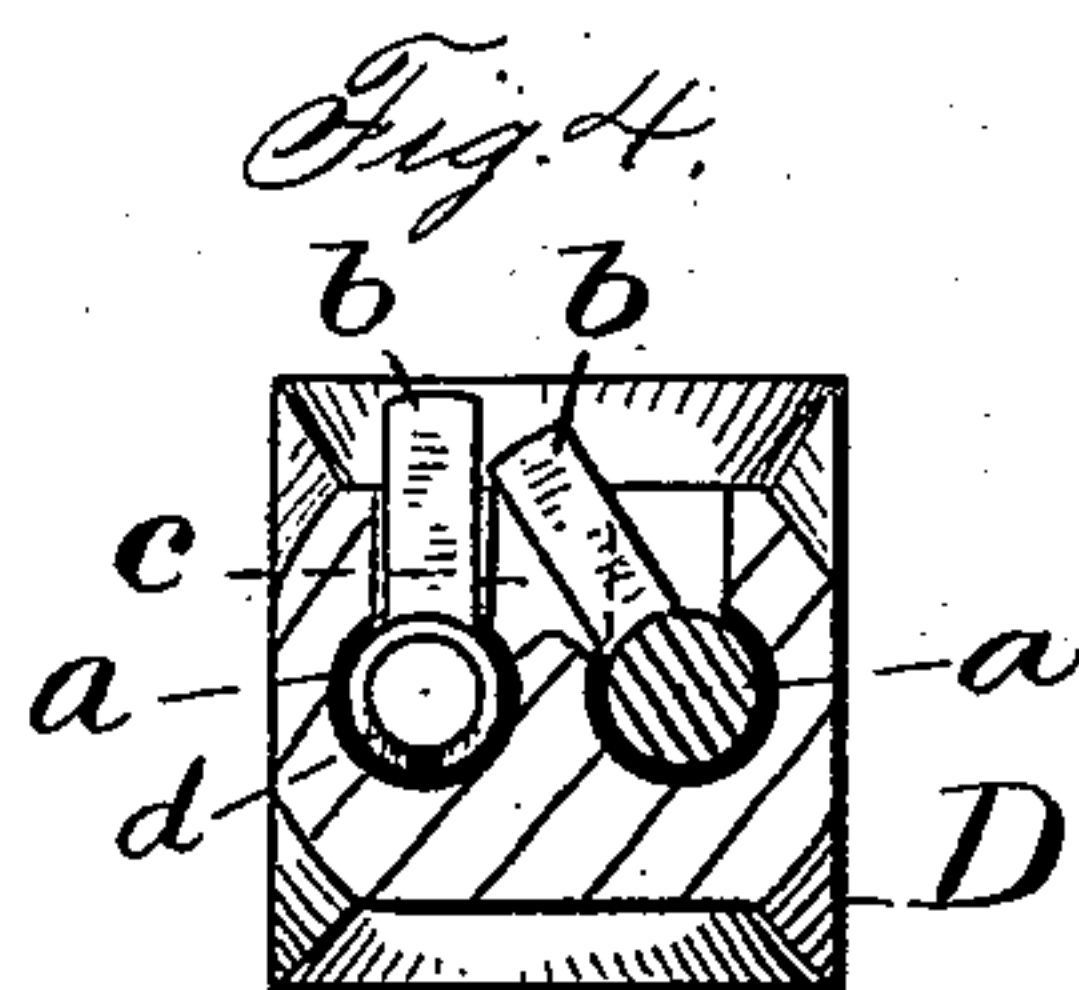
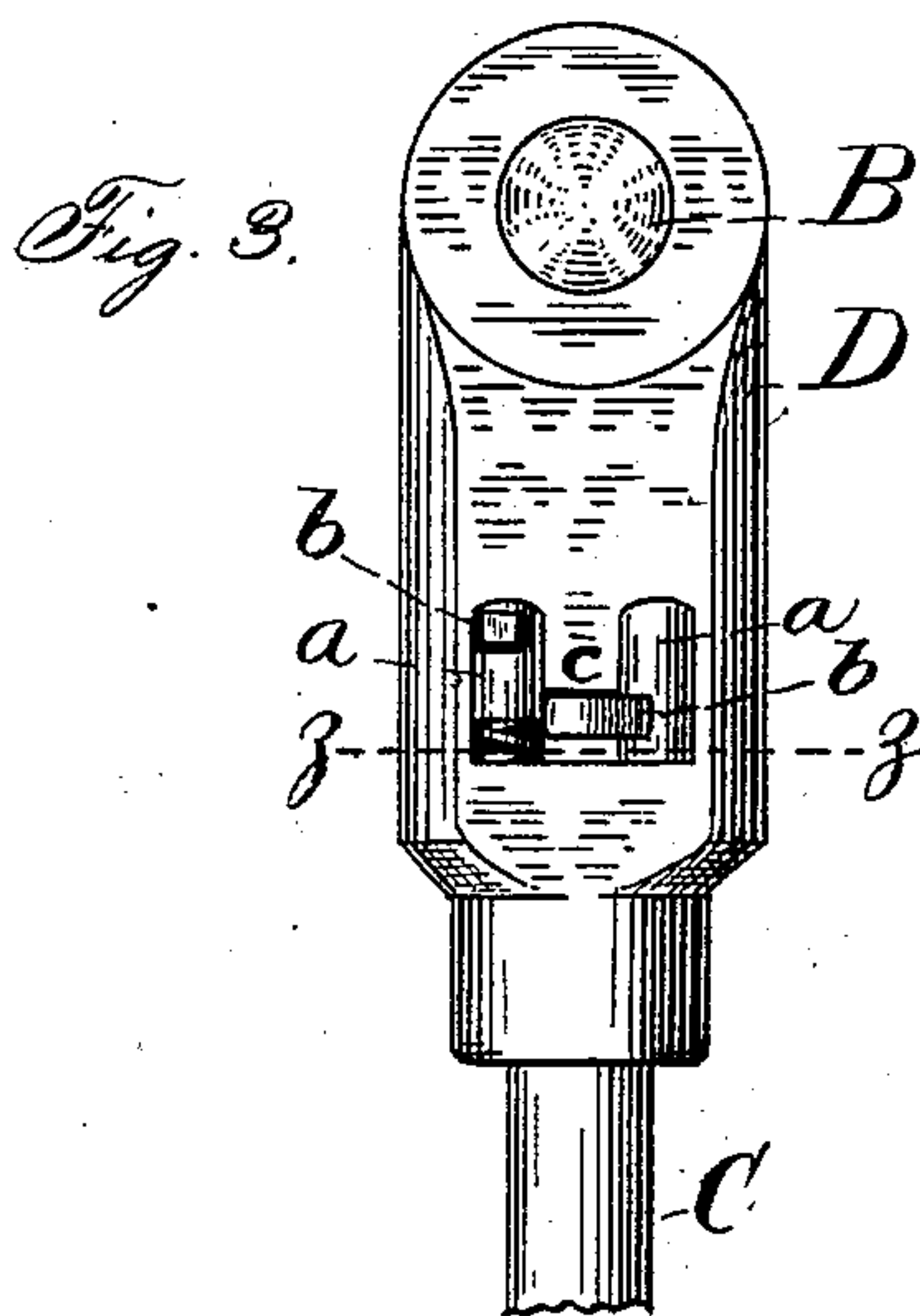
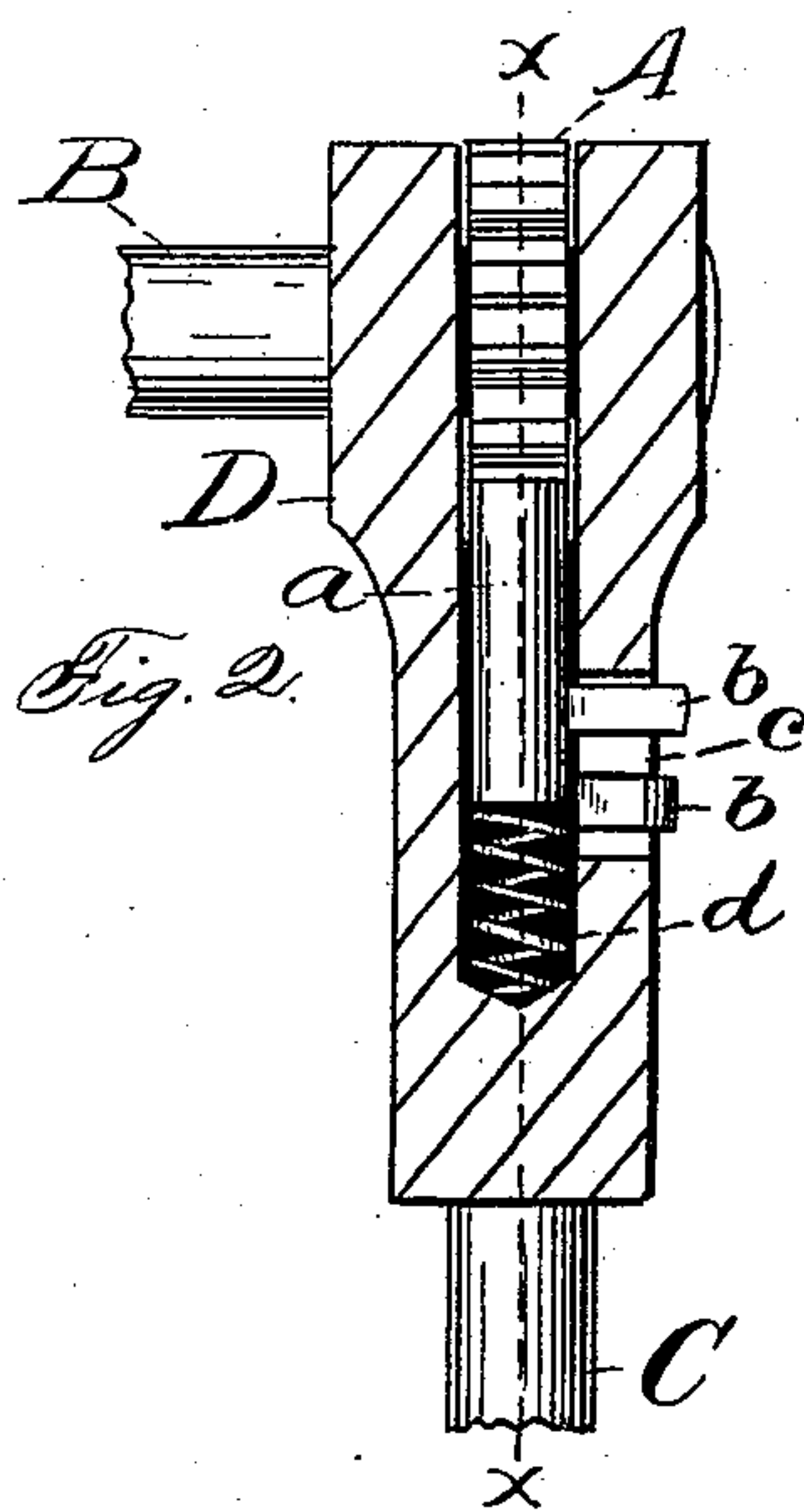
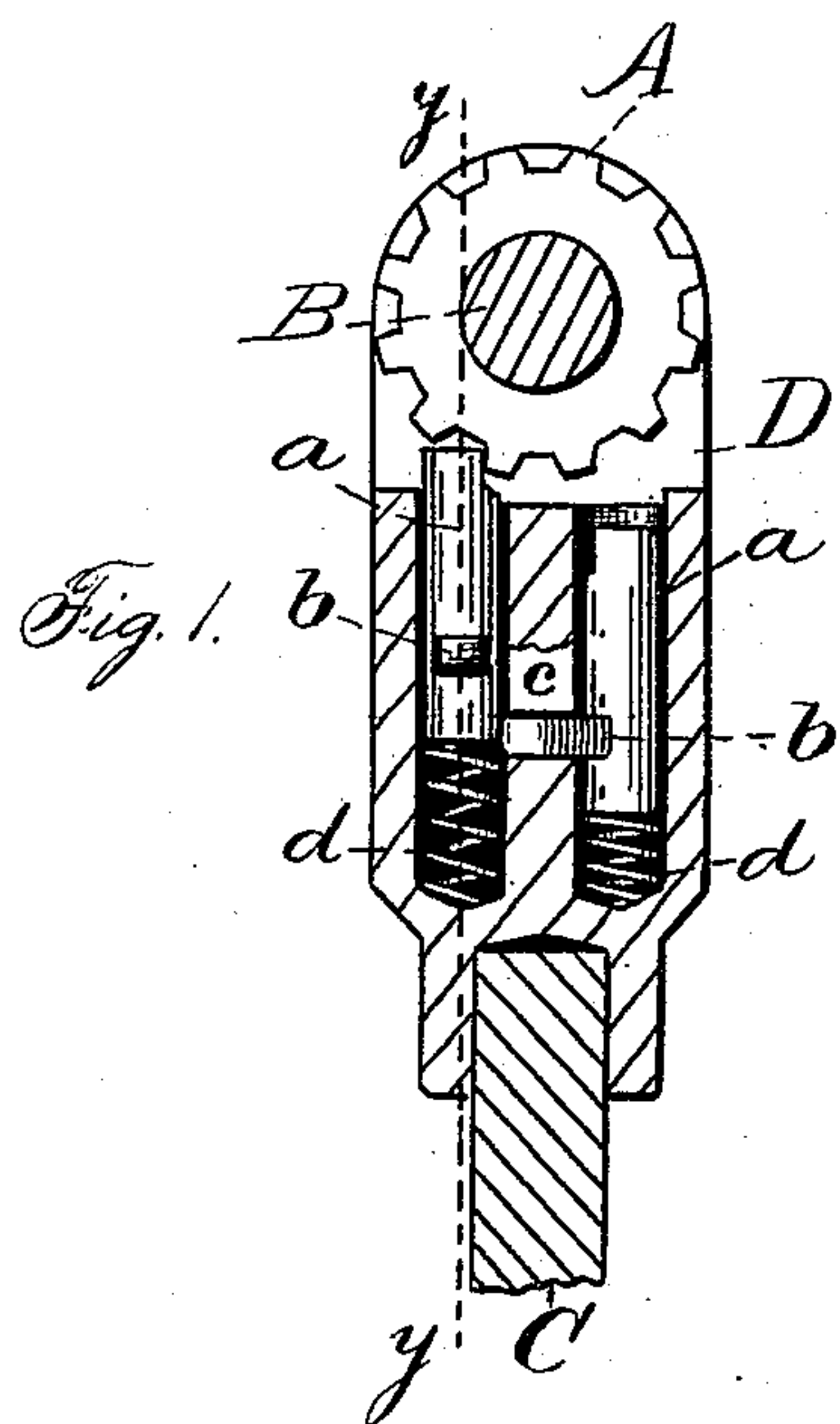


(No Model.)

C. REISING.
RATCHET DRILL.

No. 309,876.

Patented Dec. 30, 1884.



Witnesses.
John Edwards Jr.
Eddy N. Smith

Inventor.
Caspar Reising
By James Shepard
Atty.

UNITED STATES PATENT OFFICE.

CASPAR REISING, OF PLANTSVILLE, ASSIGNOR TO THE PECK, STOW & WILCOX COMPANY, OF SOUTHTON, CONNECTICUT.

RATCHET-DRILL.

SPECIFICATION forming part of Letters Patent No. 309,876, dated December 30, 1884.

Application filed January 31, 1884. (No model.)

To all whom it may concern:

Be it known that I, CASPAR REISING, a citizen of the United States, residing at Plantsville, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Ratchet-Braces, of which the following is a specification.

My invention relates to improvements in ratchet-braces and analogous tools; and the object of my invention is to produce a tool which shall be simple and efficient in operation and economical in construction. I attain this object by the simple construction illustrated in the accompanying drawings, in which—

Figure 1 is a horizontal section, partly in elevation, on line *x x* of Fig. 2, of my brace. Fig. 2 is a vertical section, partly in elevation, on line *y y*, Fig. 1, of said brace. Fig. 3 is a plan view thereof, and Fig. 4 is a transverse section of the same, on line *z z* of Fig. 3.

In the accompanying drawings, A designates a double-faced ratchet-wheel, and B a driven-shaft secured thereto, represented as broken off, to which shaft any suitable tool-holder may be attached.

At the end of the head D, opposite from the ratchet-wheel, is the handle C, which is shown as broken off, but which is designed to be extended preferably in the form of the bow of a brace.

The longitudinally-sliding pawls *a a* are formed of wire cut into proper length, and slabbed off on one side at their points of engagement with the ratchet-wheel, and their ends are formed at about right angles to their length. These rounded longitudinally-sliding pawls are provided with projections or arms *b b*, which projections are secured to said pawls preferably by being screwed thereto. The oscillating head D is formed in one piece, slotted at its end in the usual manner to receive the ratchet-wheel A. The holes or sockets to receive the sliding pawls *a a* can be readily drilled, and the pawls inserted before the ratchet-wheel and its shaft are secured therein, said holes being made deep enough to receive the springs *d d*, as shown. One side of the head, preferably the upper side, is provided with two longitudinal slots extending through into the pawl-sockets, said slots

being connected at their rear end by a transverse slot, thereby forming the holding-shoulder *c* at a point between the longitudinal slots, as shown most clearly in Fig. 3. These slots in one side of the head are for the projections or handles *b b* to work in. The pawls are secured within the head by first placing the springs *d d* and pawls *a a* within their sockets, and then securing the projections or arms *b b*. When these arms are within the longitudinal slots, as shown in the left-hand side of the several figures, said arm and slot hold the slabbed-off face of the pawl in proper vertical position to engage squarely the teeth of the ratchet-wheel. By drawing back either pawl, then giving it a slight turn on its axis, so as to bring the projection *b* back of the holding-shoulder *c*, said pawl is held out of engagement with the ratchet-wheel.

In order to withdraw one pawl from engagement and to throw the other pawl into engagement, it is only necessary to manipulate one of the handles or projections *b*, because when it is drawn back to disengage the pawl from the wheel, and then turn it to one side to throw it wholly back of the holding-face, the arm thus manipulated will strike the arm of the opposite pawl and throw it away from the holding-shoulder, and consequently throw it into engagement.

Inasmuch as the pawls are both of them placed within the head D to reciprocate longitudinally on non-radial lines with reference to the ratchet-wheel, the relative path of the respective teeth of the ratchet-wheel and the end of the pawl is practically oblique. In other words, the longitudinal movement of the pawls is in a line tangential, or nearly so, to the periphery of the shaft B, so that a pawl having an end face which stands at about right angles to the length of the pawl will operate well. This enables me to make a very stout and rigid pawl which is very durable.

I am also enabled to form said pawls cheaply from simple pieces of wire. Furthermore, by the peculiar location of the longitudinally-sliding pawl with reference to the path of the teeth of the ratchet-wheel, I relieve the pawls from that tendency to cramp or bind which is always attendant upon longitudinally-sliding pawls which reciprocate on a line that is

radial to the ratchet-wheel. In the latter case the path of the teeth of the ratchet-wheel at the point of contact is on a right angle to the length of the pawl, and consequently considerable pressure, in fact all the direct pressure of the ratchet-wheel, is exerted laterally in a line at right angles to the line of reciprocation of the pawl, and has a tendency to bind the pawl and cause considerable friction in its longitudinal movement.

In my pawl, set on a non-radial line to the ratchet-wheel, as shown, the path of the teeth of the ratchet-wheel at the point of contact lies in a direction which is much nearer the line of longitudinal movement of the pawl, so that a direct pressure is exerted to push the pawls back without any direct lateral pressure, whereby the pawls move with much greater freedom and with little or no tendency to bind. Furthermore, when it is desired to arrange two pawls side by side, as shown, they can be placed parallel to each other, and arranged within the head in a much more compact and convenient form than can be the case where two pawls are placed side by side on radial lines to the ratchet-wheel—as, for instance, in one of the prior devices herein disclaimed.

I have represented the ratchet-wheel as being acted upon by the left-hand pawl, thereby adapting the tool for use as a right-hand ratchet brace or drill. If I wish to reverse the movement of the ratchet-wheel, I can effect such a change by disengaging the left-hand pawl and throwing the right-hand pawl into engagement. Should I wish to have the ratchet-wheel turn freely in either direction independent of the head D, I have simply to bring both of the pawl-projections *b b* far enough into engagement with the shoulder *c* to obtain a good hold thereon, care being taken not to force said projections so far to one side that one will crowd the other out of engagement, as before described. Again, if I should desire to produce a dead-lock of the ratchet-wheel, I have but to throw both pawls into engagement with the ratchet-wheel A.

By the foregoing description of the manipu-

lations of my brace, I have shown that by my invention a tool can be produced which is very efficient in its operation, and one which, because of its extreme simplicity, can be produced at a very small cost.

I am aware that ratchet braces or drills have been heretofore constructed with a double-faced ratchet-wheel having a single set of teeth and two longitudinally-sliding pawls set on lines which are radial to the ratchet-wheel, so that the path of its teeth is at right angles to the length of the pawls; also, with a single longitudinally-sliding pawl arranged in the axial plane of the head, which pawl was capable of being reversed, so as to drive the ratchet-wheel in either direction; also, braces with two longitudinally-sliding pawls which acted upon a double-toothed ratchet-wheel, one pawl acting upon one set of teeth and the other upon the other set, and also ratchet-braces having two oscillating pawls, and that in all of said braces the ratchet-wheel could be driven in either direction by an oscillating motion of the head, or left free to rotate independent of the head, or to be locked against independent rotation; and such braces are hereby disclaimed.

I claim as my invention—

1. The combination of a ratchet-wheel, an oscillating head, and the longitudinally-sliding pawl set on a non-radial line with reference to the ratchet-wheel, and having its wiping-face standing at about a right angle to its length, the whole combined in the manner substantially as described, so that the path of the teeth of the ratchet-wheel at the point of contact with the pawl runs obliquely to its length.

2. The combination of the oscillating head having the holding-shoulder *c*, the double-faced ratchet-wheel, and two longitudinally-sliding pawls having projections or arms *b*, either or both of which arms may be brought into engagement with said shoulder, substantially as described.

CASPAR REISING.

Witnesses:

CHARLES D. BARNES,
DANIEL R. HUBBARD.