

DIAMOND
INFORMATION

ETL 028491

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ROUGH DIAMONDS.

About 6,000,000 carats of diamonds were mined during the year 1911. Of these 6,000,000 carats mined, only 5%, or 300,000 carats, are capable of being cut into perfect (flawless) diamonds of good to fine color that will, if properly cut, weigh $\frac{1}{2}$ carat or more, and, as 60% is lost in the cutting, there remains but 120,000 carats when the stones are polished with which to supply the whole world.

The American people buy as many diamonds as all the rest of the world together do, and in money value twice as much, for America demands only the better grades—that is, the finest colors and flawless or slightly flawed stones. Browns and yellows or badly flawed diamonds, although much less in price, do not find a ready sale.

Rough diamonds pay no duty, while polished diamonds pay a duty of 10%; consequently, it is more profitable to cut diamonds, in the United States, that weigh one carat and heavier, producing polished diamonds weighing $\frac{3}{8}$ carat and larger, of good to very fine quality, the money paid for labor being a small amount compared to the cost of the rough, although labor is paid nearly twice as much as it receives in Europe, hence the establishing here of the diamond polishing industry.

The syndicate that controls the output of the De Beers Consolidated Mines allot to American cutters certain classes of the different grades of the more perfect rough in sizes weighing one carat and heavier, not forcing them to take the smaller sizes that cannot be polished here to advantage on account of the higher cost of labor. In the "spotted or imperfect" classification, buyers must take with the larger stones all rough that comes, and as this includes many carats of rough that weigh $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$ carat, and even smaller per stone, which if polished here would cost more than it costs to produce in Europe, the American cutter has to confine himself to this rough that is allotted him by the Syndicate.

Could the American cutter buy the "spotted or imperfect" rough in sizes ranging from one carat and heavier, without having to take the smaller stones, he doubtless could produce them for considerably less than they can be imported for.

The Syndicate's other assortments of rough called "irregulars," "flats," "knarts" and "cleavage," are inferior goods, suited only for the foreign cutter.

Regarding other diamond mines of any importance in the world, the largest is the Premier. Practically all the diamonds from this mine are cut in Europe, as they average poor quality and small.

The small output of the other mines, the Robert Victor, Koffyfontein, Voorspoed Diamond Mines, etc., and the River Diggings and Brazilian diamonds, contain some good to fine stones, but comparatively few in number. Some of these stones at times reach the American cutter.

Of the German South Africa Diggings, the stones they find are so small that they cut diamonds averaging less than one-tenth carat in weight; they are all cut abroad.

DIAMOND CUTTING IN AMERICA.

There are in the United States but ten concerns of any importance that cut diamonds. These ten firms cut 98% of all the diamonds cut in this country.

These ten diamond-cutting firms are the only diamond-cutting establishments in America that can buy the fine grades of rough diamonds direct from the Rough Diamond Syndicate of London, who sell the entire output of the De Beers Consolidated Diamond Mines of South Africa. The Syndicate will not sell these grades to any one in America but these firms.

The De Beers Consolidated Diamond Mines and controlled mines are:

De Beers
Bulfontein
Wesselton

Kimberley
Dutoitspan
Jagersfontein

The bulk of the rough diamonds from which good to fine stones are now cut in the whole world, come from the De Beers Consolidated Diamond Mines, and, as only the better class of diamond are cut in America, hence the most of the rough that is polished in America comes from the Syndicate, which they sell to the American cutter in lots having a value of \$100,000.00 to \$150,000.00 for spot cash.

These rough stones come in free of duty, while cut diamonds pay a duty of 10 per cent.

Until lately these American lots of rough were almost all perfect stones, but now they are putting in a larger percentage of imperfect stones, though charging the same price as they did before, for the lots of perfect stones, thus increasing the cost of the diamond by lowering the grading, instead of an outright raise in prices.

These ten cutting firms produce somewhat over \$10,000,000.00 worth of cut diamonds a year.

A diamond cutting plant that buys and

polishes \$1,000,000.00 worth of rough a year would have a force of about:

- 1 foreman
 - 1 assistant foreman
 - 1 cleaver
 - 2 sawmen
 - 3 cutters
 - 40 polishers
 - 5 versters
 - 2 scourers

- 55 Total force of men.

Besides these ten important diamond cutting establishments, there are also several little shops, employing very few workmen, generally run by a practical polisher, that do repair work on diamonds and polish a little rough whenever they succeed in buying any.

All these little shops together do not polish more than 2 to 3 per cent of the diamonds polished in America.

THE PROCESS OF CUTTING DIAMONDS.

When rough diamonds are received at the cutting works they are carefully examined by the "foreman," who directs all operations.

A rough diamond is an octahedral or 8-sided crystal, never perfect in shape, often very deformed or distorted.

As the stones vary in shape, each one must be separately considered with regard to getting the most possible weight out of it.

Some stones are so shaped that a little piece may be sawed or cleaved off without reducing the size of the polished diamond that may be made out of it. Other stones are so thick or so elongated that it is necessary to make two or more stones out of them by cleaving or sawing.

The stone is marked by the foreman with ink when it goes to the sawman or the cleaver, so he may know just where it is to be divided, or, if these preliminary operations are not necessary it goes to the cutter with an ink mark on it, that he may know just what part of the stone will make the table and culet, and cut the stone accordingly.



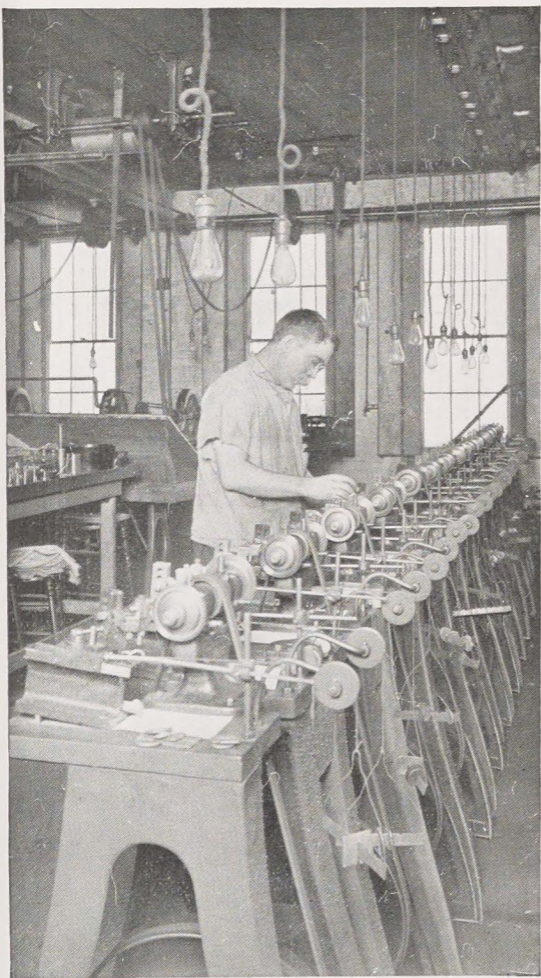
The Cleaver in the Act of Striking the Knife.

“Cleaving” is splitting the stone on the lines of the grain of the diamond. This grain runs in four directions, paralleling

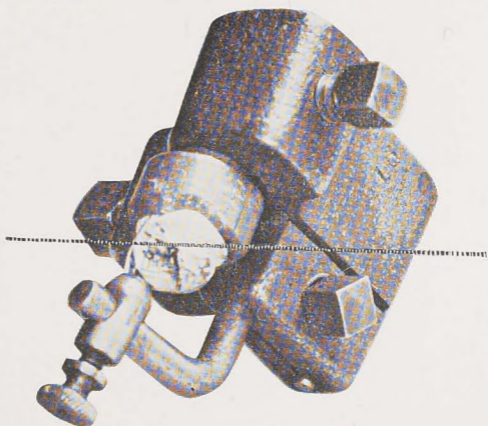
the faces of the crystallization, and is done by scratching a groove along the surface of the stone, with a sharp point of another diamond, inserting in the groove a sharp knife blade and striking the back of the blade a sharp blow with a light hammer.

Diamonds may be cleaved only along the line of the grain of the stone, and it is often advantageous to divide it in other directions; on such occasions a saw is used.

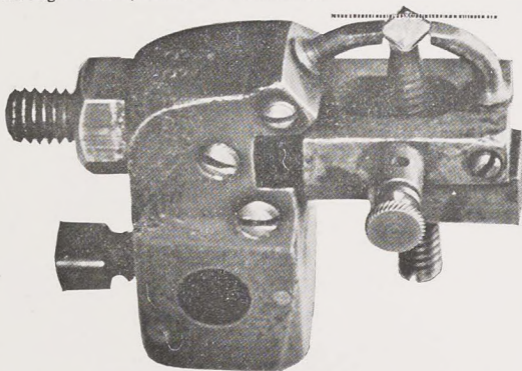
This saw is a disc of phosphor bronze, 4 inches in diameter and $\frac{4}{1000}$ of an inch thick; by impregnating the edge of the disc with diamond dust and rotating it at a speed of 4000 revolutions per minute, it will saw through a diamond that is $\frac{1}{4}$ inch across in seven or eight hours.



*The saw man is standing before his gang of saws.
American invention.*



Holding dop used in saw room for sawing diamond through center, American invention.



Holding dop used in saw room to saw top off a diamond, American invention.



Diamond cemented on spindle for cutting.

The stones after being divided by cleaving or sawing are examined and marked by the foreman with ink for the next operation and goes to the cutter. He cements it on the end of a rotating spindle, and, holding another diamond against it, gradually wears away the corners until the stone becomes round. The fine dust or "powder" that results from this operation is carefully saved and used on the saws and on the polishing wheels.

The stone is now ready for the first operation of polishing or putting on the facets that so greatly increase its brilliancy.

First the table or top facet, then the culet or bottom facet, is laid on the stone; then the long facets that extend from the table and culet to the edge or "girdle" of



The Cutter at work. Lathe is American invention.

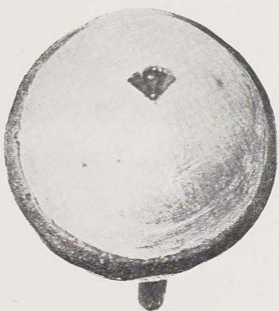
the stone go on, at an exact angle in their relation to the table and culet facets, and last the small facets.

This putting on the facets is done by men called "polishers," and is accomplished by putting the diamond in a holder and pressing it against a steel wheel, impregnated with diamond dust, that revolves laterally at a speed of 2500 revolutions per minute.

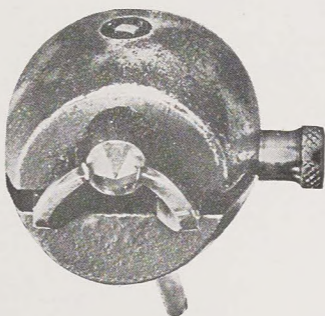
The polisher, using the old style dop after finishing each facet, passes the diamond, in its holder, to a man called a "versteller," whose duty it is to turn the diamond in the holder, the stone being turned for each facet, and there are 58 facets.

A "polisher," working on two stones at a time, can polish in a week six diamonds that weigh when finished one carat each.

"Scourers" are employed whose duty it is to keep the polishing wheels clean and turn off the ridges that the diamond, while being polished, cuts in the surface of the wheels.



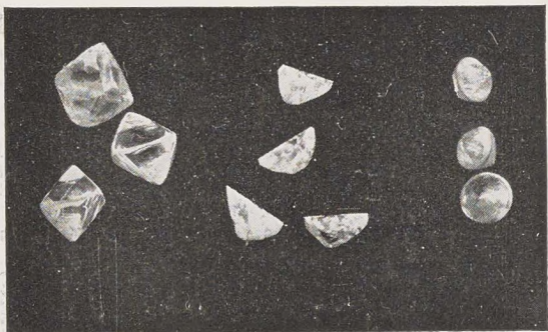
Old style dop for polishing.



*Patented holding dop for polishing.
American invention.*



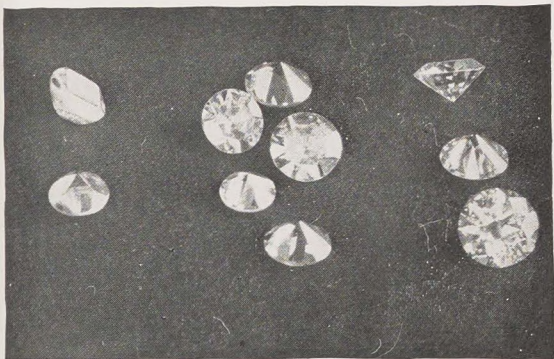
"Diamond running on a polishing wheel.



3 rough
diamonds.

2 rough
diamonds
sawed
in two
(4 pieces)

3 rough
diamonds
that have
been cut.



2 diamonds,
table and
first 4
facets
on top,
culet and
4 facets
on bottom.

5 diamonds,
8 facets on
top and
bottom.

3 diamonds,
all facets
on

