(Model.) 3 Sheets—Sheet 1.

H. E. COY.

MACHINE FOR THREADING BOLTS.

No. 251,191. Patented Dec. 20, 1881.

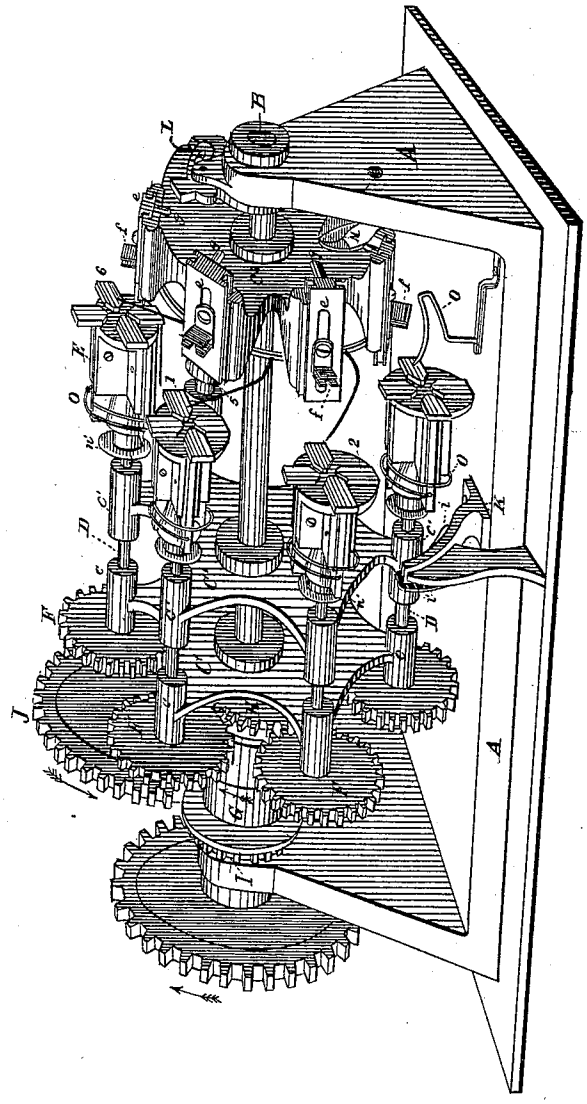

Fig. 1.

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By Liggett & Liggett

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(Model.) 3 Sheets—Sheet 2.

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Fig. 2.

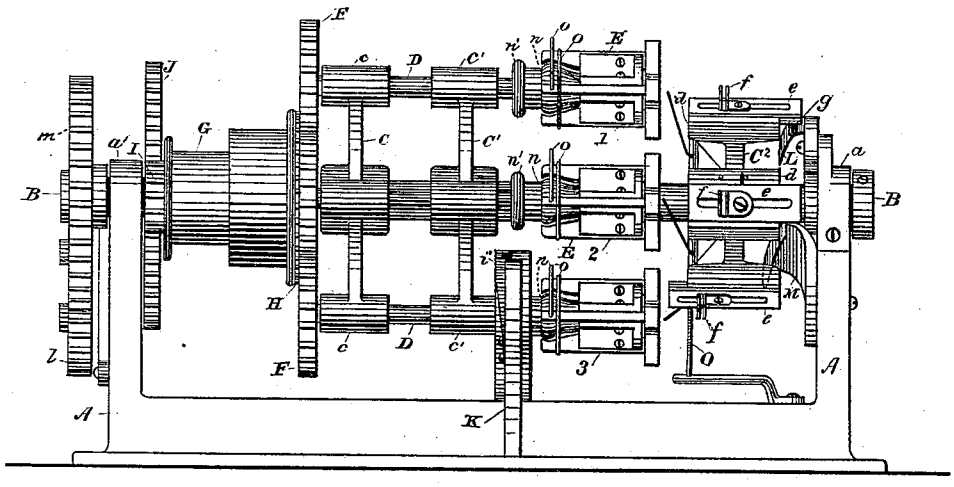


Fig. 6.

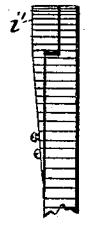
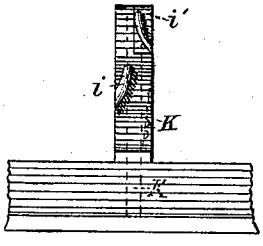


Fig. 5.



WITNESSES

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(Model.)

3 Sheets—Sheet 3.

H. E. COY.

MACHINE FOR THREADING BOLTS.

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Fig. 1.

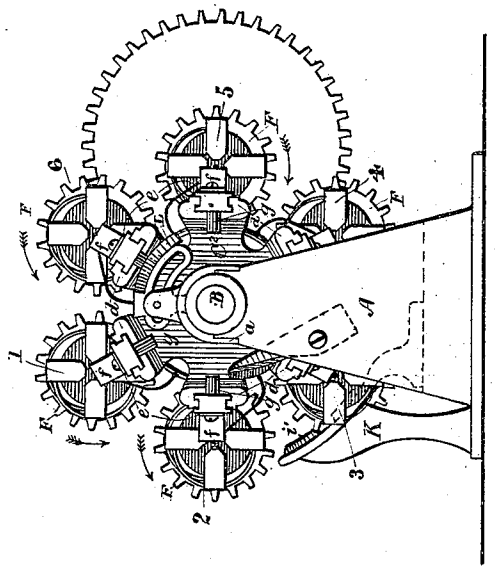
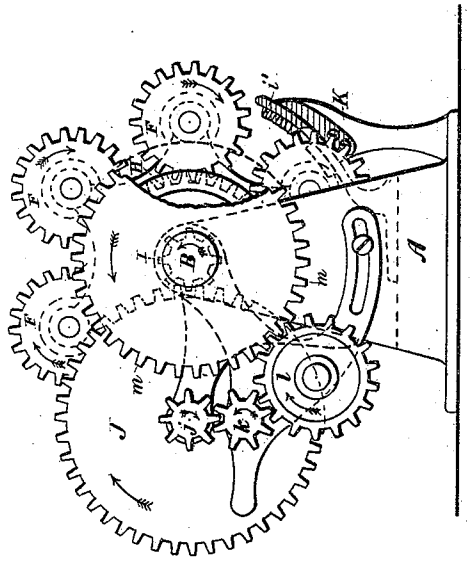


Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

HENRY E. COY, OF CLEVELAND, OHIO, ASSIGNOR TO HIMSELF, A. M. BARNES, AND E. W. GAYLORD, OF SAME PLACE.

MACHINE FOR THREADING BOLTS.

SPECIFICATION forming part of Letters Patent No. 251,191, dated December 20, 1881.

Application filed January 28, 1881. (Model.)

To all whom it may concern:

Be it known that I, HENRY E. COY, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Machines for Threading Bolts; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to bolt-threading machines; and it consists in the combination of parts hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is an isometric view of my machine. Fig. 2 is a side elevation of the same. Fig. 3 is an end view, showing the arrangement of gearing. Fig. 4 is a view of the front of my machine, showing the arrangement of bolt-holders and cutting-heads. Figs. 5 and 6 are detached views of bracket K, showing the cams *i i'*.

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

A is the frame of my machine. B is a heavy shaft, secured and revolving in bearings *a a'* of frame A. Secured to and revolving with said shaft B are two disks, C C', Figs. 1 and 2, the said disks being provided at their outer edges with journals or bearings *c c'*, in which revolve shafts D. These shafts D are provided at their front ends with cutting-heads 1, 2, 3, 4, 5, and 6, and at the other ends with gear-wheels F.

Secured to the forward end of shaft B, and revolving with it, is a carrier, C^2, which is provided at its outer edge with guides *d*, which are in turn provided with slides *e*, moving freely in said guides. To slides *e* are adjustably attached holders *f*, for holding the bolts in place while they are being threaded by cutting-heads 1, 2, 3, 4, 5, and 6. The under sides of slides *e* are provided with pins or friction-rollers *g*, which pins or rollers engage with cams L and M, to operate the slides *e* and feed and withdraw the bolts while the machine is in operation.

On the rear end of shaft B is a cone-pulley, G, which revolves loosely around said shaft and in the same direction with it. This pulley G has on its forward end a gear-wheel, H, which meshes with and drives gear-wheels F on shafts D, and through them cutting-heads 1, 2, 3, 4, 5, and 6. The rear end of pulley G is provided with a small gear or pinion, I, Figs. 2 and 3, which meshes with large gear-wheel J. Gear-wheel J imparts rotary motion to small pinion *j* on the same shaft with it, which, in turn, through the gear-wheels *k*, *l*, and *m*, imparts motion to the shaft B, disks C C', and carrier C^2.

K is a bracket, provided on its face with cams *i i'*, (shown more clearly in Fig. 5.) It will be seen by reference to this figure that cam *i'* is not rigidly attached to bracket K, but is fastened thereto by means of a spring, which may be made in one piece with the cam or attached to the cam in any practical manner.

1, 2, 3, 4, 5, and 6 are cutting-heads, each having jaws E and springs *o o* and also cone *n*, which cone is provided with an annular projection, *n'*, the object of said projection being to engage with the cams *i* and *i'* on bracket K, and thereby open and close jaws E on the cutting-heads.

The operation of my machine is as follows: Motion being imparted to cone-pulley G by means of a belt, the gear-wheel H imparts rotary motion to the cutting-heads by means of the gear-wheels F and shafts D, the motion of said heads being in the opposite direction to that traveled by the pulley G. The small gear or pinion I at the same time imparts rotary motion to shaft B and disks C C' and carrier C^2 by means of gear-wheels J, *j*, *k*, *l*, and *m*, this rotary motion being much slower than that of heads 1, 2, 3, 4, 5, and 6, and also in the opposite direction to the axial rotation of said heads, as shown by arrows in Figs. 3 and 4. For convenience of illustration, we will presume that the operator starts to cut a bolt by head 1, Figs. 2 and 4. The bolt is adjusted in holder *f* and slide *e* moved forward until the point of the bolt enters between the dies in cutting-head 1. The shaft B has by this time carried the cutting-head 1 and one of the slides *e* opposite the spring-cam L, and the pin or roller *g* now coming in contact with the cam L, the slide *e* is pushed forward, and with it the holder *f* and

bolt, thus causing the bolt to be forced between the dies and enabling the dies to grasp and cut a thread on the bolt. It will be noticed that I use a spring-cam to feed the bolt to the dies. My reason for this is that were I to use a positive cam it would, if the bolt were too large to enter the dies, force the dies out of place and cause much trouble in resetting them, or break the pin or roller *g*; but by using a spring-cam of sufficient strength to push forward the slide and properly enter the bolt in the dies I obviate this difficulty, for if the bolt is too large to enter the dies the pin or roller *g* forces the spring-cam back and rides over it, and when it has passed, the bolt, being now loose, falls to the floor and does no damage. Head No. 2 now comes in position to be fed in the same manner that head No. 1 did, and so on to head No. 5. Now, by this time it will be seen by reference to Fig. 4 that head No. 1 has reached cam *i* on bracket K, and as the head is moved forward the annular projection *n'* on cone *n*, Fig. 2, engages with this cam and throws the cone *n* from under the rear end of jaws E, thus allowing the springs *o o* to act and force the jaws open and release the bolt from its grasp. While the cam *i* on bracket K is operating to open the jaws E of head 1 the pin or roller *g* engages with the cam M and the slide *e* is drawn back, and with it the bolt, which, being now threaded, falls to the floor or into a suitable receptacle placed beneath to catch it. The head 1 has by this time moved forward until the projection *n'* on cone *n* has reached the spring-cam *i'*, and this cam, acting on the projection *n'*, will operate to force the cone under the rear end of the jaws E and close them, and they are now ready to act upon another bolt. Here, too, it will be observed, I use a spring-cam. My object in using a spring-cam is this: If after the cam *i* on bracket K has operated to open the jaws E and release the bolt the bolt should get caught between the jaws in any manner, as it sometimes happens, it would not do to close the jaws too positively, as by so doing something would have to give way, and the machine or head would be rendered thereby useless. Now, by using a spring-cam, if the bolt is caught in any manner the projection *n'* on the cone will force the cam back, and no damage will be done to the machine, and when the head has reached the operator he can stop the machine and take the bolt out.

I have provided a guide, O, attached to the frame of my machine in any suitable manner. The object of this guide is to retain the bolt in the holder *f* until the slide *e* is drawn back by cam M, when the bolt by its gravity drops to the floor or receptacle.

I have not described the heads 1, 2, 3, 4, 5, and 6 very minutely, as it is apparent that it is the same cutting-head that is almost exclusively used for cutting carriage-bolts and the like.

The shaft B may also be hollow part of its length, and be used as a means of feeding water or oil to the dies by means of pipes leading therefrom, as shown in Fig. 1 of the drawings.

The thread on the bolts may be cut to any required length by changing the gear-wheels *j* or *m*, as that would change the speed of shaft B and disks C C' and carrier C^2, and hence the thread would be longer or shorter as the speed of the shaft B and disks C C' and carrier C^2 would be faster or slower, the heads 1, 2, 3, 4, 5, and 6 always traveling at the same speed.

What I claim is—

1. In a bolt-threading machine, the combination, with shaft B and disks C C', of a cutting-head, cone *n*, having projection *n'*, and a bracket provided with cam *i* and spring-cam *i'*, said cams being arranged relative to the cone as described, and adapted to open and close the jaws of the head, substantially as set forth.

2. In a bolt-threading machine, the combination, with the shaft B and disks C C', carrying cutting-heads 1 2 3, &c., of the carrier C^2, the slides *e*, spring-cam L, and cam M, said cams being secured to the frame A, as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY E. COY.

Witnesses:
W. E. DONNELLY,
ALBERT E. LYNCH.