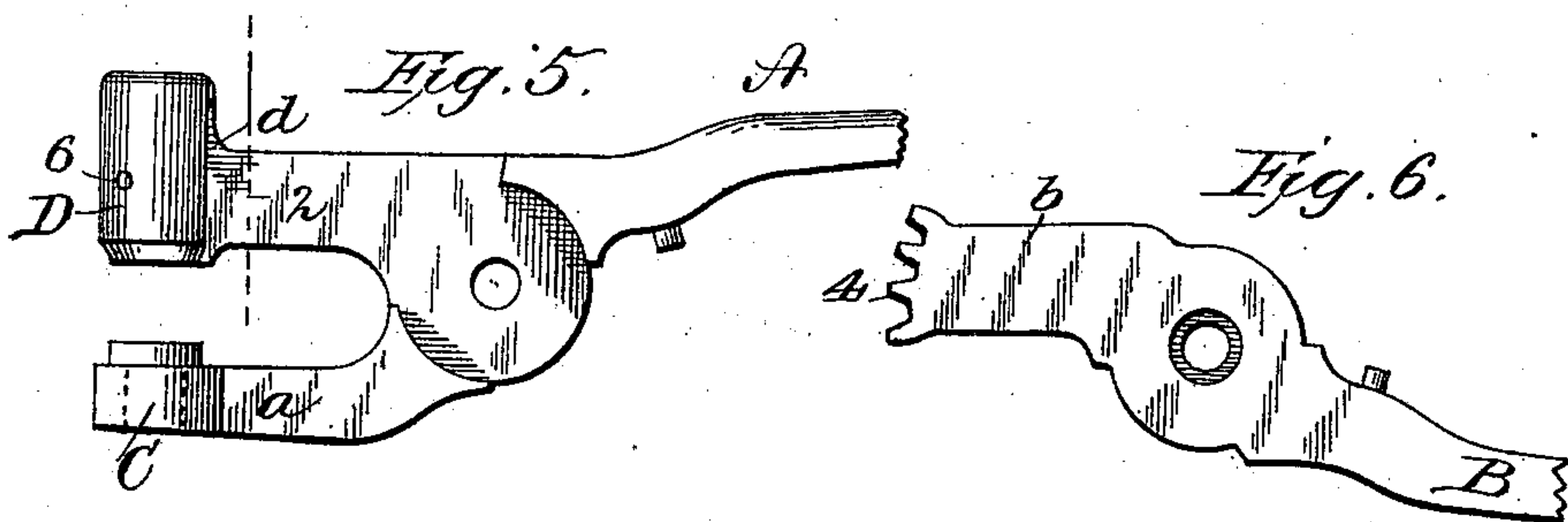
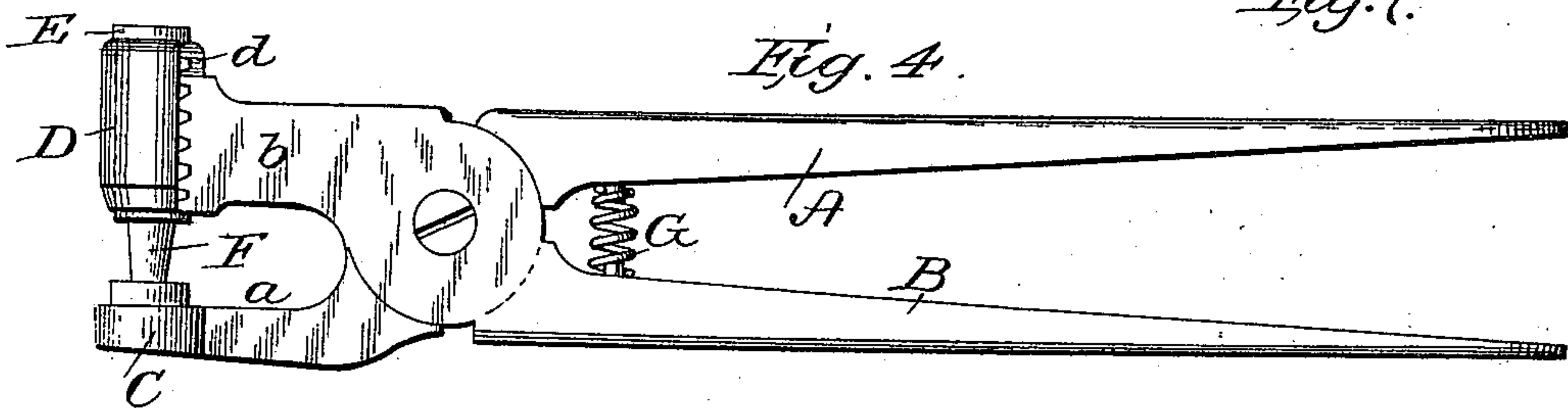
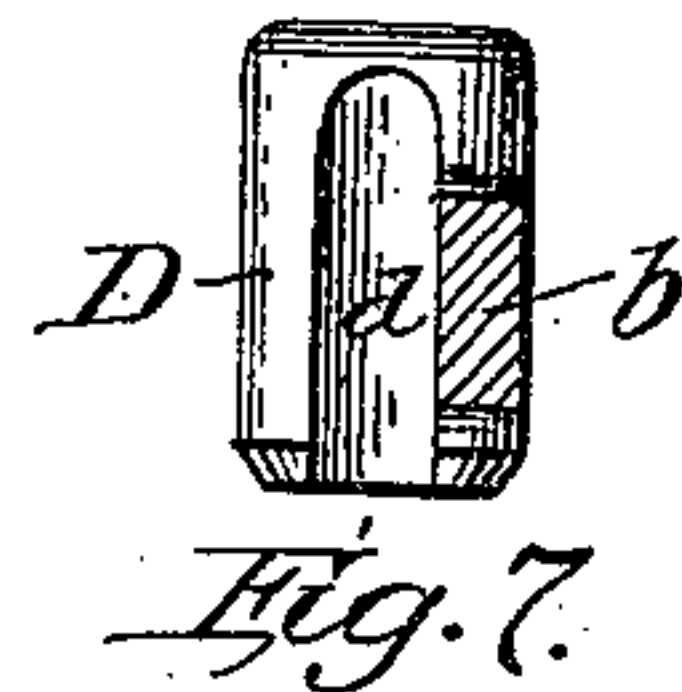
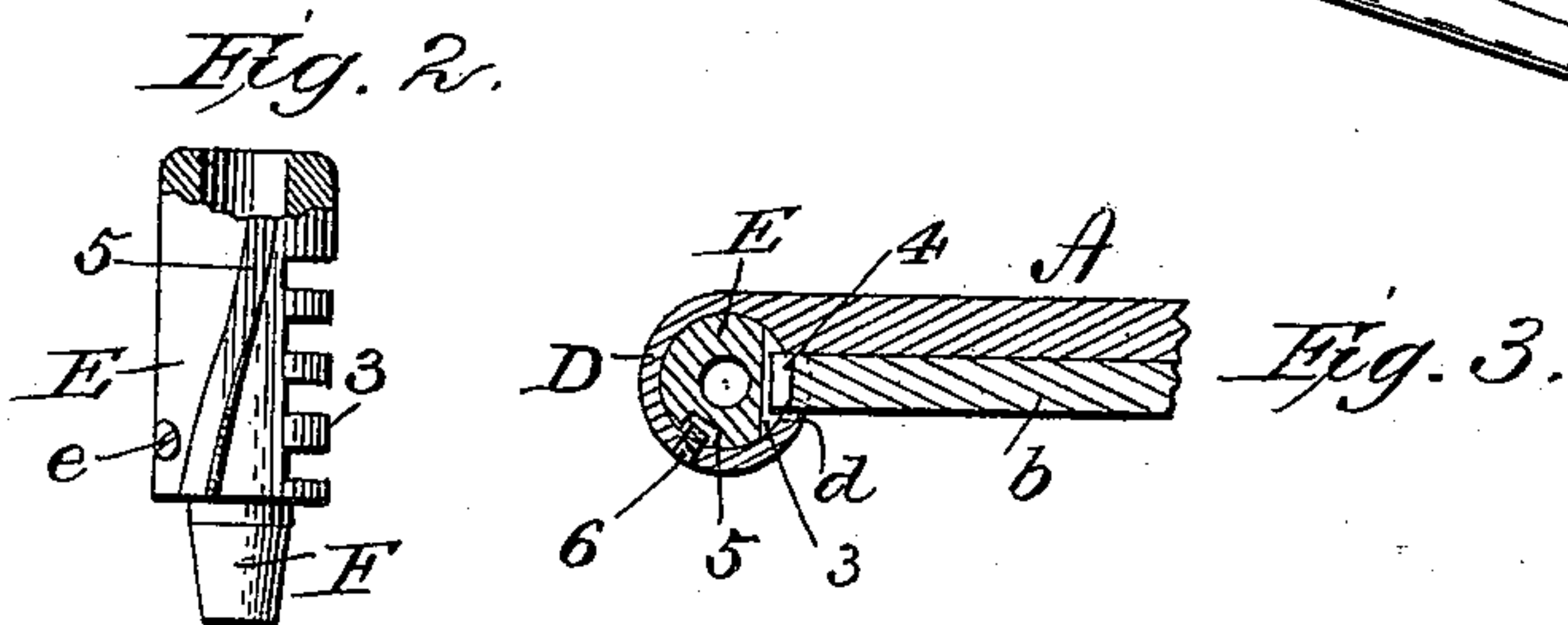
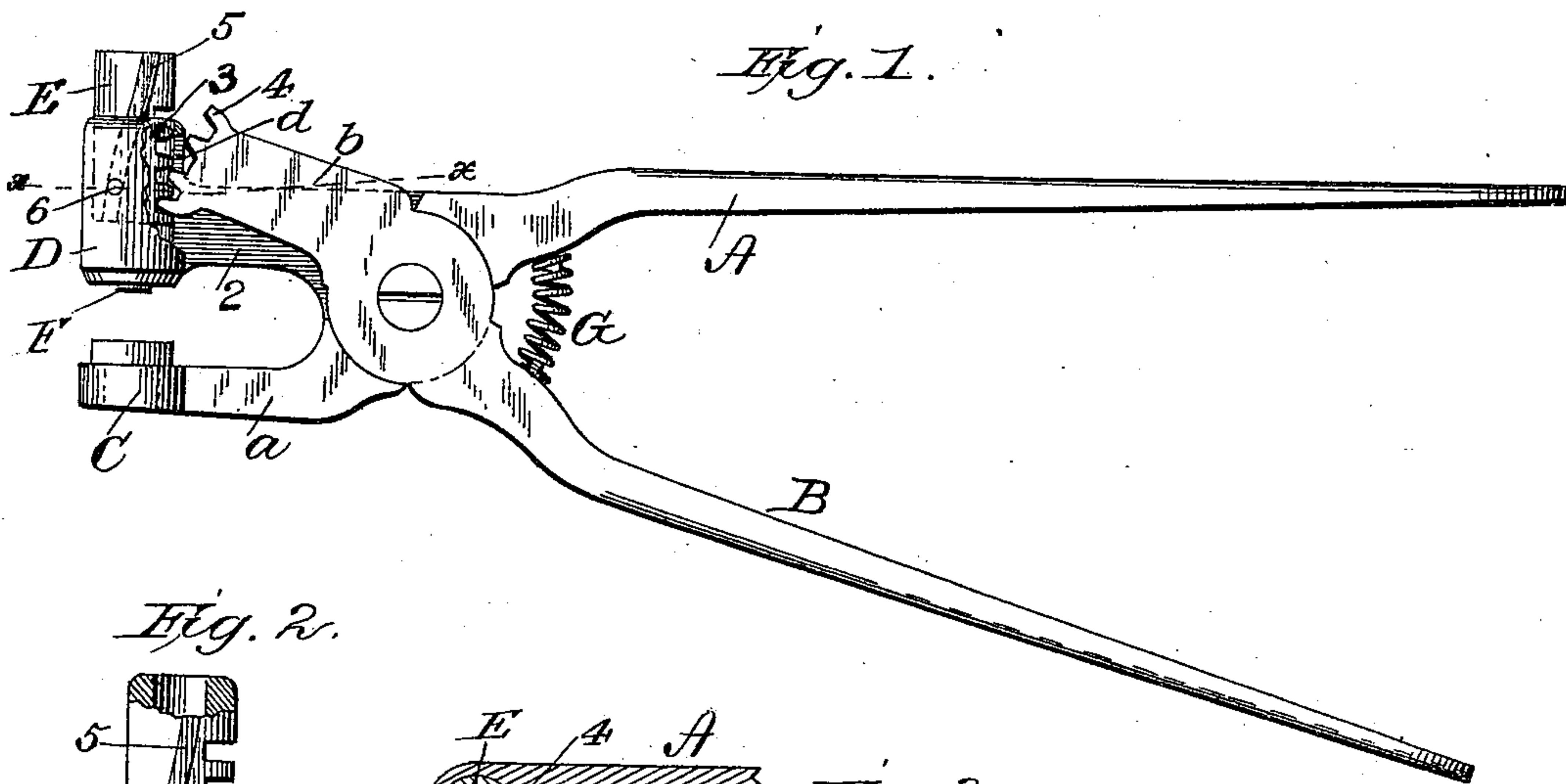


(No Model.)

J. C. RICHARDSON.
PUNCH.

No. 545,613.

Patented Sept. 3, 1895.



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UNITED STATES PATENT OFFICE.

JULIUS C. RICHARDSON, OF AUBURN, NEW YORK.

PUNCH.

SPECIFICATION forming part of Letters Patent No. 515,613, dated September 3, 1895.

Application filed October 20, 1894. Serial No. 526,492. (No model.)

To all whom it may concern:

Be it known that I, JULIUS C. RICHARDSON, a citizen of the United States, residing at Auburn, in the county of Cayuga and State of New York, have invented certain new and useful Improvements in Punches; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to punches of that class which are designed to be operated while held in the hand, and comprise two levers pivoted together near one end, the latter carrying the punching devices. In this class of tools as generally constructed the cutter has positive and rigid connection with its operating-lever, and as a consequence the cutter does not obtain a uniform bearing on the bed with which it operates to perform the required work. Again, the cutter traveling in a curved path in passing through the material to be cut binds against the walls of the opening thus provided.

The primary object of the present invention is to secure a direct and straight travel of the cutter in its various movements to and from the work. By this means many of the objectionable features obtaining against the present devices are obviated and the efficiency and usefulness of the tool increased.

Another object of the invention is the provision of a guide or barrel for the cutter-head to work in, and which forms a stop for the material operated on to obtain a purchase against when the cutter is withdrawing from the work and returning to its normal position.

A further object of the invention is to impart to the cutter a simultaneous longitudinal and rotary movement, whereby the operation of cutting is facilitated and attained at the expense of a minimum amount of energy.

The improvement consists of the novel features which hereinafter will be more fully set forth and claimed, and which are shown in the accompanying drawings, in which—

Figure 1 is a perspective view of the pre-

ferred form of the invention. Fig. 2 is a detail view of the cutter-head removed from its guide and having the cutter attached. Fig. 3 is a detail section showing the relative position of the cutter-head, its guide, and the spiral groove in the side of the cutter-head and the pin co-operating therewith to produce a rotary movement of the cutter when reciprocating the cutter-head. Fig. 4 is a side elevation of a modification. Figs. 5, 6, and 7 are detail views.

The tool comprises the two levers A and B, which are pivoted together near one end, forming the short arms *a* and *b*, respectively. These levers cross at their pivotal point, so as to bring the arms *a* and *b* on opposite sides of a line passing in the direction of and between the said levers, so that when pressing the ends of the levers together the arms will receive a corresponding movement in the same direction, thereby forcing the cutter through the material to be cut and upon its bed. The bed C is carried by the arm *a*, and is preferably a block of gum-wood, which will not destroy the edge of the cutter. This block C is fitted in a recess provided in the inner face of the arm *a*, and has a shank to enter an opening in the said arm, by means of which it is securely held in place. The arm 2 terminates in a guide or barrel D, which directs the movements of the cutter head E. This arm 2 is an integral part of the lever A and is opposite and parallel with the arm *a*. The two arms *a* and 2 form, in effect, a cleft end to the lever A. The barrel is slotted on the inner side at *d* to admit the end of the arm *b* to reach the cutter-head E and operate the latter. The arm *a* is located substantially tangential to the side of the barrel, as shown in Fig. 3, which causes the arm *b* to occupy a radial position relative to the cutter-head, whereby a direct engagement between the arm and the cutter-head or plunger is secured and any possibility of the parts becoming strained or twisted is avoided; and by extending the slot *d* only a part way of the barrel the unslotted portion of the barrel will add great strength thereto, and at the same time will permit of the barrel being made neat and light for use as a hand-punch, and by providing the cutter-head with a groove in-

stead of projecting ribs the barrel may be bored out and the head be fitted therein very cheaply and effectively.

The cutter-head E is tubular and fits snugly within the barrel D, being tubular to admit of the discharge of the cuttings therethrough. One side is provided with a series of transverse teeth 3, which in the preferred form are of sufficient length or disposition to admit of the said head having a partial rotary movement. These teeth 3 are engaged by corresponding teeth on the end of the arm *b* in the working of the tool. The teeth 4 at the end of the arm *b* are formed on the arc of a circle whose center coincides with the pivotal connection between the levers. The cutter F is of usual formation and is removably fitted to the end of the head E, so as to be readily replaced by another of the same or different size, as may be required. A binding-screw *e*, passing laterally through the head E, is turned up against the side of the cutter and holds the latter in place.

The operation of the tool is as follows: The leather or other material to be punched is placed between the arms *a* and 2 and the long ends of the levers are pressed together or, more correctly speaking, the lever A remains relatively fixed and the lever B is pressed toward the lever A. This operation advances the cutter through the material. When the lever B is released, it is returned to a normal position by means of a spring G, placed between the levers A and B. As the cutter F is returning to its first position within the barrel D, the material operated upon will engage with the lower end of the barrel D and be held during the withdrawing of the cutter therefrom. From the foregoing it will be seen that the cutter moves in a straight line and readily disengages itself from the material after operating thereon.

In the preferred form of the invention the

cutter receives a partial rotary movement simultaneous with its reciprocating motion. This is effected by means of a spiral groove 5 in the side of the head and a pin 6, projecting from the inner side of the barrel and working in the said spiral groove. Obviously, as the cutter-head receives a longitudinal movement it will at the same time receive a rotary motion by means of the co-operating groove 5 and pin 6.

The modification shown in Fig. 5 is precisely the same in all details as that shown in Fig. 1, with the exception that the spiral groove and the pin is dispensed with. Hence the cutter receives a reciprocating movement only.

Having thus described my invention, what I claim as new is—

In a punch, the combination, with the handles pivotally secured together, one end of one of which is bifurcated and one arm is provided with a cutting block and the other arm is provided with a slotted barrel located tangentially thereto, said slot extending only a portion of the length of the barrel and being located adjacent to the arm, the corresponding arm of the other handle being provided with teeth arranged in the arc of a circle with the pivotal point as a center, and adapted to fit within said slot, a cutter head within the barrel, one side of which is provided with transversely arranged teeth, and the opposite side is provided with a spiral groove, a pin through the side of the barrel to engage with the groove, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JULIUS C. RICHARDSON.

Witnesses:

E. G. WICKES,
F. G. JONES.