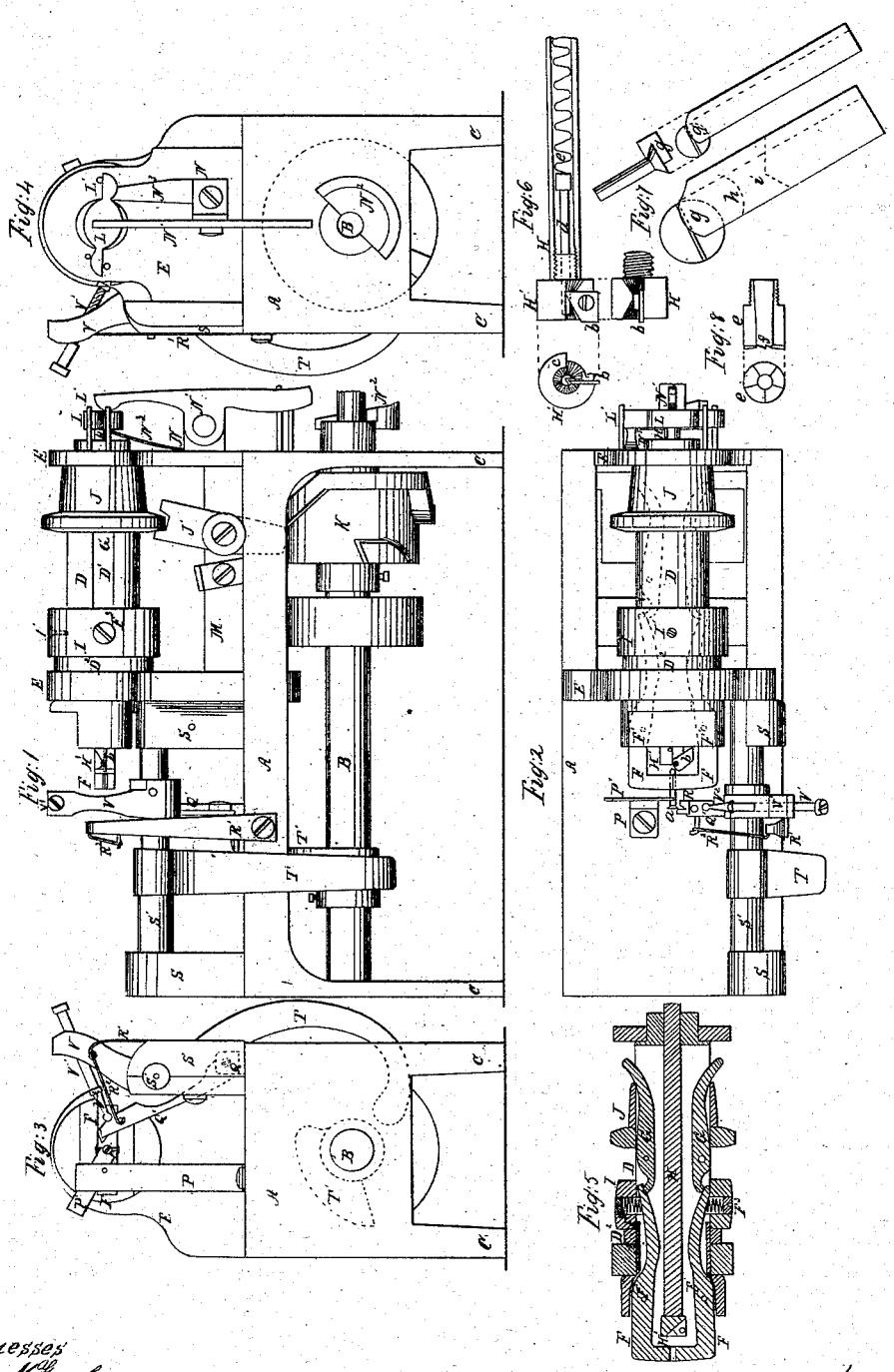
J. Dennis, Jr.

Making Wood Screws.

No. 54,873. Patented May 22, 1866.



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UNITED STATES PATENT OFFICE.

JONATHAN DENNIS, JR., OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN MACHINES FOR TURNING AND POINTING SCREW-BLANKS.

Specification forming part of Letters Patent No. **54,873**, dated May 22, 1866.

To all whom it may concern:

Be it known that I, JONATHAN DENNIS, Jr., of Washington, District of Columbia, have invented certain new and useful Improvements in Machinery for Pointing and Turning or Shaving the Heads of Screw-Blanks and other Articles; and I do hereby declare that the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvements without further invention or experiment.

The object of my invention and improvements is to so arrange and construct a machine that it will point screw-blanks, rivets, and other articles the same time that their heads are turned or shaved.

The nature of my invention and improvements consists in arranging a pointing-tool behind the griping-jaws of the machine, to point screw-blanks, rivets, and other articles at the same time their heads are turned or shaved, and in arranging a rod, made hollow or otherwise, in the arbor which carries the griping-jaws, to hold and carry the pointing-tool; also, in arranging the shanks of the griping-jaws, the levers, and other devices in the arbors of screw-machines in such a way and manner as to allow the rod which holds the pointing-tool to traverse in the arbor between them; also, in certain mechanism to hold and traverse the rod which carries the pointing-tool as will hold and traverse it to do its work of pointing the blanks, rivets, &c.; also, in arranging a rod in the pointing-tool and its rod, and a spring in the inside or on the outside of said last-mentioned rod, or some other device that will push the blanks out of the griping-jaws after they are pointed and their heads turned or shaved; also, in making the cutting-edge of the tools to turn the tops of screw-heads curved—either rounded, hollowed, or angular—so that they will extend across the groove and begin to cut on the far side of the groove in the head before they cease cutting on the hither side of the groove, and turn the heads smooth after the nick or score is cut, and work without chattering.

Figure 1 is an elevation of the front of the machine. Fig. 2 is a plan or top view. Figs. 3 and 4 are elevations of the left and right hand ends of the machine. Fig. 5 is a section of the arbor cut lengthwise. Fig. 6 shows different views of the pointing-tool enlarged, with a section of the rod which holds and traverses it; also the rod and spring for pushing the blanks out of the jaws after they are pointed and their heads have been turned. Fig. 7 shows the tools for turning the heads of the screws. Fig. 8 is a tool to mill a screw-blank.

In the above-mentioned drawings, A is a cast-iron frame, which may be made in the form shown, or in such other form as will answer the purpose. The ends of this frame project down and are perforated for the journals of the shaft B to turn in, and terminate in four legs, C C, which support the machine.

The shaft B is the main shaft of the machine, and may be provided with a fast and loose pulley for a band from some moving power to operate the machine.

The stands E E project up from the frame A, as shown in the drawings, and are perforated for the journals of the arbor D to turn in, which may be made in the form shown in the drawings, or in such other form as will answer the purpose.

The arbor D has a long slot, D′, through it, terminating in two openings in the front end of the arbor, in which openings the griping-jaws F F, which hold the screws, blanks, or rivets, vibrate on pins F′, which pass through the arbor and jaws.

The arbor is shown in section, Fig. 5, cut longitudinally by the side of the slot with the jaws F F, levers G G, and pointing-rod H all in it.

The arbor D has a large head and shoulder which turns in front and against the front stand, and in rear of this stand a loose collar, D^2, and next to the collar the pulley I, fastened by the set-screw I′.

The pulley I is perforated radially for the spiral springs F^2, which act against the rear ends of the jaws F to open them to receive the screw-blanks; and there are some short screws F^3, fitted to the pulley I to hold the springs F^2 in.

The levers G G act on the rear ends of the jaws F to close them and gripe the screw-blank *a*. These levers G are made in the form shown in Fig. 5, and vibrate on pins in the arbor D, the levers working in the slot D′ of the arbor, and when the jaws are open to receive a screw-blank the rear ends of the levers

G project out of the arbor or out of the slot D′; and to press them in and close the jaws on the screw-blank *a* the rotating traversing collar J is moved back over them by the lever J′.

The collar J is fitted to turn and traverse freely on the arbor D, and it is provided with a rib for the end of the lever J′, which forks onto it to traverse it each way when required. The lever J′ vibrates on a screw in the bar M, between the stands E E, and is worked by the cam K on the shaft B, which cam is made in the form shown in Fig. 1, or in such other form as will answer the purpose, and fastened to the shaft B by a set-screw or otherwise.

The arbor D is perforated at each end of the slot for the pointing-rod H, which is fitted to traverse freely in it, but does not turn with it, (the arbor.) This rod H holds and carries the pointing-tool H′, which consists of a cylindrical head fastened to the rod H by a socket and pin or otherwise, with its front end countersunk conically or in such other form as it may be desirable to make the point of the screw-blank.

About one-fourth of the head H′ is cut away on one side to form a seat for the cutting-tool *b*, which is fastened to its seat by a screw through the tool or otherwise. This head traverses onto the point of the screw-blank, while it (the blank) is turned rapidly, and as the blank enters the countersink it is pointed by the tool *b*, and the chips escape through the space cut away in the head H.

To prevent the rod H from turning I fasten the cross L to its rear end, and arrange it to traverse between or against the pins L′ in the stand E. To traverse the rod and head H to the blank to point it, I fasten the stand N to the stand E and hang the lever N′ to it, so that when the cam N^2 on the shaft B pushes out the lower end of the lever its upper end pushes the rod H forward, and carries or feeds the tool *b* gradually against the blank to point it. After the cam ceases to act on the lever the spring N^3, fastened to the stand E, and acting against the cross L, moves the rod back and draws the head H′ away from the point of the screw. The cam N^2 is made in the form shown in the drawings, and fastened to the shaft B by a set-screw or otherwise.

To push or throw the blank out of the jaws after it has been pointed, nicked, and the head turned or shaved, I make the front end of the pointing-rod hollow for some distance, or entirely through, as shown in section, Fig. 6, and insert a small rod, *d*, in it, fitted to traverse freely, and make a groove, *o*, in one side for the inner corner of the tool *b*, so that the rod can work by the tool as it pushes the blank out; and to operate this rod I put a spiral spring, *e*, behind it in the pointing-rod, or on the outside, so as to act on a pin projecting from the inner rod through a slot in the outer rod; or the inner rod may extend entirely through the outer rod at the rear, and there be operated by a cam or spring or other device. When the blank is inserted it pushes the rod *d* back, compressing the spring, which acts to throw the blank out when it is released by the jaws.

To mill or turn down the shaft of the blank to a uniform size a given distance where the thread is to be cut, the head *e*, Fig. 8, should have a straight hole, *f*, in it, which may be made largest at the inner end and countersunk slightly at the outer end, so that the end of the blank will enter readily. This head may be made of steel with teeth in the end, as shown in the drawings, to cut the blank the size required, or it may be made for the tool to be screwed on, like *b*, or in some other way.

I contemplate that the blanks may be fed to the jaws of my machine by the feeding-machine patented to Daniel M. Robertson, February 12, 1861, or such other machine as will answer the purpose; and that the machine or shaft B may be provided with a pulley or friction-clutch, such as is described in Daniel M. Robertson's and Jason A. Bidwell's machine, patented May 23, 1865, or such other clutch or apparatus as will start and operate the machine when desired, and allow the arbor to stop while the screw-blank is being nicked or slotted by such devices or apparatus as is described in the last-mentioned patent of Robertson and Bidwell, or such other nicking apparatus as may be preferred; and after the blank has been nicked it will be rotated to turn the point and turn or shave the head by the devices or machinery which I will now describe.

The stand P is fastened to the frame A to support the back-rest P′, against which the shaft of the screw turns when the head is turned and shaved.

Q is a stand fastened to the frame A, to which stand the arm Q′ is hinged, so as to vibrate to and from the blank and carry the tool R, which is to shave the head of the blank after it is nicked or slotted.

To hold the arm and tool R from the blank and out of the way when the blank is inserted or thrown out, I fasten the spring R′ to the frame A, and connect its upper end to the arm Q′ by the pin and link R^2. The stands S S are fastened to the frame A to support the rock-shaft S′, which turns in them, and is marked by the curved arm T, fastened to the shaft and acted on by the cam T′, fastened to the shaft B. The shaft S′ has the arm V fastened to it, and it is provided with a screw, V′, which acts on the share V^2, between the screw and the arm Q′, to press it forward and carry the tool R to the head of the blank, to turn or shave it when the cam T′ throws out the arm T. The cam T′ is made in the form shown in Fig. 3.

The present mode of preparing screw-blanks is to put them into the griping-jaws and turn the head; then stop the blank and nick it or cut the score; then set it to rotating and bring up the turning-tool to take off the burr formed in cutting the score. Efforts have been made to turn the head, after the score was cut, with

a straight-edged tool, but without success, for every time the score came parallel with the edge of the tool it would spring and begin to vibrate or chatter, so that the heads could not be turned smooth. To remedy this defect and save the time of the machine, and enable it to turn off more work in a given time, I have made a tool with rounded or curved edge, as shown at *g*, Fig. 7, which tool is so curved or rounded that the score in the screw head or blank cannot come parallel with the curved edge of the tool, and the chattering is prevented, because the curved edge of the tool extends across the groove or score in the screw-head, and begins to cut on the far side of the score or groove before it ceases cutting on the hither side of the groove, thereby shaving the heads smooth after they have been grooved, and saving the time of the machine, which has heretofore been occupied in starting, reshaving the head of the blank, and stopping again, thereby enabling the machine to do about fifty per cent. more work in a given time than it could do if it shaved the head before the groove was cut and reshaved it (the head) after the groove was cut.

The tool *g* (shown in the drawing) has its end rounded; but it may be hollowed out instead of rounded; or it may be made with an angle, so as to prevent the entire cutting-edge from coming parallel with the score in the head of the screw.

The form of the edge of a hollow-ended tool is shown at *h*, Fig. 7, and the form of the angular-edged tool is shown at *i*, Fig. 7. Both of these forms are shown by dotted lines.

I contemplate that skillful artisans will modify my improvements in various ways to adapt them to the purposes and circumstances in which they wish to use them, and that there may be projecting ears or lugs on the end of the arbor D to hold the fulcrum-pins of the griping-jaws nearer to the griping ends of the jaws; also, that the pulley I may be grooved roundwise on the inside, so as to contain C-springs to open the griping-jaws, instead of the spiral-spring shown in the model.

Having described my improvements, I will state my claims as follows:

1. Pointing screw-blanks, rivets, and other articles at the same time their heads are turned or shaved by the devices shown and described, or their equivalents.

2. Arranging the pointing-tool behind the griping-jaws for turning the heads of screw-blanks, rivets, and other articles, so as to point them the same time their heads are turned or shaved.

3. The rod H, made hollow or otherwise, and arranged in the arbor to hold the pointing-tool, substantially as described, in combination with a pointing apparatus.

4. Arranging the shanks of the griping-jaws, the levers, and other devices in the arbors of screw-machines in such a way and manner as to allow the rod which holds the pointing-tool to traverse in the arbor between them, substantially as described.

5. In combination with a pointing-tool arranged behind the griping-jaws, the cross L, pins L′, lever N′, spring N^3, and cam N^2, or such other equivalent mechanism as will hold and traverse the pointing-tool to do its work, substantially as described.

6. In combination with the pointing-tool, the mechanism described, or its equivalent, for pushing the blanks out of the griping-jaws after they are pointed.

7. Making the cutting-edges of tools for turning the scored, nicked, or grooved heads of screws, screw-blanks, or other articles curved or rounded, as shown and described.

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