H. Crum,

Making Wood Screws,

No. 1,411. Patented Nov. 16, 1839.

Fig. 1.

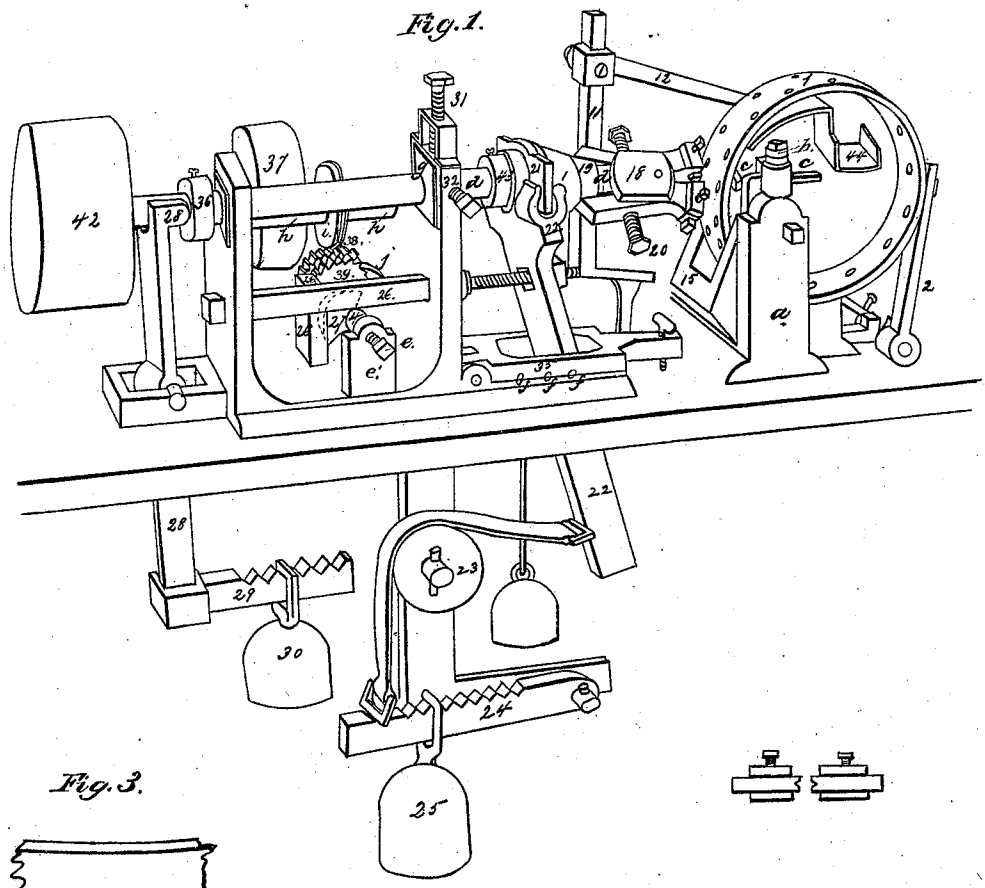


Fig. 3.

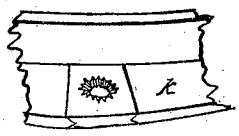
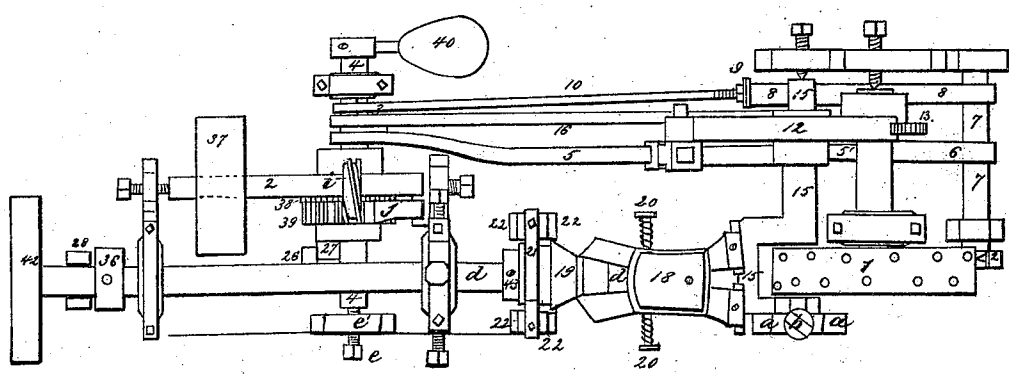


Fig. 2.



N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C

UNITED STATES PATENT OFFICE.

HENRY CRUM, OF CLARKSTOWN, NEW YORK.

IMPROVEMENT IN THE MACHINE FOR TURNING THE HEADS OF WOOD SCREWS AND RIVETS.

Specification forming part of Letters Patent No. **1,411**, dated November 16, 1839.

To all whom it may concern:

Be it known that I, HENRY CRUM, of Clarkstown, in the county of Rockland, in the State of New York, have invented a new and Improved Machine for Turning the Heads of Wood Screws and Rivets; and I do hereby declare that the following is a full and exact description thereof.

Figure 1 in the accompanying drawings is a perspective, and Fig. 2 a top view, of the machine.

In each of the drawings where the same parts are shown they are designated by the same numbers or letters of reference.

1 is the feed-wheel which is to contain the screws the heads of which are to be turned. The shanks of these are passed through holes prepared to receive them in the periphery of this wheel. The under parts of the heads are thus brought into contact with countersunk steel dies, which are fluted or ribbed, so as to present sharp cutting-edges to the under side of the head. These dies are to be let into the periphery of the wheel, so as to be renewed at pleasure when they become dull from use. In Fig. 3, *k* is one of these dies, exhibiting the flutes in the countersink and the manner in which it may be let into the wheel. The standard *a* sustains the chisel by which the heads of the screws are to be turned.

14 is a piece which swivels on a stout pin, the head of which is shown at *b*. To this swivel is attached a socket, which holds the chisel *c*, by which the heads are to be turned, and which may be so formed as to turn the edges also, or, in preference, carry a second chisel for that purpose, which second chisel may, if preferred, be on a separate stock. The chisel is withdrawn after the head has been turned to allow the wheel 1 to revolve and bring another head in place to be turned, the lower part of the cranked shaft, which embraces the wheel 1, being seen at 15, and the screw *c'* in the standard *a* constituting one of the centers upon which it vibrates.

No. 44 is a spout, into which the screws which have been finished fall by their gravity and are conducted off.

The tongs 18, attached to the spindle *d d*, are for clinching the screw and holding it while it is being whirled round by a band passing around the whirl 42.

The closing of the jaws for the purpose of clinching the screw to be turned is effected in the following manner: 19 is what I denominate a "conical wedge." This conical wedge fits onto the spindle *d*, having a hole through it to receive the spindle, which is cylindrical, allowing the conical wedge to slide or turn freely upon it. 20 is a rod inserted through the handles of the tongs and surrounded at each end by spiral springs, which, acting upon them, serve to open them when the conical wedge is withdrawn from between. The cross-bar 21, the front sway-bar 22, the pulley 23, the lever 24, and the weight 25, are for forcing the conical wedge between the handles and closing the jaws of the tongs. A collet 43 is placed on the spindle *d* immediately back of the cross-bar 21 and fixed in its place by means of a tightening-screw for the purpose of aiding in drawing the spindle back by the action of the sway-bar 22. 26 is a slide-bar, which is forced back by means of a cam 27 on the tumbling-shaft 4, *e* being a center screw in the standard *e'*, which supports one end of this shaft, the shaft itself being distinctly shown in the top view, Fig. 2. The sway-bar 22 is made capable of adjustment as regards its distance from the feed-wheel 1, in order to adapt the tongs 18 to screws of different lengths. *f f f* are openings to receive its journals *f'*. The frame 35, which confines these journals down, may be raised and the sway-bar shifted. The nut on the long screw on the sliding bar 26 adapts this bar to the required distances. The collet or socket 36, against which the back sway-bar operates, must also be adjusted to accord with the other parts. The back sway-bar 28, the lever 29, and weight 30 are for urging the spindle forward when it is at liberty to move in that direction.

To enable the spindle to conform itself to those deviations from truth in the screw which are unavoidable, and which will produce some wabbling when it is held by the tongs, I allow the collar *g* to have some play upward downward, and laterally in the puppet or standard *h*. For this purpose it is suspended

between spiral springs at each of its sides, as at 31, 32, 33, and 34.

To operate the tumbling-shaft 4 and the cams and other parts with which it is connected, I employ a second spindle or shaft *h*, Fig. 2, which carries the endless screw or worm *i* and is turned by a band on the whirl 37. This worm gears into the cog-wheel 38, which is loose on the tumbling-shaft 4; but it has a pin on one side of it, which comes in contact with a similar pin on one side of the ratchet-wheel 39, which is firmly fixed on the shaft. *j j* are pawls which serve to check the ratchet-wheel in the usual manner. When the worm or endless screw has brought the pin on the cog-wheel 38 into contact with that on the ratchet-wheel 39, the latter, being permanent on the shaft, turns said shaft 4, which previously was dormant, until the weight 40 upon an arm attached to the tumbling-shaft rises and passes beyond a point vertical to the tumbling-shaft, when it falls over by its own gravity and is ready to be again acted on by the endless screw. During the time of the falling of the weight 40 the following movements take place, and the screw fed into the flange-wheel 1 next succeeding that the head of which has been turned is brought into place to undergo the same operation: The cam 3 on the tumbling-shaft 4 raises the lever 16, which lever being attached to the shaft 15, called the "crank-shaft," and before spoken of, this turns the swivel 14 (to which it is connected) a short distance, sufficient to free the chisel from the head of the screw. A small cam on the tumbling-shaft 4 comes at the same time in contact with the rod 10 and draws it back a short distance, carrying with it the spring-catch 9, the rod being attached to it for that purpese. This unlatches the latch 8, which is attached to the shaft 7. The point on the lever 2, which falls into the divisions on the feed-wheel 1, is then withdrawn by the action of a forked spring, which turns the shaft 7. In the meantime the cam 27 on the shaft 4 comes into contact with the sliding bar 26, drawing said bar back, and with it the front sway-bar 22, and withdrawing by this means the conical wedge 19 from between the handles of the tongs, which then open by the action of the spiral springs before described. The upper end of the sway-bar carries the spindle *d d* and the tongs back to the proper distance by the aid of the collet 43. The flange or feeding wheel being now free to move, in consequence of the removal of the chisel and the drawing back of the spindle and of the freeing of the point which holds in the divisions of the feed-wheel, that wheel is moved round to the requisite distance by the raising of the lever 5 by the cam 3. The vertical arm 11 upon and attached to this lever advances the ratchet-rod 12, jointed to it, and pushes the ratchet-wheel 13, which is fixed on the shaft of the feed-wheel, the distance of one division. The short arm 5′ on the lever 5 at the same time forces down the piece 6, which is attached to the shaft 7, compresses a spring beneath the piece 6, and brings the point 2 into a new division on the feed-wheel, where it is retained during the turning of the screw-head by the latch 8, also affixed to the shaft 7, which is brought under the catch of the spring-catch 9. The other parts of the machine now assume their former position—that is to say, the spindle is propelled forward by the back sway-bar 25 and weight 30. The tongs close on the screw by the conical wedge being forced between the handles of the tongs by the front sway-bar and its appendages. The chisel is made to press upon the head of the screw situated within the fluted or ribbed countersunk dies in the feed-wheel, this being effected by means of the crank 15, the lever 5, and the weight 17, as before indicated. As the screw revolves by the revolution of the shaft *a a* the conical or under part of the head is smoothed by the ribs or flutes, while its upper or flat part is turned by the chisel, on the completion of which the tumbling-shaft is carried round by the weight, and the same routine recommences.

What I claim as my invention in the above-described machine, and desire to secure by Letters Patent, is—

1. The manner in which I operate the tumbling-shaft by the operation of the endless screw and cog-wheel, so as to give the requisite motions to the respective parts with which it is connected, as set forth.

2. The mode of combining the feed or flange wheel with the chisel, the swivel 14, and the crank 15 for turning the heads of the screws and producing the auxiliary motions necessary to the completion of that operation, as described.

3. The inserting of ribbed or fluted steel dies into the periphery of the feed-wheel, said dies being countersunk and provided with sharp cutting-edges, for the purpose of turning the under sides of the screw-heads.

4. The manner of closing the tongs which hold the screw to be turned by means of the conical wedge, and the combination of the cam 27 and sliding bar 26, with its adjustments.

5. The manner of suspending the main spindle to enable it to conform to the inequalities of the screw by the aid of spiral or other springs operating on each of its respective sides, as described, so that it may yield both vertically and laterally. I do not claim the allowing it to yield in two directions only.

HENRY CRUM.

Witnesses:
JAMES TAYLOR,
JOSEPH CRUM.