

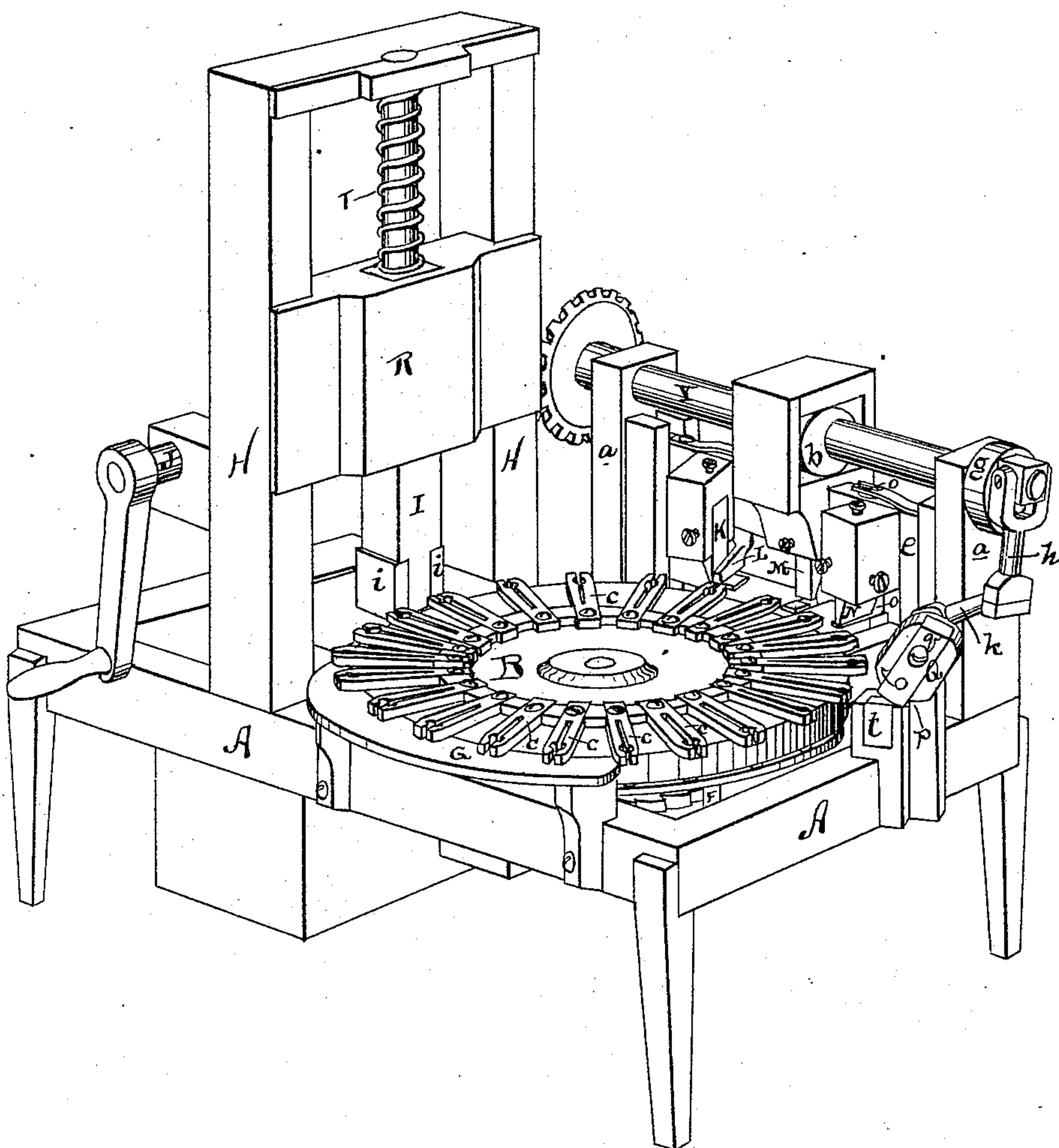
J. MILLS.

Machines for Finishing Horseshoe Nails.

No. 157,858.

Patented Dec. 15, 1874.

Fig. 1



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Fig. 2.

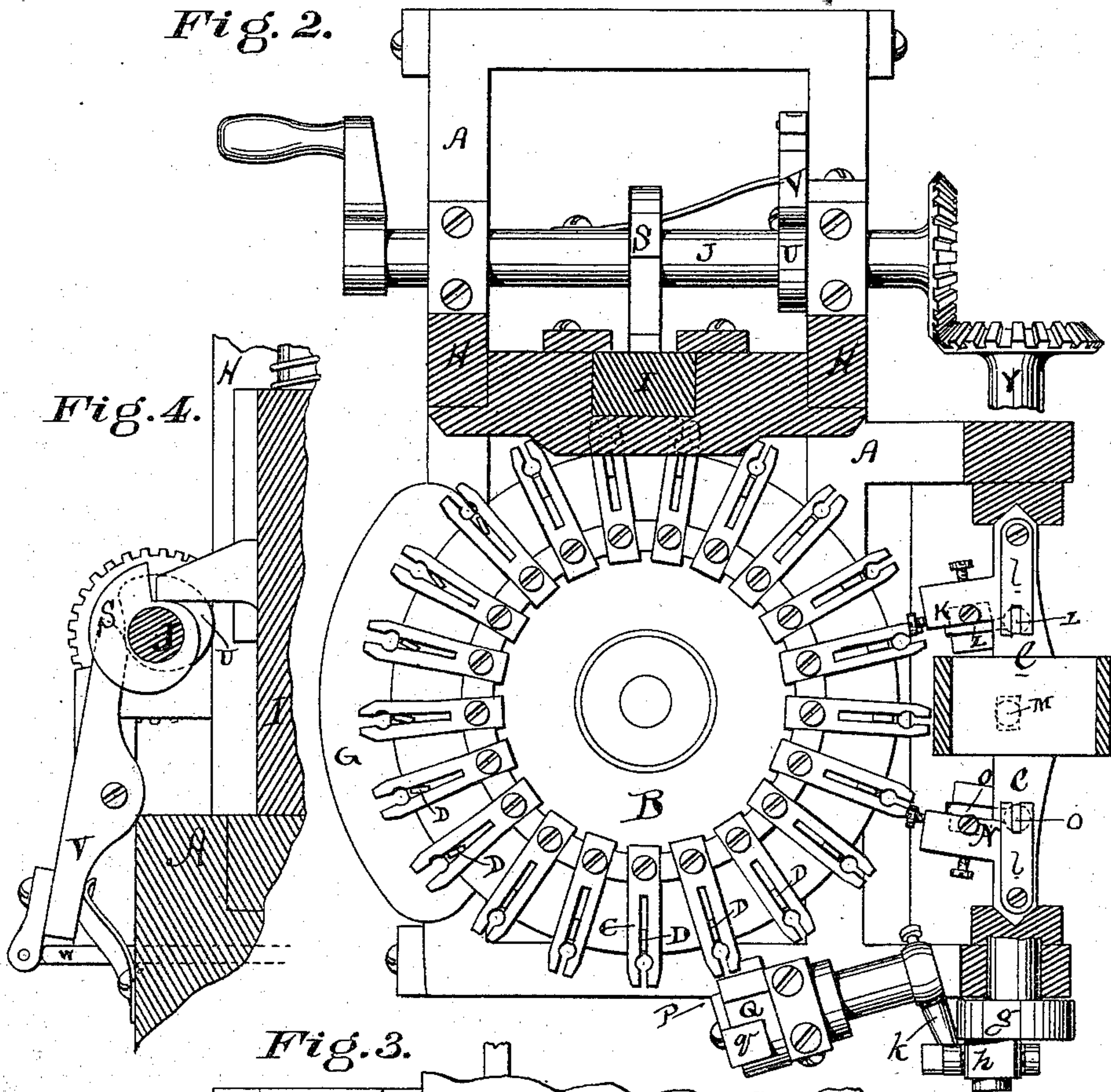


Fig. 4.

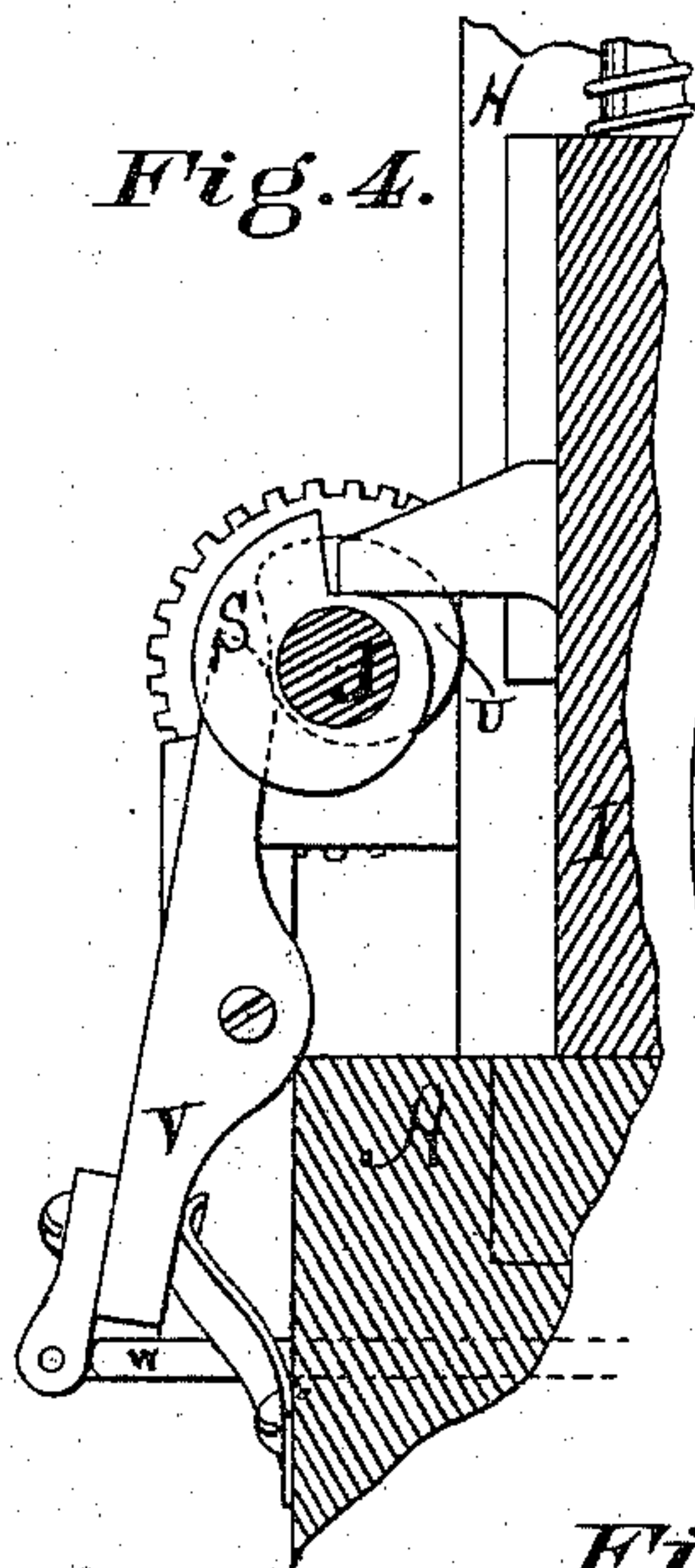


Fig. 3.

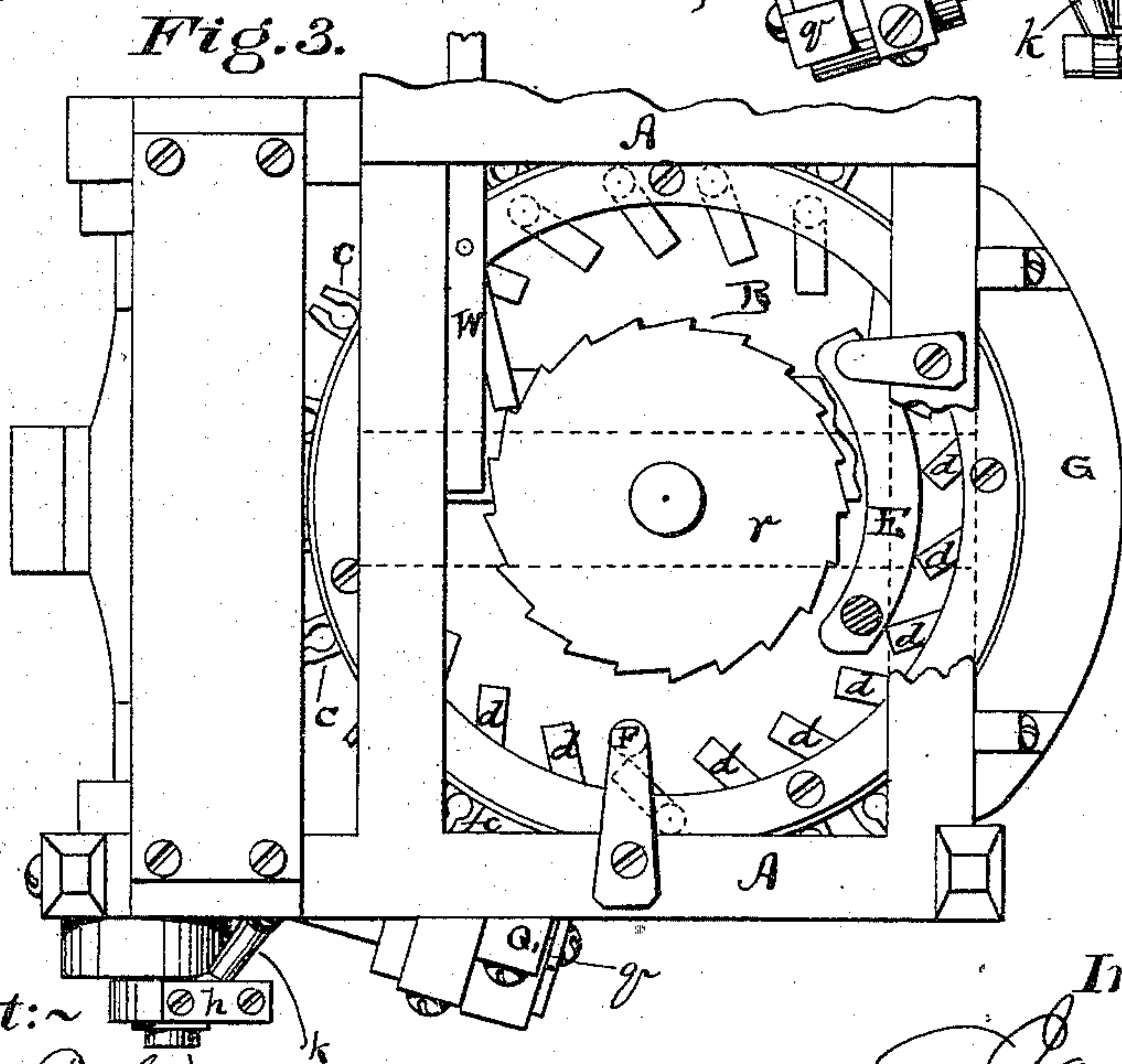
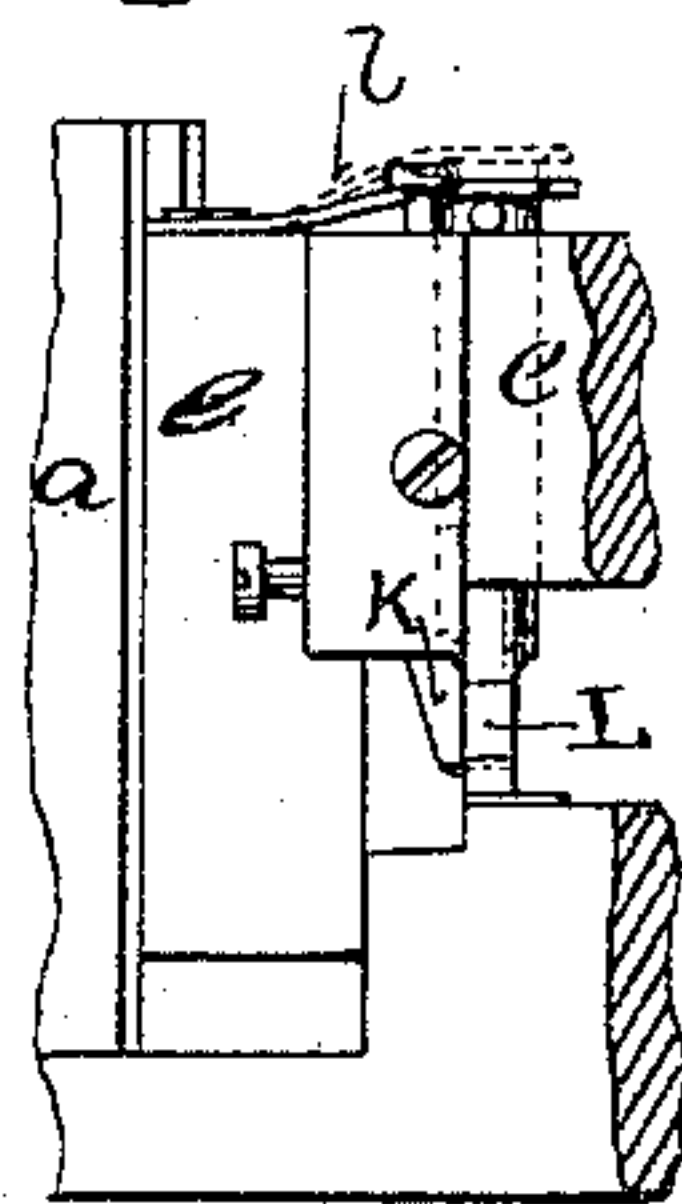


Fig. 5.



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UNITED STATES PATENT OFFICE.

JAMES MILLS, OF KEESEVILLE, NEW YORK.

IMPROVEMENT IN MACHINES FOR FINISHING HORSESHOE-NAILS.

Specification forming part of Letters Patent No. **157,858**, dated December 15, 1874; application filed May 15, 1874.

To all whom it may concern:

Be it known that I, JAMES MILLS, of Keeseville, in the county of Essex and State of New York, have invented a new and useful Improved Machine for Finishing Horse-Nails; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of my machine. Fig. 2 is a plan of the same. Fig. 3 is a bottom plan of the same. Fig. 4 is a sectional elevation of the hammer-frame; Fig. 5, front elevation of one of the shearing-dies and presser-foot.

This invention relates to a machine for finishing horse-nails, wherein the nails are held by a carrier, and successively carried under dies, whereby the nail is condensed, trimmed, and beveled; and it consists, first, in the means employed for beveling the point by means of a vibrating arm carrying a roller, which acts against a fixed anvil, and in connection with a revolving carrier and holding-nippers; second, in the devices for opening and holding open the nippers; third, in the general arrangement of devices.

The frame of my machine is supported upon legs or otherwise, as may be most desirable. An intermittently-moving carrier is mounted upon said frame, and provided with a series of nipping-holders to seize the nails by their heads, and securely hold them while they are being transported by the carrier successively to the dies, whereby the nail is hammered, trimmed, and beveled. The nipping-holders are constructed with jaws, which open laterally, and said jaws are shaped to receive the head of the nail and hold it by its edges and shoulders. The opening of said jaws is effected by the partial rotation of a small cam placed between them, and said partial rotation is effected by means of a segment-plate fixed to the frame. The nails are held horizontally, and are carried successively under a hammering-die, whereby the shank of the nail is condensed and hardened. Several hammer-dies may be placed in the same hammer-stock, and the nail be successively carried from one to another, so that it may receive as many blows as may be necessary. From the ham-

mer-dies the nail is successively carried to shearing-dies, whereby each edge and the point are separately sheared, a presser-foot being arranged to hold the nail from turning during the process of shearing. After being sheared the nail is subjected to a beveling-roller, which acts from the point toward the head, and it is then discharged by the automatic opening of the nipper-jaws. These are in general the features of my improved machine.

The methods of operating the devices above referred to may be various; and I do not desire to limit myself to any particular mechanism for that purpose. I prefer, however, the devices shown in my drawings hereto attached, and which I will more particularly describe.

The frame A is supported upon legs. The carrier-table B is circular, and has an intermittently rotary motion upon a vertical axis. Said axis has its bearings in the main frame, and receives its motion from a reciprocating pawl or pusher, W, acting against a ratchet, r, fixed to the axle of the carrier B. The nippers C are secured to the face of said table B in horizontal radial directions, and hold the nails in the same radial positions. The nippers are made with jaws, which open laterally, and are fitted to the form of the edge of the head, so that the same is firmly gripped. They are secured to the upper surface of the table B in radial positions, and hold the nails in the same horizontal radial position. A small cam, D, is placed between the jaws C, with a spindle or shaft extending down through the table, and provided with a short arm or lever, d, at its lower end to effect the necessary rotary movement of said cam. This is produced by contact with a segment-plate, E, fixed to the frame beneath the table B. When the lever d engages with said segment it is pushed aside, and the cam D is partly rotated, so as to cause the jaws C to open. So long as said lever d is in engagement with the segment-plate the jaws are held open to receive the nails as they are fed by hand or by some proper automatic machinery.

When the nails have been finished they are discharged by the opening of the jaws, and this may be upon engagement with the segment-plate E, or with a fixed stop, F, placed

in advance of the segment E. A table, G, is placed upon one side of the frame, flush with the carrier B, and directly over the segment E. The feeding is effected upon said table, the nail being supported thereon in a horizontal position until gripped by the closing of the jaw. The hammer-frame H is erected upon the main frame A, and supports a horizontal guide-frame R, in which the hammer ram or stock I moves up and down. At the lower end of the stock I one or more hammer-dies, *i*, are placed, and corresponding anvil-dies are secured to the anvil-bed immediately beneath said hammers. The distance between the hammers *i* is equal to the angular distance over which each nail is moved by one reciprocation of the pawl W, and, therefore, the nail is carried from one anvil to another and submitted to the successive strokes of the several hammers. A spring, T, may be employed to intensify and quicken the stroke of the hammer. The main driving-shaft J is mounted in boxes secured to the back of the hammer-frame H, and may be rotated by any proper or convenient power. Said shaft carries a tripping-cam, S, the revolution of which with said shaft raises the hammer-stock, and permits the same to drop as it escapes from the beak of the cam. The blow may be intensified to any desired extent, and may be adjusted by the spring T. The main shaft also carries a cam, U, whereby the lever V is oscillated, to cause the pawl W to reciprocate and rotate the table B. At the extremity of the main shaft there is a miter-wheel, which meshes with and drives a similar wheel on the counter-shaft Y. Said counter-shaft has its bearings at the tops of posts *a a*. On the inner sides of said posts *a a* there are guides for the gate *e*, which is moved up and down by an eccentric, *b*, upon the shaft Y. Said gate *e* carries the shearing and trimming punches and the yielding presser-feet, by which the nail is held from turning upon the die while being sheared. The shearing-die K is adjustably set in a stock attached to and moved by the gate *e*. Said shearing-die operates upon one edge of the nail only, and the presser L, also set in and moving with said gate, holds the nail firmly upon the anvil while said die K is in operation. The shank of the presser-foot L passes upward through

the gate *e*, and is kept down by a spring, *l*, so that said presser-foot comes in contact with the nail in advance of the shearing-die, and is enabled to rest while said gate continues to move the spring *l*, holding it firmly upon the nail the while. The spring *l* has a slit in its free end, which clasps a rectangular part of the shank of the presser-foot, and keeps the same from turning. When released from the presser-foot L, the nail is carried to a trimming-die, M, also carried by the gate *e*, and the point is thereby cut off to length. The succeeding movement of the carrier removes the nail to the shearing-die N and presser-foot O, in all respects similar to the die K and foot L, and by said die the other edge of the nail is trimmed. At the extremity of the shaft Y there is a crank, *g*, and connecting-rod *h*, jointed to the end of a rock-shaft, *k*, which carries and operates the vibrating arm Q. This latter arm is set transversely on the end of said rock-shaft, and carries, at its lower end, the beveling-roller *p*, set in a block, *q*, which is made adjustable in said arm Q, to regulate the distance of the roller *p* from the anvil *t*, which supports the nail against the action of said roller.

Having described my invention, what I claim as new is—

1. The combination, with the intermittingly-revolving carrier B, having nippers C, of the vibrating adjustable roller-arm *g*, beveling-roller *p*, and anvil *q*, substantially as set forth.

2. In combination with the nippers C, constructed to clasp the nail by its edges, as set forth, the opening-cam D, with its lateral arm *d*, and the fixed segment E, substantially for the purpose set forth.

3. The combination, with an intermittingly rotating carrier holding the nails horizontally and radially, of a reciprocating hammer, two shearing-punches, each acting on one edge only of the nail, two reciprocating presser-feet to hold the nail while being sheared, a cutting-punch to trim the nail to proper length, and a vibrating roller to bevel the point of the nail, in the manner set forth, all substantially as described.

JAMES MILLS.

Witnesses:

IRA S. SMITH,
J. E. MARKS.