

(Model.)

A. HESSELS.

Machine for Polishing Diamonds.

No. 231,577.

Patented Aug. 24, 1880.

Fig: 1.

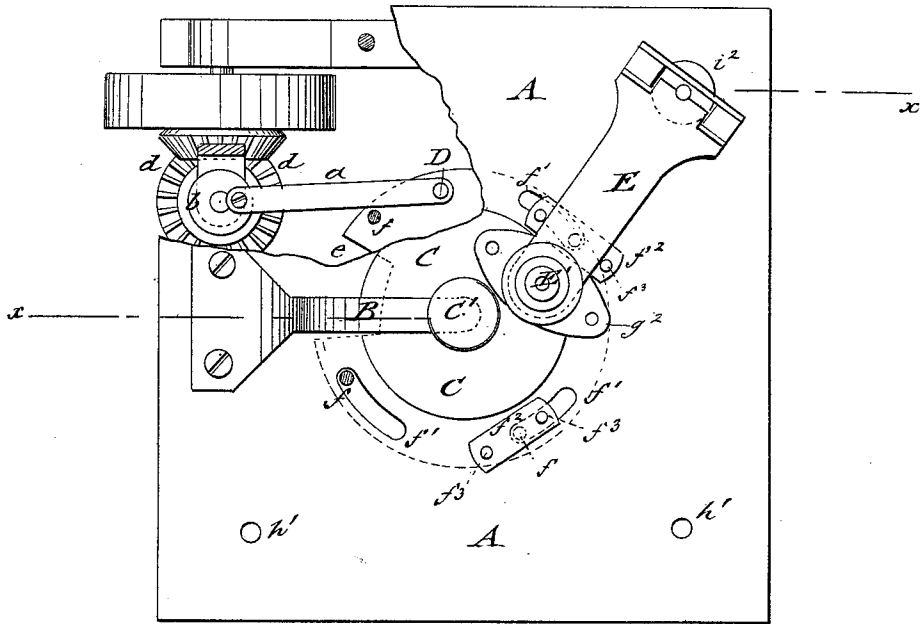


Fig: 4.

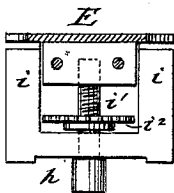
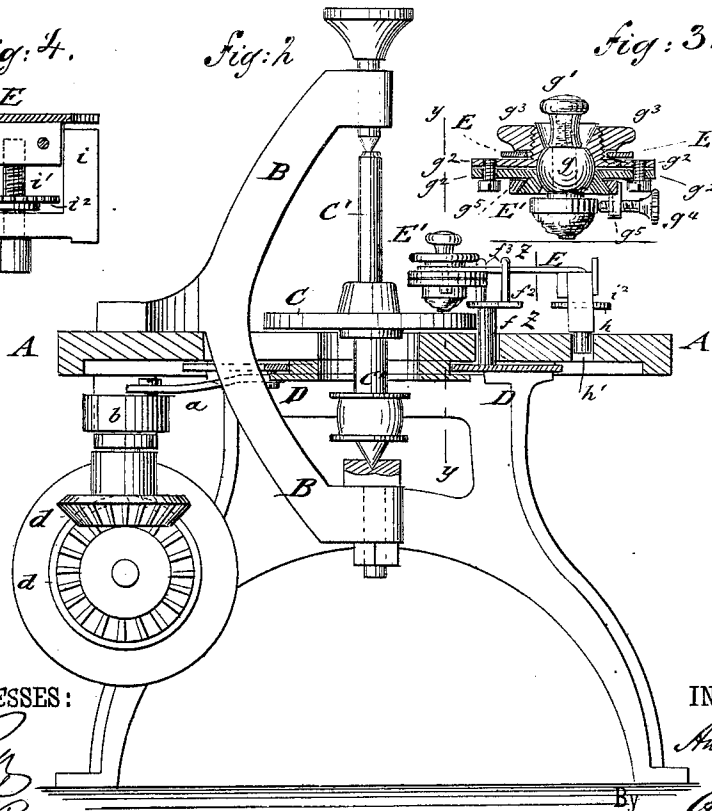


Fig: 2.

Fig: 3.



WITNESSES:

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ANTHONY HESSELS, OF NEW YORK, N. Y.

MACHINE FOR POLISHING DIAMONDS.

SPECIFICATION forming part of Letters Patent No. 231,577, dated August 24, 1880.

Application filed April 14, 1880. (Model.)

To all whom it may concern:

Be it known that I, ANTHONY HESSELS, of the city, county, and State of New York, have invented certain new and useful Improvements in Machines for Polishing Diamonds, of which the following is a specification.

In a former patent granted to me, which is numbered 216,955, and dated July 1, 1879, I have described an improved machine for cutting diamonds, so as to dispense with the expensive hand labor and produce a more accurate cutting.

The object of this invention is designed to supplement my former invention, and to furnish a machine for polishing the facets of the diamonds, accomplishing this process in a more perfect manner, at a considerable saving in time, and without requiring skilled hands.

Heretofore diamonds were polished by cementing them into dops, which were either applied to the ends of annealed copper wire or to the ends of weighted arms. The facet to be polished was left uncovered, and was held against a rapidly-revolving horizontal disk, the surface of which was covered with diamond-dust and oil. The proper polishing of the facet was left, in a great measure, to the skill and judgment of the workman.

This invention is designed to employ in similar manner as in my diamond-cutting machine mechanical means entirely for polishing the facets, so as to dispense with skilled labor; and the invention consists of a revolving polishing-disk, in combination with one or more dops, to which reciprocating motion is imparted by suitable mechanism. The dops are applied to the ends of weighted arms by means of a ball-and-socket joint and clamping-nuts, and set to an exact position by a set-screw applied to an exterior collar of the ball-and-socket joint. The rear part of the weighted arm is vertically adjustable by suitable guides and a screw-post.

In the accompanying drawings, Figure 1 represents a top view of my improved machine for polishing diamonds, a part of the table being broken away to show the driving mechanism beneath. Fig. 2 is a vertical longitudinal section of the same on line *x x*, Fig. 1; and Figs. 3 and 4 are detail vertical transverse sections on lines *y y* and *z z*, Fig. 2, of the dop-

holding ball-and-socket joint and of its lever-arm adjusting mechanism.

Similar letters of reference indicate corresponding parts.

A in the drawings represents the table of my improved machine for polishing diamonds. A vertical central standard, B, is firmly attached to the table and arranged to extend through a recess above and below the table, supporting, in conical steps or bearings, the spindle C' of a horizontal disk, C. The disk C is rapidly revolved above the table by a belt and pulley or other power-transmitting mechanism. At the under side of the table is guided, by means of an annular flange, a ring-shaped plate, D, to which rotary reciprocating motion is imparted by a crank-rod, *a*, and crank *b*, the vertical shaft of the latter turning in suitable bearings of the supporting-table, and being revolved by a bevel-gearing, *d*, actuated by a pulley-and-belt transmission from the driving-shaft. The rotary reciprocating ring-plate D is provided with a recess, *e*, of sufficient size to admit the motion of the plate D without coming in contact with the standard B. The reciprocating plate D carries fixed upright posts *f*, which extend upward through slots *f'* of the table, and carry at their upper ends axially-turning horizontal plates *f''*, having two vertical studs, *f'''*, each, which studs form with the plate a kind of fork for supporting the dop-holding lever-arm E. A suitable number of such supporting-forks may be arranged according to the size of the disk, so that a number of diamonds may be applied at the same time to the polishing-disk.

The dop-holding arm E carries at its front end a ball-and-socket joint, by which the diamond-carrying dop E' may be set to any desired angle or position. The dop E' is clamped tightly to the ball *g* of the joint by a nut, *g'*, which screws over the threaded shank end of the dop. When the dop and ball are adjusted to the position required by the facet the ball is firmly clamped between its socket-plates *g''* by a clamping-nut, *g'''*, which screws over the exteriorly-threaded part of the upper socket-plate *g''*. The final adjustment is given to the dop E' by a horizontal set-screw, *g''''*, which turns in a lug of a ring, *g'''''*, that is retained on

an outwardly-flaring collar at the under side of the lower socket-plate of the joint, the inner face of the ring g' having a corresponding flare to that of the collar, so as to be rotated thereon. When the dop has been placed in position and is firmly clamped by the nut the front part of the lever-arm E is placed into the fork-shaped support $f' f^2$. The rear part of the lever-arm E is then set by a bottom pin, h , into a socket, h' , of the table, guided along vertical side rails, i , and raised by a screw, i' , and rimmed nut i^2 , so that the height of the lever-arm above the table is readily adjusted according to the size of the diamond cemented to the dop for being polished. As the lever-arm has to be horizontal, or nearly so, when polishing a facet, it has to be raised at the rear part for a larger and lowered for a shorter diamond. The final adjustment of the facet is given by the side set-screw, g^4 , which is set by means of the ring g' into the proper relative position on the collar of the dop, as shown in Fig. 3, so that the facet is brought into full contact with the disk and exposed evenly over its entire surface to the polishing action of the same.

The disk C is covered in the usual manner with oil and diamond-dust and then revolved. The lever-arms are inserted by their rear pins into the socket-holes of the table and supported at their front parts by the reciprocating forks, the latter imparting reciprocating motion to the dops on the revolving disk.

The simultaneous motion of the disk and dops produces a uniform polishing action upon the facets, which are, however, not acted upon by the polishing medium when the diamond is not set with the grain in the direction of motion. This, however, is readily accomplished by the axial motion of the ball-and-socket joint on loosening the clamping-nut g^3 . The final adjustment of the facet is again given by the set-screw and the axially-turning ring.

By the use of the machine even an unskilled hand may soon be able to attend to the polishing of diamonds, which are turned out in a more perfect manner than it could be done heretofore by the best diamond-polisher.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a diamond-polishing machine, the combination of a revolving horizontal polishing-disk with one or more dop-holders, which are pivotally applied at their rear parts to the supporting-table and at their front part to forked and reciprocating supports, substantially as shown and described.

2. In a diamond-polishing machine, the combination of the dop holders E with forked and axially-turning supports $f^2 f^3$ and with mechanism for reciprocating the latter, as specified.

3. In a diamond-polishing-machine, a dop-holding lever-arm provided with a ball-and-socket mechanism at the front part and a mechanism for vertical adjustment at the rear part, as described.

4. In a diamond-polishing machine, the combination of a dop-holder having a ball-and-socket mechanism and an adjustable ring and set-screw at the under side to give final adjustment to the dop, substantially as described.

5. In a diamond-polishing machine, the combination of the lever-arm E and dop E' with a ball-and-socket joint and separate clamping-screws g' g^3 for the dop and socket-plates, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 7th day of April, 1880.

ANTHONY HESSELS.

Witnesses:

PAUL GOEPEL,
CARL KARP.