H. Martin,

4. Sheets. Sheet. 1.

Threading Bolts.

No. 113072. Patented Mar. 28. 1871.

Case B

Fig. 1.

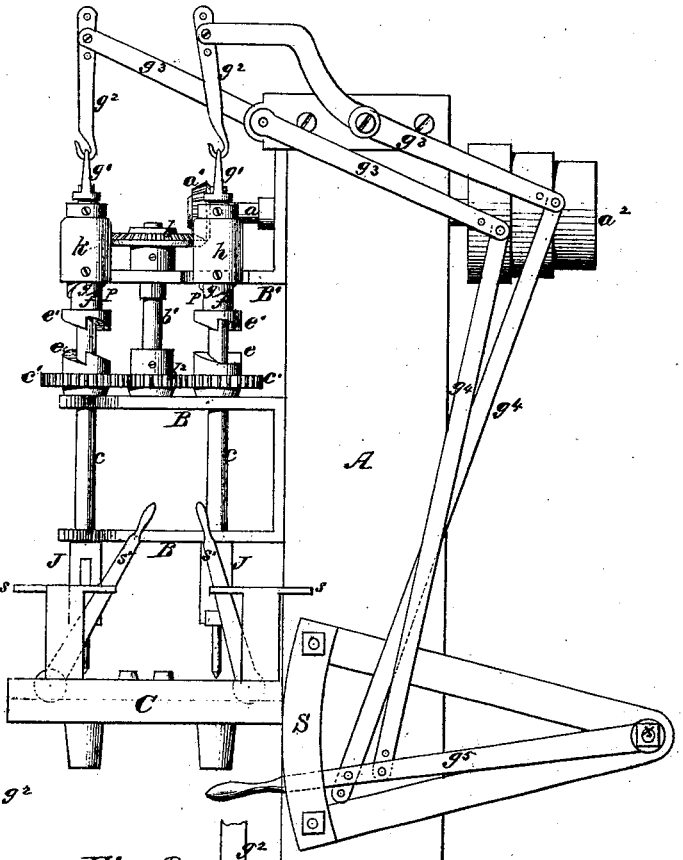


Fig. 2

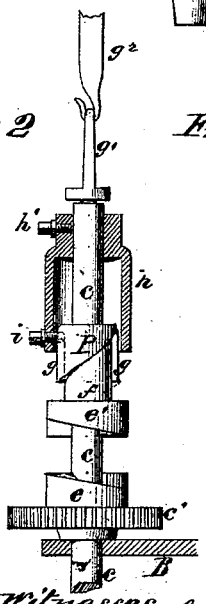
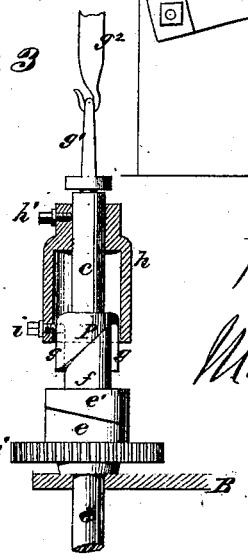


Fig. 3



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4. Sheets. Sheet. 2.

Threading Balls.

No. 113,072. Patented Mar. 28. 1871.

Case B.

Fig. 4

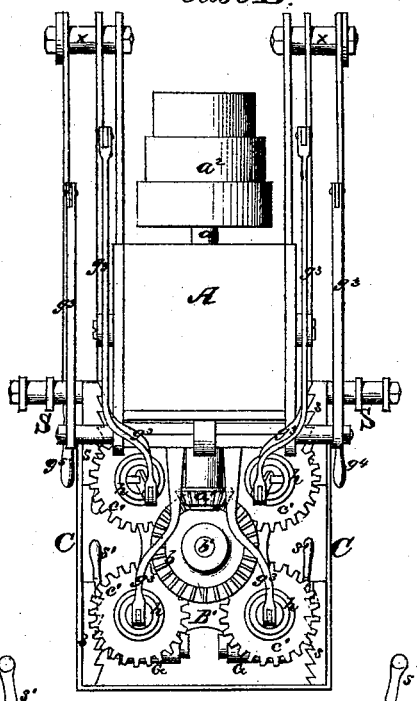
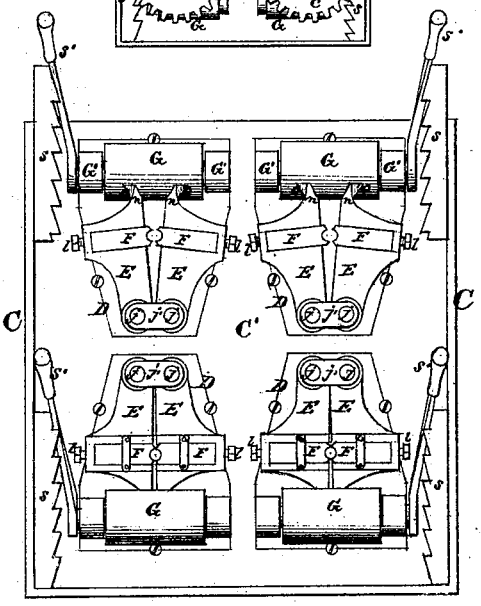


Fig. 5



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Threading Bolts.

No. 113,072. Patented Mar. 28. 1871.

Case B.

Fig. 6

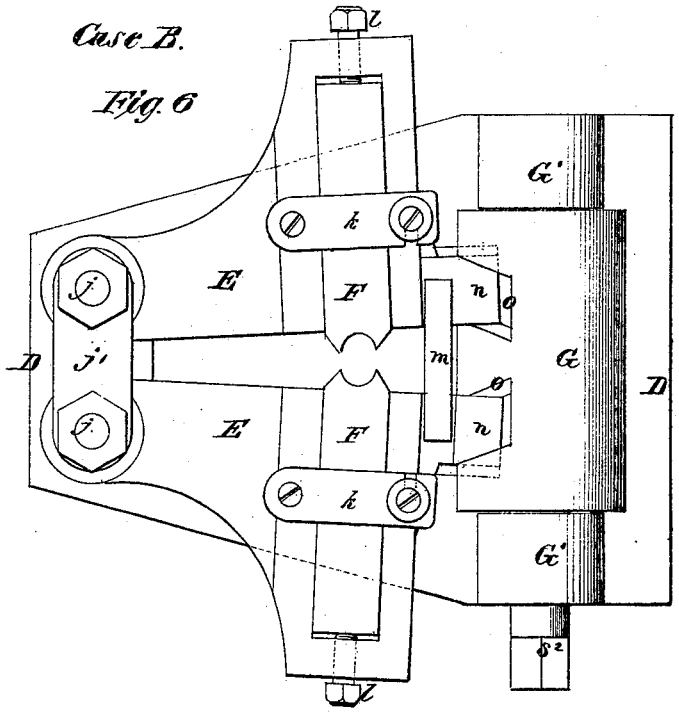


Fig. 7

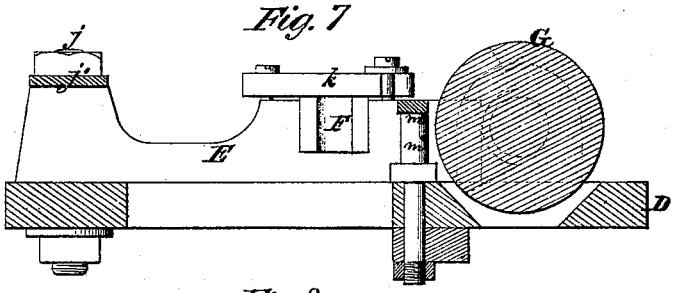
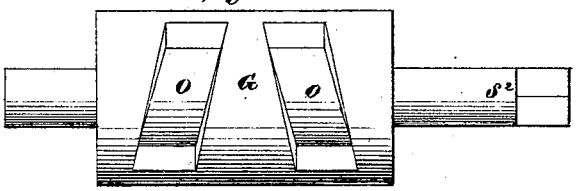


Fig. 8.



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4 Sheets. Sheet 4.

H. Martin,

Threading Bolts.

No. 113,072. Patented Mar. 28. 1871.

Case B.

Fig. 11

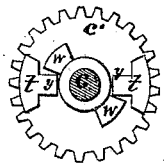


Fig. 9

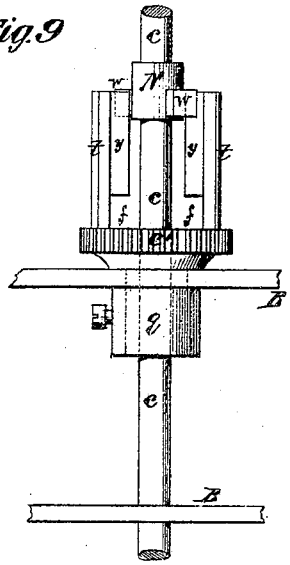
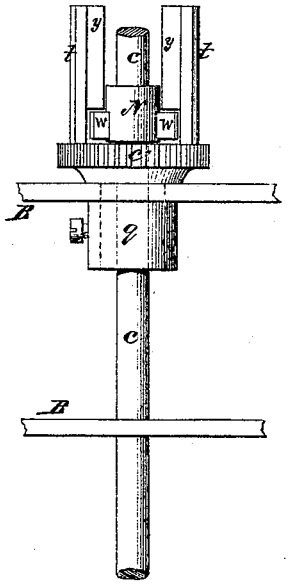


Fig. 10



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United States Patent Office.

HENRY MARTIN, OF LOUISVILLE, KENTUCKY.

Letters Patent No. 113,072, dated March 28, 1871.

IMPROVEMENT IN MACHINES FOR THREADING 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, HENRY MARTIN, of Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Machinery for Cutting Screw-Threads on Bolts; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1, plate 1, is an elevation of one side of the improved machine.

Figures 2 and 3 are views, partly in section, of the engaging and disengaging-clutches for stopping the rotation of the spindles at the moment the threads have been cut of the required length.

Figure 4, plate 2, is a top view of the machine.

Figure 5, plate 2, is a top view of the threading-dies and oil-basin.

Figures 6, 7, and 8, plate 3, show the devices for holding and adjusting the threaded dies.

Figures 9, 10, and 11, plate 4, are views showing a modification of the clutching device of figs. 2 and 3.

Similar letters of reference indicate corresponding parts in the several figures.

Before describing this invention, I will state that the bolts are confined to their spindles during the threading operation by means of bolt-holders J, which are constructed precisely as I have described and claimed them in an application for Letters Patent for bolt-threading machinery, which is marked case A, and which bears even date with the filing of this application. I do not, therefore, claim under this application said bolt-holders.

In the accompanying drawing—

A represents an upright post, which should be firmly sustained in its upright position, and which has rigidly secured to one side a horizontal oil-basin, in which the threading dies are arranged.

Above this oil-basin are three horizontal brackets, B B B′, the lower two of which receive through them four vertical spindles, *c c c c*, which are allowed to receive rotary and vertical motions.

Each spindle *c* is suspended from a vertically-vibrating arm, g^3, by means of a hooked rod, g^2, and a swivel-stirrup, g^1.

The arm g^3 of each spindle *c* is connected to a hand-lever, g^5, by means of a rod, g^4.

The hand-lever g^5 of each spindle *c* is pivoted to a bar, *x*, and lies alongside of a toothed segment, S, the teeth on which will arrest and hold down the hand-lever g^5 when the spindle connected to such lever is raised.

On the lower end of each spindle *c* a device, J, is applied for receiving, centering, and holding the bolts during the operation of cutting threads on them.

A shaft, *a*, passes horizontally through the post A, and carries on one end cone-pulleys a^2, over which a driving-belt passes.

On the opposite end of the shaft *a* a bevel-spur wheel is keyed, the teeth of which engage with the teeth of a bevel-spur wheel, *b*, which is keyed on a vertical shaft, b^1, that is held and guided by the brackets B′ B.

On the lower end of the shaft b^1 a spur-wheel, b^2, is keyed just above the upper one of brackets B. This spur-wheel b^2 engages with the teeth of four spur-wheels *c′*, which rest on the upper one of brackets B, and through which the spindles *c* pass loosely. By this arrangement the four spur-wheels *c′* will rotate when the driving-shaft *a* is rotated.

The upper end of the hub of each wheel *c′* is toothed, so as to form a clutching-end, *e*, and above such clutching-end is a corresponding but reversed clutching-face, *e′*, which is formed on the lower end of a stem, P, which has vertical shoulders, *g*, formed on its periphery above an annular recess, *f*. This stem P is loosely applied on its spindle *c*, and is received into the lower end of a thimble, *h*, which is made fast to the spindle by a set-screw, *k′*, and which, by loosening this screw, can be adjusted up or down on its spindle *c*.

By means of one or more screws *i*, which pass through the thimble *h* and abut against the shoulders *g* on the stem P, the latter is caused to turn with its spindle.

The shoulders *g* terminate below the upper end of the stem P, so that, when the spindle *c* is raised, as shown in figs. 1 and 2, so as to free a bolt from its threading-dies, the stem P will also be raised, and in this way it can be sustained free from the clutching-face *e* on the wheel *c′*. When, however, the spindle *c* is depressed, the stem P will rest upon the clutching-face of the wheel *c′*, and the clutches *e e′* will be engaged, as shown in fig. 3.

Now, when the spur-wheels *c′* are rotated, they will communicate rotary motion to their respective spindles through the medium of the shoulders *g* on clutch-stems P, screws *i*, thimbles *h*, and set-screws *h′*. This rotary motion of the spindles will continue during the descent of the spindles and threading of the bolts; but at the moment the required length of thread is produced the pins *i* on the thimbles *h* will leave the shoulders *g*, and be received into the annular recesses *f* in stems P, and the further rotation of the spindles will cease.

The length of threads to be cut is determined by adjusting the thimbles on their respective spindles, higher or lower.

Instead of employing the thimbles and the clutches, as above described, a simpler plan may be adopted for effecting the same object, which I will describe hereafter.

The basin C, which is arranged beneath the bolt-holders J, is adapted to contain oil and also the screw-cutting dies. There are four pairs of these threading-dies, corresponding to the four spindles above described; and, as all the dies are constructed and operated alike, I will describe but one pair.

The die-pieces F F, which are straight-sided, are fitted into expansible jaws E E, and are adjustable endwise by means of the set-screws *l l*.

The pivoted pieces *k k* cross the dies F F and keep them down in their places, and also allow the removal of the dies at pleasure.

The jaws E E are connected to a base-plate, D, by vertical pivots *j j*, which are sustained against lateral strain by the cross-brace *j'*.

The free ends *n n* of the expansible jaws E E are reduced, passed beneath a T-head, *m*, and received into slots *o o*, which are made into the periphery of an oscillating drum, G.

This drum is supported by bearings G' G', and to its extending shaft s^2 a hand-lever, s^1, is attached, by vibrating which the dies and their jaws will be moved further apart or nearer to one another.

It will be seen that the movements of the die-jaws are effected by making the slots *o o* oblique, as shown in fig. 8.

The hand-lever s^1 rises alongside of a notched plate or rack, *s*, which is supported by a standard above the oil-basin C. This plate or rack *s* may be adjustable when great nicety of adjustment is required for bolts of different diameters.

On plate 4 I have represented the modification of the spindle-clutch above described. The spindle *c* has a hub, N, secured to it, from which wings *w w* extend. This spindle is free to move up and down while it is rotating.

The spur-wheel *c'* is held down upon bracket B by means of a collar, *q*, and from the top side of this wheel, diametrically opposite each other, standards *t t* rise vertically, having feathers *y y* formed upon their inner sides. These feathers do not extend entirely to the surface of wheel *c'*; consequently spaces *f f* are left between the lower ends of the feathers and the wheel *c'*.

The hub N should be adjustable on the spindle *c*, for adjusting the device to different lengths of threads. It will be seen that, during the operation of threading a bolt, the spindle carrying such bolt will be slowly drawn downward while it is rotated, carrying with it the feathered hub N, and that this gradual descent and rotation of the spindle will continue until the wings *w w* pass below the feathers *y y*, when the spindle will instantly cease its rotation and descent.

By adjusting the hub N up or down on its spindle the amount of descent of this spindle can be regulated; consequently different lengths of threads on bolts can be produced in my machine at the same time or at different times.

Instead of adopting the precise construction of clutching and unclutching devices described and shown, it is obvious that the divided device *e e' f* P *g* may consist of a single piece fastened firmly to wheel *c'*, in which case the shoulder *g*, sleeve *h*, and spindle *c* may require to be increased in length somewhat, and said shoulders will terminate at the top of the part P, so as to allow the pin *i* to rise above the shoulder when it is desired to raise the spindle for the withdrawal of the screw-threaded bolts.

I am aware that Joseph R. Brown, in his patent for an improvement in screw-cutting machines, dated November 28, 1865, makes use of a reversible clutch, which operates automatically, but in a manner and by means of contrivances essentially different from mine.

My clutch is not reversible. Its purpose is not only different, but the instrumentalities employed are substantially different from his. I claim nothing which is described or shown in his patent.

I am also aware Caleb B. Walworth, in his patent of February 17, 1857, has shown some of the contrivances employed by me. I make no claim to such contrivances by themselves.

One feature of my invention consists in the contrivance by which I avoid the necessity of a feed-screw to give and preserve the proper pitch to the screw-threads to be cut. My experience has shown that, by constructing the machinery as described in my application, and of the ordinary weight, and then so arranging it that it may stand in a vertical position, so that the bolt may be fed freely downward by the action of gravity operating in conjunction with the cutting-dies by which the screws are formed on those bolts, the necessity of any other feed-motion will be wholly dispensed with. Greater simplicity of construction will be thereby obtained, and much less expensive machinery will suffice to produce results equally as beneficial as those obtained by feed-screws for that purpose.

Another feature of my invention consists in avoiding the necessity of giving a reverse motion to the bolt in order to discharge it after the screw-thread has been cut upon it, which is done in the manner hereinbefore shown. This also enables me to dispense with some of the machinery that would otherwise be necessary, and secures cheapness of construction and economy of time without lessening the efficiency of the machine.

The advantage of this arrangement is that the machine can run a number of spindles carrying bolts of different lengths or bolts of the same length, on which threads of the same length or of different lengths can be cut, each spindle being independent in its operation of the others, and each spindle automatically stopping at the moment a given length of thread is produced.

Having described my invention,

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

1. In a bolt-threading machine, in which the bolt is held in a vertical position while being threaded, the stop *i*, fixed for the time being in an unchangeable relation to the shaft *c*, which carries the bolt to be threaded, and the shoulder *g*, (which forms a part of the device that is attached to or that may be made to interlock with the gear *c'*, for the purpose of transmitting the motive power of the machine to the said shaft *c*,) in combination with a screw-cutting and feeding-die so constructed that it can readily be opened to release the bolt after the cutting of the thread thereon is completed, the whole being so constructed, arranged and adjusted that when the threading of the bolt is completed the said stop shall pass clear of said shoulder into the open space beyond, so that the bolt shall cease to revolve, all substantially as and for the purpose described.

2. In a bolt-threading machine such as is above intended and described, the thimble *h*, co-operating with the combination set forth in the foregoing claim, by virtue of which the threadings of the screw-bolt may be continued for a longer or shorter distance.

and made to terminate automatically at the pleasure of the operator, substantially as described.

3. The jaws E E *n n*, pivots *j j*, screw-cutting dies F F, cylinder G *o o* s^2, and bed D, constructed, arranged, and operating in the manner described.

4. The combination of the adjusting devices *l l*, the adjusting devices *s* s^1, dies F F, jaws E E, cylinder G *o o* s^2, and bed D, constructed and arranged and operating as described.

5. The within-described clutching and unclutching device or its equivalent, whether used in the cutting of only one length of screw-thread or different lengths of screw-threads, combined with the sliding and rotary spindle *c* of a bolt-threading machine placed in a vertical position, and with a screw-cutting and feeding-die made to close and open around the bolt which is being threaded, substantially as described.

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Witnesses:

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