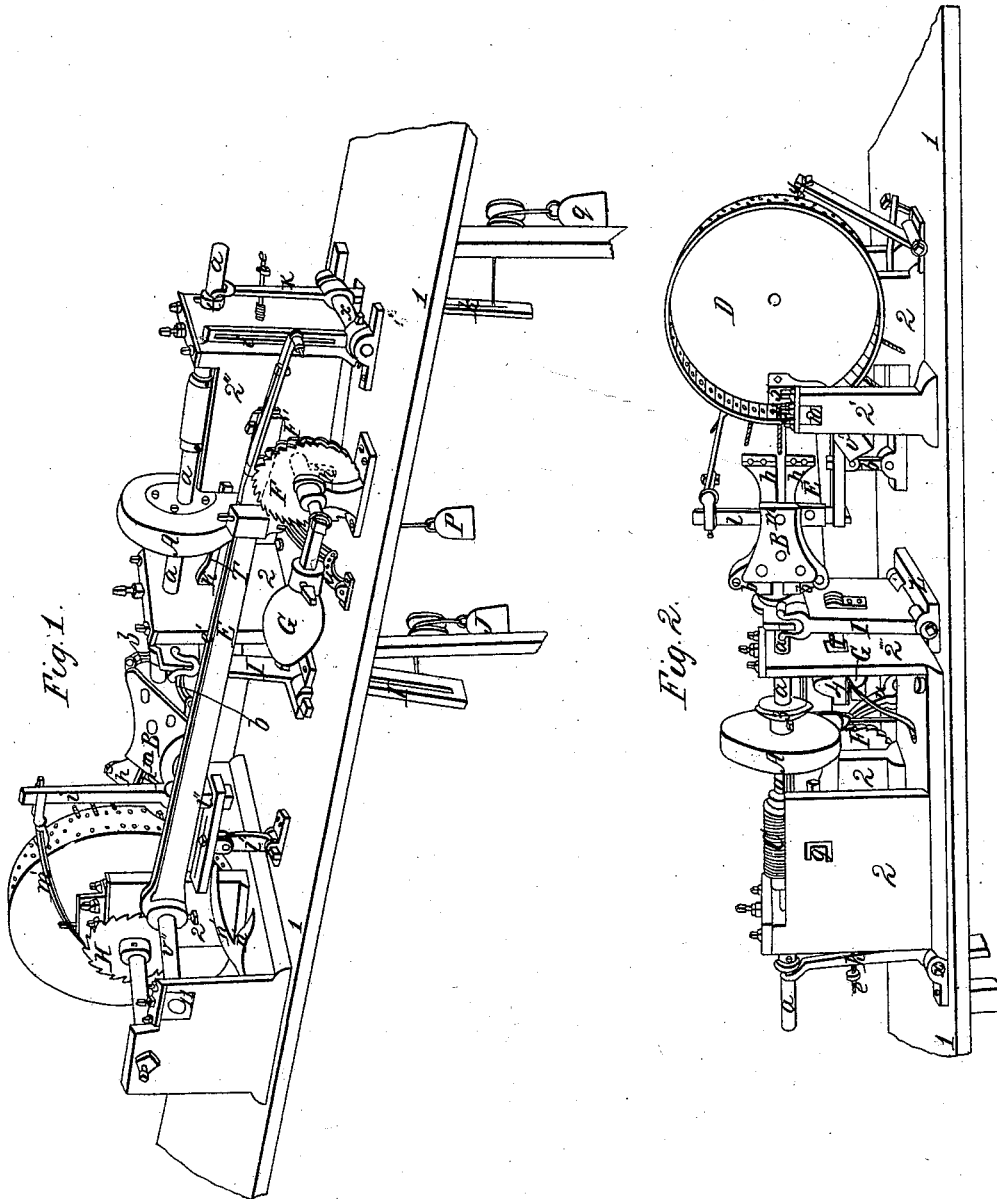


#79
H. CRUM.
MAKING WOOD SCREWS.

Patented Nov. 14, 1836.



UNITED STATES PATENT OFFICE.

HENRY CRUM, OF CLARKSTOWN, NEW YORK.

WOOD-SCREW-THREADING MACHINE, &c.

Specification of Letters Patent No. 79, dated November 14, 1836.

To all whom it may concern:

Be it known that I, HENRY CRUM, of Clarkstown, in the county of Rockland and State of New York, have invented a new and useful Machine for Cutting the Threads of Wood and other Screws, and that the following is a full and exact description of the same, reference being had to the drawings which accompany and make part of this specification.

Figures 1, and 2, are perspective views of the machine on opposite sides thereof. Fig. 3, is a plan of a part of the apparatus for guiding, and governing the motion of the spindle in cutting the screws, and Fig. 4, the apparatus which contains the dies for cutting the screws together with the compound lever, and other appendages by which it is made to operate. In these different figures the same letters of reference, and numbers are used to designate the same parts of the machine.

The spindle or mandrel *a, a, a*, which carries the dies, revolves, and traverses backward, and forward in suitable boxes, and is made to revolve by means of the wheel A. The check plates B, B, embrace the jaws that hold the dies or cutters, at their extremities *h, h*, and also the combined levers by which they are opened, and closed. These jaws, and levers are represented on a large scale in Fig. 4, the check plates being omitted to show the arrangement of the jaws, and levers, the more perfectly. The dies are fitted into grooves in the extreme ends of the jaws *h, h*, and are retained, and regulated by set screws.

m, is the pin or fulcrum of the jaws, at the other extremity of the jaws are the combined lever *b, b*, which as will be evident from the drawing will open the jaws whenever they are drawn back which is effected by the crossbar, or collar *v*, this collet being embraced by a grooved socket through which the spider passes, and in which it can slide, and being acted upon by what I denominate the sway bar or lever I. The sway bar or lever I, stands vertically passes through the bench, and vibrates on a point pin at the yoke L. The weight J, as will be seen in the drawing tends to force the upper end of the lever I, forward, and to ease off the blow; as it is intended to operate suddenly it is suspended by or rests on a spiral or other spring or I have produced the same effect without the use of

the weight J, by forcing back the foot of the sway bar, or lever, I, by a spiral spring on a rod placed horizontally, and passing through the slot at the lower extremity of the sway bar or lever, T, is a latch which is connected by a joint to the sway lever, and passes through the front puppet head against which it is borne by a spring acting on the underside, and latching it by means of the projection K. When the sway lever has passed far enough back for that purpose, No. 4 is a cam on this latch by which it is to be disengaged at the proper moment, this being effected by the contact of the conical collar 3.

C, is a guide or leader placed upon the spindle its thread corresponding with those of the cutting dies; under the guide screw is the segment of a female screw or comb, *a*, Fig. 3. This figure is a plan of the apparatus by which the comb is sustained, and disengaged at the proper period.

b, b, is a horizontal platform to which the comb is attached. This platform works on joint pins at one end, and may be depressed at the other, so as to disengage the comb from the guide screw. This falling end is seen at *g*, Fig. 2, passing through a mortise in the side of the frame.

K, K, is a second sway lever similar in its construction to that first described, one of the uses of which is to disengage the comb from the guide screw, and this it does by the moving back of the mandrel *a, a*, which brings this lever into contact with a nut on the rod *e*, this rod passing through a slot in the lever. When in contact with this nut, the rod *e*, acts upon the levers *f, f*, and *d*, Fig. 3, draws the wedge *c*, back when the platform *b, b*, falls, disengages the comb, and allows the weight *q*, to carry the mandrel forward.

W, is a spring which acts on the lever *a*, which with its connections operates in a way which will be understood by inspecting the drawing.

It will be observed that the rod *e*, passes through the back puppet head as well as through the lever K, and has on it a spiral spring to regulate its action receiving the blow from its return, and forcing the levers *f, f*, forward. The blanks which are to be cut are fed into holes made through the periphery of the wheel D, which wheel is in the form of a shallow drum with one head as shown in Fig. 2. This wheel may be cast

iron, and the inside of its periphery or rim there are pieces of cast steel let in by dovetails, or otherwise fastened so as to correspond with the holes for receiving the blanks. These pieces of steel are drilled and countersunk so as to adapt them to the heads of the blanks, the countersinks of these steel dies are fluted or ridged to prevent the blank from turning while being cut.

In order to hold the blank in its place while the screw is being cut upon it pressure is made against its head by a steel pin V, passing through the head 5, of a cranked lever, the lower portion of the cranked part being seen, at 6, Fig. 2, the 10, in the standard 2, containing one of the pivots upon which it turns. The other pivot is in the box, 11, of the standard 2.—Fig. 1, V, being the straight part of the shaft. This shaft is so bent as to form a crank between the two parallel sides of which the wheel D, is embraced. The necessity of this cranked form will be apparent as the wheel D, comes in the line of the axis of the shaft V. The lever E, seen most fully in Fig. 1, is made fast to the shaft V, and when it is raised the pin *v*, which presses upon the screw-head will also be raised, but when it is forced down, the pressure upon the head will be continued. The weight *p*, is suspended from this lever for the purpose of making pressure upon the screwhead, which pressure is continued during the whole time of cutting the screw.

The shaft X, which is the fulcrum of the lever K, behind the back puppet head has an upright arm, or lever *i* attached to it which of course moves back with the moving back of the lever, K, by the action of the spindle *a*, *a*, *a*, the rod *i*, as it moves backward retracts the hooked latched rod S, and draws the ratched wheel F around, raising the weight G, which is attached to the shaft of the ratchet wheel until the weight passing a little beyond a vertical line falls over by its own gravity effecting a purpose to be presently explained, at this moment the comb is disengaged from the guide screw, and the mandrel is forced forward suddenly by the action of the weights already described.

Upon the ratchet wheel shaft, between the ratchet wheel, and that part of the frame marked 2''', in which one of its gudgeons works, there are two cams which lift two levers, one of them the lever E, and the other which is parallel to it marked *e'*. One of these cams is shown by the dotted line *h'*, and the other is near, and similar to it. The falling over of the weight G, brings these cams up against these levers below which they are situated, and raises them, the effect of raising the lever E, will be to remove the pressure from the head of the screw which has been cut, and to

allow the wheel D, to pass around far enough, and bring another blank into the position to be embraced by the cutting jaws.

The second lever *e'*, is for the purpose of forcing the wheel D, around at the instant it is at liberty to turn or vertical arm *V'* rises from it, and carries the feed arm M', which acts upon the ratchet wheel H, having upon it the same number of teeth as there are holes for blanks in the wheel D, which is consequently carried around the required distance. The rod *V'*, has a pointed screw, or pin Y, at its upper end which falls into dividing holes similar to those used on the plate of a dividing engine, retaining the wheel D, in the precise position required, it is acted upon by the system of levers *V''*, *V'''*, and the spring *n'*, *n'*, so as to engage and disengage it by the motion of the lever, *e'*.

It will be seen that there is a second ratchet wheel F on the shaft of the tumbling weight G, which holds it in the position given to it by the action of the rod S, the pawls upon U, falling into the notches as it advances and retaining it till the weight falls over.

Having thus fully described all the parts of this machine, which are necessary to enable a competent machinist to understand its operation fully, and to construct by the aid of said description, and the drawing to which it refers, I will still to render its action the more conspicuous give a full detail of its manner of operating.

The blanks are fed into the holes prepared for them in the interior of the wheel D, where they are retained by their own gravity until they arrive at the points where they are to be cut.

All the motions of the machine result from that of the whirl A, which is turned a band as the machine is shown in the drawing (Fig. 2.), the spindle *a*, *a*, has been drawn back by the engaging of the comb on the guide screw *c*, and the lever *h*, has been carried back so as to be nearly in contact to the collet or nut on the rod *e*, by moving this back the levers *f*, *f*, Fig. 3, are drawn from a right line so as to form an angle with each other, the wedge *c*, which kept the comb in contact with the guide screw is consequently withdrawn, and the platform C', C', falls. The spindle now free is propelled forward by the lever K, acted on by the weight *q*, the projection *h*, of the latch T, holding against the standard 2'''' detains the sway lever I, I, and the grooved collet, and cross bar *r*, while the spindle proceeds on by sliding through the grooved collet which from the connection of the jaws *h*, *h*, with the jointed levers *b*, *b*, Fig. 4, and their attachment to the collet by joint pins opens the jaws, and screw dies so that they may advance upon the blank. At this period the conical collar 3 comes into contact with

the cam 4, on the latch T, depresses and liberates it, the weight J then forces the upper part of the lever I forward, the jointed levers *b, b*, consequently close the jaws upon the blank, and they are in the position to cut the thread, by the retreat of the spindle *a, a*. The same motion of the lever K which disengages the comb from the guide screw, acts by the intervention of the arm *i*, and the hooked ratchet rod *s* to take the pressure from the head of the cut screw, by the falling over of the weight G, and the action of the cams on its shaft raising the lever E, and brings a new blank into its proper place for being cut, by the operation of the lever *e*, and its appendages as already described. The screw (8.) when cut passes round with the wheel D until they arrive at a point where they fall out of their holes by their own gravity, dropping into a trough or leader by which they are conducted off.

Figs. 5, 6, 7, 8, show in detail certain parts which could not be distinctly represented in the other drawings and the same marks of reference being made on them as on corresponding parts of the preceding figures, no further description of them will be found necessary.

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

1. The principle or method by which the sway lever I is combined with and made to operate upon the spindle *a, a*, and the jaws *h, h*, containing the dies for cutting the screws.

2. I also claim the combination of the levers E and *e*, with the lever K, acting through the medium of the ratchet rod S, to raise the weight G, which when turned over in the way described brings the cams into contact with and raises the levers E and *e'* in the manner and for the purposes set forth.

3. I also claim the use of the wheel D, or other analogous contrivance for receiving and holding the blanks while being cut by the screw dies.

4. Although a great variety of machines have been constructed for the purpose of cutting the threads of wood screws it will be perfectly apparent to every machinist fully acquainted with what has been heretofore done that the general combination and arrangement of this machine as a whole is peculiar in its character, and cannot be mistaken for or confounded with any other; I therefore claim in addition to the respective parts already enumerated as being new in their arrangement the general construction and arrangement of the whole as combined together including in this combination and arrangement all those individual variations of which a machine so complex is susceptible while it remains substantially the same in the operation and in the effects produced by it.

HENRY CRUM.

Witnesses:

ANTHONY HOUSTON,
JOHN S. WELLING.