



THE FIELD DIAMOND CUTTING MACHINE.

to be driven by power, this is not found practicable, because the cutting, as already explained, is partly a matter of feeling as well as of sight.

Having been roughly shaped by cutting, and perhaps also by cleaving, the diamond has next to be set in alloy for polishing. A brass cup with a copper wire handle called a "dopp," is used for this purpose. An alloy of lead and pewter is used to fill it and is built up in acorn shape. When of the consistency of putty, like plumbers' solder when a joint is being wiped, the diamond is inserted in the apex. With a stick, or with the fingers, the hot metal is wiped away so as to give the right exposure.

After cooling it goes to the polisher. The wire stem of the "dopp" is fastened in the end of a wooden clamp. The operative in the upper central figure is seen holding one and examining the diamond in the "dopp." The clamp is next placed on the table steadied by a couple of pins secured thereto. A horizontal disk of iron cut or scratched in approximately radial grooves is mounted in the center of the table, and rotates at a speed of 20,000 to 25,000 revolutions per minute. The speed is so high and the motion so steady that the disks seem motionless. As the clamp is placed on the table, the diamond at its end rests upon the disk. The latter is charged with olive oil and diamond dust from the cutting boxes. After a few seconds the polisher removes the clamp and examines the stone. By pushing the cup he bends the wire one way or the other, so as to get a proper bearing. One or two trials are made. When all is right some lead weights are placed upon the clamp and it is left to itself. The polishing, which is really cutting to a considerable extent, now goes on, and lasts for a variable time, according to the work to be done.

The polisher becomes very expert in seeing what is going on by inspecting the diamond, as well as in detecting by the feel of the clamp how the diamond is resting on the disk. Even the bending of the wire of the dopp requires considerable skill.

The modern system of diamond cutting is said to have originated in 1456, with Louis Bergnen, who established a regular guild of diamond cutters at Bruges in 1470. Since then the

art gradually centered itself in Amsterdam, and now only is beginning to spread to other cities.—*Scientific American*.

POLISHING WOOD WITH CHARCOAL.

A method of polishing wood with charcoal, which is much used by French cabinet-makers, is thus described in a Paris technical journal:—

All the world knows of those articles of furniture of a beautiful dead-black color, with sharp, clear-cut edges and a smooth surface, the wood of which seems to have the density of ebony. Viewing them side by side with furniture rendered black by paint and varnish, the difference is so sensible that the considerable margin of price separating the two kinds explains itself.

The operations are much longer and more minute in this mode of charcoal polishing, which respects every detail in carving, while paint and varnish would clog up the holes and widen the ridges. In the first process they employ carefully selected woods, of a close and compact grain, then cover them with a coat of camphor dissolved in water, and almost immediately afterward with another coat, composed chiefly of sulphate of iron and nut-gall. The two compositions, in blending, penetrate the wood and give it an indelible tinge and render it impervious to the attacks of insects. When these two coats are dry, they rub the surface of the wood at first with a very hard brush of couch-grass (*chien dent*), and then with charcoal of substances as light and friable as possible, because if a single hard grain remained in the charcoal, this alone would scratch the surface, which they wish to render perfectly smooth. The flat parts are rubbed with natural stick charcoal, and the indented portions and crevices with charcoal powder. Alternately with the charcoal, the workman also rubs his piece of furniture with flannel soaked in linseed oil and the essence of turpentine. These pouncings repeated several times cause the charcoal powder and the oil to penetrate the wood, giving the article of furniture a beautiful color, and a perfect polish, which has none of the flaws of ordinary varnish.