

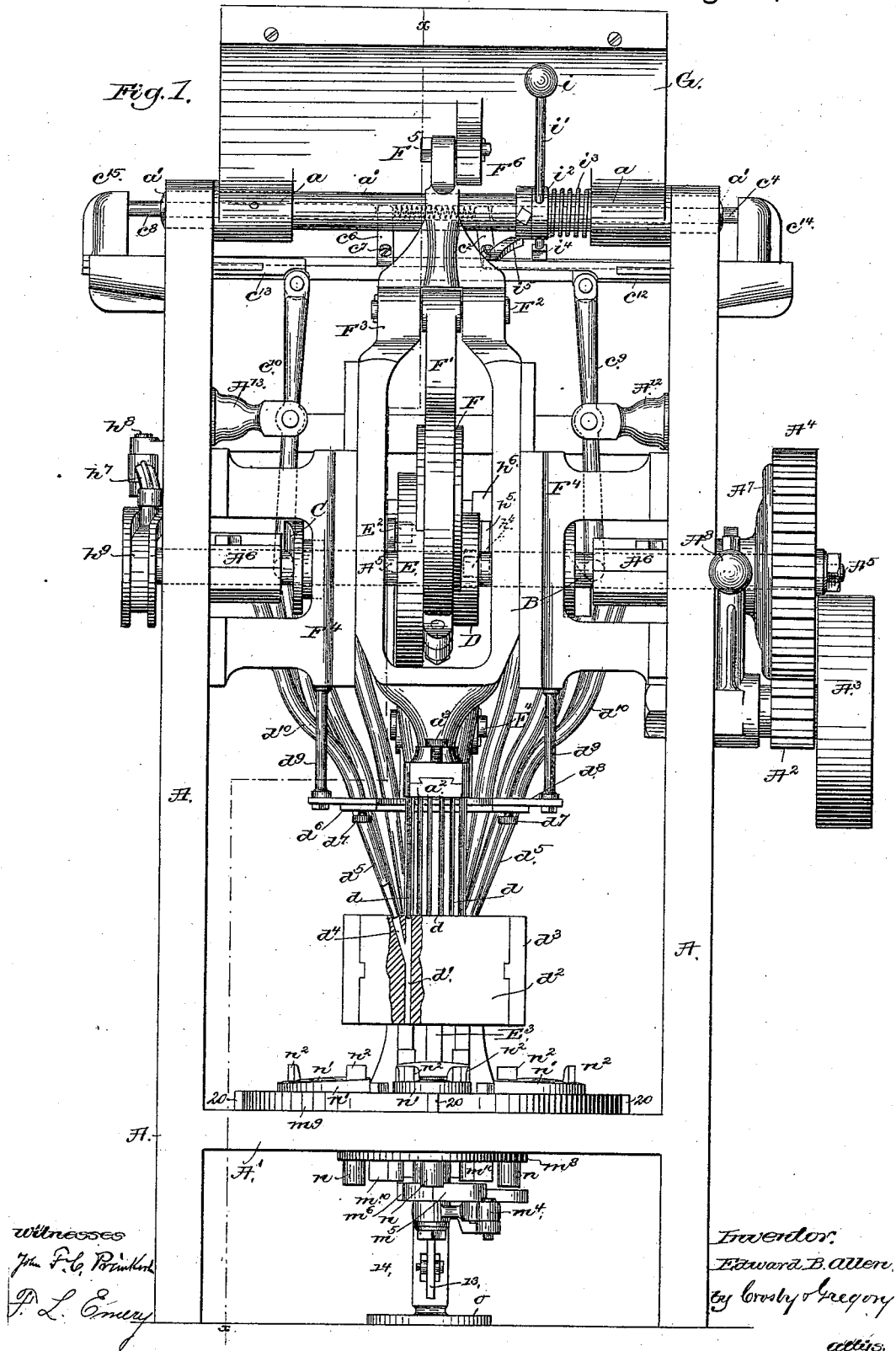
(No Model.)

4 Sheets—Sheet 1.

E. B. ALLEN.
HEEL LOADING MACHINE.

No. 348,091.

Patented Aug. 24, 1886.



(No Model.)

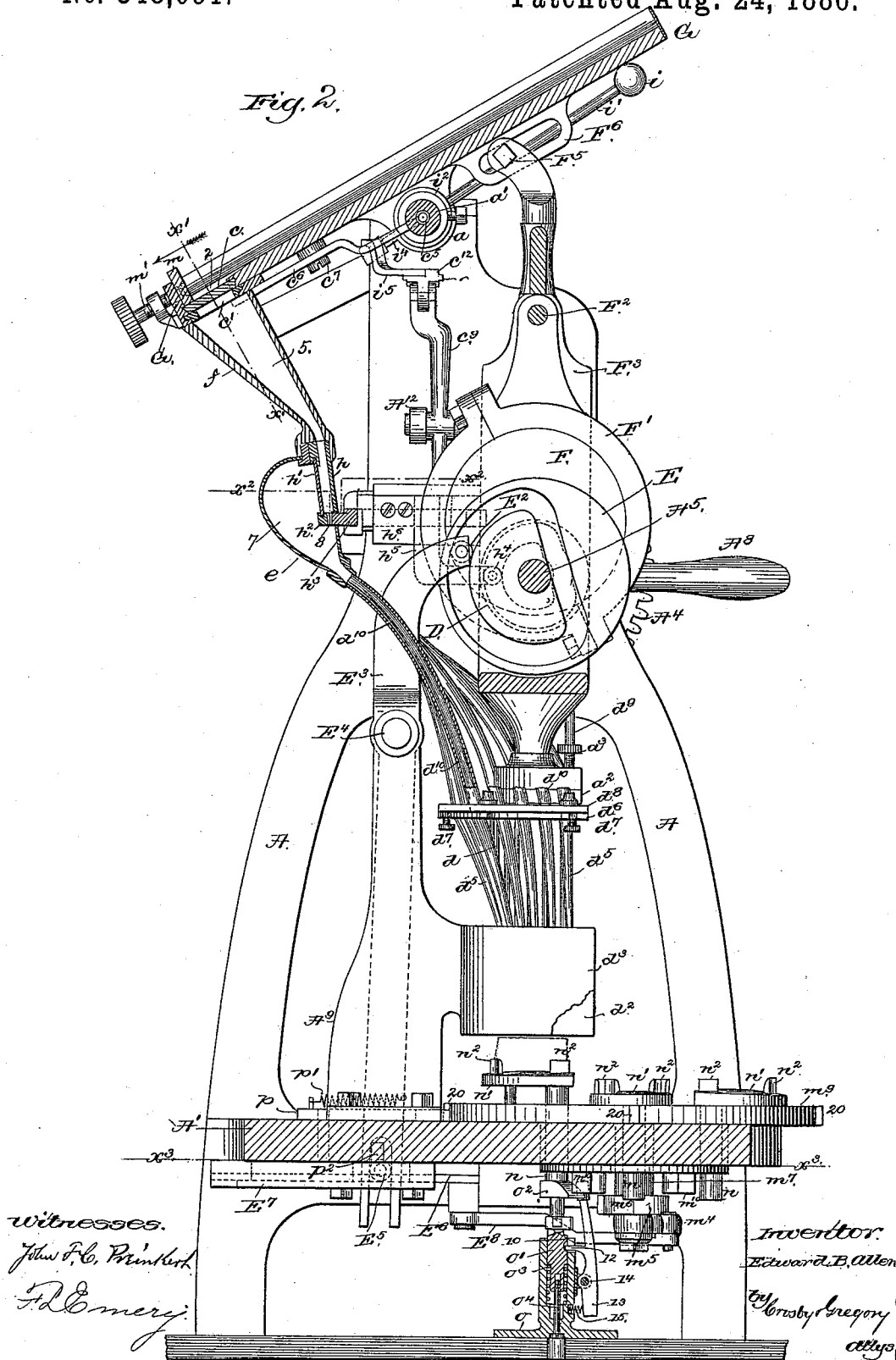
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Fig. 2.



Witnesses.

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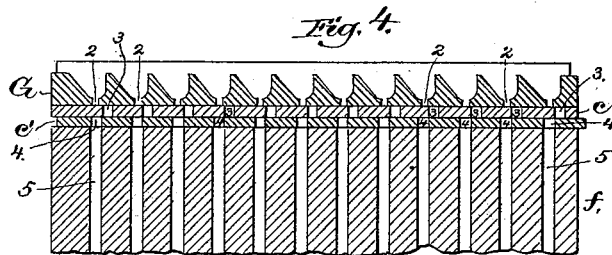
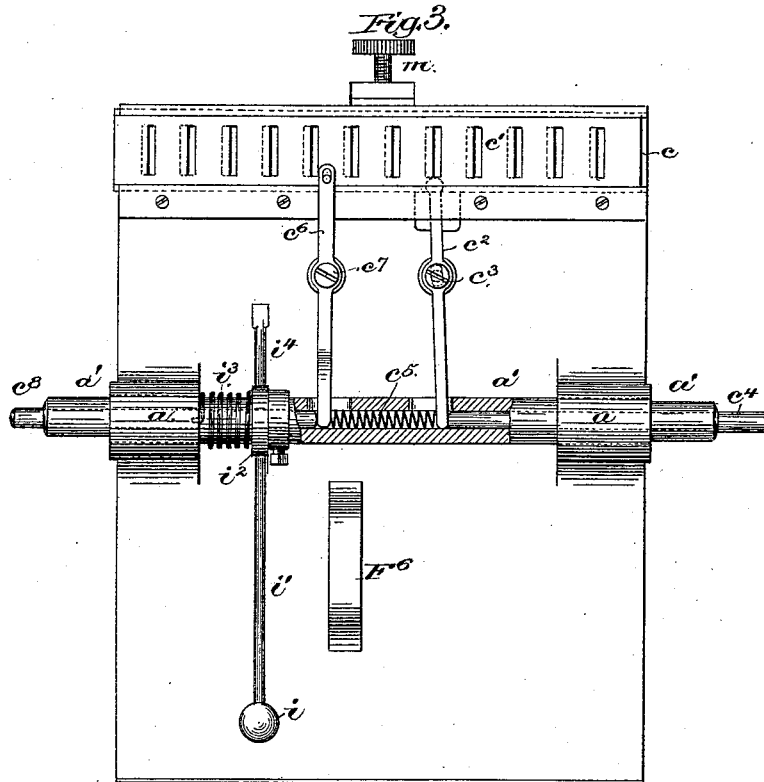
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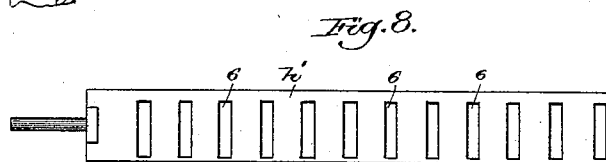
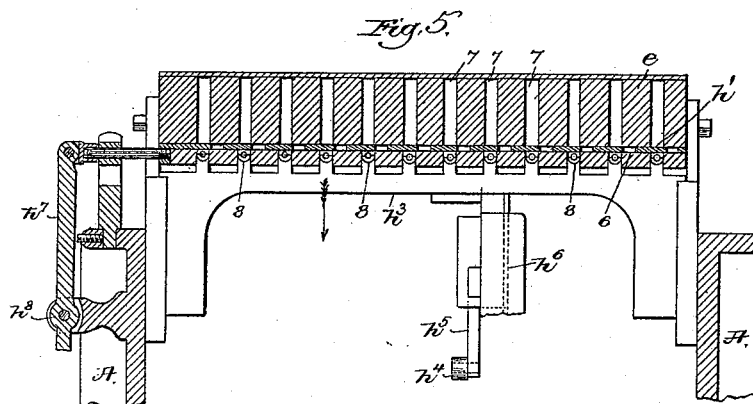
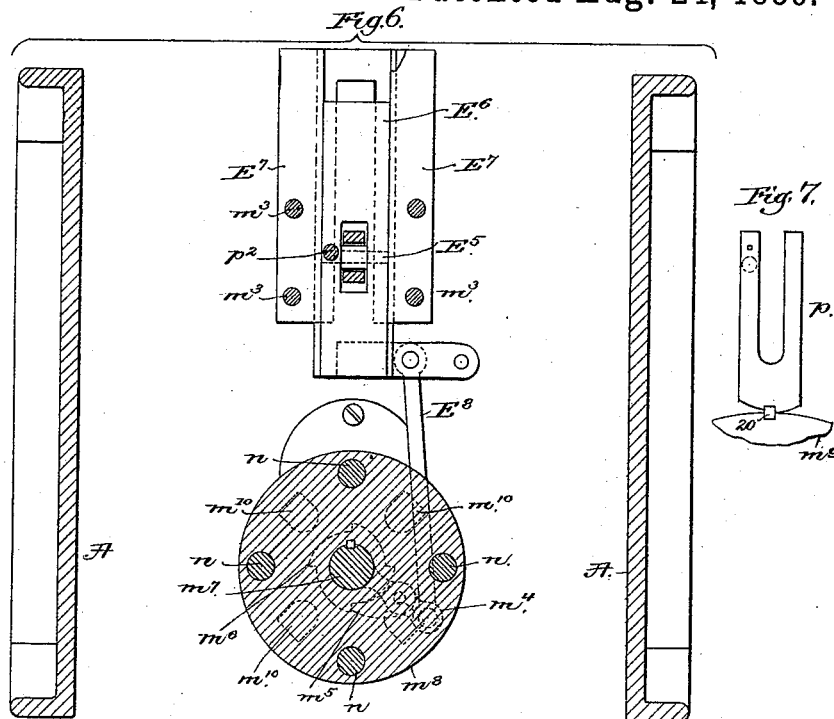
(No Model.)

4 Sheets—Sheet 4.

E. B. ALLEN.
HEEL LOADING MACHINE.

No. 348,091.

Patented Aug. 24, 1886.



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UNITED STATES PATENT OFFICE.

EDWARD B. ALLEN, OF PORTLAND, MAINE, ASSIGNOR TO JAMES W. BROOKS,
TRUSTEE, OF CAMBRIDGE, MASSACHUSETTS.

HEEL-LOADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 348,091, dated August 24, 1886.

Application filed October 7, 1885. Serial No. 179,220. (No model.)

To all whom it may concern:

Be it known that I, EDWARD B. ALLEN, of Portland, county of Cumberland, and State of Maine, have invented an Improvement in
5 Heel-Loading Mechanisms, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object the production of an organized machine by which to automatically deliver into pricked holes of heel or other blanks the nails which are put into the different lifts of the said heel or other blanks.

15 In accordance with my invention the tapering nails, without projecting heads, but having one end of greater diameter than the other, the end of greatest diameter being denominated the "head," are thrown upon a tilting table having, preferably, a series of grooves, each groove having co-operating with it certain cross-slides containing slots through which the nails may pass into a conductor, the lower
20 end of each conductor being in communication with a nail-selecting device, herein shown as provided with a series of pockets, and as having a movable side and a separable bottom plate provided with holes, one for each pocket, the movable side also having slots at intervals, movement of the side plate placing the slots
30 thereof opposite the pockets, in order that the nails dropped into the latter with their larger end downward may tip over into a hopper, from which latter extends a series of tubes to the
35 loading-die, the latter having as many holes as there are nail-holes in the blank to be filled or loaded. The cross-slides of the tilting table are placed one upon the other immediately
40 below the slots in the grooves of the table, and the said slides are moved one upon the other by suitable levers, so that a nail caught in a pocket at the end of one of the grooves of the table is, by a movement of the upper-
45 most slide, permitted to drop into a slot therein, the nail falling upon the upper side of the undermost slide, and thereafter, by a movement of the under slide, the nail is permitted to drop into one of its slots, return movement of the
50 under slide permitting the nail to drop from its slot into one of the slots of the chute. The

perforated heel-blanks to be loaded with nails will be placed in succession upon followers made vertically movable in an intermittently rotating bed, each follower being supported
55 somewhat above the bed when the nails are being driven into the holes in the blank, the follower being so elevated by means of a lifting device, which is held up by a spring. As the nails are driven, the stress of the spring is
60 overcome just before the nails are fully driven, and the follower-lifting device descends until a projection or pin of a locking device engages a shoulder on the shank of the follower-lifting device, thus locking the latter in its
65 lowest position. In this condition of the parts the table is moved one step, the ends of the nails projecting above the heel-blank are moved out from under the die, and the stem of the follower is removed from the cam-shaped
70 hub of the follower-lifting device, and thereafter, and before the stem of the next follower arrives in position to meet the follower-lifting device, the locking device is disengaged from the shank of the follower-lifting device,
75 permitting it to rise in position to act upon and lift the next follower in succession. The tilting table and the plunger containing the driver-carrying plate and drivers are operated by the same eccentric and strap.
80

My invention in heel-loading mechanism consists in a loading-die provided with communicating nail and driver passages, and a series of drivers adapted to open and close the nail-passages, as will be described; also, in
85 a nail-loading die provided with communicating nail and driver passages and a series of tubes, combined with a selecting device and with nail-passages in communication with the tubes leading to the nail-loading die; also, in
90 the combination, with a hopper, of a nail-selecting device having a movable side plate and separable bottom plate, to permit nails entering the selecting device with their heads foremost to be overturned and those with their
95 points foremost to be dropped through the bottom plate; also, in a tilting table grooved for the reception of nails and provided with pockets, and one or more co-operating cross-slides having slots or recesses, combined with
100 means for operating the said cross-slides; also, in a tilting table grooved for the reception of

nails and provided with pockets and with one or more slotted cross-slides, combined with a chute and with a nail-selecting device to direct the nails points foremost into the recesses or tubes.

Other features of my invention will be hereinafter described, and set forth in the claims at the end of this specification.

Figure 1, in front elevation partially broken out, represents a heel-blank loading-machine embodying my invention; Fig. 2, a section of Fig. 1 in the irregular dotted line $x x$, the parts below the platform of the frame-work being partially broken out. Fig. 3 is an under side view, partially broken out, of the tilting table, showing its cross-slides and parts to operate them. Fig. 4 is a sectional detail in the line $x' x'$, Fig. 2. Fig. 5 is a sectional detail of the nail-receiver in the line $x'' x''$, Fig. 2. Fig. 6 is a sectional detail of the parts below the dotted line $x'' x''$, Fig. 2. Fig. 7 is a detail of the device for locking the rotating table, and Fig. 8 a detail showing the side plate of the selecting device.

Referring to the drawings, the frame-work A, of suitable shape to contain the working parts, has a platform, A'. The frame-work, at one side, has fixed to it a stud, upon which is loosely mounted the small pinion A² and its connected belt-pulley A³, the said pinion engaging and driving a toothed gear, A⁴, mounted loosely upon the main shaft A⁵ of the machine, the said shaft supported in suitable bearings, A⁶, having splined upon it, outside the frame-work and next to the said toothed gear A⁴, a friction-disk, A⁷, of usual construction, which, by a lever, A⁸, may be made to engage a conical recess of the gear A⁴ whenever it is desired to rotate the main shaft and operate the machine. The main shaft has fixed to it cams B C D E and an eccentric, F. The eccentric F is embraced by an eccentric strap and link, F', connected by the pin F² with the plunger F³, having at its side suitable tapering gibs, which are fitted to slide in guideways F⁴. The plunger F³, extended upward, has a pin, F⁵, which enters a slot (see Fig. 2) in the ear F⁶ of the tilting table G, having two hubs, $a a$, (see Figs. 1 and 3,) which receive through them a hollow shaft, a' , the ends of which constitute journals for the tilting table, the said shaft having its bearings in the frame-work A. The plunger F³ at its lower end is provided with a dovetailed groove (see Fig. 1) to receive a dovetailed projection of the driver-carrying plate a^2 , the said plate having attached to it a series of drivers, d , of usual construction, the plate being held in place by a set-screw, a^3 , the lower ends of the said drivers, when the plunger is elevated, standing in holes d' of the loading die d^2 , supported in an open yoke, d^3 , projecting from an upright, A⁹, rising from the platform A'. The grooves d' in the loading-die d^2 are intersected by nail-receiving grooves d^4 , (see Fig. 1,) the said nail-receiving grooves being in communication with terminal tubes d^5 , connected with

the removable plate d^6 , adjustably attached by screws d^7 , or otherwise, to the supporting-plate d^8 , suspended, as herein shown, by rods d^9 from the guideways F⁴. The supporting-plate d^8 has in communication with it tubes d^{10} , which practically form prolongations of the terminal tubes d^5 , the tubes d^{10} being in communication with the hopper e .

By connecting the terminal tubes with the plate, as described, the loading of heels of different sizes is facilitated, as each loading-die d^2 will have the terminal tubes fixed to it, and the upper ends of the terminal tubes will have more or less spread or incline to bring them into proper working position with relation to the tubes d^{10} , the latter being in number to correspond with the number of nails to be delivered into the largest heel.

The tilting table G (shown in longitudinal section in Fig. 2 and in cross-section in Fig. 4) is provided with a series of longitudinal grooves, and at the lower end of each of the said grooves there is a recess or pocket, 2, into which is caught a nail as the table is tilted about its center. Below this series of pockets 2 are two cross-slides, $c c'$, each provided with a series of slots, as shown at 3 4, the said slots being interposed between the pockets 2 and the space 5 (see Fig. 5) in the chute f . The slide c is reciprocated by the lever c^2 , pivoted at c^3 , one end of the lever being extended through a slot in the hollow shaft a' , where it is acted upon by a sliding rod, c^4 , and by a spring, c^5 . The slide c' has a pin at its under side, which is engaged by a lever, c^6 , pivoted at c^7 , the long end of the said lever also entering a slot in the hollow shaft a' , and being acted upon by a slide-rod, c^8 , and by a spring, c^9 .

The frame-work A has brackets A¹² A¹³, which support the levers $c^2 c^{10}$, operated, respectively, by the cams B C, which are side cams, the upper ends of the said levers being pivoted, respectively, to the sliding carriages $c^{12} c^{13}$, provided, respectively, with lugs $c^{14} c^{15}$, which, in the movement of the carriages toward the center of the tilting table, act upon the rods c^4 and c^8 , and operate the levers $c^2 c^6$ and their attached slotted cross-slides $c c'$, they being operated in the proper times and in such direction with relation each to the other and to the pockets 2 and the openings 5 in the chute f , to enable a nail deposited in the pockets 2 to be dropped therefrom into the recesses 3 in the cross slide c , and next into the recesses 4 in the cross-slide c' , and then, by a longitudinal movement of the latter cross-slide, a nail let in its recess 4 will drop into one of the openings 5 below it, and descending through the said opening will enter into a recess in the selecting device h , the said selecting device having a recess to correspond with each space 5 in the chute f . The selecting device h has a movable side plate, h' , provided (see Fig. 5) with slots 6, the side plate normally standing with its slots in such position as to close the passage-ways or recesses in the selecting device

from the passages 7 in the hopper *e*, the passages 7 corresponding in number with the passages 5. The selecting device has a bottom plate, *h*² *h*³, provided with a series of holes, 8, and divided longitudinally into two pieces, the line of division being substantially at the centers of the holes, (see Fig. 5,) the part *h*³ of the bottom plate being made movable laterally away from the part *h*² by means of the cam D, grooved at its side and receiving the roller-stud *h*⁴ of the arm *h*⁵, fitted to slide in the guide-way *h*⁶. The movable side plate, *h*⁷, is connected at one end, as shown in Fig. 5, with a lever, *h*⁷, pivoted at *h*⁸, and operated by a cam-hub, *h*⁹, fast on the shaft A². The nails, dropped from the cross-slides of the tilting table through the passages 5 and into the recesses in the selecting device *h*, enter the said recesses, some of them with the small ends or points leading, others having their large or head end leading. If the point ends lead, the said points enter the recess 8, and stand therein until the movable part *h*³ of the bottom plate is moved in the direction of the arrow, Fig. 5, which permits the nails so freed to enter, point first, the lower portion of the recess 7 in the hopper and thence in the tubes *d*¹⁰. The nails which enter the recesses of the selecting device with their large ends or heads foremost stand upright in said recesses until the movable side plate, *h*⁷, is moved toward the left in Fig. 5 far enough to place the slots 6 in line with the space 7, when, owing to the inclined position of the selecting device *h*, the said nails are tipped out and over into the space 7, and therefrom entering the tubes *d*¹⁰. In this way all the nails are made to enter the tubes *d*¹⁰, point first, and are delivered from the tubes *d*¹⁰ into the terminal tubes *b*⁵, and load the die *d*², point first.

The nails are dropped into each tube while the drivers are down in the spaces *d'* below the grooves *d*¹, and the drivers support the points of the nails until the drivers are elevated, as in Fig. 1, when each nail drops immediately into the space *d'* below the drivers, it being supposed that a pricked heel or other blank to be loaded is in place below and in contact with the lower end of the loading-die *d*². The tilting table will have enough nails thrown upon it to partially or nearly fill the grooves.

The table has arranged below it a hammer composed of a head, *i*, on a rod, *i*¹, of a hub, *i*², placed loosely on the hollow shaft *a*¹, one end of a spring, *i*³, being connected with the said hub and with the lug *a*, the said spring normally acting to throw the hammer against the table, the hub having a second arm, *i*⁴, which, at each descent of that end of the table carrying the cross-slides, strikes against the projecting arm *i*⁵, attached to the carriage *c*², before referred to, the inward movement of the said carriage, in actuating the cross-slides *c*¹, causing the arm *i*⁵ to pass beyond and release the arm *i*⁴, permitting the spring to actu-

ate the hammer, causing the latter to strike the table G.

The lower end of the inclined table is provided with a gage-bar, *m*, connected loosely with a screw, *m*¹, extended through a threaded lug, *m*², fast to one end of the table, the adjustment of the said gage-bar shortening the pockets 2, to adapt them to nails of different length.

The cam E has a groove at one side, as shown in Fig. 2, which receives the roll or other stud, E², at the upper end of the lever E³, having its pivot at E⁴ on the upright A², before referred to, the lower end of the said lever being made to engage, as herein shown, the roller or other stud, E⁵, on the slide-bar E⁶, adapted to slide in guideways E⁷, attached to the under side of the platform A¹ by suitable bolts, *m*³, the slide-bar E⁶ having connected with it the link E⁸, pivoted to the lever *m*⁴, keyed upon a shaft, *m*⁷, thus rotating the said shaft intermittingly. The shaft *m*⁷ has also keyed upon it a hub, *m*⁸, of the table *m*⁹, the said hub entering a hole in the platform A¹. This table and hub are bored vertically to receive the shanks *n* of the followers *n*¹, provided with guide projections *n*², to position upon the followers the pricked blanks which are to be filled with nails. Attached to the floor underneath the platform A¹ is a stand, *o*, in which is placed the shank *o*¹ of the follower-lifting device *o*², it having an inclined or cam-shaped head, the shank being cut away to extend through a spiral spring, *o*³, and having attached to it a screw-rod, *o*⁴, provided with a head. The shank *o*¹ has a projection, 10, and below it an inclined notch, in which extends a finger, 12, of the locking device 13, made as a lever, pivoted at 14, the upper end of the lever extended above the top of the follower-lifting device being held pressed toward the latter by a spring, 15. The hub *m*⁸, at its underside, is provided with a series of tappets, *m*¹⁰. (Shown by dotted lines, Fig. 6, and by full lines, Figs. 1 and 2.) The spring *o*³ acts normally to lift the follower-lifting device, so that in the rotation of the table *m*⁹, as the lower end of the shank *n* of each follower, provided with a pricked blank, arrives at or reaches the inclined head of the follower-lifting device, the latter acts to lift the plunger, as shown in Fig. 2, wherein I have shown by dotted lines a pricked blank into which the nails are to be loaded. In this condition of the follower the plunger descends, causing the drivers to drive the nails from the nail-loading die into the pricked holes in the blank, but just before the nails are fully inserted into the holes in the said blank, the pressure exerted on the follower is sufficient to overcome the strength of the spring *o*³ and depress the follower. Depression of the follower causes the inclined surface thereof to act upon the finger 12 of the locking device and turn the upper end of the said device, so that the finger catches above the shoulder 10 on the shank *o*¹, the locking device thereafter serving to hold the follower-lifting device down until after such time, in

the rotation of the table m^9 , the projecting ends of the nails pass the lower end of the loading-die, which done, the tappets m^{10} strike the upper end of the locking device, moving it and releasing the follower-lifting device, permitting it to rise in position to lift the next follower in succession.

The table m^9 at its periphery is provided with teeth 20, one for each follower, and while the nails are being inserted into pricked heel-blanks a locking device, composed of a slide, p , having a notch (see Fig. 7) at its front end, and laid upon the platform A' , and actuated by a spring, p' , is made to engage one of the said teeth, the table-locking device being thrown back at the proper time by a projection, p^2 , (shown by dotted lines, Fig. 2,) attached to the upper side of the slide-bar E^6 .

I claim—

1. In a machine for loading pricked blanks for heels, &c., the loading-die provided with passages d' , having communicating nail-passages d^4 , a series of reciprocating drivers adapted to stop the open lower ends of the nail-passages when the drivers are thrust down into the die and to uncover the nail-passages when the drivers are elevated, two series of converging tubes, d^5 d^{10} , to conduct nails into the said nail-passages, combined with a selecting device, substantially as described, to assort and insure the entrance, points foremost, of the nails into the said tubes, substantially as set forth.

2. The nail-loading die provided with passages d' d^4 and the tubes d^5 , combined with the tubes d^{10} , means, substantially as described, to connect them, and with a hopper provided with nail-passages in communication with the tubes d^{10} , substantially as described.

3. The hopper provided with passages 7, combined with a nail-selecting device having a movable side plate and a separable bottom plate operating, substantially as described, to permit nails entering the selecting device with their heads foremost to be overturned and those with their points foremost to be dropped through the bottom plate, substantially as described.

4. The tilting table G, grooved at its upper side and provided with pockets 2, in which the nails are caught and laid horizontally, and one or more cross-slides located below the said pockets and having slots, the unslotted parts of the uppermost slide supporting the nails while they lie in the said pockets, combined with a chute having a series of slots or passages, 5, to receive the said nails from the said cross-slides, substantially as described.

5. The tilting table G, grooved at its upper side and provided with pockets 2, for the reception of the nails horizontally, and one or more cross-slides having slots, the unslotted parts of the uppermost cross-slide supporting the nails while they lie in the said pockets, and a chute having a series of slots or passages, 5, to receive the nails from the said cross-slides, combined with a nail-selecting device and with a hopper to lead the nails into the tube d^{10} point foremost, as set forth.

6. The main shaft A^5 , its eccentric and eccentric strap, and the plunger, its connected driver-carrier A^2 , drivers, and nail-loading die, combined with the tilting table, substantially as described.

7. In a machine for loading blanks for heels, &c., the tilting table, its slotted cross-slides c c' , the levers c^2 c^3 , and means, substantially as described, to operate them.

8. The tilting table, the shaft a' , and hammer mounted loosely thereon, combined with the projection i^5 and spring i^3 , to operate substantially as described.

9. The intermittingly-movable table, the series of plungers carried thereby, and plunger-lifting device to act upon and lift the said plungers in succession, combined with a locking device to hold down the plunger-lifting device while the loaded heel-blank is being moved from under the loading-die, substantially as described.

10. The loading-die, the drivers, and tubes d^3 , combined with the intermittingly-rotating table, the series of followers carried thereby, and with a follower-lifting device, substantially as specified, to act upon and raise the said followers to place the blanks against the under side of a nail-loading die, substantially as described.

11. In a heel-loading machine, the intermittingly-rotating bed and the series of followers carried thereby and provided with registering-projections n^2 , combined with a loading-die and with a lifting device, substantially as described, to raise the said followers in succession to place the blanks against the under side of the said loading-die, as and for the purposes set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD B. ALLEN.

Witnesses:

G. W. GREGORY,
F. CUTTER.