

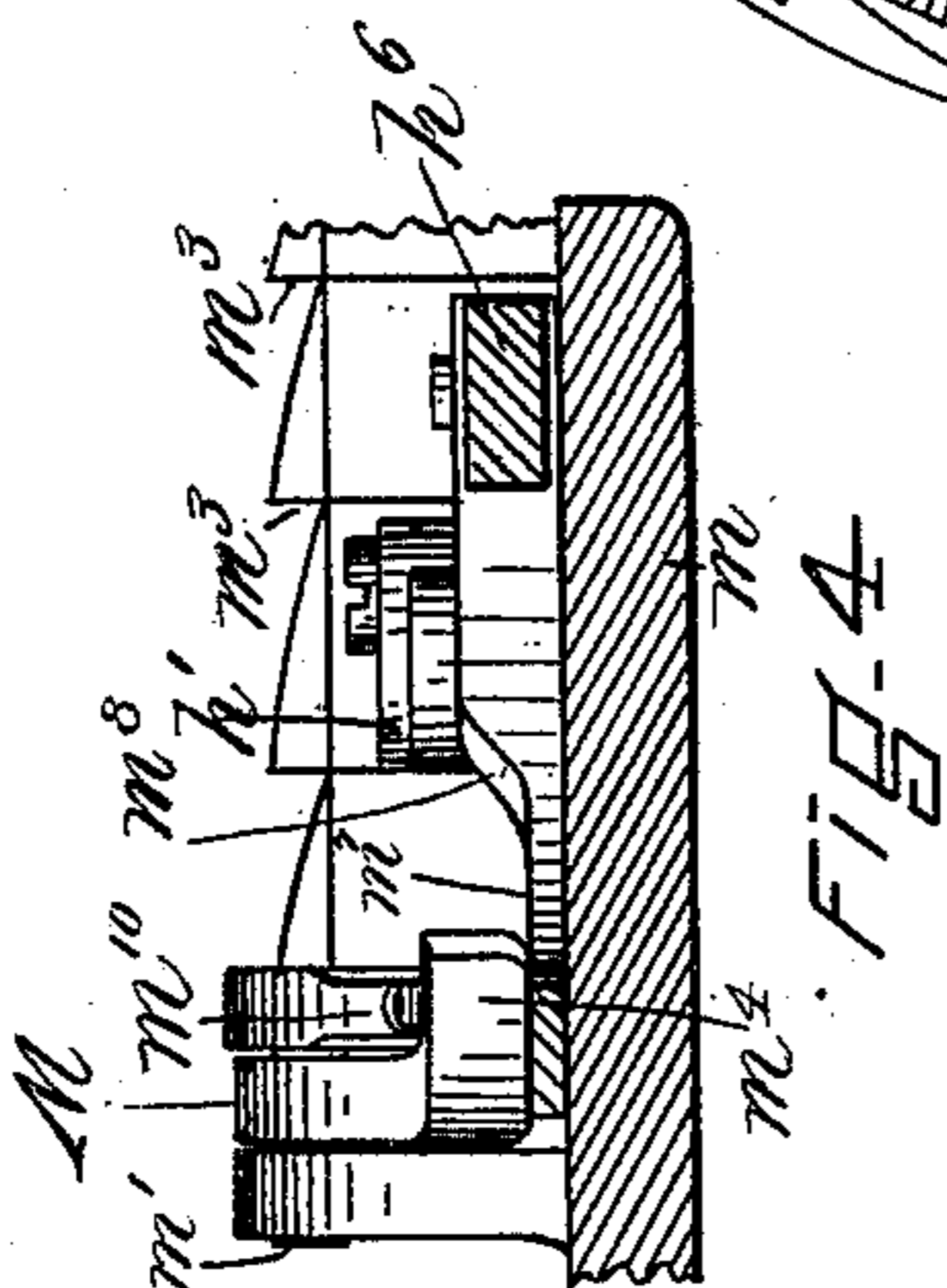
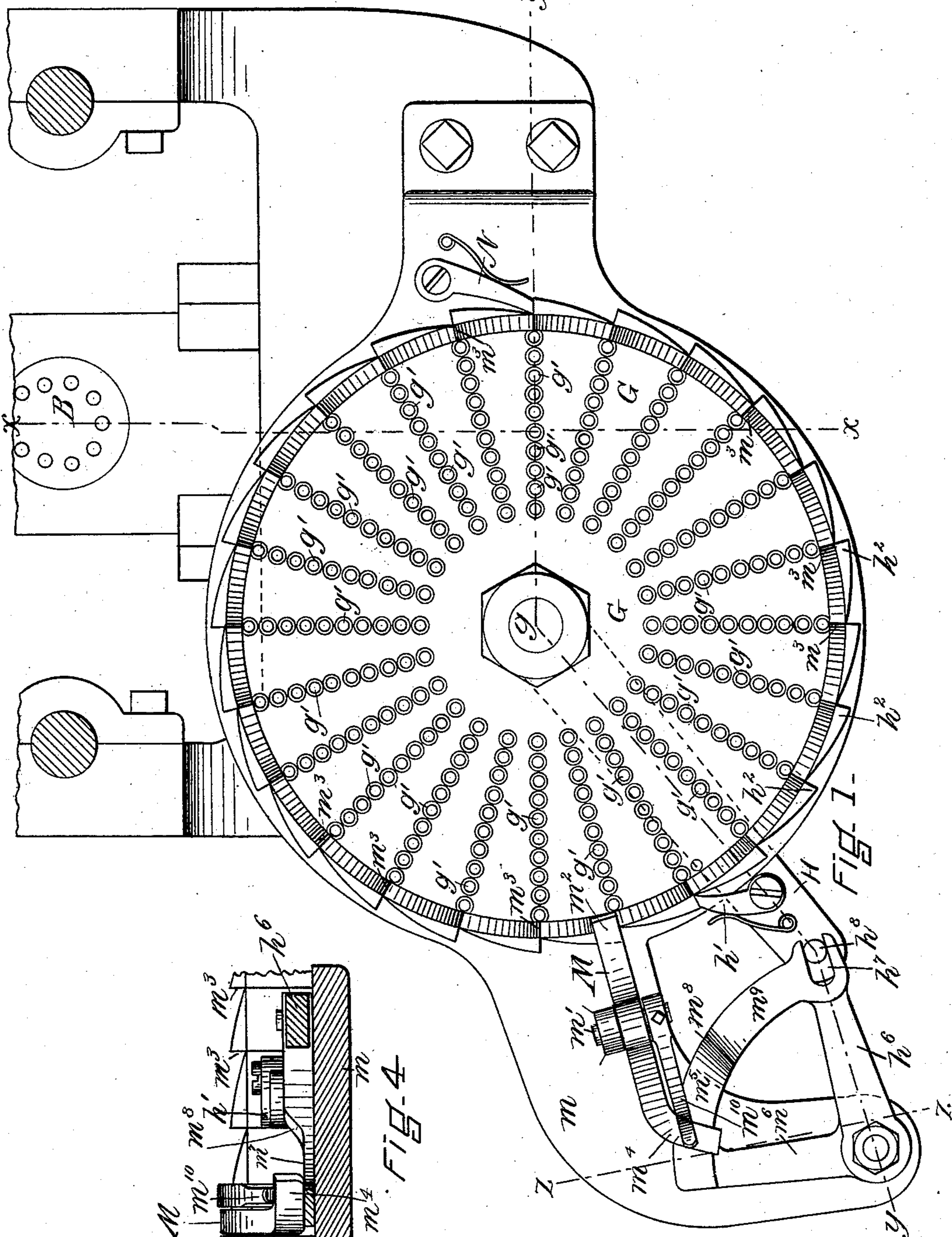
(No Model.)

3 Sheets—Sheet 1.

F. F. RAYMOND, 2d.  
HEEL NAILING MACHINE.

No. 358,298.

Patented Feb. 22, 1887.



WITNESSES

J. M. Dolan  
Fred. B. Dolan.

INVENTOR

F. F. Raymond

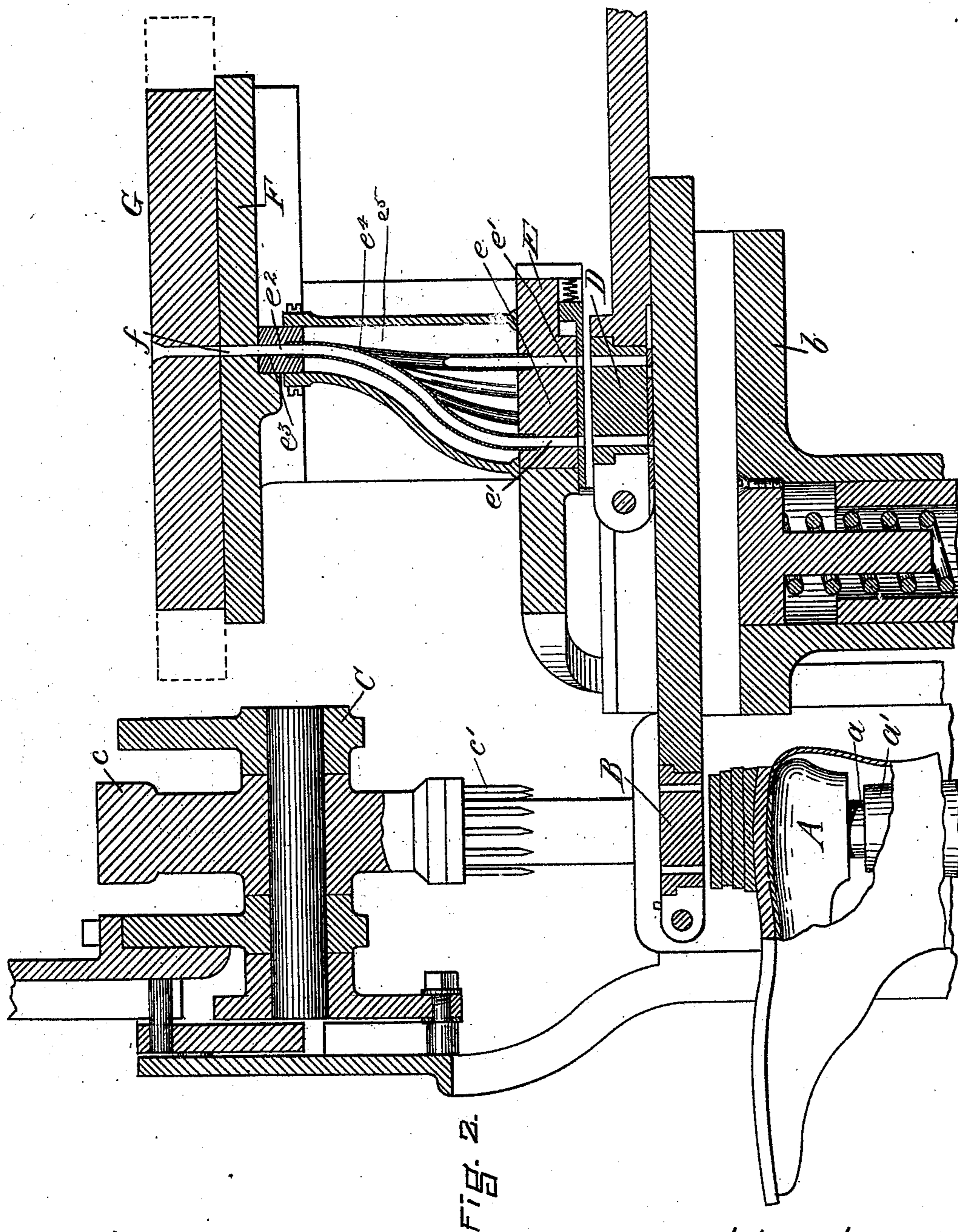
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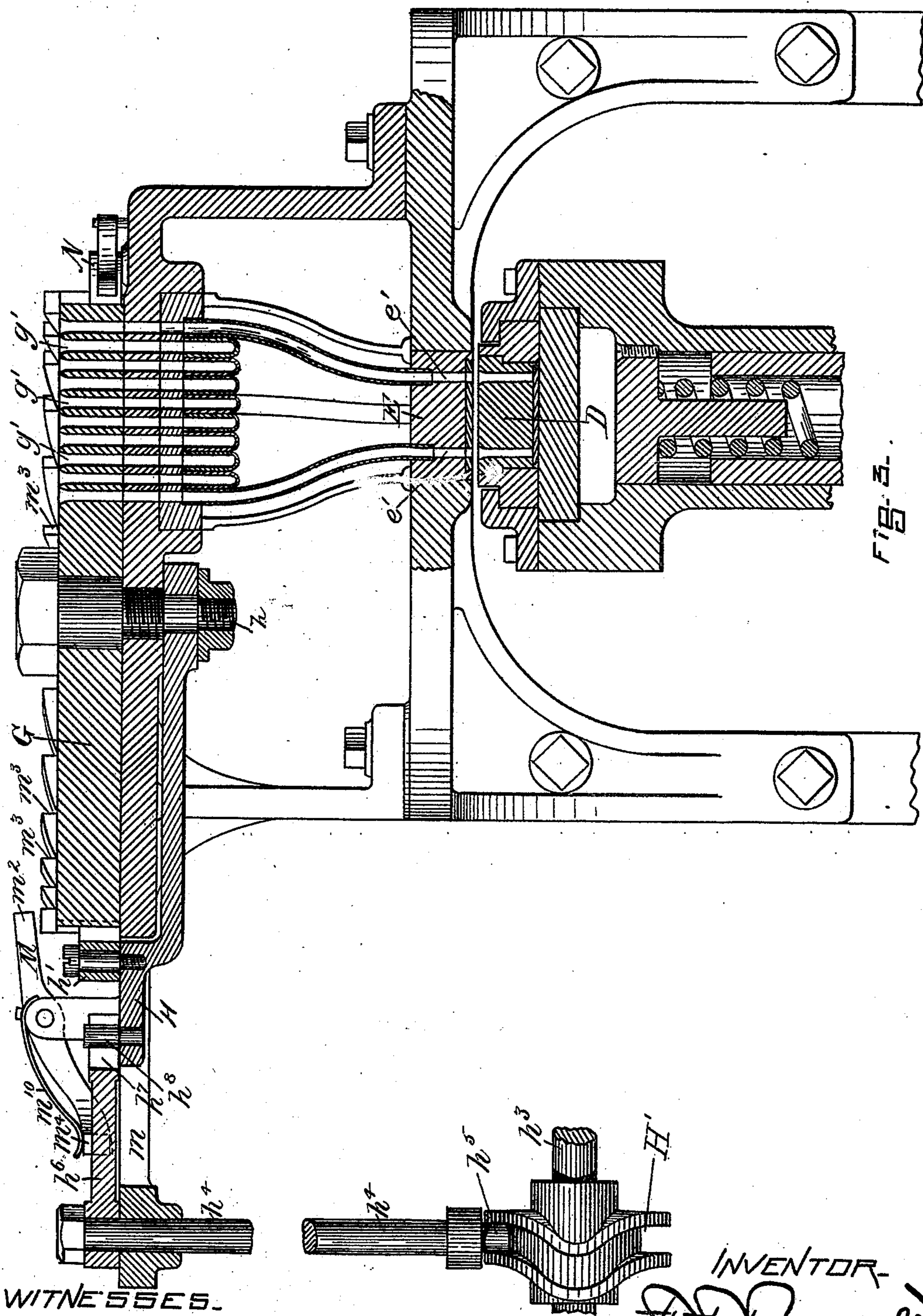
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# UNITED STATES PATENT OFFICE.

FREEBORN F. RAYMOND, 2D, OF NEWTON, MASSACHUSETTS.

## HEEL-NAILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 358,298, dated February 22, 1887.

Application filed November 26, 1886. Serial No. 219,900. (No model.)

*To all whom it may concern:*

Be it known that I, FREEBORN F. RAYMOND, 2d, of Newton, in the county of Middlesex and State of Massachusetts, a citizen of the United States, have invented a new and useful Improvement in Heel-Nailing Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention comprises a heel-attaching machine having a nail feeding and distributing device of peculiar construction.

It relates also to devices for arranging nails for delivery to a distributor, and to the combination of said devices with the nail-driving devices.

It further relates to various details of construction and organization.

In the drawings, Figure 1 is a plan view of the parts of the machine to which the invention especially relates. Fig. 2 is a vertical section taken upon the line  $xx$  of Fig. 1, and also showing parts of the heel-attaching devices. Fig. 3 is a vertical section upon the line  $yy$  of Fig. 1. Fig. 4 is a vertical section upon the dotted line  $zz$  of Fig. 1.

A is the last or work-support. It is mounted upon the spindle  $a$ , which is supported by the jack-post  $a'$ . B is the templet. It is supported by the vertically-movable table  $b$ .

C is the cross-head. It carries the revolving head  $c$ , which is adapted to be automatically revolved, and which has an arm supporting a block carrying a gang or group of awls,  $c'$ , an arm supporting a block carrying a gang or group of drivers, (not shown,) and a spanker-arm, which may or may not have top-lift-holding devices.

D is the nail-carrier. It is movable from the distributor E to the templet B, and is adapted to carry or transfer nails from the distributor to the templet. The distributor comprises the block  $e$ , having the holes  $e'$ , of the arrangement of the holes in the nail-carrier and templet, the block  $e^2$ , which has a straight line of holes,  $e^3$ , preferably at uniform distances apart, and the tubes  $e^4$ , which connect the block  $e^3$  with the block  $e^2$ , and form the passages  $e^5$  from the holes  $e^3$  to the holes  $e'$ . These tubes are bent or curved forward so as to per-

mit the block  $e$  to be placed as near the templet as possible to shorten the throw or extent of movement of the nail carrier or transferrer D. This distributor is made removable from the machine.

Above the distributor is a plate, F. This has also a line of holes,  $f$ , which corresponds in location with the line of holes in the block  $e^2$ , and this plate supports a block, G, which is adapted to be rotated upon the pin or center  $g$ , and which has formed therein the radial lines of holes  $g'$ . These holes are placed quite closely together, so as to provide the block with as large a number of lines of holes as possible. The block is so pivoted or arranged in relation to the block  $e^2$  of the distributor that the various lines,  $g'$ , of holes are adapted upon the turning of the block to be brought in line with the holes  $f$  and holes  $e^3$  of the block  $e^2$ , and so as to discharge nails therefrom directly into the distributor, and the block being mounted upon an imperforate flat plate, F, the nails cannot escape from the lines of holes  $g'$  until they are brought in register with the line of holes  $f$ .

The block G may be revolved by hand; but I prefer to rotate it automatically with an intermittent movement, and for this purpose I have provided mechanism for moving it upon this center  $g$  intermittingly, so that the various lines,  $g'$ , of holes are brought in successive order in register with the holes  $f$ .

The mechanism which I have shown comprises a pawl-arm, H, pivoted upon the stud  $h$ , which attaches the block G to the bed or plate F, and below the said bed, so that the arm shall be underneath the block, instead of over it, and thereby leave the entire upper surface of the block G unobstructed. This arm carries near its outer end the spring-pawl  $h'$ , which is adapted to engage the ratchet-teeth  $h^2$  upon the outer edge of the block G, and upon the movement of the arm H to rotate the block a portion of a revolution or the length of one tooth. This arm H is provided with a swinging or oscillating movement at given intervals upon its center  $h$ , by means of the cylinder-cam H' upon the cam-shaft  $h^3$ , (see Fig. 3,) the rock-shaft  $h^4$  having the cam-pin  $h^5$ , which enters the groove of the cylinder-cam, and the arm or lever  $h^6$ , at the upper end

of the rock-shaft, which has a slot,  $h'$ , which receives the pin  $h^8$ , extending upward from the arm H.

In order that the lines,  $g'$ , of holes may register with the holes  $f$ , it is necessary to automatically lock the block G when the line of holes has been brought into registering position; and this is obtained by means of the latch or locking bar M. (See Figs. 1, 3, and 4.) This block M is pivoted to a bracket,  $m$  10  $m'$ , so that its end  $m^2$  shall have a vertical movement in relation to the surface of the block G, and there is formed upon the surface of the block G about its edge the ratchet-teeth or projections  $m^3$ , which are parallel with the ratchet-teeth  $h^2$ , but are opposed thereto. The latch or locking bar M also has the end  $m^4$ , (see Figs. 1 and 4,) which projects over the movable curved arm or lifting device  $m^5$ , and attached by the lever  $h^6$  and arm  $m^6$  to the rock-shaft  $h^4$ . This lifting-arm  $m^5$  has the lower flat surface,  $m^7$ , (see Fig. 4,) the inclined surface  $m^8$ , and the upper flat surface,  $m^9$ , and the end  $m^4$  of the latch-bar M is maintained in contact therewith by the spring  $m^{10}$ . (See Figs. 1, 3, and 4.) Upon the movement of the lever  $h^6$  to move the feed-pawl  $h'$  and the block G, the arm  $m^5$  is moved under or beneath the end  $m^4$  of the latch-bar, and the latching end of the bar remains lifted or elevated, so that the tooth  $m^3$ , which it was last in contact with, may pass under it, and until the arm  $m^5$  has been moved sufficiently to bring the incline  $m^8$  beneath the end  $m^4$ , when the latch end M is moved downward into a position to act as an abutment or stop for the projections or teeth  $m^3$ , and after being moved into this position it is held in such position by the flat surface  $m^9$  of the said arm, and the movement of the lever  $h^6$  and feed-pawl  $h'$  continues until the stop or tooth  $m^3$  comes in contact with the side of the locking-bar M, when it ceases, and the block G is held rigidly between the locking-bar M and the end of the feed-pawl  $h'$ , and when the block is in this position one of the lines,  $g'$ , of holes is in register with the holes  $f$ , and the cam is timed to deliver nails to the distributor, preferably once in every three reciprocations of the cross-head, or one gang for every heel attached. The time for this delivery may vary; but preferably it is immediately after the carrier has taken from the distributor a previously-fed gang or group of nails.

To hold the block G during the reverse movement of the feed-pawl to engage the next tooth in order, I use a detent-pawl, N, which prevents the block G from being moved backward by the drag of the feed-pawl upon its reverse movement. The latch-block M remains in operative position until the feed-pawl has very nearly reached the end of its backward movement, when the removal of the raised part of the arm  $m^5$  from beneath its end  $m^4$  allows the spring to operate to raise the end  $m^2$ , so that the block G cannot be moved back-

ward. Neither can it be moved forward during the greater part of the return movement of the feed-pawl.

The lines,  $g'$ , of holes may be supplied with nails automatically from a nail-making or a nail-delivery device, or by hand, and it is especially adapted for the latter use; and while it may be rotated by hand to deliver nails to the distributor, I prefer that it be rotated automatically, as that relieves the boy or attendant from so much work, and gives him more time to supply the holes  $g'$  with nails. By this device it will be seen that the boy or attendant can work in advance of the operation of the machine to an extent sufficient to enable one boy to attend to two machines.

I would say that I do not confine myself to the especial movements herein described for providing the block G with the automatic movements specified, but may use in lieu any mechanical equivalents for the devices mentioned.

In use the holes  $g'$  are supplied with nails, and upon the starting of the machine the block G is rotated sufficiently to advance one line,  $g'$ , of holes to the distributor. This, however, takes but an instant, and during the remainder of the movement, and at all other times, the plate G is stationary, so that the feed of the nails to other lines of holes can proceed as rapidly as desired. The nails are delivered from the block G through the holes of the distributor to the carrier D, and by it they are advanced to the nail-driving devices, preferably automatically.

While I have represented this device as applied to a heel-nailing machine, I would say that it can be used with any nailing-machine adapted to drive nails in a gang or group.

I would further say that while I have shown the invention as applied to or embracing a plate having a series of lines of nail receiving and holding holes, which lines of holes are adapted to be brought in consecutive order in line with the holes of the distributor, yet I do not wish to be understood as limiting the invention to the use of a rotary plate, as a slide-plate having parallel lines of holes, and having an intermittent feeding movement, so that its lines of holes are brought consecutively in line with the lines of holes of the distributor, would be the same thing.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The combination, in a heel-nailing machine, of heel-nailing devices, the nail-distributor E, the block G, having the lines,  $g'$ , of holes, and the ratchet-teeth  $h^2$ , with the arm H, pivoted to the stud  $h$ , and the spring feed-pawl  $h'$ , carried thereby, substantially as described.

2. The combination, in a heel-nailing machine, of the block G, having the lines,  $g'$ , of holes, the ratchet-teeth  $h^2$ , and the teeth or

projections  $m^3$ , with the feed-pawl  $h'$  and the stop or latching bar M, substantially as described.

3. The combination of the block G, having  
5 the lines,  $g'$ , of holes, and the ratchet-teeth  $h^2$ , and teeth or stops  $m^3$ , with the feed-pawl  $h'$ , the detent N, and the movable stop or latch M, substantially as described.

4. The combination of the block G, having  
10 the lines,  $g'$ , of holes, the ratchet-teeth  $h^2$ , the arm H, the feed-pawl  $h'$ , carried by the said arm, a cam,  $H'$ , a rock-shaft, and lever connecting the cam with the arm H, substantially as described.

15 5. The combination of the block G, having the lines,  $g'$ , of holes, the stops or teeth  $m^3$ , and

the latch block or bar M, pivoted at  $m$ , its operating-arm  $m^5$ , shaped as specified, the spring  $m^{10}$ , the cam  $H'$ , and the rock-shaft  $h^4$ , substantially as described.

6. The combination of the block G, having  
20 the lines,  $g'$ , of holes, and the ratchet-teeth  $h^2$ , the stops or teeth  $m^3$ , with the feed-pawl  $h'$ , the movable latch or block M, and a cam,  $H'$ , connected with the said feed-pawl and with  
25 said latch, and adapted to simultaneously operate them, substantially as described.

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Witnesses:

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