# H. A. Harvey,

## Making Wood Screws,

No. 42,767. Patented May 17, 1864.

Fig. 1.

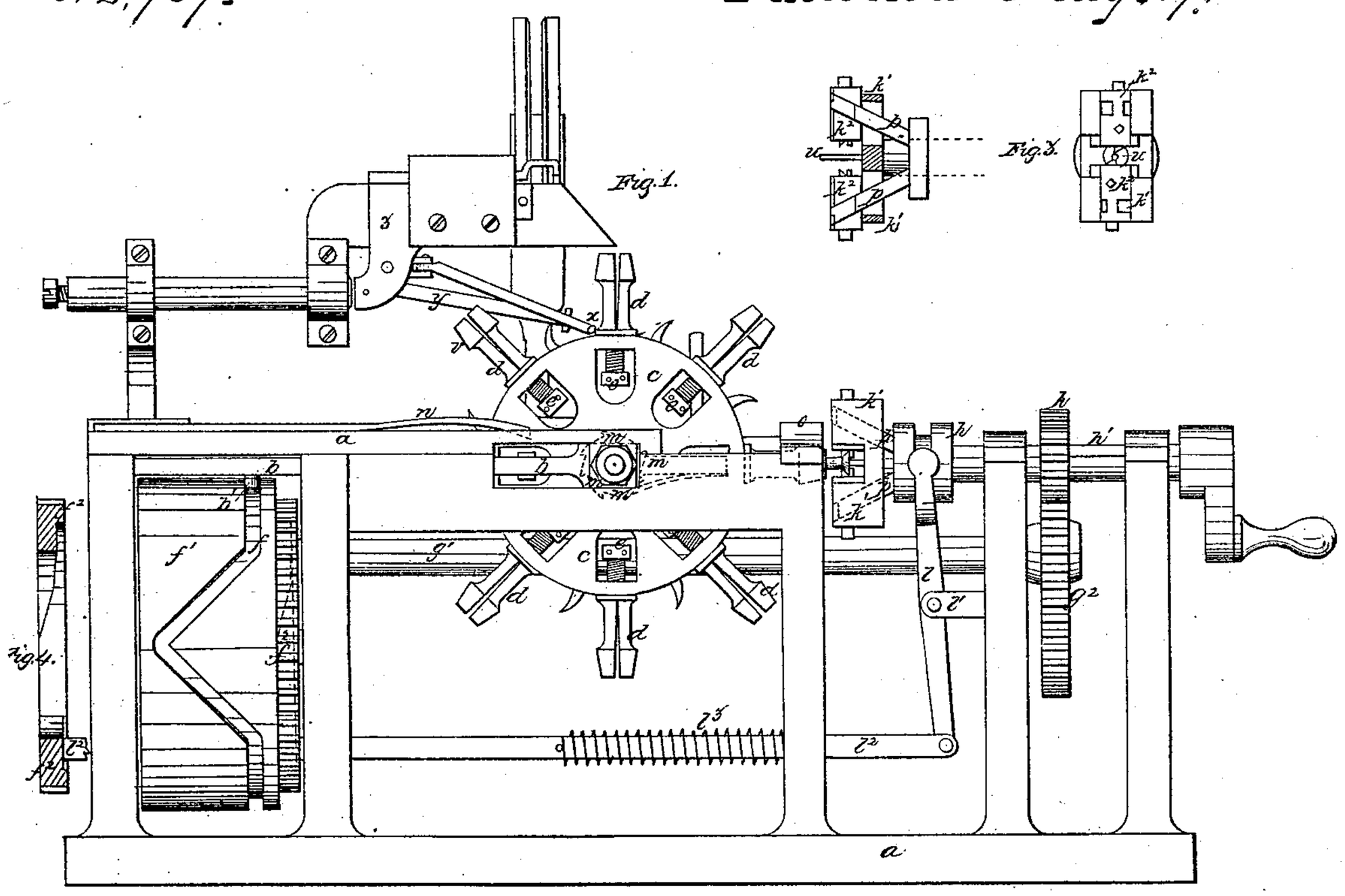


Fig. 2.

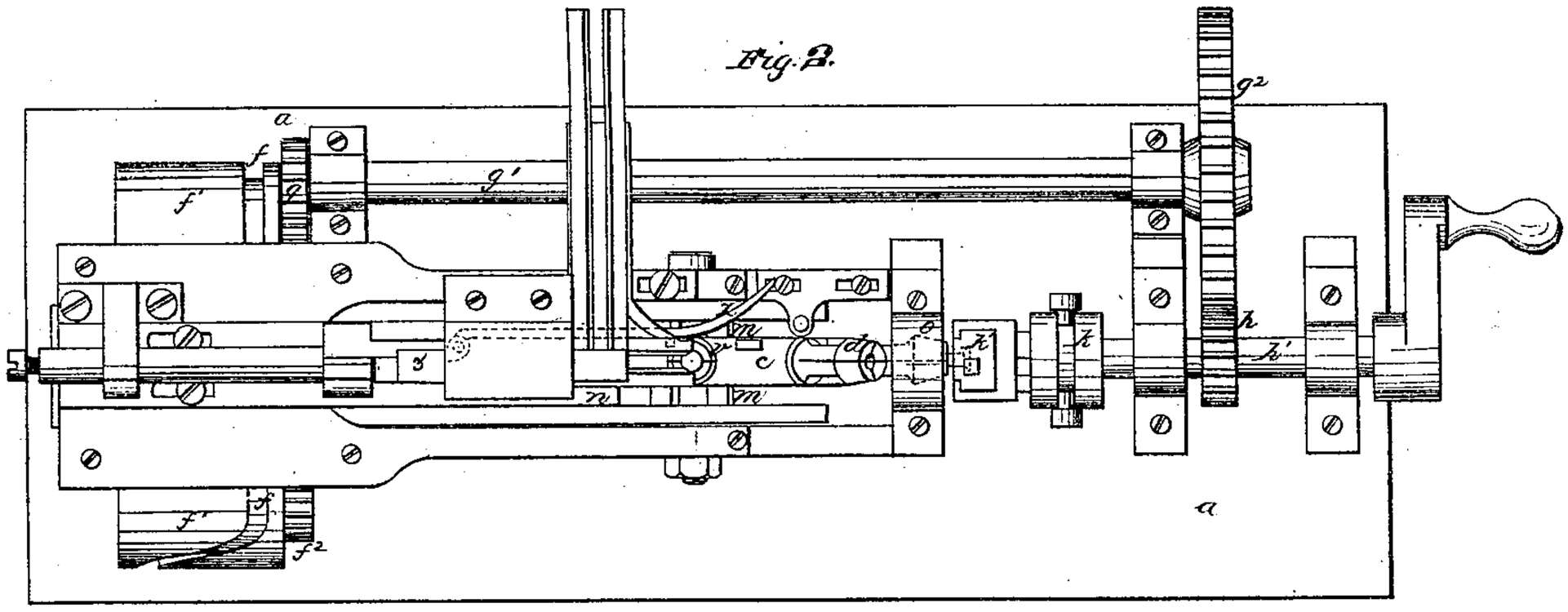


Fig. 3.




Witnesses:
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H. A. HARVEY, OF NEW YORK, N. Y.

## IMPROVEMENT IN APPARATUS FOR SHAVING THE HEADS OF SCREW-BLANKS.

Specification forming part of Letters Patent No. **42,767**, dated May 17, 1864.

*To all whom it may concern:*

Be it known that I, H. A. HARVEY, have invented certain new and useful machinery for shaving the heads of screw-blanks, parts of which are applicable to other purposes; and I do hereby declare that the following, taken in connection with the drawings, is a full, clear, and exact description thereof.

In the drawings, Figure 1 is a side elevation; Fig. 2, a plan of the machine; and Fig. 3 an elevation of and section through the cutter-head, tool-holders, &c.

This machine is similar in many respects to those for nicking and threading screw-blanks invented by me, and for which applications for patents are made cotemporaneously with this one, and the description in this specification will be somewhat general, those desiring more full information being referred to the description of the other machines.

All parts of this machine are mounted upon a bed-plate, *a a*, on which, in proper guides, is supported a carriage or slide, *b b*, in which is mounted a carrying-wheel, *c c*, from the periphery of which project a series of spring receivers and holders, *d d*. These receivers are by preference made of steel turned on the outside and bored out on the inside, and slit, as shown in the drawings. Each receiver may, moreover, be provided with a set-screw to close the bottom of its cavity, as shown at *e e*. Each receiver has its outside beveled at the end thereof; and in line with the axis of the carrying-wheel a conical socket, *o*, is secured to the bed-plate of the machine. The bore of the receivers is of such size that screw-blanks will fall easily into them, and the slits are so contrived that the blank can be held or grasped firmly in the carrier, as in a vise, when the conical end of the latter is forced into the conical socket or gripper. This gripper is represented in the drawings as fixed fast to the frame-work, but I prefer in practice to mount it in guides, so that it may slide to and fro in a line between the cutter-head shaft and the center of the carrying-wheel, and to locate a spring of india-rubber or other material in such way as to force the gripper towards the carrying wheel. By this arrangement I obviate all difficulties arising from unequal diameters of blanks.

The forked carriage *b b* has depending from it a pin, *b'*, which enters into a cam-groove, *f*, of a rotating cam, *f'*. This cam has secured to it a cog-wheel, $f^2$, which is driven by a cog-wheel, *g*, mounted on a shaft, *g'*, on the other end of which is secured another cog wheel, $g^2$, which is in gear with a pinion, *h*, fastened to a shaft, *h'*, which latter is to be rotated by any proper machinery. Upon the shaft *h'* is a grooved sliding sleeve, *k*, and a cutter-head, *k'*, provided with sliding tool-holders $k^2$. A lever, *l*, pivoted at *l'*, has on its upper end pins which take into the groove in the sleeve, and this lever is vibrated through the intervention of a rod, $l^2$, which is, by means of a spring, $l^3$, forced to bear against a face-cam cut on the end of the cam-wheel *f'*. (See sketch in section, Fig. 4.)

The shape of this cam is such as to cause the tools to approach each other gradually while a screw-blank is held for their action and until the shaving is completed, then to recede rapidly from each other and remain in that position until the blank just shaved is withdrawn and a fresh unshaved blank is placed ready for their action, and the cam-wheel *f'* makes one revolution during the entering, shaving, and withdrawing of a blank.

To each side of the carrying-wheel are secured ratchet-teeth *m m*, and upon the frame is bolted a spring-pawl, *n*, in such manner that it may be adjusted so as to strike against the teeth at the proper time. The carrying-wheel has also attached to it a series of lugs, as described, in the nicking-machine, and in the drawings is shown a contrivance for feeding blanks to the receivers and holders in all respects the same as in the nicking-machine, and acting in connection with the carrying-wheel in the same manner as there described; but, as in this machine, blanks are operated upon in the condition in which they leave the header, and as there are often burrs on the heads, which will cause the slide *z* to catch or stick, I prefer, in this machine, to bevel the working side of the latch *x* in such manner that it will bend the spring *y* and fly off from the lug whenever the slide is jammed or stuck fast, and in this way I prevent fracture of the parts.

The revolving cutter-head for carrying the tool-slides, and the slides, tools, and contrivances for actuating them may be constructed in any usual or proper manner known to makers of screw machinery. I have in the drawings shown the tool secured in blocks or

slides $k^2$, free to slide in straight lines. These slides have inclined slots cut through them, into which enter the parts of a fork, $p$, which is attached to the sleeve $k$. As this sleeve moves back and forth the tools must approach or recede from the blank-head, and I have found this arrangement to answer well in practice. The carrying-wheel is to be provided with holding-pawls, as described in the nicking and threading machines, so as to hold it at rest after it has been turned and until one of the receivers enters the gripper. The operation of the machine is as follows, supposing the machine to be in position, as shown in the drawings, and three of the receivers to to contain screw-blanks: In this position a blank is represented as partially shaved, and until this is completed the tool-head revolves, and the cutters continue to approach each other, while the carrying-wheel remains at rest. As soon as the shaving is completed the tools recede from each other and the groove $f$ draws the carriage and carrying-wheel backward, so that the receiver and blank that it carries are free of the socket or gripper $o$, and the ratchets then strike against the pawls, which cause the carrying wheel to revolve through the arc comprised between two receivers. The socket marked $v$ then becomes upright and lies under the angle formed by the two parts of the ways carrying the column of blanks. A fresh blank is then dropped into the receiver $v$, while it and the whole series of receivers and the carrying-wheel are being advanced by the cam-groove $f'$. As they are thus advanced the blank next in succession to the one just shaved is by its carrier forced into the gripper, and the latter, acting on the conical end of the receiver, causes it to grasp the blank firmly. The pin $b'$ has now returned again to the straight part of the groove $f$, and the tools, which have all this time been revolving without performing any duty, now commence to approach each other and shave the head of the new blank. The blank that has been shaved is carried downward and drops out by gravity. In some cases the blanks may not be forced completely home by gravity into the sockets, and in this case the cutters might be injured. As a measure of precaution, therefore, I intend sometimes to locate a punch such as is indicated at $w$, Fig. 3, so as to shove the blank home. This punch may be a spring-punch always tending to force the blank home, and removed out of the way of the cutters by an inclined plane on the cutters striking a pin projecting from the punch, or the punch may slide in a cavity in the shaft of the cutter-head and be connected to a sleeve which is moved forward to shove the blank home and then retracted to take the punch out of the way of the cutters by any proper cam.

The tools may be of any proper kind, and operated in any appropriate manner, so long as they rotate to shave the head of a blank held at rest and open to permit its removal and the entrance of a fresh blank, and it is obvious that parts of this machine, which may be fed by hand or any suitable machinery, may be employed usefully for other purposes—for instance, the carrying-wheel, with its receivers and carriers and gripper or gripping-socket, might be used in connection with a saw mounted on oscillating bearings, thus constituting an nicking-machine.

I claim in this patent as of my own invention—

The combination of a series of receivers and holders, with a socket or gripper and proper rotating shaving-tools, the whole being and acting in combination under a mode of operation substantially as specified.

H. A. HARVEY.

In presence of—
JAS. J. WIGHTMAN,
P. JAMES GAGE.