2 Sheets—Sheet 1.

F. M. SHAW.

MACHINES FOR NAILING BOOTS AND SHOES.

No. 169,661. Patented Nov. 9, 1875.

Fig. 6.

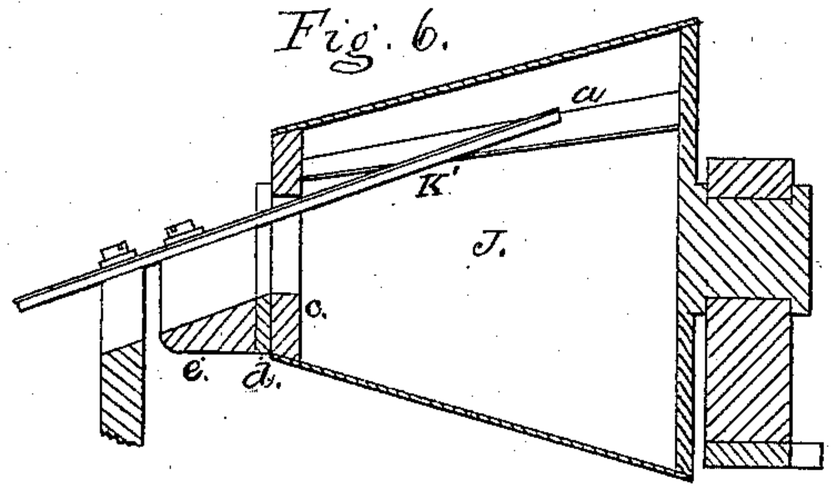
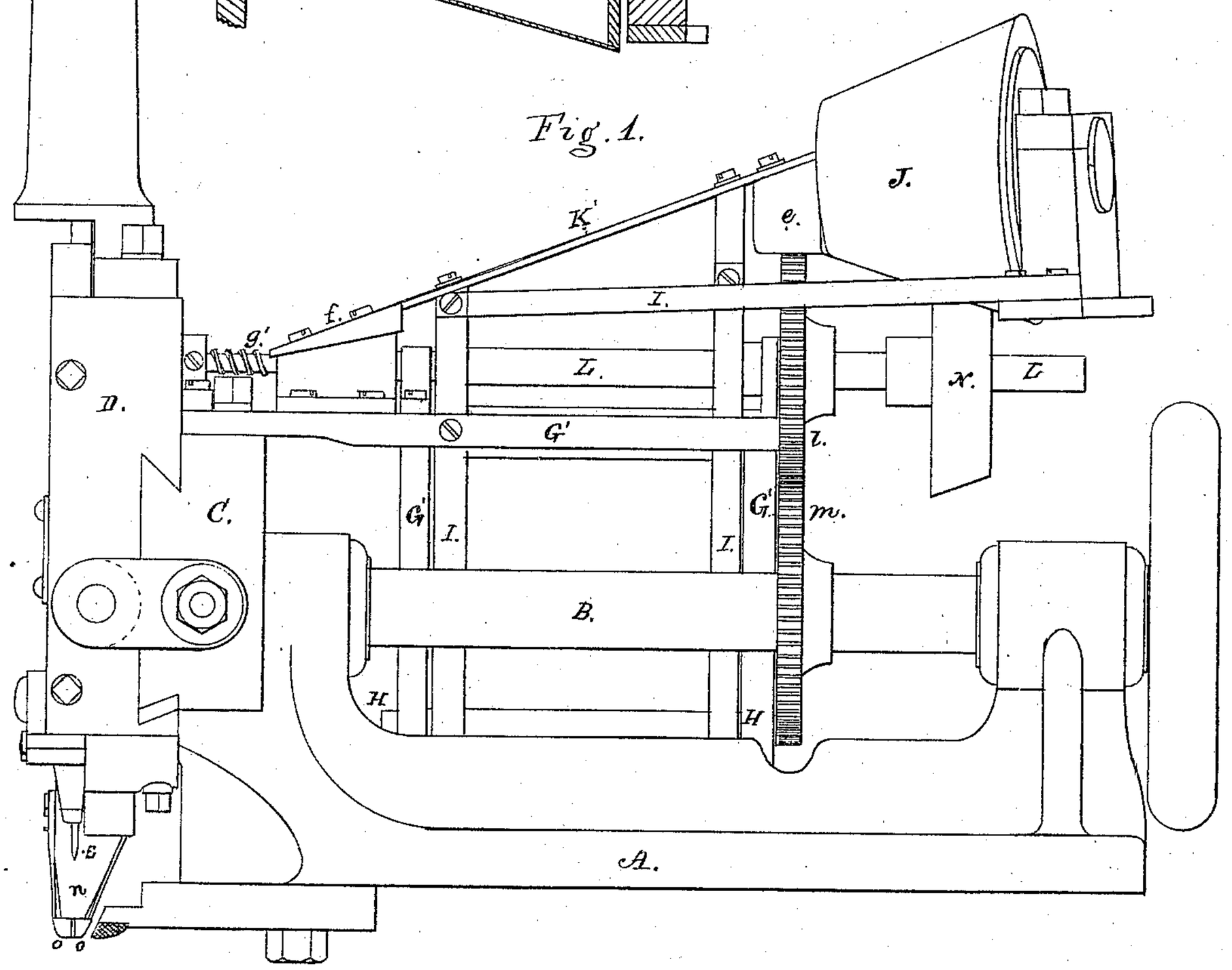


Fig. 1.



Witnesses.

Geo Gray.

F. C. Hall.

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Francis M Shaw

By his Atty

H. P. Hall

2 Sheets—Sheet 2.

F. M. SHAW.

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Fig. 2.

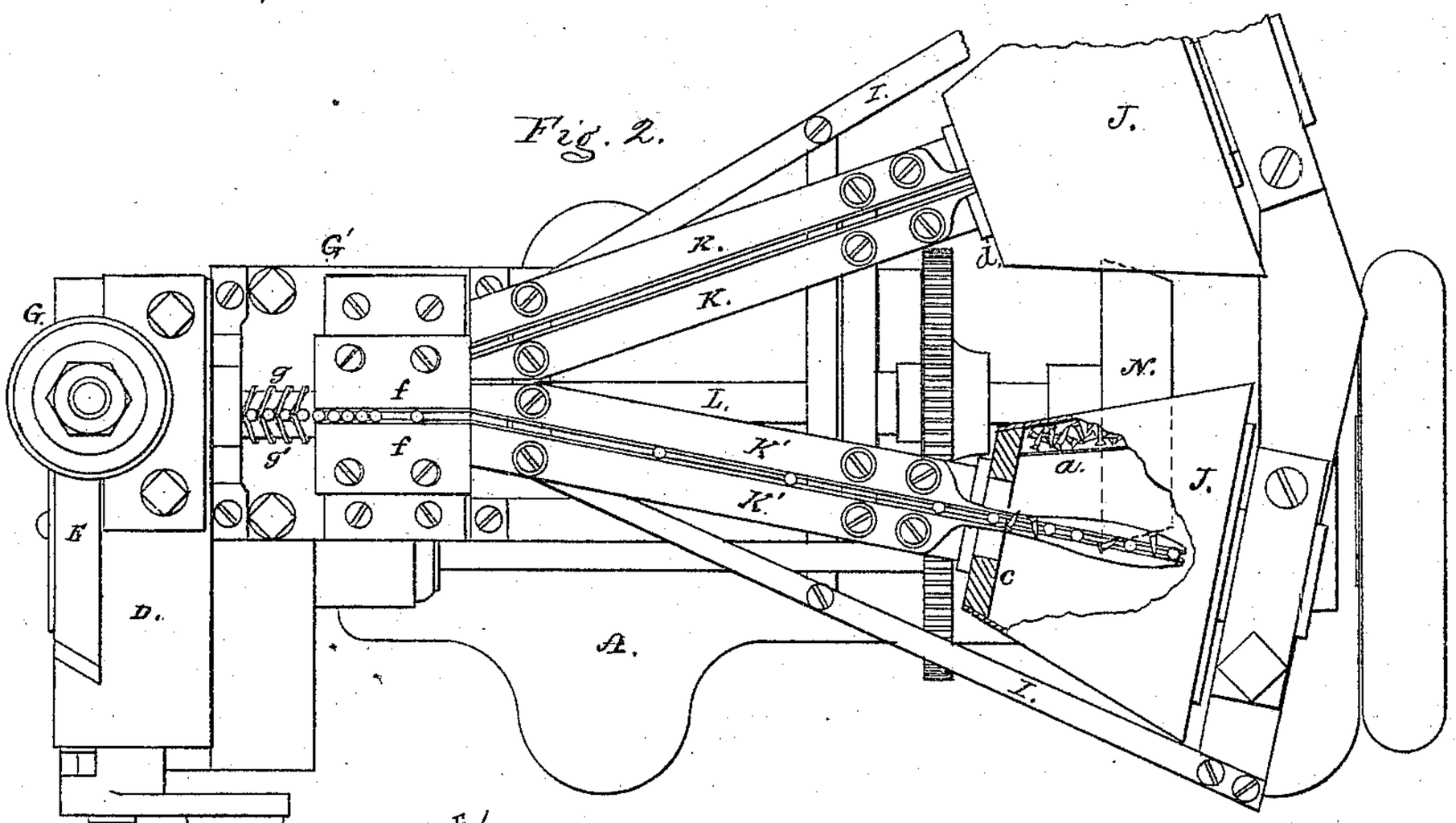


Fig. 3.

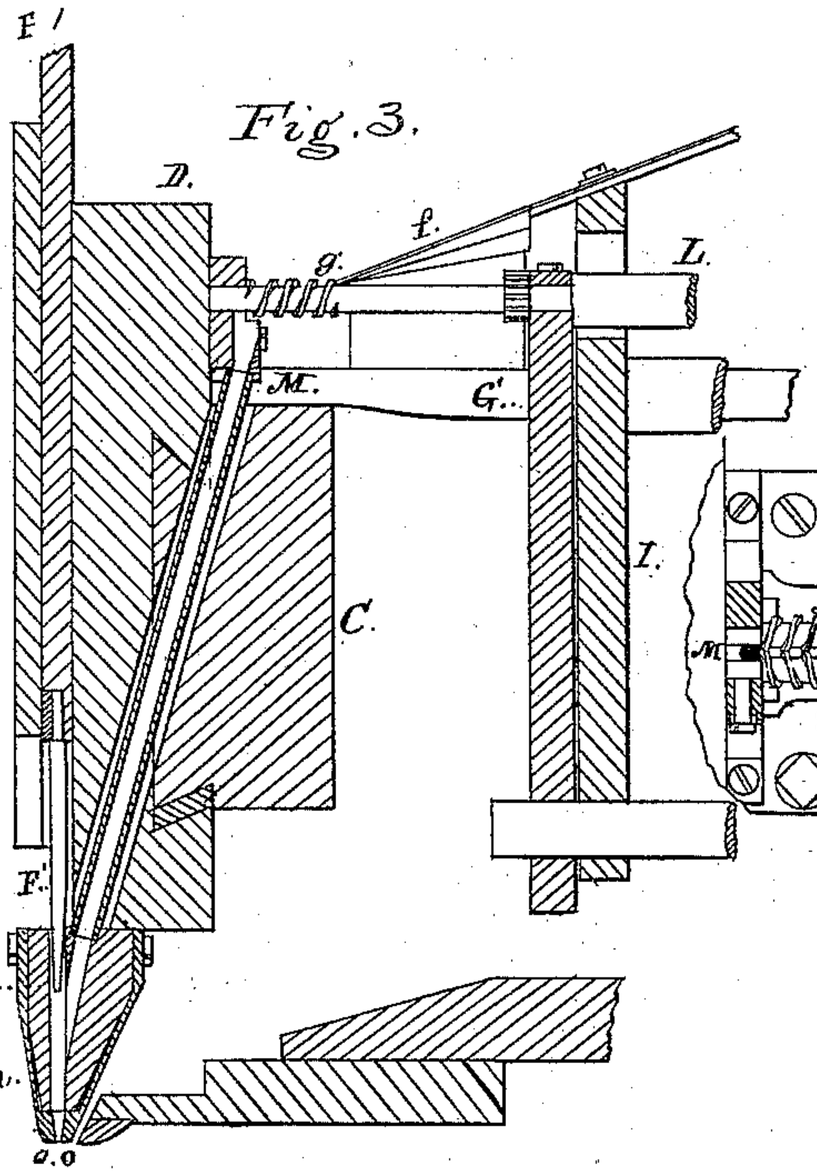


Fig. 4.

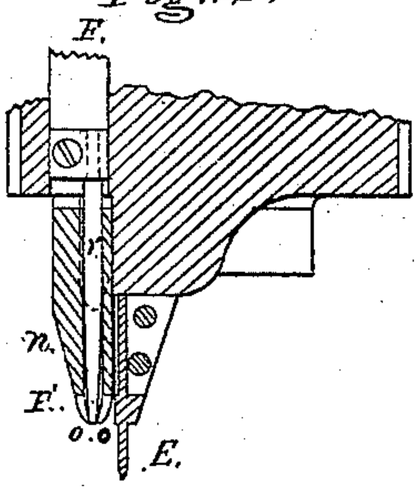
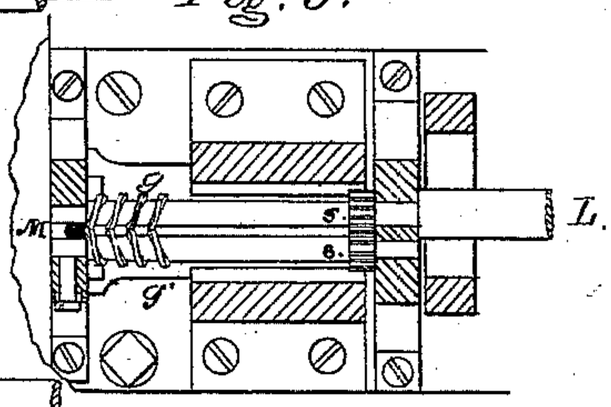


Fig. 5.



Witnesses.

Geo. Gray.

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UNITED STATES PATENT OFFICE.

FRANCIS M. SHAW, OF BROCKTON, ASSIGNOR TO DAVID WHITTEMORE, OF WOLLASTON, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR NAILING BOOTS AND SHOES.

Specification forming part of Letters Patent No. **169,661**, dated November 9, 1875; application filed February 5, 1875.

To all whom it may concern:

Be it known that I, FRANCIS M. SHAW, of Brockton, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Machines for Nailing Boots and Shoes; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

In the said drawings, Figure 1 is a side elevation, and Fig. 2 a top view, of a nail-driving machine embodying my improvements. Fig. 3 is a detailed sectional view of the head-stock, the cross-head, the driver, the driver-tube and spring nail-retainers, the nail-receiving tube, and showing sundry parts adjacent thereto. Fig. 4 is another detailed sectional view taken through the awl-stock, the awl, the driver, driver-tube, and nail-retaining jaws. Fig. 5 is another detailed sectional view, showing the screw-transferrers, their connecting-gears, and the arrangement of the said transferrers with respect to the nail-receiving tube. Fig. 6 is another sectional detailed view, taken longitudinally and vertically through one of the nail-reservoirs, and showing the parts immediately adjacent thereto.

My invention may be said to be an improvement upon the well-known automatic pegging-machine; and consists in dispensing with the mechanism for holding, severing, and feeding the peg-wood, and substituting therefor mechanism, as hereinafter described, whereby the machine is adapted to the driving of headed nails, the nails being conveyed from one or more reservoirs, carried to and inserted in the soles of boots and shoes automatically.

In the drawing, A denotes the base or frame for supporting the main operating parts; B, the driving-shaft; C, the head-stock, which is securely affixed to one end of the frame. D is a cross-head, which slides horizontally on the head-stock C. E is a block, which slides vertically in the cross-head D. This block E has the awl-stock that carries the awl attached to it, such rising and falling with the block E. F is the driver-stock; F′, the driver, attached to the lower end thereof. G is the chimney in which the driver-stock moves, all the said parts being constructed and operated as in the said pegging-machine. My improvements are ingrafted thereon. Connected with the head-stock C is a frame, G′, which is securely bolted thereto, and carries the nail-feeding mechanism, next to be described.

Pivoted to the frame G′, at H H, is a rocking frame, I, which, at its rear part, supports two elevated frusto-conical nail-reservoirs, J J, each having one or more flanges or radial shelves, *a*, upon its inner surface, as shown in Figs. 2 and 6. K K and K′ K′ are inclined slotted bars or ways affixed to the frame I, and respectively extending up into the interior of the nail-reservoirs, as shown in Fig. 2, a portion of the reservoirs being broken away in order to exhibit the same. These ways are formed with beveled inner edges to receive the nails, and support them by their heads while traveling down the ways. The lower end of each nail-reservoir has a wide elastic head, *c*, of rubber or its equivalent, inserted therein, such having a hole made through it of sufficient size as to allow the ways to pass through it, and also the nails, when suspended in the ways by their heads. An elastic washer, *d*, is firmly secured against each elastic head by a retaining-block, *e*, affixed to the ways, as shown in Figs. 1, 2, and 6. Each of the said ways is so arranged as to operate with the stationary sectional ways *f f* affixed to the frame I, as shown in Figs. 1, 2, and 5, and by simply moving the rocking frame I either to the right or left either pair of the movable ways may be brought, as circumstances may require, into alignment with the stationary ways. The employment of the two reservoirs is to enable nails of different lengths to be used, as may be desirable, without stopping the machine or changing the reservoir, as would be required were the machine provided with but one inclined way.

Supported in suitable bearings in the frame G is a shaft, L, which extends horizontally of

the machine, and has on its front end a male screw, *g*, which operates with another screw, *g'*, which is supported in bearings in the frame G, and arranged in the same horizontal plane with the screw *g*, and in such close relation therewith as to permit their threads to rotate without touching, the two threads being cut in opposite directions, and being of such distance apart as to receive and support the heads of the nails between the two. These screws are connected by gears *s s*, (having a like number of teeth, as shown in Fig. 5,) such screws being disposed in front of the stationary ways *f f*, and receiving the nails between them as they drop from the said ways. These screws have not their threads extending to their extreme outer ends, but terminate at a point in a vertical plane over a hollow receiving-tube, M, which is affixed to the front end of the frame G, and into which the nails successively drop when released from the threads of the screws. The rotation of the screws is effected by a spur-gear, *l*, on the shaft L, which engages with a gear, *m*, disposed on the driving-shaft, each of the gears *l* and *m* having a like number of teeth, in order that the shaft L and the driving-shaft shall perform a like number of revolutions, and thereby cause the screws to make a single revolution, and discharge a nail at each revolution of the driving-shaft, a hole being made in the sole, the sole fed along, and the driver raised and forced downward at each revolution of the driving-shaft.

Disposed near one end of the shaft L is a friction-wheel, N, which is so arranged as to bear against the surface of either of the nail-reservoirs, as may be desired, and serving to impart rotation thereto, and thereby raise the nails which may lodge on the partitions, which, when the latter shall have been raised into a vertical position over the ends of the inclined ways, will deposit more or less of the nails thereon. The tube M, having its mouth directly under the discharging end of the screw-transferrers *g g'*, extends down and opens into the driver-passage *r* near its upper end at a slight inclination thereto, such driver-passage being formed in a toe, *n*, which is affixed to the under part of the head-stock C. *o o* are two spring-retainers, which are affixed to the toe-part *n*, the same being formed with lips to extend down and close the lower end of the driver-passage, such lips serving to prevent the discharge of the nail until the toe has been moved over the hole in the sole, so as to bring the driver-passage and driver into alignment with the hole last made by the descent of the awl.

When the driver is forced down the lips or retainers are forced apart, so as to allow the nail and driver to pass through them. When the driver has been retracted such retainers return to their original position and close the eduction-mouth of the driver-passage.

As the jack for supporting the shoe or boot sole into which the nails are to be driven constitutes no part of my invention, I would remark that the jack employed in the ordinary automatic pegging-machine may be used, or any other suitable for the purpose, as the support and guiding of the boot or shoe, whether being pegged or nailed, are precisely similar.

Having described my invention, its operation is as follows: If we suppose the reservoirs to have been supplied with nails, and the driving-shaft to have been put in revolution, the friction-wheel N will cause the reservoir with which it is in connection to rotate, and, when its shelves have been brought to their highest point and over the forked ways, will discharge the nails therefrom, a part falling on the ways, and will, by the concussion of the driver, be caused to fall between the ways, and be suspended therein by their heads. Should any fall sidewise upon the ways upon reaching the opening in the rubber head, the latter, by impinging against the same, will, by its rotation, remove them laterally from the ways, while the nails properly suspended by their heads in the ways will be caused, by the continued concussion of the driver, to pass down the ways K K or K' K' into the stationary ways *f f*, from which they will pass into the screw-transferrers, by which they will be carried forward, and a single one at a time dropped into the mouth of the tube M, or into the nail-passage in the toe *n*, the action of the screws and the driver being so timed that the nail shall be dropped into the tube when the driver is down. The point of the nail, impinging against the side of the driver, will be retained thereby until the driver is raised, when the nail will drop into the driver-passage in the toe *n*, where it will be retained by the spring or retainers until the driver shall next descend, when the nail will be driven into the sole.

I would remark that, if desirable, a single reservoir may be used; but I prefer to employ two, as it enables nails of different lengths to be employed, and the change from one to the other to be effected without stopping the machine.

I would further remark that in rendering the apparatus more compact I intend to so arrange the frame G that the nails, when discharged from the screw-transferrers, shall drop directly into the nail-passage *r* in the toe *n*.

What I claim as my invention is—

1. In a machine for nailing boots and shoes, the combination, with the ways K K and K' K', of the reservoirs J J, each provided with one or more shelves and an elastic discharging-head, *c*, substantially as and for the purpose set forth.

2. In combination with the inclined ways *f f*, the screw-transferrers *g g'*, for conveying and discharging the nails singly into the nail-tube M or passage *r* of the toe *n*, substantially as and for the purpose set forth.

3. The combination, with the frame G', pro-

vided with the stationary ways *f f*, of the rocking frame I, having two sets of inclined ways and nail-reservoirs, substantially as and for the purpose set forth.

4. In combination with the reservoirs J J, or either of them, the friction-wheel N, as and for the purpose set forth.

5. In a machine for nailing boots and shoes, the combination, with an inclined way for receiving and guiding the nails, of a rotary nail-reservoir, provided with an elastic discharging-head, as and for the purpose set forth.

6. In a machine for nailing boots and shoes, the screw-transferrers *g g'*, for receiving, conveying, and discharging the nails singly into the nail-tube, substantially as set forth.

7. In combination with suitable receptacles for receiving the nails in bulk, an interchangeable delivering mechanism, adapted to deliver from either receptacle according to the length of nails desired, substantially as specified.

In testimony that I claim the foregoing as my own invention I affix my signature in presence of two witnesses.

FRANCIS M. SHAW.

Witnesses:

F. P. HALE,

F. C. HALE.