

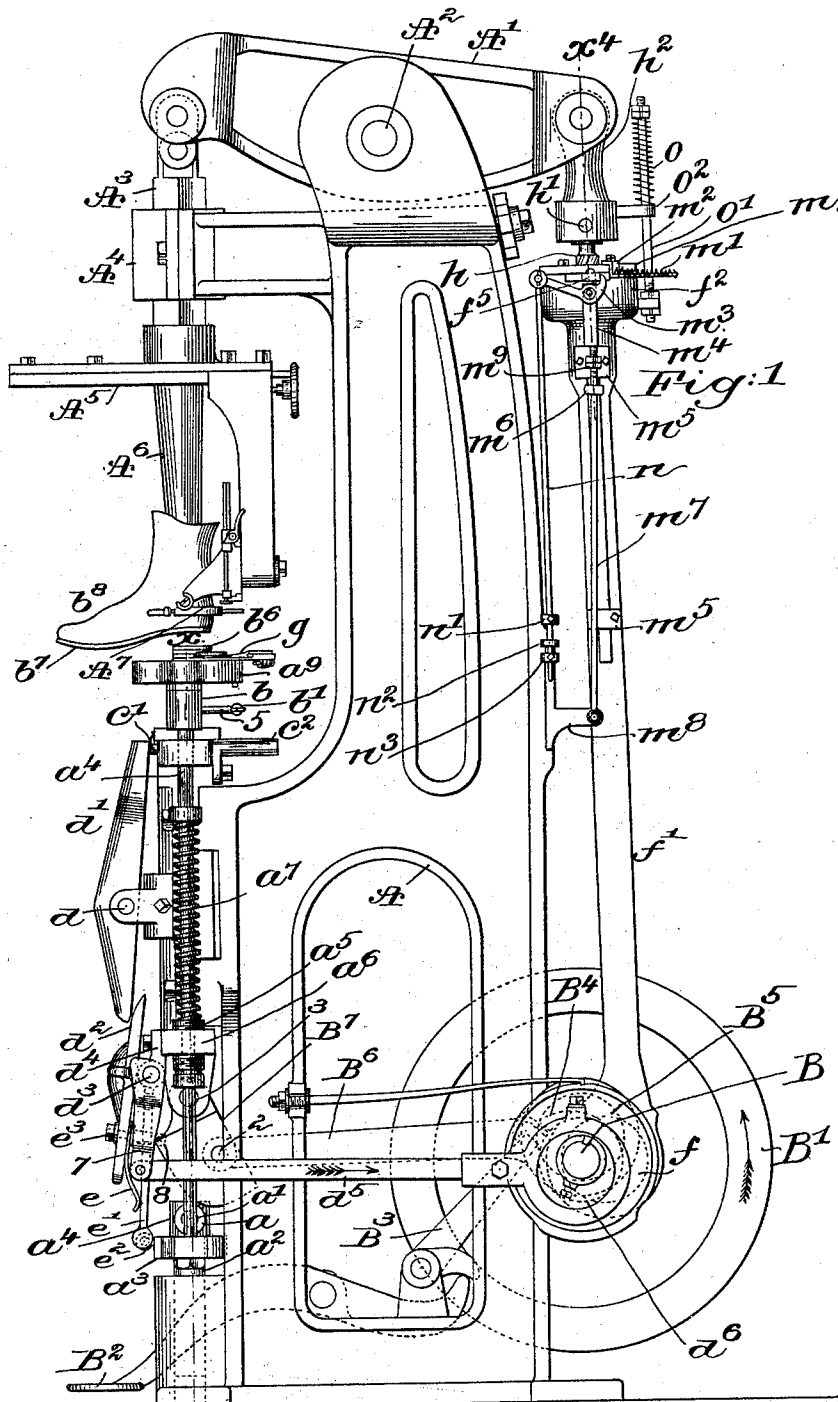
(No Model.)

3 Sheets—Sheet 1

A. D. ELLIOTT.
HEELING MACHINE.

No. 510,012.

Patented Dec. 5, 1893.



Witnesses.

Edward G. Allen.

Fred. S. Grunk of.

Inventor

Alvin D. Elliott.
by Crosby & Gregory
Attys.

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Fig:4.

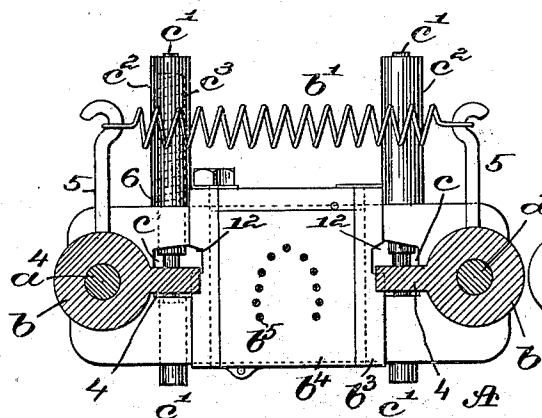


Fig:5.

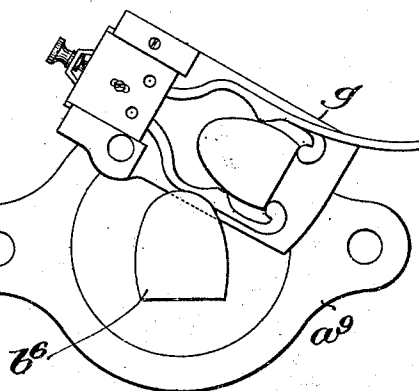


Fig:2.

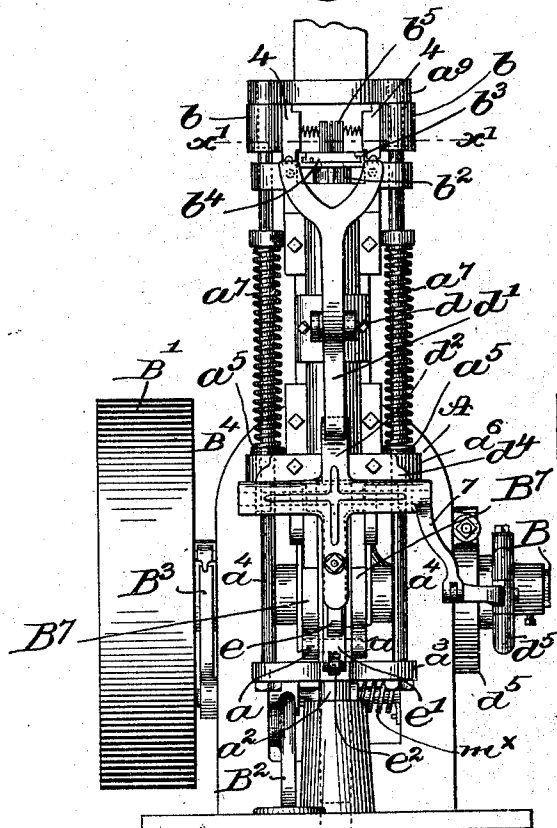
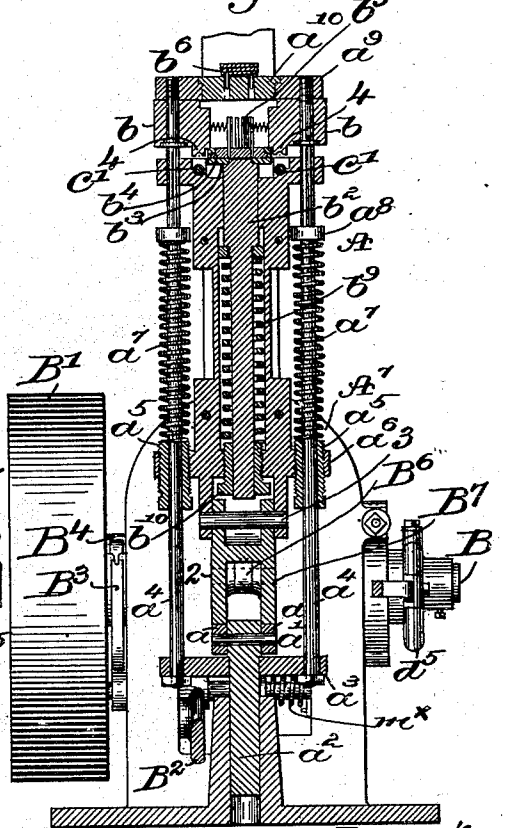


Fig:3.



Witnesses:
Edward F. Allen

Fred S. Grunt ap.

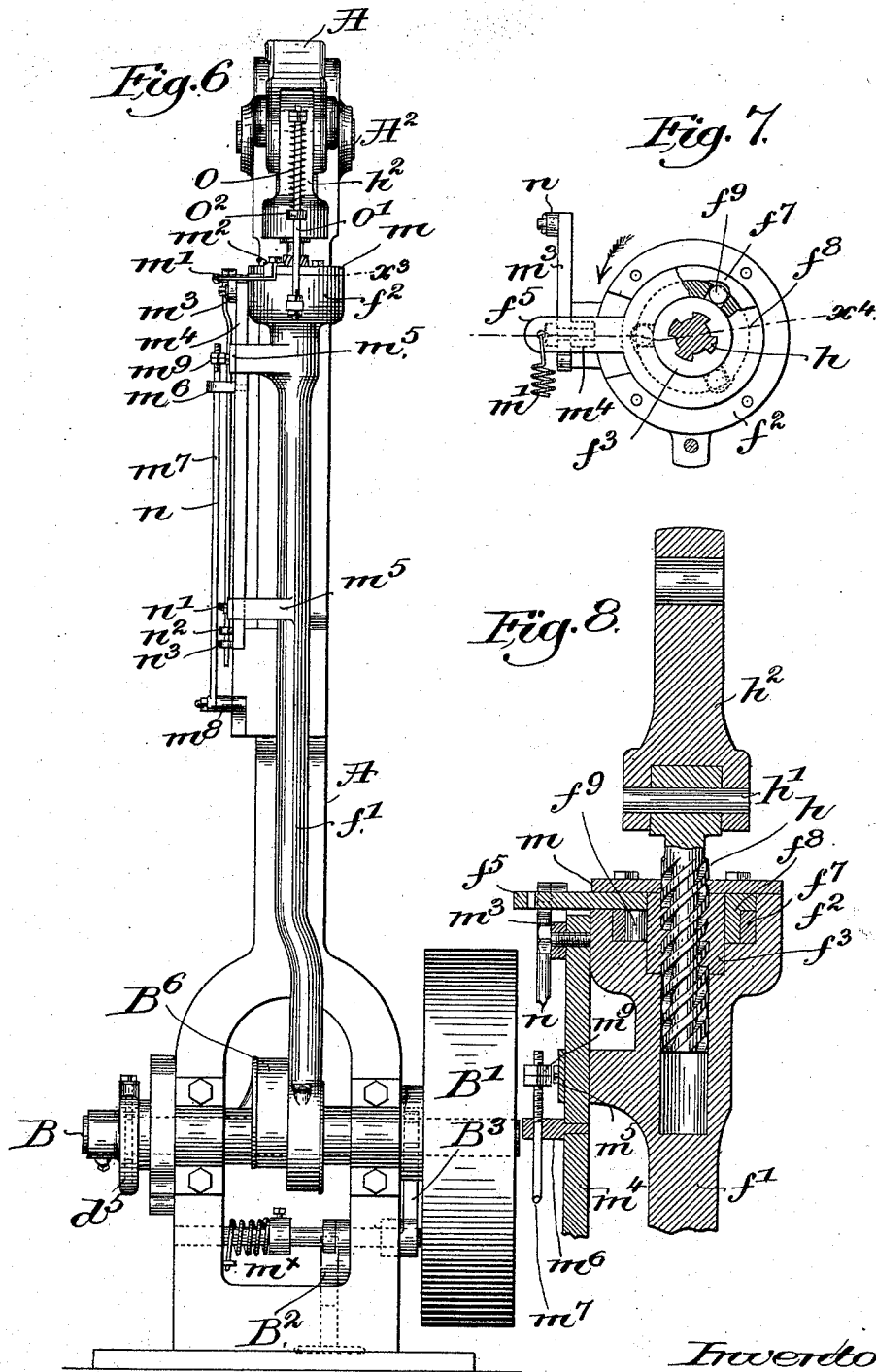
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UNITED STATES PATENT OFFICE.

ALVIN D. ELLIOTT, OF LAWRENCE, ASSIGNOR TO JAMES W. BROOKS,
TRUSTEE, OF PETERSHAM, MASSACHUSETTS.

HEELING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 510,012, dated December 5, 1893.

Application filed December 24, 1892. Serial No. 456,274. (No model.)

To all whom it may concern:

Be it known that I, ALVIN D. ELLIOTT, of Lawrence, county of Essex, State of Massachusetts, have invented an Improvement in Heeling-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and numerals on the drawings representing like parts.

10 This invention has for its object the production of a novel mechanical organization for attaching heels to soles, the apparatus being also adapted for applying a top lift to the tread end of a heel, this invention being an improvement on that described in applica-
15 tion Serial No. 453,641, filed on the 30th day of November, 1892. In the application referred to, the driver, as well as the templet and its carrier, is actuated by springs released in succession during the attaching of
20 a heel to a shoe, but the said driver-bar and templet are shown as located above the shoe support, and the latter is shown as actuated by a manually operated treadle or lever.

25 In this my present invention I have devised novel mechanical devices and have organized them in a power machine whereby the different or successive steps of attaching a heel and providing it with a top lift if desired, are carried out automatically, and in
30 this machine I have devised devices for automatically moving the shoe holder into position to insure not only a firm contact of the sole with the seat end of the heel to be nailed to it, but also to suitably compress the material of the heel prior to the heel attaching
35 operation, the devices for operating the shoe holder or support being capable of insuring a definite amount of compression of the heel prior to driving the nails therein, the said
40 shoe support being, however, locked firmly in position during the driving of the nails, the position at which the said shoe support is so held locked varying according to the
45 height of the heels.

This invention is, it may be considered, also an improvement upon that contained in United States application Serial No. 441,020, filed on
50 the 23d day of July, 1892, wherein the provision for self-adapting pressure to the heel is broadly claimed.

Figure 1 is a right-hand side elevation of a heeling machine containing my improvements. Fig. 2 is a partial front elevation of the machine shown in Fig. 1; Fig. 3, a partial section in the line x Fig. 1. Fig. 4 is a section on the line X' Fig. 2. Fig. 5 is a top or plan view of the uppermost parts in Fig. 3. Fig. 6 is a partial rear side view of the machine shown in Fig. 1; Fig. 7, a partial
55 section in the line x^3 , Fig. 6. Fig. 8 is a section in the line x^4 , Figs. 1 and 7.

The frame-work A is and may be of any usual or suitable shape to sustain the working parts.

65 The walking beam A' pivoted at A², the spindle A³ to which it is jointed, said spindle sliding in a bearing A⁴, the last slide A⁵ and its shoe holding post A⁶, the clamp A⁷ for the rear part of the shoe, and the devices for adjusting said clamp, are and may be all substantially as in United States Patent No. 446,383, dated February 10, 1891.

75 The power shaft B has mounted loosely upon it a constantly rotating pulley B', it in practice, being part of a clutch, substantially such as employed on the main shaft in United States Patent No. 415,670, dated November 16, 1889, said clutch being under the control of a treadle B² and a pawl B³, the removal of
80 the pawl from the stop lug B⁴ of the clutch effecting the engagement of the clutch with and so as to rotate said shaft.

While it is preferred to use a Horton clutch for simplicity and certainty of operation, yet
85 any other usual or suitable clutch pulley may be used instead and yet be within the scope of this invention.

The power shaft has a suitable eccentric B⁵ surrounded by the strap of a link B⁶ jointed
90 at its end at 2 to a cam device B⁷ represented as pivoted at 3 on a fixed part of the frame-work. This cam device, see Figs. 2 and 3, is represented as having two similar acting faces to contact with preferably rolls a , carried by
95 a pin a' mounted in the upper end of a slide a^2 , shown as a pin sliding loosely in a suitable bearing or socket in the frame. This slide is extended through a cross tail a^3 having attached to it suitable rods a^4 extended
100 through, as herein shown, adjustable bearings a^5 in lugs a^6 forming part of the frame-

work, said rods above said bearings passing through strong spiral springs a^7 , the upper ends of the springs made adjustable as to their effective strength by the nuts a^5 , acting against shoulders or collars a^8 on the rods, the said springs normally acting to elevate the rods and with them the cross head a^9 which in practice is suitably shaped to receive and sustain the templet a^{10} .

Just below the cross head a^9 , the rods a^4 are provided with depressing devices b , herein shown as hubs mounted loosely on said rods and having fingers 4, and arms 5, said arms being connected by a suitable spring or actuator b^7 , said depressing devices, as herein devised, being made movable so as to permit the release of the driver-bar when the drivers are to act.

The front part of the frame-work has suitable bearings, best shown in section Fig. 3, the upper bearing receiving and guiding the upper end of a driver bar b^2 having mounted upon it a suitable receiver b^3 for the driver plate b^4 having a gang of drivers b^5 adapted to rise through holes in the templet and act on and drive nails from said holes so that their point ends protrude through the heel b^6 , resting on the templet and enter the heel end of the sole b^7 of the shoe b^8 held in usual manner on the shoe holder or post A^6 . The driver-bar having been extended through a suitable actuating spring b^9 , has its lower end extended through a tubular nut b^{10} which as shown constitutes not only a bearing for the said bar but also an adjusting device for the spring b^9 . The under sides of the fingers of the depressing devices b referred to, see Fig. 3, have near their ends downwardly projecting lugs provided with semi-circular notches, the fingers near the lugs being adapted, in the descent of the cross head a^9 under the action of the cam device B^7 , to act on the receiver b^3 to thus depress the driver bar and compress its spring b^9 . During the operation of depressing the driver-bar the lugs referred to enter notches c in the frame A , and the semi-circular notches of the lug embrace trip rods c' extended horizontally through suitable bearings in the frame, one of the ends of said trip rods being embraced by cases c^2 inclosing springs c^3 , one of which is shown by dotted lines Fig. 4, said springs at one end acting against a suitable shoulder 6 on the rod, the other end of the spring being seated on the case, so that said springs normally act to keep the ends of the pins out in the position shown in the drawings. These trip pins are for a short distance reduced in diameter where they are embraced by the lugs of the fingers 4. The fingers having acted as described to depress the driver-bar, will hold said bar depressed until the fingers are moved by the trip pins to release the driver-bar. This is done in the following manner: I have mounted upon the frame-work at d a trip-lever d' , the lower end of which is borne by the springs c^3 against a trigger d^2 pivoted on a pin d^3 of a depending

stand d^4 properly secured to the frame-work. The trigger, as represented, has a crank arm 7 jointed to an eccentric strap d^5 embracing a suitable eccentric or equivalent device d^6 on the main shaft B . The lower end of the trigger has co-operating with it a spring e which acts against a latch e' mounted on the pin d^3 and provided preferably with a roll e^2 to engage the cross-tail when depressed, and thus constitute a locking device to retain the cross-head and its templet depressed with the springs a^7 compressed. The lower arm of the trigger has extended through it a stud e^3 , which is extended through an opening in the said locking device and is thereafter provided with a cross-pin 8. Let it be supposed that the cross head and driver have been partially depressed, the mechanism being left in such condition when the machine was stopped after its cycle of operations, the stopping being for the purpose of enabling a heeled shoe to be removed and another shoe to be heeled to be put into place. In this condition, the last slide and shoe are substantially in their highest positions. The operator having applied a heel to the templet a heel preferably previously loaded, will put his foot on the treadle and release the clutch to start the shaft B^5 . This will cause the cam device to be moved, see Fig. 1, to the left and effect the complete depression of the cross-head with the templet, and will fully compress the templet springs a^7 in order that they may at their subsequent expansion spank on a top lift, and during the descent of the said cross-head the driver will be fully depressed and its spring compressed, and the trigger, drawn at its lower end toward the shaft B^5 , will by the spring e cause the locking device e' to engage the cross-tail. During the descending operation of the cross-head a^9 , a suitable eccentric or equivalent f , shown by dotted lines Fig. 1, will act through the eccentric strap f' to elevate the same and cause a slip device thereon to act and elevate the rear of the walking beam, thus depressing the post A^6 and the shoe to effect the placing of the heel end of the shoe against the seat of the heel, the pressure exerted being sufficient to resist the impact of the nail drivers on the nails when driving the nails into the shoe. During the movement last described, or while the shoe is being clamped or pushed against the heel, the trigger link d^5 is moved in the direction of the arrow thereon in Fig. 1 and the pressure alluded to having been attained, the trigger in its movement with said link acts against the lower end of the trigger-lever causing its upper end to press against and move the trip rods so that the latter rods by their shoulders acting against the lugs of the fingers 4, rotate the depressing devices b far enough to carry the extremities of the said fingers, see Fig. 4, opposite the notches 12 in and clear of the receiver b^3 , thus releasing the driver-bar and permitting it to be actuated by a quick blow to drive the gang of nails into the heel and shoe.

This done, the devices for operating the walking beam in their continued action lift the last post A^6 and remove the attached heel from the templet, the head ends of the nails slightly protruding from the tread end of the heel. At this time by or through a suitable top-lift carrier g , represented in Fig. 5, it during the heel-attaching operation being held to one side by the heel itself, is permitted by the lifting of the heel from the templet, to come into position between the heel and the templet, and now to spank the top-lift onto the nails at the tread end of the heel, the templet carrier must be released. To do this, the shaft A^5 in the mean time has moved sufficiently through its cycle of motion to push the link d^5 in the direction opposite the arrow in Fig. 1, and in so doing, the pin 8 acts against the locking device e' and removes it from the cross-tail, thus tilting the springs a^7 out to throw the cross-head and templet upward to effect the spanking operation. In the continued movement of the shaft, the stop-lug B^4 is arrested by the pawl B^3 and the clutch device is disengaged and the machine is stopped in the parts in the position Fig. 1. It will be remembered that the driver-bar descended first, and then the crosshead, and as the cross-head was raised the fingers 4 of the depressing device rising in unison with the cross-head, are by the spring b' again turned into position to catch onto the receiver b^3 in the first partial descent of the cross-head in effecting the separation of the templet from the tread end of the heel preparatory to removing the heeled shoe. In the machine herein described the movement of the driver-bar in the direction to compress its actuating spring is dependent upon the movement of the cross-head carrying the templet.

This invention is not limited to the shape or number of springs used to actuate the templet carrier and templet.

The cross tail-rods and cross-head constitute what are designated as a templet carrier. The trip pins c' constitute releasing devices for the depressing devices b , but this invention is not necessarily limited to the exact construction shown for the releasing device, as any usual or suitable equivalent device may be employed for that purpose. The spring m^x acts normally to keep the outer end of the treadle B^2 elevated.

Referring again to the link f' , it has at its upper end a box or enlargement f^2 chambered for the reception of a cam ring f^7 fixed in the box and provided at its interior with a series of cam surfaces, shown best in Fig. 7. The cam ring f^7 receives within it the ring-like hub f^8 of a lever f^5 , the said hub being cut through at intervals, herein supposed to be cut at three places to form spaces for rolls f^9 . The box f^2 supports loosely a cylindrical nut f^8 , said nut being loosely surrounded by the hub of the lever f^5 , the nut engaging the threaded portion of a steep screw h , pivoted

at h' on a link h^2 , in turn pivoted to the walking beam at its rear end.

The lever f^5 and rolls constitute a clutch to, at the desired times, grasp and prevent the rotation of the nut f^8 , the nut being grasped when the link f' is to positively move the walking beam or shoe carrier, to effect the positive pressure on the heel preparatory to driving the nails.

The parts carried at the opposite ends of the walking beam are of such weight with relation to each other and the fulcrum of the beam, that when a shoe is applied, the over-balanced front end of the beam has a tendency to descend, and the first part of this descent is aided by the friction of the rising nut f^8 on the screw h , the nut itself being then restrained as to its free rotation by only its friction against the box.

The lever f^5 is kept in place in the box f^2 by a suitable cover m , and a spring m' ,—one end of which, see Fig. 7, is attached to the lever, and its other end to an arm m^2 of the cover,—acts normally to move the clutch in the direction of the arrow Fig. 7 to effect the grasping of the nut. The clutch is, however, for the most part of the time, held out of its operative position by a suitable latch m^3 pivoted upon a latch-carrier m^4 , shown as a slide-bar, frictionally held in boxes m^5 attached to the link f' .

The latch-carrier has an ear m^6 , through which is extended loosely a releasing device, shown as a rod m^7 , said releasing device being represented as pivoted at its lower end to a stand m^8 attached to the frame, said rod having as part of it a nut or collar m^9 which in the ascent of the link f' and the carrier m^4 , arrests the ascent of the carrier and effects the release of the clutch to enable the spring m to instantly operate the clutch and restrain further rotation of the nut f^8 , this release being effected after the heel seat end of the sole of the shoe and the seat of the heel have been put together with the desired preliminary pressure. The latch referred to has pivoted upon its long arm (see Fig. 1) a rod n provided with a collar n' , the lower end of the rod being extended through a hole in a fixed ear n^2 and below the said ear the rod may have if desired a collar n^3 .

Fig. 1 shows the shoe as applied to the shoe-holder and with the parts in position to start the machine, a heel resting upon the nail box. The operator releases the clutch controlling the rotation of the main shaft B , and the link f' rises, the clutch controlling the nut f^8 being held out of operative position by the latch m^3 . The latch continues to hold the clutch until the nut m^5 of the releasing device meets the ear m^6 of the latch carrier, at which time the ascent of the carrier is arrested and the latch is immediately pulled away from the clutch, permitting it to clutch and restrain the rotation of the nut, and thereafter the nut, held positively during its further rising move-

ment, carries the screw positively with it and moves the walking beam positively to effect a predetermined amount of positive pressure to compress the heel positively preparatory to driving the nails therein. After the nails have been driven as described, the eccentric f in its further movement, causes the link f' to descend, and at such times, the small spring o on the rod o' connected to an ear of the box f^2 , acts upon the ear o^2 gently, just enough to overbalance the heavier end of the walking beam and aid in separating the heel with its partially driven nails from the nail box preparatory to the top-lift carrier turning and putting its top-lift into the space between the tread end of the heel and the nail box, at which time the top-lift is spanked upon the heads of the nails, as previously described. Just before the completion of the descent of the link f' , the lower end of the carrier m^4 meets a projection of the stand m^3 , and is arrested, while the link continues to descend, and the outer end of the clutch lever is put into position to be engaged by the latch, the latter having been turned somewhat upon its pivot on the carrier by the contact of the nut n' with the stop n^2 , so that the outer end of the clutch is practically carried below the point of the latch, the said latch thereafter by a slight movement about its pivot effected by the nut or collar n^3 , striking the under side of the stop n^2 , engaging the end of the clutch and turning the same in the direction to release the nut.

The nut, co-operating with the screw referred to, constitutes what may be denominated a slip device, and the clutch referred to, in its co-operation with the nut, enables the latter to slip on the screw or to move the screw in unison with it longitudinally, at the desired times, as has been fully described.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a heeling machine, the following instrumentalities, viz:—a templet; a templet carrier; a suitable actuating spring therefor; a driver-bar having a gang of drivers; an actuating spring for the said driver-bar; devices to move the templet carrier in a direction to compress its actuating spring; and a depressing device between the templet and driver-bar, whereby as the templet carrier is moved to compress its actuating spring, the depressing device is made operative to depress the nail driver-bar, substantially as described.

2. In a heeling machine, the following instrumentalities, viz:—a templet; a templet carrier; a suitable actuating spring therefor; a driver-bar having a gang of drivers; an actuating spring for the said driver-bar; devices to move the templet carrier in a direction to compress its actuating spring; a depressing device between the templet and driver-bar to act on and move the driver-bar in the direction to compress its spring, and a

suitable releasing device for said depressing device, substantially as described whereby after the said springs have been compressed, the driver-bar may be first released to operate and drive nails before the templet is released, substantially as described.

3. In a heeling machine, a driver bar, its actuating spring, a receiver b^3 for the driver plate and attached to said driver bar, said receiver being notched; and a depressing device to depress the said receiver and driver bar and compress the spring and hold the driver with its spring compressed, combined with a releasing device to move said depressing device and let the driver bar spring work, substantially as described.

4. A spring-actuated driver-bar having an attached notched plate, two movable depressing devices having fingers to act on said plate and compress the driver-bar spring, and having lugs, combined with trip pins having shoulders to act on the lugs of the said depressing devices to place their fingers opposite the notches of the said plate in order that the driver-bar spring may operate, substantially as described.

5. In a heeling machine, the driving shaft, the templet, its carrier and spring a^7 ; combined with a cam device and mechanism between said shaft and cam device to move the latter automatically, and compress the carrier spring, substantially as described.

6. In a heeling machine, the templet, its carrier and springs a^7 , combined with a cam device and mechanism between said shaft and cam device to move the latter automatically, and act on the depressor, and with a locking device to hold the templet carrier with its operating spring compressed, substantially as described.

7. In a heeling machine, the templet, its carrier and springs a^7 , and the depressor a^2 , combined with a cam device to act on the depressor, and with a locking device to hold the templet carrier with its operating spring compressed, and releasing devices to release said locking device, substantially as described.

8. In a heeling machine, devices to hold the driver-bar in position with its actuating spring compressed, and releasing devices to move the devices to let the said springs operate the drivers, combined with a trip-lever, a trigger to operate it, and automatic devices to move said trigger, substantially as described.

9. A heeling machine containing the following instrumentalities, viz:—a power shaft; a support for the shoe to be heeled; connections between said shaft and shoe-support to place the shoe in contact with the heel to which it is to be attached; a templet adapted to receive a loaded heel; a carrier for said templet; springs to actuate the templet carrier in the process of attaching a top-lift; devices to compress the springs of the templet carrier; a locking device substantially as described to retain the templet carrier springs in a compressed state; a driver-bar; a series of drivers carried by it;

a driver-bar actuating spring; depressing devices between the templet carrier and driver-bar to effect the compression of the driver-bar actuating spring in unison with the compression of the templet carrier spring; and devices to automatically effect the release of the driver bar depressing devices and the templet carrier in succession in order that the driver-bar may be actuated to cause the gang of drivers to drive a gang of nails with a spring blow, and the templet thereafter act with a spring blow, substantially as described.

10. In a heeling machine, the following instrumentalities, viz:—a templet to support the heel; a shoe support; and actuating devices for the said shoe support, said devices including a screw, a nut loosely mounted thereon, means to move said nut longitudinally with relation to the screw, a clutch, and suitable actuating devices therefor to control the clutch and effect the locking or release

of the nut, to operate, substantially as described.

11. In a heeling machine, a driver bar, its actuating spring, a receiver b^3 for the driver plate and attached to said driver bar, said receiver being notched; and a depressing device to depress the said receiver and driver bar and compress the spring and hold the driver with its spring compressed, combined with a releasing device to move said depressing device and let the driver bar spring work, and a trip lever to actuate the releasing device in one direction, and means to actuate said trip lever, substantially as described.

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

ALVIN D. ELLIOTT.

Witnesses:

JOHN S. GILE,
JAMES MURPHY.