S. W. Putnam Jr.,

Screw Cutting Mach.

No. 111,248. Patented Jan. 24. 1871.

Fig. 1.

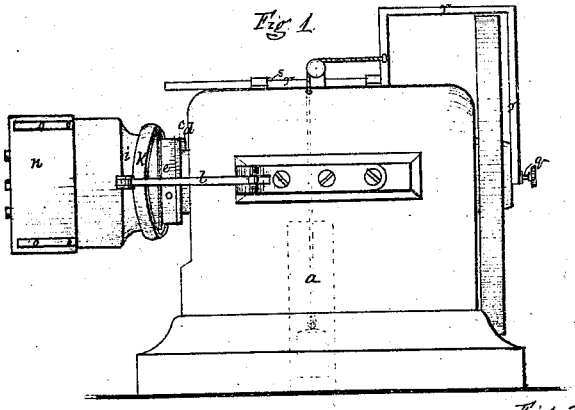


Fig. 3.

Fig. 2.

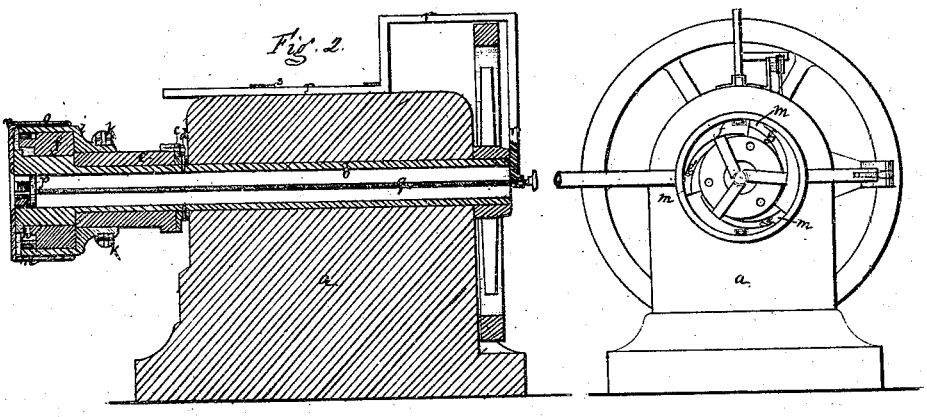


Fig. 5.

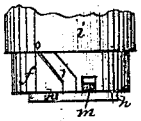


Fig. 4.

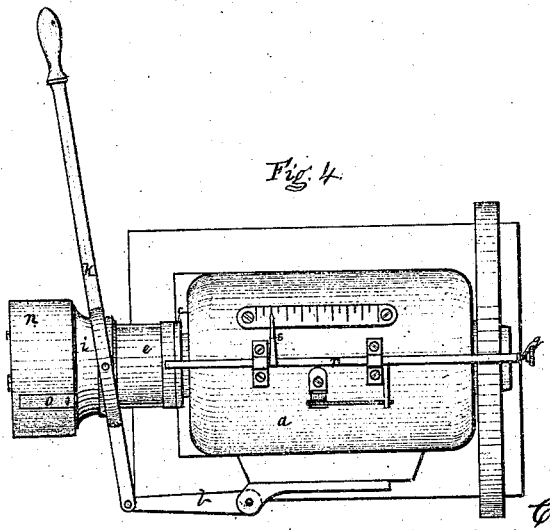
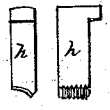


Fig. 6.



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SALMON W. PUTNAM, JR., OF FITCHBURG, MASSACHUSETTS.

Letters Patent No. 111,248, dated January 24, 1871.

IMPROVEMENT IN MACHINES FOR CUTTING SCREW-THREADS ON BOLTS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, SALMON W. PUTNAM, JR., of Fitchburg, Worcester county, State of Massachusetts, have invented certain new and useful Improvements in Screw-bolt Threading-Machines; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

This invention relates to details in the construction of that class of machines in which the bolt to be screw-threaded is held from rotation, but is allowed to advance toward and retreat from the screw-thread-forming dies which are made to rotate.

The drawing shows of my improved machine, in—

Figure 1, a side view; in

Figure 2, a vertical central longitudinal section; in

Figure 3, a front-end view with the front cap *n* removed; in

Figure 4, a plan; and in

Figure 5, a plan of the portion of the front end of the hollow rotating spindle which carries the screw-thread-cutting dies.

a is the head or standard, in which is formed a pipe-box, which receives a hollow arbor, *b*, to the rear of which is attached the wheel or pulley, which, by a belt or other suitable means, causes rotation of the arbor.

On the arbor, at the front of the head *a*, is fixed a collar, *c*, to which, by means of a screw, *d*, passing through a slotted hole in the collar, is adjustably attached a sleeve, *e*, which is so fitted on the arbor *b* that it can be turned thereon, when the clamp-screw *d* is loosened, by application of a lever or wrench in the holes made at the rear of *e* for that purpose.

On the front end of the arbor *b* is fitted, so as to turn freely thereon, a ring, *f*, on the periphery of which are formed two grooves, one of which is seen most clearly in fig. 5, each of said grooves being inclined to the axis of arbor *b*, except for a short distance from the front of the ring, where the grooves are made parallel with said axis.

Into the material of ring *f* are cut cam-grooves, seen in fig. 3 and marked *g*, the purpose of which is to receive projections on the dies *h*, which fit in slots made in the front end of arbor *b*, so that, by turning ring *h*, the dies can be forced toward and drawn from the center of the arbor.

To impart a turning motion to the ring *f* a sliding cylindrical piece, *i*, is splined to the sleeve *e*, so that it can slide freely thereon without turning, said piece *i* having fixed to it pins or rolls which fit in the grooves before mentioned in the periphery of ring *f*, which grooves are marked *j*.

In the rear of piece *i* is made a groove concentric with the arbor *b*, in which groove is fitted, in halves, a ring, to which the lever *k* is pivoted, said lever surrounding said ring, and being fulcrumed to a link, *l*, pivoted to the head *a*, so that it will now be obvious how, when the operator vibrates lever *k*, that the piece *i* is reciprocated, and that such reciprocations result in giving rotary motion to ring *f*, which motion either forces the dies toward the center of rotation of arbor *b* or withdraws them from it, according as the lever *k* is vibrated toward or from the front end of the arbor *b*.

In the ring *f*, communicating with the cam-grooves *g* therein, are cut openings, *m*, through the periphery of *f*, the purpose of which is to allow the extraction of the dies without removing the ringed cap-piece *n*, which is secured to the face of arbor *b*, and holds the dies in the grooves *h* formed therein, and prevents access of foreign matter to the dies.

In the ring part of *n* are cut slots, which correspond in location to the position of the openings *m* in ring *f*, and said slots are closed to prevent foreign matter from getting into and clogging the action of the incased parts.

The closing of the slots may be effected, as shown, by slides *o*, or an external ring may be applied which may be removed, or, if it is also slotted, it may be turned upon *i* to open or close the slots therein.

Figure 6 shows one of the screw-thread-cutting dies in edge and side elevations.

These dies are made in sets to suit, within reasonable limits, any diameter of bolt, the operative ends being shaped to produce threads of desired form, pitch, and spacing.

The arbor *b* being tubular its internal diameter is the limit of the diameter of the bolts which can be screw-threaded in the machine, while the length over which the screw-threads can be cut is only limited by the length of the rods or bolts introduced into the machine for its action.

In operating to cut screw-threads, the dies being rightly adjusted and the arbor in rotation, the attendant draws forward the lever *k* and presents the bolt to the dies, which seize upon it and draw between the dies into the hollow arbor as the dies cut the threads thereupon.

When the screw-threads have been cut upon a sufficient length of the bolt or rod the operator moves the lever *k* to the rear, which draws the operative faces of the dies out of contact with the rod or bolt which may then be withdrawn out of the hollow spindle without stopping rotation of the arbor or reversing its direction.

By angular adjustment of sleeve *e*, with reference to collar *c*, the position of the dies is changed so as to

cut more or less deeply on the rod presented to them, and thus within reasonable limits the diameters of the screw-threaded parts may be varied.

To aid the operator in setting the dies to any given diameter adjacent index-scales are marked on the sleeve *e* and on the collar *c*.

When one set of dies is to be removed and another set substituted the openings in the cap *n* are uncovered and the bolt *d* is slackened, so that, by turning the sleeve *e* relatively to the collar *c*, the openings *m* are brought into line with the die-holding grooves in the face of the arbor *b*, and then by turning slowly the arbor *b* the dies will drop out one after the other and their places can be supplied with another set, which are adjusted in position by turning sleeve *e* relatively to the collar *c*.

To indicate to the operator when a screw-thread has been cut over any desired length of bolt, I make an attachment to the machine, as follows:

Within the bore of arbor *b* I place a piston or disk, *p*, to which is attached a rod, *q*, extending through arbor *b*, and beyond its rear, where it is screwed into one end of a bar, *r*, which extends in any convenient direction to a location in view of the operator, where it can be fitted as a guided slide carrying an index-finger, *s*, extending to the divisions of a scale or rule.

It will be obvious that as the bolt or rod which the machine is operating on to screw-thread passes through the dies it will force piston *p* rearward to a distance indicated by the index *s*, so that when any desired length of the rod has received the action of the dies they are thrown open clear of the rod by the operator.

To bring back the disk *p* to its position against the dies I make use of any simple attachment of a weight or spring to the bar *r*, the arrangement of the weight indicated in the drawing being sufficient for the purpose.

The disk *p* may be nicely adjusted with reference to the dies, and to the index-finger and scale, by turning the screw-threaded rod in the nut formed in the end of bar *r*, and, when adjusted, kept in position by screwing a check-nut against said end.

This apparatus may detached from the machine in whole or in part when it is desired to cut very long screws.

When the rolls or pins attached to the piece *i* are in those parts of grooves *j* which are parallel with the axis of the arbor *b*, the ring *f* is locked thereby, as the strain of the dies *h* will not then tend to force the piece *i* backward, as would be the case if the grooves *j* were inclined to the axis of rotation throughout their entire length.

I claim—

1. Jointly, the ring *f*, constructed as described, with the double-acting cam-grooves in its end or front face, and the spiral or inclined grooves on its periphery, terminating toward the front end in the short straight grooves, and the combination of the said ring with the hollow arbor *b*, the cylindrical piece *i*, provided on its inner surface with rolls or pins, and the lever *k*, all as shown and described.

2. The cap *n*, made to hold the dies in the grooves, and constructed with covered openings to be used in conjunction with the openings *m*, substantially as described.

3. The combination, with a hollow die-carrying arbor, of the disk *p*, located within the arbor, and connected with an indicator, and so arranged that the amount of its movement, caused by passage of a bolt through the dies, may be indicated to the operator, substantially as and for the purpose set forth.

SALMON W. PUTNAM, JR.

Witnesses:

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JOHN F. HASKINS.