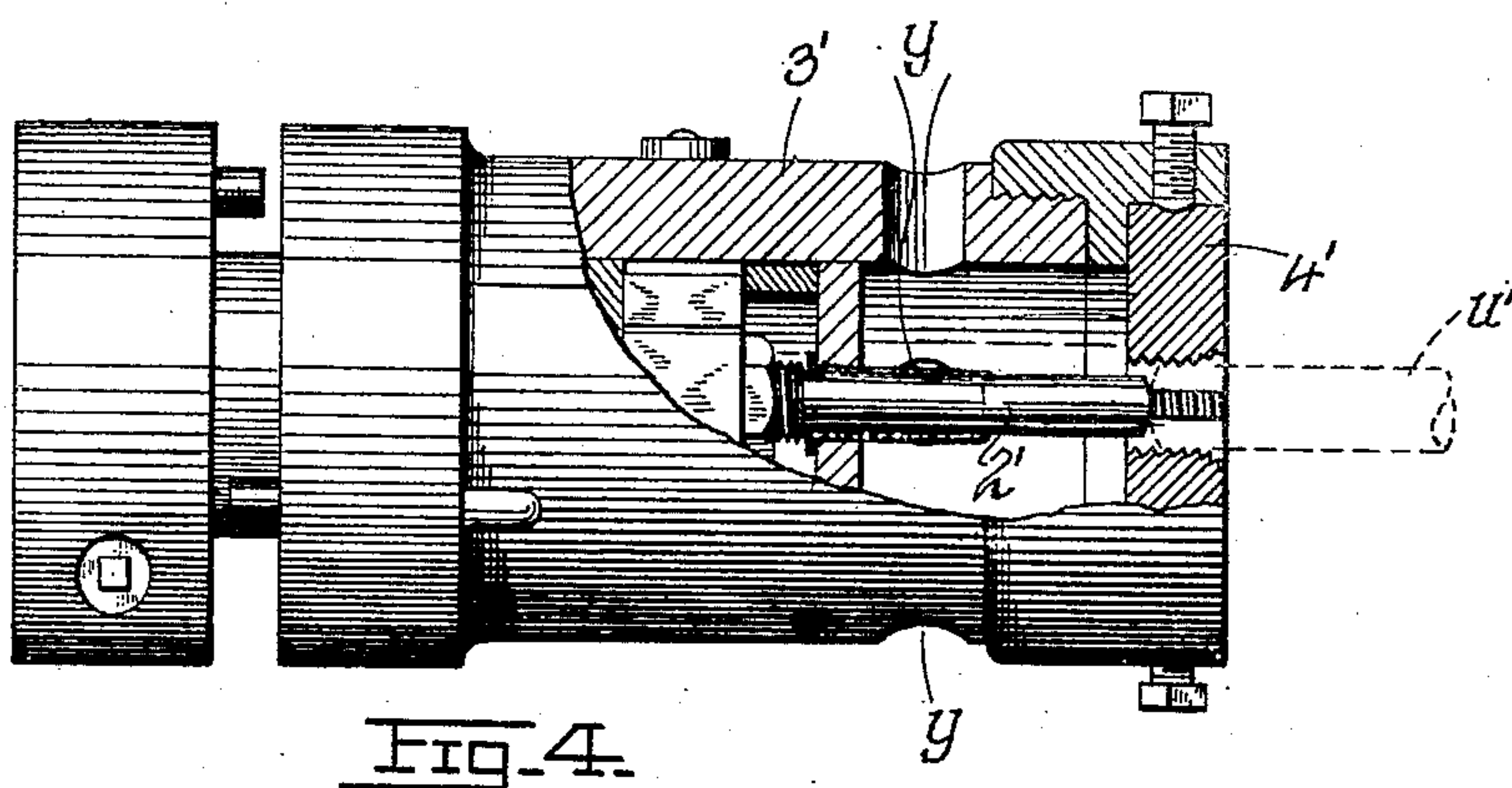
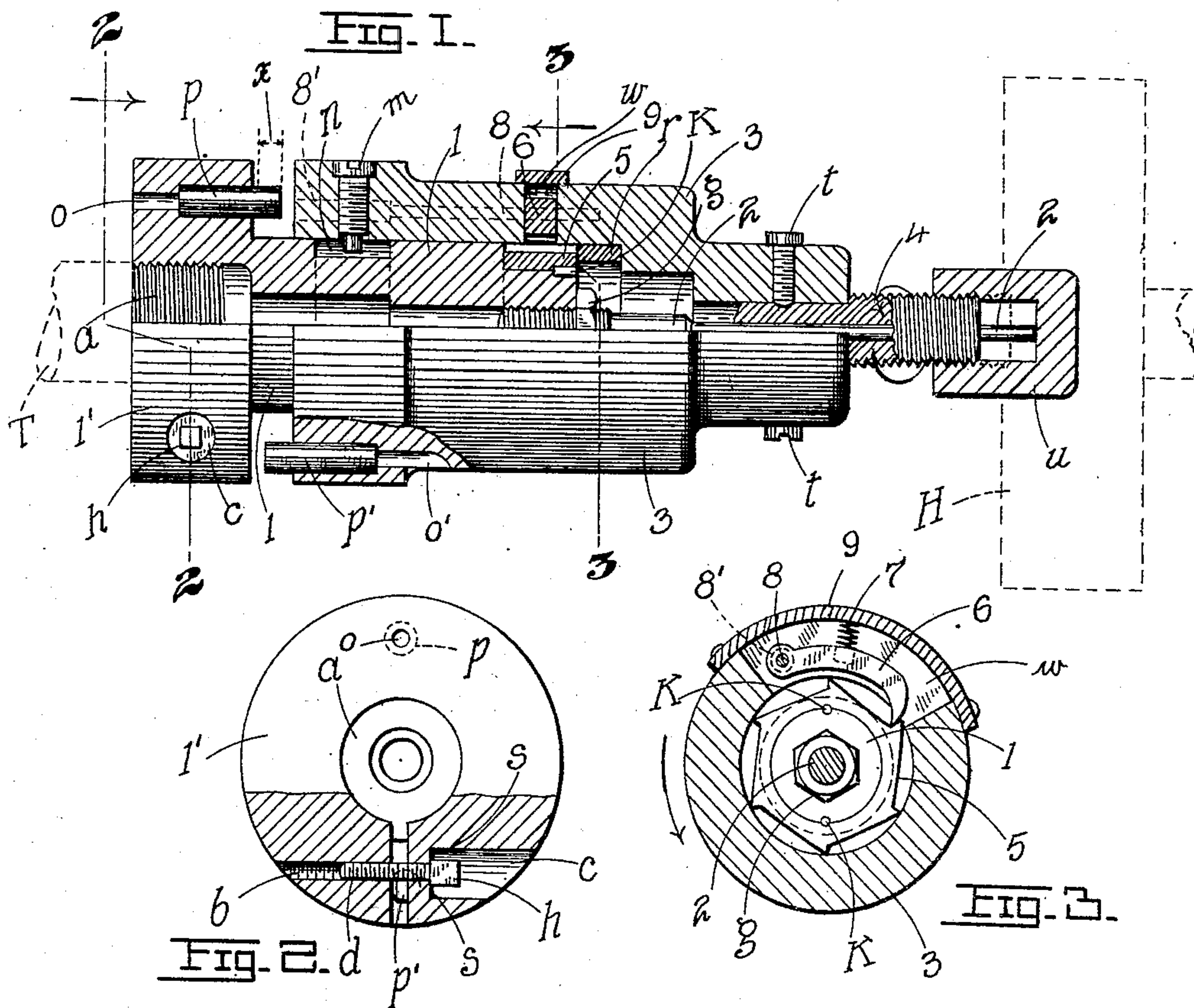


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TAPPING HEAD OR THREAD CUTTER.
APPLICATION FILED APR. 15, 1908.

915,201.

Patented Mar. 16, 1909.



WITNESSES:

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GEORGE A. MILLER AND LOUIS E. MILLER, OF ST. LOUIS, MISSOURI.

TAPPING-HEAD OR THREAD-CUTTER.

No. 915,201.

Specification of Letters Patent.

Patented March 16, 1909.

Application filed April 15, 1908. Serial No. 427,166.

To all whom it may concern:

Be it known that we, GEORGE A. MILLER and LOUIS E. MILLER, citizens of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Tapping-Heads or Thread-Cutters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

Our invention has relation to improvements in tapping heads or thread-cutters; and it consists in the novel details of construction more fully set forth in the specification and pointed out in the claims.

In the drawings Figure 1 is a combined longitudinal section and elevation of one form of our invention; Fig. 2 is a combined rear end view and cross section on the line 2—2 of Fig. 1; Fig. 3 is a cross section on the line 3—3 of Fig. 1; and Fig. 4 is a side elevation with parts broken away showing another form of our invention wherein a screw-cutting die is substituted for a tap.

The object of our invention is to construct a head or tap for cutting screw threads in caps, sockets, unions, couplings, on screws, bolts, and the like, the operation of which can be automatically terminated when the proper depth or length of the thread has been cut, the head or tap being so mounted that upon rotation in proper direction of the article operated on, the disengagement of the head or tap from the article may be effected, and the latter be removed from its mounting.

A further object is to construct a tool by means of which any depth or length of thread may be cut this result being effected by the proper adjustment of the member on the initial position of which the degree of advance of the tool or tap depends.

The advantages of the invention will fully appear from a detailed description thereof which is as follows:—

Referring to the drawings, and for the present to Figs. 1 to 3 inclusive, 1, represents a hollow tool-spindle having a base 1' provided with a screw-threaded socket *a* adapted to be screwed to the tail-piece T of a lathe, the cap, socket, or other article *u* in which the thread is to be formed being mounted to the rotating head-chuck H. To more effectively secure the base 1' to the part T, we preferably split the former and then tighten the parts by means of a screw *d*

provided with a square head *h* which may be operated by a wrench inserted into the socket *c*, the screw operating in a screw-threaded socket *b* on the opposite side of the split as best seen in Fig. 2. The head *h* rests on the shoulders *s, s* at the base of the socket *c*. Carried by the spindle 1 and secured preferably in any adjusted position thereon by screwing, is a pilot-pin 2, which when once adjusted is locked by a nut *g*.

Capable of a limited longitudinal movement on the spindle 1 and rotatable about the same is a sleeve 3 to one end of which is secured by means of screws *t*, the cutter or tap 4, the pilot-pin 2 passing freely through said cutter and normally projecting a suitable distance beyond the same. The degree of longitudinal movement of the sleeve 3 on the spindle 1 is determined by the width of the peripheral groove *n* formed on the spindle, suitable screw-pins *m* carried by the sleeve engaging the groove and preventing the sleeve from working or slipping off the spindle.

Projecting inwardly toward the sleeve and mounted in a socket in the base 1' of the spindle is a cylindrical pin *p*, a similar pin *p'* being mounted in a socket in the base of the sleeve and projecting toward the base 1' of the spindle. Upon removal of the sleeve from the spindle either pin may be forced out by tapping it with a suitable instrument inserted through the opening *o*, or *o'* of the spindle and sleeve respectively. The pins (or clutch devices) *p, p'*, project in opposite directions from their respective mountings to an extent such that when the sleeve is rotated sufficiently to bring the pin *p'* into engagement with the pin *p*, the pins will overlap a distance approximated by the line *x* (Fig. 1), so that while the pins are thus engaged they temporarily prevent rotation of the sleeve about the spindle; and rotation of the sleeve is only possible when the sleeve has been moved longitudinally a sufficient distance to bring the path of rotation of the pin *p'* out of range of the pin *p*, a distance just a little more than the length of their normal overlap represented by the line *x*.

Housed in the chamber of the sleeve 3 at the forward end thereof is a packing ring *r* against which abuts (during the feeding operation) the adjacent end of a ratchet-disk 5 secured by keys *k* to the reduced forward end of the spindle, the teeth of the ratchet disk being engaged by a pawl 6 under

the action of an expanding spring 7, the pawl being pivoted to the stem 8 of a screw 8' passed into the sleeve, the pawl and spring being housed in a cavity or pocket *w* formed in the sleeve, and closed by a cover plate 9 against which the outer end of the spring bears.

The operation of the device is as follows:—

The spindle 1 being attached to the tail piece or carriage T, is advanced longitudinally toward the cap (or other article) *u* which is being rotated by the head-chuck H to which it is secured. In such longitudinal advance the spindle 1 bears against the ring *r* of the sleeve advancing the latter and the tap 4 toward the cap. The moment the tap 4 grips the rotating cap *u*, the latter gives the sleeve a partial rotation in the same direction (see arrows Figs. 1 and 3), the pawl 6 riding over the teeth of the ratchet 5, such rotation of the sleeve being arrested by the pin *p'* striking the side of the pin *p*. From this moment, the tap 4 continues to cut into the cap, the latter all the time rotating, until the free end of the pilot pin 2 strikes the base of the cap, whereupon further advance of the spindle is arrested. Since however the sleeve cannot rotate by reason of the locked position of the pins *p*, *p'*, it follows that a further rotation of the cup *u* will draw the tap 4 farther into the cavity of said cap, to a point represented by the dotted line in the cap *u*, Fig. 1, by which time the pin *p'* has slipped off the pin *p* (having traversed a distance slightly in excess of the line *x*). The moment however, that the pin *p'* is free from the intercepting or locking influence of the pin *p*, the sleeve is free to turn on the spindle 1, and thus turns in unison with the cap *u*. Of course the moment the sleeve with its tap 4 turns as a unit with the cap *u*, no further cutting is possible, as no farther advance of the tap 4 into the cap can take place. The thread being thus cut to the required depth the operator by the proper manipulation of the belt shifter (not shown) reverses the rotation of the chuck H and the cap *u*, such reverse rotation reversing the rotation of the sleeve until the pawl 6 engages the first available tooth of the ratchet 5 whereupon the sleeve is arrested in its rotation, and, as the cap continues to rotate in such opposite

direction, it follows that the tap 4 with its sleeve, and the spindle 1 will be forced away from the cap, until the tap is finally ejected whereupon the threaded cap may be removed from the chuck. The cap *u* in its rotations acts as a nut, the tap acting as a screw-bolt, and it follows of course that as the nut turns in one direction or the other, the screw-bolt will move longitudinally in proper direction to respond to such rotations of the nut. The depth of the thread cut may of course be regulated by a proper adjustment of the pilot pin 2, which is used for arresting the longitudinal movement of the spindle at any predetermined point of the travel of the latter.

Where it is desired to cut a thread on a screw *u'*, we use the modified form shown in Fig. 4, wherein a die 4' is substituted for the tap 4, the pin 2' serving as the arresting member by coming in contact with the stock *u'*. The cuttings drop through the openings *y* formed in the sleeve 3'. In other respects the two devices are similar. The term "cutter" in the claims may represent a tap or die, or any cutting tool whatsoever.

Having described our invention what we claim is:—

1. In combination with a tool-spindle, a longitudinally movable sleeve rotatable about the spindle, clutch devices on the sleeve and spindle adapted to be engaged and disengaged by the longitudinal movement, a perforated threading cutter secured to the sleeve, and a pilot pin secured to the spindle adapted to engage the article and arrest further relative advance of the spindle and article.

2. In a thread cutter, a spindle, a longitudinally movable sleeve rotatable about the spindle, a perforated threading tool on the sleeve, a pilot pin secured to the spindle and passing freely through said tool, and means for locking the sleeve to the spindle during the cutting and disengaging movements of the tool.

In testimony whereof we affix our signatures, in presence of two witnesses.

GEORGE A. MILLER.
LOUIS E. MILLER.

Witnesses:

EMIL STAREK,
FANNIE E. WEBER.