

H. A. Harvey.

Screw-Threading Machine.

N^o 51,179.

Patented Nov. 28, 1865.

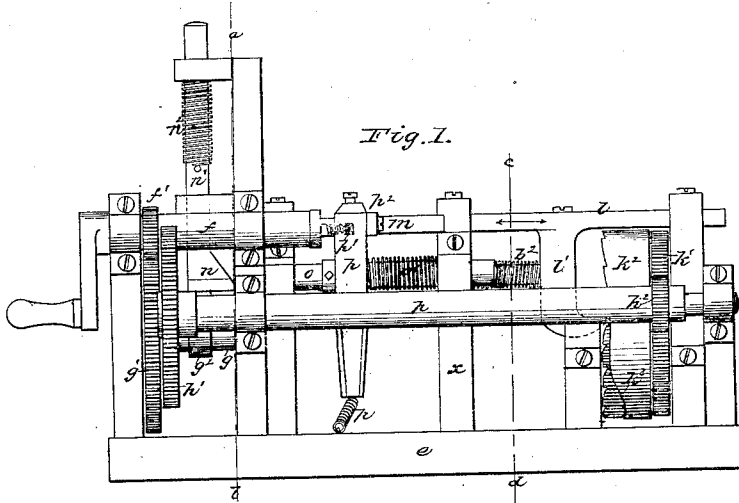


Fig. 1.

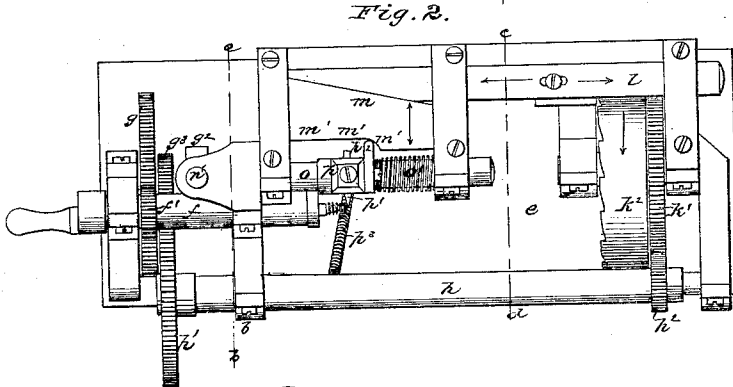


Fig. 2.

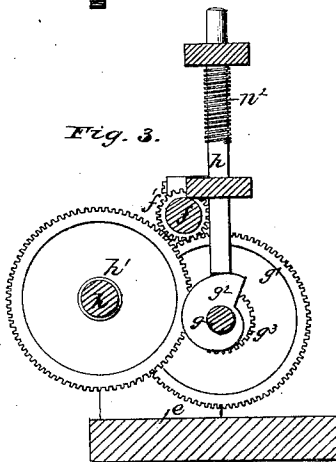
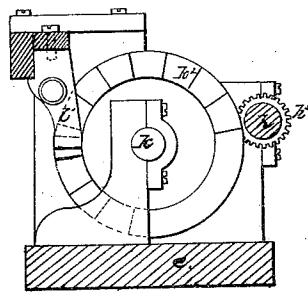


Fig. 3.

Fig. 4.



Witnesses:
Geo. W. Bernard.
Chas. Plow.

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UNITED STATES PATENT OFFICE.

H. A. HARVEY, OF NEW YORK, N. Y.

MACHINE FOR THREADING SCREWS.

Specification forming part of Letters Patent No. 51,179, dated November 28, 1865.

To all whom it may concern:

Be it known that I, H. A. HARVEY, of the city, county, and State of New York, have invented a new and useful Improvement in Machinery for Threading Screws; and I do hereby declare that the following, taken in connection with the drawings, is a full, clear, and exact description thereof.

In the drawings, Figure 1 is an elevation of a machine embodying my improvements. Fig. 2 is a plan of the same, and Figs. 3 and 4 are vertical sections through the same in the lines *a b a b c d c d* of Figs. 1 and 2.

The improvement which constitutes the subject-matter of my present invention is a combination of mechanical devices by means of which the motions of the chaser are governed or controlled in such manner as to cause it to cut a succession of cuts upon a screw-blank, and this combination governs the chaser in a more firm and exact manner, and affords better and easier means of adjustment, and of alteration of the same machine to thread screws of various sizes than other mechanical devices employed for the same purpose heretofore.

In the machine shown in the drawings there is a bed-plate, *e*, fitted with proper standards for supporting the whole of the machinery. In these standards are mounted a driving-shaft, *f*, which also rotates the chaps or holder which supports the blank to be threaded. This shaft carries a pinion, *f'*, which engages with a wheel, *g'*, upon a shaft, *g*, upon which is mounted the cam, *g²*, that causes the chaser or chasing-tool to travel along the blank from the head toward the point of the screw. This same shaft also carries the pinion *g³* which gives motion to the cog-wheel *h'* upon the shaft *h*, which supports the pinion *h²*, which is in gear with the cog-wheel *h'* upon the cam-shaft *k*. Upon this shaft is mounted a cam, *k²*. When the driving-shaft is put in motion, the screw-blank will revolve and also both of the cams *g²* and *k²*.

A wedge, *l*, is mounted in proper ways or slides so that it may move to and fro in the direction of the axis of the blank, or nearly so, and this wedge is forced to travel in one direction by the cam *k²* acting upon a hanger, *l'*, attached to or making part of the slide, and in the other direction by a spring, *l²*, surrounding a pin attached to the hanger. This spring bears at one end against the hanger, and at the other end against a standard, *x*, through which

the pin slides. This spring causes the hanger to bear against the cam and moves the wedge in a direction from the head toward the point of the screw-blank when the cam permits it to do so. This wedge bears against one side of a mold or former, *m*, which is fitted in proper guides, and is free to travel toward and away from the screw-blank. This former, whose acting-face *m' m' m'* gives the contour to the finished screw, is moved toward the blank by the wedge, and away from it by the tool or some piece moving with the tool, or it may be moved away by a spring or a connection with the wedge or other moving part of the machine.

An inclined plane, *n*, is attached to a sliding rod, *n'*, pressed downward by a spring, *n²*, and this inclined plane rests upon the cam *g²*, and abuts against one end of a rod, *o*, which is free both to rock and slide in standards attached to the bed-plate. A spring, *o'*, forces this rod against the inclined plane, and the inclined plane, being caused to rise and descend by means of the cam and spring, causes the rod *o*, to move to and fro parallel to the axis of the screw-blank, or nearly so.

Upon the rod *o* is mounted the tool-post or chaser holder *p*, carrying the tool or chaser *p'*, and also a guiding-pin or tracer *p²*, which is kept in contact with the acting face of the mold *m* by means of the spring *p³*.

When a screw-blank is inserted in the chaps, the bearing-piece of the hanger rests in the deep and long depression of the cam *k²*, as at *k³*, the wedge being then thrown back by the spring *l²*, and the mold being forced away from the screw-blank by the spring *p³*, acting through the intervention of the tool-post and tracer, the chaser itself being therefore out of contact with the blank and free to travel in directions from its point to its head, and vice versa, without touching the blank.

As the cam *k²* revolves, it commences to force the wedge in the direction of its point, and when the chaser is opposite that part of the blank where the thread commences, the wedge has forced the mold or former so near the blank that the tool governed by it commences to cut, being carried toward the point of the screw by the inclined plane *n*, and forced toward the axis of the screw by the mold, wedge, and cam *k²*. When one cut is finished, the hanger drops into a depression of the cam, the wedge approaches the cam, the mold re-

cedes from the blank, and the tool, no longer kept up to its work by the mold and freed from the control of the inclined plane n , is forced, by the spring o' , back again to the point of commencement of the screw-thread. The cam k^2 , as it continues to revolve, again forces the wedge in the direction of its point, as before, again carrying the mold against the tracer and the tool against the blank, and this latter is then chased deeper than before, owing to the fact that the wedge is forced farther toward its point on account of the shape of the cam. After this second cut is finished, the hanger drops into a succeeding depression and the tool recedes away from the blank and retreats toward its head, ready to commence the third cut, which is deeper than the second. Successive cuts are thus made until the thread on the screw is completed.

It is deemed unnecessary to give any special description of sizes of gearing or shape of cams, or the depth of successive cuts, or the number thereof, as all these points are well known to makers of screw-threading machinery. Yet I do deem it necessary to state that the screw-blank may be held and revolved in any known or proper manner; that the chaser may be mounted as described, or in any proper way so long as it can be moved in directions both parallel and perpendicular to the screw-blank, and that it may be forced to travel parallel to or in the direction of the axis of the blank by means of an inclined plane or a cam, a comb, or a leading-screw. I also deem it necessary to state that the wedge controlling the mold or former may be governed by a cam mounted upon an axis perpendicular to the line of motion of the wedge, instead of parallel to it, as shown in the drawings; and, further, that the wedge may be moved in both directions by the cam or in one direction only, and in the other direction by any suitable spring, or a motion derived from some moving part of the machine; but in all cases a cam must

determine the position of the wedge which controls and determines the position of the mold or former. The mold, it will be perceived, is held firm and steady by the wedge, and cannot rock or change its position while any one cut is being made. It will also be perceived that the machine may be accommodated to blanks of greater or less diameter, or adjusted with accuracy for any given diameter of blank by simply changing the position of the hanger in relation to the point of the wedge. It is also obvious that the depths of successive cuts may be decreased or increased by using wedges of greater or less inclination in connection with molds varied in shape to fit the inclination of the wedge, and I intend to provide for such substitution of wedges without changing the mold by so constructing the same that the face upon which the wedge bears is adjustable with respect to the acting face of the mold.

I am aware of the fact that cams have been used to control the successive cuts of a chaser both directly and through the intervention of other mechanical devices. I am also acquainted with the fact that a mold or former is an old device in screw-threading machinery, and that it has been caused to approach and recede from the blank by various mechanical appliances.

I therefore claim as of my own invention only—

The combination of a cam, a wedge, and a mold or former, constructed and operating to control a chaser or threading-tool in its motions perpendicular to the axis of the blank, or nearly so, substantially in the manner hereinbefore described.

In testimony whereof I have hereunto subscribed my name.

H. A. HARVEY.

In presence of—

GEO. W. PENWARDEN,
CHAS. BLIVEN.