

E. E. BROWN & T. B. McCALL.

RATCHET TOOL.

(Application filed Nov. 19, 1901.)

(No Model.)

Fig. 1.

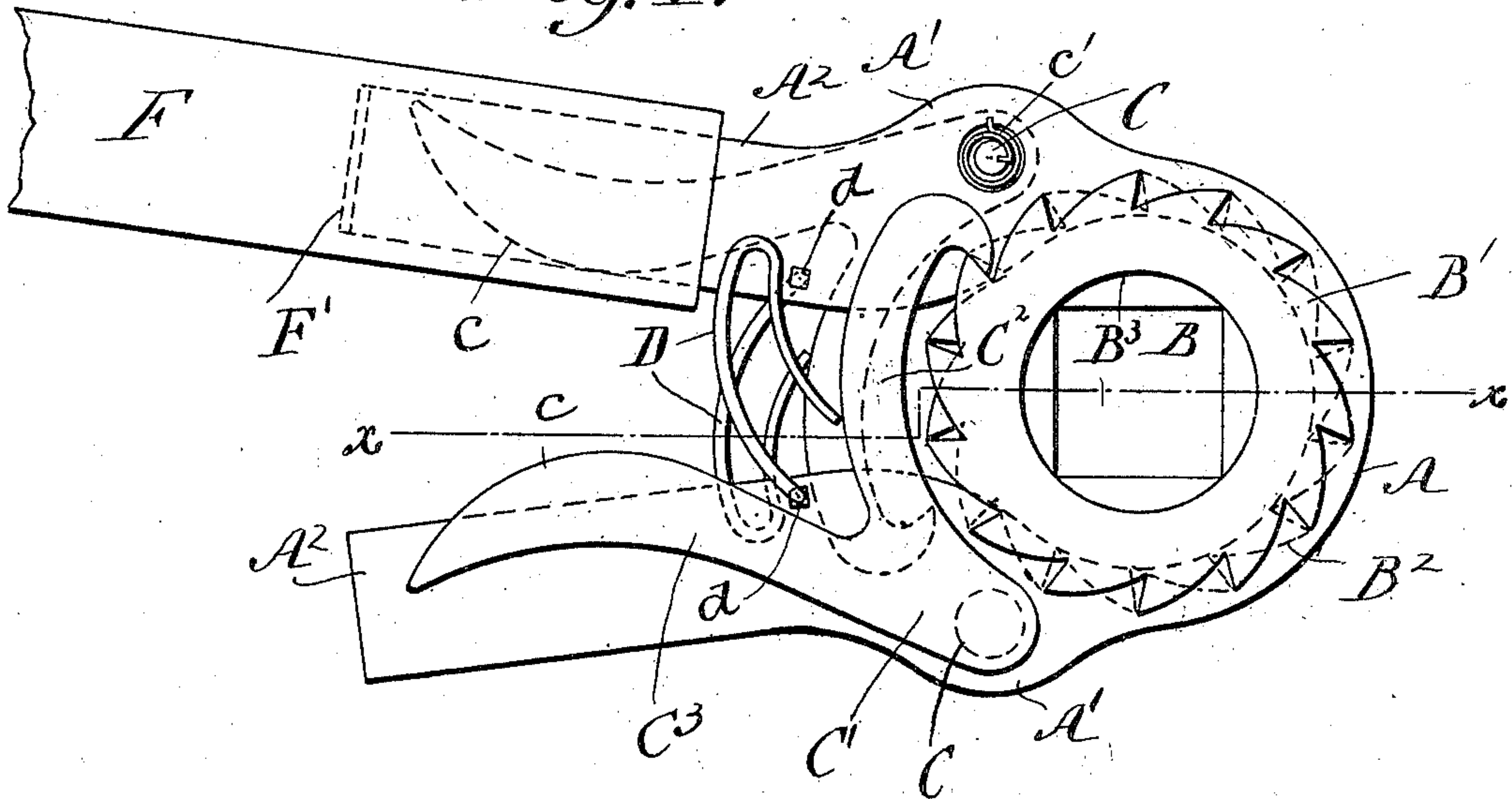


Fig. 2.

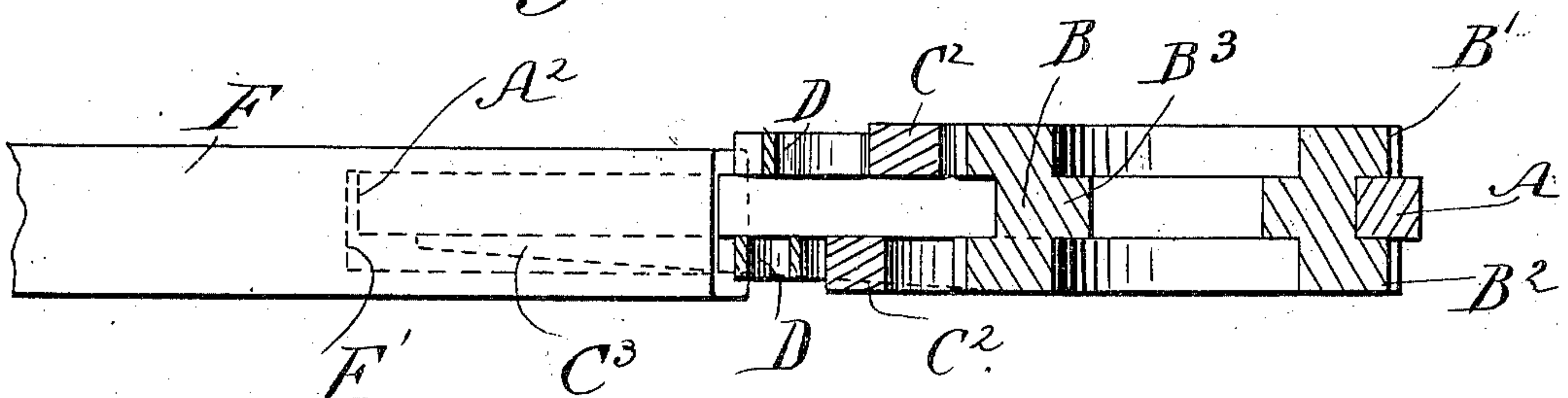
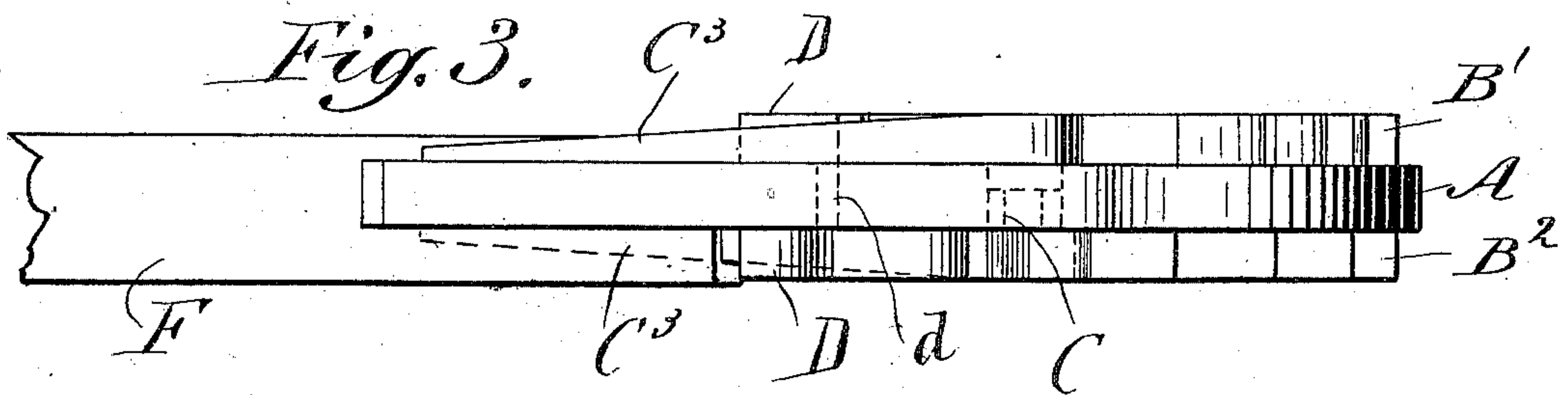


Fig. 3.



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# UNITED STATES PATENT OFFICE.

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## RATCHET-TOOL.

SPECIFICATION forming part of Letters Patent No. 705,029, dated July 22, 1902.

Application filed November 19, 1901. Serial No. 82,843. (No model.)

*To all whom it may concern:*

Be it known that we, ELIJAH ENOSH BROWN and THOMAS BERNARD McCALL, citizens of the United States, and residents of Cripple-creek, county of Teller, and State of Colorado, have invented certain new and useful Improvements in Ratchet-Tools, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof, in which similar letters of reference indicate corresponding parts in all the figures.

The subject of the present invention is an improved ratchet-tool adapted for various uses—as, for instance, a pipe-wrench and, with suitable dies, a thread-cutter—and one of the prominent features connected with the improved tool is its capacity for positive ratchet movement in either direction according to requirement.

With the above objects in view the invention consists in a ratchet-tool embodying a peculiar form of head, in which bears a ring-section having peripherally relatively reversed ratchet-teeth, the head being integrally provided with a pair of short stocks designed to coact with a pair of reversely-arranged pawls adapted to be so clamped by a handle slid upon either of the stocks that the pawl corresponding with the clamped stock will, as the latter oscillates the head, positively engage its ratchet-teeth and intermittently rotate the ring in one direction and ride over the teeth with a spring yield when moved in the other.

There are other novel features connected with the improved tool, all of which will be fully set forth hereinafter.

In the accompanying drawings, forming part of this specification, Figure 1 is a side view of a ratchet-tool embodying our invention. Fig. 2 is a horizontal section of said tool, the section being taken in the plane indicated by the dotted line  $x x$ , Fig. 1; and Fig. 3 is an edge view of said tool.

The main or body portion of the tool is represented by a single piece comprising the head A, providing a circular bearing, and offsets A', from which extend the short stocks A<sup>2</sup>. Within the bearing is mounted a ring B, having externally a central annular chan-

nel within which the major portion of the head bears, those portions of the ring at opposite sides of the channel presenting two annular series of reversely-arranged ratchet-teeth B' B<sup>2</sup>. A central circular flange B<sup>3</sup>, square in cross-section, may of itself constitute the portion of the ring designed to embrace and grip the object to be turned or be capable of receiving accessories, as thread-cutting dies, should the operation necessitate.

Each of the offsets A' has a circular opening for receiving the circular stud C, integrally projecting from the elbow portion C' of one of a pair of pawls of special form, each pawl being somewhat of a bell-crank configuration and comprising the narrow extended elbow portion C', referred to, a curved inner ratchet-engaging hook C<sup>2</sup>, and an outer curved arm C<sup>3</sup>, presenting the cam-surface  $c$ , this said arm being tapered toward its free end in horizontal cross-section, as indicated in dotted lines, Fig. 2, and both full and dotted lines, Fig. 3, for a purpose which will presently appear.

Inasmuch as the pawls are to engage the relatively reversed ratchets, the pawls themselves are relatively reversed, being on opposite sides of the offset portions of the head. A small coiled spring  $c'$  embraces the projecting portion of each stud C and has one end engaging the latter, while its other end engages the contiguous part of the head.

The respective pawls are held in spring engagement with their ratchets by return-bend springs D, which are curved, as shown in Fig. 1, and which each have a squared stud  $d$  at one end to engage square holes in the side of the stock, while the other end bears against the rear curved edge of its particular pawl. The peculiar shape and disposition of each spring results in the securing-point and bearing ends being close together, while considerable flexure is afforded. Naturally the springs lie in different planes side by side, and consequently their clamping-screws are on different sides of their stocks, respectively.

F designates an operating-handle having at its forward end a longitudinal socket or recess F' (dotted lines, Figs. 1 and 2) of a general rectangular configuration. The stocks are of a rectangular shape in cross-section,



and as each carries a pawl at the outer side and it is desired to slip the socketed end of the handle over both the stock and the contiguous pawl-arm  $c^3$  the socket is of liberal area horizontally. By slipping the socketed end of the handle upon either of the stocks one of the interior surfaces of the socket will contact with the cam-surface  $c$  of the contiguous pawl-arm and so move said pawl as to disengage and hold disengaged the same from its ratchet, the arm of course entering the socket alongside of its stock. As the pawl-arm enters the socket its tapering side face contacts with one of the vertical edges at the mouth of the socket and the arm is moved toward and held against the side of its stock, the coiled spring  $c'$ , combined with a limited play afforded the stud  $C$  in its perforation, affording such movement. With one of the stocks and its pawl-arm so held by the socketed end of the handle the other pawl will, through the medium of its spring, be held in yielding engagement with its particular ratchet, and as the handle is vibrated the last-mentioned pawl will intermittently rotate the ring  $B$  in one direction, as will be apparent. Correspondingly the engagement of the other stock and its pawl-arm will result in the intermittent rotation of the ring in the reverse direction.

From the foregoing it will be appreciated that a tool embodying our improvements is not only simple and durable, but capable of efficient service for many purposes.

We do not wish to be understood as limiting ourselves to the particular construction shown and described, as the same may be modified or changed without departing from the spirit of our invention.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a ratchet-tool, the combination with a head having the stocks  $A^2$ , and ring-bearing portion, of a ring in the latter, having differential ratchet-teeth, and normally spring-engaged pawls for the latter, each having an arm contiguous to its stock to be held with the latter and be thrown out of engagement.

2. In a ratchet-tool, the combination with a head having the stocks  $A^2$ , and ring-bearing portion, of a ring in the latter having differential ratchet-teeth, and normally spring-engaged pawls for the latter each having an outwardly-tapering arm and cam-face  $c$ , said arm adapted to be held with its stock to retain its pawl out of engagement.

3. In a ratchet-tool, the combination with a head having the stocks  $A^2$ , and ring-bearing portion, of a ring in the latter having differential ratchet-teeth, and normally spring-engaged pawls for the latter, each presenting the extended elbow  $C'$ , having the lateral stud-bearing in the head, curved ratchet-hook  $C^2$ , and outer curved arm  $C^3$ , the latter adapted to be held with its stock to retain its pawl out of engagement.

4. In a ratchet-tool, the combination with a head having the stocks  $A^2$ , and ring-bearing portion, of a ring in the latter having differential ratchet-teeth, and bell-crank parts for the latter, including an outwardly-extending arm, of springs  $D$ , each having its secured and free ends contiguous and serving to normally hold its pawl engaged.

5. In a ratchet-tool, the combination with a head having the stocks  $A^2$ , and ring-bearing portion, of a ring in the latter having differential ratchet-teeth and bell-crank pawls each having a stud loosely bearing in the head and having its projecting portion embraced by a spring engaging both the stud and head, each of said pawls also having an outer tapering arm  $C^3$ , provided with a cam edge and contiguous to the stock.

6. The combination with a ratchet-tool provided with a head having the stocks  $A^2$ , ring-bearing portion, ring in the latter having differential bearing-teeth and normally spring-engaged pawls for the latter each having an arm contiguous to its stock, of an operating-handle having a socketed end designed to be slipped over either of the stocks and its pawl-arm to hold that particular pawl disengaged.

7. The combination with a ratchet-tool having the head with stocks  $A^2$ , the bearing-ring, and ring in latter with differential ratchets, and pawls each with outer tapering arm provided with cam edge  $c$ , of an operating-handle having a socketed end designed to be slipped over either of the stocks and its pawl-arm to hold that particular pawl disengaged, the socket in the handle being of greater area horizontally than the stocks and tapered portion.

In testimony that we claim the foregoing as our invention we have signed our names, in the presence of two witnesses, this 26th day of October, 1901.

ELIJAH ENOSH BROWN.

THOMAS BERNARD McCALL.

Witnesses:

J. C. COLE,

S. W. McELROY.