

3 Sheets--Sheet 1.

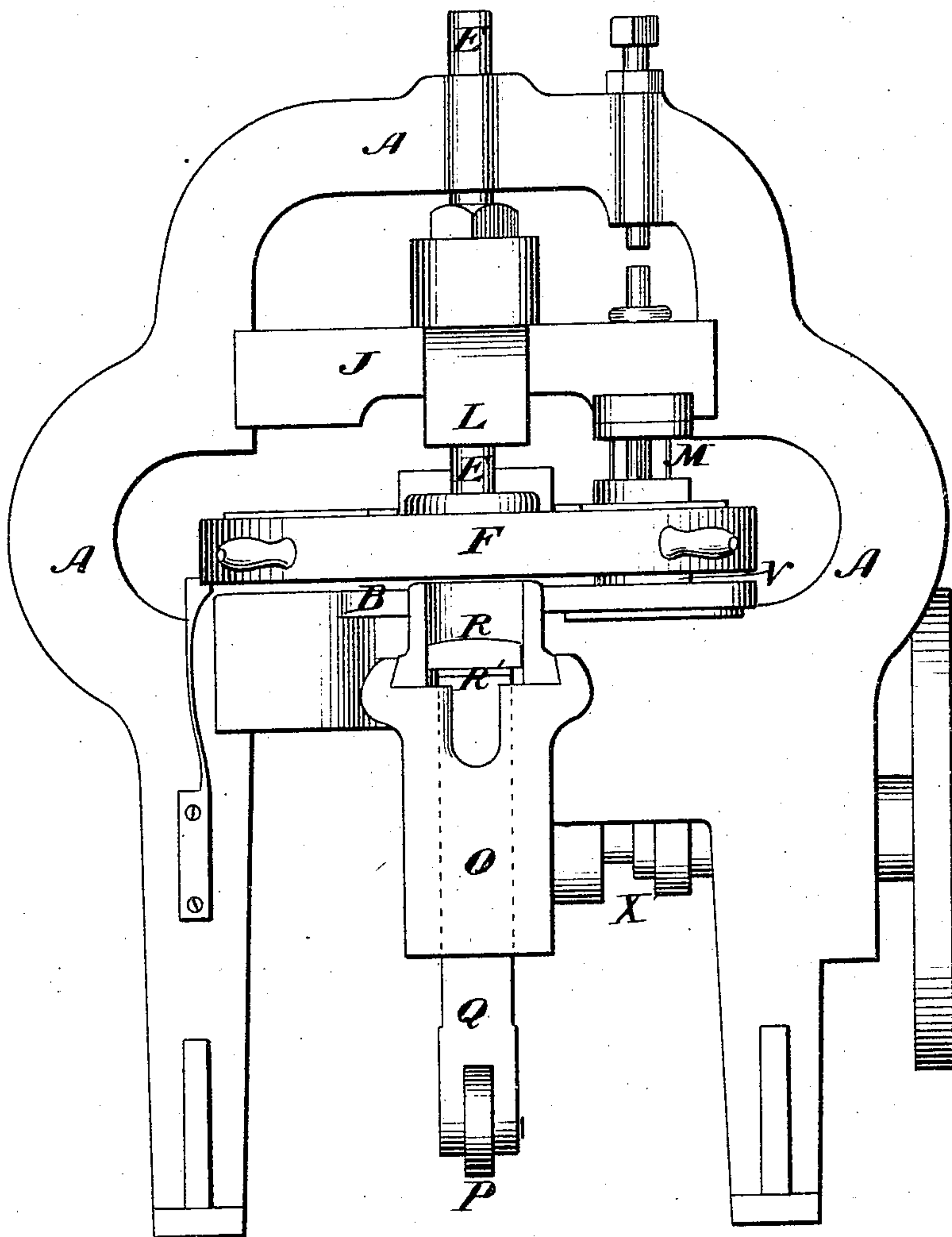
G. McKAY & H. P. FAIRFIELD.

Machines for Making Boot and Shoe Heels.

No. 153,360.

Patented July 21, 1874.

Fig. 1.



Witnesses.

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Fig. 2.

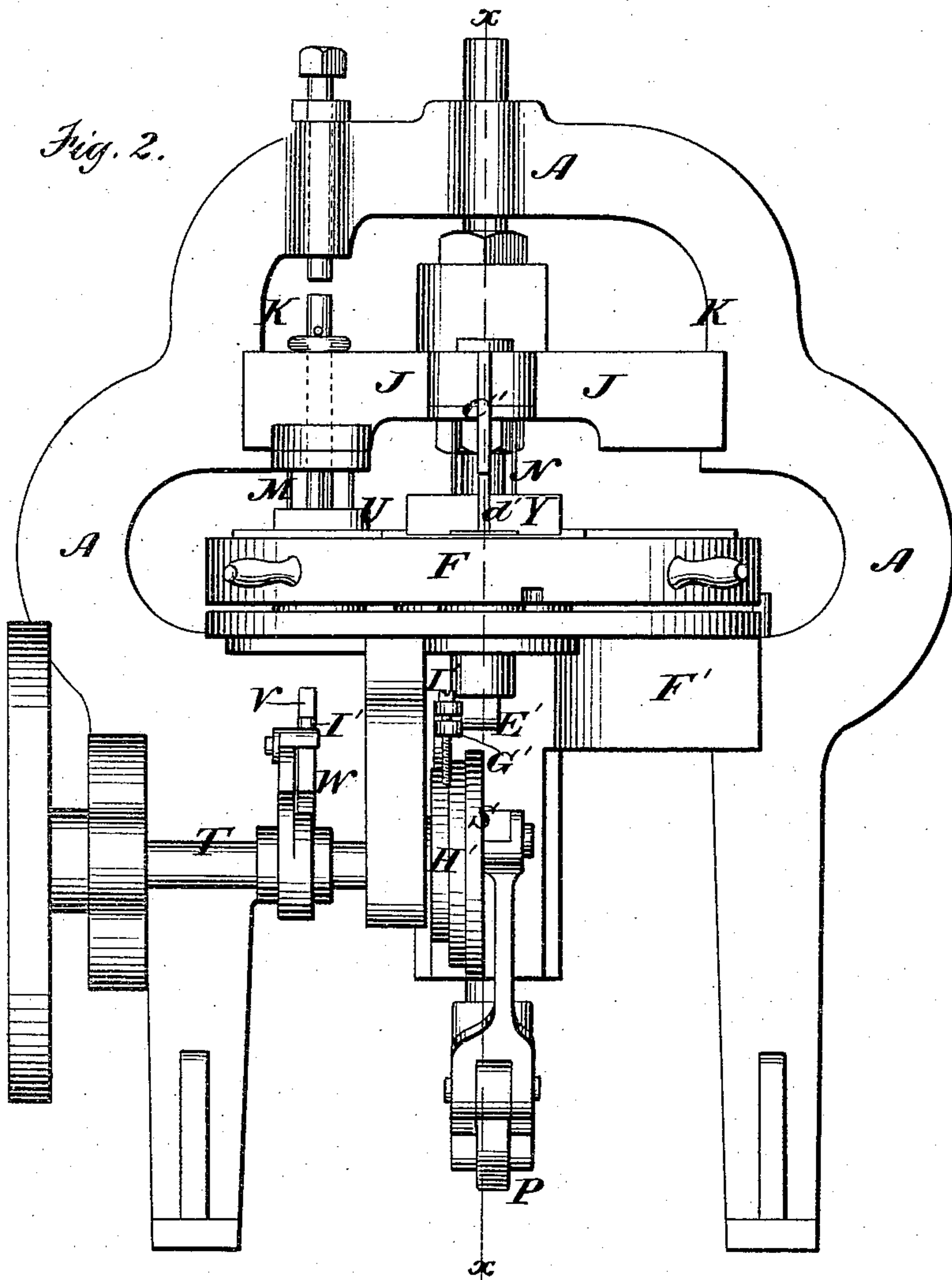
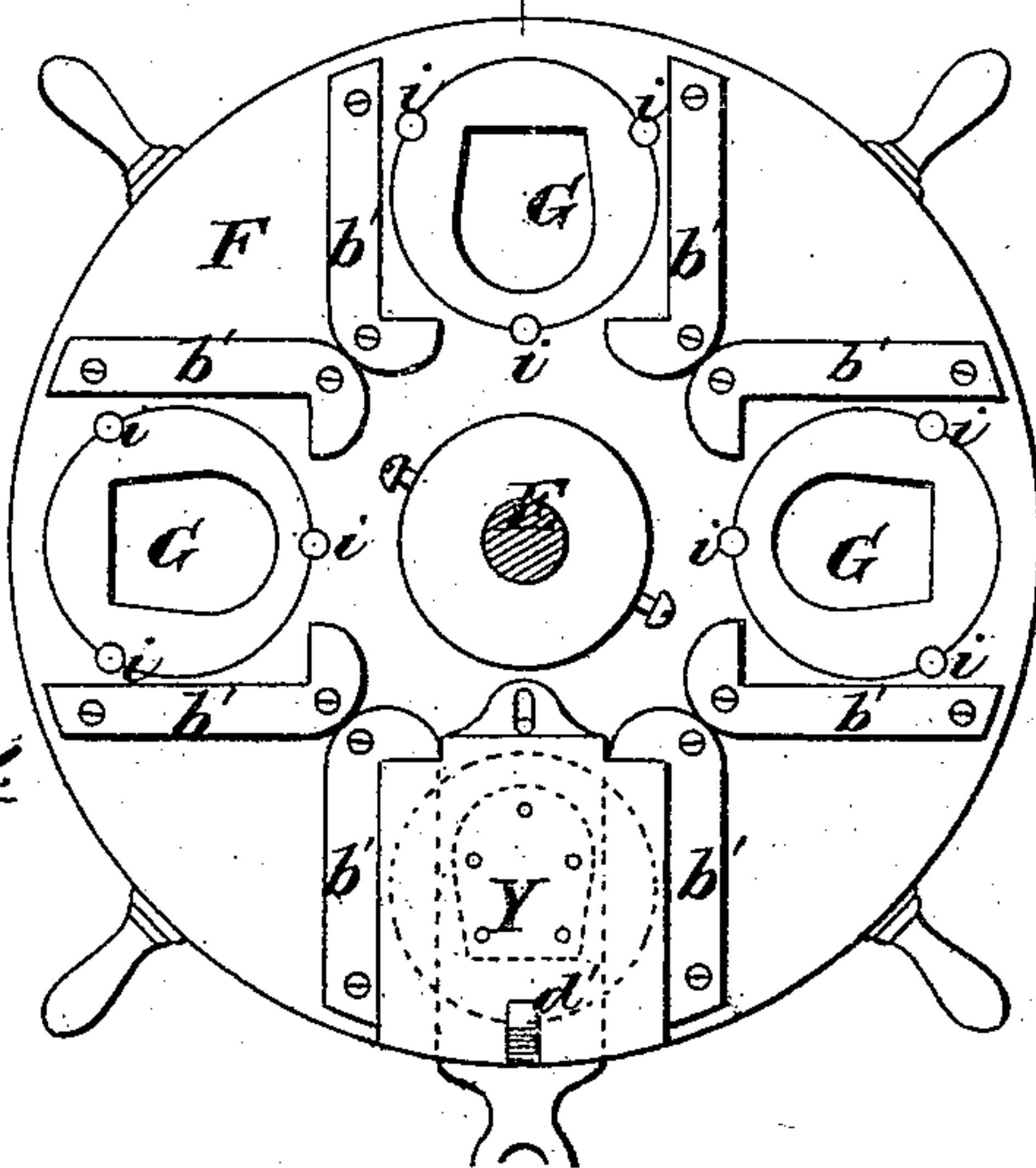


Fig. 3.



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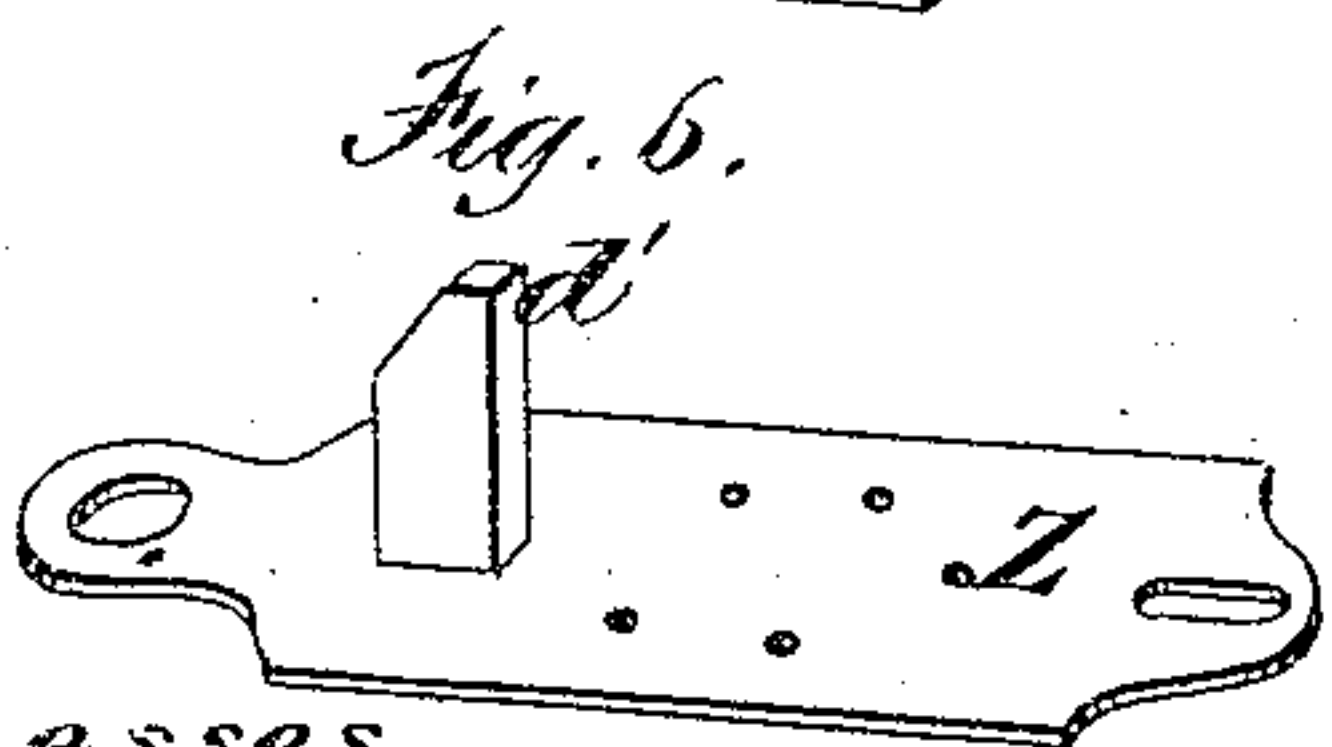
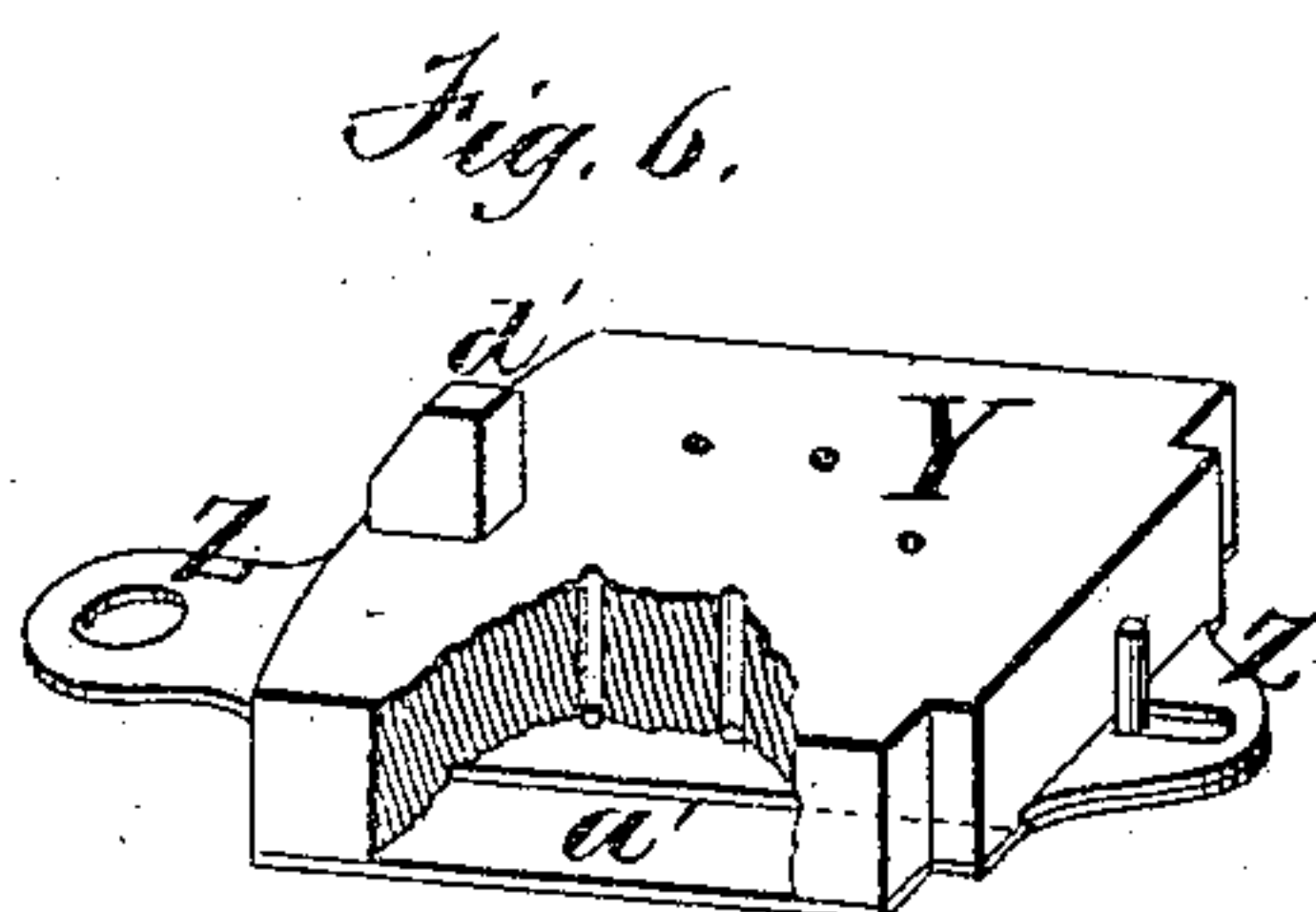
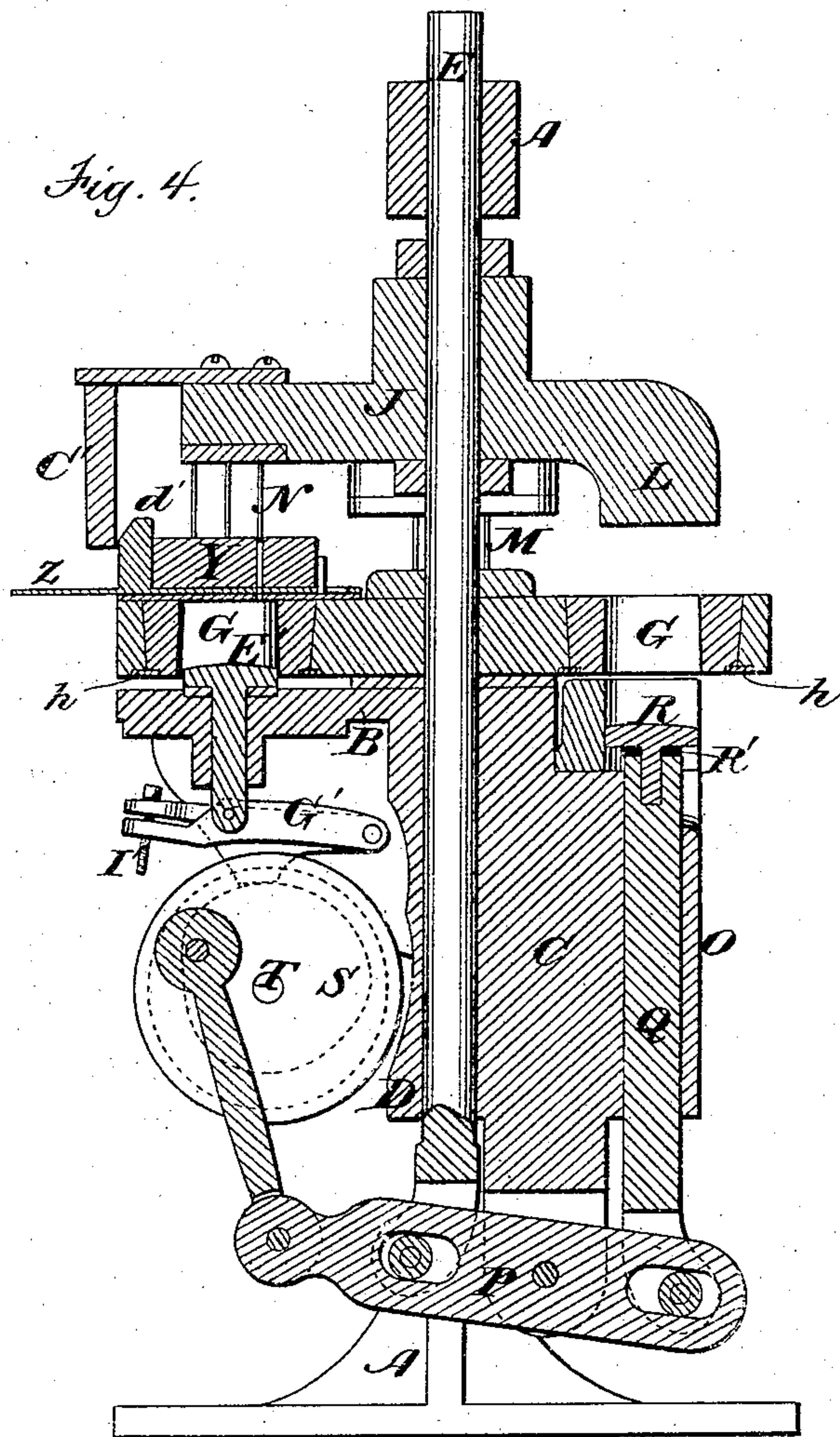
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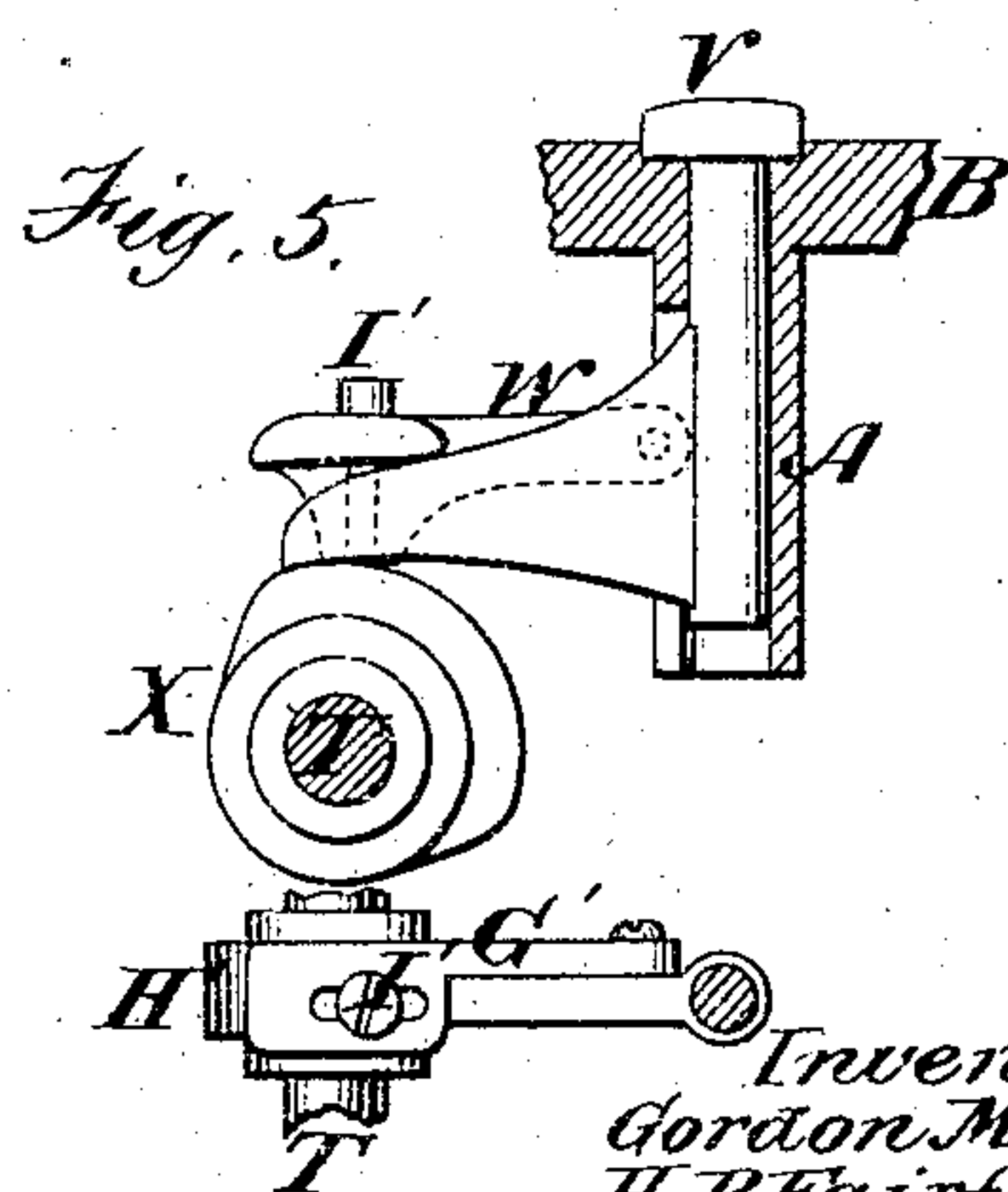
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UNITED STATES PATENT OFFICE.

GORDON MCKAY AND HADLEY P. FAIRFIELD, OF BOSTON, MASSACHUSETTS,
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IMPROVEMENT IN MACHINES FOR MAKING BOOT AND SHOE HEELS.

Specification forming part of Letters Patent No. **153,360**, dated July 21, 1874; application filed
March 31, 1874.

To all whom it may concern:

Be it known that we, GORDON MCKAY and HADLEY P. FAIRFIELD, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Machines for Making Boot and Shoe Heels; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings forming part of this specification, in which—

Figure 1, Sheet 1, is a front elevation of our improved machine. Fig. 2, Sheet 2, is a rear elevation of the same. Fig. 3, Sheet 2, is a top-plan view of the revolving die-table detached from the machine. Fig. 4, Sheet 3, is a vertical section of the machine taken in the plane of the line *xx*, Fig. 2. Fig. 5, Sheet 3, is a detached view of the devices for operating the follower of the pricking mechanism. Fig. 6, Sheet 3, is a perspective view of the nail-charging device, one side being broken away. Fig. 7, Sheet 3, is a perspective view of the sliding plate detached from the nail-charging device.

Similar letters of reference in the accompanying drawings denote the same parts.

Our invention relates to a machine for compacting heels for boots and shoes, pricking the holes for the nails which fasten the heel to the shoe, putting the nails into these holes, and driving them sufficiently to hold in the heel ready for the operation of permanently nailing the heel to a shoe.

A general description of the action of the machine is as follows:

There is a revolving table containing four tapering dies, free to move vertically in the table, of the form of the finished heel. A "heel-blank"—that is, an assemblage of heel-lifts—of suitable size to form a heel, is introduced into one of these dies, and forced into the tapering cavity therein by a pressing-plate acting on the under and larger side, while another pressing-plate acts to prevent the heel from being pressed through the die, thus pressing the heel on all sides at once. These two pressing-plates are then withdrawn and the heel is retained in the die by its adhesion to the sides alone. The plate then re-

volves one-quarter of a revolution, bringing the heel under the pricking mechanism. Another heel-blank is now introduced, in the manner already described, into the die that has, by the rotation of the plate, come over the compressing apparatus, and as blanks are introduced at each quarter revolution of the revolving plate, and follow each other through the same process, it will be unnecessary to describe anything more than the progress of one heel through the machine. The first heel is now pricked for the nails. This is done by a gang of awls, which pass through an awl-block and come in contact with the upper surface of the heel. The die, in coming under the pricking mechanism, comes over a follower, which, by an adjustable cam, is raised very nearly to the under side of the heel, and as the awls come down to prick the heel they carry it down onto the follower, and thus release the side pressure, making it easier for the awls to enter the heel. The awls are then withdrawn, and thereby the heel is again carried up into the taper of the die and retained there firmly, being wedged into the taper of the die, while the revolving plate makes another quarter revolution, bringing the heel under the apparatus for putting the nails into the holes pricked for them. Here there is also a follower like the one under the pricking apparatus. To load the nails into the heel there is used a charging-plate, having holes drilled in it to correspond with the holes already pricked in the heel. This plate is a little thicker than the length of the nails, and has on the under side of it a thin sliding plate, made to move about one-fourth of an inch. There are holes through this under plate, which, when it is pushed in, correspond with the holes in the thick plate first mentioned; but when the sliding plate is drawn out the holes are closed. The charging-plate is filled with nails and placed over the heel. There is a gang of drivers which come down to carry the nails through the charging-plate into the heel, and a projecting piece on this gang comes in contact with an inclined piece on the sliding plate in the charging-plate, and pushes it in so as to open the nail-holes and let the nails enter the heel. The gang of

drivers in forcing the nails into the heel carry it onto the follower and free it from the tapering die. The die-plate now revolves another quarter revolution, and the loaded and compressed heel drops out through a hole in the under plate.

In the accompanying drawings, A A is the frame of the machine, made in the general form shown in the drawings, and cast or otherwise provided with a central horizontal bed-plate, B, from the front edge of which, between the uprights of the frame, depends a bracket or arm, C. The rear side of this bracket is formed or provided with a pipe-box, D, for the passage of the shaft E, which extends vertically through the center and top cross-piece of the frame. F is the die-plate or table, mounted upon the shaft E so as to turn freely thereon in close proximity to the bed-plate B. G G are the tapering dies, four in number, arranged at equal distances apart within the die-plate, with their smallest openings uppermost. They are supported within the die-plate by flanges *h*, secured to the bottom of the latter, and are free to move vertically, being guided in such movements by the ribs *i*, as shown. J is a cross-head, firmly keyed to the shaft E above the die-plate, so as to move vertically with said shaft, and is recessed at its ends to fit the guide-ways K, formed by the sides of the frame. One arm of the cross-head forms the top compressor L for the heel within the front die. The next arm, in the direction of the rotation of the die-plate, carries a gang of awls, M, for piercing the compressed heel, and the rear arm carries a gang of drivers, N, to drive the nails into the pierced heel. The several arms are of course arranged to coincide with the dies, when the die-plate is in position for the various operations. O is a vertical guide-box, secured to or cast upon the front of the bracket, in line with the top compressor L, and having a front opening at its upper end for the insertion of the heel-blank. P is a lever, whose fulcrum is upon the lower end of the bracket G. The front end of the lever is pivoted to a block, Q, which occupies a vertical position within the guide-box, to receive the lower compressing heel-plate R. This plate rests upon a rubber cushion, R', as shown, to receive the jar of the parts and prevent their displacement. The vertical shaft E is also pivoted to this lever immediately in rear of the bracket, and the lever is worked by the crank-wheel S. In the drawings, the crank-shaft T is arranged to be operated by a crank, but in the full-sized working-machine gearing is employed, driven by a belted balance-wheel having an engaging mechanism operated by a treadle, so as to give one revolution to the crank-shaft and arrest the motion when the crank-pin is at its lowest point. This mechanism is too well known to need description, and is omitted in the drawings, to avoid complication.

The heel-blank to be compressed is inserted

in the top of the guide-box, so as to rest upon the compressor-plate R, and when this plate is raised by the operation of the machine it carries the front die up with it till the die meets the top compressor L, which, descending with the shaft E, forces such die down as far as the upper surface of the die-plate, the under pressing-plate at the same time entering the die a short distance. By this means the heel-blank is forced into the cavity of the die. The compressors are then retracted to their first positions by the revolution of the crank-shaft, and the die-plate revolved by hand one-quarter round, carrying the compressed heel beneath the awl-gang M. The descent of the cross-head causes the awls and their plate U to press upon the upper surface of the heel and carry the latter down to a follower, V, thus loosening the heel in the die to admit of its being easily pierced by the awls. The follower V is lifted by the pivoted adjustable levers W and the cam X on the crank-shaft, as shown in Fig. 5. This release of the heel in the die is very slight—sufficient only to effect the purpose, but not enough to allow the heel any perceptible lateral movement. The awls pierce the heel, and, as they are withdrawn by the ascent of the cross-head, they draw the heel firmly into the die again. If desired, the awl-plate U may be constructed to drive an inclined or slanting awl, as described in the patent of John Gibson, dated May 31, 1870, No. 103,734.

After the awls have ascended, the die-plate is again turned one-quarter round, and carries the compressed pricked heel under the charging gang or drivers N, at which point a device called a charging-plate is used to receive and guide the nails while being driven into the pricked heel. This plate is composed of a block, Y, perforated for the reception of the nails, the perforations being so disposed as to coincide with the drivers and the awl-holes in the heel-blank. The block Y is provided upon its under side with a thin plate, Z, perforated in a similar manner and arranged to slide longitudinally in the guides *a'*, for closing the bottom of the holes in the block, to support the nails therein, and for uncovering such holes to permit the passage of the nails into the heel.

The charging-plate, being first loaded with nails, is placed upon the die-plate beneath the drivers, and registered with the pierced heel by guide-pieces *b'* on the die-plate, as shown. If desired, dowel-pins entering the holes in the die may be employed for this latter purpose.

The descent of the drivers forces the nails through the charging-plate into the heel, the slide Z being automatically operated to open the passage for the nails by a pin, *c'*, on the head of the drivers coming in contact with a beveled upright, *d'*, on such slide, and thereby forcing the latter inward, as shown in Fig. 4. As the nails are driven, they force the heel downward a very little onto a follower, E', in the frame, and therefore release it from the gripe of the die. The drivers then ascend, and the charging-plate is removed. The die

plate is again revolved one-quarter round, carrying the loaded heel to an opening, F', in the bed-plate, through which it drops out of the machine. The follower E' is also operated by pivoted adjustable levers G' and a cam, H', on the crank-shaft, as shown in Fig. 4. These levers, as well as the levers of the follower V, are made adjustable by means of set-screws I' at their outer ends, for the purpose of carrying such followers to various heights, as required by the varying thickness of the heels.

The charging-plate not only holds the nails to be driven, but also serves to guide them into the heel and keep them true with the direction of the holes therein, thus facilitating the subsequent placing of the heel on a nailing-machine.

Having thus described our invention, what we claim as new is—

1. In a heel-compressing machine, the combination of an upper and lower compressor with an open tapering die, operating to compress the heel on all sides and then release the pressure on the top and bottom surfaces, substantially as described.

2. The combination of an awl-gang and awl-

plate with an open tapering die, operating first to release the side pressure on the heel, secondly to prick the holes therein, and thirdly, by the withdrawal of the awls to replace the heel in the die, substantially as described.

3. The followers, arranged to regulate the depression of the heel when the awls and nail-drivers operate to press it downward, substantially as described.

4. In a machine for nail-charging heels, an automatic nail holding and delivering plate, for discharging a gang of nails directly into the heel, substantially as described.

5. A nail-charging plate, consisting essentially of a nail-holder and an automatic slide-opener, for the automatic opening of the nail-holder and discharge of the nails, substantially as described.

6. The method of releasing the heel from the gripe of the die by the operation of driving the nails, substantially as described.

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