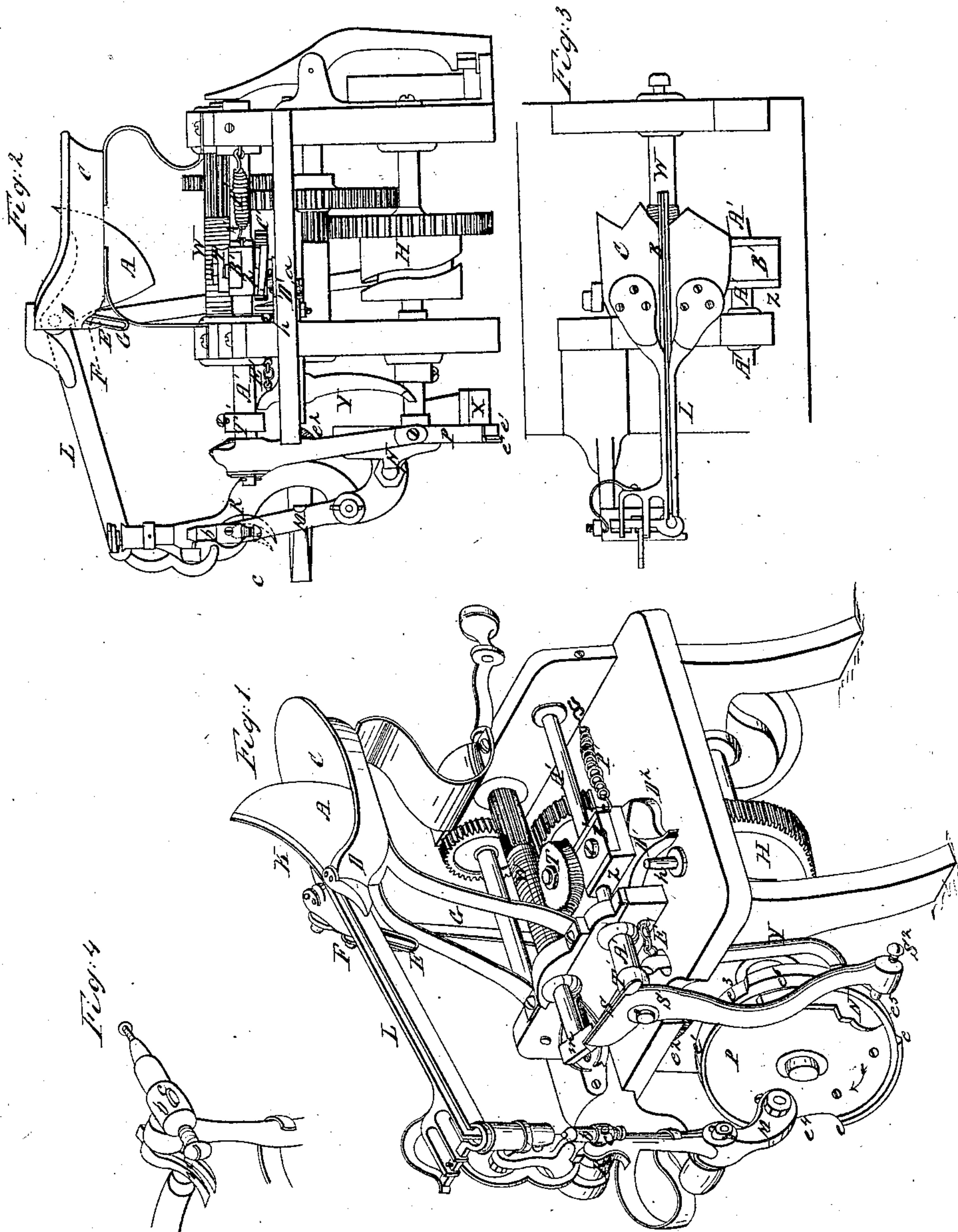


T. Newbury,
Making Wood Screws,

N^o 16,803.

Patented Mar. 10, 1857.



UNITED STATES PATENT OFFICE.

THOMPSON NEWBURY, OF TAUNTON, MASSACHUSETTS.

IMPROVED MACHINE FOR CUTTING SCREWS.

Specification forming part of Letters Patent No. 16,803, dated March 10, 1857.

To all whom it may concern:

Be it known that I, THOMPSON NEWBURY, of Taunton, in the county of Bristol and State of Massachusetts, have invented an Improvement in Screw Machinery; and I do hereby declare that the following is a full, clear, and exact description of the principle or character which distinguishes it from all other things before known, and of the usual manner of making, modifying, and using the same, reference being had to the accompanying drawings, of which—

Figure 1 is a perspective view of the machine; Fig. 2, a side elevation; Fig. 3, a top view of the feed-pan; Fig. 4, a detached view of the carrier.

My invention consists in certain improvements in screw-making machinery hereinafter described, as follows:

For feeding the blanks I employ a jointed segmental elevator A, vibrating up and down through a slot B in the bottom of the feed-pan C. This elevator is hung upon the shaft D and operated by means of the slotted arm E on shaft D and pin F on the vibrating arm G, which arm, having its center of motion at *a*, is vibrated by a projection on its lower end working in the cam H. When the elevator is down, its upper edge lies even with or just below the bottom of the pan and the blanks fall into the trough K of the elevator and catch or hang by their heads, the heads being wider than the trough. As the elevator is raised, it carries up a supply of blanks, and when sufficiently elevated the blanks slide into the fixed ways L, whence they descend one by one into the carrier, this part of the operation being regulated by means common to screw machinery and not necessary now to describe.

The carrier *b* vibrates upon the axis *c* at the upper extremity of arm M, which arm is operated by cam N on the wheel P. The requisite motions of the carrier for conveying the blanks to the nippers *m* are effected by means of the curved slotted guide-piece R, which is attached to and turns with the axis of the carrier and the stationary pin *n*. It will be readily seen that as the arm M vibrates back and forth the curved slot of the piece R will be drawn over the pin *n* (shown in

Fig. 4) and move the carrier *b* from the vertical to a horizontal position.

During the pointing of the blank the tool is moved lengthwise the blank by the side cam X acting on lever Y and during the threading by the leader-worm T. The threading and pointing tool S, attached to the upper part of arm S', is moved toward the blank by the action of the risers *e e' e'* of cam-wheel P upon the lower end of arm S' and from the blank by the action of the spiral spring *e²* upon the arm S', in conjunction with the recesses *e³ e⁴ e⁵* in the periphery of wheel P. The risers *e e' e'* are raised on their outer edges, as shown in Figs. 1 and 2, and the form given to the periphery of these risers corresponds to the form of the point of the blank.

The axis of the leader-worm wheel T has its bearing in the enlargement Z of the shaft A', said bearing being adjustable by means of the sliding box B'. Fixed to the lower end of the axis of the worm-wheel and revolving with it is a catch-wheel C', provided with a suitable number of stops (six in this case) to be caught by the spring-pawl D', pivoted to the enlargement Z of shaft A'. The revolution of the leader-shaft W causes the worm-wheel T and the catch-wheel C' to revolve until the stops of the catch-wheel are arrested by the spring-pawl D', when the rotary motion ceases, and by the action of the leader upon the worm the worm, catch, pawl, enlargement, and shaft A' all move in the direction of the length of the shaft carrying the threading-tool along the blank to cut the thread. Supposing a screw-blank to have been taken by the nippers from the carrier, the pointing is first to be effected as follows:

During the revolution of the wheel P, when the inner and lowest part of the riser *e* comes into contact with the set-screw S² in the arm S' it acts upon the arm so as to depress the tool and bring it into contact with the blank for the purpose of commencing the operation of cutting the point. As the wheel P continues to revolve in the direction of the arrows shown in Fig. 1, the action of the side cam X upon the lower end of lever Y forces its upper end against the collar T' on the shaft A' and moves the shaft carrying the tool and lever S' endwise toward the end of the blank,

and thus carries the set-screw S^2 onto the raised portion of the riser e . The effect of this movement is to gradually depress the point of the tool toward the axis of the blank, and thereby cut the blank to a point.

During the operation of pointing the inner end of the spring-pawl D' is kept from contact with the catch-wheel C' by means of the chain E' , attached to the upper end of the lever Y and to the inner end of the pawl, so that the worm-wheel T , being allowed to revolve on its own axis, does not operate to "lead" or move the shaft A' lengthwise. The lengthwise motion of the tool during the pointing is thus effected by the cam X and lever Y independently of the means for effecting the lengthwise motion of the tool during the threading operations.

As the lengthwise motion of the tool during the pointing of the blank must be slower than it is during the cutting of the thread, the two motions must be independent of each other, and the cam X is so shaped as to give the required rate of motion to the tool for pointing the blank.

When the pointing is completed, the lever Y passes off from the cam X as the wheel P revolves and the spring-pawl P' , attached to the frame-work of the machine, and the enlargement Z of the shaft A' pulls the shaft A' back and brings the tool in position to commence the threading operation. At the same time the chain E' is slacked and allows the spring D^2 to force the inner end of the pawl into contact with the catch-wheel C' .

The lengthwise motion of the tool for threading is effected as follows: The revolution of the worm-wheel T being stopped by the action of the pawl upon the catch-wheel C' , which, as before said, is fastened to the axis of the worm-wheel and revolves and stops with it, the threads of the leader-shaft acting upon the worm move the shaft A' lengthwise, carrying the tool along the blank to cut the thread. When the tool has cut the thread to the point, the outer end of the

pawl D' , by coming into contact with the stop, releases the inner end from the catch-wheel and the spring P' again pulls back the tool with its shaft A' into position to commence another threading operation. This operation may be repeated as many times as may be necessary to cut a full thread. According to the drawings herein referred to there are provisions shown for passing the tool over only twice in the threading operation. In order to cut the thread, the tool is brought into contact with the blank by means of the risers e^6 and e' acting successively upon the levers S' . The riser e' , which operates to make the second cut, being a little more raised than the riser e^6 , causes the tool to cut deeper into the blank. These risers are similar in form to the riser e , which operated in cutting the point, their outer edges being raised to operate upon the tool, so as to cut the thread down to the point. When the threading is completed, the lower end of the lever S' falls into the recess e^4 , thereby withdrawing the tool out of the way, so that the screw may be dropped from the nippers by any of the usual modes known and used in screw machinery.

What I claim as my invention is—

1. The jointed elevator passing through the bottom of the feed-pan, substantially as herein set forth.
2. The vibrating slotted guide-piece fixed to the carrier-shaft operated by arm M and pin n , as herein set forth.
3. Giving the threading-tool for the purpose of pointing the blank a motion independent of and slower than that required to effect the threading, substantially as herein set forth.
4. The catch-wheel C' with its pawl and stop, in combination with the leader-worm T , as herein set forth.

THOMPSON NEWBURY.

Witnesses:

CHAS. G. SAGE,
R. T. CAMPBELL.