No. 826,610. PATENTED JULY 24, 1906.

W. RICHMOND.

THREADING DIE.

APPLICATION FILED NOV. 22, 1904.

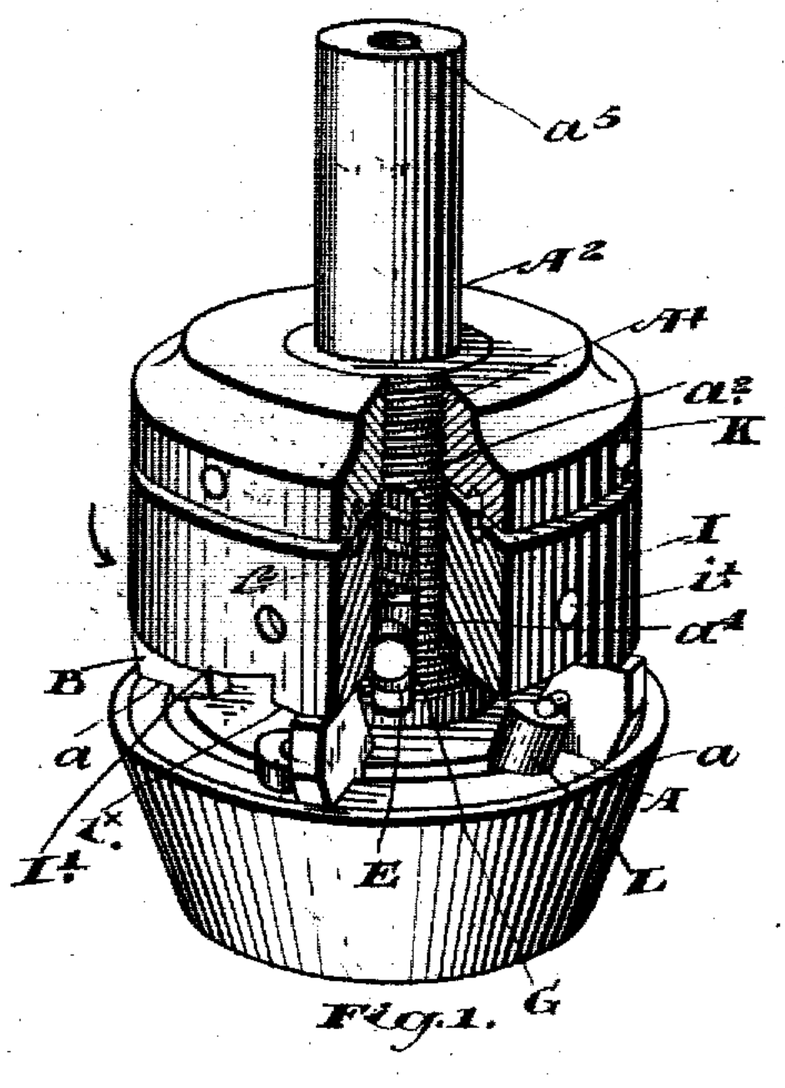

Fig. 1.

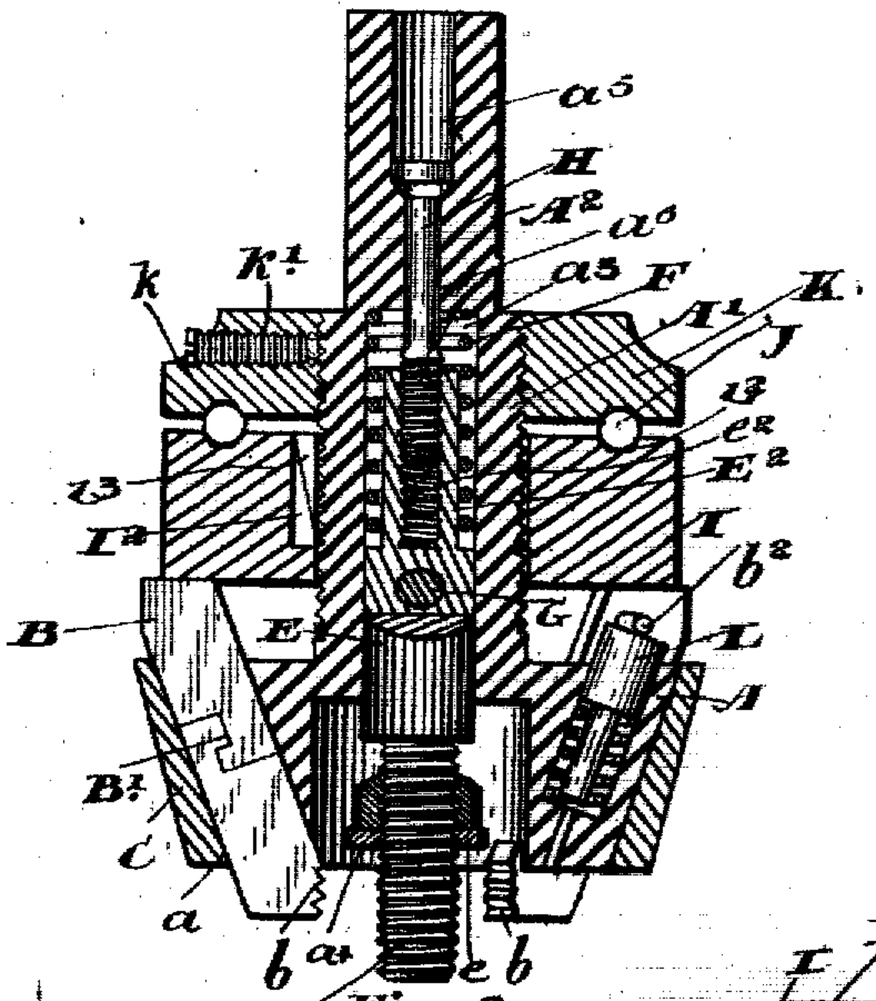

Fig. 2.

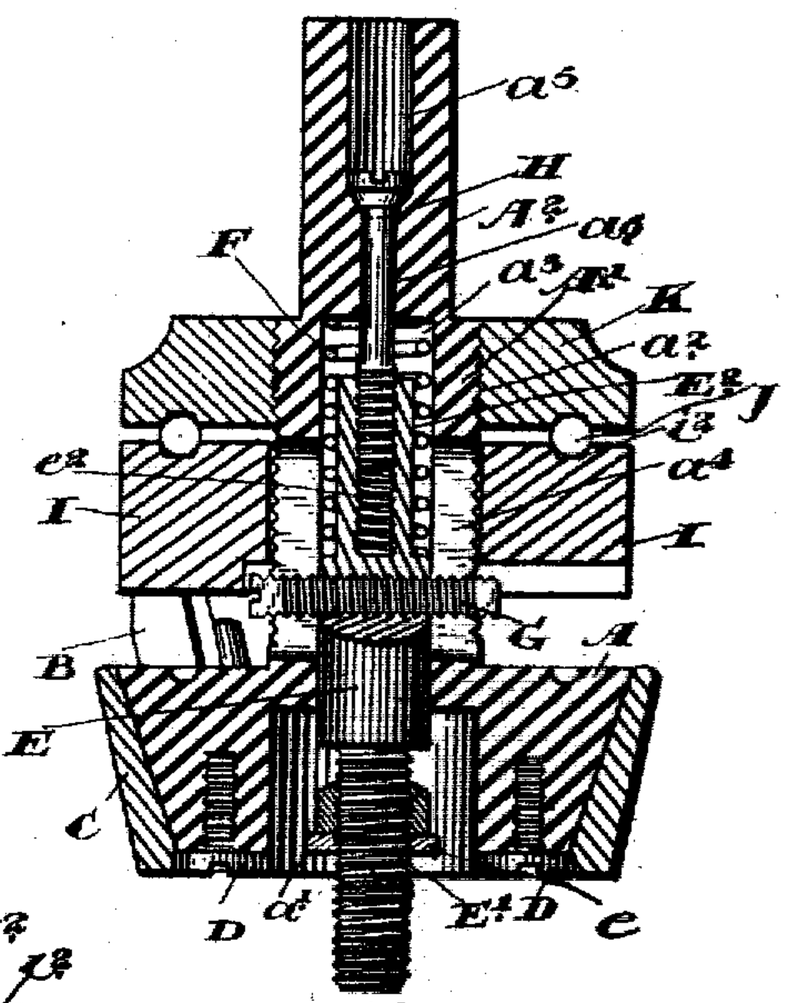

Fig. 3.

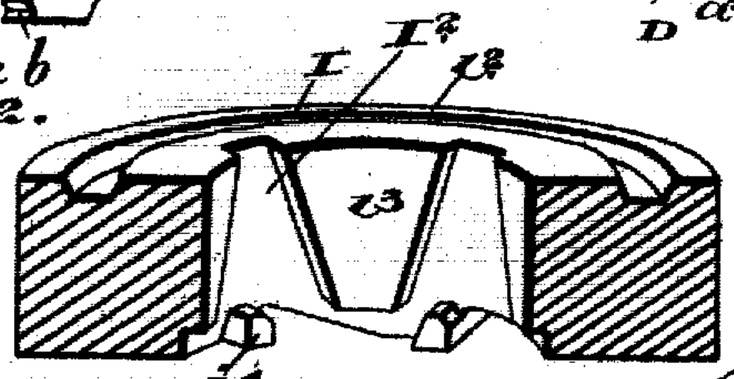

Fig. 4.

Witnesses.
W. B. Sheffield
A. L. Bate

Inventor:
Wm. Richmond.
by Fred. B. Tibbitts & Co.
Atty

UNITED STATES PATENT OFFICE.

WILLIAM RICHMOND, OF LONDON, CANADA.

THREADING-DIE.

No. 826,610. Specification of Letters Patent. Patented July 24, 1906.

Application filed November 22, 1904. Serial No. 233,838.

To all whom it may concern:

Be it known that I, WILLIAM RICHMOND, of the city of London, in the county of Middlesex, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Threading-Dies, of which the following is a specification.

My invention relates to improvements in dies for threading pipes, cylindrical caps, studs, pins, bolts, &c.; and the object of the invention is to devise a holder for the dies by which the length of the thread may be accurately gaged and the dies withdrawn after a determinate movement without reversing the driving-shaft; and it consists, essentially, of a die-holder provided with an enlarged body and reduced shank, slots in the body to receive the dies, and a holdfast-ring on the exterior of the body and screws in the face of the body for holding the ring in position, a spring-pressed plunger provided with a cross-pin extending into slots in the shank of the die-body, and an outer threaded end provided with an engaging nut, a spring surrounding the inner end of the plunger, a central adjusting-screw extending into a threaded hole in the inner end of the plunger, a collar adjustably secured on the shank, a supplemental collar located between the body of the die-holder and the aforesaid collar and provided with a face-ratchet designed to coact with the ends of the dies, and internal substantially V-shaped grooves designed to coact with the pin extending through the plunger, so as to turn the collar and bring the face-ratchet into position to release the dies, the parts being otherwise constructed and arranged in detail as hereinafter more particularly explained.

Figure 1 is a perspective view, partially in section, of my die-holder complete. Fig. 2 is a longitudinal section through the die-holder. Fig. 3 is a longitudinal section, and Fig. 4 is a sectional perspective detail of the adjustable collar whereby the dies are operated and withdrawn.

In the drawings, like letters of reference indicate corresponding parts in each figure.

The holder which I shall now describe is designed for application to an appropriate part of a machine, as the spindle of a lathe or the turret thereof.

A is the die-body, which is provided with slots *a* and in which are located the cutting-dies B. It will be noticed that the die-body is tapered and the slots correspondingly so, in order to receive the dies B, which are retained in position by a ring C, held in place on the tapered die-body by the screws D.

The die B is provided with the usual cutting end *b* and is preferably made in two parts connected together by a lock-joint B′, substantially as shown, the advantage being that when the lower portion of the die is worn it may be replaced.

The body A is provided with a central orifice a' and a shank A′, having a reduced end A^2. The shank A′ is provided with the external thread a^2 and has a central orifice a^3, as indicated, and diametrically-arranged slots a^4.

E is a central plunger fitting the orifice a^3 and provided with a reduced lower threaded end E′, having a gaging-nut *e*, as indicated, such gaging-nut being designed to limit the movement of the dies in cutting the pipe, or, in other words, to determine the length of the thread.

The plunger E has a reduced upper end E^2, and between the shoulder on the plunger formed by this reduced end and the top of the orifice a^3 and encircling the plunger extends a spiral spring F.

G is a screw-pin which extends through the plunger intermediate of its length and through the slots a^4. a^5 is an orifice having a reduced lower end a^6, such orifice being made in the shank, as indicated, and extending down to the orifice a^3.

H is an adjusting-screw, which fits into the orifices a^5 a^6 and extends into a threaded orifice e^2 in the plunger. By means of the adjusting-screw H the position of the plunger, and consequently the screw-pin G, may be varied for a purpose which will hereinafter appear.

I is a collar which fits the shank A′ and is provided with a face-ratchet on the bottom face designed to abut the end of the die B. The collar I may be adjusted by means of a spanner designed to operate in the holes i'. The collar I is provided with an annular raceway i^2 to receive the balls J, which reduce the friction between the collars I and K, which latter collar is also provided with an annular raceway *k*, into which the balls extend. The collar K is screwed on the upper threaded end of the shank and may be adjusted by a spanner and fastened in any desired position by a suitable set-screw k'.

In the face-ratchet I′ there are as many teeth as dies B, and in case a tapered thread

is designed to be made the ends of the teeth are beveled off, as at $i^{\times}$. The dies B normally abut the crown of the teeth of the face-ratchet I', being held in position against the same by spring-pressed plungers L, abutting the laterally-extending pins b^3, fixed in the upper end of the dies B.

The collar I is provided with an internal bore having formed therein the substantially reverse V-shaped recesses I^2, which are formed between the major projecting portions i^3 and the minor projecting portions i^4.

By adjusting the plunger E vertically the pin G is brought into the proper operative position circumferentially opposite the projecting portions i^4 and at the left hand of the same. (See Fig. 4.)

The diametrical distance of the cutters from each other is regulated by adjusting the collars K and I and the plunger E so as to bring the pins G into proper operative position, the farther up the collars being raised the greater being the diameter which the tool will cut, and vice versa.

As the holder with the dies is caused to move onwardly onto the pipe or other article operated upon the pin G at about the limit of the movement contacts with the side of the V-shaped recess I^2, and thereby forces the collar in the direction indicated by arrow, thus bringing the face-ratchet I' around until the dies B come opposite the bases of the ratchet-teeth, when the spring-pressed plunger forces the dies outwardly into the base of the teeth and the dies withdrawn from the cutting position.

If the article to be cut is tapered, I provide a beveled end $i^{\times}$ to each tooth, which allows of the dies to pass gradually outwardly and be withdrawn from the work, thus necessarily following the taper.

To restore the collar in the proper operative position, so as to bring the crown upon the top of the dies again, it is simply necessary to turn the collar I around by a spanner.

It will now be seen that my invention is simple and efficient to attain the result desired.

What I claim as my invention is—

1. The combination with the tapered die-body provided with a central orifice and the dies inclinedly set, and the shank of the die-body having an orifice extending up into the same from the orifice in the die-body and diametrical slots a^4 and the plunger fitting in the orifice in the shank and the pin extending through the plunger and the slots a^4, of the collar provided with a face-ratchet engaging with the dies and internal V-shaped recesses with which the pin is designed to coact and means for preventing longitudinal movement of the collar as and for the purpose specified.

2. The combination with the tapered die-body provided with a central orifice and the dies inclinedly set, and the shank of the die-body having an orifice extending up into the same from the orifice in the die-body and diametrical slots, and the plunger fitting in the orifice in the shank and the pin extending through the plunger and diametrical slots, of the collar provided with a face-ratchet engaging the dies and internal V-shaped recesses with which the pin is designed to coact, means for preventing longitudinal movement of the collar and means located within the die-body and operating against the dies to force the same against the ratchet-face of the collar as and for the purpose specified.

WILLIAM RICHMOND.

Witnesses:
J. E. DOBIE,
T. H. LUSCOMBE.