DIAMOND CUTTING IN AMSTERDAM.

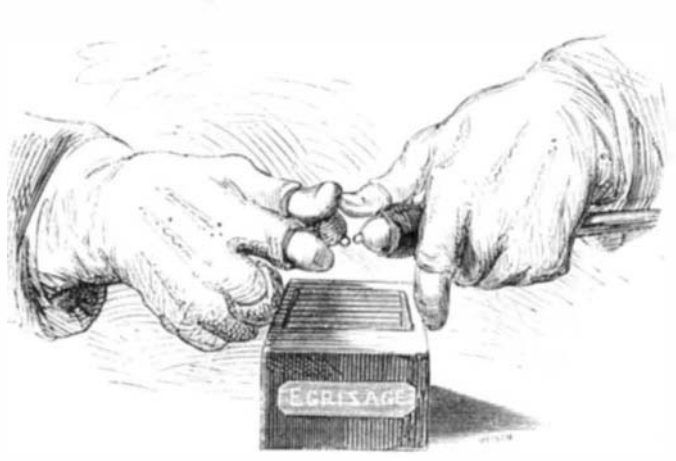
Our readers will recollect an interesting communication from the pen of Mr. J. E. Emerson, published on page 390, Vol. XX., of the SCIENTIFIC AMERICAN, on diamonds and diamond cutting in Amsterdam, Holland, a city famed for this industry, and in which probably more precious stones are cut and polished than in all the rest of the world put together.

Our engravings herewith published illustrate the various processes employed.

FIG. 1

FIG. 2

FIG. 3.



MODE OF CUTTING DIAMONDS.

It must be borne in mind that in the treatment of the most costly substance known to man that only the most refined skill can be tolerated. The lapidaries of Amsterdam are men who undergo a long and severe apprenticeship in the cutting of inferior stones before they are intrusted with valuable gems.

The diamond, like all other crystals, has its lines of cleavage, in which it can be readily split, the process being performed as shown in Fig. 1.

The stone is first examined to determine whether it possesses any flaws or defects, the presence or absence of which will determine the character of the subsequent work. Stones are often divided on account of such defects, which otherwise would be worked entire.

The examination is made by either steeping the diamonds in Canada balsam, oil of sassafras, or anise-seed oil, and being turned around in one or other of these fluids, the changed refraction of light renders the flaws apparent; or the stone may be heated and thrown into water, when it cracks to pieces where the flaws exist.

If, on account of defects or from other cause, it be decided to split the diamond, it is furrowed on the proper plane by a sharp-edged diamond, and the cleaving tool applied to it, as shown in Fig. 1, the diamond being held in position by a strong cement, which fastens it to a block of wood. In regard to this operation Feuchtwanger remarks that "it is made a great mystery." The splitting instrument is of steel and it is operated by striking it upon the back, as shown.

Fig. 2 shows the "Dopp," as it is called, a copper cup with a stem of stout copper wire, in which is fixed a ball of plumber's solder. The upper part of this ball is softened by heat, and the diamond is imbedded therein while undergoing the process of polishing, its position being changed as often as required, by fusing the solder.

Previous to the polishing it is cut into the proper form by hand, as shown in Fig. 3. In this operation the diamond is cemented to the end of a stout stick, about a foot long, leaving only such part projecting as will, when removed, leave the desired facet. The instrument employed for cutting is another diamond fixed in a similar stick, and having one of its solid angles projecting. Feuchtwanger says:

"In order to collect the powder and shivers that are detached during the process, the cutting is performed over a strong box, four or five inches square, furnished with a false bottom perforated with excessively minute holes, in order to sift, as it were, the dust from the shivers; and also with two upright iron pegs, fixed on the sides, for the workman to support and steady his fingers against, while with a short repeated stroke, somewhat between scratching and cutting, he is splitting off, or more laboriously wearing away the diamond in that part where the facet is to be placed. This being done, the cement is softened by warming it, and the position of the diamond is changed, in order to bring a fresh part under the action of the cutting diamond. When, in this slow laborious way, all the facets have been placed upon the surface of the diamond, the cutting is completed. The stone, if examined by a moderate magnifier, now presents ragged, rough edges; and a broken, foliated surface, with a glistening luster on those facets that are nearly in the direction of the natural laminæ, and on the other facets a more even surface, but of a dull, opaque, grayish-white color."

The next operation is that of polishing, shown in Fig 4. The diamond being fixed in the dopp, as above described, is held upon the polishing mill, a simple circular cast-iron plate mounted on an upright spindle, as shown, driven by means of a larger wheel and a belt. The large wheel is usually turned by an assistant. The upper surface of the plate is covered with radial lines or scratches formed by rubbing it with a fine-grained stone. These lines aid in holding the polishing material, a mixture of diamond dust and oil (oil of brick). The stem of the dopp is held by pincers or "tongs" of wood, as shown, weighted to give the proper degree of pressure. The "tongs" have two legs at the end remote from the wheel, which rest upon the table, and pegs of iron serve to steady them during the operation. Sometimes three or four diamonds are simultaneously polished. The completion of a single facet often occupies some hours.

The brief description we have thus given will give a general idea of the processes of splitting, cutting, and polishing diamonds, but an adequate idea of the patience and skill required to do the work in a superior manner, is doubtless only to be gained by personal inspection.

FIG. 4

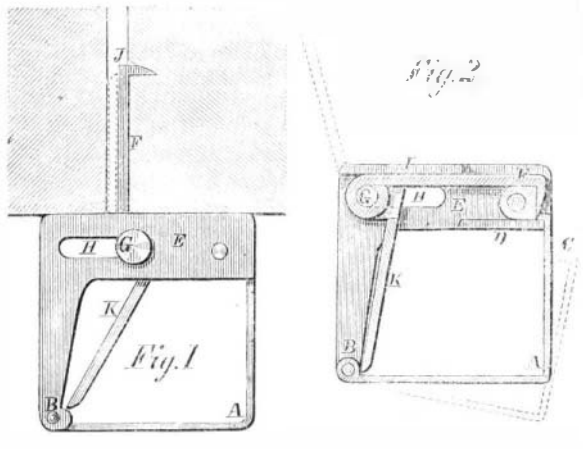
MELENDY'S IMPROVED COMBINED KEY RING AND DOOR FASTENER WITH COMPENSATOR.

Our engravings illustrate one of those simple yet convenient devices which often secure great popularity, while at the same time their parts can be made by machinery at a rapid rate and very cheap, so that they afford a large profit to the manufacturer.

Punching and finishing by polishing comprise nearly all the work on this device, except putting it together.

Fig. 1 shows the device as used for a door fastener, and Fig. 2 shows it as a key ring.

To adjust the parts, as shown in Fig. 1, for a door fastener, the spring bar, A, which is bent at right angles, and pivoted at B, as shown in both figures, and which is provided with a



lip, or catch, C, as shown in the dotted outline, Fig 2, is sprung off from ribs or ledges, D, Fig. 2, formed on the inner sides of the side pieces, E. This allows it to turn on the pivot, B, and drop into the position shown in the dotted outline in Fig. 2.

This being done, the hook, F, which, when in the position shown in Fig. 2, cannot turn on its pivot, G, Figs. 1 and 2, may be thrust along, its pivot sliding on the slots, H, formed in the side pieces, E, till the pivot, G, reaches the end of the slots, H. This releases it from its engagement under ledges, I, also formed on the inner sides of the side pieces, E, and allows it to be opened on its pivot, G, into the position shown in Fig. 1. While in this position, its pivot, G, may be slid along in the slot, H, to its original position. Then the hook, F, being placed between the edge of a door and the jamb, so that the jaw, J, is towards the jamb, closing the door will drive the jaw into the wood. The body of the apparatus being then slipped along on the pivot, G, into the position shown in Fig. 1, it abuts against the door, so that the latter cannot be opened by any one outside, except by tearing out the wood of the jamb.

Should the door have shrunk, so that it does not press sufficiently against the hook, F, to force it into the wood, the compensator, K, also pivoted on G, is turned up to the back of F, as shown by the dotted outline in Fig. 1, so as to fill up the space left by shrinkage.

When the bent spring-arm, A, is opened, as shown in Fig 2, and in the manner above described, keys may be slipped upon it; the arm clasped again will hold them securely.

This device has been made the subject of two patents, dated respectively, May 17, and July 19, 1870, both issued to B. H. Melendy, 36 Walnut Street, Manchester, N. H., through the Scientific American Patent Agency. For further information, communications may be addressed to him as above.

Electro-Typographic Machine.

A new electro-typographic machine, the invention of M. Henri Fontaine, a French barrister, is now at work in one of the public offices in Paris. The object of this machine is to print off with economy and rapidity the quantity of short papers required in law courts, public and private offices, or commercial houses, now executed by the longer and more expensive processes of printing or autography. The machine of M. Fontaine, like the electric telegraph, is on the principle of substituting fixed for movable types, one type only being employed for the same letter; thus dispensing with the ponderous and bulky movable types of the printer. Steel types, representing the different characters used in printing (capitals, small letters, italics, etc.), are ranged around two horizontal disks, placed one over the other. Above these is another metallic circle divided into notches corresponding with the type below. By a very simple machine, as the handle or bar in the center presses against the notch representing the letter required, an electric shock lowers the type upon a sheet of paper rolled around a cylinder placed beneath, prints the letter, and again returns to its place. The operation is so rapidly performed that a hundred letters may be easily printed in a minute. When completed, the paper is transferred to the lithographic stone to be worked off. The great recommendation of M. Fontaine's machine is its great simplicity, the ease and rapidity with which it is worked, its convenient size (about three feet by two), and its moderate cost. The typography is remarkably clear and distinct, from the employment of finely engraved steel types.

JOSH BILLINGS thus speaks of a new agricultural implement, to which the attention of farmers is invited: "John Rogers' revolving, expanding, uncerimonious, self-adjusting, self-contrakting, self-sharpening, self-greasing, and self-righteous hoss-rake iz now and forever offered to a generous publik. Theze rakes are az eazy to keep in repair az a hitching post, and will rake up a paper of pins sowed broad kast in a ten aker lot of wheat stubble. Theze rakes kan be used in winter for a hen roost, or be sawed up in stove wood for the kitchen fire. No farmer of good moral karakter should be without one, even if he has to steal one."

FAIR OF THE SOUTHWESTERN VIRGINIA AGRICULTURAL SOCIETY.—The second exhibition of this association will be held on their fair grounds near Wytheville, Virginia, commencing on the 27th of September, 1870, and continuing four days. A large list of premiums is offered. The secretary of the society is Alex. S. Mathews.

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