

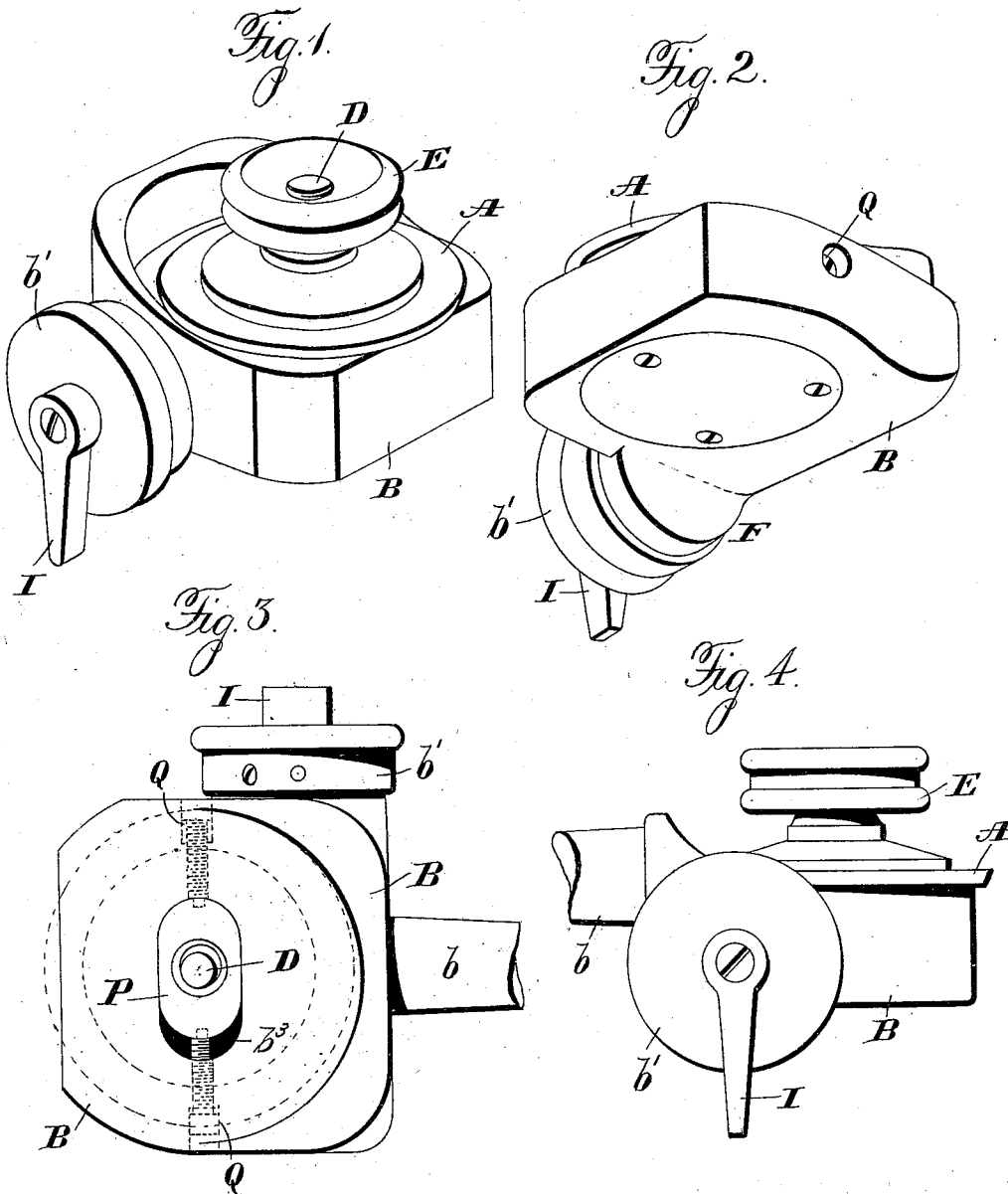
(No Model.)

3 Sheets—Sheet 1.

C. A. SMITH.
REVOLVING CUTTER.

No. 555,468.

Patented Feb. 25, 1896.



Witnesses:

Jas E. Hutchinson.
Chas. Williamson.

Inventor.

Curtis A. Smith, by
Prindle and Russell, his Attys

(No Model.)

3 Sheets—Sheet 2.

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Fig. 5.

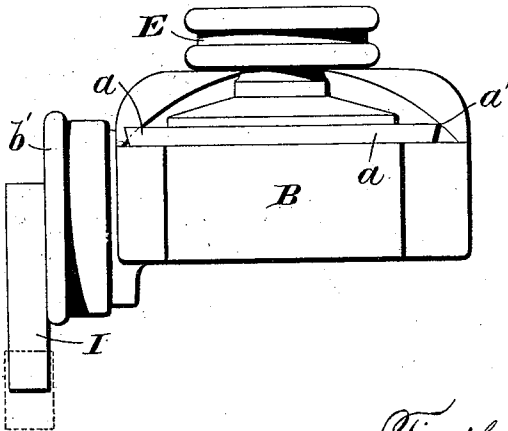


Fig. 6.

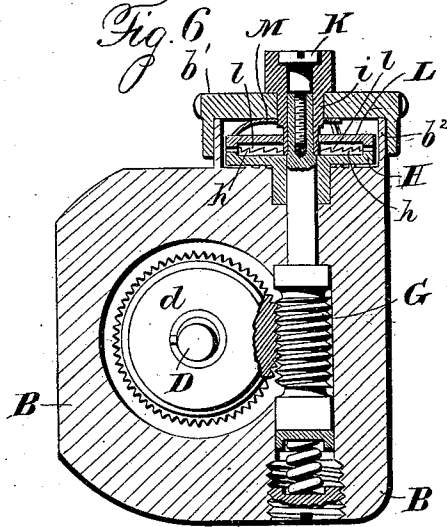
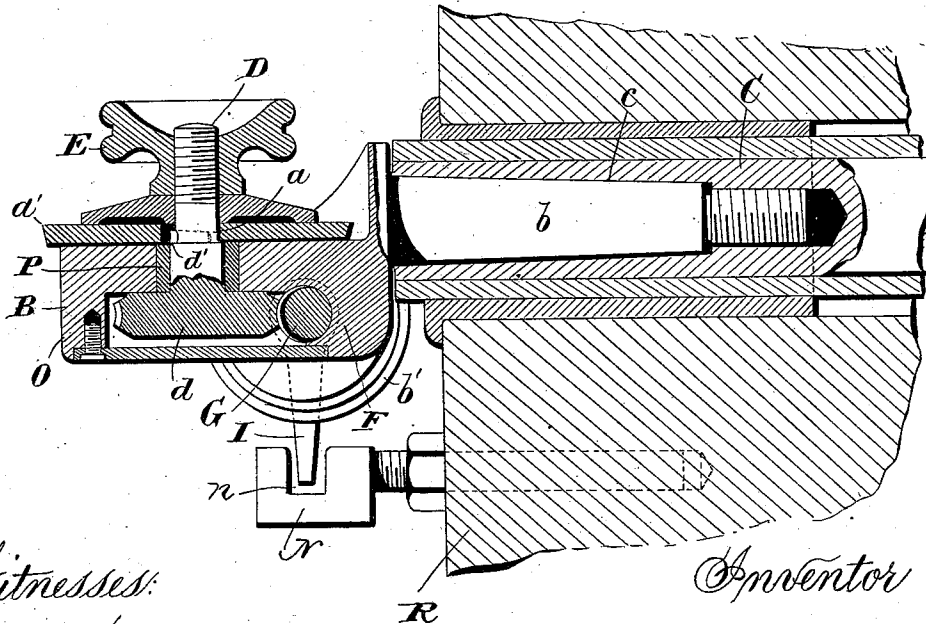


Fig. 7.



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(No Model.)

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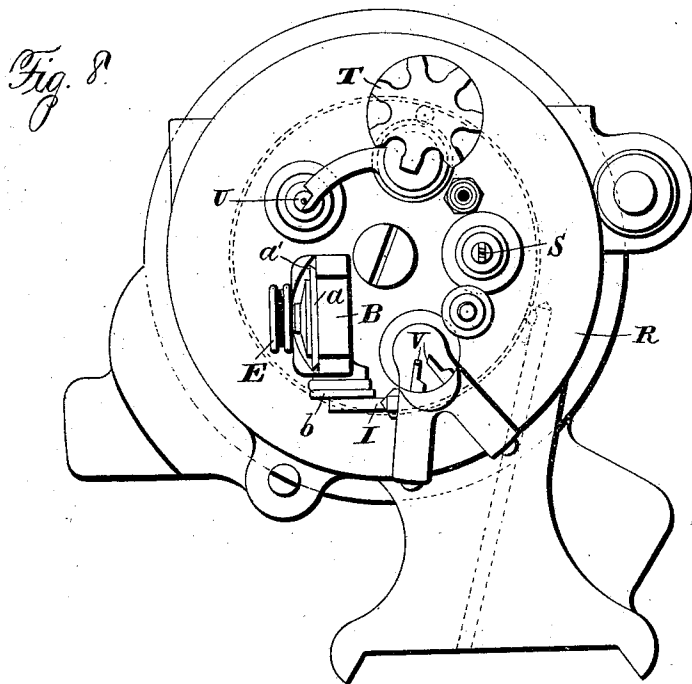
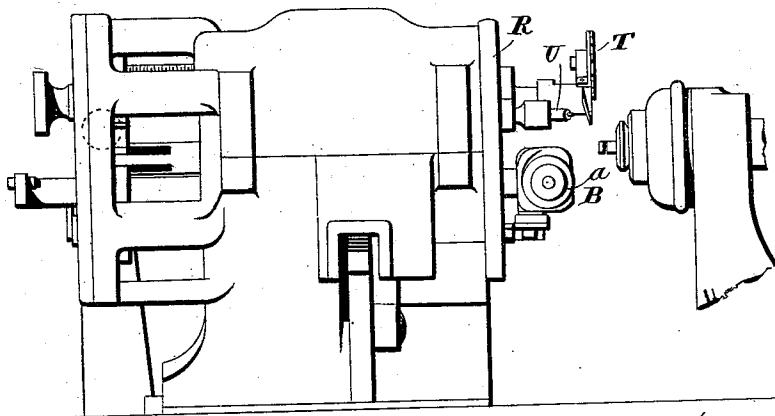


Fig. 9.



Witnesses:

Jas. C. Hutchinson.
Chas. J. Williamson.

Inventor.

Curtis A. Smith, by
Charles H. Russell, his Attys.

UNITED STATES PATENT OFFICE.

CURTIS A. SMITH, OF ELGIN, ASSIGNOR TO THE ELGIN NATIONAL WATCH COMPANY, OF CHICAGO, ILLINOIS.

REVOLVING CUTTER.

SPECIFICATION forming part of Letters Patent No. 555,468, dated February 25, 1896.

Application filed October 13, 1893. Serial No. 488,084. (No model.)

To all whom it may concern:

Be it known that I, CURTIS A. SMITH, of Elgin, in the county of Kane, and in the State of Illinois, have invented certain new and useful Improvements in Revolving Cutters; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view, from the upper side, of my tool detached from its spindle. Fig. 2 is a like view of the same from the lower side. Fig. 3 is a plan view of the tool from the upper side, the cutter being detached. Fig. 4 is a side elevation of said tool from the pawl side. Fig. 5 is a front elevation of the same. Fig. 6 is a horizontal section of the front portion of the tool. Fig. 7 is a vertical longitudinal section of the same and of the engaging portion of the operating-spindle; Fig. 8, an end elevation of the rotatable head of a jewel-setting machine with my tool applied thereto, and Fig. 9 an end view of the same.

Letters of like name and kind refer to like parts in the several figures.

The design of my invention is to increase the efficiency and to insure greater accuracy of and uniformity in the action of cutters for automatic mechanism; and to such end my said invention consists in a revoluble cutting device, substantially as and for the purpose hereinafter specified.

In the carrying of my invention into practice I employ a circular cutter A, which has a central opening *a* and at its edge is beveled so as to form around its entire periphery a cutting-edge *a'*, as shown. For the support of such cutter I employ a head B that has substantially the form of a disk, and upon one edge is provided with a tapering shank *b* that is adapted to fill a correspondingly-shaped socket *c*, which is formed in the end of a spindle C.

Within the head B, at or near its center, is journaled an arbor D that upon its lower end is provided with a worm-wheel *d*, and has its upper portion threaded to receive a nut E, while between said nut and a shoulder *d'* that is slightly above the face of said head said arbor is adapted to receive the cutter A, which

is thus secured in place by means of said nut and is rotated with said arbor.

Journaled within a suitable housing F, upon the lower side of the head B, is a worm-shaft G, which is arranged transversely and engages with the wheel *d*, and upon one of its ends, which projects beyond the side of the head, has secured a disk H that is provided upon its outer face with a series of ratchet-teeth *h* and *h*. Outside of such ratchet-disk is journaled the hub *i* of a lever I, which hub is held in place by means of a screw K that passes into an axial threaded opening in the end of said worm-shaft, the arrangement being such as to enable said lever to be turned freely upon such shaft.

The inner end of the hub *i* is squared, and upon the same is loosely fitted a disk L, which corresponds in size to the disk H, and is provided upon its inner face with a series of ratchet-teeth *l* and *l*, that are the opposite of the teeth *h* and *h*, and are adapted to engage with or trip over the latter when said disk L is turned in opposite directions by the movements of the lever I. The ratchet-disks are inclosed by means of a cap *b'*, that is secured upon a concentric housing *b''*, and between such cap and the outer disk L is placed a spring M, which operates to hold the latter with a yielding force in engagement with said disk and to produce ratchet action between said disks whenever said lever is moved to and fro upon its pivotal bearing.

The front end of the head B being cut away, as shown, so as to give clearance to the cutter A at such point, the tool is ready for use, as follows, viz: When the tool is to be moved toward and from the work at each operation, a notched piece N is secured to some relatively stationary part of the machine in position to enable the free end of the lever I to be loosely contained within the notch *n*, when at each forward or backward movement of said tool the ratchet-disk L will engage with the disk H and give to the same, the worm-shaft G, the wheel *d*, the shaft D, and the cutter A a partial rotation, so as to cause a different portion of the cutting-edge *a'* to be presented for action each time. Should the tool remain stationary while at work, it will then be necessary to give to the ratchet-lever the necessary

movements by any of the usual means for producing a vibratory motion.

The worm-wheel *d* is preferably inclosed by a housing O, and for convenience in setting the tool I journal the worm-wheel arbor D within a block P, which is contained in an elongated slot *b*³ in the head B and is adapted to be adjusted laterally to and secured in position by means of two set-screws Q and Q that pass through threaded openings in said head and engage with the ends of said block.

The spindle C to which I have shown the tool attached is a longitudinally reciprocable one mounted in a head R—such as is shown in the jewel setting-machine covered by the application of George E. Hunter, No. 488,086, filed October 13, 1893—which head carries other spindles for holding other tools that are adapted by its step-by-step rotation to be successively placed in position for operation.

The first tool brought into action is a drill and end cutter S that forms the jewel-opening in a blank and squares the end of the latter. A partial rotation of the head R now brings the spindle containing a jewel-holder T into position opposite said blank, whereupon a jewel is automatically fed into the opening, after which said head is given another partial rotation and moves into position the third spindle, which carries on its end a burnishing-tool U. The fourth spindle carries my cutter, which, on being placed in position, acts to remove surplus material from the end of the setting after the jewel has been burnished therein. After the operation of my cutter, a tool V, carried by the fifth spindle, is by the partial rotation of the head placed in position to turn the outside of the blank to size, which completes the operations as far as the tools carried by the head are concerned.

Having thus described my invention, what I claim is—

1. In combination with a cutter carried by a reciprocating part, a relatively stationary part, and connections between said parts,

whereby the movement of said reciprocating part will cause the cutter to be moved to present a new cutting portion to the work, substantially as and for the purpose specified.

2. In combination with a cutter, a pivoted arm or lever, connections between the latter and the cutter, a reciprocating part carrying both cutter and lever, and a relatively fixed part to engage the lever, when said reciprocating part is moved, whereby said lever is operated to move the cutter, substantially as and for the purpose shown.

3. In combination, a rotary cutter, a vibratory lever, worm-gearing between the latter and the cutter, and means for automatically moving the lever, substantially as and for the purpose specified.

4. The combination of a spindle-carrying, rotatable head, a longitudinally-movable spindle, a rotary cutter carried thereby, and a positive feed mechanism for turning the cutter each time the spindle is reciprocated, substantially as and for the purpose shown.

5. The combination of a spindle-carrying, rotatable head, a longitudinally-movable spindle, a rotary cutter carried thereby, ratchet mechanism geared to the cutter, a lever to actuate said mechanism, and a part upon said head engaging such lever, substantially as and for the purpose set forth.

6. The combination of a rotatable head, a jewel-holder, and a series of spindles mounted in said head one of which is reciprocable, and carries a rotary cutter that is provided with a ratchet and a positive feed mechanism for turning the cutter each time the spindle is reciprocated, substantially as and for the purpose described.

In testimony that I claim the foregoing I have hereunto set my hand this 11th day of August, 1893.

CURTIS A. SMITH.

Witnesses:

GEO. S. PRINDLE,
CARLOS H. SMITH.