

No. 670,531.

Patented Mar. 26, 1901.

G. H. BURLEY.
EXPANDING TAP.

(Application filed Aug. 16, 1900.)

(No Model.)

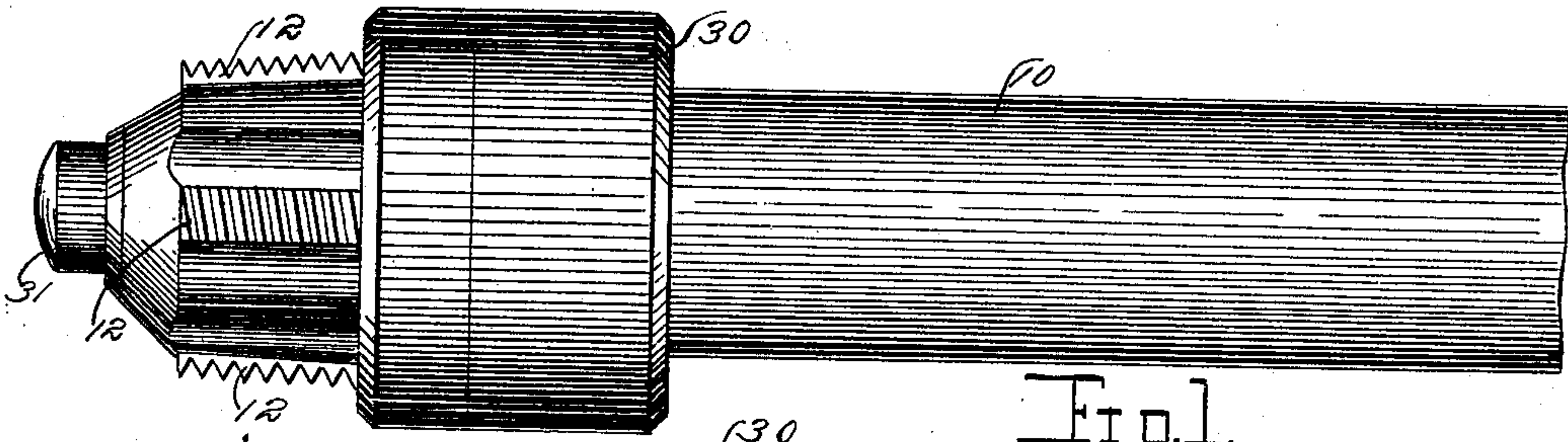


Fig. 1.

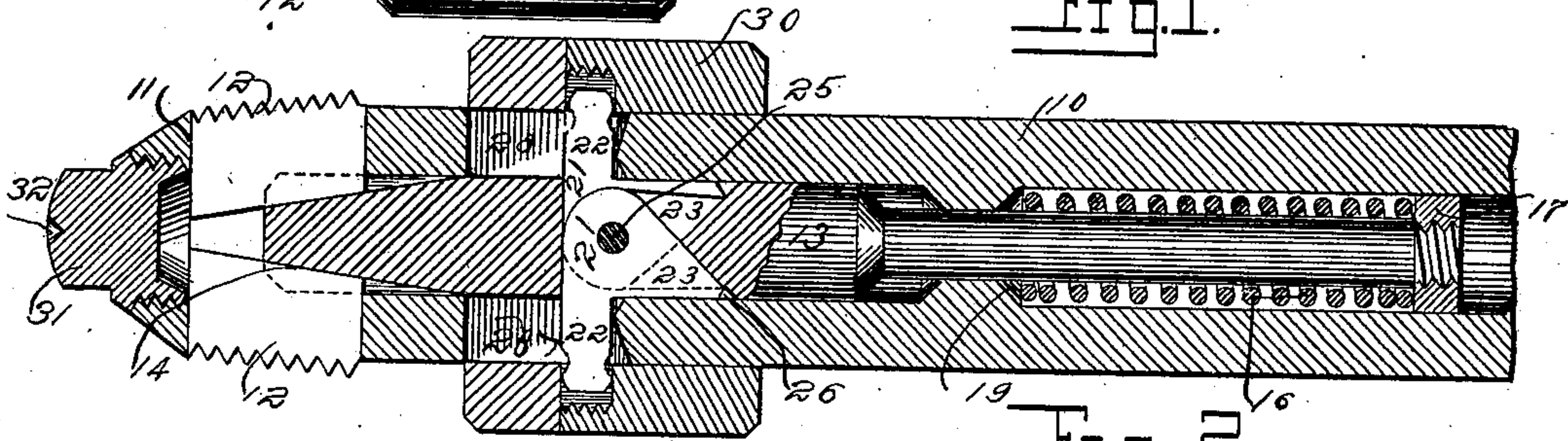


Fig. 2.

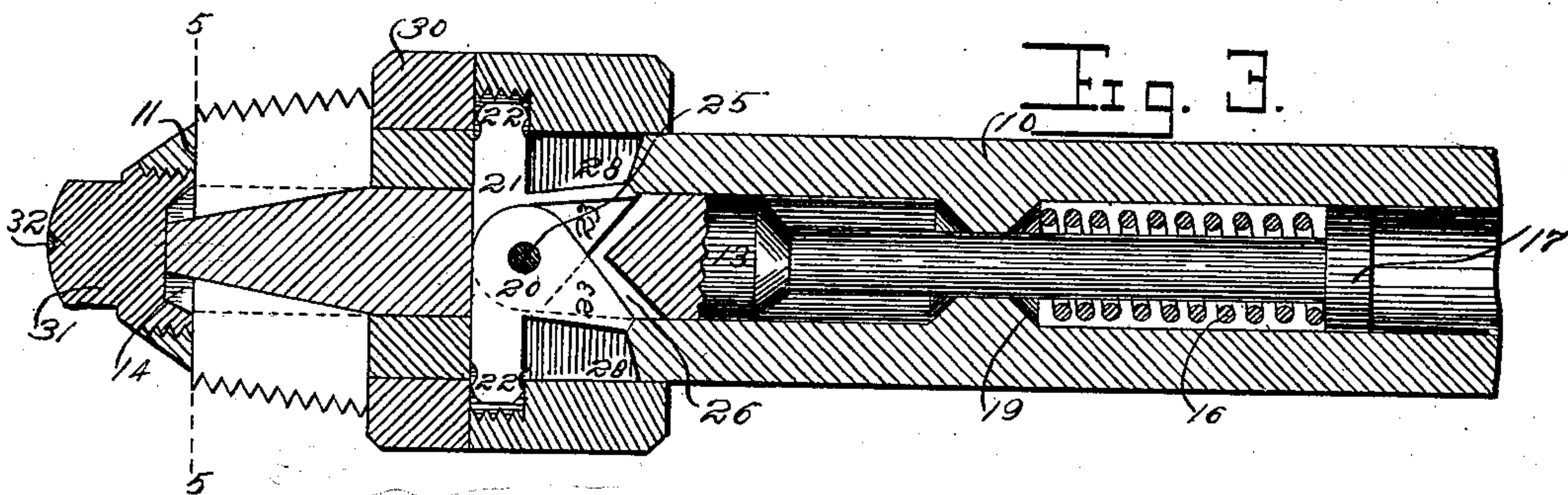


Fig. 3.

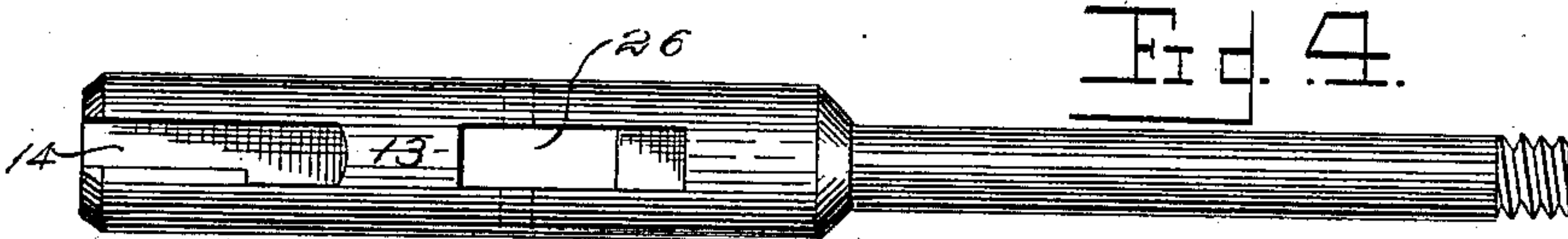
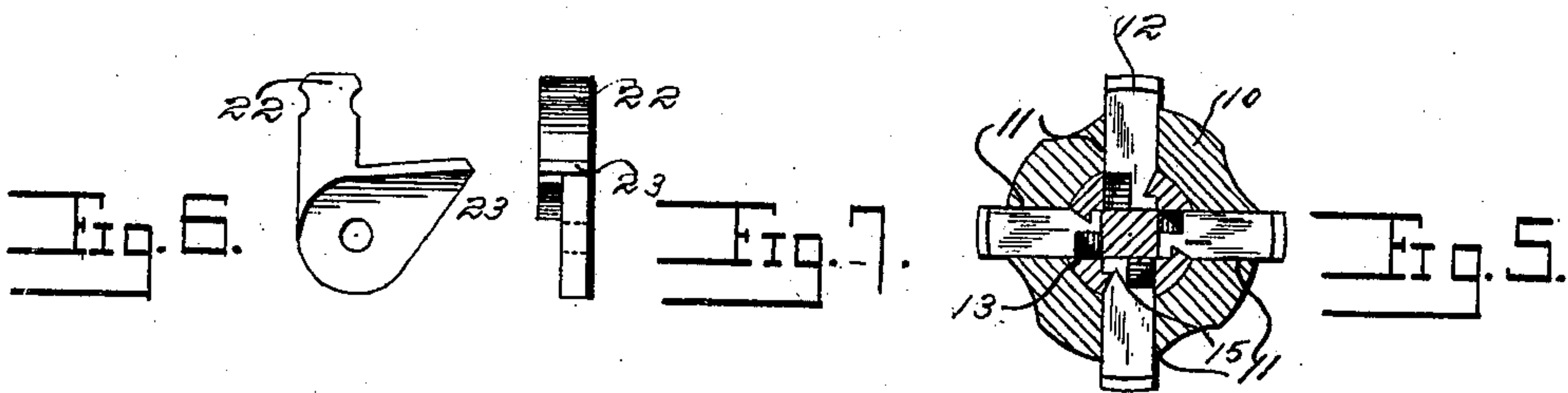


Fig. 4.



Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE H. BURLEY, OF TYRONE, PENNSYLVANIA.

EXPANDING TAP.

SPECIFICATION forming part of Letters Patent No. 670,531, dated March 26, 1901.

Application filed August 16, 1900. Serial No. 27,080. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. BURLEY, a citizen of the United States, residing at Tyrone, in the county of Blair and State of Pennsylvania, have invented a new and useful Automatic Tap, of which the following is a specification.

This invention relates to taps for cutting interior threads; and it has for one object to provide a device wherein the cutters will be adjustably mounted whereby they may be projected from the body portion of the tap when a thread is to be cut and may be withdrawn from the threads after they are cut, so that the tap may be removed without necessitating reverse rotation thereof.

Further objects and advantages of the invention will be evident from the following description.

In the drawings forming a portion of this specification, and in which like numerals of reference indicate similar parts in the several views, Figure 1 is a side elevation showing the complete tool with the cutters projected ready for operation. Fig. 2 is a longitudinal section of the tool with a portion of the plunger in elevation and showing the plunger retracted to withdraw the cutters. Fig. 3 is a view similar to Fig. 2 and showing the plunger in the forward position with the cutters projected. Fig. 4 is a side elevation of the plunger which operates the cutters. Fig. 5 is a section on line 6 6 of Fig. 3. Fig. 6 is a side elevation of one of the locking-pawls. Fig. 7 is an edge view of a locking-pawl.

Referring now to the drawings, the tool comprises a tubular body portion 10, adjacent one end of which are formed equidistant radial slots 11, communicating with the bore of the body portion, and in these slots are slidably-disposed cutters or bits 12, which are adapted for radial movement to project beyond the periphery of the body to cut a thread and may be withdrawn inwardly to move them from the threads they have cut, so that the tool may be lifted from the threaded hole without necessitating backing of the tool.

In order to move the cutters in the manner described, a plunger 13 is inserted in the tubular body portion, this plunger entering be-

tween the cutters and having key-slots 14, formed longitudinally thereof, the bases of the slots being disposed convergingly toward the extremity of the plunger. The inner ends of the cutters are formed to fit the key-slots, as shown at 15, and their rear edges are cut at an angle corresponding to the convergence of the key-slots, whereby when the plunger is moved longitudinally into and out of position between the cutters the cutters will be forced outwardly and drawn inwardly, the plunger having a wedge action in its forward movement.

In order to hold the plunger normally retracted and the cutters at the same time withdrawn into the body 10, a helical spring 16 is disposed upon the reduced rear end of the plunger and rests at one end against a radial flange 17 at the rear end of the plunger, while its opposite end rests against an inwardly-directed flange or shoulder 19 on the interior of the body, the flange 17 being in the form of a nut, as shown, to permit assembling of the parts.

In order to hold the plunger in its forward position, at which time it holds the cutters projected in their operative positions, a locking device is provided, and this device comprises two pawls 20 and 21, each of which includes two members 22 and 23, lying at right angles to each other, said pawls being mounted upon a common pivot 25 in a transverse slot 26, formed through the plunger, while the members 22 of the pawls, which are in the form of radially-extending arms, project outwardly through the slot 26. The arms or members 22 engage slots 28, formed through the body portion 10 and extend beyond the outer periphery of the body, the extremities of the arms engaging in recesses in the inner periphery of a two-part sleeve 30, which is slidably mounted upon the body 10. The helical spring 16 tends to hold the plunger normally where the portions 23 of the pawls will lie within the inclosure of the body 10, and when the plunger is moved forwardly to a proper extent the arms 22 may be manipulated to move the pawls pivotally to carry the portions 23 outwardly and into the slots 28. If the plunger be then released, the ends of

the portions 23 of the pawls will be brought to lie against the lower ends of the slots 28, and the plunger will be held in position with the cutters projected.

5 The plunger is moved forwardly by means of the sleeve 30, which by its action upon the arms 22 moves the pawls pivotally to engage them with the slots 28. When the plunger is to be released to permit the spring 16 to
10 retract it and withdraw the cutters from their projected or operative positions, the sleeve is moved rearwardly of the body 10, the effect of which is to operate the arms 22 and to draw the portions 23 from the slots 28, when the
15 spring may act.

The forward end of the body 10 is interiorly threaded, as shown, and engaged therewith is a plug 31, the inner end of which is recessed to receive the outer end of the plun-
20 ger when the latter is moved forwardly to its limit. This plug serves also to clamp the cutters rigidly when they are to be returned for sharpening or in the original manufacture of the cutters, the plug having a center 32
25 formed therein, as shown.

It will be understood that in practice various modifications of the specific construction shown may be made and that any suitable materials and proportions may be used for the
30 various parts without departing from the spirit of the invention.

In the practical operation of this tool after the cutters have passed fully into the hole to be threaded the sleeve strikes against the
35 material at the edge of the hole, after which further inward movement of the cutters acts to press the sleeve rearwardly to operate the locking-pawls to disengage them from the body of the tool, when the spring moves the
40 plunger and retracts the cutters. The tool may be then lifted from the hole.

What is claimed is—

1. A device of the class described comprising a body portion cutters slidably mounted
45 in the body for movement radially thereof for projection and retraction, a plunger connected with the cutters and adapted for movement therebetween to project the cutters, means for holding the plunger normally re-
50 tracted to hold the cutters withdrawn, means for moving the plunger to project the cutters, and means operable by the moving means for locking the plunger in its forward position to hold the cutters projected.

55 2. A device of the class described comprising a body portion having cutters mounted therein for movement into and out of operative position, a plunger connected with the cutters for projecting and withdrawing,

means for moving the plunger, and locking 60 mechanism operable by the moving means to hold the plunger against movement.

3. A device of the class described comprising a body portion having cutters mounted therein for movement into and out of opera- 65 tive position, a plunger connected with the cutters for projecting them and withdrawing them, means for holding the plunger normally and yieldably in its retracted position, means for moving the plunger against the 70 tendency of said holding means to project the cutters to their operative positions, and locking mechanism operable by said moving means for locking the plunger with the cutters projected and for unlocking the plunger 75 to permit it to move to its normal position.

4. A device of the class described comprising a body portion having cutters mounted therein for movement into and out of opera- 80 tive position, a plunger connected with the cutters for projecting and withdrawing them, means for holding the plunger normally in position to hold the cutters retracted, pawls carried by the plunger and adapted for en- 85 gagement with the body to hold the plunger at times in its forward position, said pawls having arms extending exteriorly of the body, and a sleeve upon the body and connected with the arms, said sleeve being movable 90 longitudinally of the body to move the plunger and operate the pawls to engage and disengage the body.

5. A device of the class described comprising a body portion having cutters mounted therein for movement into and out of opera- 95 tive position, a plunger in the body portion and having connection with the cutters to project and withdraw them, a spring connected with the plunger for holding it normally in position with the cutters withdrawn, pawls 100 pivoted in the plunger and adapted for engagement with the body to hold the plunger with the cutters projected, said pawls having radially-projecting arms lying in slots in the 105 body and extending beyond the outer periphery of the body, a sleeve slidably mounted on the body and engaged with the arms for moving the plunger and operating the pawls, and means for engagement with the cutters at 110 times to hold them against movement.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

GEORGE H. BURLEY.

Witnesses:

F. J. GATES,
C. O. TEMPLETON.