D. M. ROBERTSON & J. A. BIDWELL.

MACHINE FOR THREADING SCREWS.

No. 111,572. Patented Feb. 7, 1871.

Fig. 2.

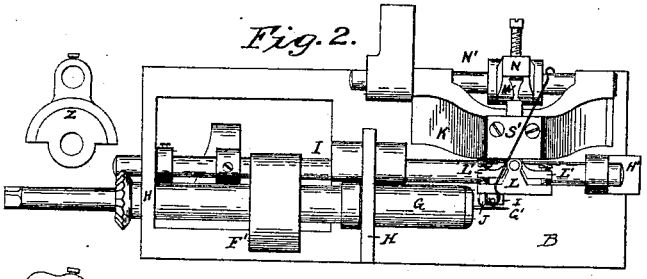


Fig. 4.

Fig. 5.

Fig. 1.

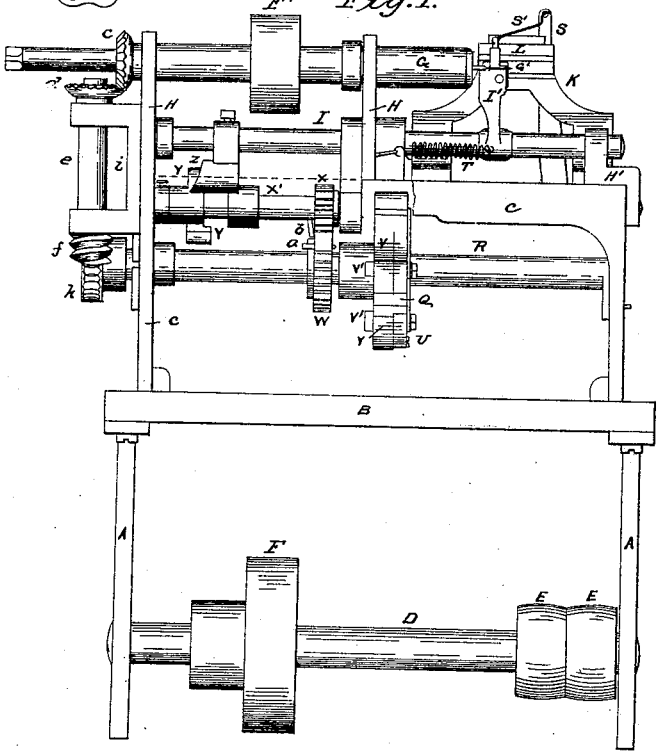
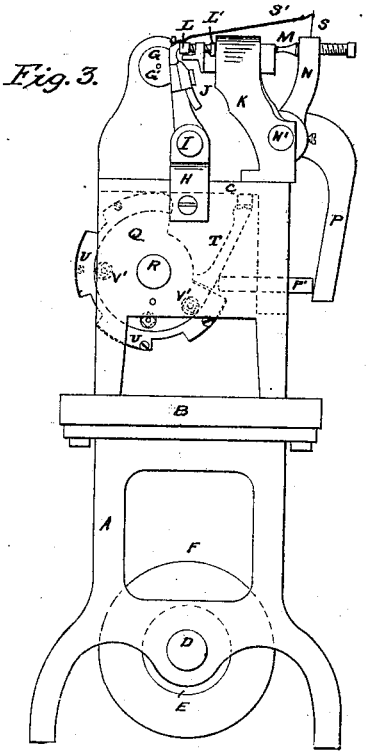


Fig. 3.



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Letters Patent No. 111,572, dated February 7, 1871.

IMPROVEMENT IN MACHINES FOR THREADING SCREWS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, DANIEL M. ROBERTSON, of East Boston, and JASON A. BIDWELL, of Boston, both in the county of Suffolk and State of Massachusetts, have invented a new, useful, and improved Machine for Pointing and Threading Wood-Screws; and we do hereby declare that the following specification 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 our said invention or improvements without further invention or experiment.

The nature of our invention and improvements in machines for pointing and threading screws consists in the peculiar construction and arrangement of devices for traversing the threading tool, so as to cut alternately on each side of the score, or alternately on each side and in the bottom of the score, so that the tool will cut easier and make a smoother thread than if it cut each side of the score at the same time.

To enable others skilled in the art to make and use our improvements, we will proceed to describe them, referring to the accompanying drawings, in which the same letters indicate like parts in each of the figures.

Figure 1 is an elevation of our improved machine.

Figure 2 is a plan or top view.

Figure 3 is an elevation of one end.

In these drawings—

A A are the ends of the frame, firmly fastened to the platform B, and to the top of this platform the frame C is fastened. These frames may be made in the form shown, or in such other form as will answer the purpose of holding the several parts of the machine in their proper places.

The shaft D turns in the ends A A, and is provided with pulleys E E for the band which is to operate the machine.

The pulley F carries a band to turn the pulley F′ and arbor G, which carries the screw-blank G′ to be threaded.

This arbor G turns in the stands H H on the frame C.

I is a rod, arranged to traverse in the stands H H and H′ and carry the tool-holder I′, which carries the tool J to thread the screw-blank G′.

K is a stand, made in the form shown, and fastened to the frame C to hold the movable guide, which presses the tool against the screw-blank to thread it.

The stock of the guide L is made in the form of the letter T, and is fitted to be moved toward or from the screw-blank in a score in the top of the stand K, and is held in place by a cap screwed onto the stand.

The front of the guide L may be made straight, curved, angular, or in such form as will guide the tool to give the required shape to the screw. It has a shank projecting back from its center and fitted to vibrate on a pin in the stock, and may be adjusted by the screws L′ L′ in the arms of the stock.

When the tool J begins to move forward toward the point of the screw the guide presses it against the screw, being forced forward by the share M acted on by the arm N from the rock-shaft N′, which turns in the stand K and is worked by the arm P acted on by the slide P′, which is pushed out by the cam Q on the shaft R, which turns in the ends of the frame C, and is connected by a train of gears with the arbor G, which carries the blank to be threaded.

After the tool passes off of the end of the screw a recess in the cam Q allows the spring S and link S′ to draw the tool-holder and guide from the screw, while the spring T draws the tool-holder back by the side of the screw, to be ready to make a new cut when it is forced forward again, as before.

The slide P′ traverses in a stand on the frame C, and the end next to the cam is held up by the link T′ from the frame C.

The sectional cam Q is shown in elevation in fig. 3. It is fastened to the shaft R.

The working parts of the cam Q are made adjustable and fastened to the disk by screws U U, which hold the sections V V, fig. 4, which sections may be forced out by the wedges V′ V′, which are made in the form shown in fig. 5, and provided with screw-nuts to draw them in behind the sections and force them out to adjust them as desired, the holes in the disk of the cam being elongated radially to allow the adjustment of the sections, of which there are four, but more may be used if required. These sections act on the slide P′ to force the tool against the screw-blank to be threaded, and the several sections are so arranged as to make the tool cut deeper each time it is traversed forward until the screw is finished. The recesses between the sections allow the tool to be drawn from the blank when it is traversed back after making a cut.

There is also a wide space between the sections of about one-fourth of the circumference of the cam, to allow the screw, when threaded, to be removed and a blank inserted in the arbor, which may be provided with the griping apparatus described in Patent No. 45,524, granted to D. M. ROBERTSON and his assigns December 20, 1864.

The bevel-gear *c* on the arbor *g* turns the gear *d* and shaft *e*, which carries the worm *f* to turn the gear *h* and the shaft R, making a connection between the arbor G and shaft R to bring the several parts in unison.

The shaft *e* turns in the stand *i*, fastened to the stand H.

To traverse the rod I and tool J attached thereto forward to thread the blank we fasten the gear W to the shaft R to drive the pinion X and shaft X′, which turns in the frame C and carries the tappets Y Y, which act on the inclined plane Z fastened to the rod I to force the rod forward with the tool to thread the screw-blank. This inclined plane Z is the segment of a circle corresponding with the orbit or revolution of the tappets. These tappets Y Y are not both in the same plane; one stands a little before the other, so that the tool will cut first on one side of the score or thread and then on the other side of the score or thread.

By using three tappets and a cam with six sections, and proportioning the gear and pinion to correspond, the tool may be made to cut alternately or successively on each side and in the bottom or center of the score or thread of the screw-blank, so as to cut the thread much easier and smoother than if it cut both sides of the score at the same time.

There is a space on the gear W of about one-fourth of its circumference, with teeth so arranged as to let the tappets stop, and also the rod I, while the long space in the cam Q is passing the slide P′.

And to start or move the pinion X and bring the teeth on the pinion and gear properly into mesh we put a pin, *a*, in the side of the gear, and an arm, *b*, on the side of the pinion, so arranged that the pin will strike the arm and move the pinion so that the teeth of the gear will enter the spaces between the teeth of the pinion and prevent the ends of the teeth of the gear from striking the ends of the teeth of the pinion, and stopping both or breaking either gear or pinion. It is intended that the screw-blank shall be held in position by a back rest while being threaded, which is so well known it need not be shown or described.

It will be apparent from the foregoing description that, while the long space in the cam Q is passing the slide P′, a blank is secured in the arbor and the gear W begins to turn the pinion X to start the tool forward, when the first section of the cam brings the tool to the blank, while one of the tappets moves it forward cutting a spiral groove in the blank, and after the tool passes off of the end of the blank the slide P′ passes into one of the spaces, while the tool is drawn back and the tappet passes off of the inclined plane, when the spring T moves the tool back and the other tappet strikes the inclined plane and starts it forward again, and the cam Q moves it against the blank and it cuts deeper and on the opposite side of the score cut before; and, as the threading proceeds, it cuts on the opposite side of the score at next stroke, and so on until the threading is completed, when the screw may be released and a new blank inserted in the arbor to be threaded.

What we claim as our invention and improvement in machines for threading wood-screws is—

The threading-tool holder I′, in combination with the rock-shaft I, spring T, cam Z, and arms Y Y, arranged substantially as described.

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