3 Sheets—Sheet 1.

J. F. STARRETT.

Making Wood Screws.

No. 108,648. Patented Oct. 25, 1870.

Fig. 2.

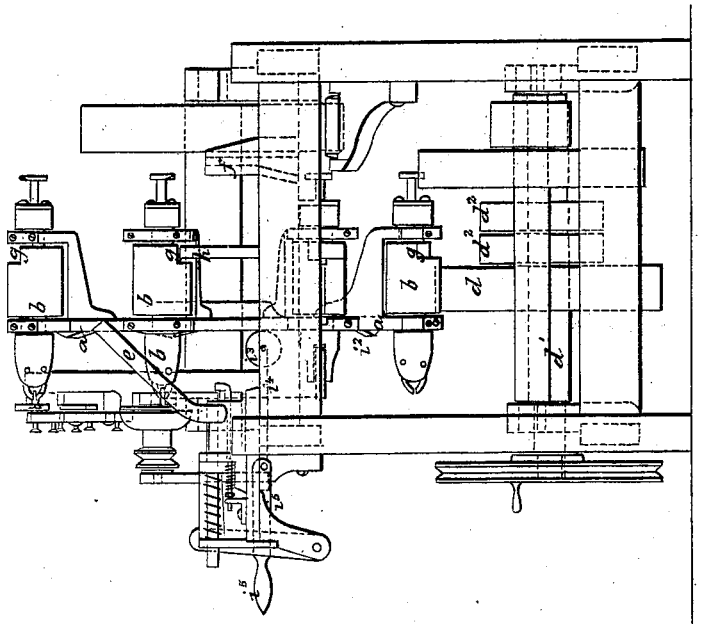

Fig. 1.

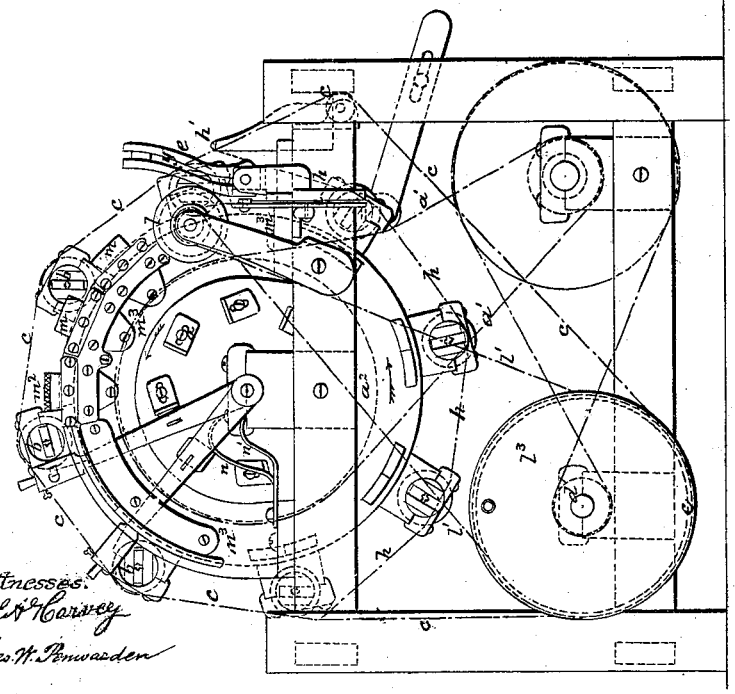

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Fig. 3.

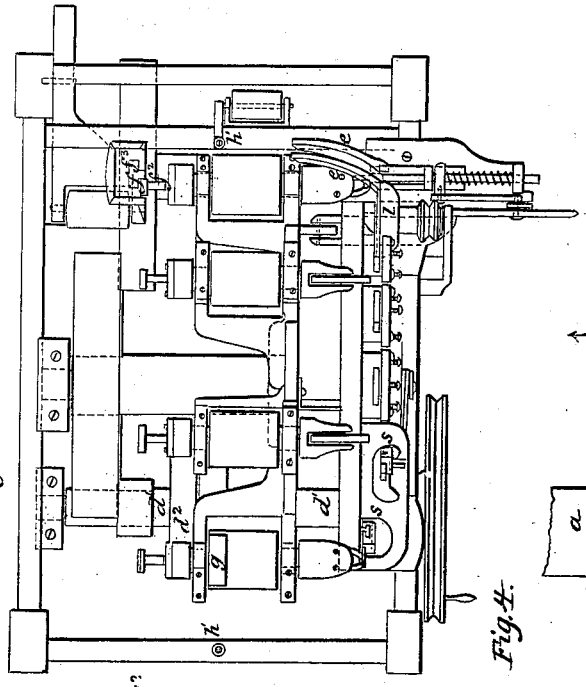


Fig. 4.

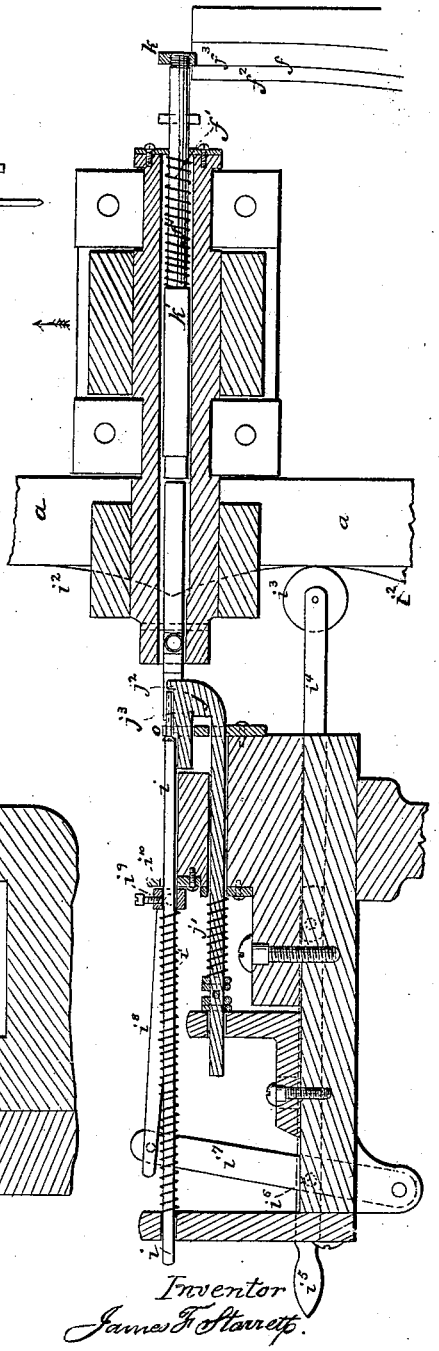


Fig. 5.

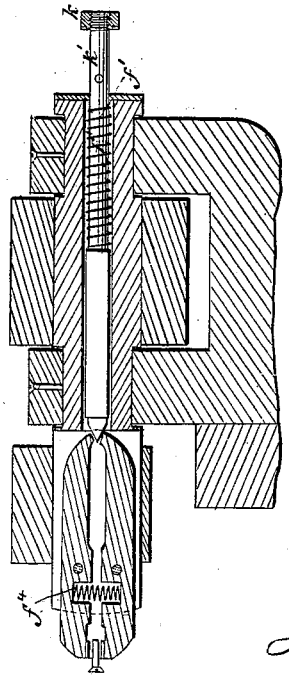
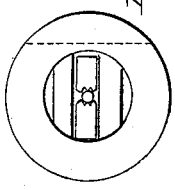


Fig. 6.



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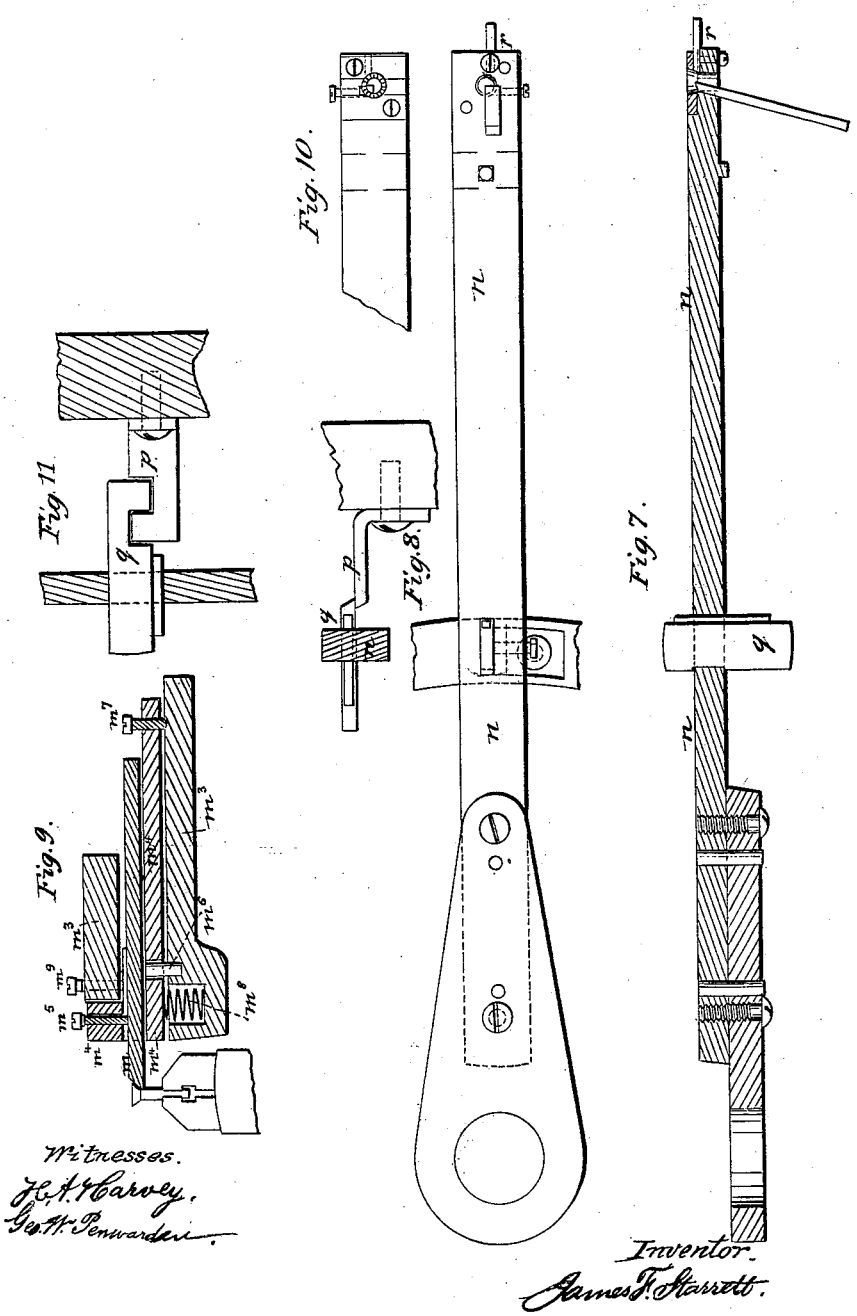

UNITED STATES PATENT OFFICE.

JAMES F. STARRETT, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINES FOR SHAVING THE HEADS OF SCREW-BLANKS.

Specification forming part of Letters Patent No. **108,648**, dated October 25, 1870; antedated October 15, 1870.

To all whom it may concern:

Be it known that I, JAMES F. STARRETT, of the city, county, and State of New York, have invented a new and useful Machine for Shaving the Heads of Screw-Blanks and Similar Articles; and that the following, taken in connection with the drawings, is a full, clear, and exact description thereof.

In the drawings, Figure 1 is a front elevation of a machine made according to the principles of my invention. Fig. 2 is a side elevation of the same with the belts removed. Fig. 3 is a plan thereof with the belts removed. Fig. 4 is a section (full size) through the introducing apparatus, and a revolving nippers, showing also the cam for opening the jaws thereof, and that for actuating the pusher. Fig. 4, A is a plan of part of the introducing apparatus. Fig. 5 is a section through a nippers, taken at right angles to the former one, (also full size.) Fig. 6 is a full-size elevation of a nippers. Figs. 7 and 8 are a section through and an elevation of one of the cutter-stocks and some of their accessories, (full size.) Fig. 9 is a section showing a method of mounting the files, and also the jaws of a nippers with a screw-blank therein. Fig. 10 shows the upper end of a stock with a modified form of cutters. Fig. 11 is a detail view of a hooked tappet and hooked stump.

This invention consists in certain combinations of parts, many of which, considered by themselves, are old and well known.

The invention is represented in the drawings in the form in which I prefer, and which has been in successful practical use; and the machine may, in general terms, be said to consist of a slowly continuously-revolving carrying-wheel, on which are mounted a series of holding-jaws or nippers of any usual or proper construction, each revolving on its own axis, which is parallel to the axis of the carrying-wheel, or nearly so.

These jaws carry screw-blanks (deposited in them) past rotary jigs, or past cutters progressing with the carrying-wheel or stationary files, or past all or any of them in succession, in such manner that the jigs, files, or cutters act upon and cut chips or filings off the heads of the blanks while the nippers or jaws are revolving on their own axes.

With the carrying-wheel, provided with nippers and cutting-tools, files, or jigs, I prefer to combine apparatus for holding the blanks in a column, and introducing them in succession to the jaws, and also apparatus for shutting and opening the jaws automatically, the latter operation permitting the shaved blanks to drop; and the apparatus preferred by me for introducing the blanks is one which accurately adjusts the position of the heads thereof with respect to the nippers or pairs of jaws.

In order to introduce the blanks, I prefer to cause the jaws to cease their rotation on their own axes during such length of time as is necessary to insert the blank; and the nature of my invention consists, first, in the combination of a continuously-revolving carrying-wheel, with a series of jaws mounted thereon, as described, with a belt (or curved surface) acting upon flat, or nearly flat, surfaces attached to or making part of the jaws, whereby the jaws are prevented from revolving on their own axes, as hereinafter described; second, in the combination of a carrying-wheel, with rotary jaws mounted thereon, as described, first, with a rotating jig or emery-wheel, second, with stationary files, and, third, with cutters which, for a certain time, progress with the blanks around the carrying-wheel, these three combinations being as hereafter described; third, in the combination of a pusher having a definite and precise range of motion, and acting on the head of a screw-blank, with a spring or yielding gage not attached to or moving with nippers or jaws, whereby the head of a blank is made to occupy its proper position in the grasp of nippers or jaws, irrespective of the length of the shank of the blank, as hereafter described, and whereby the same gage may be made to apply to several nippers; fourth, in the combination of a continuously-revolving carrying-wheel, having jaws mounted thereon, as described, with an apparatus for introducing blanks into the jaws as specified, the combination being as specified; fifth, the combination of a cutter with cams to guide its line of travel and to throw it out of action, when such cutter is combined with jaws or nippers mounted on a carrying-wheel, and capable of revolution on their own axes, as described.

In constructing my machine I take a carry-

ing-wheel, a, and mount thereon nippers or jaws b b, of any usual or proper construction known to builders or users of screw machinery, in such manner that said jaws may be free to revolve, the way of mounting them being well known, and I apply to the wheel proper machinery to cause it to revolve, either cog-wheels or friction-wheels, or a belt or cords, such as belt a^1, acting upon a pulley, a^2, mounted upon the carrying-wheel shaft, and proper machinery to cause the jaws to revolve on their own axes while the carrying-wheel is revolving, preferring to use for the latter purpose a belt or cord, c, which acts upon pulleys or drums attached to all the nippers, and is caused to travel by the drum d, mounted on the shaft d^1, which also carries fast and loose pulleys d^2 d^2, on which a driving-belt from some prime mover may be applied.

In front of the jaws are the ways e, provided, if desired, with means for preventing the endwise displacement of blanks, in which rests a column of screw-blanks, and at the foot of the ways is the introducing apparatus, to be hereafter specially described.

In rear of the apparatus is a cam, f, which acts upon some proper part or accessory of the jaws, to open the same and hold them open while the blank is being introduced, the cam acting to serve this purpose in consequence of its inclination and the passage of a part of the jaws over its surface.

Various mechanisms for opening jaws are well known, and many of them may be employed, and they (the jaws) may be caused to shut either by a spring, as shown in the drawings at f^1, Figs. 4 and 5, or by a positive motion, in manner well known prior to my invention.

Each pair of the jaws has attached to it a flat, or nearly flat, surface, g. This surface is so disposed as not to come in contact with the driving-belt c.

Underneath the carrying-wheel there is a stationary belt, h, secured at h' h', and I intend sometimes to pass one end of this belt over a pulley, with the free end so passing attached to a heavy weight. This belt forms a curved surface, concentric, or nearly so, with the carrying-wheel.

As the pulleys upon the jaws are, by the revolution of the wheel, carried out of range of the belt c, (see Fig. 1, at x,) they cease to revolve except by their momentum, and as they are carried farther around, the exterior of the jaws comes in contact with the slightly-flexible curved surface formed by the belt h. This surface causes the jaws to cease their revolution as soon as they have so far traversed over it that the flat surfaces g g rest upon the belt h, (the jaws rolling over on the belt until the flat surface rests upon it;) then the jaws are held at rest, so far as their motion on their own axes is concerned, and travel with the carrying-wheel without revolving until about the time that a blank is introduced and held by them, when they pass out of control of belt h, and into the control of belt or cord c, which again sets them, and the blanks they carry, in revolution, and the jaws may be opened at any part of the periphery of the main wheel, and may be caused to cease their revolution at any time, so long as they revolve long enough to do the shaving, and so long as they cease their revolution just prior to their reaching the introducing apparatus.

I intend at times to use, in place of the introducing apparatus specially described, well-known forms of introducing apparatus, but prefer that shown in the drawings. It consists, essentially, of three parts—a pusher, a supporter, and a yielding gage; and, as I have stated, the pusher is to be actuated by a definite motion, so that the pusher shall always move the head, against which it acts, to exactly the same spot in relation to a plane passing over the front of all the nippers, irrespective of the length of the shank, whereby blanks of varying length may be introduced.

I have on the plan of the machine (specially represented in the drawings) shown the pusher as advanced by a spring, i^1, and retracted by cams i^2 (one for each nippers) on the carrying-wheel a. These cams act upon a wheel, i^3, secured to a rod, i^4. This rod slides in proper guides, and has pivoted to it a link, i^5, which has a hook or slot in it that catches over a pin, i^6, in a rock-shaft arm, i^7. The link can be lifted up by hand so as to destroy the connection between it and the rock-shaft, thus preventing the pusher from working in case of emergency.

The rock-shaft arm i^7 is pivoted to a link, i^8, whose other end is pivoted upon the pusher i, which is properly guided, so as to move in right lines. The connection to the pusher is adjustable, and this whole train of devices serves the purpose of moving the pusher backward, and may be replaced by any other suitable for the purpose.

To the pusher is attached an adjustable collar, i^9, which strikes against a stop, i^{10}, the effect being that its forward motion is stopped at a definite, predetermined point.

The gage j also slides in guides or a slot, and its acting face at j^2, which is really the gage, lies opposite the acting end of the pusher. This gage is a thin blade of metal, and the horizontal surface thereof, j^3, between its acting face and the pusher, which I prefer to groove slightly, so as to steady the blank, serves as the supporter of the screw-blank until it is caught by the acting faces of the nipper-jaws, being aided, if necessary, by the groove or gutter j^5 at the bottom of the ways which support the column of blanks.

The cam f is secured to the frame of the machine, and consists of a piece of metal with a slot, f^3, in it, into which leads a slot, f^2.

Pieces of metal k k are attached to the rods k' k', making parts of the nippers, around which the springs f^1 f^1 are coiled. These rods are coned or wedge-shaped at the ends, and act against the tails of the jaws proper, said

ducing apparatus, the combination being substantially such as set forth.

5. In combination with revolving jaws mounted on a continuously-revolving carrying-wheel, cutters, and cutter-stocks, and cams acting to throw cutters in and out of action, and also the combination of jaws, mounted, as described, upon a revolving carrying-wheel, with files, mounted and brought up to their work by a spring, so as to yield in case of necessity, these combinations being substantially such as set forth.

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