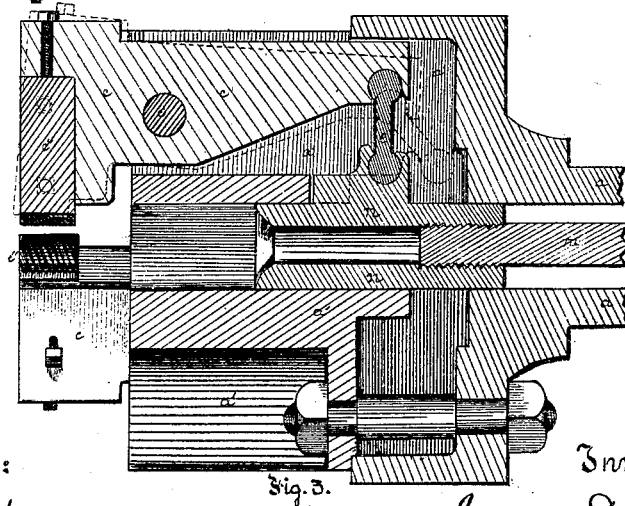
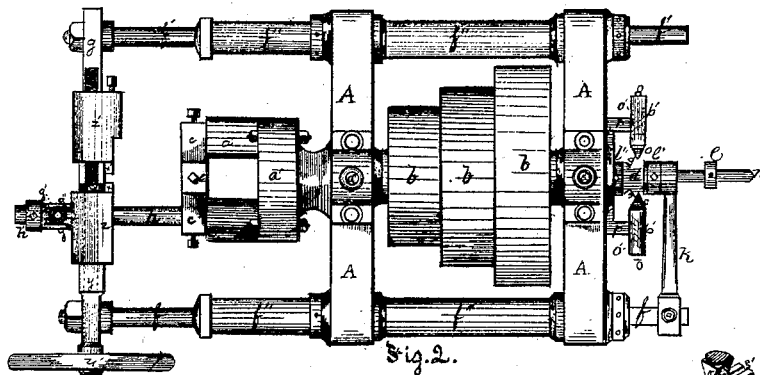
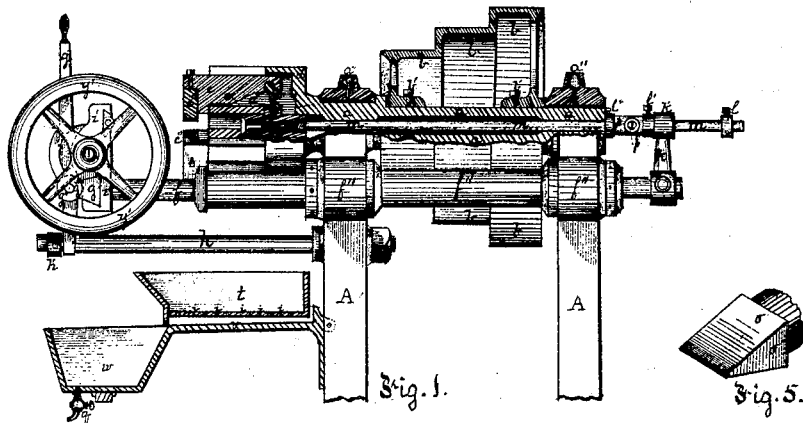


*J. S. Atkinson,*  
*Screw Cutting Machine.*  
*No. 111,899. Patented Feb. 21. 1871.*



Witnesses:  
*G. H. Christy*  
*Thos. B. Kern*

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# UNITED STATES PATENT OFFICE.

JAMES S. ATKINSON, OF ORMSBY BOROUGH, PENNSYLVANIA.

## IMPROVEMENT IN MACHINES FOR CUTTING SCREWS.

Specification forming part of Letters Patent No. 111,899, dated February 21, 1871.

*To all whom it may concern:*

Be it known that I, JAMES S. ATKINSON, of Ormsby Borough, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Screw-Cutting Machine; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had by letters and figures indicating like parts to the accompanying drawing, in which—

Figure 1 is a side elevation of my improved screw-cutting machine. Fig. 2 is a plan view thereof. Fig. 3 is a longitudinal section through the dies, die-holders, and chuck. Fig. 4 is an enlarged view, in perspective, of the abutment-piece; and Fig. 5 is a like view of one of the catches that play against it.

My invention consists in an improved construction of machine for cutting the threads of screw-bolts, whereby, among other advantages, a quick, instantaneous motion is given to the threading-dies in opening and closing.

To enable others skilled in the art to make and use my improvement, I will describe its construction and operation.

The frame-work A is of any form or construction suitable for supporting the operative devices. The hollow spindle *a* is securely mounted thereon, but so as to revolve freely. To it, by set-screws *b'*, keys, or other equivalent device, the cone of driving-pulleys *b* is secured.

The bearings of the spindle *a* are oiled through the cups *a''*. The forward end of the spindle *a* terminates in a boxed head, in which is inserted the chuck *a'*, in which latter, by pins *c'*, the die-holders *c* are hinged, with sufficient room for the latter to open and close therein. The threading-dies *c''* are adjusted in the die-holders by set-screws or in other usual way.

In the hollow spindle *a* is a rod, *m*, the forward end of which screws into a hub, *n*, which latter is arranged inside the heel ends of the die-holders *c*, and it is connected with each die-holder by a toggle, *e*, and these parts are so arranged that, with the forward thrust of the rod *m* and hub *n*, the toggles *e*, acting on the die-holders *c*, will close the dies *c''* on the bolt, and the backward thrust of the rod

*m* will, by a reverse movement in the parts named, open the dies and release the bolt.

Extending along lengthwise of the frame A, and one on each side of the devices described, is a pair of sliding rods, *f f'*, supported by and moving longitudinally in any suitable bearings *f''*. These rods extend forward beyond the threading-dies, as shown, and carry at their outer ends a cross-bar, *g*, which latter is moved toward and from the dies *c''* by means of a lever, *g'*, pivoted to the lugs *g''*, and with its lower end engaging any suitable fulcrum. That shown in the drawing consists of a rod, *h*, which extends out from one of the legs of the frame A, and is slotted at or near its outer end to receive the lower end of the lever *g'*.

Passing over the end of the rod *h*, and outside the lever *g'*, is an adjustable collar, *h'*, by which to change the point of leverage, so as to adapt the machine to the threading of bolts of different lengths of shanks.

On the rear end of one of the sliding rods *f* or *f'*, by a set-screw or its equivalent, is adjustably attached one end of a knocking-arm or knocker, *k*, the other end of which slides on the rod *m* at any suitable point back of the toggle *e*, and for this purpose it has an eye, *k'*, or other like device.

On the rod *m*, outside the knocker-eye *k'*, is an adjustable collar, *l*, and inside the knocker-eye *k'* is an abutment, *d*, the lateral faces of which are inclined forward, as shown at *s*. It is held in place at any desired point of adjustment by two adjustable collars, *l''*, one on each side, each secured by a set-screw, in the usual way.

In each lateral face of the abutment *d*, at the bases of the inclines *s*, is a slight groove, *s'*, and the opposite end of each incline *s* terminates in a shoulder, *s''*, Fig. 4.

The arms *p* each carry a socketed head, *p'*, and in each head is a wedge-shaped catch, *o*, supported by a spiral spring, *o'*. Fig. 5 shows the form of the catch-head. Figs. 1 and 2 show the adjustments of these parts when the dies are closed ready to commence work—the edges of the wedge-shaped catch-heads *o* in the grooves *s'*.

For the purpose of holding the bolt while it

is being threaded, I adjust on the cross-bar *g*, by dovetail joints, as illustrated in Fig. 1, two die-blocks, *z z'*, Fig. 2. One of these die-blocks, *z*, works back and forth on the cross-bar *g* by means of the shank of a screw, *y*, which passes through it, the threaded end of the screw *y* working in a tapped eye of the other die-block, *z'*. The screw is operated by a hand-wheel, *y'*.

The die-block *z'* is fixedly attached to the cross-bar *g*, or adjustably attached by means of a set-screw.

The die-blocks *z z'* carry gripping-dies *x x'*, Fig. 2, which gripe the bolt and hold it while it is being threaded.

To adapt the machine for feeding in bolts of different sizes, the die-block *z'* may be set forward or backward, or the die *x'* therein may be set in or out, and the die-block *z* carried forward or backward by turning the hand-wheel *y'*; also, by this last-named motion, the dies *x x'* are made to bite or release the bolts while the machine is in operation.

The bolt to be threaded being placed in the position described—that is, gripped by the dies *x x'*, and with its point a little short of the threading-dies *c'*, the latter being closed—the machine is then in the position shown in Figs. 1 and 2. By the lever *g'* the point of the bolt is then brought to the opening of the threading-dies *c'*. These latter, being rotated, take a bite on the bolt, draw it in, and thread it in the usual way. The bolt, while being thus drawn in, draws with it the die-heads *z z'*, cross-bar *g*, to which they are attached, and imparts a longitudinal motion to the parallel sliding rods *f f'*.

When the desired length of screw-thread has been cut, the eye *k'* of the knocker-arm *k* strikes the collar *l* on the rear end of the rod *m*, and forces the rod backward. By this motion the abutment *d* is released from the hold of the catches *o*, and passes back between them.

As soon as the catches *o* leave the grooves *s'* their inclined faces strike the inclined faces *s* of the abutment *d*, and, under the pressure of the springs *o'*, force it back with a sudden instantaneous throw, and with it the rod *m*. This motion causes the toggle *e* to open the threading-dies *c'*, as already explained, but with a quick motion. By this means I cut the desired length of perfect thread, and no more, whereas in many, if not all, the machines heretofore in use the threading-dies have been opened gradually or by a slow motion, in which case the thread of the bolt gradually tapers out into the shank. The operator then grasps the wheel *y'* and withdraws and loosens the finished bolt, both at the same time. A new

bolt is put in and the die-block *x* turned up to gripe it.

The withdrawal of the bolt has carried forward the parallel sliding rods *f* and knocker *k*, so as to bring the knocker-eye *k'* against the collar *l'*, whereby the abutment *d* is driven forward between the catches *o* till the edges of the latter rest again in the grooves *s'*. The rod *m* is also thrust forward by the same action, and it, acting through the toggles *e*, closes the threading-dies, and the work continues.

By the proper adjustments of knocker *k*, collars *l l'*, and abutment *d*, the machine can be readily adapted to cutting any desired length of thread on bolt-shanks of different lengths.

Underneath the threading-dies *c'* I arrange a drip-pan, *t*, sliding or removable, for convenience in cleaning, and with a finely-perforated bottom, as shown. Underneath this is a table, *v*, inclined so that the oil dripping down thereon through the perforations *i* of the pan above shall run into a receptacle or vat, *w*, whence it may be drawn off through a cock, *g*. In this way I avoid wastage in either iron or oil, and keep the machinery and machine-room clean and in good condition.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The abutment *d*, with its inclined lateral faces *s*, a groove, *s'*, at the base of each incline, and a shoulder or stop, *s*, at the opposite end of each incline, and the combination of such abutment with the rod *m* and wedge-shaped catches *o*, reciprocating knocker *k*, and collars *l l'*, substantially as and for the purposes set forth.

2. The subject-matter of the foregoing claim, in combination with a toggle, *e*, leading to each of the die-holders of a screw-cutting machine, substantially as described.

3. The combination of the abutment *d*, constructed substantially as described, catches *o*, knocker *k*, operated by any suitable means, and rod *m*, having stops *l l'*, in connection with any suitable mechanism for opening the dies.

4. The arrangement of drip-pan *t* with perforated bottom, inclined table *v*, and receptacle or vat *w*, for receiving and drawing off the oil, substantially as described.

In testimony whereof I, the said JAMES S. ATKINSON, have hereunto set my hand.

JAMES S. ATKINSON.

Witnesses:

W. N. PAXTON,  
G. H. CHRISTY.