in the Treasury vaults. It is plain to see that it will take but a short time to so exhaust the supply of gold currency as to send gold up to a premium, and that its value will continue to increase in proportion to its scarcity. The moment gold goes above par a financial panic may reasonably be anticipated. Already it is becoming extremely scarce, and there are indications that it is being hoarded by speculators in anticipation of the time when it will command a premium. Let that point be once reached and there is no predicting how high gold may go, nor the disasters to business interests that will necessarily follow. Yet there is a strong party in the West and South opposed to the repeal of the act of 1878; it insists that silver is "the currency of the people," and that the government shall continue to coin the delusive dollars. They re-echo the stale cry that plenty of money means prosperity, but fail to show how the tons of silver dollars kept on storage in the Treasury vaults affect the business of the country. For all the good they do to trade and commerce they might as well be buried a mile deep in the bowels of the earth.

The discussion of the silver question threatens to occupy the attention of Congress for the major part of the present session. The owners of silver mines, for whose benefit the act referred to was passed, will not see their chief market for their product closed against them without a severe struggle, in prosecuting which they are prepared to spend money liberally. While doubt remains as to what action Congress will take in the matter business enterprise is almost at a standstill, the doubt as to what shall be the circulating medium tending to prevent business investments and the expansion of productive enterprises. All other conditions favor a period of great business activity and prosperity, yet hesitation and doubt pervade the community lest the recognized standard of currency shall be driven from commerce by the efforts of those who seek to supersede it with a cheap and dishonest currency. Just so long as the present law remains and the agitation of the silver question is kept up, just so long will this hesitancy and doubt continue to depress business men and to prevent the enlargement of business activity. But one thing more is necessary to bring about a season of extreme financial depression, and that is a prolonged discussion in Congress of the irrepressible tariff question. Even this is threatened, but there is hope that it may be averted by the interposition of political questions to occupy the attention of Congress. If that body would at once repeal the silver bill and declare that there shall be no tariff tinkering this year, the country would settle down to business with a zest that would insure the speedy advent of those "good times" all have been hoping for so long. But the silver men are extremely active, and unless the honest currency men are equally so, there will be little hope for the repeal of the silver bill, that incubus hung about the neck of commerce like a veritable old man of the sea. There is a proposition on the part of some of the silver men to effect a compromise of the question, but to still maintain silver as a currency basis in conjunction with gold. Their plan is to re-coin the eighty cent dollars into coin intrinsically worth one hundred cents, redeemable in gold, and to let commerce absorb as much as possible of this currency, the government to buy as much silver as will be

necessary to keep the demands of the country supplied. This is better than to continue the manufacture of debased coin, but is still open to the objection of making silver a currency standard as well as gold. Gold is the recognized standard of all civilized nations except this, and our financial panics and business disasters are largely attributable to the fact that we recognize a dual standard, and by legal enactments attempt to place a cheap metal on a par with gold. Congress may pass all the laws it chooses to this effect, may declare in favor of brass or leather currency, but business men in their business transactions will only recognize as standard and acceptable currency that which possesses an intrinsic value corresponding to its face value. Eighty cents in a silver coin is not worth a dollar in gold, and no legislative enactment can make it so.

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## Sight.

*What the Optician Should Know About the Eye.*

[BY DR. C. A. BUCKLIN, NEW YORK.]

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### SYMPATHETIC DISEASES OF THE EYE.

Under the above title I wish to call attention to some facts of the greatest possible importance.

Having been brought so frequently face to face with this horrible condition known as sympathetic diseases of the eye, I shudder when I think that the sad fate of the patient is too frequently the result of a failure of some family practitioner or too positive specialist to appreciate the intricate nature of the trouble or the hidden danger which is lurking under a calm exterior.

They fail to fully explain and warn the patient of the danger which may follow in time, and complete blindness is the result. The time required from the injury until the other eye is destroyed varies from a few weeks to forty years.

It is impossible to consider in our limited space the entire details of sympathetic disease of the eye.

The entanglement of one of the various nerves which run between the coatings of the eye in considerable numbers, in a *scar* or any other constant source of irritation existing in an eye, as *chronic inflammation*, *calcarious deposits*, foreign bodies, scars resulting from a wound, a cataract which is over ripe and has become calcarious may cause the destruction of the eye—the fellow eye or both eyes.

I desire to present such illustrative cases as will cause the careful to think and the careless to beware.

I present the facts as they exist, not with an intention to criticize, but with a pure desire to do the greatest good.

Case I.—Mrs. B., age 50. In May the right side of the face was covered with an eruption which followed an attack of malaria. The eruption caused a severe burning and itching sensation of the right side of the face, which later became covered with a yellow crust.

The line of division, however, between the crust-covered right side of the face and the left side was very sharp.

At this stage she consulted a physician who considered the disease acute eczema ("salt rheum") and treated it as such for three months, when one of the pustules appeared upon the cornea.

It ulcerated, the eye ball was perforated by the ulcer, the pupil became extensively attached to the wound, the eye was lost by inflammation which invaded the eye ball, and three months later the other eye was affected by sympathetic disease.

The sharp line of division between the affected and healthy side of the face should have attracted the attention of the physician at once, and caused him to recognize the trouble as arising from an inflamed nerve.

This case illustrates the importance of recognizing and properly treating diseases of the fifth nerve.

A failure to make a correct diagnosis in this case made a blind

woman, when a correct diagnosis would have led to a favorable termination of the disease.

Case II.—Mr. M., age 33, was chipping cast iron in 1865, when a piece of the iron or chisel struck him on the margin of the cornea. It made a simple clean wound of the cornea, through which the margin of the iris prolapsed. The eye at the time I saw it looked exactly as if Critchett's operation for displacing the pupil had been carefully performed by a skilled operator. He retained fair vision in the injured eye. He consulted his family physician and several specialists of this city; each and every one of them were enthusiastic in their explanation of the patient's great good luck in having a sharp piece of iron strike the eye ball and do so little damage.

The general verdict was: "*It is a very fortunate accident.*"—"The eye is all right."

Let us now observe the consequences and see how unfortunate the accident was, and how fortunate it would have been for the patient had the eye been so mutilated that its immediate removal would have been necessary. All attempts to use his eyes for any length of time fatigued him. His business called him upon the water in 1873, eight years after the accident; he began to see dark clouds pass over the water, or he would observe an undulating appearance of the water which none of his companions could see. It was three months after he first saw these dark shadows before he saw them again.

The periods became more frequent. Within one year from the appearance of these dark shadows the *uninjured* eye was totally blind, and only sufficient vision remained in the *injured* eye to enable him to read large print with difficulty.

No one had considered the injury serious, and none of them warned him of the possibility of the other eye being lost by sympathy.

The operation of Critchett's for displacing the pupil has, in many instances, brought about the same sad consequences years after the patient has passed beyond the observation of the surgeon.

Case III.—Mr. M., struck in 1859 upon the sclera by a sharp piece of steel which perforated the eye but did not enter the ball. It glanced off. The choroid prolapsed through the wound, and, at the time of examination, looked like a black pin head on the white sclera under the conjunctiva.

To show that there is a possibility of every one being mistaken about the consequences which may follow such a simple accident, I casually mention the fact that he repeatedly consulted our most respected authorities on ophthalmology about the black speck on his eye. They assured him that it was a matter not worthy of attention.

In 1873, fifteen years after the accident, his eye began to tire easily—he began to see smoke in the atmosphere, the vision would periodically become obscure—at least the acuteness of vision became permanently obscure. All effort to use the eyes produced an immediate sensation of fatigue and was disagreeable to him.

He was sent to me by an optician to see if glasses would remedy the trouble.

Upon observing the choroidal hernia, I suspected that one of the ciliary nerves\* was implicated. I cut down by way of experiment and cut the hernia off as close as possible to the wound, from which I freed it as thoroughly as I could.

The vision at this time was  $\frac{2}{3}$  of normal vision.

The strange feature in this case which surprised me as much as it will any of my readers is, that in eight days the vision increased to  $\frac{3}{4}$  of normal vision, and all unpleasant symptoms disappeared.

Those who propose to open the eye to introduce magnets or transfix the choroid with needles, should remember that this case illustrates the possibility of doing a damage which may fifteen years later cause both eyes to be lost, although the *original object* for which the magnet or needles were introduced was well accomplished and successful.

Such patients can not be too thoroughly cautioned as to the possibility of danger years afterward, and the symptoms which announce

the approach of danger should be carefully described. Such as mist before the uninjured eye—dark shadows which appear periodically—great fatigue upon attempting to use the eyes, etc.

Case IV. illustrates an example of a careful specialist who is thoroughly aware of the danger while treating a child on the expectant plan. The child has an ulcer of the cornea, which slough and a large portion of the iris becomes fast in the ulcer. This is followed by severe inflammation within the eye ball for which she is being treated, while the other eye is kept under observation.

The mother is told to bring the child back in four weeks, as the inflammation in the injured eye has quieted down. In six weeks she returns with the child, and imagine the mental chill which must pass over one when he looks into the *uninjured* eye, and sees delicate cyclitic membranes stretching entirely across the field of vision. It is too late to enucleate the offending eye, *the child is blind.*

There was no warning in the shape of a complaint from the child. There was no decided injection of the eye to attract the attention of the mother or physician.

Specialists are frequently deterred from doing their duty by the outside pressure of parents, friends, physicians and dishonest or sometimes ignorant "*eye doctors,*" who are willing to give a favorable prognosis on no other grounds than a desire to please the family.

I believe in children upon whom we cannot rely for early information regarding symptoms in the other eye, it is the duty of the specialist to strongly advise the removal of every eye which decidedly endangers its fellow eye.

Case V.—Mr. R., at age of 20, cataract developed in one eye from unknown cause. At *fifty* sympathetic irritation appeared in other eye in the form of flashes of light. Enucleation of offending eye arrested further development of disease in uninjured eye. The lens were calcareous and calcareous deposits were thickly distributed through the ciliary body. There were evidences of an old intra ocular inflammation with extensive detachment of the retina. The disease not being traumatic was evidently venereal.

Case VI.—Mr. L., struck in the eye with a cow's horn during boyhood. At the age of sixty the other eye, which had behaved well during this time, is affected sympathetically, the development of which affection is announced by dark shadows followed by flashes of light and entire loss of the uninjured eye.

The last two cases bring us to a practical point regarding cataract extractions.

How often has the following rule been laid down to students of ophthalmology: *Never remove a cataract before it is ripe.* Meaning as long as fingers can be counted.

*Never remove a cataract from an eye when it is plain that no visual improvement can be attained,* unless the patient desire it done for cosmetic purposes.

*Never remove a cataract as long as there is good vision in the other eye.*

In all cases of cataract except the congenital variety, the crystalline lens is undergoing progressive atrophy—the vitreous is becoming fluid, and the intra ocular blood vessels are becoming weak.

Calcareous deposits are quite sure to form in the hyper-mature cataract.

Is it not better to disregard all these rules and remove the diseased lens at such time as it can be removed with the greatest safety to the patient. A calcareous lens is a dangerous thing to have in an eye, and also a very dangerous lens to remove by the usual method of opening the capsule, the calcareous debris being liable to fall into the eye during the evacuation of the lens.

I have seen both eyes totally lost within ten weeks after such an accident. The operated eye was destroyed by severe intra ocular inflammation, and the eye not operated upon was destroyed by sympathetic disease.

If it can be seen that a lens is filled with calcareous deposits and it is to be removed, it is better to remove it in its capsule entire.

The removal of the lens in its capsule is a dangerous operation

\* See delineated eye published by Spencer Optical Manufacturing Co.

under the most favorable circumstances, and still more liable to cause loss of vitreous and ocular hemorrhage in cases where the lens has remained in the eye till it is filled with calcarious deposits.

Having waited till this stage one is between two fires, and it is impossible to judge which is the most dangerous, the chance of dropping calcarious deposits into the eye by the ordinary method of extraction, or the chance of causing intra ocular hemorrhage or severe inflammation by the violence done the eye in attempting to remove the lens in its capsule. I prefer to remove the lens as soon as they can not count fingers at a greater distance than two feet.

In the majority of cases this avoids all serious complications. The lens comes out easily. There are no calcarious deposits in it. The vitreous and intra ocular blood vessels are in a healthier state than they ever will be at any subsequent time.

When I see some specialist of experience who is willing to have the lens and capsule *torn* from his own eye, I shall believe that this method of removing the cataract in its capsule has one enthusiastic and honest advocate.

I will not do an operation on a patient's eye that I would not ask a colleague to perform on my eye if I were the patient.

In iritis we sometimes see a nodular appearance of the surface of the iris; this is due to circumscribed portions of the iris being so sealed down to the lens that local cavities are formed in which fluid accumulates and lifts the iris, forming an elevated nodule of which there may be several. Such eyes as visual organs are of no value; they are almost sure to set up sympathetic disease in the other eye, the only preventive measure against which is enucleation of the eye.

If the family do not endorse this operation, let some kind-hearted colleague take the case and also the responsibility. Iridectomy in these cases is of but little value.

When the entire margin of the pupil is fast to the lens or cornea, iridectomy is usually all that will be required to make the offending eye safe.

Having illustrated what may happen to those who do not appreciate the dangers which may arise from sympathetic disease of the eye, we will mention two cases which will illustrate what the over zealous specialists do occasionally.

Mrs. C., aged 50, has acute syphilis. Right eye develops plastic iritis with multiple adhesions of the margin of the iris. Four months later simple plastic iritis breaks out in the left eye. She visits two of our city eye institutions. The pupil of the last affected eye dilates readily under atrophine, with one marginal attachment of the iris to the lens.

The disease of the second eye is declared sympathetic. The enucleation of the right eye is most urgently insisted upon at both institutions. I freely confess that I am not so bold as to advise the removal of an eye that still has a good visual field, because plastic iritis has broken out in the fellow eye suddenly and without any premonitory symptoms.

The syphilitic eruption being in a most flourishing condition, is it not more judicious to call the iritis of the *second* eye syphilitic, and to treat it energetically as such, rather than enucleate one eye before you are sure which eye will turn out to be the better one, and before you are sure that the *enucleation* of the eye will not have a disastrous effect upon the fellow eye which is already in a dangerous and irritable condition. It must also be remembered that such eyes, as a rule, do very well without enucleation.

Mr. R., age 25, had syphilitic iritis of one eye which caused extensive pupillary attachments of the iris to the lens. The pupil appeared blocked with a mass of exudation.

Several weeks later the second eye was attacked with plastic iritis. The advice given by several specialists was to enucleate the bad eye at once. He was treated for syphilis and iritis; at the end of four months the eye with which he could read was the one the enucleation of which had been strongly advised.

A single adhesion of the iris to the lens is more dangerous than two or more adhesions, so situated that the movement of the iris is

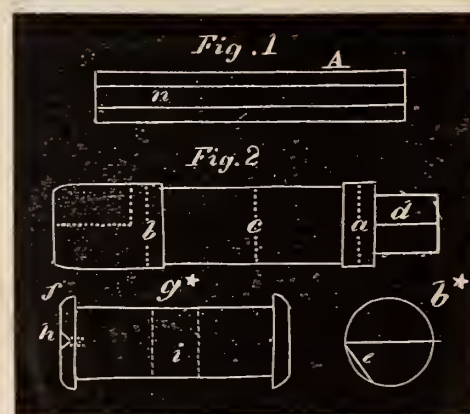
limited. Such eyes are only to be operated upon when sympathetic irritation appears in the fellow eye, or the attachment of the margin of the iris to the lens becomes complete and water-tight. This condition can only be diagnosed by the pupil becoming sunken or "crater-shaped," thus proving that fluids can no longer escape into the anterior chamber.

Adhesion of the iris to the cornea are more liable to be followed by sympathetic troubles than adhesions of the iris to the lens.

## Lathes and Lathe Work.

BY THE MODEL WATCHMAKER.

IN MAKING such a measuring instrument as I described in last article, the first thing to make is the round bar on which the slide works. The best material for such a bar is soft, gray cast iron, but this material is so subject to rust that it is well to substitute steel or bell metal. Soft steel, if carefully wiped and put in a box after using, will last for all uses to which such a tool is subjected for a great many years. But the reader must understand that a tool capable of measuring  $\frac{1}{100000}$  of an inch is a *very* delicate instrument, and must be used with the greatest possible care. And in the making of one the greatest exactness must be observed. I shall describe how to make one, and do it in such a manner that any skillful workman can construct one, even if he has not such a lathe as has been described. A cylindrical bar with one flattened side was selected for the piece on which the movable head worked, for the reason that it is easier to make accurate than any other form. We will now go on with the details of making. For the main bar shown at *A*, fig. 1, we select a piece of 1 inch eight-square steel. The reason for selecting eight-square steel in preference to round is because it is usually of a better quality. The bar should be a trifle (say,  $\frac{1}{8}$  of an inch) longer than the exact length, so as to finally finish exactly 5 inches.



The bar should be carefully annealed in a charcoal box, after which it should be accurately centered and the ends faced off in the lathe. It should now be bored from end to end with a  $\frac{3}{8}$  of an inch hole. There need be no especial care used in boring only so that the hole may be tolerably true and straight. It is well to do the entire drilling from one end, as a piece drilled from each end is most always in a bad shape to bore out true and straight. So drill from one end, but be sure the hole comes out so as to leave steel enough to finish  $\frac{3}{4}$  of an inch in diameter. The hole should be enlarged to  $\frac{7}{8}$ , and to bore out such a hole and do it accurately is a rather nice job. About the best tool for it is one known to machinists as a hog-nosed reamer. Such a tool is shown at fig. 2, and in the present instance is  $\frac{1}{8}$  of an inch larger than the hole was drilled. It is a piece of steel  $2\frac{1}{2}$  inches long, put into a lathe and turned as shown in full outline; the size at *b* being  $\frac{1}{8}$ , at *c*  $\frac{3}{8}$ , at *a*  $\frac{7}{8}$  scant; the part at *d* is squared up for holding. At the end *b* one-half is cut away as shown at the dotted lines; this part is shown in an end view at diagram *b\**; one lip of the cut away is beveled to form a cutting edge as shown at *c*. This reamer is  $\frac{1}{8}$  of an inch larger than the hole was orig-

inally bored. After the hole through the center is bored out with the reamer described we are ready to turn up the outside. The hole at each end is quite too large for using a lathe center directly in the bore, consequently it is better to fit a plug in each end. These plugs should be carefully centered and turned, when they can be driven into the hole at each end and retained in place until the bar *A*, fig 1, is finished. One of these plugs is shown at diagram *g*\*. These plugs cannot be too carefully made, and for this reason I will speak somewhat at length about them. The center at *n* should be drilled and countersunk; a countersink for such work should have the same angle exactly as the center of your lathe, that is  $60^\circ$ . A word about centering: with most lathe men this is not attended to as close as it should be; even the drilling for a center, if we are going to recognize such measurements as  $\frac{1}{10000}$  of an inch, must be done with a drill which cuts a round hole; a twist drill if sharp will answer. The countersink should be turned, and to be right should be fluted, but if cut into coarse graver lines and hardened will answer. In making such a pair of centers it would be well to take a piece of Stubs steel  $\frac{5}{8}$  of an inch in diameter and 2 inches long; drill slight holes, say  $\frac{1}{40}$  of an inch in diameter, at each end. Put this piece of steel into your lathe and face off each end; take it out and countersink slightly. Next restore it to the lathe and turn it to about  $\frac{9}{16}$  of an inch in diameter. Finish it as smooth and true as possible. It is now a solid cylinder 2 inches long and  $\frac{9}{16}$  in diameter. Put this cylinder into your lathe with a back rest (as has been described) and turn in new centers, drilling with a drill about  $\frac{1}{32}$ ; but previous to drilling, perfectly turn out the first center and its drill hole. Now use your graver fluted countersink so the recess will exactly fit your lathe centers. After both ends have been treated to new centers, put the piece back into your double center lathe, slightly face off each end and next turn it as shown in diagram *g*\*; the dotted lines only fill out so as to show both ends. The part shown at *g* is intended to go into bored out hole (*n*, fig 1) which we bored through our bar *A*. The part *g* should fit tightly into the hole, and should be driven in until the flange *f* comes flat against the faced off end of the bar *A*. I should have said the pieces *g* should be hardened and reduced to a dark straw color before driving into their places. The countersink at *h*, diagram *g*\*, should only be enough to hold securely, say,  $\frac{1}{10}$  of an inch across. A piece *i* should be cut from the middle, as the plug *g* need not extend into the tube more than  $\frac{1}{2}$  an inch. We have now got our bar all ready for the lathe; and now we should look to our lathe centers to see if they are as perfect as possible, for we have a job in hand which will task our skill for correctness. We put the bar into our lathe and commence to turn it into a cylinder. I have described how to turn approximately true, but now comes a test case of the highest accuracy. Oh, if we only had our callipers now to measure and see if we are turning the thing parallel; but we have not so must make shift as we can; but, thanks to our lathe with two dead centers, we can take our work out and measure it, and put it back as many times as we please and be sure we are not interfering with its accuracy. If any person should be tempted (as I sincerely hope they will) to make such an instrument with a live center lathe, let him harden and temper his live center (let it down to a blue) and then turn it off as careful as he would a watch pivot, and you can take your work out and put it back into the lathe and not have it run untrue. Few machinists, with any of the callipers in common use, can measure closer than  $\frac{1}{2500}$  of an inch; now, our job calls for just 40 times this accuracy, and we must arrange it so as to obtain it as far as parallelism and truth in the round are concerned; but in regard to the bar being exactly  $\frac{3}{4}$  of an inch in diameter is of no importance, for if it is a  $\frac{1}{1000}$  of an inch more or less, it no ways interferes with the measuring qualities of our micrometer callipers. We will go on with our turning, using the common callipers until we have no appreciable error, *i. e.*, our bar is true to  $\frac{1}{2500}$  of an inch. After this degree of accuracy is obtained we will cease to use the turning tool and turn our lathe into a parallel grinder, using an emery wheel running for soft steel at an intensely high velocity. We

described how to do this in a former article. In my next communication I will describe a simple yet very perfect instrument for testing our bar for parallelism and truth in the round.

### Advice to Watchmakers' Apprentices.

BY A MAN WHO HAS SPENT TWENTY YEARS AT THE BENCH.

THE REPAIR of spectacles and eye-glasses form no inconsiderable part of the work done in the ordinary jeweler's shop, and for this reason a few hints on these same spectacles may not come amiss. The writer does not propose to write a treatise on the optical part of the business, more than to tell how to select and match lenses of the standard form, either convex or concave, and make no reference to cylindrical or other special lenses. Spectacles or eye-glasses with one lens lost or broke brought in to be matched, is about as common a job as we have, and the matching, as a rule, is very poorly, or, I might say, imperfectly done. The usual course pursued is focus the remaining lens by getting the image of a window or some light object on a bit of white paper. This does pretty well for lenses of high power, *i. e.*, glasses of from 6 to 12 inch focus, but take lenses above 24 inches and there is, as the Chinaman says, heap too much guess work. We will suppose a case of a 24 inch lens. We test it in the common manner, say, by the image of a window 12 or 15 feet distant, and the lens would measure near 26 inch focus, as the law is the nearer the object the farther the focus recedes. The 24 inch focus is from parallel rays, such as the sun's rays. The best way to proceed is to have your glasses or lenses assorted like your watch glasses, into divisions, each lens in its appropriate box according to its focus. A very little experience will tell you very near what the focus is; you select a lens which your judgment tells you is about right, and now for a crucial comparison. We will suppose we have a lens of about 18 inch focus to match. About the best test is an ordinary window bar; we should stand away from the window about 3 or 4 feet holding the lens you wish to match, say, in left hand; side by side with it you hold the lens you are testing. At fig. 1 is a view of the manner of testing, *A* representing the lens, *B* the window and *C* the eye. For a lens of 18 inches focus they should be held about 2 feet from the eye and 12 or 15 inches from the bar *B*. At

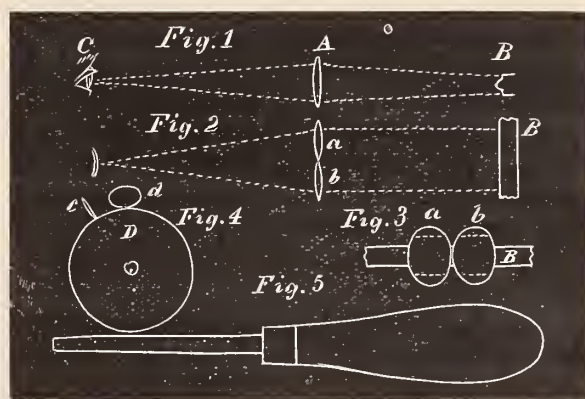


fig. 2 is shown the method as if seen from above, *a b* representing the lenses to be tested side by side. It is important they should be held exactly side by side and not one glass nearer the object than the other. At fig 3 is shown the lenses as they appear when looking at the bar through them; *a b* represents the lenses, *B* the sash bar and the dotted lines across the lenses represent the magnified image of the bar. If, now, the glasses are moved a little up and down in the direction of the arrows, a point will be found at which the magnified image in both lenses will seem to correspond line for line if the lenses are exactly of the same power; if one lens has more power than the other the image will seem to be the widest. To recapitulate the conditions which are essential in this system, the lenses must be held at right angles to the line of vision; they must be both held at the same distance from the object, moving the lenses up and down until the image comes in line as shown in fig. 3. By attending to

these rules lenses can be expeditiously and perfectly matched. If you have no window bar a narrow ruler set horizontally will answer. Near-sighted or concave lenses can be matched in the same way, only it is better to select some object more distant, like the courses of brick in a wall, say, at 15 or 20 feet away. Lenses can be cut with a diamond or one of those patent Yankee glass cutters to very near the right shape. Patterns made of sheet brass to cut around are very useful; they should vary in size to match. Sniping is breaking off small chips of glass to get them down to the right size for grinding and is best done with a pin vise jaws, learn to manipulate the screw to adapt the jaws to the thickness of the glass. But what most workmen manage the worst is the grinding. There is no need of describing how it should not be done, but let us consider the best methods of doing it. A grindstone for grinding spectacle lenses should be of medium grit; a white finish being the best, a Nova Scotia next, but a clear perfect Ohio does very well. A stone for this purpose should be at least 2 feet in diameter and not more than 2 inches thick, mounted to run easy and worked by a treadle. The grinding surface or face of the stone should be slightly concave, but never guttered or grooved. This will be avoided by holding the lens so its plane is parallel to the axis of the grindstone as shown at *c*, fig. 4, where *c* represents the lens and *D* the grindstone; at *d* is shown a glass as it should never be held. A glass should be held between the thumb and finger of both hands, giving it a swinging motion across the face of the stone at the same time revolving it. Frequent trials in the frame when near the right size is much better than getting a glass too small. If a lens is a trifle small a shred of thin sheet lead put between the glass and the frame will generally keep the glass from coming out; the superfluous sheet lead can be cut away after the frame is screwed up. For polishing the edges of such lenses as are set in skeleton frames a wooden wheel is the best. The wood should be some close-grained, hard wood, apple or pear tree wood being the best, but gum tree or maple will answer. The polishing wheel should be cut off the stick cross wise to the grain, and about 6 inches in diameter and about 1½ inches thick. These wheels should be arranged to go on to the polishing lathe. They should never be allowed to get dry, but kept constantly submerged in water when not in use. There should be two, one for grinding smooth and another for polishing; on the first is used pulverized pumice stone and water; on the latter, putty powder or tripoli and water. A sponge should be arranged to keep the wheels wet. For drilling glass a very hard steel drill moistened with turpentine will soon effect the object. A box should be kept divided off into compartments for old frames for repairs. These should be divided up so as to waste no time looking for parts. And there is no tool so important in spectacle repairing as a screw driver; it should be strong and have a handle on it, not like a watchmaker's screw driver, but something you can put the force on to. A joint screw which would defy an inexperienced person with an ordinary screw driver, will yield with the best possible grace if attacked with just the right tool applied knowingly. A good form of screw driver is shown at fig. 5. The end of your vise against which you can put the obdurate joint and apply strong pressure at the same time you are turning is what is wanted. But usually your vise is on the wrong side of you. The writer has an American lathe at his left against which he has placed many a joint which the boys insisted could not be got out, and satisfied these same boys that some things which in their experience seemed impossible, could be accomplished if gone at in the right way.

### Problems in the Detached Lever Escapement.

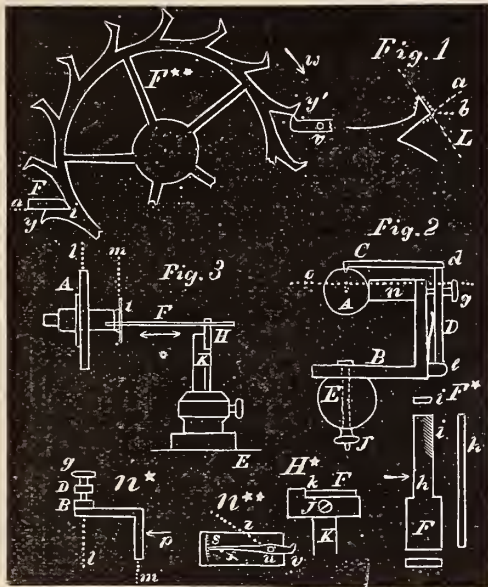
BY DETENT.

BY MEANS of the pliers described in last article, we can flatten and extend the teeth of our scape wheel more than enough to supply the part stubbed and worn off. Now, the best method to be

pursued is to *over do* the stretching, as shown at fig. 1, where the full outline represents the correct form of the tooth, and the dotted outline the shape of the stretched and flattened tooth. What we want is to get back the correct form of the tooth. Perhaps we may be even able to improve the form, except the original wheel was scaped very close. At any rate we propose to have it as good as new at the least. The thing to be first done is to restore the teeth on the dotted line *a* which represents the front of the teeth. We put the wheel into the wax chuck described in last article, and by means of the spacing wheel attached, bring tooth after tooth to exact form. And, as we are to use no milling wheel, we must resort to some other method. We must first understand exactly what we want to do and then devise the means to accomplish this result. In this case we want to restore the teeth on the line *a*, and this restoration must be on the following conditions. The face line *a* must be on a certain angle (24°), and every tooth at the point which is ultimately to represent the commencement of the impulse angle, and indicated at fig. 1 by the dotted line *b*, must be equally spaced. We will first consider how to restore the line *a*. The spacing wheel described in last article should be made double and divided carefully into 45 or 60 teeth; if the former number is used 3 spaces represent a tooth; if the latter, 4 spaces for each tooth of your scape wheel. For holding the spacing wheel (*A*) in position a device is shown in fig. 2. It consists of a pawl *C*, shaped as shown, falling into the teeth of the spacing wheel *A*. This pawl is held steady by being attached to a piece bent at right angles and shown at *B B*. This piece (*B*) is secured to the lathe bed by the screw *f f*. The pawl *C* is attached by a joint *d* to the piece *D*, also jointed at *e* to *B*. The screw *g* serves to draw *D* forward against a spring between *B* and *D*. This screw *g*, by being manipulated, will adjust the division wheel *A* into any intermediate position between the regular spacing. The cut at fig. 2 is supposed to be seen looking in the direction of the axis of the lathe, and *E* the bed piece of the lathe. We have now our system of division established; what we want next is a cutting device to re-shape our teeth. In the present instance we intend using a flat instrument shown at *F*. At diagram *F\** it is shown in 4 positions, *F'* being an edge view, and the small drawing above and below *F* are end views. It is simply a flat piece of steel about 2 inches long by half an inch wide at the widest place. At *h* it is cut into a very fine file by graver cuts as shown. The idea is, this instrument (*F*) is used as a fine file to dress up the face of the teeth on the dotted line *a*. This file or cutting instrument *F* is used by resting the file cut end on the tooth while the back end rests on a guide which goes into the tool rest holder, as shown in fig. 3, which is a view of the device seen at right angles to the axis of the lathe. The piece which holds the back end of *F* is shown separate at diagram *H\**, and consists of a piece of large brass wire (as large as will go into the tool post hole) shown at *K*. At the top of *K* is a T-shaped piece of thick (No. 12) sheet brass shown at *H*, which is secured to *K* by the screw *j*. This screw *j* should be a good strong one, as *H* is intended to turn on it to set it (*H*) in position as will be explained. The piece *F* is beveled on one edge as shown at *i*, diagram *F\**; this will be understood by inspecting diagram *F\*\** which shows the action of *F* on the inner face of the tooth. Let us look over and see what shape we have our tooth shaping device in. We have (suppose) the scape wheel (*z*) in the wax chuck, and the division wheel *A* set right, we put *F* so the wide end rests on *H*, and the narrow file cut end rests on the tooth as shown in diagram *F\*\**. We turn and tip *H* until the face of *F* is right to restore the tooth on the line *a*, fig. 1. We now gently rub the piece *F* back and forth guided by the edge of *H* from any up down motion and by *k* from swinging latterly. But there is no guide to let us know when the inner face of the tooth, as shown in diagram *F\*\**, is faced off sufficiently. At *n*, fig. 2, is shown a piece projecting from the upper part of *B*. Now, this piece is L-shaped, as shown at diagram *n\**, which is a view of fig. 2 looking down on the dotted line *a*. The position of the division wheel is on the line *l*, and the scape wheel we are truing up on the line *m*. These



lines are also shown in fig. 3. The face of *n*, seen in the direction of the arrow *p*, is shown in diagram *n\*\**. On the face of *n* (diagram *n\*\**) is a small hand (*r*) and index (*s*) working on a small screw at *u*. The object of this dial and hand is to measure when we have enough removed from the face of the tooth we are working on. To illustrate we will suppose we rub our file *F* back and forth until the face of tooth shown at *y*, diagram *F\*\**, seems to be faced off enough, at least we are satisfied that each tooth to follow will have to receive a full face to correspond in the spacing. We now revolve our lathe spindle after lifting *C* out of the division wheel *A*; as the lathe spindle revolves, of course, the scape wheel (*l*) in its wax chuck is also carried forward; now, if the piece *n* is set so it is nearly opposite to where it was at *y*, diagram *F\*\**, as the wheel revolves the scape wheel teeth will one after another strike *v*, the short end of the lever and hand *r* turning it up in the direction of the dotted line *z*. The idea in the test is just as the tooth *y* we have been facing up touches *v*, one of the spaces in the division wheel *A* will receive the pawl *C*, fig. 2. The hand *r*, when not engaged, drops and rests on a pin at *x*. Now, by means of the screw *g*, fig. 2, we can move our division wheel so that when the pawl *C* is in the proper division or notch in *A*, the tooth we are testing will raise the hand *r* to a certain division or mark on the index *s*. The end *v* of the hand *r* is shaped as shown and is intended to engage each tooth in succession exactly where it locks with the pallet. Now, if each tooth in succession, when the



pawl *C* is in its proper notch, rises the hand *r* to the same graduation on the index, the spacing of our scape wheel must be perfect. We must next change our piece *F* to grind off the impulse angle or face on the dotted line *L*, fig. 1. But to describe this will take more space than is allotted to one article, so we must carry the description over. The description of this device reads a little complicated, but the machine is really quite simple if the idea is once fully understood. The file *F* can be substituted for a thin slip of Arkansas stone, but the stone only need be quite small and attached to a piece of brass of the right size and shape. The device described or partly described, can, in many cases, be used to true up and restore one or two defective teeth, as it will be seen, that by means of the adjustments of which it is capable, that it may be set to match or suit a correct tooth of a scape wheel and the injured teeth brought to correct form. It has (the device) one great advantage as—suppose you are using an American lathe, you can unscrew your drawing-in spindle, take out the wax chuck with the division wheel, leaving the pawl and all the other attachments in place, and manipulate a tooth with pliers or tweezers and put back the chuck in your lathe, drop the pawl *C* into the proper notch in *A*, and everything is relatively in the same condition as before. You can measure your tooth with the index *s* and see what alterations you have made or are to make. And for ratchet tooth scape wheels you need only the one index.

The best way is to experiment with a few old scape wheels, and you will soon be astonished at the power you have to manipulate them if you only have some correct means of ascertaining when they are right.

### The Manufacture of Repeating Watches.

*Continued from Page 309.*

IN THE frequent case where it strikes almost at the same time, it will be expedient to delay the moment when the locking is effected by lengthening the long piece, by filing the part of the quarter piece which is coming to rest against the lifting of the large hammer, and lastly by increasing the action of the slide at the return.

*Striking the hours.*—To ensure the hour striking well, it is necessary for the large hammer to have a sufficient lifting, and for the strength of the spring to be proportionate to its weight; the counter spring ought to be weak enough to yield under the blow of the pin when the hammer strikes. This ought to be held at a certain distance from the bells by the adjusting screw, so as to touch it lightly in letting it escape after the half of its lifting; when the blade of the bell is strong and vibrates little, the hammer can be brought nearer than that.

There are many means of increasing the lifting of the hour hammer. The first consists of lengthening the lever against which the teeth of the twelve-toothed ratchet act; it is suitable to employ it, when, in pushing the rack strongly, there is a risk of making it pass a tooth too much in making the arm "give" which rests against the hour snail. Another plan which has been previously indicated, consists of bringing the inner side of the lever nearer to the teeth of the twelve-toothed ratchet, of that which acts against the pin of the hammer. Finally, the examiner should also be able to replace this latter by a large one.

After having increased the lifting of the hammer it should be ascertained that the tooth of the lever, in escaping from those of the ratchet, does not strike against those following; this would much diminish the sound of the bell. In this case it should be brought nearer to the hammer by bending it near the block, and the inside of the lever should be filed without shortening the tooth.

In certain repeating works the arm of the rack is long and narrow, so that it bends at the point like a spring when it rests against the hour snail; this produces a movement in the star which sometimes makes it jump before the hand has arrived on sixteen minutes. When it is struck at the moment that the star is going to jump at the tenth and eleventh hours, the arm can escape from the edge of the notch after the quarter piece has fallen, and the piece strikes the following hour and three-quarters.

This defect can be corrected by placing on the plate, as near as possible to the sink of the star, a block, against which the outside of the arm just touches, and which prevents it from giving when the rack is pushed strongly; this block ought to leave the arm entirely free before it is just going to rest against the snail.

*Striking the quarters, five minutes and minutes.*—When the strokes of the two quarter hammers are too close to each other, the teeth of the quarter piece acting against the lever of the small hammer can be shortened so that this may strike more quickly. In the case where the lifting of this hammer should not be long enough, the part of the lever which acts against the pin of the hammer ought to be bent or hammered to bring it nearer to the pallet of the said lever; if this operation is not practicable, a larger pin should be put in.

The intervals between the strokes of the hammer can also be increased by hammering the teeth of the quarter piece to increase the lifting of the large hammer; but this plan cannot be employed in the minute pieces, these teeth being too short to hammer; to obtain the same result they should be brought nearer the lever, as it has been already indicated, in tempering the quarter piece while

exercising by the aid of two tongs, a traction following the plane of its surface.

When it should be expedient to increase or diminish the lifting of the hammer without changing the harmony, the examiner should be able, for the first case, to close the angle formed by the two parts of the lever by hammering them or to put a larger pin, and, for the second case, to open this angle by filing the part acting against the pin; it is understood that the points of the teeth remain between them in exactly the same position; the duration of the intervals between the strokes of the two hammers would not be changed.

When the strokes of the small or the large hammer are too distant from each other, file the teeth of the quarter piece which acts on the lever of the large hammer in order that it may strike more quickly, and if, by doing this, the lifting of the large hammer is diminished too much, it should be increased by closing the angle of the arm with the pallet of the lever or by changing the pin. The strokes of the two hammers can equally be brought closer by hammering the teeth of the quarter piece which acts on the lever of the small hammer, after having stretched the teeth it will strike slower, and if, in lifting, it near touches the bridge or cock, the lifting should be taken away by filing the arm of the lever. In increasing or diminishing the lifting thus, the examiner must by no means change the duration of the interval between the strokes of the two hammers modified by either of these operations.

In *five minute repeaters*, when the first stroke of the fifty-five minutes is too near to the hours, the examiner should file the part in contact with the finger which brings back at the moment of striking the first of the eleven strokes in such a manner as to obtain a sufficient interval. When the strokes of the small hammer are too quick compared to those of the hours, they may be made slower by filing the part of the five minute piece against which the finger slides in bringing it back; if that is not sufficient, the spring of the hammer should be strengthened, and in the case where the lifting of this latter should not be sufficient it will suffice to increase it, to diminish the thickness of the pipe of the five minute piece, the teeth of which should be brought sensibly nearer to the small lever by the effect of the pressure of the spring of the said piece.

The last plan can also be employed to avoid hammering the arm of this piece when it passes a tooth too much on one or more notches of the five minute snail.

In *minute repeaters* a slackening is often observed when the last minutes strike; that proceeds from the increasing resistance offered to the train by the different springs at the moment when the minute piece is nearly brought back. If, after having weakened these springs, this defect still remains, this indicates that the spring of the train is not set up sufficiently, or else that it is not free at this moment; it is sometimes sufficient to change the position of the barrel one way or the other, in order that the train may more easily surmount the drag occasioned by the springs of the repeating work when the stopping is going to take place.

A "perfection" recently introduced in minute repeating works is the detaching mechanism of the jumper of the surprise, which has the effect of taking off the drag occasioned to the large train by this jumper. Before its employment, the examiner had to carefully diminish this drag by limiting the descent of the jumper, and leaving the spring just strong enough to insure its action. The detachment is applied by two methods: in the first place by leaving a light contact of the surprise with the point of the jumper, when the rack, entirely brought back, has made it recover its position; this touch is necessary in order that the surprise may be pushed behind at the moment where, in striking from twelve to thirteen minutes after each quarter, it should be able to hinder the minute piece from falling on the snail, as it is this which causes the hand to move back. In the second place, the examiner can also adapt in the thickness of the quarter snail, a spring acting against the nut which is adjusted to move stiffly on the canon pinion, so as to keep the snail and the surprise behind under the minute snail till the moment

when on each quarter the jumper pushes them forward, from which it results that the quarter piece falls on the following notch and that of the minutes on the surprise or zero minute.

The employment of this spring offers two advantages: it allows the jumper to be completely detached, and prevents the piece from going back when the hands are turned back after each quarter without arriving at the point where the jumping takes place.

This spring of the snail ought to be weak enough for those of the jumpers of the star and of the surprise to overcome it with certainty. At one o'clock and at the moment of changing on the points of the quarters, the jumper ought to make the surprise advance all the way that the opening permits in which the pin passes, which is fixed to the minute snail; for that, the leaf-shaped piece below the jumper ought not to be too much hollowed out near the point.

The jumping of the star from twelve to one o'clock ought to have taken place a little before that of the surprise; without that, the jumping of the surprise might have been effected while the push took place for striking, and when the arm of the rack had already passed before the high part of the snail corresponding to one o'clock, the piece would strike twelve o'clock without quarters or minutes when it ought to have struck one.

*Verification of the actions and putting on the other parts.*—The putting in action of the dial and repeating work being finished, the spring applied and the piece set going, the correctness should be verified by making it strike many times a little before the hours and quarters. Just at the moment that the minute hand has passed the points, the examiner must assure himself that these changes operate exactly without the hand making any movement, when the quarter or the five minute piece falls on the snail or the surprise. If he observes a forward movement it will be expedient to weaken the springs of the said pieces, and also those of the overswinging of the levers of the hammers, the resistance of which they ought to overcome, even when these pieces arrive without drop on the notches of the snail. If, on the contrary, it produces a backward movement of the hand immediately before the jumping on the hour, this should indicate that the arm of the quarter or five minute piece touches in falling against the snail; this or the arm should be filed in such a manner that it may have a sufficient space for safety at the moment when the star is ready to jump.

It should be ascertained that the edges of the notches of the snail as well as the end of the arm are correctly filed, so as to leave the angles sharp. If, after these re-touches, the minute hand will not remain fixed when the piece is struck at the moment of changing on each quarter, the burr on the arbor of the canon pinion must be strengthened to make it fit tighter in the center pinion.

After having put the hands at their definite height, the glass and the glass in the dome (if there is one) should be fitted, and then the piece should be dismantled to make the corrections, of which note has been taken, and to prepare the different parts of the movement for the engraving, gilding, stoning, polishing the screws and the other steel pieces. It will be well to mark the snail with the canon pinion, to the five minute and minute pieces as well as certain screws, and to mark the position of the barrel of the small train, to set up the spring the same quantity, when the movement is finally put together again.

If there is an inscription or a name to engrave on one of the bars, the direction of the letters should be taken while holding the pendant toward oneself.

To the movements with lever escapements it should be remarked if the balance comes in and out easily, and also if it is necessary to make an opening for the balance pivot on the edge of the hollow of the sink, and to thin the flat part of the escape cock.

Before ending the case to be prepared for ornamentation, the cover of the bottom should be raised; if there is not space for the glass the hole in the joint of the dome should be opened out, and the dome made to open a proper distance for it to remain outside the glass of the bottom of the case, and a point should be marked

opposite the pendant to indicate the direction of the inscription to the engraver.

When the different parts shall have been returned and examined, the bridge of the winder should be screwed on the plate with the spring bar, the case screws and the studs of the minute wheel and the repeating work, then re-mount with great care the two trains and the escapement.

Put the slide on after having cleaned the hand and ascertain that the winder is entirely free, with the movement in the case, the screws well home.

The levers of the hammers, their springs, counter springs and adjusting screw will be re-mounted and their actions verified, above all, taking care to put oil wherever it is necessary.

The examiner should be assured that the small train runs freely during the complete action of the spring; it should be afterward stopped by the screw of the "fast and slow" (*vite et lent*), in order to easily be able to place the gearing of the pinion in agreement with the teeth of the rack, and to set up the spring the required quantity.

The other pieces of the repeating work will be replaced and their actions definitely verified.

Mr. John Hugenin then adds: "Arrived at the end of the task that we have undertaken, we hope that the manufacturer or repairer of repeating watches will kindly address to the editor of the *Journal Suisse d'Horlogerie* any observations they have made themselves, and which are not contained in this short study.

[THE END.]

## Recent Patents.

The following list of patents relating to the jewelry interests, granted by the U. S. Patent Office during the past month, is specially reported to THE JEWELERS' CIRCULAR by FRANKLIN H. HOUGH, Solicitor of American and Foreign Patents, 925 F Street, N. W., rear U. S. Patent Office, Washington, D. C. Copies of patents furnished for 25 cents each.

*Issue of November 17, 1884.*

330,632—Clocks, Contact Maker for Electric. L. H. Spellier, Philadelphia, Pa.

330,673—Eye-Glass Hook. G. D. Briggs, Providence, R. I.

330,521—Eye-Glass Nose Pad. J. S. Spencer, New York, N. Y.

330,558—Watch Balance Wheel. A. S. Buckelew, Jersey City, N. J.

330,487—Watch Case. B. F. Hope, Sag Harbor, N. Y.

330,717—Watch Case. J. Lamont, Sag Harbor, N. Y.

330,401—Watch, Stem Winding and Setting. C. T. Higginbotham, Assignor to Hampden Watch Co., Springfield, Mass.

330,537—Watch Stem Winding and Setting Mechanism. C. V. Woerd, Waltham, Mass.

*Issue of November 24, 1885.*

330,938—Clock; Primary Electric. W. L. Stevens and E. J. Wescott, Hyde Park, Mass.

330,896—Clock Striking Mechanism. A. G. Hovde, Honefos, Norway.

330,923—Clock Synchronizer. A. Ramel and W. W. Dean, St. Louis, Mo.

331,086—Finger Ring. W. H. Richmond, Providence, R. I.

330,905—Watch. E. Kuhn, Brooklyn, N. Y., Assignor to Manhattan Watch Co., New York, N. Y.

*Issue of December 1, 1885.*

331,664—Bracelet Clasp. W. E. Willis, North Attleboro, Assignor to T. Totten & Co., Attleboro, Mass.

331,719—Cabinet, Jeweler's. H. Knickmann, East New York, N. Y.

331,743—Chains, Appendage for Ornamental. J. L. Sweet, Attleboro Falls, Mass.

331,638—Ear Ring. G. M. Hathaway, New York, N. Y.

331,465—Eye-Glass Spring and Nose Guard. G. W. Wells, South Bridge, Mass.

331,417—Watch, Stop. H. A. Lugin, New York, N. Y.

*Issue of December 8, 1885.*

331,798—Bracelet. P. Lettre, Assignor to T. I. Smith & Co., Attleboro, Mass.

332,053—Chain for Bracelets. I. Cole, Brooklyn, N. Y.

332,183—Jewel Setting. G. Becker, Assignor to Hancock, Becker & Co., Providence, R. I.

332,023—Watch, Self Winding. H. Von Der Heydt, Chicago, Ill.

## The History of Goldsmithing.

*Continued from page 332.*

THE TOILET which P. Germain made for the queen in 1726, was composed of no less than thirty-five pieces. Poor Marie Leczinska! She so ugly, so simple and so honest a woman!

This toilet set, it appears, was most charming, and gave Germain a great name. The Queen of Spain did not rest content until she had another similar set. A few years later Germain made several others for the Queen of Naples and for a Brazilian princess—the name we have forgotten. Finally, in 1745, he made the last set for the Dauphiness of France, the value of which was sixty thousand livres.

Germain worked at the same time for the Dauphin, whose first arms (a sword, pistols and a gun) he ornamented. Among other various pieces of work, he made also a cross ten feet high and several large candlesticks for the King of Portugal, next all the silverware for the King of Denmark, as well as that presented by Louis XV. to the Sultan.

Few goldsmiths ever enjoyed a greater renown during their lives, and Germain really deserved his fame. The pieces he wrought might have been considered as giving him an evanescent name, if he had not taken the pains of issuing a book of his models, entitled, "Elements of Goldsmithing." From this we extract the two accompanying models, fig. 45, a water pitcher, and fig. 46, a wash basin, which will give an



FIG. 45.

idea of his style.

The most serious rival he had, as far as talent is concerned, appears to have been one Roettiers, an excellent goldsmith, who, in 1742,



FIG. 46.

made a quantity of silverware for the Dauphiness, valued at three hundred thousand livres, a table service for the Elector of Cologne, and for public use a number of pieces wrought with much ability, a

certain number of which has come down to us. The flambeau, fig. 47, is one of his best known pieces.



FIG. 47.

He had another rival, Meissonier, who possessed much skill in devising, and has left us a number of models. The taste of the day appears to have been his principal law, and no matter how *bizarre* it was, Meissonier followed and improved on it; no one has, therefore, more faithfully and completely represented the so-called rococo style.

It would not be just if we were to completely ignore one Charton who made the very original coffee pot, fig. 48, and Nicholas Besnier who, in 1737, was by the king charged with the execution of a table service of silver and brass, of the weight of eleven hundred marcs.



FIG. 48.

It is well known that the tastes of Louis XV. were not inclined to pomp and circumstance. Thus, the diary of Barbier informs us, that in 1754 he still possessed forty-two golden chairs, all made by dozens every year, and paid for with the New Year's purses given to him.

As for the questions of art, he willingly abandoned their care to his favorites, and although they were, on the

whole, far from being like Diana de Poitiers, it must be acknowledged that neither Mme. de Pompadour, nor even Dubarry, refused their protection to artists of intelligence and men of taste.

Several important publications which, toward this time, were issued from the press, illustrative of the best productions of art or antiquity, also contributed to bring about a reaction in taste and style.

But, unhappily, when the tide of reaction against the mischievous rococo style began to set in, France was seized with its chronic shortness of finances caused by the lavish expenditures of this unhappy reign. Near the end of 1759, extreme want set in. M. Paul Mantz, from whom we make this extract, says: One course was still open, and the works of the goldsmith were levied on to pay the war expenses, as had been done under Louis XIV. The king invited all his good subjects to carry to the mint all their silverware. Mme. de Pompadour, the Duke of Orleans, the Marechal de Belle-Isle, the Duke de Choiseul and the other ministers set the first example, and the king himself made sacrifices. His silverware was smelted, and 5,400 marcs of it were in two days delivered to the mint.

Although the measure was intended to be radical, its application was in no respect as vigorous. At first, the king, possessing more love of the beautiful than his grandfather, desired to reserve cer-

tain objects specially precious by their work, for instance, the magnificent set of toilet articles of the Dauphiness, being the work of Thomas Germain; all those who carried their silver to the mint were paid the value—one-fourth in silver, the balance in promissory notes.

At the same time, however, while royalty became impoverished, the middle classes grew more wealthy, and while these were gaining in riches and possessions, they also lost their former state of abasement and ignorant simplicity. The great lords or the rich farmers of the public revenue were no longer the only ones to aspire to distinction. The *bourgeoisie* began to feel that they were a power in the land, and that the day when they had been a downtrodden and grovelling race was past; the Jean-Jacques Rousseaus, Corneille Dumoulins, etc., and other heroes of the ever-memorable revolution were born. The first rays of day shot athwart the sky at night. The French Revolution began to be foreshadowed. People commenced to wear jewelry, even if of an inferior grade, and a new industry, that of making false jewels—strass—was developed. This manufacture of imitation jewels soon assumed immense proportions, and a special set of laws and ordinances were enacted for its regulation.

Religious, as well as profane, goldsmithing declined from year to year, and toward the middle of the century it barely more than existed in name. The last important work of the former class we remember, is the shrine of St. Germain, Bishop of Paris, which Jean Louis Chevalier, Canonicus of Notre Dame, presented to his church in 1763. Contemporaries all are loud in their praises of the composition of this piece, made by Philippe Caffieri, brother of the able sculptor of this name. This Caffieri was goldsmith, bronze worker, sculptor, etc., and was very renowned for his talent of decorating.

The remarkable perfection of the gilt-bronze industry during the second half of the eighteenth century was another cause that most powerfully contributed to the decline of goldsmithing. The fashion being still in vogue, it is useless for us to say anything farther on the subject.

On the other hand, the porcelain industry also assisted. Due to the repeated destructions, by royal edicts, silverware had become rare in the country; the wealthier classes were impoverished, while the *bourgeoisie* was only beginning to grow rich, and both parties met on one common level—porcelain, the choicer productions of which appeared on the table of the wealthier classes, while the poor contented themselves with inferior articles. Many of the readers of THE JEWELERS' CIRCULAR have themselves seen collections or single specimens, and with us will attest to their great beauty.

The only branch of goldsmithing that really flourished in the last quarter of the past century, was the counterpart of the word *grosserie*, what the Italians once aptly styled *minuterie*—that is to say, the manufacture of the thousand and one small objects exacted by fashion, such as snuff doses, bonbonnières, smelling bottles, etc.

Thus wags the world! The goldsmiths of antiquity, as we have endeavored to show in this history, erected gigantic statues to their gods and goddesses; those of the mediæval age wrought reliquaries and monumental shrines for their saints, and in our times they made bonbonnières and bottles for smelling salts.

The beautiful had given way to the pleasing; but who can deny that the pleasing, if treated properly, is still an art. We have come to be a practical people, and everything about our works of art must be shaped to the same ends, while the ingenious taste of its composition, the exquisiteness of its "get up," to use an Americanism, make it salable and stamp it as works of modern art.

We were never so much struck with the different styles in vogue only during one short century, than we were on comparing the collection of M. and Mme. Lenoir, in the Louvre, composed in greater part of snuff doses, either of gold or of some other precious material mounted in gold, ornamented with diamonds, fine jewels, covered with enamels, miniature cameos, etc. Nearly all of them pertain to the age of Louis XV. and Louis XVI., and the visitor to the Louvre may study the several styles so different even in their smallest details,

and he has ample scope to trace the *bizarre* conceptions of the rococo style with the most elegant caprices of the fashions which supplanted it.

Many of these boxes bear the names of their manufacturers. Those most in favor appear to have been those made by Vachette, Sageret, both father and son, goldsmiths of the Duke of Orleans, Lerfant and Antoine, who still lived at the commencement of this century.

After Louis XVI. we arrive at a period of social convulsions and terrible strifes, when all the industry *de luxe* were for a long time under a cloud. It was the time when church bells were cast into cannon, a time which not only produced nothing, but which laid its heavy hand on the pieces in existence and religiously preserved in collections, many of which went into the revolutionary crucible.

### 3.—*The seventeenth and eighteenth centuries in Europe.*

We will next cast a look around us to see what the rest of Europe was doing during these two centuries in goldsmithing.

England, in spite of its revolutions, has always remained a conservative country. A fair number of large pieces are still found dispersed throughout the country—pieces similar to those wrought in France under Louis XIV., which, unhappily, did not survive his reign.

Thus the queen, among many other pieces too long to enumerate, possesses several very valuable silver tables (one of them dates to the year 1670, is ornamented with chased work [*repoussé*], in the center of which is the monogram of Charles II.); next a silver frame, highly ornamented with fruits, flowers and figures of love, in *repoussé*; a pair of andirons of silver-gilt, both bearing the initials of Charles II.; another pair of silver andirons with the initials of William III. (1696), formed of two figures of young men, each one carrying a basket of flowers; and water pitcher and its plattern, of silver-gilt, dated 1782, representing the birth of Venus, Neptune and various other marine divinities; a vase of antique form, having for its subject the age of gold and the age of silver (draughted by the sculptor Flaxmann), etc.

By the *Liber Aurifabrorum* we see that all the ancient "regalias," which had been ruthlessly destroyed in the civil wars by king or Parliament, were remade for the coronation of Charles II. They are of gold, with the exception of the silver-gilt spoon, which weighed only 3 ounces, 5 dwt., the cost, with the fashion, being £2. Hence it is evident that the coronation spoon, as well as the other pieces, were actually made at this time, the shape being retained, as nearly as could be remembered, of the ancient one. This spoon is described by H. Shaw ("Dresses and Decorations of the Middle Ages") as being of gold, and he has given a drawing of it with the enamel restored in all its presumed pristine brilliancy, attributing it to the 12th century. On close inspection of the drawing itself, we are of opinion that he was mistaken, and that it is not really more ancient than the latter part of the seventeenth century, the ornamentation being clearly of the time of Charles II. In fact, the interlaced C.'s of that king will be easily recognized, the form of the rat-tail spoons of that period. The ancient ampulla used at the coronation of English sovereigns was, according to Mezeray, of *lapis-lazuli*, with a golden eagle on the top enriched with pearls and diamonds, the tradition being that it was miraculously presented by the Virgin Mary to St. Thomas, of Canterbury (Becket), when he was in France. We may add that the old crown of state, mentioned in the goldsmiths' bill, weighing 72 ounces, was broken up at the coronation of her present Majesty, Queen Victoria, in 1838, and a new crown more suitable for a lady's brow substituted, its gross weight being only 37 ounces, made by Rundell and Bridge, who took the framework of the previous crown in part payment.

In the list of fees provided for the coronation of Charles II. will be found "two ingots of gold." One of them was for the first oblation at the high altar, of a Troy pound (12 ounces) of gold. The other for the second oblation, of a mark (8 ounces) of gold.

This custom was very ancient, and mention is made in old chron-

icles of these offerings by sovereigns at the high altar on their coronation. Edward I., at the first oblation, offered a pound of gold (12 ounces Troy), in the likeness of a king holding a ring in his hand; the second was a mark of gold (8 ounces of avoirdupois), in form of a pilgrim putting forth his hand to take the ring, which represented the legend of St. Edward receiving a sapphire ring from the hand of St. John the Baptist in Waltham Forest (still worn at coronations and actually used by Her present Majesty). Henry III. also offered a pall (pallium) or mantle of cloth of gold and a plate of gold. The custom has been continued to the present day. George III., at his coronation, for the first oblation laid upon the altar a pall of cloth of gold and an ingot of gold of a Troy pound (12 ounces). After the ceremony of anointing and crowning, etc., the king made a second oblation of a mark of gold (8 ounces).

Sir Robert Viner, of Lombard street, London, was, in 1666, a celebrated goldsmith; Sheriff in 1666, Mayor 1675. He made the crown jewels for Charles II.'s coronation, at a cost of upward of £30,000, and entertained his Majesty at Guildhall during his mayoralty in 1675. Pepys says: "1st February, 1666.—Thence to Sir Robert Viner's, leaving clear in his hands £2,000 of my owne money to call for when I pleased." A short time after Pepys adds that he went to Lombard street and brought it away, being much surprised to find he received £35 for the use of it for a quarter of a year. When the exchequer closed in 1672, Viner had in it no less than £416,724. This, however, does not appear to have ruined him or shaken his credit, as he was elected Mayor a few years after. Evelyn in his "Diary," 19th June, 1679, says: "I dined at Sir Robert Clayton's with Sir Robert Viner, the *great banquer*."

The following story is recorded by Grammont: Sir Robert Viner was a very loyal man, and if you will allow the expression, very fond of his sovereign. He entertained his Majesty, Charles II., at Guildhall during his mayoralty in 1675; but what with the joy he felt at heart for the honor done him by his Prince, and the warmth he was in with continual toasting healths, his lordship grew a little too fond of his royal guest, and entered into a familiarity not altogether graceful in so public a place. The king understood very well how to extricate himself in all such difficulties, and, with a hint to the company to avoid ceremony, stole off and made toward his coach which stood ready for him in Guildhall Yard. But the Mayor liked his company so well and was grown so intimate, that he pursued him hastily, and, catching him fast by the hand, cried out with a vehement oath and accent: "Sir, you shall stay and take t' other bottle." The airy monarch looked kindly at him over his shoulder, and, with a smile and graceful air, repeated this line of the old song: "He that's drunk is as great as a king," and immediately returned and complied with his host's invitation.

Prince Rupert, son of the Queen of Bohemia (daughter of James I.), who died at his house in Barbican in 1682, and was buried in Westminster Abbey, left a collection of jewels valued at £20,000, which were disposed of by lottery under the management of Mr. Francis Child in the following year. An advertisement in the London *Gazette*, October, 1683, announced that "the jewels had been valued by Messrs. Isaac Legouch, Christopher Rosse and Richard Beauvoir, jewelers, and will be sold by lottery, each lot to be £5. The biggest prize will be a pearl necklace valued at £3,000 and none less than £100. The money to be paid to Mr. Child, who will stand obliged to all adventurers, and that they shall receive their money back if the drawing does not take place on the 1st February next. The drawing will take place in the presence of His Majesty, who will himself see that all the prizes are put in among the blanks, and that the whole will be managed with equity and fairness." The drawing took place at Whitehall, the king counting the tickets among all the lords and ladies who flocked to take part in the adventure.

John Croker, born at Dresden in 1670, was originally a jeweler, came to England and was employed at the Mint. In 1705 he was appointed chief engraver, subsequently mint master by Queen Anne,

until his death in 1740, when he was succeeded by Dassier. Queen Anne's farthings, about which some absurd rumors have been in circulation as to their value, were designed by him, but, owing to the queen's death, they were never circulated.

Charles Boit, born at Stockholm, the son of a Frenchman, was a jeweler, and came to England to follow that trade. He afterwards painted portraits in enamel so successfully, that he was much patronized in the reign of Queen Anne. He died in 1726.

Pierre Harache, an eminent goldsmith and plate worker, of Suffolk street, Charing Cross, emigrated from France after the revocation of the edict of Nantes. The first time we meet with his mark is on the copper plate of Goldsmiths' Hall, between 1675 and 1697. The first record of his name is of the latter year. The earliest pieces of plate we have seen are an old standard two-handled cup of the year 1691, and a fine helmet-shaped ewer of the New Standard of 1697, engraved with the arms of William III., presented by the king to the Duke of Devonshire, weighing 70 ounces. He died in 1700, and was succeeded by his son, Peter Harache, Junior, then residing in Compton street, Soho. The father's mark was his initials with two ermines above, surmounted by a crown, and a crescent under, to which the son added a fleur-de-lis between the letters. The latest pieces we have seen are of 1705-6, probably the date of his death.

Thomas Snow was, in 1700, a well-to-do goldsmith at the "Golden Anchor," in the Strand, and was accounted to be a very careful man of business. The following story is told of him: Sampson Gideon, a great Jew broker, had occasion to borrow £20,000 of Mr. Snow, the banker. Very shortly after a panic occurred, and Mr. Snow, alarmed for the safety of his loan, addressed a piteous epistle to the Jew, entreating him to pay the money at once, and thereby save him from bankruptcy and utter ruin. Gideon knew his man well, and determined to give him back his coveted property but to punish him at the same time for his want of confidence. Accordingly he sent for a phial of hartshorn, and, wrapping it in twenty notes of £1,000 each, returned the loan in that form.

David Willaume came to England about 1686, and commenced business as a goldsmith and plate worker in Pall Mall. His mark is found on the copper plate previous to 1697, and he entered his name at the Hall for the New Standard in April, 1697. He was one of the Protestants who fled from Metz after the revocation of the edict of Nantes, declared October 24, 1685.

(To be Continued.)

## Gossip of the Month.

EVERY year the holiday display of goods becomes more and more attractive. Dealers in all kinds of goods take advantage of the holiday season to bid liberally for patronage, and, as a consequence, the business streets of New York during the month of December, have the appearance of a long drawn out bazaar, where each dealer tries to outshine his neighbor in the variety and attractiveness of the display he can make in his show windows, and upon the shelves and counters that are exposed to public view. Crowds gather around these exhibits to gaze upon the many beautiful things thus displayed, and, going from one to another of these tempting "free exhibitions," each individual is materially aided in making up his mind as to the particular articles he will require when the time comes for him to buy presents for relatives and friends. To make an attractive display of goods is considerable of an art, requiring an artistic eye and good practical business sense. Manufacturers of show cases have simplified the matter somewhat by the introduction of cases of various forms and designs that are in themselves attractive; but to "dress" these properly, so that the various articles displayed shall have position according to their importance and yet make a harmonious appearance, is an art that comparatively few possess. The jewelry

trade is generally successful in this matter, and dealers display their goods to most excellent advantage. Their show windows were never more artistically arranged than during the holiday season this year. They were greatly favored in having a large variety of desirable and tempting goods to show, and they made the most of them. A favorite mode of display is to select a few rich and valuable articles that harmonize in shape and style, and arrange them attractively behind plate glass show windows, with appropriate drapery surrounding them to show them off to the best advantage. To overload an exhibition window with a great variety of incongruous goods is to dwarf them all, giving undue prominence to the least deserving. There is no better method of catching transient trade than to make a tempting exhibit at the entrance to a handsomely decorated, well kept, tidy looking store. The first thing a dealer has to do is to get his goods; the next, to let everybody know he has them.

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IF ONE wishes to find out who are the dealers in bogus jewelry, he should consult those newspapers that are known as "religious," "family" or "agricultural" journals. It is in these papers that the swindlers who deal in absolutely bogus goods do most of their advertising. We have before us the advertisement of one of these New York swindlers which we found in a religious paper that boasts of a large circulation, and claims to exercise careful supervision over its advertising columns in order that the unwary may not be misled by sawdust swindlers or other sharpers. This advertisement announces "18-k. Solid Rolled Gold Rings almost given away," and is accompanied by cuts showing the styles of the rings, each one apparently being stamped "18-k." A sample "chased ring" is offered for twenty cents; a "Royal Filled Wedding Ring" can be had for forty-five cents, this being the most costly; others are offered at fifteen cents and even as low as three cents; postage stamps thankfully received. Other advertisements we have seen offer a miscellaneous assortment of jewelry, from gold and silver watches to shirt studs at similar prices, each article being "warranted." These advertisements on their face show that the goods are fraudulent, but, nevertheless, the dealers in them must make a good thing out of it or they would not continue to advertise so extensively. But the fact is, that the swindle is even deeper than sending out bogus goods, for in a majority of cases where a victim forwards the amount required no goods of any kind are returned, the swindlers simply pocketing the money. Publishers of newspapers cannot be expected to vouch for the character of all their advertisers, but they should exercise such authority over their advertising columns as would cause them to reject any advertisement that is, *prima facie*, a misrepresentation and a fraud. They do discriminate against all advertisements of an obscene or immoral tendency, but it has taken special laws to compel them to make even this concession to public sentiment. We presume publishers are like most other men, not inclined to be over-scrupulous as to the source of their revenue. Horace Greely was extremely sensitive in this matter, and exercised discrimination so far as lay in his power. On one occasion he was sued by a quack advertiser for having thrown out his advertisement after it had been accepted by some one in the business office. The suit was dropped, however, when the advertiser found that its prosecution would result in revealing the true character of his business. But these dealers in bogus goods do not always escape the vigilance of the law. Recently an individual responding to the name of Emil Basset was arrested in Philadelphia by United States officers, charged with using the mails for fraudulent purposes. The accused is a member of a firm who advertise extensively to sell watches at ridiculously low prices. The firm, he said, had a factory in Birmingham, England, which is conducted with a capital of \$225,000. The government inspectors learned that Basset lived in New York and kept a boy in his office in Philadelphia who sent his mail to him.

A large quantity of papers containing the firm's advertisement were taken from his office, and although he asserted that he was enabled to sell the watches cheap because they were shipped direct from England, the published announcement stated that they would be supplied from this country. The complaints against the so-called firm were made by merchants of Philadelphia and New York. Bassett was held in \$2,500 bail by United States Commissioner Edmunds for a further hearing.

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THE precious stones and articles of personal adornment owned by noted persons is always a matter of interest to a large number of readers. In our issue of last month we gave an account of the million dollar collection of jewels accumulated by Mrs. Morgan, that is now being sold for the benefit of her estate. Mrs. Stanford, wife of the millionaire Senator, Leland Stanford, of California, has also a collection of jewels valued at \$1,000,000 and upwards. She has sets which belonged to Queen Isabella, of Spain, the mother of King Alfonso, whose death occurred but a few weeks since. It will be remembered that the queen at one time was in Paris in such needy circumstances that she had to sell her jewels and other valuables. Governor Stanford bought the four complete sets at that time. Each set has tiaras, necklaces, brooches, ear rings, bracelets and other ornaments. One set is called blue, because the rays which are emitted are of a violet blue. These are the rarest of all diamonds. Another set give out rose-colored flashes; another has yellow tints and the fourth pure white. The price paid for these sets was \$600,000. Outside of these Mrs. Stanford has one necklace which cost \$100,000, and the pendant \$30,000. She also has many black diamonds, and has sixty rings of great magnificence and does not wear any. She has emeralds, pearls and rubies in addition to a million dollars of diamonds. She is the bereaved mother who mourns her dead boy and finds no consolation in wealth or splendor.

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WHEN goods are sent out by a manufacturer or jobber without a definite understanding as to the conditions under which the custody of the property is charged, trouble is apt to arise. This was recently illustrated in the case of a New York jobber who had furnished a liberal supply of goods to a western dealer. The latter failed and all his stock went into the hands of his assignee. The New York jobber claimed that his goods had been sent to the western firm to sell on commission and that the ownership of them had never passed from him. He applied to the courts to recover possession of the property, but the decision was adverse to him, the Court holding that the insolvent dealer had come into possession of them by purchase in the customary way on credit, and that the New York jobber must fall in line with the other creditors, and be content to take his proportion of the sum realized from the insolvent's estate. Had the creditor had a definite understanding at first to the effect that he was simply entrusting the dealer with goods to be sold on commission, and could have established such understanding by competent evidence, of course he would have recovered possession of his property when his consignee failed in business. Too much care cannot be exercised in matters of this kind; a full and complete understanding between business men of the relations existing between them is conducive to lasting friendships, while misunderstandings cannot fail to result in trouble and possible loss.

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THE jewelry trade carries a vast amount of insurance in the aggregate and pays out a large sum in premiums every year. No doubt

most of them trust this branch of their business entirely to brokers who take the responsibility of keeping them insured. This is not always a safe thing to do, as some New York merchants recently ascertained to their cost. The broker who attended to their insurance matters declared that they were insured in "good companies," but when a fire destroyed their property they ascertained that some of their policies were issued by "wildcat" companies without capital that would not pay a dollar, while others were issued by companies not authorized to do business in the State. There was no hope of recovery from the "wildcats," and the courts of the State are closed to citizens of the State for prosecuting an unauthorized company; if they have to sue them, they must go to the State wherein the company is chartered. This law seems hard, perhaps, but it is based upon the idea that corporations doing business in the State should bear their fair share of taxation and other public burdens, and that property owners ought to support the law-abiding, tax-paying companies. Every property owner should carefully watch this matter of insurance for himself, and make certain that his policies are issued lawfully, so that in case he suffers a loss there will be neither difficulty nor delay in collecting his claim. The unauthorized or "underground" companies, as they are called, generally offer low rates, which they can afford to do because they have no taxes to pay; but if the insurer gets a low rate he makes up the difference in his tax bill, as he must contribute to make up for what the company evades. Brokers are very apt to work best for those who pay them most, and the underground companies are very liberal in paying commissions. While the fact that an insurance company does not choose to comply with the laws of this State does not reflect upon its solvency, it nevertheless closes the State courts against any citizen who seeks redress from such company. An attempt has been made to enforce a law, making it a misdemeanor for any individual to buy his insurance of an unauthorized company, but this is such a restriction of the rights of the individual that it is believed to be invalid. Consequently the Superintendent of Insurance only prosecutes the insuring company, when he can catch it, and not the individual insured. But the matter is one deserving the attention of the insurer; when property is being destroyed at the rate of \$100,000,000 a year by fire, the character of the insurance indemnity contract becomes one of importance; its validity or worthlessness may involve the entire property and business prospects of the person insured, and it is certainly worth his while to exercise a careful oversight of the transactions of the broker. The things to be considered are the standing of the insuring companies and their right to do business in the State where the property insured is located. The difference in rates between the authorized and unauthorized companies is so trifling as to have no weight in deciding the question of insurance indemnity. Overhaul your policies and throw out all those not issued in accordance with law.

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A PARAGRAPH in this department recently made mention of the fact that the plated knives manufactured for table service have a limited capacity for cutting things—that they are, in fact, by their uniform dullness a constant source of aggravation. A manufacturer informs us that this is a necessary condition of their manufacture; the blade may be made of metal susceptible of taking a fine edge, but it is impossible to plate such an edge in a workmanlike and acceptable manner; the process of burnishing would rub the plate off the sharp edge or make it curl up and have a ragged appearance. This is precisely what we supposed, therefore we suggested that somebody should invent a knife that, while it should harmonize with the rest of the table furniture, would still hold a cutting edge that would enable the user to overcome an average beefsteak without calling forth unseemly remarks. Why is a plated knife necessary? Cannot a suitable substitute be devised? Our manufacturing friend

also informed us that a plated knife may be whetted on an ordinary steel provided care be used to allow only the extreme edge to touch the steel. We tried the experiment in the midst of our family, whereupon the lady who rules over us declared she would not have her knives scratched up in that way. Surreptitiously we persisted in using the steel, but after a few applications found the plate gradually peeling away from the edge and exposing the metal beneath. The experiment will cost us a new set of knives, and we are looking for some with good steel cutting edges that can be sharpened as occasion requires.

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COMPLAINT is made that retail dealers quite frequently send packages and job work by mail unaccompanied by any letter of instruction, and often with no mark whatever by which the sender can be identified. The receiver is first made aware of who his correspondent is by receiving a wrathful demand to know why the work is not returned or his wants attended to. Of course, it is nobody's fault but his own, but he would be reluctant to admit that his business methods were so lax and his carelessness so great. In the first place it is a risky thing to trust valuable merchandise to the mails because of their liability to receive injury. The very nature of the postal service precludes the possibility of valuable articles receiving the care that should be bestowed upon them, and which is secured by the express companies. In the next place, if a package is entrusted to the mails it should be accompanied by a letter of instructions. The letter and the package arriving together are attended to promptly in the regular routine of the day's work; but if the package arrives alone it is apt to be laid one side to await the arrival of instructions, and to be forgotten or lost. Business men generally are apt to lack method and to become careless and negligent; they ought not, however, to attempt to cast the blame upon others for the inconvenience and annoyance that comes of their shortcomings.

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THE war between patentees and patent pirates is one that promises to be interminable. No sooner does a person obtain a valuable patent than one or more envious rivals forthwith infringe upon it, and bid defiance to all efforts to restrain them from gathering the fruits of the inventor's brains and industry. The worst feature of it all is that when an inventor sues an infringer who is robbing him, he is at once thrown upon the defensive and required to show not only that he has a patent for his original idea, but that the idea was original and patentable by him. Instead of being the aggrieved party in the transaction, he is placed in the attitude of a culprit who is striving to fleece the community by means of fraudulent claims. When he undertakes to make war upon the pirates they turn the tables upon him, put him on the defensive and he is fortunate if he escapes with a vestige of reputation left. It is a reproach to the Patent Office that so many patents are issued for substantially the same thing, thus entailing much costly litigation and endless trouble and annoyance. A manufacturer of jewelry recently told us that some time ago he obtained a patent on a novelty in jewelry. He proceeded to make the goods under his patent, but soon found that his competitors were selling substantially the same articles. Naturally indignant he began proceedings for infringement, but before they had gone far it was discovered that no less than three patents had been issued to different members of the trade for devices that were, in all material respects, precisely identical. In this case there was no piracy, because each manufacturer had a right to produce the goods, but in a majority of infringement cases the offending party has deliberately and without a shadow of right, appropriated that which is the property of another, and sought to rob him of the

profits that should accrue to him from the use of such property. There are numerous such instances in the jewelry trade, and some means ought to be devised to protect legitimate patentees. When the originator of a new and desirable style of goods announces that fact, his rights should be respected by all purchasers of such goods, and the cold shoulder given to infringers. Self-interest should impel this course, for in this country any man is liable to become an inventor at any moment, without provocation or malice, and need the assistance of his fellow citizens in repelling pirates. We trust public sentiment will one day be educated up to the point of recognizing property in ideas, and to visit as severe penalties upon the thief who steals such property as it does upon one caught stealing an empty pocketbook.

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THE jewelry trade is frequently victimized by burglars, sneak thieves and swindlers, but its contributions to the criminal classes are remarkably small. It is a rare thing to hear of a jeweler turning embezzler or robber, and it is seldom one seeks the congenial society of defaulting bank officers in their snug Canadian retreats. Occasionally a workman gets away with some of his employer's goods, but even these are rare offenses, and it can be placed to the credit of the jewelry trade, numbering its thousands of persons, whose transactions extend to every city and village in the land, that the court records show that it furnishes a far less percentage of criminals than any other industry of equal magnitude. Possibly the habitual contact with valuable goods overcomes the desire for their possession to a great extent, as confectioners are said to abhor sweetmeats, but whatever the cause, the facts are as stated.

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IT is conceded that the work thus far accomplished by the National Association of Manufacturers of American Movements and Cases has been beneficial to the trade in general. Cut-throat competition has been done away with, and standard prices maintained for standard goods. There is room and work for still another organization that shall include in its membership the manufacturers and jobbers of all goods that go to make up the stock of a retail dealer. Perhaps it is impracticable to incorporate them all in one association; if so, the lines of demarkation between the productive branches is so pronounced that it would be an easy matter for each branch to form a protective-offensive-defensive association. The chain makers have frequently been upon the war-path looking for each others' scalps, at which times their war-cry has been "war to the knife, the knife to the hilt and the hilt to the heart." Under the influence of such sanguinary warfare, their trade at times has been almost destroyed. Manufacturers of plated goods have also at times gone about asking each other to knock intangible chips from imaginary shoulders, the result being that they have been temporarily knocked out of the profits they should have secured. These and other equally well defined branches of the jewelry trade could readily organize associations similar to that of the movement and case makers, which should not only afford protection to themselves but also to the retail dealers. These latter are organizing in various sections of the country, and are proposing to move on the works of those they regard as their enemies. They include in this category all manufacturers and jobbers who indulge in irregular practices or seek business outside of the legitimate channels. Associations of these varied interests, co-operating for the general good, would tend to put the business on a better and more profitable basis than it has known for several years.

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THE CIRCULAR has been a persistent advocate of the plan of retail



dealers diversifying their stocks by the addition of other goods of a kindred nature, that would tend to attract customers. We are not prepared to go so far, however, as some western dealers have done in this respect. For instance, a letter head recently received reads as follows: "J. W. Thompson, Barber, Justice of the Peace and Jeweler." Still another and even more ambitious individual inscribes upon the heading of his communication: "Ethurial Anabasta Peterson, Doctor, Hotel Keeper, Druggist, Bookseller, Stationer and Jeweler." If he puts all this on his sign he should add: "Washing, ironing and going out to days' work done inside." These are good samples of the western idea of "diversifying stock" and mixing occupations, but they are not much ahead of the Jerseyman in a neighboring village whose sign reads: "Shaving and Hair Cutting, Watches and Jewelry Repaired, False Hair and Wigs Made to Order." His window is filled with a conglomeration of wigs, false fronts, second-hand plated ware, some antediluvian specimens of worn out jewelry, umbrellas in various stages of dilapidation, a canary bird and a red-headed poll parrot. We dropped into this place one day and found it a veritable "old curiosity shop," in its display of broken down furniture, baby carriages, cheap clocks, melodions and accordions, battered brass instruments and plated ware that looked as if it had been used for ammunition in a street riot. The proprietor was engaged at the time in shaving a rough sort of a customer and talking politics at him at the rate of sixteen to the dozen. There was a work bench in one corner, on which were three watches in various stages of "repairing." This man was a veritable "Jack-of-all-trades," doing odd jobs of all kinds, and, among other things, priding himself upon being a good veterinary surgeon and cow doctor. His neighbors speak of him as a "genius," entirely harmless, and occasionally of service at "tinkering up things." We found no one, however, possessed of sufficient hardihood to classify this very much diversified individual as a jeweler, notwithstanding the ambitious claim upon his sign board.

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ASSAYERS of gold find excellent customers in manufacturing jewelers who frequently have waste and sweepings to dispose of. These assayers do not always discriminate in buying gold, and not unfrequently become receivers of stolen property. We have heard of several instances where they have bought waste gold from shop boys without so much as inquiring whether the boys were selling on their own account or under instructions from their employers. Shop boys have abundant opportunity for concealing precious metal while undergoing the process of manufacture, and if the assayers become willing receivers of stolen property the boy is constantly in the way of temptation. A manufacturer who had frequently missed gold from the shop, suspected the boy who did the sweeping and obtained a warrant to search his home. An officer made a most careful search but could find nothing; he was about to give up the job when he by accident laid his hand upon a shot gun that stood in the corner of the room. When he attempted to lift it he found it was like a solid bar of iron. Investigation showed that it was loaded to the muzzle with small slugs of gold the boy had stolen from the shop. Over \$600 worth was recovered from this singular receptacle for stolen property. There was no assayer in this case; if there had been no gold would have been recovered, for it would have gone to the melting pot as soon as received. Persons whose business it is to buy valuable articles should exercise discrimination as to the individuals from whom they buy, lest by encouraging dishonesty they lead astray boys and youths who occupy positions of trust. The facility with which stolen property can be disposed of makes more thieves than any other one thing.

The Jewelers' League.

President, HENRY HAVES.....Of Wheeler, Parsons & Hayes.  
 First Vice-President, JAMES P. SNOW.....Of G. & S. Owen & Co.  
 Second Vice-President, ROBERT A. JOHNSON.....Of Colby & Johnson.  
 Third Vice-President, WM. C. KIMBALL.....Of H. F. Barrows & Co.  
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EXECUTIVE COMMITTEE.

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THE JEWELERS' CIRCULAR is the exclusive official paper of the Jewelers' League, and has been selected for the publication of all matters of interest pertaining thereto. Letters or inquiries pertinent to its business or purposes, and which might interest the trade or inquirers, will herein be answered. Address Jewelers' League, Box 3,444, P. O., New York, or the office of THE CIRCULAR.

AT THE regular monthly meeting of the Executive Committee of the League, there were present President Hayes, Vice-Presidents Snow, Kimball and Johnson, and Messrs. Bowden, Hale, Howe, Greason, Lewis, Smith and Sexton. Dr. Wilbur was also present.

- Five (5) changes of beneficiary were granted.
- Two (2) applications were rejected.
- One (1) application was referred for re-examination.
- The following eleven (11) were accepted:

R. A. Sanguinetti, C. H. Eppstein, New York, N. Y.; F. Hyde, Brooklyn, N. Y.; J. Jalbert, Oswego, N. Y.; F. B. McKinley, Washington, Pa.; S. Salabes, Baltimore, Md.; J. A. Jury, Boston, Mass.; E. A. Rich, Chicago, Ill.; A. F. Gourley, Springfield, Ill.; G. L. Goodale, Lenox, Iowa; R. W. Goncher, Clay Center, Kans.

The Jewelers' Security Alliance.

President, DAVID C. DODD, JR.

First Vice-President, AUGUSTUS K. SLOAN.....Of Carter, Sloan & Co.  
 Second Vice-President, HENRY HAVES.....Of Wheeler, Parsons & Hayes.  
 Third Vice-President, DAVID UNTERMAYER.....Of Keller & Untermeyer.  
 Treasurer, W. C. KIMBALL.....Of H. F. Barrows & Co.  
 Secretary, C. C. CHAMPENOIS.....Of Champenois & Co.

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 GEO. W. PARKS.....With E. I. Franklin & Co.  
 J. T. SCOTT.....Of J. T. Scott & Co.  
 N. H. WHITE .....Of N. H. White.  
 CHAS. G. LEWIS.....Of Randel, Baremore & Billings.

EXAMINING FINANCE COMMITTEE.

JOS. STERN.....Of Stern & Stern.  
 CHAS. F. WOOD .....Of Chas. F. Wood.

Counsel, HON. ALGERNON S. SULLIVAN.

For further information, Application Blanks for Membership, By-Laws, etc., Address P. O. Box 3277. 170 Broadway, New York.

THE REGULAR monthly meeting of the Executive Committee was held on the 11th inst., attended by Vice-President Hayes, Treasurer Kimball, and Messrs. Bowden, White, Lewis, Parks and Secretary Champenois.

- The following firms were admitted to membership, namely:
- B. Franklin & Son, Troy, N. Y.; Louis Jaccard, Liberty, Mo.; Knepfly & Son, Dallas, Tex.; J. C. Lee, Gouverneur, N. Y.; W. W. Mansfield, Portland, Me.; Stephen Paine, Providence, R. I.; R. C. Parsons, Derby Line, Vt; G. Scherzinger, Fond du Lac, Wis.; J. P. Stevens, Atlanta, Ga.; R. H. Trask, Ottawa, Ill.

Pendulum Arcs of Precision Clocks.

THE DESIGNATION "precision clock" I hope will be retained in horology to have a meaning similar to the use of the term "precision" as an adjective in other arts. We have already such

descriptions as "precision level," "precision thermometer," "precision standards" (of length), and in each of these cases the word "precision" is used to designate the highest accuracy attainable in construction. We may very properly, therefore, use the term "precision clock" to indicate a clock which is built with the special end in view of the greatest possible accuracy in timekeeping. That is, the greatest accuracy attainable with our present knowledge; for the clock of precision which is made to-day would not be a clock of precision twenty years hence. Then the measure of a day will be corrected for a number of errors which we cannot determine to-day, but which, nevertheless, disturb the going of the clock.

What such disturbances may be we can only guess; but I should think it probable that such causes as the following will, in the not distant future, occupy the attention of the mathematical horologists:

The rotation of the earth on its axis tends to twist the pendulum from its apparent plane of vibration, and to give the effect described by Foucault in his long wire pendulums experiments. The moon in its motion about the earth varies the position of the center of gravity of the moon and the earth considered as a system. There is, therefore, a slight effect on the arc of a pendulum attributable to the position of the moon in its orbit. The magnetic pole of the earth is slowly changing its position, and there are very considerable diurnal changes in the resultant direction of the earth's magnetism and its intensity. In the case of steel pendulums, therefore, there is some effect exerted by these magnetic influences to affect the rate of the clock. These are examples of the most subtle influences of which the new science of years hence will try to avoid the effect.

At present we are combating with much grosser effects in the light of present knowledge. We may assume that present science is satisfied with an accuracy of measurement of one one-hundred-thousandth part of the entire amount to be measured. That is the one-thousandth of one per cent. Suppose the quantity to be measured to be an inch. Then we should expect to measure it to 0.00001 in., and if it was a yard it would be 0.00036 in., which would correspond to our expected error.

Thus we might measure an inch to a hundred thousandth of an inch; but when we come to a yard, the effect of temperature, instability of supports, changes of form, want of parallel motion in the comparator employed, and other causes, increase their effect over the absolute amount of inaccuracy in measuring the inch to, say, thirty-six times its amount. So, for other measures, one can best express the precision attained as a function of the magnitude measured.

If we take a day we have in it  $24 \times 60 \times 60 = 86,400$  seconds; and if we apply the above experience we should have for the accuracy to be attained in clocks a capacity to measure a day to  $\frac{86,400}{1,000,000}$  of one second or about 0<sup>s</sup>.9. Now, it only takes a fairly good clock to measure a day within 0<sup>s</sup>.9, and indeed we can expect the best modern clocks to measure the day to a quarter of this amount, or to 0<sup>s</sup>.2, which would be, say, the  $\frac{1}{400,000}$  part of a day.

So much for the measure of a day. How accurately can we measure an hour? More accurately than we can a day, but to nothing like the degree of increased accuracy we found in going from the yard to the inch. Two-tenths of a second in a day would mean  $\frac{0.2}{24}$  in 1 hour, or roughly, 0<sup>s</sup>.01 per hour. It is not at all probable that we can measure an hour to the  $\frac{1}{100}$  part of a second. Yet if our clock was an accurate standard we should be able to maintain the same percentage accuracy as in the case of a day. We cannot measure an hour very accurately; we can measure a day with almost the same absolute accuracy. Why is this? A clock differs from all measuring machines in that it is a moving engine in which the time is taken for a pendulum or some other mass to move from one point to another. In the pendulum we assume that the path is of the same length for each swing, and that it moves over the same distance in the same time. If this were the case the hour would be measured with the same percentage accuracy as the day. Unfortunately for our ideas of precision time measurements, the pendulum does not perform two successive swings in the same path, the total length of

each swing (*i. e.*, the arc) is not the same in two cases, and our day is made up of a number of pendulum beats, some of which are too short, some too long, but by that doctrine of probabilities by which we know that the "heads" will come up as often as "tails" in the tossing of a penny a hundred thousand times, the short and the long swings will neutralize each other in the day, and one day will be nearly like another.

My present purpose is to bring to mind the causes now operating in our best clocks to keep them from a higher accuracy, and to prevent the measurement of short time intervals from being more accurate in the proper proportion than the long intervals.

If any of my readers have a clock which performs very satisfactorily (*i. e.*, whose rate can be depended on to  $\frac{1}{4}$  second a day), they will be very well repaid if they will try the following experiment: Take an oblong slip of plate glass mirror, say an inch wide and three inches long, and attach it to the pendulum rod in such a way that a distant (over 20 feet) object may be seen by reflection in the small mirror. Bring a well defined point, say an end of a piece of wire, so that in looking through a hole at the end of the piece of wire you can see the wire end like the sight of a gun in range with the reflected image in the mirror. Now, swing the pendulum. If the pendulum is moving in a straight line, or rather, if it is moving in the same plane throughout its swing, the object reflected from the mirror will remain in range with the sight through the hole. If, however, the pendulum moves in a curved path, then the mirror will swing about its axis, and will bring some other object in range with the wire end through the hole.

The reason of this is evident when we consider that so long as the pendulum moves in a plane the angle of reflection from the mirror is the same, since the mirror is simply carried along parallel to itself. If a train of cars reflected an object from its windows as it passed us, so long as the track is straight we should see the same object reflected in the same direction from its successive windows. Let the train now move in a curve, and we see the reflected image from a new direction, and the more the curvature of the track the greater the displacement of the reflection.

Watching our reflected image in the mirror, as the pendulum swings it will be evident that not only does the pendulum not swing in a plane, but that the curves in which it swings are not the same for each swing, but that it makes many swings sometimes before it returns to the same point it started from. Thus the path of the pendulum may be like a very thin figure 8, or it may be similar to the complex figures described in engine engraving; in any case, instead of the straight path we may have anticipated, we have in our pendulum motion an indicator of our whole clock escapement, mounting and pendulum.

In the study of rocks the new geology begins by polishing the surface of small specimens, and then subjecting these surfaces to careful microscopic study. The results in this case have been most fruitful to science. It is not too much to expect that from the study of the curves described by pendulums we may derive our best knowledge concerning the irregularities of clock rates. To what are these curves owing? There are many causes. Suppose the impulse given to the pendulum is not accurately in the plane of vibration. This may happen from giving the impulse through a crutch rod with pins. In this case the torsion of the crutch rod, when the pins come in contact with the pendulum rod, causes a resultant thrust to be made out of the plane of vibration. This disturbs that plane.

Suppose the center of gravity of the ball does not coincide with the axis of the rod and the suspension spring. Then, with a thin spring we have a strain on one side of the spring greater than the strain on the other, with the result that the spring tends to "buckle" on the side of the least strain. The same effect is produced when the suspension spring is not perfectly uniform in its rate of change from one of its chops to the other. Suppose it to be a little thinner on one side than on the other. The result is that the thick side has greater "molecular friction" than the other, with the tendency to

make the pendulum path curve outward from the stiff side of the suspension spring.

The term "molecular friction" means the friction of the molecules of the spring upon each other, by reason of which a clock pendulum would stop swinging without power to drive it, even though it swing in vacuo. A *stiff* or thick spring has greater molecular friction than a thin one, and a string would have almost no molecular friction. It is highly important that this molecular friction in suspension springs should be uniform through any section of the spring taken perpendicular to the pendulum rod. In certain forms of flat springs, uniform in section from top to bottom, as in the English Frosham or Dent clocks which have come under my notice, this molecular friction is uniform throughout the entire spring. In some of the best modern suspensions, however, such as those made by Mr. Hartnuss of the Liverpool Observatory, the form of the suspension bridge is wedge shaped, both in the direction of the pendulum swing and at right angles to it. In this case, of course, the molecular friction rapidly varies from the top to the bottom of the spring.

To insure this uniformity of molecular friction it is necessary that the chops (or cheeks) which are clamped firmly against the spring from the support above and the pendulum rod beneath, should be precisely parallel and at right angles to the axis of the pendulum. That the spring should have a uniform temper and increase or decrease in section with accurate uniformity. I remark in passing that this molecular friction of the suspension spring is one of the serious difficulties in the compensation of a pendulum. I do not remember seeing it pointed out in other writings, and I do not think it has received the attention at the hands of practical horologists which its importance deserves. The molecular friction of a suspension spring is affected by temperature. We can imagine a steel spring heated to a red heat and becoming as pliable as a string; *i. e.*, having practically no molecular friction. We can imagine that between the ordinary temperature and elasticity of the suspension spring and that at which it shows the malleability of a red heat, there are all degrees of elasticity. Now, any change in the elasticity of this suspension spring is a change in the amount of resistance experienced by the pendulum in its path, and consequently a change in the rate of the clock. There have been no observations recorded, so far as I am aware, to show how much this influence is; but not unlikely it is one of the prominent influences in settling the belief in the minds of the most successful clockmakers that no two clocks can be compensated alike. Certainly, if compensation depended *only* on the effect of the expansion of steel rods and cylinders, it would not be difficult to build six escapements and six pendulums which should be compensated to each other. If, however, as seems almost certain, the performance of the suspension spring is a serious disturbing agent, owing to a change in its molecular friction with a change of temperature, then we have an entirely new and somewhat difficult class of questions to study, which depend on the molecular condition of steel.

The effect of a change in the molecular friction of the suspension spring would be to shorten or lengthen the arc of vibration. It has been observed that variations of rate are nearly proportional to variations in the length of the arc after the arc has reached a certain vibration. I mean that supposing the arc is 3°, that for every minute of arc measure that the arc of vibration is increased there will be a decrease of rate, and this decrease is very nearly twice as much for 2' as it is for 1' of arc. It is small to be sure, not over 0<sup>s</sup>.3 for 1' of arc, but still measureable; it varies with different escapements and with different pendulums.

There seems to be no variation in the rate of a clock which does not show itself as some function of the arc of vibration of its pendulum. The study of the form of this arc, the rendering of it as nearly in one plane and as uniform in length as possible, is the object of

the successful clockmaker, and I have pointed out in the above paper one method of magnifying and observing the actual motion of a clock pendulum as a preliminary to correcting the observed errors.

LEONARD WALDO.

## Flashions in Jewelry.

### A Lady's Rambles Among the Jewelers.

AT THIS time last year a rift of hope appeared on the goldsmiths' horizon. It was not much bigger than a man's hand, and yet the most short-sighted could see it. It promised to clear away dull times and let in once more the light of prosperity. It promised better times and the better times are come. Slowly but surely the improvement has been felt right on up to the holidays. And now we have the satisfaction of asserting, without fear of contradiction, that the predictions of a fair holiday trade made by THE CIRCULAR have been more than verified during the month just passed. It has been a long time since a new year dawned upon so many smiling jewelers as did Jan. 1st, 1886. Neither manufacturers, importers or retail dealers have had so busy and so profitable a season before in three years.

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THERE is but one expression: all agree that the number of articles sold have greatly exceeded the holiday sales of last year, and that these articles included a larger proportion of elegant and costly goods. While there has been no diminution in the sale of low priced goods, there has been a very noticeable increase in expensive articles. Dealers in fine gems and diamond jewelry, and houses carrying costly stocks of sterling silverware who have been interviewed on the subject of the holiday trade, report without exception the increased number and value of articles sold. Manufacturers and dealers in silver plate goods tell the same story. These last, by the way, have profited very materially by the increase in the southern trade; so have the manufacturers and dealers in gold and silver jewelry. Texas is mentioned by one of our leading silver plate firms as having come to the front in a most unexpected and agreeable manner; in such a way, in fact, as spoke volumes for the general prosperity of that great State.

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A WELL known importer of diamonds, who has better opportunities, perhaps, for feeling the pulse of the entire country more accurately than any other one man, in a conversation with the writer said that the sales of rare and perfect stones had been greater during the past six months than before for several years. This statement does not stand alone, but was substantiated by other trustworthy authorities in the diamond business, and proves the utter absurdity and falsity of the fashion notes that manage to find space every now and then in our daily papers about the vulgarity of wearing large diamonds and the decline of diamond jewelry. That the wearing of pronounced gems and gem jewelry at the breakfast table or in a morning promenade through a crowded thoroughfare is avoided by the better class of ladies, THE CIRCULAR has been telling its readers these two years; but the observance of a proper time and place for gem jewelry does not alter the fact that fine diamonds and other gems are more worn than ever by the *creme de la creme* of New York society.

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Not only are fine gems of large size worn, but in greater profusion

than heretofore. One has but to go to the opera and look in the boxes occupied by ladies of acknowledged social position as well as wealth, or note the personal adornments worn by these same ladies at some notable reception or wedding to see with their own eyes this statement verified. At any and all of these places, or wherever fashion admits of a trained dress and *decollete* corsage, New York ladies wear gems *ad libitum*; in the hair, about the throat, interspersed with lace garniture at the neck, on the arms and on the fingers. Gems glitter on every part of an evening toilet that the taste of the wearer may suggest, whether to shine in a shoe buckle, a clasp, a pendant, a bracelet, a necklace or a tiara, it matters not. On full dress occasions fine gems go with the lady who possesses them; these do not stay at home to hide their shining lights under the cover of a jewelry casket.

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WITH the present tendency to adopt everything that is English, it could not be otherwise than that ladies should make a display of their fine gems on all suitable occasions. English women, as everybody knows, who is versed in the social customs of their country, wear a great profusion of gems with their full toilets, even at the afternoon receptions, although at other times there is often an almost total absence of any sort of jewelry. It is, therefore, of ordinary occurrence that a lady who appeared in the morning dressed in a plain tweed or tricot suit and common sense walking boots, with perhaps no other ornament than a gold pin or Scotch pebble trinket, is the one who at a reception a few hours later is not content with a blazing circlet around neck and arms, and gems flashing from hair and hands, but uses fine stones to assist in the garniture of her corsage and to hold up the draperies of her dress.

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WHILE on the subject of fashions abroad, mention may be appropriately made of the dainty evening shoes with Louis XV. heels, decorated with bows of lace and ribbon caught through pearl or diamond buckles, and worn by French women with full dress toilets. Often these jeweled buckles are in the shape of a star, and sometimes they simulate a horse shoe. It goes without the saying that these buckled shoes suggest jeweled garters. These latter, by the by, were a prominent feature among the holiday goods exhibited in the New York stores. A preferred style of garters is one of silk elastic ribbon of dainty color, fastened with a gold clasp or buckle set with small colored stones. Jeweled garters are but one of a long list of styles; there are any number of garter buckles and slides in both gold and silver; some are enameled in floral pattern, some are carved and etched, and all are exceedingly attractive in effect.

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NUMBERED with caprices that find favor in Paris are all sorts of talismans and charms, the newest of which is a revival of a talisman from Egypt, dating back to the time of the Pharaohs, and known by the name "Oudjo." This talisman, says tradition, originally represented the eye of Horus, or rising sun, and signified health and prosperity. The new baubles now made by Parisian jewelers are copies of oudjos in the Louvre and in the British Museum. These are small gold frames of gold or silver, containing the painting of an almond-shaped eye from which falls a glittering tear in shape of a gem. These oudjos appear on bracelets and are also worn as charms on the watch chain.

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THE mention of charms recalls some exceedingly pretty charm

lockets now in the show cases and designed to wear on a Queen chain. These new lockets are small and elaborately carved with a diamond or other gem set in the center. So attractive in appearance are these charms, it is quite probable that they will again become popular, especially with young people who like a convenient hiding place for a tress of hair, a tiny miniature, a pressed flower or other souvenir.

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A STYLISH necklace is one consisting of single stones, set so close as to show no gold and snugly clasping the throat. An immense diamond of fine quality or a rare colored gem is often worn with this form of necklace as a pendant. These close-fitting necklaces, while representing one of the preferred styles, by no means precludes the wearing of loose necklaces that fall low on the neck. Mrs. Astor's famous diamond necklace, as many New Yorkers know, consists of three rows of stones, one falling below the other.

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JEWELED pendants continue to be fashionable, and are set so as to do duty for a number of ornaments. Sometimes they hang suspended from a necklace, sometimes they appear on a bracelet, again they become brooches or hair ornaments. Jewels are much worn in the hair this winter, not only mounted on hair pins but in other ways. A beautiful ornament seen and representing a new style, consists of five diamond stars set on a gold wire rounded so as to fit over the top twist or knot of hair. This ornament, with a slight adjustment, can also be worn across the front of a low corsage with pleasing effect. And this recalls the fact that some of the diamond bracelets are so fashioned that they can be clasped together and worn as a necklace.

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THE increased demand for rare gems has by no means affected the employment of small gems, and what are known as semi-precious stones. There are many very effective ornaments for both the hair and the neck, made of fine gold and silver and set with these stones. Many of these ornaments, under gaslight, emit much brilliancy, and consequently they are patronized more largely than the casual observer imagines.

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THE demand for rubies continues unabated, and emeralds without flaws are disposed of as soon as in stock. Sapphires, especially the finer ones, are also in request. The association of colors in gem jewelry is as fashionable as ever, and there is no falling off in the employment of small diamonds and other tiny gems in gold and silver jewelry.

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JEWELED girdle slides, shoulder clasps and buckles for holding dress draperies, are all in more or less request, and are made of small gems such as garnets, turquoise and sapphires. Mention has been made in a previous number of THE CIRCULAR concerning the decorative dress buttons. The very newest ones are set like real gems in low mountings of silver or gold, and are veritable art effects.

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THERE are any number of really artistic and beautiful specimens of the goldsmiths' handiwork in the new brooches. A wild rose of

gold with frosted leaves that gives the impression of the velvety bloom of nature's own production, with a diamond center that simulates a dew drop, is not perhaps so novel in design as some, but it is exceedingly beautiful in effect. A gold wheel within a wheel, with a diamond for a hub, and little stones set thickly in the spokes, is an improvement on the French "wheel of fortune" we read so much about in Paris journals. The daisy, the buttercup, the crescent and the star, all make acceptable brooches, as do also a number of the popular insect subjects.

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IN EAR rings is reported by several manufacturers a decided increase in demand for the little chased gold balls, with or without small gems. An attractive pattern, competing with the little ball pattern, is the knot in both round and flat forms.

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A NEW use for the bonnet and ribbon pins is fastening down the ends of white and colored silk handkerchiefs worn close up about the neck, and tucked under the cloak or coat for warmth. This fashion gives employment to as many as three pins, the most attractive one, of course, being placed at the throat to hold the handkerchief close and snug.

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THE wonderful favor with which the knot pattern has been received in jewelry is a subject of continual congratulation. The secret of its success lies largely in the fact that it is subject to all sorts of variations as regards size and shape, and then it affords an admirable setting for small gems. These knots occur on everything; they constitute a round pin when of large size, they decorate lace pins, they appear on scarf and bonnet pins, they form the ornaments for Queen chains and bracelets.

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VERY beautiful are the new sleeve buttons that show a border of open chasing around a center of carved work. Sometimes this open work takes on the form of a crescent, the body of the button being the star, and showing a quivering gem in the center. Again, the entire button is heavily carved, with a pearl or diamond star in the center. An attractive pattern is a button with a gold daisy center and a carved edge.

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THE lace or bar pin has come to be regarded in jewelry very much as a black silk dress is regarded in a lady's wardrobe, and that is as a necessity, a something without which womankind would be uncomfortable; hence it continues in favor during successive changes that bring in and take out other styles. The brooch being new is naturally attracting the lion's share of attention, but the old lace pin, in fresh patterns, retains a large and respectable patronage. "It is so very convenient," says one lady; "the pin never breaks," says another; "it is the only thing in the shape of an ornamental pin," avers another, "with which one can hold securely in place masses of lace or flowers;" and so it has come to pass that the endless assortment of enameled, flower and round pins has failed to push the bar pin out of date. A new pattern, by the by, which had quite a run during the holiday season, is a bar of Roman gold set with three

gems and wound around with a fine gold twisted cord running out and in between the gems.

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How long the Queen chain will remain in favor is, it appears, a conundrum no jeweler is willing to answer. Certain it is that nothing newer or more popular was offered to the holiday trade; the Queen was emphatically a queen among chains, overshadowing all other kinds except, indeed, the convenient and modest little vest chain which had a respectable patronage; of course, there are any number of new designs in the Queen. One of the prettiest seen was a small and exceedingly dainty twist chain terminating in a twisted knot, a chain that to be appreciated should be seen.

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THERE is, perhaps, no one article of jewelry worn by gentlemen that has given the jeweler more anxiety and less successful results than the shirt studs for evening dress. Diamond, pearl and opal studs have all been offered at one time or another, but the fancy has been to wear buttons as unobtrusive as possible; hence the fashion of the white enameled ones simulating linen. Last autumn the moonstone was selected as the stone to set in studs, which, on account of its absence of color, seemed to be the next simple ornament to the white enamel, and both studs and sleeve buttons have taken very well with younger men, though these have by no means driven the white enameled ones out. The moonstone continues in favor on scarf pins. One of the newer styles consists of a moonstone ball set in a gold claw.

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IT is a fortunate circumstance for the jewelers that ladies are devoted to all sorts of scarf pins, and are so largely patronizing not only the pins made especially for their use, such as the bonnet and ribbon pins, but those made for gentlemen. There is certainly an immense and varied stock of attractive scarf pins in the market from which to make selections. If the predictions of clothiers and dealers in men's furnishing goods prove correct, next summer scarf pins for gentlemen's wear must give way to shirt studs. It is claimed by those who are supposed to be posted in regard to exclusive styles, that low cut vests and long cravats tied in a small bow will, when the spring flowers bloom again, banish the made scarf and scarf pins and necessitate three shirt studs. Dealers and manufacturers having large stocks of scarf pins on hand need not, however, exclaim in the plaintive accents of the "Mikado," "Oh! bother the flowers that bloom in the spring," for scarf pins will continue to be worn by that large class of people who are slow to accept innovations and loth to give up well tried and convenient articles. Then, too, the boom in studs will furnish a profitable exchange.

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AMONG the few styles of rings worn by New York gentlemen is a seal, cut intaglio, and set flush and round with a nugget gold ring. The sard and hyacinth are both popular stones for the purpose. These Marquis, or glove rings as they are also termed, because a glove can be readily pulled on and off when the ring is on the finger, are made in small size for ladies. Ladies, as a rule, have just now a fancy for having their autographs cut on these rings. Rings in which the gems are set around the finger find favor with many; so do the slender wire rings with one small, but very fine, gem. Sometimes two of these rings are worn at one time with the stones so

turned as to slip past each other, and present the appearance of a gold wire wound twice about the finger with a different gem, as a ruby and diamond, in the over-lapping ends.

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FOR the toilet innumerable articles in both sterling silver and silver plate appeared at the holidays. The newest were those finished in *repoussé* or old English chasing, though there were some exceedingly beautiful specimens of enamel and etchings. Many of these articles will prove good selling ones throughout the year, and therefore are included in desirable things for the spring trade. Manicure sets head the list; these are always in demand, and include a wide range as regards selection and cost. A set may embrace a polisher, a file and pair of scissors only, or it may include powder boxes, knives, button hooks and sundry other articles. Hair and clothes brushes, combs and brush and brooms are also staple articles, being used alike by both sexes and affording always an appropriate birthday or other present. Shaving sets, sealing sets and smoking sets swell the list of popular things representing the silversmiths' handiwork, that are safe to place in any retail dealer's show cases.

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Two exceedingly popular articles in silver just now are little comfit boxes and toilet trays. The former, as a rule, are round in shape and small enough to carry conveniently in one's pocket. These boxes, as the name indicates, are for confections, and especially such drops and lozenges as are beneficial to the throat. Naturally these comfit boxes find a large patronage among both amateur and professional singers, but outside of this patronage they are also popular, and have been put to a variety of uses, such as a receptacle for homœopathic pills and powders to be taken frequently, quinine pills and the like. These boxes show all the varieties of finish seen on other silver articles, such as chasing in floral decoration, a bright center with a fluted edge, etching and oxidizing, and last, but by no means least attractive, enameled and jeweled decoration. The toilet trays come in many shapes and in sizes from very small to medium. Their uses are varied, such as holding hair pins, a manicure set, a powder box and puff, or rings and other jewelry.

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NUMBERED with fancy articles which promise to outlive the holiday season that introduced them, are smoking sets, trays, sealing sets and the like, of enameled copper. This goods is not to be confounded with the nickel copper plate of last season. It is solid copper with an enameled surface, and presents a very pleasing effect.

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IN SILVER plated ware, the satin finish appears to be numbered with popular sorts, and very good effects are gained with a satin finish or ground work and a bright cut decoration. In plated ware, as in sterling silver, there occur some exceedingly attractive associations of glass and silver and this is as good a place as any to say a word for American cut glass which is now used in all the best houses.

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QUITE an impetus has been given to the sale of silver viniagrettes by the plating of silver on glass, as the glass bottle and stopple inside

the silver holder prevents corrosion of the metal by the acid in the salts. The pungents made of cut crystal and mounted in gold and silver are desirable; so are the medium sized colognes with gold or silver caps. Very popular are the small glove colognes and scent bottles in both glass and silver.

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NUMBERED with new styles in shoe lifts are those with ivory horns and decorated silver handles, also those with silver horns and ivory handles. The all silver shoe lifts and long shoe buttoners continue in favor, and the stained ivory ones are still in fashion.

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ALL the better class of silver plate ware reproduces the leading styles made in sterling silver, and thus affords to a large class of people, at comparatively small cost, the benefits of beautiful as well as enduring goods. Silver plate, as it is made nowadays by our best manufacturers, will last indefinitely with ordinary care. Articles in silver plate which are all the while finding an extended patronage are water pitchers, butter dishes, vegetable dishes and baking dishes. It is claimed that the losses sustained by the breaking of these articles when of china or glass far exceeds the extra cost of the silver ones, and then the purchaser has the advantage of decorative appearance thrown in. Ice pitchers having a porcelain lining enameled on metal have found great favor, not only because of their cleanliness, but because the lining is not liable to be broken. A patent pitcher which has made a place for itself within the past twelve month, is one from which the water is forced out by air, when a slight pressure is made on the handle. This arrangement does away with the cumbersome standard necessary for swinging pitchers, or having to lift the pitcher every time one wants to pour water from it.

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IN SILVER table ware the forms, for the most part, are low. The *repoussé* finish is a popular one, but all artistic decoration may be said to be in style. There are very beautiful samples in new goods of the Queen Anne style, the Japanese, the etched and oxidized. The old English chasing certainly is very popular just now, and the same may be said for the bright finish with fluted borders.

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THE rage existing some time ago for decorative lamps subsided, and for a short time there was a decided lull in the demand for these ornamental and useful articles. But a revival has taken place, and lamps are again regarded as a staple with a good steady demand. The bowls are of copper, brass, old silver or porcelain, and the shades are beautifully colored and decorated.

ELSIE BEE.

### The Bement Collection of Minerals.

[In "Verhandlungen des Naturh. Vereins d. preuss. Rheinl. u. Westf., 1884, pages 295-395, appeared the following article on the Mineral Cabinet of Mr. Clarence S. Bement, of Philadelphia, by Prof. Gerhard vom Rath, of the University of Bonn.

This journal having a limited circulation, and appearing only in German, it was felt that a translation of the principal views of so eminent a foreign authority must be of interest to all American collectors.

Mr. Bement does not collect names only. As a gathering of authentic species his is one of the most complete collections known.

One of the striking features of the collection is that even the most uncommon and the most obscure species are here represented in such unexampled perfection of form that all doubt as to their authenticity is removed.

Prof. vom Rath mentions 9,000 specimens; the collection now numbers over 10,500, 1,500 specimens having been added since the writing of the article. This number was principally swelled through the addition of selections from several well known collections, one of them a well known collection of Franklin minerals, and another containing a number of choice things that have only recently been found and described.

From recent developments, and from the New Orleans Exposition, were also added some of the finest wulfenites, vanadinites, azurites, and topaz.—GEORGE F. KUNZ.]

Inspired by an enthusiasm for science, and aided by a fine mineralogical eye, Mr. Bement, after searching far and wide, has succeeded in bringing together a collection of about 9,000 choice specimens. Without seeing this (undoubtedly the most remarkable private collection in the world), I should have had but a faint idea of the beauty of American minerals. European mineralogists will naturally wonder how it was possible in a comparatively short time to amass so many specimens of incomparable beauty, and, above all, to retain them in this country. This assemblage of the best and finest only was obtained by Mr. Bement, not only by purchasing new finds, but also by selecting the choicest treasures of other collections. About ten years ago there were a dozen good mineralogical cabinets in this country, some of the owners of which gave Mr. Bement the privilege of choosing what he wished. He availed himself of this privilege, consequently nearly every rarity passed into his hands, while many of these collectors found themselves unable to replace the missing minerals, as they had hoped, lost their zeal, and gave up the pursuit entirely. A glance at the Bement collection will effectually remove all misgivings at the fate of the smaller ones from which it was gleaned. It is to be hoped that these treasures, so happily combined, will become the property of the nation, and find a worthy place in the National Museum at Washington.

Some preliminary notes may not be unwelcome.

**Gold.**—The finest crystalline dendrites (very similar to the forms from Vöröspatak), described in Groth's Zeitsch. f. Kryst. I, 1, from the mines at Santiam, Oregon. Extraordinary crystallizations from Central City, Col. Gold on and in iron pyrites from the same place, and also from the Cape of Good Hope; from the Ontario mine at Breckenridge 40 miles from Leadville, Col. From the mine Cedar Bird in Eldorado Co., Cal. Magnificent crystals, with the forms  $3O_3$ ,  $O$ ,  $\infty O\infty$ , from Cal. Mexico, Antioquia, Brazil (gold on specular-ore from Ouro Preto), Zalatna, Vöröspatak, are represented by excellent specimens.

**Silver.**—From the National mine, Ontonagon District, Lake Sup., with copper, a polished face showing both metals in remarkable distribution; islets of silver in copper and *vice versa*. Superb cubic twin crystals from Lake Sup. Tetrahedral twins, with Calcite, from Batopilas, rivaling in size and beauty the masses from Kongsberg. From the latter mine there is also a cubic crystal, measuring 20 mm. on the edge. The dendritic silver from Lake Sup. vies with the older finds of Saxony.

**Copper** is a special feature. A large 4 cm. tetrahedron from L. Sup., resembling the dodecahedron. A 5 cm. dodecahedron from the Osceola mine, Michigan. Many crustlike developments, like those described in the Zeitsch. f. Kyrst. II, 169; the central crystal forming a flattened dodecahedron, or a tetrahedron like the  $\infty O$ . On closer inspection portions free from an envelopment reveal a combination of brilliant cubes, and of dull dodecahedral faces. Large twins of the tetrahedron resembling the dodecahedron, Lake S. Transparent *analcite* full of the minute dendritic twins of copper. Especially worthy of note is a rounded mass of

copper, inclosing a 6 cm. spherical core of calcite, with numerous twinned layers. It is difficult to determine whether many of these crystals are pseudomorphs or not. Copper in distorted or knotted fibers (evidently a pseudomorph), filling a cavity in a greenstone.

**Bismuth.**—A cleavage piece of B. 5 cm. long with twinned lamina.

**Lead.**—Encrusted with ucassicot from Camp Creek, Mon. (s. Journ. Philos. Soc. XI, p. 440).

**Tellurium.**—A remarkable hexagonal prism, about 1 cm. in length, terminated at both ends by right and left-handed rhombohedrons, the faces showing a series of depressed faces, from the Keystone mine, Magnolia District, Col. Wonderful sulphur crystals, in peculiar combinations, from the Humboldt mine, Eureka, Nevada.

**Stannite** in pyramidal tetrahedrons, measuring 35 mm. on the edges, from Peru.

**Stibnite.**—From Amelia Co., Va.; splendid groups from Japan, with almost countless terminal planes rounding off the summit.

**Rutile** is one of the crowning glories of the cabinet. It would be hard to find another mineral, which, from the elements of a single system, and a limited number of forms, furnishes such manifold and varied examples of twinning. The crystals from Graves Mountain, Georgia, and from Magnet Cove, Arkansas, are sufficient to confirm this assertion. Among the countless variety of forms from Graves Mountain, there are few which have the regularity of the accompanying diagram. The rutiles from Parkersburg, Chester Co., Penn.,

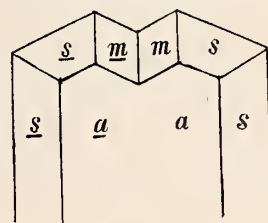


FIG. 1.

are little known in Europe. Six crystals, with deeply striated prisms, are ranged one after another in geniculated growth in the same plane. These extraordinary forms, recalling those of the Zillertal, are found loose in the soil. The rutiles from Alexander Co., N. Car., associated with quartz, spodumene, and emerald, are truly wonderful, while those from Hartford, Vt., are somewhat less beautiful. An acicular crystal, from Middlesex, Vt., penetrates a rhombhedron of dolomite. The saganite from Burke Co., N. Car., rivals the handsomest crystals from the Alps. The collection is likewise rich in select *arkansites* from Magnet Cove, partly in the original form, partly as paramorphs.

**Uranite**, in lustrous black crystals ( $O$ ,  $\infty O\infty$ ,  $\infty O$ ), from Branchville, Conn. The same, a solid black core, in pieces of gummite and uranotil of 1 to 2 cm., from Mitchell Co., N. Car.

**Pyrolusite**, from the Jackson mine, Michigan.

**Zincite.**—A well-defined, acute, six-sided pyramid (quartzoid) from Franklin, N. J.

**Melaconite** from Arizona.

The twinned *zircon*s from Eganville, near Renfrew, Canada, one of the most surprising phenomena that have engaged the attention of mineralogists in the last ten years, lie imbedded in feldspar, cal-

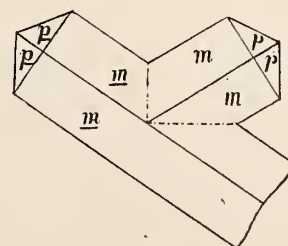


FIG. 2.

cite and hornblende, others free from the gangue, as in the drawing. They are, indeed, magnificent specimens, 8 cm. in size. The twins

that are not crossed abut upon the twinning plane, together with the prism faces, or form at the knee with the octahedral faces, a "visor," in striking similarity to twins of cassiterite. Also bow-like or crooked zircons, one flattened prism, with the plane  $\infty O$  predominating, describing an arc of about  $35^\circ$ . A remarkable dioctahedron from Mills gold mine, Burke Co., N. Car. An excellent primitive form, with basal plane, from Cheyenne Canon, near Pike's Peak (discovered by Dr. Whitman Cross, s. Sitzb. d. niederr. Gessel, 7 January, 1884). 15 mm. zircon-crystals, with well-marked basal plane. 15 mm. in size, from Perth.

*Quartz* is represented by a large number of the most interesting and beautiful specimens. Here, too, is one of the most superb crystals of smoky quartz from Tiefengletscher, weighing 64 lbs., named the "President," because of its perfection and size, with twinning distinctly visible. I was astonished to see, for the first time, the pale smoky quartz from Alexander Co., N. Car., with such numerous planes, and the forms resembling amethyst, from Burke Co. Among the fluid-bearing crystals from Alexander Co. is one with a cavity, in which the bubble moves 5 cm. Fluid-bearing crystals are also found in Burke and Iredell Cos. One from Burke contains an elongated cavity, filled with red ochre. Ellenville, N.Y., has contributed strange crystals, of tabular structure, through the elongation of the rhombohedral faces, while the tabular crystals from the emerald pockets in Alexander Co. are produced by one prism face. Cellular quartz from Iredell Co., perhaps replacing calcite. Magnificent dark morion, with very beautiful twin markings, from Pike's Peak. From a cavity in the Yellowstone geyser region we have a 20 cm. stalactite of chalcedony, with a quartz crystal at its extremity. Quartz-pseudomorph after apophyllite, from Bergen Hill, N. J. Quartz from Hot Springs, Arkansas, showing the curious distortions represented in figure No. 3. A geode of amethyst from Brazil, with crossed twins, is worthy of mention.

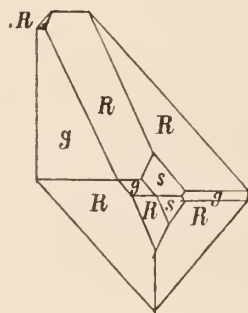


FIG. 3.

Two specimens, consisting of combinations of the right and left-handed rhombohedrons, have become bound round the main axis like some specimens of twinned chabasite. In some of the twins one crystal juts above the other considerably, others resemble amethysts, with indented edges, and prove, where they are joined with those forms through change that is by no means possible, in some instances, to explain the latter phenomena by twinning. Crystals of marvellous beauty from Herkimer. Twisted quartz from the Alps, besides a number of extremely interesting forms of development. We can almost believe that the *augites* of the New World surpass those of the old, when we see the white crystals from Gouverneur, N. Y., also those occurring with white garnet from Hull, Canada, the occurrences at De Kalb, N. Y., from Wakefield, Quebec, from Natural Bridge, N. Y. (accompanied by feldspar, with the faces N and O broadened. The dark-green *pyroxene* from Ducktown, Tenn., is very interesting. It is implanted in copper ore, and has numberless twinned lamina parallel to the base. White *diopside* from Ala. Also, from the same place, white and green *diopside* intermingled in the same specimen. Magnificent black *hornblende*, a short vertical prism, measuring 8 cm. on the orthoaxis, from Edenville, N. Y., and crystals, equally fine, from Alexandria, N. Y., and Renfrew, Canada. *Tremolite* of incomparable beauty, from Clark's Hill, N. Y. De Kalb, Russel, and St. Lawrence Cos.,

N. Y., have also furnished uncommonly fine *augite* and *hornblende*. Rectangular prisms of white *augite*, 10 cm. in length, changed into pencilings of white *tremolite*. The points of radiation are readily discernible on the cleavages, and show the *tremolite* in the periphery of the altered *augite*. Accordingly, the *augite* does not determine the former position of the fibrous *hornblende*. Large crystals of *hornblende* capped with *augite*. The arrangement of the crystallization at the end is the same as that to be seen in the Vesuvian intergrowths of *augite* and *hornblende* (see Verhandlungen, XXXIV, Neue Folge, 10, p. 144); that is, the hemipyramid,  $148^\circ 30'$ , of *hornblende*, inclines to the same side as the basis of *augite* indicated in like manner, by its numerous twinning lamina. When the *hornblende*, in a growth similar to that from the Ural Mts., is associated with *augite*, the fine basal twinning lamina do not project through the *hornblende* (a phenomenon common in American *augite* (see Gitzungsberichte d. Niederhein Gesellschaft, 8 Nov., 1880, p. 238). A twinned growth parallel to the base sometimes occurs in the *hornblende* from St. Lawrence county, New York, to which Dr. G. H. Williams, of Baltimore, had the kindness to direct my attention.

*Fowlerite*.—A large, beautiful crystal of diopsidlike form, from Sterling, New Jersey.

*Wollastonite*, from Natural Bridge, New York.

Both the domestic and foreign beryls of the Bement collection demand particular attention. It includes the largest of the North Carolina emeralds, a prism 20 cm. in length, grown together with another smaller one. Its commercial value as a specimen is about \$1,000. Another specimen has two crystals, about 3 cm. in length and thickness, showing both prisms, one of noble lustre, the other dull, dihexahedrons of the first and second orders, with predominating basal plane. A large 15 mm. emerald, resting on the dihedral face of quartz from Alexander county, North Carolina, and partly imbedded, is worthy of mention. The mass of quartz is broken and shattered around the emerald. Another emerald has been broken and repaired anew by a more recent growth. Small vermicular orifices in the prism faces are characteristic of North Carolina beryls. A magnificent beryl from Avondale quarry, Pennsylvania, resting on a mass of albite, encrusted with muscovite. Here, also, is the Taglioni emerald, a royal crystal from Muzo, which the Czar of Russia presented to the *danseuse*. Of foreign occurrences I was specially struck by two awl-shaped yellowish beryls, from the Ural mountains, the larger 12 cm. long and 8 to 10 mm. thick, terminated in a needle-shaped form by undeterminable dihexahedrons and didodexahedrons.

The emerald-colored *spodumene* (*hiddenite*), of which only a few well developed crystals have been found, may be regarded as one of the treasures of this cabinet.

According to Mr. Bement's statement, more care and labor have been expended on the garnets than any other suite, for in spite of the common occurrence of this mineral crystals of faultless structure and perfect beauty are rarely seen. A glance at the garnets, however, will show how well these efforts have been rewarded. It is an interesting fact, that the very crown of all the garnets was found at Avondale quarry, in the immediate vicinity of Philadelphia ( $2O_2, \infty O$ ). White garnet from Hull and Quebec; black garnet from Franklin, New Jersey, and from Hot Springs, Arkansas; red garnet from Amelia Court House, Virginia, and from Warren, New Hampshire; *essonite* from Boxburg, Massachusetts; *ouwaronite* from Wakefield and Oxford, Canada; reddish-yellow crystals, similar to those from Val Maigels, from Delaware county, Pennsylvania; fine red crystals from Raymond, Maine; brownish red  $2O_2$ , with topaz conjoined, in a new empire-rock from Chaffee county, Colorado.

The suite of *orthoclase* is well worth seeing. The localities in Delaware county, Pennsylvania, have furnished ideal crystals, reddish from Leiperville, white from Dixon's quarry. Crystals resembling *adularia* from near Hot Springs, Arkansas. St. Lawrence county, New York, has contributed many magnificent specimens.



In addition to the well known localities, the region of Pike's Peak, Colorado, has lately furnished marvellous feldspar, which is no whit inferior in the beauty and multiplicity of its forms to that from Baveno and Elba.

Green *microcline* from Pike's Peak, partly in large show-pieces, partly in elegant crystals, forms a splendid array. Similar forms from Amelia Court House, Virginia, and Delaware county, Pennsylvania, are next in order. Among the latest finds, the sanadine-like feldspar from the neighborhood of Leadville, Colorado, deserves special mention, being distinguished by an apparent perfect cleavage, and a bright lustre, parallel to a very sharply inclined hemidome.

The series of tourmalines is superb. Brown crystals, with scalenohedrons, from Gouverneur, New York; light brown and light green from Franklin, New Jersey; bluish and light green from Auburn, Maine; red within and green without from Maine, and the same from Brazil; white, imbedded in calcite, from De Kalb, St. Lawrence county, New York; perfect black crystals from Pierrepont, same county, with main axis much shortened, and like forms from Middletown, Connecticut, Springfield, New Hampshire (with predominant basal plane 7 cm. across), and from Coosa county, Alabama; tourmaline in muscovite from Bakersville, Mitchell county, North Carolina; green tourmaline, in radiated groups in muscovite, from Auburn.

Cyanite in very large prisms from Delaware county, Pennsylvania, with unmistakable basal twinning lamina; the same from Canton; crystals with determinable pyramidal planes, from Massachusetts.

America can also cope with the eastern world in the beauty of its *topaz*, if not in the quantity of the yield. The noble crystals from the Pike's Peak region (colorless, reddish and bluish) are followed by those of the same colors from Stoneham, Maine, discovered and described by Geo. F. Kunz, Hoboken, N. J. The long known locality in Utah (see Dana's Min., p. 379) has recently yielded a large number of very beautiful crystals. These are found isolated, but the colorless or light red crystals from Chaffee county are found with garnet in the small cavities of a light volcanic rock. Both of these resemble the Mexican crystals in respect to the predominance of the acute pyramid terminal.

The *datolite* crystals, from the Osceola mine, Lake Superior, are a principal feature, the datolite being rarely met with in crystals there.

The titanite is wonderful—a 15 cm. twin, completely symmetrical, the flat-faced prism  $113^{\circ} 30'$  according to G. Rose, from Renfrew, Canada, and many other fine specimens, both from Renfrew and St. Lawrence county, N. Y.

Here, too, I saw, without doubt, the most beautiful crystal of sphene ever found in Zillerthal, a greenish yellow, entirely transparent, flat twinning plane  $\infty P(P, \text{Rose})$ . This crystal, 35 mm. long and 30 wide, if I am not mistaken, was one of the gems of the Spang collection. Bridgewater Station, Delaware county, Pennsylvania, has also yielded noble sphene, especially single crystals,  $\frac{1}{2}P\infty$ ;  $(x)\infty P(P)$ ;  $P\infty(y)$ ;  $\infty P(e)$ . Colorless sphene from Selenkina, near Miask; magnificent zeolites from Nova Scotia (green apophyllite, with brown chabasite from Cape d'Or); also rose apophyllite from Guanajuato, in perfection. The collection contains a series of well-developed crystals of *microlite* from Amelia county, Virginia, one of the most wonderful recent finds in the United States. The crystals are  $O, \infty O, 3O_3$ , measure about 3 cm., and are not unlike reddish brown garnets in color and cleavage. These crystals surpass in size all those that the eastern hemisphere has produced, and the American *monazite*, in 15 cm. crystals, from Amelia county, Va., is unrivalled. *Monazite* is usually found in smaller masses and crystals resembling turnerite in form, as a common associate of gold in the placers of North Carolina.

Herderite, likewise one of the great surprises that America has furnished for the mineralogists, is represented by a crystal 2 cm. in size, for the most part well defined and closely agreeing with fig. 2, Groth's Zeitschr. f. Kryst, IX., p. 279.

*Columbite* and *tantalite*, of which remarkable finds have been

recently made at Standish, Maine, Northfield, Massachusetts, Branchville, Connecticut, and Yancey county, North Carolina, are excellently represented.

*Tysonite* and *bastnasite* are among the greatest rarities. Light yellow tysonite, found probably in loose pieces in Cheyenne canon, Pike's Peak region, a pale yellow core of a hexagonal crystal, with basal cleavage (tysonite), a combination of cerium, lanthanite, and didym with fluorine, surrounded by a reddish brown, uncleavable, altered zone of bastnasite (a carbonate of the same earths in combination with unaltered fluoride.)

The "Castle Dome" and "Silver District" mines, in the Chocolate mountains, southwest Arizona, have contributed excellent *vandinite*. One fine specimen of the Bement collection is noticeable for the size of the crystals and the variegated colors of the center and top.

From the same mining region, north of Fort Yuma, we have *wulfenite* of many different forms. The *lanthanite*, from Saucon Valley, Pennsylvania, appearing in white, apparently rhombic plates, is extremely rare, and hitherto never seen by me. There is a second piece of this uncommon mineral in the W. S. Vaux collection, now united with the cabinet of the Philadelphia Academy of Natural Sciences.

*Calcite* from Lake Superior is represented by such a choice suite as could probably not be found in another collection. Among these are specimens which, in variety of form ( $R, \frac{1}{2}R, 2R, 4R, \frac{5}{8}R, \frac{7}{8}R, \frac{7}{8}R, 18R, \infty R, \frac{1}{2}R_4, R_3, R_7, R_9, 2R_2, 4R\frac{5}{8}, \frac{1}{8}R\frac{1}{8}, \frac{4}{8}R_3, \frac{7}{10}R\frac{7}{8}$ , like those described by Hesseberg in No. 9 Mineral. notizen No. 9, in Abh. Senkenberg. Gesellsch., VII., p. 257), symmetry, transparency, and ideal beauty, surpass anything of this species that has heretofore appeared. These forms are peculiarly beautiful when they contain dendrites of native copper.

Datolite, associated with calcite, from the Owl Creek vein, near Phoenix, Lake Superior. In one piece from Copper Falls mine a twinned plane lies parallel to the basal plane. There are also scalenohedral forms, parallel  $R$  of twinned growth, from Lake Superior; the localities of Rossie, Nova Scotia; Bergen Hill (by reddish brown scalenohedral, with white terminations); Matanzas, in Cuba (stalactites); St. Louis, Missouri, and Galena, Illinois.

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## Correspondence.

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### Chicago Notes.

*To the Editor of the Jewelers' Circular:*

A more encouraging and reassuring condition of trade is to be reported from Chicago for the month of December than for several of the fall months past. Even the most pessimistic croaker cannot evade the admission that the month has been one of prosperity for the city jobbers. A more hopeful and cheerful feeling is the order of the day in all circles, and high hopes are entertained that the early spring trade will sustain the confidence engendered by the holiday rush, and counter-balance the depressing experiences of the fall trade. The city has been all alive for weeks with troops of country and local worshippers at the shrine of Father Christmas, purchasing their surprises for "Yule Tide." Orders from country dealers and visits from country buyers have gladdened the hearts of city jobbers, and scarcely a jobber but is feeling better than he has done for months past. The class of business done has been largely in the line of specialties, as is naturally to be expected at this season, but the encouragement given to retailers by the brisk holiday trade has reacted favorably on the tools and materials and general staple departments, and not a few retailers' shelves are heavier and jobbers' stores lighter than before Christmas. Watches have been in more than ordinary demand, and the exquisite engraving and design of cases has played no unimportant part in their sale. Chicago has

amply demonstrated that she no more belongs to the "Rowdy West," but has as keen and refined a taste and appreciation for "the gems of purest ray serene" as her more pretentious eastern neighbors. Diamonds are still the envy and ambition of westerners, as most of the large dealers know to their benefit, and the tempting displays shown in the large wholesale and retail stores of the city have proved alluring baits to thousands of holiday present seekers. Taking things all in all the jobbers of Chicago have every reason to be satisfied with the unexpected and providential run of business which has come to make amends for the disappointments of the year. The retail merchants who have been hanging back in their orders are beginning to awake to the folly of carrying depleted lines of goods, and confidence generally between jobber and retailer is beginning to be reassured. The country retailers who have been too timid to order until they "knew" how things were going to move, have already repented of their tactics of delay and promise more sensible things for the "New Year."

New Year! It awakens hopes and rouses anticipations by its very name; and to the trade here generally it is to be devoutly trusted that this will prove, in the best sense, a "New Year." Collections are improving, relations between jobbers and retailers are in a more encouraging state of reciprocity, and all over the indications point to better times.

The usual gang of robbers who take advantage of the holiday crowds here have been around again, and once more Giles, Bro. & Co. have been the victims. While throngs of holiday purchasers were in Messrs. Giles' store, some adroit thief succeeded in getting away with a tray of rings from one of the diamond safes almost in front of Mr. C. K. Giles' own eyes. The loss will figure up about \$700, and, as usual, no trace of the shoplifters have been found.

Messrs. Glickauf & Newhouse are still doing a rushing business in their patent watch springs. The simplicity, compactness and general adaptability of the new spring to the wants of the watchmaking and watch repairing part of the trade have secured for it general recognition.

Samuel Swartchild is still busy over his new catalogue, and somewhere about February one of the most comprehensive lists in the tools and materials departments that has ever come before the trade may be looked for.

The affairs of Perry Bros. are now really straightened out, and although they have lost the benefit of the holiday trade through the hanging out of one of their creditors, there seems every indication that they will have their due share of the spring trade.

The Blauer Watch Case Co. is still working all hands, and finds difficulty in supplying the demand; but this young watch case company has come in to win, and its business enterprise looks like carrying it to victory.

Chandler & Shader, Clapp & Davies, Chas. Wendell's Sons, Cogswell & Wallis, Rosenkrans & Weber, all report gratifying signs of improvement in business, and if present signs are to be relied on, a steady general improvement is to be looked for.

To give a general estimate of the present condition of trade in Chicago, it may be said that while business has not been up to anticipation, it has shown such an encouraging stride towards improvement that a better feeling has been created in all circles and confidence re-established. Less grumbling and sense of depression may be looked for in the coming winter and spring months than has been so characteristic of the jobbing trade for many months past.

Travelers in the West and Northwest are feeling more hopeful than for nearly two years over the outlook, and, if their predictions are realized, brisk times may be looked for in the jobbing trade. Such calculations are based on the probable output of the crops, and judging from the state of the markets, there seems every chance of their being verified. Improvement in almost every other staple line of business is already assured, and it will indeed be a surprise if the jewelry business does not follow fast in the wake of such other progress. Dry goods and hardware stores have been reaping a rich

harvest for over two months, and the present indications in the jewelry trade justify the belief that business is reviving all around. The better feeling, and removal of previously existing tension between jobbers and retailers, coupled with the distinct all-round improvement in every line of trade, show the ushering in of a "Happy New Year" to the jewelers of the Northwest.  
W. A. B.

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## Communications.

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BROOKLYN, E. D., N. Y., Dec. 2, 1885.

*Gentlemen:*

Your article in last month's CIRCULAR entitled "Itinerant Auctioneers" was read with considerable interest and attention, and there is no doubt in my mind that the legitimate trade who complain so often and strongly are largely responsible for giving these venders the opportunity of obtaining such ware, for many of the trade who would repel an intimation that they were dishonest with righteous indignation and inuendo, have become so urgent in their demands for cheap goods stamped triple plate, that a number of the reputable manufacturers whose names are known broadcast, and whose advertisement grace the pages of household and trade journals, have found it profitable to meet such a demand and have flooded the market with inferior goods, stamping them with some fictitious name or firm, and the "poor and ignorant public," trusting the honesty and uprightness of their fellow citizen and neighbor, buy the same believing them to be as stamped. Many in the trade confess that they handle such ware because it finds readier sale, and howls when an itinerant auctioneer, who is just as honest (only bolder), comes in their midst and claims his ware to be as stamped, while the legitimate tradesman will avoid all responsibility by keeping his mouth shut or excuse himself with the assertion that he bought it for triple plate and believed it all right, knowing full well that he utters a deliberate lie; all ware for which he pays a triple plated price is stamped with the manufacturers name, and bears with it a guarantee that it is as represented. Concerning the jewelry trade I know but little, but from conversations that I have had with a number of manufacturers, fear the same state of fraud and deception exists; 10, 12, 14 and 18 karat being stamped on much lower grade goods, and done generally at the earnest solicitation of some of their patrons. Not only do I wonder with you that the public are gulled by the "glib-tongued auctioneers" in paying high prices for single plate and washed goods, but that the trade are so blind to their own interests as to offer or encourage the sale of such falsely stamped ware over their own cases, and stranger that many of them are among the "intelligent and refined." The words of Saint Paul can certainly be applied to such: "The love of money is the root of evil, which, many coveting after, have erred from the faith." You are certainly to be commended for the able and scathing manner with which you have always denounced and exposed all tricks that are antagonistic to the true interest and advancement of the trade, but would not the truer and better way to overcome and hinder such evils be to have every responsible dealer refuse to handle any goods that they know is other than the stamp on it implies, and thus largely stop the opportunity of auctioneers obtaining such wares. I doubt if any manufacturer would find it profitable to so stamp these goods simply to meet the demands of that trade. So pernicious and widespread has this evil become that many are beginning to lose faith and confidence in that which is fair and regular. Oh, that men would reason and consider that "honesty is not only the best policy," but that it is right.

Very Resp'y, HENRY SCHADE.

I write strongly from the fact I am constantly called upon to refuse orders given on condition that I will falsely stamp goods, but when I find that I cannot make a living without being fraudulent I will go to work again at the lathe.

PHILADELPHIA, Nov. 20, 1885.

*Editor Jewelers' Circular :*

In the November issue of your journal a correspondent speaks of "the petrified woods known as tigers eye." There is implied in this an error of such frequent occurrence that I beg leave to offer a correction. The stone known to the trade as tiger eye is not a petrified wood, but is a pseudomorph of the mineral crocidolite. This is a fibrous, asbestos-like mineral, lavender blue or leek green in color, with long, delicate, easily separable fibers, and is found in several different localities. A deposit of this in South Africa constitutes a vein from an inch to two and a half inches in thickness in a porphyritic rock containing much oxide of iron. This vein of crocidolite has at some time been penetrated by silica in solution which gradually replaced the original deposit, retaining its fibrous-like appearance. This resulting quartz pseudomorph is the tiger eye, which bears no relation to petrified wood except that in the one case silica replaces wood-fiber, while in the other it takes the place of the fibrous mineral asbestos. Petrified wood is found in almost any part of the world, while the "find" of tiger eye is confined to the one region of South Africa.

A. F.

DETROIT, Nov. 14, 1885.

*To the Editor of the Jewelers' Circular :*

## DISTURBANCES OF CLOCKS BY ELECTRICITY.

There is much written at the present time of electricity derived from magnetic or chemical action, and but very little of frictional electricity which is almost unthought of by the present scientists, probably for the reason of its non-usefulness, but there are occasions when this frictional electricity manifests its power, and in a way that I think may be of interest to your readers, and of which I have seen no published account.

Some years ago I had in my care a clock with a large glass door exposing to view the pendulum, which was a seconds pendulum, composed of a wooden rod and brass faced bob. I noticed every time within from three to five minutes after the glass was cleaned the clock would stop; thought at first the jar or shake imparted to the clock by the cleaning was the cause, but all my efforts to shake the clock by other means would not stop it, as it was firmly fixed to a brick wall. This induced me to experiment, and I found by briskly rubbing the glass with dry paper the pendulum would take a zigzag motion, touching the back of the clock first with one side and then with the other until it was brought to rest.

I had then no doubt of the cause, but continued experimenting with a clock of very similar construction with a shorter pendulum hanging nearer the glass, and found by rubbing the glass briskly with warm dry paper, on ceasing and removing the paper, the pendulum would strike the glass with great force and remain there, stopping the clock instantly; the bringing of my hand close to the glass would release the pendulum, but on withdrawing it, it would again be attracted to the glass; this could be repeated several times before the electric energy was exhausted.

I have often noticed that many clocks in a favorable condition would produce electric sparks with a loud click common to such electric discharges, the electricity in this case being generated on the glass by merely dusting it with a feather duster, the clock hands carrying it off and charging the movement in the same way as the accumulator on a frictional electric machine, and the discharge takes place between some part of the movement and the dial which is insulated from it by the dry wood case.

From these experiments I have come to the conclusion that many of the mysterious clock disturbances can be attributed to electricity generated by friction on the glass.

C. W. RUEHLE.

*To the Editor of the Jewelers' Circular :*

A great deal has been said concerning the return of prosperity to the jewelry trade which we country jewelers have lived in anticipation of for several months. Promises and signs are of no avail. There are several abuses the jewelry dealers are made to face in a

disastrous way, which, I am sorry to say, are practiced to a great extent, and one of them is the memorandum merchants, who are a great drawback to an established jewelry man. Many young men whose only delight is to sell goods in large quantities during the holidays, they having never served a regular apprenticeship at the bench (where his reputation should spring from), whose only delight is in cutting prices as well as botching up all the watches that come to him in such a manner as to cause vexation to a competent mechanic, who are sure to have the jobs brought to them in the end, are in the habit of getting all the goods they can to exhibit during the holidays and fair weeks from a dozen or more houses and returning what he has not sold, he knowing full well that his reputation as a regular representative of the craft, as far as workmanship is concerned, and cannot work up an advertisement of good standing, he "skips," leaving memorandum bills for collection, and Maiden Lane gets left, likewise the regular established merchant across the street, who has been established for years, satisfied with fair profits and the confidence of the community, must stand and stare his eyes out watching the customers coming from the "Immense Closing Out Sale."

The old practice of sending out postal cards and unsealed circulars with quotations and changes in prices of goods and materials in plain print, which are only an advertisement for postmasters and clerks to read and get better acquainted with the great drives of the day, who are always ready to pry into the merits of trade, and in smaller country places, where post offices are in dry goods, gents' furnishing stores, etc., who are led to believe they have a right to sell anything in the market, will put in a show case of jewelry, Waterbury watches and cheap nickel clocks, which, by the way, are a torment to any well regulated work bench, they being bought of houses dealing in "culls," and hence the jewelry business of to-day is no more strictly confined to a well established jewelry store, but all over town. And we of the craft have to put up with jewelry, spectacle and silverware peddlers who sell goods on the instalment plan, and the custom which should be given to the regular established merchant is given to some land shark with no reputation at stake, who has no store rent to pay, gas bill or clerk hire or taxes to pay, and whose delight is to undersell. I hope the day will soon be when goods will not be wholesaled to persons who cannot show a regular established card. The latest to torment jewelry men who sell plated ware is a manufacturer at the capital city not being satisfied with doing a legitimate wholesale trade, which would be of great convenience to country merchants in neighboring villages, and for own personal interest, runs a peddler wagon through the country and right under the eyes of the jewelry stores, selling from house to house his wares until he has canvassed well his territory, selling at regular wholesale rates, crawls in to the jewelry man and has the cheek to want to sell goods to him. Put him out; do not countenance such infringement, and buy of only houses whose name cannot be brought forward as practicing such abuses in direct violation of the jewelry trade. B. S.

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### Proceedings of the Horological Club.

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#### A DISTINGUISHED BODY OF WATCH AND CLOCK MAKERS.

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*One hundred and thirty-eighth discussion.—Communicated by the Secretary.*

[NOTICE.—Correspondents should write all letters intended for the Club separate from any other business matters, and headed "Secretary of the Horological Club." Direct the envelope to The Jewelers' Circular Publishing Company, Seth W. Hale, President. Write only on one side of the paper, state the points briefly, mail as early as possible, as it must be received here not later than the eighth day of the month, in order to be discussed and reported in THE CIRCULAR for the next month.

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WHEN WAS THE SECONDS HAND FIRST USED ON WATCHES?

*Secretary of Horological Club :*

I am tempted to ask if you can inform me when the seconds hand

was placed on the watch? It was so placed by Berthoud (1727-1807), but in what year? I have hunted through thousands of pages and have made inquiries in Europe, but all in vain. I would be obliged for a reply through your journal. C. P. D.

Mr. McFuzee said he was unable to find a date any more definite than that mentioned by Mr. D., and he suggested that his letter be inserted in the Proceedings, where it might catch the eye of some one who had sources of information from which he could ascertain the time more closely.

#### NEW TOOL FOR THE TRADE.

##### Secretary of Horological Club:

In my travels through the States selling watches and jewelry to the retail jewelry trade exclusively, I often have my attention directed to some new idea or thing, tool, appliance, etc., that will prove of benefit to the trade at large. I ran across a watchmaker the other day who is a genius. He is a wonder. Such men you seldom see, and they are NEVER half as much appreciated as they should be. This man was just finishing up a nice job that he was doing when I called on him. It was a large music box. The mainspring had broken, and had stripped 12 teeth out of the barrel and broken one out of the pinion. He put a steel tooth in that pinion that was BETTER than the original, and he made his mould and cast out of GOOD brass a barrel, much better than the old one, which was of common soft brass. He had a large heavy lathe with a slide rest, etc., etc., on which he turned that barrel up, cut the teeth and made the tools to do it with. It was the first job of the kind he ever did, and it was done well. He showed me many other things that he has done which I have not time to mention here. He has got a tool laying in his drawer that he has had patented, which is by far the best thing of the kind I have ever seen. It lays over anything in the market to-day, and would be hailed with as much delight and pleasure as the Allen Ring Gauge is to-day. I told him to go to work and make it, and place it before the public and on the market, and I think he will soon. This man has made an indexing machine that is simple and yet it is marvelous. It is used in connection with this new patent tool of his, and I assure the trade that they will ever feel grateful to this man for inventing and making such a useful tool, and you will often wonder how you ever got along without it before. W. F. A. W.

Mr. Clerkenwell said that our correspondent's enthusiastic praises of the new tools might be fully justified by their merits, but as he gives us no information whatever about their construction or operation, we are unable to judge as to that. He does not even tell us what the tool is for—which is rather singular, in view of the fact that it has been patented, so that there would be no danger in explaining it fully. We are always glad to receive *descriptions* of new tools and attachments, new ways of doing work and improvements of all kinds, and to publish them without charge for the benefit of the trade at large. But we hope our friends will send us full *particulars* when they write, as mere praises convey no information and do no good to any one. We would like to hear from Mr. W. again with a description of the tool referred to.

#### BACK VOLUMES OF THE CIRCULAR FOR SALE.

##### Secretary of Horological Club:

I wrote you more than two months ago that I would sell the back numbers of THE JEWELERS' CIRCULAR from February, 1876, to February, 1881, inclusive, for the subscription price (that is, ten dollars), delivering them at the R. R. depot well packed, but no notice has been given of my offer. If the purchaser chooses he can have more of them at the same price. They are in about as good order as I received them, and I have no further use for them as I have no apprentice. If you will kindly notice this in your "Proceedings" next month, it may be you will benefit some impecunious "Chip," and will certainly oblige greatly, Yours resp'y,  
Minden, Webster Parish, La. EDWARD ETTER.

The Secretary said Mr. Etter's former letter must have miscarried, as this was the first one received from him. He would with pleasure give it place in the Proceedings and call the attention of our readers to it.

#### PREVENTING RUST ON STEEL.

##### Secretary of Horological Club:

Will you kindly inform me through the columns of THE JEWELERS'

CIRCULAR of the best means (*i. e.*, chemically) of destroying the effects of sea water on the steel parts of watches. And also the best means of preventing the action of salt air on steel and iron, tools and materials. Filing the rust spots entirely off does not seem to entirely destroy the effects of sea water, as it will appear again unless the parts are kept entirely covered with oil.

Yours very truly, A. E. M.

Mr. Uhrmacher replied that there is no chemical way to destroy the effects of sea water on steel. All that is necessary is to completely remove the sea water, or the salts which may have been dissolved in the water, from the steel, which can readily be done by thorough washing in hot water. The rust itself must then be *completely* removed, as every spot which is left, no matter how minute, serves as a starting point for extending itself, both in area and depth. Where filing and re-polishing are impracticable, the rust may be chemically dissolved off by a strong aqueous solution of cyanide of potassium—but this itself must then be completely removed by thorough washing in hot water, *without soap*, and then re-washing again in *clean* hot water, after which the article is dried in hot box-wood sawdust.

As for *preventing* steel from rusting when exposed to conditions favorable to rust, that is about as difficult as to prevent an umbrella from getting wet when it is exposed to the rain. Causes which produce rust will repeat their action as often as the object is presented to them, no matter how thoroughly or how often the effects of previous rusting may be removed. About the only thing that can be done in that direction is to boil the article for ten or fifteen minutes in melted paraffine or oil which is entirely free from acid, at a temperature as high as can be used without removing the temper. In the case of small springs, the temperature must be quite moderate, and should be tested both beforehand and during the operation by a piece of similar spring. When the article is not of spring temper nor hardened a higher heat may be used. When the oil gets cool enough the article may be wiped clean, and will be found to have absorbed a minute amount of oil in its external pores which assist to prevent subsequent rusting. In the case of paraffine, the article should be wiped while hot enough to prevent the paraffine from solidifying upon it.

If any of our readers know of any other way for preventing rust we should be glad to have them describe their methods.

[Reprinted from the Mineral Statistics of the United States for 1883-1884. Edited by Mr. Albert Williams, Jr. Published by the Geological Survey.]

### Precious Stones.

BY GEORGE F. KUNZ.

*Continued from page 351.*

GARNETS are found at many localities in California and Arizona. According to Prof. W. P. Blake they have been found at the following places in California: Rodgers mine, in the eastern part of El Dorado county, a green grossular stone in copper ore; near Petaluma, Sonoma county, associated with specular iron, calcspar, and iron and copper pyrites; in the Coso district, Inyo county, in large semi-crystalline masses of a light color, some specimens of which were taken to San Francisco under the impression that they contained tin; three miles from Pilot Hill, El Dorado county, in blocks several feet thick; also in Plumas, Mono, Fresno, Los Angeles, and San Diego counties. Garnets occur in great quantities in mica-schist at the mouth of the Stikeen river, near Fort Wrangle, Alaska. Blood-red stones are plentiful on the Nacimiento desert, near Fort Defiance, northeastern Arizona. They are found here in the loose sand, having probably been brought by the action of water from a point 50 miles to the north, where they occur in the so-called syenite. This is thought to be the place where the perpetrators of the famous "diamond swindle" procured the garnets with which they salted the bogus diamond field. In the western part of Arizona, on the same parallel with

Fort Defiance, garnets have been observed on both sides of the Colorado river.

*Kyanite*.—The finest American kyanites were possibly those formerly found at Chesterfield, Massachusetts, a fine example of which is in the British Museum cabinet at South Kensington. The crystals in this are all distinct, of a fine dark blue color, and would cut into some small mineralogical gems.

At the locality at Derby creek, Moon's ferry, Delaware county, Pennsylvania, fine deep azure-blue blades, 5 and 6 inches long, have been found, which would afford gems if they were thicker. Blue, green, and gray specimens are found at East Bradford.

Fine crystals are found, together with lazulite, at Chubb's and Crowder's mountains, Gaston county, North Carolina, on the road to Cooper's gap.

In Maine kyanite is found in fine crystals at Windham.

The old localities are Worthington, Blanford, Westfield and Lancaster, Massachusetts; Litchfield and Washington, Connecticut; Stratford, Salisbury, and Bellows Falls, Vermont; near Wilmington, Delaware, and at Willis mountain, Buckingham county; also two miles north of Chancellorsville, Spottsylvania county, in Virginia.

No really fine gems have as yet been produced from American kyanite.

*Danburite* is found in considerable quantity at Russell, New York.

*Lithia Emerald (Hiddenite)*.—Lithia emerald, or hiddenite, has been found in very small quantities at Stony Point, Alexander county, North Carolina, since the Spring of 1883; nearly all the gems sold by the company now are, therefore, of old material, usually small stones, or else rather light colored.

#### SILICA GROUP.

*Transparent Quartz*.—In Herkimer county, New York, quartz crystals have been collected by many for their remarkable brilliancy and perfection, rivaling even those found in the Carrara marble; many collections of them have been made, notably one by Rev. Bogert Walker, of Herkimer. There are a number of others at Middleville, Little Falls, Canajoharie, and other places. Many are sold along the railroads, a two-ounce vial of them usually bringing \$2. Crystals with a drop of water bring from \$1 to \$30; single fine limpid ones, from 10 cents to \$25. At times they are brilliant, transparent, and perfect as any known substance, whiter even than any diamond. Curious groupings or inclusions, such as bitumen, pearl spar, etc., also bring fancy prices.

Many fine crystals were obtained where the railroad was opened, at Middleville and Newport, also at Little Falls, on the line of the West Shore railroad. The old diggings at Little Falls have been worked so extensively that the highway has been encroached upon, thus partly preventing further digging. These crystals are in demand all over the United States, several men being required to dig nearly all the time to supply the demand from all quarters. At Diamond Point and Diamond Island, Lake George, the same crystals occur as in Herkimer county, and are extensively sold there.

Some of the most magnificent known groups of quartz were formerly obtained at the Ellenville lead mines, Ulster county, New York, some of the finest of which are now at the American Museum of Natural History, New York City. Few, if any, of these were used for gem purposes, although many were sold as souvenirs at the locality over twenty years ago. The Sterling mine, at Antwerp, New York, furnishes small, fine, doubly-terminated dodecahedral crystals, and the same forms, slightly different, are also found in the specular iron at Fowler, Herman and Edwards, Saint Lawrence county; Diamond Hill, Lansingburg, is an old but poor locality, and Diamond Island, Portland Harbor, Maine, is well known for the small but bright crystals found there.

Dr. Genth, in "Preliminary Mineralogy of Pennsylvania," mentions crystals from 1½ to 3 inches across, short and thick, but with clear pyramid, from Nazareth, Northampton county, Pennsylvania;

also fine crystals, 1½ inches long and wide, from Crystal Springs, on Blue mountain, in Bushkill township.

The highly modified crystals from Diamond Hill and Cumberland Hill, Rhode Island, also the fine ones from White Plains and Stony Point, Alexander county, and from Catawba and Burke counties, North Carolina, are worthy of mention, and lately formed the subject of a crystallographic memoir by Prof. Gerhard vom Rath.

The San Francisco *Bulletin* of July 16, 1884, mentions the finding of a large deposit of crystal or pebble stones on the Santa Margarita rancho, San Diego county, California, special reference being made to one specimen of pure crystal 8 inches in diameter.

Mention is made by Dr. Daniel G. Britton\* in a paper on the folk lore of Yucatan, in quoting the language of Garcia that the natives were converted from pagan idolaters to christian idolaters, and speaking of the belief in witchcraft and sorcery among them, that the wise men divine with a rock crystal, and that it has great influence over their crops. Their occurrence in the mounds of Arkansas, North Carolina and elsewhere, and the abrasion of the crystalline edges, would lead to the inference that they were not collected only to bury with the dead, but that they were carried by the natives for a long time to produce certain influences, and having been used for such purposes, were probably buried with them as their property. Personal observation in Garland and Montgomery counties, Arkansas, carried on at times forty miles from the Crystal mountain locality, showed these crystals associated with a quantity of some of the finest chipped arrow points of chalcedony anywhere found, and yet no trace of a chipped crystal could be found among them. In a number of the mounds leveled by the farmers in cultivating, and not worked systematically, many single crystals of quartz were revealed, which may, however, have been kept for their beauty and symmetry by the Indians. These masses of transparent quartz, especially from North Carolina, would afford perfectly clear crystal balls, at least two to four inches in diameter, and a few have been cut over two inches.

A large mass weighing five kilos was recently brought from Alaska, and was only a part of an original mass which must have weighed twenty kilos. It afforded clear crystal slabs for hand glasses three by five inches. The superiority of this material over glass lies in the fact that it does not, like glass, by its color detract from the rosiness of the countenance. A fine glass of this kind is in the Dresden "green vaults."

*Amethyst*.—One of the finest American amethysts was lately shown me by Mr. L. M. Ives, of New York city. The color was nearly equal to the finest Siberian, and the crystal would afford a gem three-eighths inch across. It was found by Mr. Ives 1½ miles from Roaring brook, near Cheshire, Connecticut.

Amethyst of a light purple, and at times pink color, is found in crystals 3 inches long and over in large abundance at Clayton, Rabun county, Georgia. At times these have large liquid cavities containing movable bubbles of gas. They are of little gem value, although fine as specimens. Some fine amethysts in the Hamlin cabinet are from Oxford county, Maine. Very fair crystals were formerly found at Mount Crawford, Surray, Waterville and Westmoreland, New Hampshire. Some very fair crystals have been observed at Bristol, Rhode Island. Dr. F. A. Genth† mentions magnificent specimens from Delaware and Chester counties, Pennsylvania. Among the principal localities may be mentioned the farms of S. Entrikin, William Gibbon, Mrs. Faulkes and Dr. Elwayne, in East Bradford township; in Pocopson township, John Entrikin's and Joseph B. Darlington's; Birmingham township, on Davis B. William's farm; in Charlestown township about 1 quart of loose crystals were obtained; on Charles Passmore's farm, Newlin township, about 100 pounds have been found.

(To be Continued.)

\* *Folk Lore Journal*, August, 1883.

† "Preliminary report on the Mineralogy of Pennsylvania," page 57, B.

## Trade Gossip.

G. L. McCoy succeeds S. S. Lavey, Lima, O.  
 Mr. Henry Fera sailed for Europe on Dec. 12.  
 M. S. Hodge succeeds Geo. Goff, Washburne, Ills.  
 D. B. How succeeds F. P. Seiglitz, Anderson, Ind.  
 A. Brunner has moved from Morton to Peoria, Ills.  
 Wyman & Davis succeed F. H. Wyman, Warren, Pa.  
 E. E. Ruton has moved from Pataskala to Jersey, O.  
 Mr. W. A. Malliet has removed to No. 9 John street.  
 Ermold & Tyack succeed Frank Tyack, Reading, Pa.  
 S. Jewett has moved from Quenemo to Hartford, Kan.  
 F. F. Heyse succeeds Samuel Carpenter, Jamaica, N. Y.  
 Geo. Hanna & Co. succeed Geo. Hanna, Rushville, Ills.  
 D. J. Hodges succeeds L. F. Cochran, Bloomington, Ills.  
 F. A. Pell has moved from Chatsworth to Louisville, Ills.  
 Wm. Thain has moved from Smithfield to Raleigh, N. C.  
 J. Breitmaier has moved from Oak Harbor to Bellevue, O.  
 Johnson & Co. have moved from Utica to Glendale, N. Y.  
 W. H. Orear & Co. succeed W. H. Orear, Jamestown, Ind.  
 Benj. F. Burk & Co., succeed B. F. Burk, Jonesboro, Ind.  
 F. M. Coffin has moved from Carthage to Shelbyville, Ind.  
 Amos P. Root has moved from Farmdale to Kingsville, O.  
 E. A. Blosser has moved from Blosserville to Newville, Pa.  
 Chas. A. Woerner succeeds Louis Greiner, Indianapolis, Ind.  
 Joseph A. Durst succeeds Geo. W. Eastman, Foxboro, Mass.  
 L. A. Frincke has moved from Breckenridge to Denver, Col.  
 G. E. Battelle has moved from St. Helena to Santa Cruz, Cal.  
 A. M. Smythe & Co. succeed A. M. Smythe, Hampshire, Ills.  
 Elmer Reed has moved from Augusta, Kan., to Lebanon, Mo.  
 C. B. Gregory has moved from Brunswick to Kansas City, Mo.  
 Wm. H. Elliott has moved from Phenix to Arctic Centre, R. I.  
 A. J. Nelson succeeds the firm of Fisk & Clark, Massena, N. Y.  
 J. W. Harlan has moved from Wellsville, Mo., to Dallas, Texas.  
 N. E. Emmons, Grand Rapids, Wis., is closing out his business.  
 J. E. Douglas has moved from Excelsior Springs to Lawson, Mo.  
 J. K. Norman has moved from Nevada, Mo., to Los Angeles, Cal.  
 A. V. May succeeds the firm of A. B. Clapp & Co., Brattleboro, Vt.  
 Jaxtheimer & Hull succeed the firm of Vautrol & Hull, Warren, O.  
 A. F. Murray succeeds the firm of Murray & Co., Huntsville, Ala.  
 I. Hirsch has moved from South Pueblo to West Las Animas, Col.  
 Wm. H. Hamilton, St. Paris, O., is succeeded by Wm. H. Heater.  
 A. J. Satterlee succeeds the firm of Satterlee & Gilman, Adain, Mo.  
 Kimball & Son have moved from Seattle to Walla-Walla, Wash. Ter.  
 Bohne & Brown succeed the firm of Pratt & Bohne, North Loup, Neb.  
 J. C. Morgan has moved from Middletown, Ind., to Princeton, Kan.  
 A. P. Hayes succeeds the firm of Horton & Hayes, Decatur, Texas.  
 Wm. Hamilton succeeds the firm of Hamilton & Heater, De Graff, O.  
 S. H. Dickinson has moved from Middlebury, Ind., to Mooresville, Mo.  
 Chapman & Jandon succeed the firm of B. Chapman & Co., Red Wing, Minn.

Mr. Thos. Le Boutillier left for Europe in the steamer *Oregon*, Dec. 26th.

F. L. Sutliff has purchased the business of A. B. Tarbox, Susquehanna, Pa.

Harris Bros. have purchased the business of D. L. Gudgen, New Philadelphia, O.

The firm of W. H. Harris & Co., Detroit, Mich., is succeeded by P. B. Peltier & Co.

Henry W. Pobst has purchased the business of Wm. G. Baldwin, Tazewell C. H., Va.

Henry Oppenheimer & Co., Chicago, Ills., is succeeded by Henry Oppenheimer's Sons.

G. L. Fox, of M. Fox & Co., arrived home from Europe Dec. 20 on the steamship *Werra*.

The annual election of the New York Jewelers' Board of Trade will be held Monday, January 25th.

D. B. Waite has been admitted to partnership in the firm of Waite, Mathewson & Co., Providence, R. I.

Mr. Louis Neresheimer, of Messrs. E. Aug. Neresheimer & Co., sailed for Europe in the *Oregon* Dec. 26.

Mr. H. W. Sowade, formerly with Messrs. M. Fox & Co., has made an engagement with Mr. A. J. Grinberg.

Messrs. Fisher & Sons, No. 1 Maiden Lane, carry a full line of watchmakers' and jewelers' materials, and will promptly attend to job work for the trade.

The E. Howard Watch and Clock Company have leased offices in the new buildings, Nos. 41 and 43 Maiden Lane, which they will occupy early in January.

Messrs. Hutchinson & Huestis will have their samples of new styles of rings ready for the inspection of the jobbing trade immediately after the 1st of January.

Henry B. Horton, the inventor of the Ithaca calendar clock and autophone, died suddenly in Ithaca recently from neuralgia of the heart. He was 66 years of age.

Mr. Julius Goldsmith, formerly with Messrs. Louis Strasburger & Co. has made an engagement with S. F. Meyers & Co., and will look after their city and near by trade.

Mr. W. Frank Corry, who has for several years past represented Messrs. Unger Bros. on the road, will, after January 1st, accept the Eastern agency of the Illinois Watch Co.

Messrs. Foster & Bailey, manufacturers of the Mount Hope Button and Bracelet, have introduced their usual lines of new goods that will be of interest to the jobbing trade.

Mr. Carter, of the firm of Henze & Carter, will retire from the firm January 1st, and Mr. Gardner, who has represented them as traveling salesman, will be admitted to the firm.

Messrs. Godfrey & Adams, manufacturers of the "Automatic Sleeve Button," have introduced for the spring season an entire new line of these goods, embracing many new designs.

Messrs. Unger Bros. have engaged Mr. E. H. Eckfeldt, formerly with Carrow, Bishop & Co., to represent them in the West. Mr. E. will travel over the same territory that Mr. W. Frank Corry did.

The store of Harvey & Otis, jewelers, of Providence, was opened by burglars recently, and the entire contents, consisting of charms, society emblems and other kinds of jewelry, valued at \$2,500, stolen.

Mr. William T. Smith, of Providence, assayer and refiner, is prepared as usual to handle waste of all kinds containing gold and silver, and to give the best results to those who favor him with their trade.

Mr. J. P. Stevens, of Atlanta, Ga., opened his new store in that city Dec. 7. He announced an entirely new stock of goods, including diamonds, watches, jewelry, etc. Mr. Stevens was formerly of the firm of J. P. Stevens & Co.

In the recent fire of the Morgan House, Tallahassee, Fla., Mr. John W. Steele had a very narrow escape. He succeeded in saving his trunk of goods. Eight minutes from the time he reached the street the entire structure was in ruins.

Messrs. Ruger & Kimball, having recently formed a co-partnership, have opened a handsome jewelry store on Main street, Buffalo, where they exhibit a full stock of jewelry of all kinds, watches, diamonds, and artistic goods of every description.

On the morning of Dec. 23d burglars broke into the jewelry store of Ramsey & Co., Milton, Canada, and carried off a cart load of jewelry, silverware, money, etc. The store was cleaned out. The stolen goods were worth many thousands of dollars.

The fire that recently occurred in the establishment of the E. N. Welch Manufacturing Company at Forrestville, Conn., was confined to one building, and did not interfere with their facilities for filling orders. It caused no interruption to their business whatever.

William Schwencke, manufacturing and jobbing jeweler, is now making a specialty of Masonic emblems, badges and medals, designs for which may be seen at 42 Maiden Lane. These goods, made to order on short notice, do not, however, interfere with other lines of work.

The New England Manufacturing Jewelers' Association gave a social entertainment at their rooms in Providence Dec. 18. It was a pronounced success in every respect. This was the first of a series of monthly entertainments of a similar nature which the Association proposes to give.

John Gauter, a watchmaker from Baden, Germany, died Oct. 21, while in the employ of Mr. James Fricker, at Danville, Va. He informed Mr. Fricker that he had two brothers in this country. If either or both of them will address Mr. Fricker, he will give them further information regarding their deceased brother.

The retail dealers of Cleveland, whose preliminary meetings were noticed in our issue of last month, have perfected an organization, designated as the Jewelers' Association of Cleveland. The following named gentlemen have been chosen as officers for the current year: President, P. L. Miles; Secretary, Frank Sumner; Treasurer, Francis Meckes.

Mr. M. H. Berg, Secretary of the National Watchmakers' and Jewelers' Association, is prepared to furnish copies of the By-Laws of the Association, and blank applications for membership to all dealers who apply. His address is care of Hyman & Co., 12 State street, Chicago. The Association ordered 15,000 copies of the By-Laws printed for circulation in the trade.

The American Watch Company, of Waltham, has issued a circular to the trade, announcing that hereafter they will make no key-winding watches above the grade of the Broadway. The key-winding Wm. Ellerys, R. E. Robbins, P. S. Bartlett, and Appleton, Tracy & Co. movements are therefore dropped from their list. The demand for fine movements is confined almost exclusively to stem-winders.

The mysterious disappearance of R. Bruno Brandt, a Toronto jeweler, from a Jersey City hotel on November 16, is explained. He went to Germany by the Hamburg steamship *Eider* on November 18. The ship has just arrived here on the return trip, and the captain brought over for collection Brandt's draft of \$800. His baggage, which he left in the Jersey City hotel, will be forwarded to him.

Harris Goodman, of London, was recently convicted of manufacturing and selling a bogus imitation of the watch oil made by Ezra Kelley, of New Bedford, Mass. This oil is sold abroad in large quantities, and the accused was found to have gone regularly into the business of making an imitation of it. On his premises there was found a large lot of adulterated fish oil, and bogus labels bearing the mark: "Ezra Kelley, Superior Watch and Clock Oil." The Justice before whom the prisoner was arraigned sentenced him to 12 months' imprisonment at hard labor.

Hancock, Becker & Co. have just received a patent on an improved setting, which is said to be the only exact imitation of a solid gold mounting made. It is polished both inside and out, and there being no base metal exposed to view. Among their new novelties they have a perfect imitation of a Black Diamond, which is attracting great attention. This firm have removed their New York office to 196 Broadway.

Messrs. Richmond & Co. have recently received a patent for an improvement in ring settings. It refers to raised settings where the stone is sunk. The raised part is made hollow, the setting of the stone therein being completed with a piece of tubing which closes up the cavity, thus making a setting wholly of gold. It is designed for settings of all kinds of stones, is practical and serviceable, and will be appreciated by the trade.

Attention is called to the pierced, chasing and carved work in gold jewelry, at Shoemaker, Pickering & Co.'s, 21 Maiden Lane. This new style of ornamentation is very attractive, and is especially effective on sleeve buttons. This firm are also making some choice patterns in Queen chains, that found a ready sale during the holiday season. A large stock of lace and bar pins include a number of novelties. In a word, these new goods are well worthy the attention of buyers.

Mr. Charles Schlag died recently in this city at the age of 42 years. He was born in Germany, and about twenty years ago came to this country where, after working for a time as a journeyman, he associated himself in business with Mr. C. Nordt in Broome street. The firm subsequently removed to Maiden Lane. Three years ago the firm dissolved, each partner going into business for himself. He leaves a widow and one daughter. His business will be carried on for the present by his nephew, Mr. Charles Jung.

Mr. C. W. Schumann is the happy possessor of an elegant painting—10x15 feet—by Constantin Makowsky. It represents a Russian wedding feast in the seventeenth century, and is regarded as the masterpiece of that distinguished artist. At the World's Fair at Antwerp this painting received the first prize, and was the center of attraction for all lovers of art. Mr. Schumann has the picture hung in his store, No. 24 John street, where it has been viewed by hundreds of lovers of art. The trade are invited to call and see it.

The electrical clock in the store of Duhme & Co., Cincinnati, came very near being destroyed recently. It is connected with the Western Union wires, over which they receive the time from the Washington Observatory. On the occasion referred to, an electric light wire became entangled with the telegraph wires, and a strong current of electricity was transmitted over the wires. A hissing noise was detected in the vicinity of the clock, and the cause being suspected, the wires were promptly cut and the clock saved from injury.

Mr. Samuel Swartchild, of Chicago, dealer in watches, watch materials and tools, will issue a new and complete catalogue for the trade about January 15, which will be sent to all dealers on application. Mr. Swartchild reports a largely increased demand for his material and tools of late, and a large sale for his improved work bench, which is highly commended by all who have used it. His catalogues contain lists and illustrations of everything required by watchmakers, and constitutes a reference book of great value to all workmen.

Attention is called to the advertisement in this issue of Messrs. Fowler Bros., manufacturers of the English crape stone jewelry, which is already well known and popularly received by the retail trade of the country in mourning goods. As the name implies, this jewelry presents a surface simulating that universal symbol of deep mourning, fine English crape, in hue, finish and sheen, and is sold on crape bordered cards. This jewelry is made in onyx and jet, and is susceptible of elaboration in pattern and by the association of pearls. It presents several grades in quality thereby affording a popular grade in prices.

Mr. Samuel M. Miller, of the firm of Phelps & Miller, of San Francisco, died recently in that city after a brief illness. He was forty years of age and leaves a wife and one daughter. Mr. Miller was born in this city, and was formerly in the plated ware business with his father and brother in Maiden Lane. Eight years ago he removed to San Francisco where his firm became the representatives of a number of prominent Eastern houses. He was a courteous, pleasant gentleman, popular in the trade and universally liked for his business ability and his integrity.

The week before Christmas was one of extraordinary activity among the retail dealers in this city, and, as a consequence, the jobbers were kept busy filling orders. There was evident a better feeling among Christmas buyers, for they were more liberal in dispensing their money, and bought freely of the many attractive novelties offered them by the trade. Reports from the retail trade indicate that their sales this year were nearly if not quite fifty per cent. larger than they were last year during the corresponding Christmas week. Although driven with business, members of the trade wore smiling countenances, that betokened their satisfaction with the holiday "boom." Let us hope that it is but a precursor to better times for the coming year.

The movement to make Saturday a half holiday permanently in all branches of trade is being vigorously pushed, and is meeting with much encouragement. A committee of prominent business men was appointed to further the object, and they have enlisted the co-operation of most of the clergymen of the city. In a circular addressed to the business public the committee say: "The committee feel assured that a cause which has the bettering of the condition of working people as its object, and is supported by the unanimous voice of the church and of the press, will meet with a cordial reception from a generous public, and will become an institution which will do much to promote the social, physical, and moral welfare of that large class of our people who are obliged to earn their living by working for others."

An unknown and desperate burglar recently robbed Alexander Allen's jewelry store, at Sallsburg, Pa., successfully eluded the pursuit of fifty people by the aid of a pistol, fought off an officer, and was drowned by the latter after a desperate struggle in the waters of the Conemaugh. The burglar entered the store by forcing a back door, and succeeded in carrying off about fifty watches and some jewelry. Mr. Allen soon missed his goods, and calling on his neighbors they started in pursuit. Catching sight of the thief, he turned on his pursuers, fired several shots at them, and disappeared in the woods. Next morning Constable Jones saw the man, and gave chase. The burglar fired several shots at him and then plunged into the river. Jones went after him, and a desperate struggle ensued, when the officer, finding he could not get his prisoner ashore alive, held his head under water till he was dead. No clue to the identity of the dead man could be found. Some of the stolen watches were subsequently found concealed in a barn.

The annual meeting of the Jewelers' League will be held at Masonic Hall, Sixth avenue and Twenty-third street, New York City, on Tuesday evening, January 19th, 1886. There will be the reports of the regular committees of the League and of its officers, the annual election of officers, and other matters which should interest alike every member of the League. Amendments to the constitution have been proposed, whereby, if approved, the limit of age for new members will be *forty* instead of *forty-five*. The Secretary's salary to be fixed at \$3,500 per annum. A plan is also proposed whereby members may vote by proxy. Propositions, also, to enlarge the Executive Committee to eight members. To assess each member one dollar each quarter of the year, for the purpose of increasing the contingent fund. To assess all new members upon the following basis: From 21 to 30 years of age, \$2.50 at each assessment; 30 to 35 years of age, \$3 at each assessment; 35 to 40 years of age, \$3.50 at each assessment; 40 to 45 years of age, \$4.00 at each assessment.

We acknowledge the receipt of a very handsome calendar from H. Muhr's Sons, of Philadelphia. It contains portraits of the three sons who now carry on the business founded by their father, and also an illustration of their Philadelphia factory. The card is an elegant specimen of the lithographic art, is tasteful as to drawing and color, and notable for the absence of gaudiness which usually destroys the beauty of lithographic work. We have also received a handsome calendar from Messrs. H. F. Barrows & Co., makers of fine rolled plate chain. The monthly calendars are mounted on rollers top and bottom, each one being illustrated by a seasonable picture. By turning the rollers, the month desired is brought to the front. It is very convenient for office use. Mr. O. E. Hausburg, sole agent for the Standard Watchman's Clock, has also issued a neat calendar, each leaf of which contains a timely admonition as to the necessity for using watchmen's clocks, if it is desirable to keep the watchman awake. The gentlemen named will please accept our thanks for these gentle reminders of the flight of time.

The 36-inch object-glass of the Lick telescope was to have been tested January 1st, according to announcement. H. E. Matthews, Secretary of the Lick Trust, has received the plan of the dome, made by Professor Bull, of the University of Wisconsin. The interior of the dome is to be seventy feet in diameter, and the upper part of the structure is to be of iron. Bricks and other material have been received at Mount Hamilton, but no work will be done on the dome until the roads are opened in the Spring. All the workmen have been discharged. Except the dome for the large equatorial, all the buildings of the Observatory proper are now completed. A suitable dwelling for the Superintendent has recently been erected. All the principal instruments of the Observatory, except the large object-glass, have been inspected and mounted, so that observations can be at once commenced. Nearly all the minor apparatus will be in place before April 1st, when the large object-glass will receive a practical test on the grounds. An extensive astronomical library is in course of formation. It is hoped that the Observatory will be in working order next Fall.

E. N. Marks' jewelry store, at No. 103 Adams street, Chicago, was robbed by burglars on the night of December 7. They forced open a vault in the rear of the store and stole jewelry valued at \$8,000. Two men were arrested for the robbery by the Chicago officers, who learned that the jewelry had been shipped to New York in a trunk, and so advised Inspector Byrnes. All the description that could be given of the trunk was, however, that it was tied about with a rope, and on this meager information the detectives went to work. Detective Sergeants Frink and Maguire searched all the baggage rooms in all the depots, and at night found in the West Shore depot, at the foot of West Forty-second street, an unclaimed zinc trunk, tied about with a rope. It had come from Chicago, and no one had called for it. It was opened in the depot, with the consent of the railroad officials. A soap box, with clothes packed about it, was found in the trunk, and in the box were 34 gold watches, 55 watches of silver, 44 gold chains, 38 diamond rings, 13 diamond pins, 17 diamond studs, 12 pairs of diamond ear rings, 2 diamond crosses, 3 diamond collar buttons, a pair of diamond sleeve buttons, a diamond anchor pin, 8 gold bracelets, 7 scarf pins, and a lot of jewelry that has been broken up and melted. These goods were subsequently identified as the articles stolen from E. N. Marks. About the same time some persons were arrested in this city for receiving stolen goods from Boston and elsewhere, the proceeds of robberies, and a great variety of articles was recovered. It is supposed that the trunk from Chicago was intended for them, and that they were acting as receivers for different gangs of burglars and thieves, operating in various sections of the country.









