

S. H. WRIGHT.

Improvement in Bolt-Threading Machines.

No. 126,170.

Patented April 30, 1872.

Fig. 1

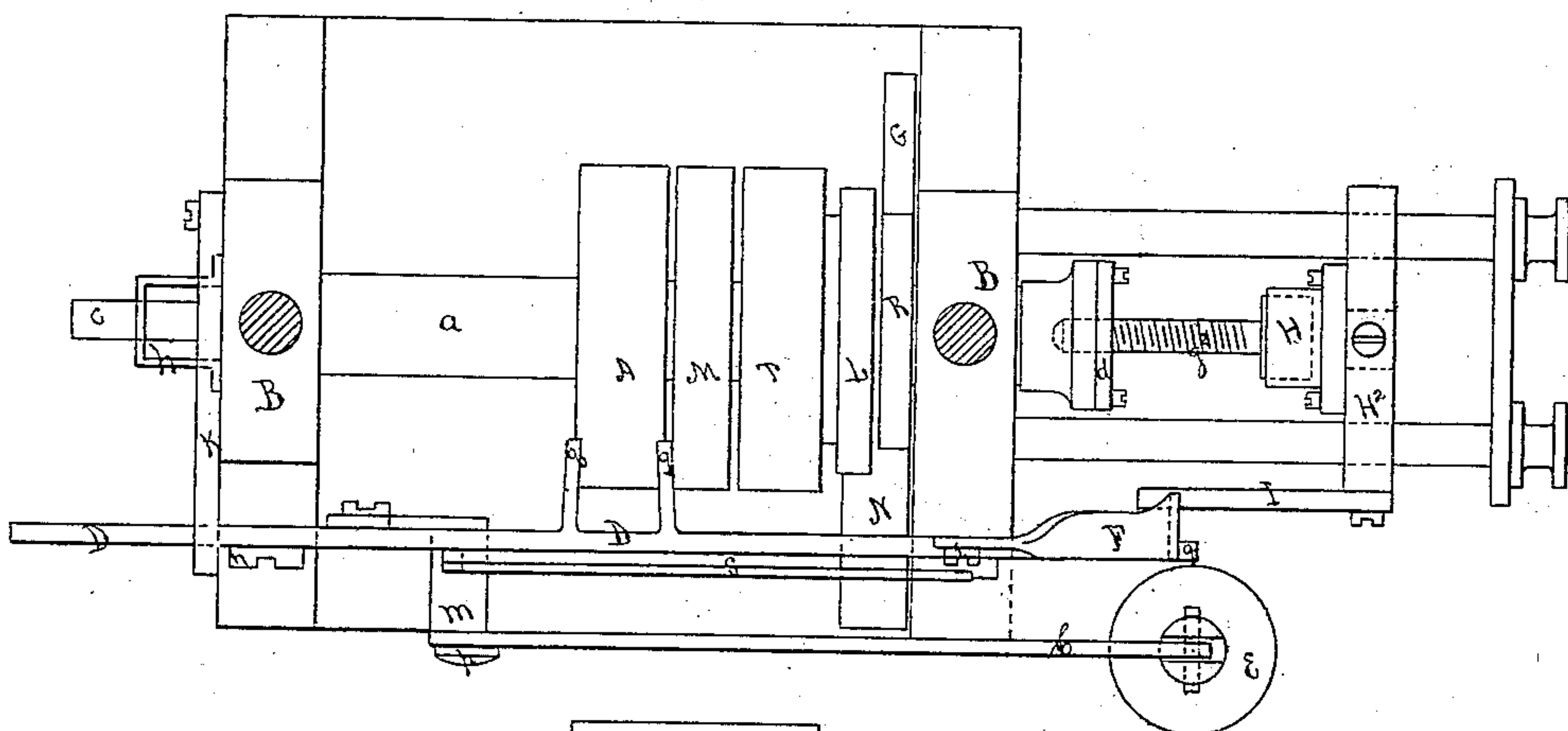
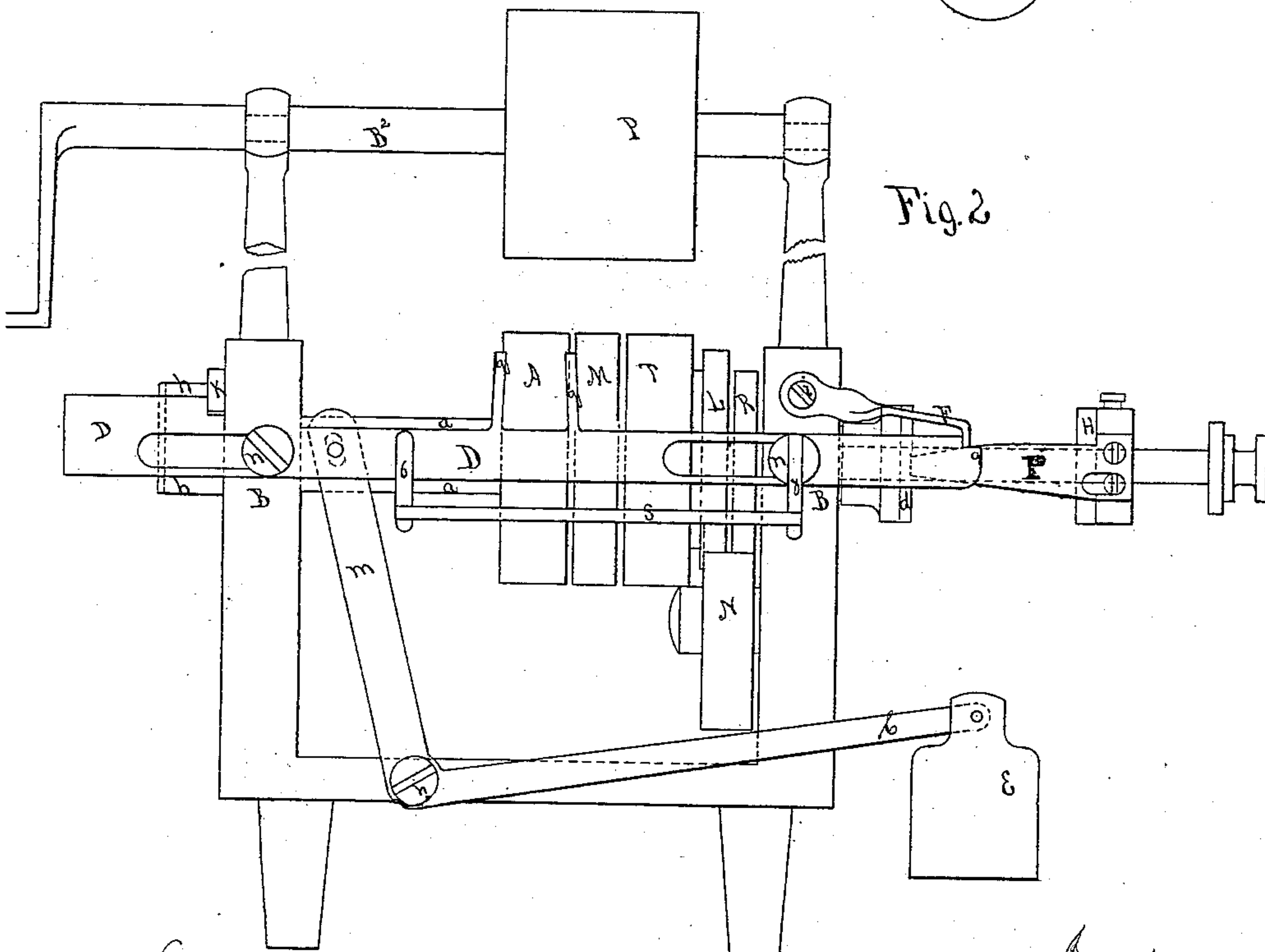


Fig. 2



Witnesses

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IMPROVEMENT IN BOLT-THREADING MACHINES.

Specification forming part of Letters Patent No. 126,170, dated April 30, 1872.

To all whom it may concern:

Be it known that I, SHEFFIELD H. WRIGHT, of Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Bolt-Threading Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1 represents a plan or top view; Fig. 2, a side elevation; Fig. 3, a rear end elevation of the head-stock; Fig. 4, a vertical central longitudinal section; and Fig. 5, an enlarged sectional elevation of the adjustable central cone-carrying rod, and the cone which operates one of the shipper-releasing mechanisms.

This invention relates to machinery for screw-threading bolts, and has for its object to simplify the construction and reduce the cost of such machinery, to increase its efficiency, and facilitate the bolt-threading operation or process. This invention consists in certain adjustable shipper releasing and retaining mechanisms, in combination with gearing spindles and pulleys to insure the action and retention of the belt-shifting apparatus, and thereby move or shift the belt and reverse the motion of the operating spindle and the connected screw-threading die, whether revolving at a high velocity or at a moderate rate of speed; one of the said releasing mechanisms being operated by an adjustable releasing cam carried by the bolt-holder, and the other said mechanism by the forward moving bolt, pressing the end of an adjustable-rod arranged within the hollow spindle, and having a cone near its rear end, or a similar rod having an adjustable cone on the rear end thereof, and in either of these a spring to return the rod; in one case the cone is adjustable, in the other case the rod, by screwing one part, 3, into the other part, 4; or the rod may have both of these adjusting elements or devices, which, in combination with other elements, form part of my invention.

In the said drawing, *a* denotes the hollow spindle supported in bearings *B*, which are the ends of the head-stock, and the screw-threading die *d* is secured to the forward end of the spindle, as usual. Within the hollow spindle I arrange an adjustable or other rod,

c, or a similar rod having an adjustable or a fixed cone, *b*, near its rear end, or a rod with both of these adjusting elements. The rod *c* fits loosely in a collar, *e*, secured to the interior of the spindle, and near the opposite end and fastened to the rod is a similar collar, *f*, and between these two collars a spiral spring, *g*, operating to press the rod forward, as shown. The rear end of the rod *c* projects beyond the end of the spindle, where it is further supported by a guide or bracket, *h*, on the rear end of the head-stock. On the rear portion of the rod *c*, and inside of the spindle, is the adjustable or fixed cone *b*, the smaller end of the cone opposite or at the end of the spindle or near that point.

When the cone is movable and adjustable the rod may be solid, and when the rod is adjustable, by parts 3 and 4, one screwing into the other, the cone may be fixed, each being a convenient and facilitating adjusting device under different circumstances and conditions, which makes the two together of greater utility than either of them alone.

On one side of the head-stock I arrange a slotted shipper-slide, *D*, which is movable on studs or screws *n*, and it carries the usual belt-shifting rods *q*. Near the rear end of the slide *D* a suitable elbow or bell-crank lever, *m*, is loosely connected by its slotted upper end, and the fulcrum of said lever may be a stud, *p*, projecting from the bed of the head-stock, the arm *C* extends forward, and a weight, *E*, attached to the end, operates the lever to move the slide *D* in one direction; or a contracting-spring, *S*, with one end fastened to a brace, *6*, depending from the slide, and its opposite end to a stationary brace, *8*, will perform the same operation. The slide may be moved back by pushing it, or by lifting the weight or the lever either by hand or by a foot-lever of ordinary construction. The forward end 9, of the slotted slide is notched or formed to receive the hook or catch end of a retaining and releasing device, *F*, which swings on a pivot, *i*, entering the end of the head.

On one end of the bolt-holder *H* is an adjustable releasing-cam, *I*, which, when the bolt *g*² is feeding forward in the revolving die, is carried beneath the catch end of the latch *F*, and by its inclined upper surface raises the latch and liberates the slide, and allows the

weight and lever, or the spring, to move the slide and shift the belt, and reverse the motion of the spindle as soon as the required length of thread has been cut upon the bolt, and this length of thread is predetermined and graduated or regulated either by the adjustable cam I, suitably set to raise the latch F as the bolt and the holder advance, or by the entering end of the bolt pressing the end of the spring-actuated rod *c*, and forcing the cone *b* beneath and raising the pivoted rear latch K, and releasing it from contact with its retaining notch formed in the edge of the rear end of the slide, or by both of these mechanisms operating in connection.

When operating with the rod *c* and the cone *b* to regulate the length of cut or threading of the bolt I sometimes make only the cone adjustable on the rod, and this is sufficient, and in fact the best means for making the wider adjustments, as when changing from long bolts to short ones, or vice versa; and the cone may be set with sufficient accuracy for any kind of work; but for making the finer or shorter adjustments the adjustable rod with one part screwed into the other is more convenient and a more ready and rapid adjustment, and the length of this adjustment is intended to be sufficient for any kind of work within the capacity of the machine.

The rear latch K is loosely pivoted to the rear end of the head-stock, and a slotted bracket, *h*, is a guide for the rising and falling latch to keep it in position and insure its catching action with the notched slide when this is moved back to shift the driving-belt, which runs from a pulley, P, to and around the pulleys A, M, and T on the spindle *a*—the center pulley M being loose on the spindle as a shifting-pulley; the pulley A fast on the spindle to drive it in one direction for threading bolts; and the pulley T loose on the spindle, but connected to the gear L, which is also loose on the spindle. Between the loose gear L and the end B of the head-stock is a gear, R, which is fast on the spindle; and below this is a stud-gear, N, and at one side of this a second stud-gear, G. The loose gear L intersects with the stud-gear N, and this with the stud-gear G, which meshes into the fast gear R on the spindle, and this train of gears reverses the motion of the spindle when the belt is shifted to the loose pulley T to back off the threaded bolt, the bolt-holder, and the connected releasing-cam I.

The upper or driving shaft B² is intended to carry a common cone of pulleys, so as to reduce or accelerate the rotary motion of the shaft, and thereby revolve the spindle and the cutting-die at any required velocity, according to the size of the bolts being threaded; and

when threading small bolts, and in order to perform a great amount of work, the spindle and die may revolve at a velocity varying from two to five hundred revolutions per minute; and when thus rapidly operating the slide-retaining and releasing mechanisms cannot too well perform their joint operation, especially in catching and retaining the slide, as this prevents false motions and facilitates the bolt-threading operation.

When threading larger bolts, and by revolving the die comparatively slow, the motions of all the other parts of the machine are necessarily slow. It is then I find that a single-catching, retaining, and releasing mechanism is sufficient, as there is ample time for either of these to operate; and either the latches I or K, with their specified releasing mechanisms, will perform all that is required; but when operating at high rates of speed I consider the two mechanisms and their joint action of considerable importance, as before described.

The bolt-threading die is adapted to apply to the holding cross-head H², and the bolt-holder H to the end of the spindle. This, however, is no invention, and it would be but a common expedient.

The pulleys A, M, and T, and the connected train of gears, with the spindle *a*, the slotted slide D, and the lever *m* C, and weight E, or the spring S, constitute the driving and reversing mechanism.

The latches F and K, in combination with the slide D and its operating devices are the separate or joint catching and retaining mechanisms, and in combination with the cam I and cone *b*, and with their carrying devices, these latches form part of the releasing mechanisms, adapted for separate use or both in connection.

I claim as my invention—

1. The combination of the differential gearing, pulleys, spindle, and mechanism for shifting the belt automatically, substantially as described.

2. The combination of the pulleys A, M, and T, the train of gearing, and the spindle *a* with the slotted belt-shifting slide D, lever *m* C, adjustable weight E, latch F, and adjustable cam I, substantially as shown and described.

3. In combination with the pulleys A, M, and T, the train of gearing, the spindle *a*, and belt-shifting slide, the interchangeable releasing and holding mechanisms, substantially as shown and described.

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Witnesses:

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