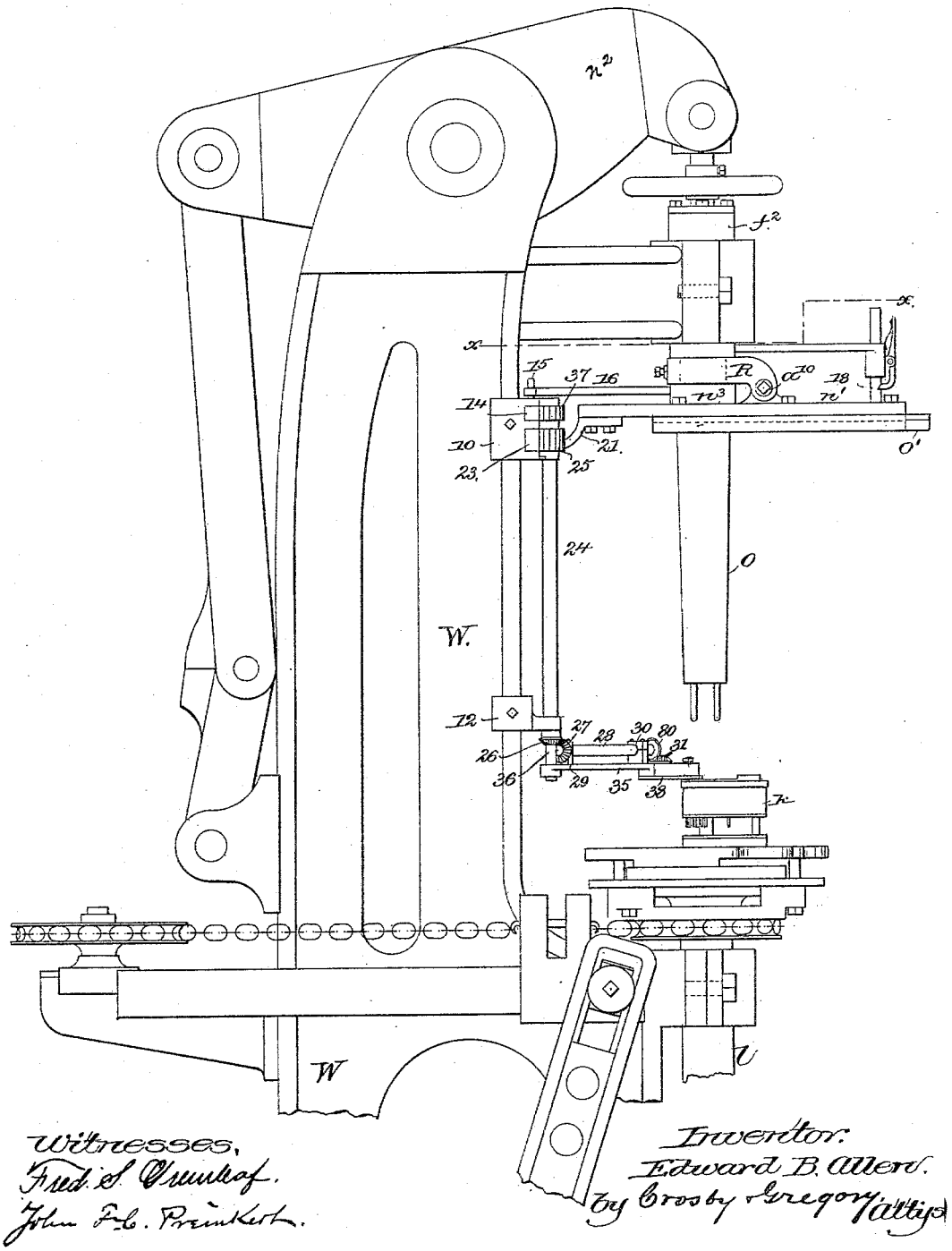
(No Model.) 3 Sheets—Sheet 1.

E. B. ALLEN.

HEEL NAILING MACHINE.

No. 384,343. Patented June 12, 1888.

Fig. 1.



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Inventor:
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by Crosby & Gregory Attys

(No Model.) 3 Sheets—Sheet 2.

E. B. ALLEN.

HEEL NAILING MACHINE.

No. 384,343. Patented June 12, 1888.

Fig. 2.

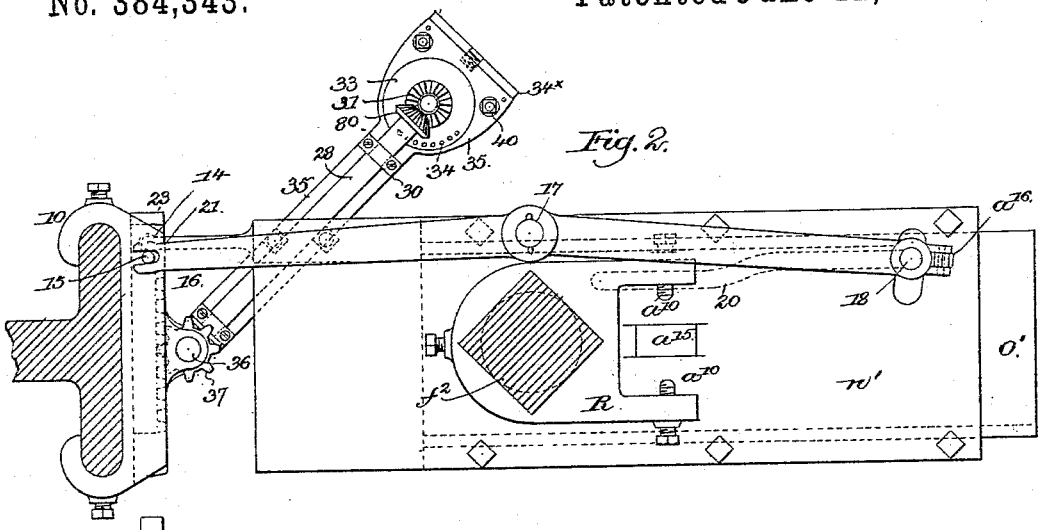


Fig. 3.

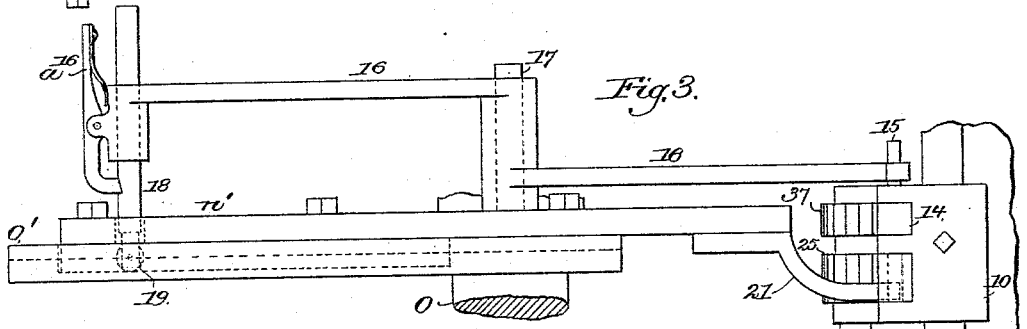
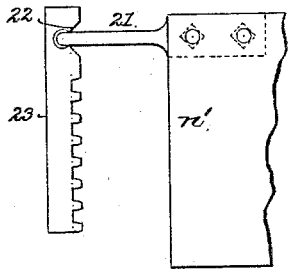
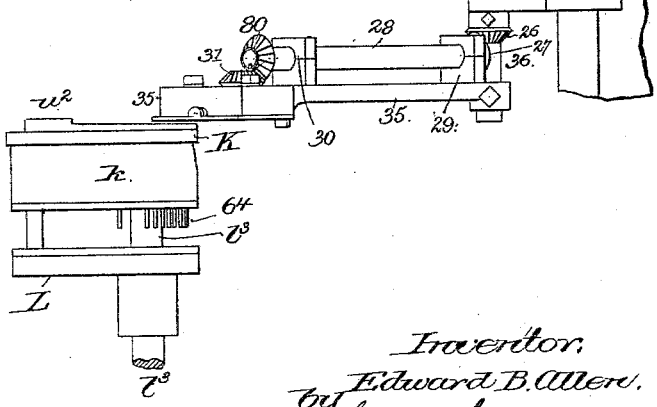


Fig. 4.





Witnesses.
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(No Model.) 3 Sheets—Sheet 3.

E. B. ALLEN.

HEEL NAILING MACHINE.

No. 384,343. Patented June 12, 1888.

Fig. 6.

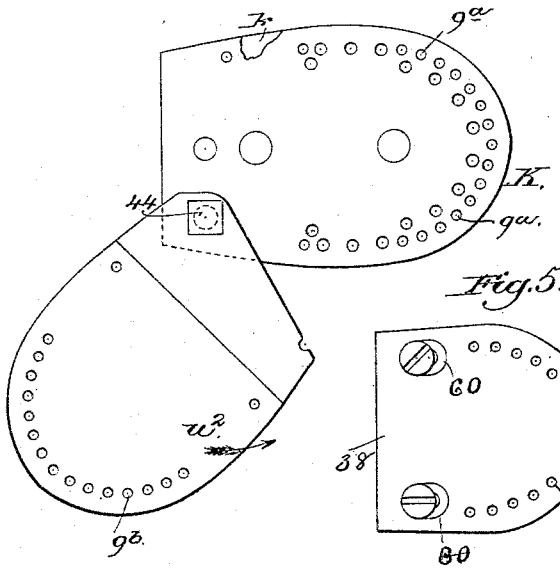


Fig. 5.

Fig. 9.

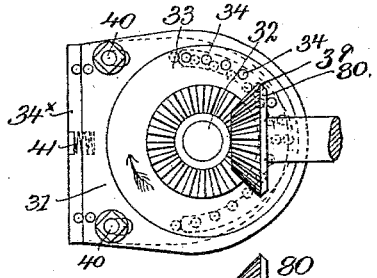


Fig. 10.

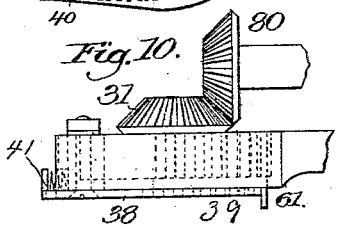


Fig. 7.

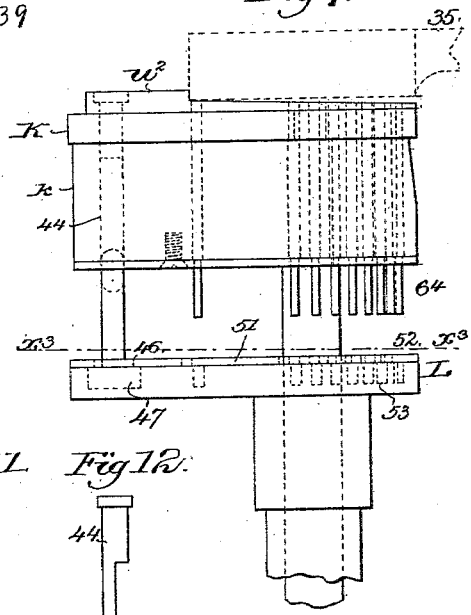


Fig. 8.

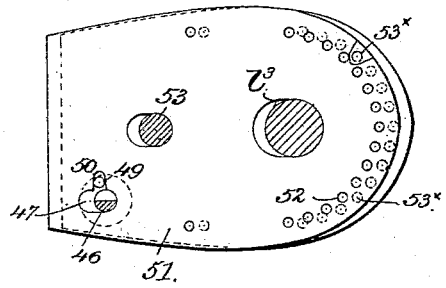


Fig. 11.

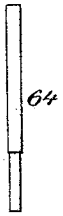
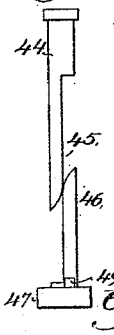


Fig. 12.



Witnesses.
Fred. L. Gruenbaum
John F. C. Printkett

Inventor:
Edward B. Allen.
By Crosby & Gregory
Attys

UNITED STATES PATENT OFFICE.

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

HEEL-NAILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 384,343, dated June 12, 1888.

Application filed September 27, 1887. Serial No. 250,799. (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 Nailing-Machines, 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 to improve the construction of heel-nailing machines, whereby the nail-box, it having extra holes or pockets for the reception of slug-nails, may be automatically filled with slug-nails. I have also provided means whereby the slug-loading apparatus is made to discharge its slug-nails into the proper holes in the usual nail-box, according to whether the slug-nails to be driven are to be inserted in a right or left foot shoe, it being understood that the slug-nails are driven into the outer side of the heel and preferably after the top lift has been blinded upon the heel in usual manner.

My invention is applicable to the machine represented in United States Patent No. 332,032, granted to me December 6, 1885.

In accordance with my invention, the upright part of the frame-work is provided with suitable bearings for a hollow shaft provided at its upper and lower ends with gearing, the said shaft being oscillated for a short distance by or through the lateral movement of the head on which moves the slide to which is attached the shoe-holding spindle, the said head being provided with a projection which, co-operating with a rack, as the head is vibrated to one or the other side, causes the said hollow shaft to be oscillated, and by gearing turn more or less the slug-nail receptacle in the movable arm of the slug-loading apparatus, to thus place the said slug-nails at one or the other side of the heel, the said arm being attached to a shaft extended through the said hollow shaft and provided at its upper end with a gear which is acted upon by a rack-bar set in motion by a lever or equivalent device, deriving its movement from the slide carrying the shoe-holding spindle, the said slide, as herein shown, being provided at its upper side with a cam, as will be described, the movement of the said slide into and out of operative position swinging the said arm respectively out of and then into operative position. The driver-plate located below the nail-box is provided at its upper side with a thin rest-plate having holes corresponding in number with the slug-nail drivers, which are provided with shoulders to prevent them from dropping out of the nail-box. This rest-plate, common to other nailing-machines, is, however, provided with a series of holes and made movable, as herein shown, longitudinally, so that at one rise of the driver-plate, as when the usual nails are being driven to attach the heel to the shoe, the lower ends of the slug-nail drivers will enter the said holes and also holes in the driver-plate, and as a result thereof the slug-nail drivers will not be actuated to drive the nails deposited above them in the nail-box, but just before the second rise of the driver-plate the said rest-plate is moved so as to bring a solid or unperforated part of the said rest-plate under the slug-nail drivers, thus actuating them to drive the slug-nails as the top lift is being blinded upon the heel.

Figure 1, in side elevation, represents a sufficient portion of a heel-nailing machine to enable my improvements to be understood. Fig. 2 is a section of Fig. 1 below the dotted line x, but enlarged; Fig. 3, an enlarged detail of parts at the opposite side of the machine shown in Fig. 1. Fig. 4 is a detail showing the rear end of the head and the rack actuated by it; Fig. 5, a detail of the retaining-plate actuated by the lever to be described; Fig. 6, a top or plan view of the nail-box, with the top-lift plate turned aside; Fig. 7, an enlarged side elevation of the driver-plate, nail-box, and co-operating parts; Fig. 8, a section below the line x^3, Fig. 7. Fig. 9 is a top view, enlarged, of the slug-nail receptacle and parts of the arm to which it is attached. Fig. 10 is a side elevation thereof. Fig. 11 shows one of the slug-nail drivers removed; and Fig. 12 shows the connecting-fingers through which the top-lift plate is made to move the rest or slug-nail-controlling plate.

My invention consists in the combination, with a nail-box having a series of holes for the reception of slug-nails, of an automatically-operated slug-nail-loading device to deposit

slug-nails into the nail-box holes of the nail-box; also, in a slug-nail-loading device consisting, essentially, of a movable bar, a perforated controlling-plate, and a movable slug-nail receptacle, the latter by its movement being adapted to cause the nails carried by it to be dropped through some or other of the holes in the said controlling-plate, according to whether a right or left heel is to be slugged; also, in a nailing-machine, a head, a lever mounted thereon, a rack-bar, a shaft, and an arm, combined with a shoe-holding spindle and its slide, and a cam to actuate the said lever, whereby the same may be moved into position above and then away from the top of the nail-box, all substantially as will be described.

Other features of my invention will be pointed out in the claims at the end of this specification.

The frame-work W, the die-bed spindle *l*, the spindle f^2, and the lever n^2 are the same as designated by like letters in my Patent No. 332,032, and in operation the said parts may be actuated in like manner and time.

The shoe-carrying spindle O, depending from the under side of the slide O′, of dove-tailed shape in cross-section, and free to slide longitudinally on the plate n', loosely mounted on the lower end of the spindle f^2 and supported by the collar n^3 and forked piece R, is substantially as designated in United States Patent No. 203,440, dated May 7, 1878, wherein the letters O, n', and R are also used on like parts.

The nail-box *k*, its shank l^3, the driver-plate L, the pattern-plate K, and top-lift plate u^2 are common to the so-called "McKay and Bigelow heel-nailing machine," all the said parts being fully shown and described in United States Patent No. 166,795, dated August 17, 1875, and No. 321,017, dated June 30, 1885.

In accordance with my invention the upper part of the frame-work has bolted, clamped, or otherwise secured to it brackets, 10 and 12. The bracket 10 is grooved at its front side to receive a rack-bar, 14, having a pin, 15, which is embraced by the forked inner end of a lever, 16, (see Figs. 2 and 3,) pivoted at 17 on a lug or ear of the plate n', the said lever at its outer end having a downwardly-extended stud, 18, provided preferably with a roll, 19, which enters a cam-groove, 20, (see dotted lines, Fig. 2,) formed in the slide O′, having the spindle O, the longitudinal movement of the said slide in placing the spindle and the shoe carried by it (not shown) into and out of operative position moving the said lever and sliding the rack-bar 14 in one and then in the opposite direction. The plate n' has extended from its rear end an arm, 21, which in practice enters a notch, as 22, in a rack-bar, 23, located in the bracket 10, and as the head is swung to the right or left about the spindle f^2, as usual when nailing a right or left heel, the said arm slides the said rack-bar.

The brackets 10 and 12 form bearings for the hollow shaft 24, provided at its upper end with a spur-gear, 25, engaged by the rack-bar 23, and at its lower end with a bevel-gear, 26, which engages a bevel-gear, 27, on a short shaft, 28, having bearings at 29 30, the said shaft 28 at its outer end having a second bevel-gear, 80, which engages a bevel-gear, 31, on a shaft, 32, to which is attached in suitable manner the slug-nail receptacle 33, it being herein shown as a cylindrical block or plate having a series of holes, as 34. (Shown in heavy black for the reception of the slug-nails.) This slug-nail receptacle 33 is placed in the chambered outer end of an arm, 35, fixed to the lower end of a shaft, 36, having its bearings in and extended through the hollow shaft 24, the said shaft 36 at its upper end having attached to it a spur-gear, 37, which is engaged by the teeth of the rack-bar 14, the inward movement of the slide O′ turning the lever 16 and causing the rotation of the shaft 36 in a direction to remove the arm and slug-nail receptacle from above the usual nail-box, *k*, into the position, Fig. 2, when the slug-nails may be placed in the holes 34; but the outward movement of the said slide to place the spindle O in position to have removed from or applied to it a last and shoe acts to turn the shaft 36 in the opposite direction, placing the arm 35 and nail-receptacle 33 directly over the top of the nail-box. The lower side of the chambered part of the arm 35 is provided with a retaining-plate, 38, having a series of holes, 39.

The retaining-plate 38 has two or more countersunk slots, 60, which enable the said plate to slide for a short distance upon screws or studs 40, screwed into the lower side of the chambered part of the arm 35, the under sides of the heads of the screws being tapering, a spring, 41, bearing against the said chambered part, and a ledge, $34^{\times}$, of the plate 38 acting to normally keep the said plate in such position (see Figs. 9 and 10) as to retain the holes 39 out of line with the holes 34, and as a result thereof the plate 38 keeps the slug-nails in the holes 34 of the receptacle 33. The holes 39 are double in number those of the holes 34.

When the plate n' is drawn out, the slug-nail-loading apparatus is swung into place above the nail-box *k*, the top-lift plate at such time being turned back or off from the nail-box (see Fig. 6) and the chambered part of the arm 35 arriving nearly in position above the nail-box, a lug, 61, attached to the rear end of the plate 38, and having preferably a roller upon it, meets the rear side of the pattern-plate K and causes the plate 38 to be moved in the direction to compress the spring 41 and place the holes 39 in the plate 38 in line with the holes 4 in the receptacle 33, at which time the slug-nails in the said holes 34 drop through the holes 39 in the plate 38 and enter the holes in the pattern-plate K, constituting the top of the usual nail-box.

In Fig. 9 the receptacle for the slug-nails is in position to feed the slug-nails into the nail-

box for a right-shoe heel; but in case the operator was about to slug-nail a left-foot-shoe heel he would turn the plate n' to the left, as fully described in United States Patent No. 166,795, and such movement, through the rack-bar 23, the hollow shaft and its gearing, and the short shaft 28 and its gearing, would turn the receptacle 33 a quarter-turn in the direction of the arrow thereon, thus placing the holes 34 in such position with relation to the holes in the plate 38 that when the said plate arrived in position and was moved, as before described, to uncover the bottoms of the holes 34 the slug-nails would fall into the holes at the left-hand side of the nail-box instead of into the holes at the right hand side thereof.

The slug-nail drivers 64 are constructed the same as the drivers described in my patent, No. 319,377.

The top-lift plate u^2 is provided with a headed stud, 44, which serves as a pivot for it. This stud is slabbed off at one side and beveled, as shown in Fig. 12, to form a finger, 45, which co-operates with a like finger, 46, of a round block, 47, seated in the driver-plate L, the said head having a stud, 49, which is extended into a slot, 50, of a rest or slug-nail-controlling plate, 51, having a series of nail-holes, 52, the said plate being slotted to embrace the shank l^2 of the nail-box, also a guide-pin, 53, common to the class of heeling-machines referred to.

The driver-plate L has a series of holes, $53^{\times}$, (shown by dotted lines, Fig. 8,) which, when the top-lift plate w^2 is in position to uncover the top of the nail-box, are uncovered by the controlling-plate 51, and at that rise of the driver-plate which drives the usual nails into the heel to attach it to the sole the lower ends of the slug-nail drivers 64 enter both holes 52 and $53^{\times}$, and consequently the slug-nail drivers are not actuated. At the next rise of the driver-plate L the top lift will be blinded upon the heads of the nails just driven; but preparatory thereto the top-lift plate w^2 will be swung into position to cover the top of the nail-box and pattern-plate, and as the said top plate is turned in the direction of the arrow on it in Fig. 6 the finger 45, rotated with it and having its flat side in contact with the flat side of the finger 46, will turn the block 47 and cause the pin 49 in the slot 50 to draw the plate 51 into the position shown in Fig. 8, or in position to bring a solid part of the plate 51 immediately under the lower ends of the slug-nail drivers, so that as the driver-plate next rises the said slug-nail drivers will be lifted to drive the slug-nails.

My patent, No. 319,377, before referred to, has a movable plate to be thrown into and out of operative position, as it was desired to have the drivers rise or not rise flush with the top plate of the nail-box, so as to avoid the use of a top-lift plate.

The slug-nails are dropped into the row of holes 9^a in the nail-box k, and are driven out therefrom through the holes 9^b in the top-lift plate.

The extent to which the plate n' may be swung when changing from rights to lefts is determined by the adjusting-screws a^{10}, they meeting the lug a^{15} on the plate n'.

If it is desired to prevent the movement of the lever 16 by the cam 20, it is only necessary for the operator to move the latch a^{16} in the direction to disengage its end from the rod 18, when the latter may be elevated to remove the roll 19 out of the said cam-groove.

I do not desire to limit my invention to the exact form of devices shown by which to automatically move the slug-nail-loading device, for instead thereof I may use any other well-known form of devices to automatically place the slug-nail holder at the proper time, as described, above the nail-box.

The pin 15 is of such length and the gear 25 of such width or thickness that the lever 16 and the arm 21, respectively, remain in gear with them, notwithstanding the ascent and descent of the spindle O and plates O′ and n'.

I claim—

1. In the herein-described nailing-machine, the combination, with a nail-box having a series of holes at each side for the reception of slug-nails, of the automatically-operated slug-nail-loading device to deposit slug-nails into either series of the slug-nail holes of the nail-box, substantially as described.

2. The herein-described slug-nail-loading device, consisting, essentially, of a movable bar, a perforated controlling-plate, and a movable slug-nail receptacle, the latter by its movement being adapted to cause the nails carried by it to be dropped through some or other of the holes in the said controlling-plate, according to whether a right or left heel is to be slugged, as set forth.

3. In a nailing-machine, a head, as n', a lever mounted thereon, a rack-bar, a shaft, and an arm, 35, combined with the shoe-holding spindle and its slide, and a cam to actuate the said lever, substantially as and for the purpose set forth.

4. In a nailing-machine, a nail-box having a series of holes for the reception of slug-nails, an arm, 35, the slug-nail receptacle 33, carried by it, and a movable plate, n', to serve as a support for the spindle carrying the shoe to be slugged, combined with intermediate mechanism whereby the movement of the said plate to adjust the shoe with relation to the nail-box for a right or left shoe will automatically operate the slug-nail receptacle to deposit the slug-nails into holes in the right or left side of the nail-box, sustantially as described.

5. In a nailing-machine, the nail-box, the top-lift plate, and the plate 51, provided with a series of holes, 52, combined with fingers or connections 45 46, whereby the movement of the top-lift plate always moves the plate 51 in unison with it, for the purposes set forth.

6. In a nailing-machine, a nail-box having a series of holes for the reception of slug-nails, slug-nail drivers therein having shoulders, combined with the driver-plate having a series of holes, 53×, and a plate, 51, having a series of holes, 52, to operate substantially as described.

7. In a nailing-machine, the arm of the slug-nail-loading mechanism, the slide-plate 38, connected therewith having holes and having a projection, as 61, a spring for moving the said slide-plate in one direction, and a slug-nail receptacle, combined with a nail-box having a top plate against which the said lug strikes as the slug-nail-loading device is brought into operative position above the nail-box, substantially as and for the purpose described.

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,
C. M. CONE.