F. H. Hamilton,

Making Wood Screws,

No. 2,161. Patented July 8, 1841.

Fig. 2.

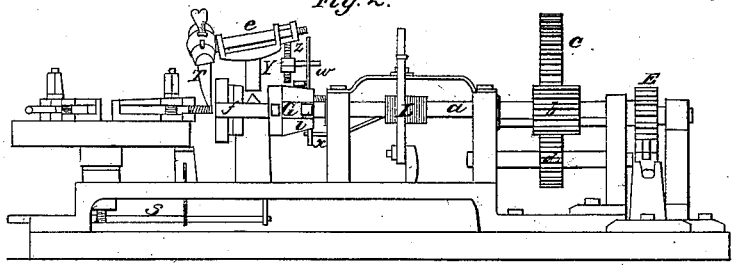


Fig. 1.

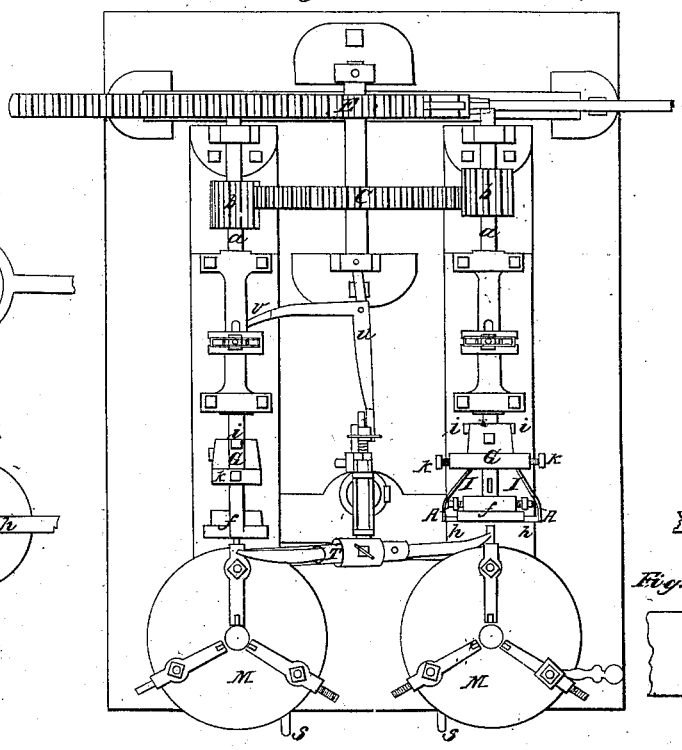


Fig. 5.

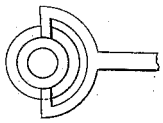


Fig. 6.

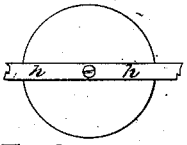


Fig. 8.

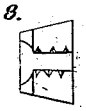


Fig. 7.

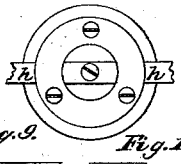


Fig. 9.

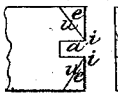


Fig. 10.

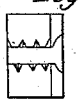


Fig. 4.

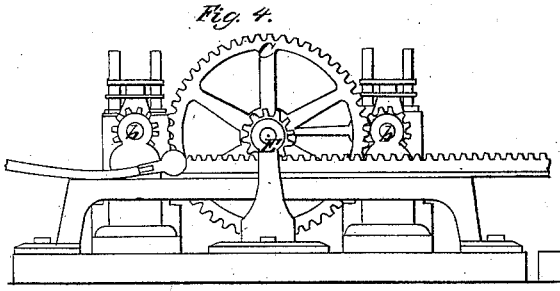
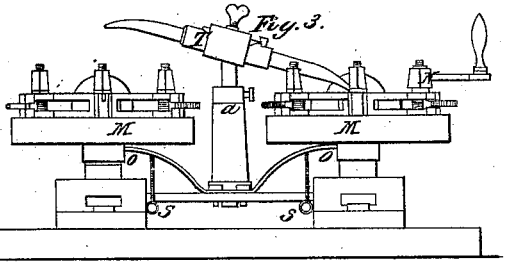


Fig. 3.



UNITED STATES PATENT OFFICE.

FARWELL H. HAMILTON, OF SCHENECTADY, NEW YORK.

IMPROVEMENT IN MACHINES FOR CUTTING WOOD-SCREWS.

Specification forming part of Letters Patent No. **2,161**, dated July 8, 1841.

To all whom it may concern:

Be it known that I, FARWELL H. HAMILTON, of the city and county of Schenectady and State of New York, have invented a new and Improved Machine for Cutting the Threads on Wood-Screws; and I do hereby declare that the following is a full and exact description.

The nature of my invention consists in making a double self-operating machine of simple construction, and in making my dies of such construction that they cut very fast and easy, and also in giving to the oil-tube its requisite motion by a simple arrangement of machinery.

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

I place my spindles (marked *a* in the drawings) in their proper stands or frames, about fourteen inches apart, parallel with each other, on each of which spindles, near the back end, I place a pinion, *b*, of about two inches diameter, and which has two or three inches length of cog, according to the length of the screws to be cut. Between these two pinions I place a cog-wheel, *c*, of about twelve inches diameter, which matches into the left-hand pinion *b* of Fig. 1, and on the right-hand under pinion *b* I place another pinion, (see *d*, Fig. 2,) which matches into *b* and *c*, thereby giving opposite and alternate rotary motion to the spindles. The shaft of the wheel *c* extends far enough back to receive another pinion, which matches into the rack at E', whence it derives its motion. On the front end of each spindle I place a round casting of about three inches diameter, (marked *f*,) across the face of which I cut a dovetailed groove, in which the dies *h h'* are placed. (See Fig. 6.) For larger screws I sometimes make a square groove and put on a thin plate of iron to keep the dies in place, as in Fig. 7. About two inches back of *f* is another casting, *g*, on the front end of which is a flange or projection, through a slot in which I pass two springs, I I. These springs are fastened by a screw at *i i'*, and the other ends rest on the ends of the dies at *h*, Fig. 1. Through the flange, and extending into the slots, I put a screw, *k*, Fig. 1, by means of which the springs are made to press more or less on the dies, as occasion requires. Immediately behind the dies in the casting *f*, under each spring, I put a screw, (see A, Fig. 1,) to prevent the dies from being pressed down farther than is necessary to cut a full thread.

The spindles are made to traverse back and forward, and the dies forced on the "blank" to be cut away by a shell-thread or endless screw and a clasp. (Marked L in Fig. 2.) Wood-screws before the threads are cut on them are termed "blanks."

On the circular horizontal plates, (marked M,) which I term "dial plates," I fix two or more vises, which hold the blanks while in the process of being cut. The blanks are fastened into the vises by means of a pin made fast into the dial-plate and passing through the vise, with a nut on the top, which is turned by a crank-wrench. (See N, Fig. 3.) The blanks are held by the head, the vises having a nick in the jaws for that purpose. The jaws of the vise are made to open by means of a spiral spring around the vise-pin. The dial-plate turns on its axis, so that when one blank or screw is cutting those in the other vises may be changed. The dial-plates are held fast by springs O O, Fig. 3, and a nick in the rim of the dial-plate on the under side, the end of the spring turning up to fit into the nick.

At S, Figs. 2 and 3, is represented a rod and twisted wire, which is used to press down the spring when the dial-plates are to be turned.

At T is represented a tube to contain oil, of proper length to extend to either blank when in position to be cut. Into each end of this tube I insert a piece of lamp-wick, which prevents the oil from dropping, but which is sufficiently saturated with oil to oil the screws alternately at each end when the spindle is run back. To give the oil-tube motion, I make a collar of one and a half inch diameter, into which I turn a groove about one quarter of an inch deep and wide, and I put this collar onto one of the spindles just behind the thread. I then make an elbow, which hangs on a pivot at its angle U, Fig. 1, one end of which has a fork with rounded ends and turned inward, so that it may run in the groove of the collar at *v*, Fig. 1. The fork and collar are represented by Fig. 5. The other end of the elbow extends forward toward the oil-tube, and is bent down about one inch and a half, as represented at *x*, Fig. 2. On the stand of the oil-tube I put a band, *a*, Fig. 3, with a pin extending back about one and one-half inch. On this pin,

near its extremity, I put a vertical rod about four inches long and three-quarters of an inch wide, (see *w*, Fig. 2,) working on its center, and made thick or with a hub in the middle, so that it may work true. In the lower end of this rod I put the forward end of the elbow at *x*. I place the shaft *e*, Fig. 2, which holds the oil-tube, in a slanting position, or at an angle of twenty or thirty degrees, so as to give the oil-tube a slanting instead of a perpendicular movement. This shaft is supported by collars firmly attached to the stand. On the back end of this shaft I put a nut with a handle or pin, *z*, Fig. 2, the pin being bent so as to hang perpendicularly, and having a thread on it. On this pin I put another and similar nut and pin, *y*, which pin extends back and enters a slot in the upper end of the said rod, (marked *w*,) and thus a connection is formed from the oil-tube to the collar on the spindle. The spindle traversing back and forward gives the requisite motion to the oil-tube. By moving the nut and pin *y* up and down more or less movement is given to the oil-tube.

In making the dies, after fitting them to their grooves, I make a nick in the end (see *a*, Fig. 9) about one and one-fourth of an inch deep, and the width is according to the size of the screw I wish to cut—that is, if the blank is one-fourth of an inch in diameter which I wish to cut, I make the nick one-eighth of an inch wide, or so as to make the thread deep enough without having the dies come together. I then file it off each way from the nick-beveling, (see *u*, Fig. 9,) except a thin lip at the front side, *e*, Fig. 9. This lip is left to enable the dies to run on the screw or blank more easily, and in which to make a countersink. I then put the dies in their grooves and run in a tap about the size of the screw I wish to cut, which, instead of a thread only, makes teeth in the sharp corners. (See *i i*, Fig. 9.)

Figs. 8 and 10 represent the ends of the dies after they are finished—8 a bevel and 10 a square die.

The dies generally used have a regular thread similar to those used for cutting bolts. Mine have the thread all filed away, leaving sharp points only. Mine will cut more easily and faster than any of the other kinds now in use. The novelty and superior advantages of mine consist in the foregoing particulars, and also in that they cut the iron out clean and leave the thread and interstices perfectly smooth, while the others by partially pressing the iron out have the effect to raise the thread, make the screw longer, and leave it rough and uneven.

This machine may be applied to the cutting of any kind of iron or brass screws, and may be moved by any of the different kinds of crank or eccentric motion.

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

1. The arrangement of machinery which operates the oil-tube, and its combination with the machinery which gives to the spindles an opposite and alternate rotary motion, in the manner and for the purpose described.

2. The method herein described of making the cutting part of the dies with teeth instead of a thread, in combination with the lips, as above described.

This difference in the construction of the dies from all others gives them the superiority and advantages above enumerated.

FARWELL H. HAMILTON.

Witnesses:

G. F. YATES,

WM. B. PIERCE.