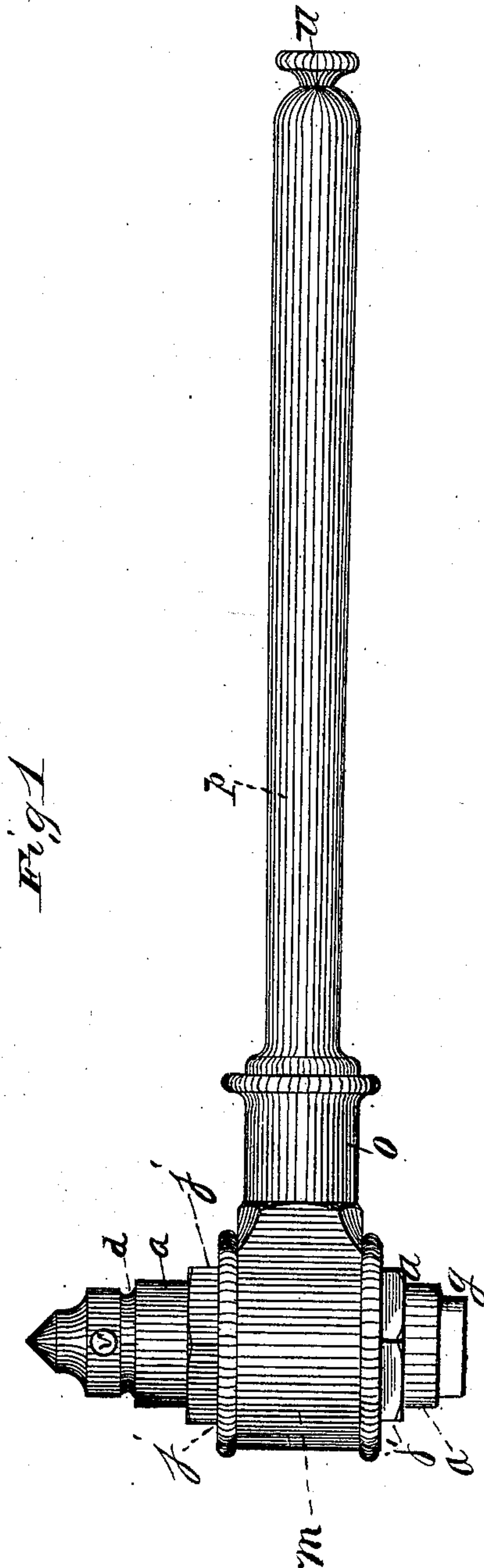


3 Sheets—Sheet 1.

J. RENSHAW.  
RATCHET DRILL.

No. 176,683.

Patented April 25, 1876.



Witness

*S. P. Wilder*  
*Jeremy W. Bly*

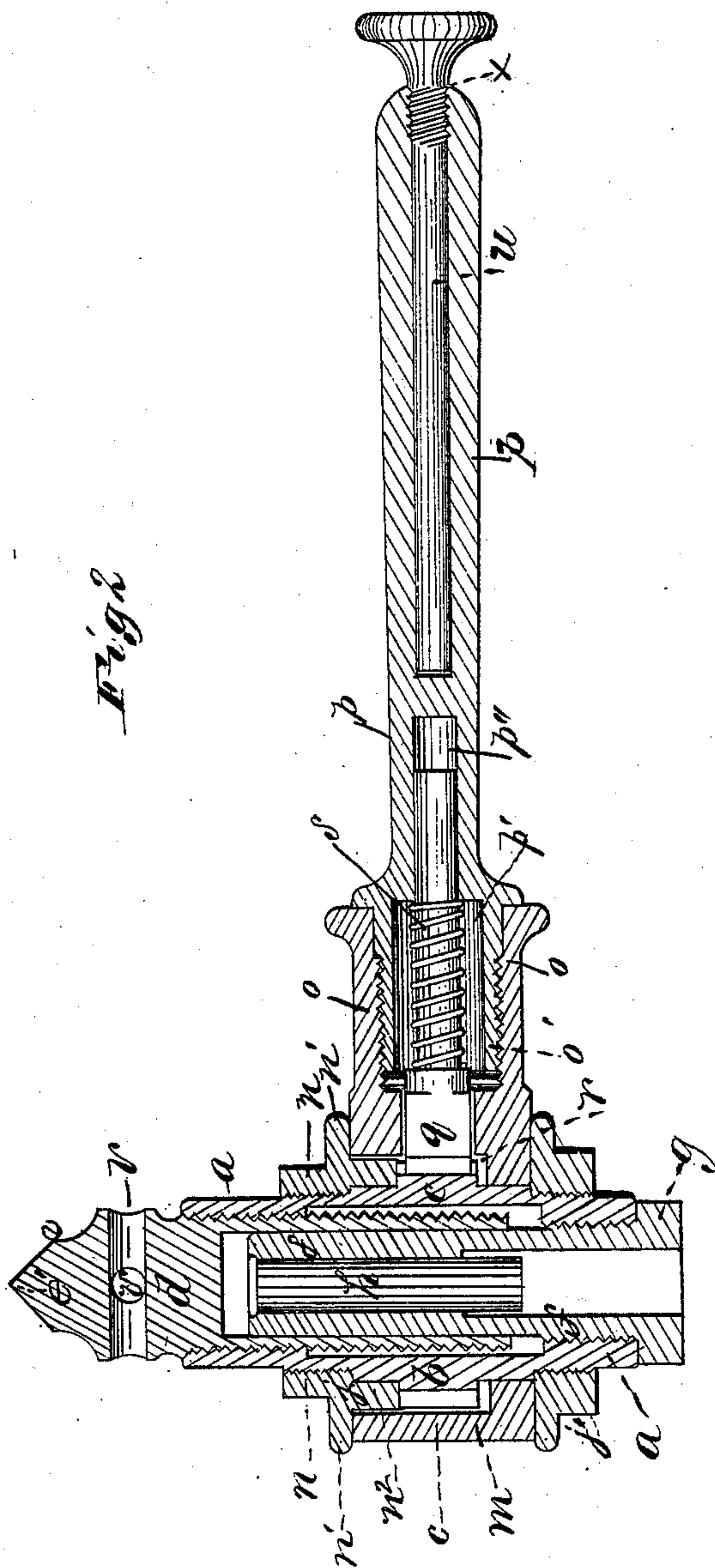
Inventor

*Joseph Renshaw*

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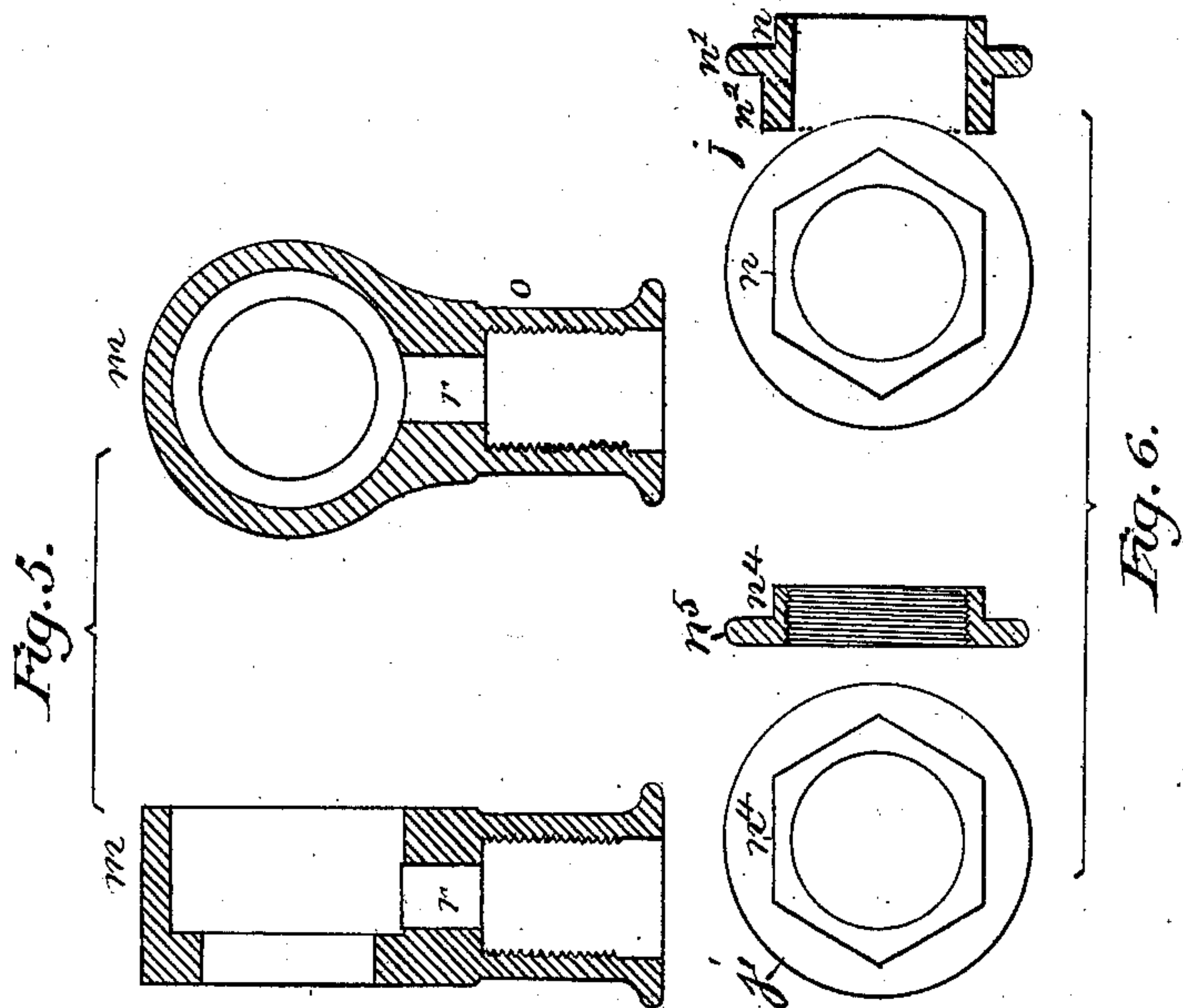
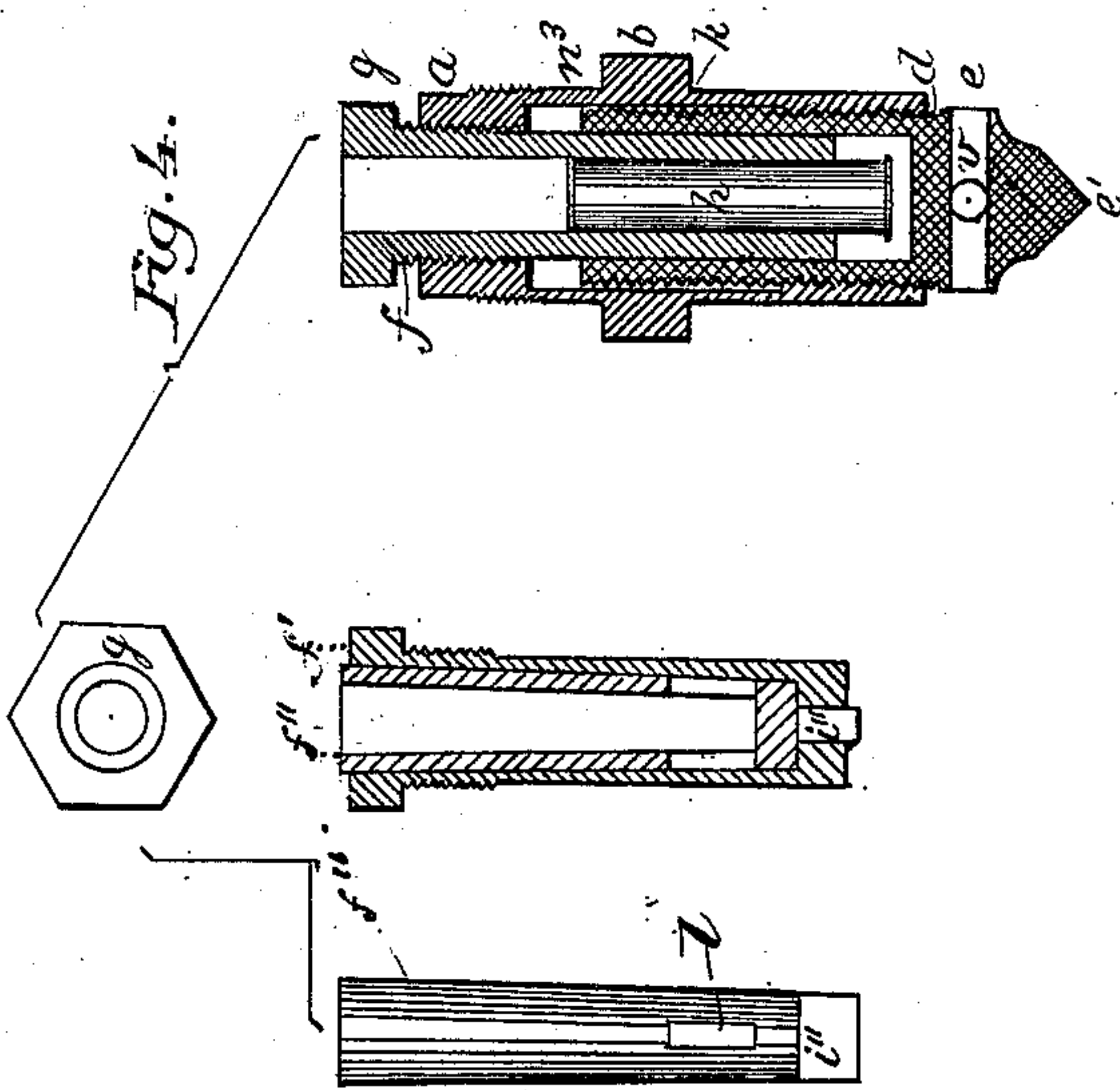
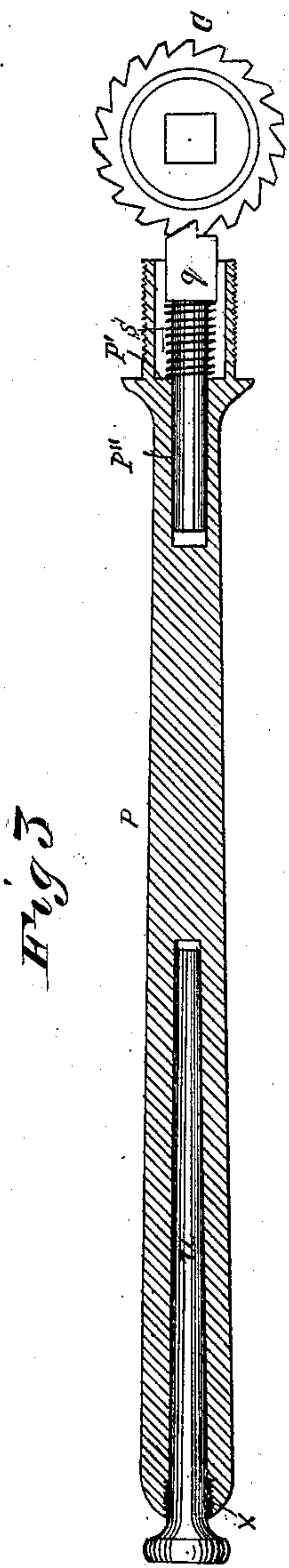
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Witnesses:  
S. F. Wilder -  
Jeremy W. Bly's

Joseph Renschaw  
Inventor:



# UNITED STATES PATENT OFFICE

JOSEPH RENSHAW, OF HARTFORD, CONNECTICUT.

## IMPROVEMENT IN RATCHET-DRILLS.

Specification forming part of Letters Patent No. **176,683**, dated April 25, 1876; application filed September 14, 1875.

*To all whom it may concern:*

Be it known that I, JOSEPH RENSHAW, of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Ratchet Drilling-Tools; and I do hereby declare that the following is a full, clear, and exact description thereof, whereby a person skilled in the art can make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Like letters in the figures indicate the same parts.

My invention relates to tools such as are usually used in drilling metal by hand in such positions as are not readily accessible to automatic machine-tools. In such cases the drill is inserted in a drilling tool or stock, which is turned intermittently by means of a lever and pawl operating a ratchet, while the drill is advanced by means of a feed-screw bearing against some resisting support.

The object of my invention is to provide a drilling-tool which shall occupy less space between the outer point of the feed-screw and the work to be drilled, so as to operate in more contracted and less accessible positions, and which shall be adapted to hold securely and work readily with drills of different forms and patterns in the part fitting into the drilling mechanism. It also has for its object providing a means for removing the drill from the stock readily and easily.

My invention consists in the construction and arrangement of the several parts of the mechanism of the ratchet drilling-tool, that will be hereinafter described.

In the accompanying drawings, on three sheets, Figure 1 is a side view of my improved drilling-tool, showing its exterior form and appearance with a drill inserted. Fig. 2 is a vertical longitudinal section through the middle of the tool, showing the interior parts of the drill-socket in the position they have when the drill is removed. Fig. 3 is a longitudinal horizontal section through the handle and ratchet mechanism. Fig. 4 shows details of the drill-socket and interchangeable parts, that will be hereinafter described. Fig. 5 shows a vertical and horizontal section of the ring or band to which the handle is attached,

and which fits and surrounds the rotating part of the mechanism. Fig. 6 shows an end and sectional view of the nuts which lie above and below the band to which the handle is attached.

*a* is a hollow spindle, forming the main body of the tool, to which the other parts are attached. Around this spindle is the ratchet-wheel *c*, formed upon an enlarged part or ring, *b*, near its middle. *d* is a hollow feed-screw, having an external thread, which works in a nut or internal screw-thread in the upper part of *a*. The head *e* of this feed-screw is provided with a point or center, *e'*, which presses against a support when the tool is in use, and upon which the screw is turned to advance the drill by means of a lever inserted in the holes *v*. *f* is a hollow tool-socket, screwed into the lower end of *a*, and fitting the interior chamber of the hollow feed-screw *d*. It is screwed into its place or removed by means of the polygonal head *g*. *h* is a sliding pin, fitting in the upper part of the socket *f*, which is intended to hold the tang of the drill. This pin has a narrow flange upon its upper end to prevent its falling out when the drill is removed.

When the drill is inserted in the socket, the pin is pushed inward in the position shown at *h* in Fig. 4, so that its end projects beyond the socket *f*. When it is desired to remove the drill, the feed-screw *d* is turned in until it strikes the pin *h*, and expels the tang of the drill from the socket. The pin *h*, instead of being a separate piece in the socket *f*, may be part of the tang of the drill, and be inserted and removed with it. In this case the tang would be of such a length that the pin would project a sufficient distance beyond the end of the socket to be acted upon by the head of the feed-screw, as shown at *h''*, Fig. 4.

*j* is a ring or collar upon the spindle *a*, forming the top of the groove in which the band *m* turns. This ring is shown in the drawings as screwed onto the spindle *a*; but it may be made in one piece with it, as it does not require to be removed.

*j'* is a similar ring or collar, between which and *j* the band *m* is held in place. This ring is attached to *a* by means of a screw-thread, as it requires to be attached after the band *m*



is in place. The collars  $j j'$  are provided with the polygonal heads  $n n^4$ , for applying a wrench to turn them.  $m$  is a band surrounding the spindle  $a$ , and having on one side the socket  $o$ , into which is screwed the handle  $p$ . In the end of the handle which enters this socket is the pawl  $q$ , which is actuated by the springs  $s$ , and passes through the opening  $r$ , so as to engage with the ratchet-wheel  $c$ . This pawl is of the bolt form, and slides in the opening  $r$ , and in the recess  $p''$  of the handle.  $u$  is a pin for operating the feed-screw  $d$ . It fits the holes  $v$ , and when not in use is retained in the end of the handle  $p$  by means of the screw-thread  $n$ .

For the purpose of adapting my improved drilling-tool to suit the different sizes and shapes of tangs which are to be found in the drills of different manufactures, drill-sockets of various internal form may be made to be interchangeably inserted in the spindle  $a$ . Two forms of socket are shown in Fig. 4 at  $f$  and  $f'$ . Or the drill-socket can be made to suit the largest size of tang used, with a collet or interior socket, whose exterior form is the counterpart of the tang of the largest size, and whose interior is of the form and size of the smaller tang. This arrangement is shown at  $f''$ , Fig. 4. The collet  $f''$  is placed upon the smaller tang, which makes it operate in the same manner as the larger, and it is forced out of the socket  $f'$  by means of the pin  $i'$  and the feed-screw  $d$  in the same way. The inner socket or collet is provided with a slot,  $i$ , to insert a wedge or other tool, for the purpose of withdrawing the tang of the drill lying within it. The drill-tangs fitting into the sockets herein described may be round or square, and of any desired taper. They can be held from turning either by friction, or by making some

part angular. The socket in  $f$  is supposed to be square, but might be of any other form. The socket in  $f'$  is supposed to be round and taper, with the part  $i''$  of a tenon form, to hold in an angular mortise in the end of  $f'$ . This, however, is not usually required.

The sockets  $f f'$  may also be set into the spindle  $a$ , so as to hold by friction instead of being screwed in, as described.

What I claim as my invention is—

1. The combination of the hollow externally-threaded feed-screw  $d$  and the hollow internally-threaded ratchet-spindle  $a$  with a drilling-tool, substantially as described.

2. The combination of the hollow externally-threaded feed-screw  $d$ , the hollow internally-threaded ratchet-spindle  $a$ , and an interior tool-holding socket, substantially as herein described.

3. The combination of the hollow externally-threaded feed-screw  $d$ , the hollow internally-threaded ratchet-spindle  $a$ , the collet  $f$ , pin  $h$ , and drilling-tool, substantially as described.

4. The combination of the hollow externally-threaded feed-screw  $d$ , the hollow internally-threaded ratchet-spindle  $a$ , a tool-holding collet or socket, and a drilling-tool, substantially as described.

5. The combination of the hollow feed-screw and the interior open-ended drill-socket, to expel the drill, substantially in the manner herein described.

6. The combination of the hollow internally-threaded ratchet-spindle  $a$ , the band  $m$ , with its socket  $o$ , the collars  $j j'$ , the lever  $p$ , and the pawl  $q$ , substantially as described.

JOSEPH RENSCHAW. [L. S.]

Witnesses:

S. I. WILDER,

JEREMY W. BLISS.