(No Model.)

2 Sheets—Sheet 1.

F. F. RAYMOND, 2d.

HEEL NAILING MACHINE.

No. 410,196. Patented Sept. 3, 1889.

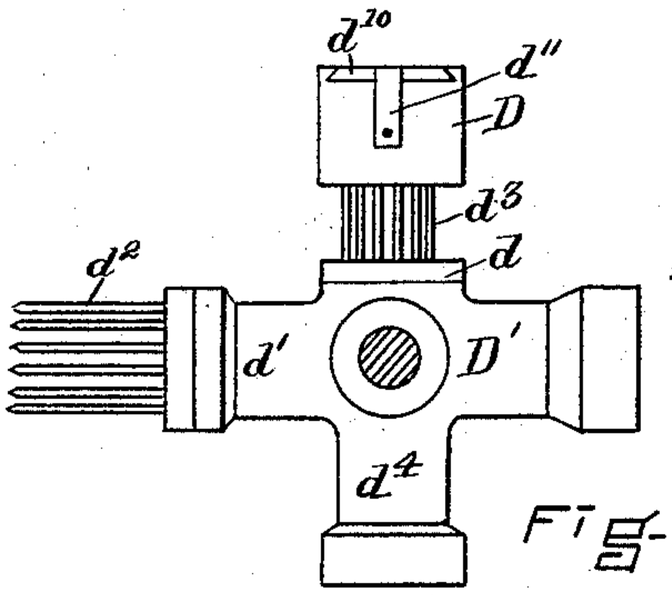
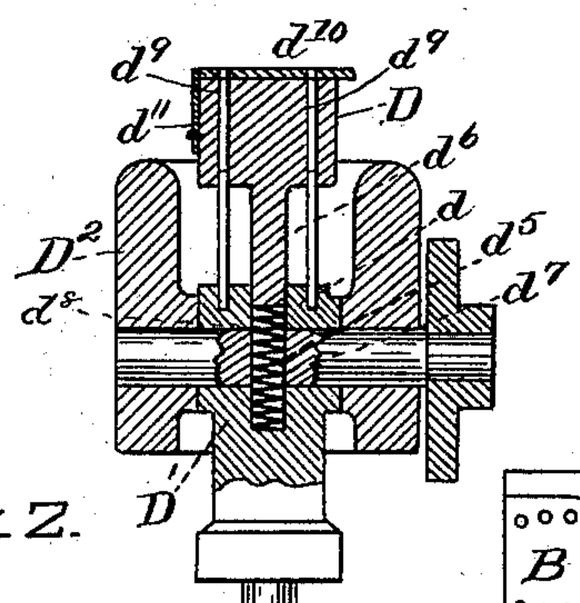


Fig. 2.



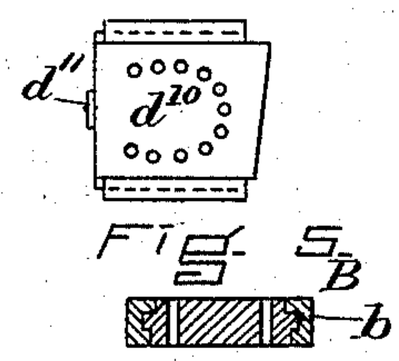


Fig. 5.

Fig. 4.

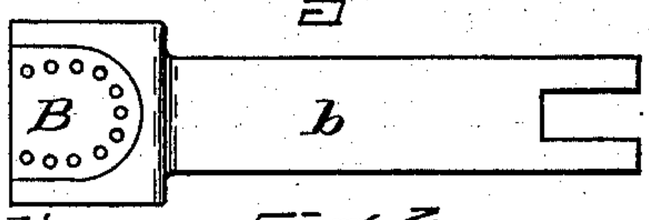


Fig. 3.

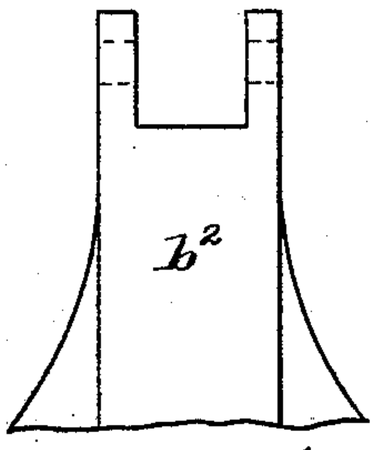


Fig. 6.

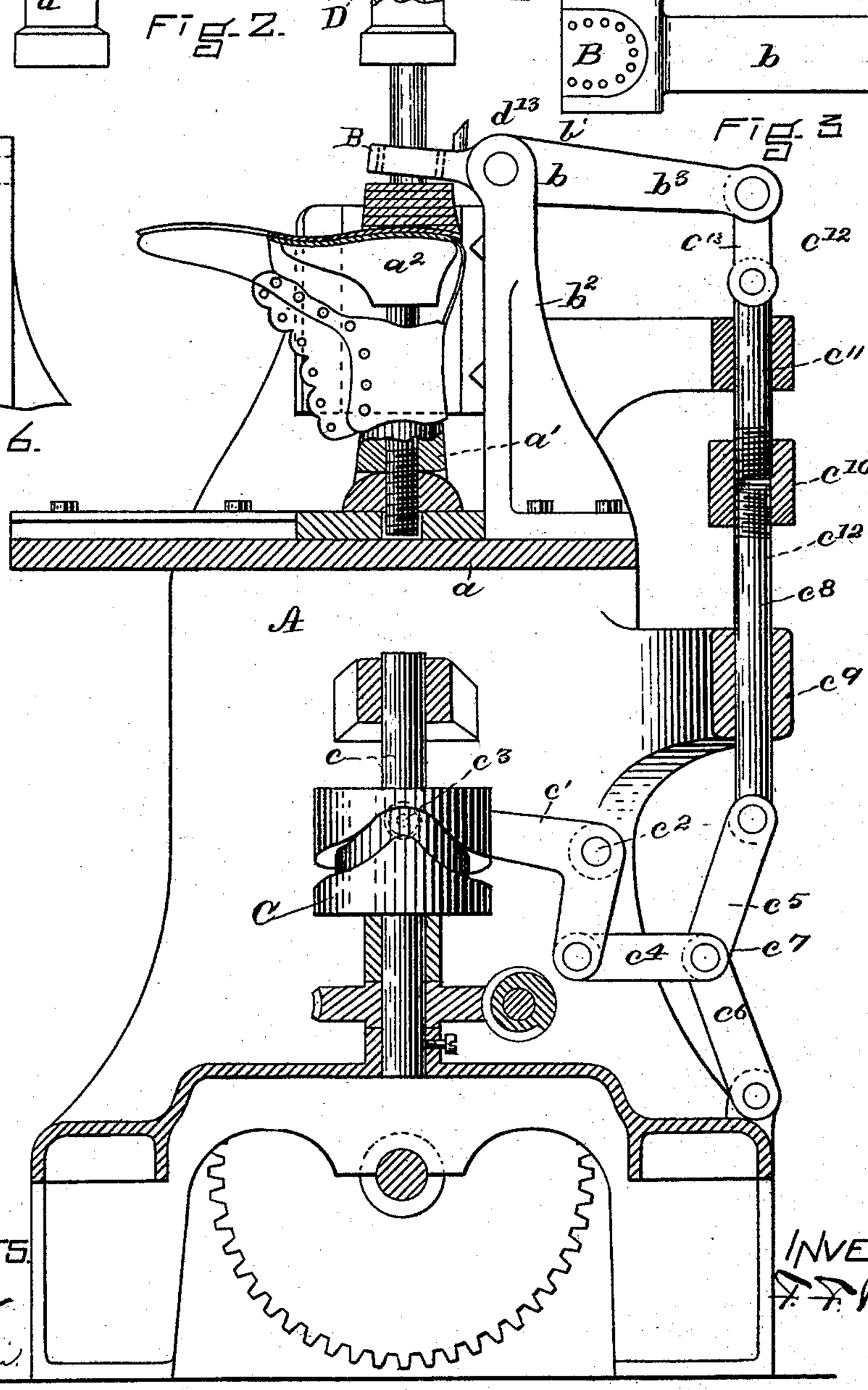


Fig. 1.

WITNESSES.
J. McDolan
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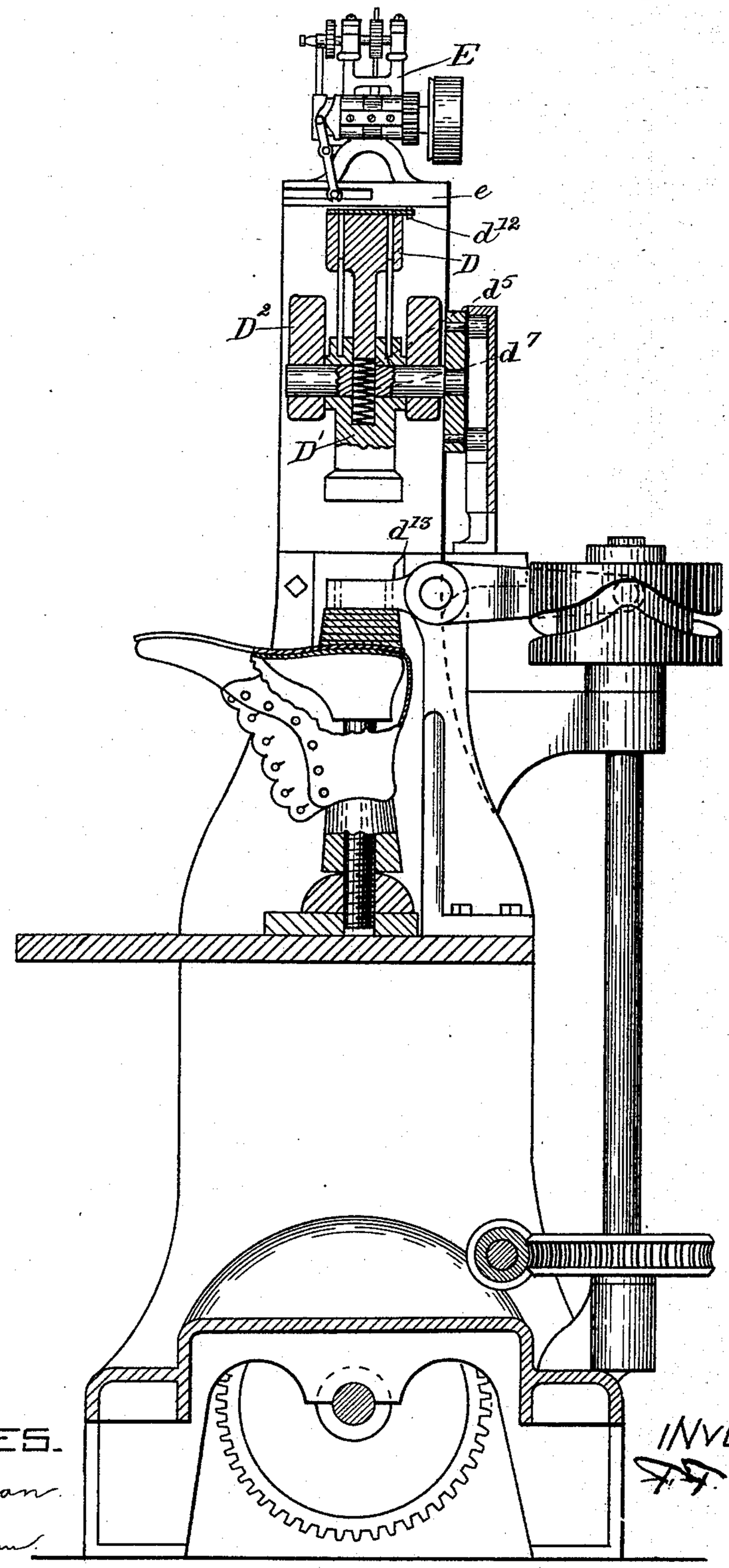
(No Model.) 2 Sheets—Sheet 2.

F. F. RAYMOND, 2d.

HEEL NAILING MACHINE.

No. 410,196. Patented Sept. 3, 1889.



WITNESSES.
J. M. Dolan.
Fred B. Dolan.

INVENTOR.
F. F. Raymond 2d

Fig. 7.

UNITED STATES PATENT OFFICE.

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

HEEL-NAILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 410,196, dated September 3, 1889.

Application filed April 30, 1887. Serial No. 236,611. (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 relates to a heel-nailing machine having a templet supported at the end of a lever and adapted to be moved toward the last or work-support to compress the heel-blank upon the outsole of the boot or shoe.

It further relates to a heel-attaching machine having a templet movable in relation to the heel-support, as above specified, in combination with the nail-driving devices.

It further relates to the templet movable in relation to the heel-support, as above specified.

It also relates to a templet movable as above specified, and a cam for operating or moving it either directly or indirectly.

It further relates to various features of construction and organization, each of which will be hereinafter described.

In the drawings, Figure 1 is a view in vertical central section of a machine containing my invention. Fig. 2 is a view of the revolving head. Fig. 3 is a view in plan of the templet and its lever or support. Fig. 4 is a vertical section taken through the templet. Fig. 5 is a plan view of the nail-carrier. Fig. 6 is a view in front elevation of a portion of the post supporting the templet-lever. Fig. 7 is a view in vertical central section of a machine having the features of my invention, showing the nail supplying and distributing device in elevation.

Referring to the drawings, A represents the frame of the machine.

a is the table, upon which slides the jack a', which supports or carries the last or work-support a^2.

B is the templet. It is mounted at the front end of the lever or pivoted holding-plate *b* in a manner to be removable therefrom. This lever or pivoted holding-plate is pivoted at b' to a post or support b^2, has the long arm b^3, and is provided with movements for moving the templet toward and from the last or work-support by the cam C upon the shaft *c*, the lever c', pivoted at c^2, and connected by means of a cam-pin c^3 with the cam, and by means of the link c^4 with the links c^5 c^6 of the toggle c^7. The link c^5 of the toggle is connected with the slide-rod or connection c^8, which is guided in a suitable guideway in the bracket c^9. The upper end of this slide rod or block is connected by means of an adjustable connection c^{10} with the end of the lever or plate *b*. The adjustable connection shown comprises the two parts c^{11} c^{12}. The part c^{11} is connected by a link c^{13} with the end of the lever b^3. The part c^{12} is the upper part of the slide block or rod c^8. The continuous ends of the parts c^{11} c^{12} have screw-threads, which are opposed to each other, and each receives the adjusting nut or connection c^{10}. The cam is timed or constructed so as to provide the templet with any desired movement or movements in relation to the last or work-support.

Generally the movement will be as follows: Upon the starting of the machine the last or work-support, with the boot or shoe mounted thereon and with the heel-blank in position, is placed beneath the templet. The templet is immediately swung downward to compress the heel-blank upon the outsole of the boot or shoe, and the heel-blank is held thus compressed during the forming of the awl-holes by the awls and the feeding of the attaching-nails and the driving of the same by the drivers. If the heel is to be blind-nailed, then the cam is constructed to move the templet away from the attaching heel-blank sufficiently to permit the top-lift plate, with the top lift, to be inserted between the attached heel-blank and it, and it is then moved again to compress the top-lift plate and top lift so that the top lift is spanked upon the ends of the heel-attaching nails. If the attached heel is breasted in the heel-attaching machine, the templet remains in place during the operation of the breasting device, and it is then lifted to release the work. If it is not breasted, then it is lifted immediately after the attaching of the top lift, to release the work.

Any suitable form of nail-carrier may be employed, and it may be operated by hand or automatically. I prefer that the nails be fed

automatically, and have represented a carrier not unlike that represented in my patent, No. 329,951, excepting that it is used for the main or principal attaching-nails instead of for the auxiliary nails, as herein specified. D is the carrier. It is supported by the arm d of the revolving head D′. This revolving head is carried by the reciprocating head D^2, and is adapted to be automatically rotated by mechanism substantially as described in the Henderson and Raymond patent, No. 317,647, or in my pending application, or in the pending application of C. C. Small.

The revolving head has the arm d', which supports a block carrying a gang or group of awls d^2, the arm d, above referred to, which also supports a block carrying a gang or group of drivers d^3, and an arm d^4, which may carry a breasting-knife. The arm d has a central hole d^5, which receives a post d^6, attached to the nail-carrier. This post bears on a coiled spring d^8, which tends to move it outward or away from the arm d. The drivers are carried by a block attached to the arm d, and their ends enter the holes d^9 of the carrier when the carrier is moved outward to its greatest extent from the arm d. (See Fig. 1.) The carrier D receives its nails from a suitable nail making and distributing machine E, (see Fig. 7,) which is mounted upon a support e, so as to deliver nails to the carrier D when the head has been rotated sufficiently to bring the carrier beneath the nail making and distributing machine. The said nail making and distributing machine E may be of any preferred construction and of the form of nail-feeding mechanism described in my various patents. The only distinction is, that the machines are organized to deliver nails to the carrier D with heads lowermost instead of their points.

The carrier D has a perforated slide-plate d^{10}, which slides in a dovetail recess in the carrier, and is automatically held thereon to cover its holes by a spring d^{11}. This plate is moved to uncover the holes to permit the carrier to be supplied with nails when in its receiving position, the projection d^{12} extending downward from the support e, so that as the carrier D rotates into position the edge of the plate d^{10} comes in contact with it and is moved sufficiently to bring its holes in register with the holes of the carrier. Upon the rotation of the head D to bring the carrier into position to deliver nails into the templet the spring d^{11} automatically moves the slide-plate d^{10} to close the holes, and the plate remains in this position until the carrier is brought into position over the templet and is being moved downward in relation thereto, when the edge of the plate is brought into contact with the projection d^{13} on the templet-support, which causes the slide-plate to be moved sufficiently to bring its holes in register with the holes of the templet and the holes of the nail-carrier before the slide-plate is brought in contact with the upper surface of the templet, thereby permitting the nails to leave the carrier and enter the holes of the templet.

The mechanism for rotating the head D′ is so timed that it turns the head a quarter of a revolution during each reciprocation thereof and stops with the nail-carrier D in position to receive nails from the nail-feeding device E. Consequently, upon the starting of the machine the awls are in a position to be moved into place to register with the holes of the templet during the upper part of the downward movement of the cross-head D^2. This moves the drivers and nail-carrier D into the position which the awls occupied before such movement. The next reciprocation of the head D^2 brings the nail-carrier D and drivers over the templet during the upper part of the downward movement of the head, and as the head is moved downward the nail-carrier covering-plate d^{10} is moved and the holes of the carrier uncovered, so that the nails drop therefrom into the holes of the templet and the nail-carrier comes to rest upon the upper surface of the templet. The head D^2, however, continues to descend, and the drivers then move in the carrier through it and into the templet, driving the nails therefrom into the heel-blank and soles of the boot or shoe. Upon the upward movement of the cross-head the drivers are returned to their original position in relation to the carrier and the head rotated another quarter of a revolution to bring a breasting-knife adapted to be attached to one member or arm of said head into position, and upon the next quarter-revolution of the head the carrier is moved into position beneath the nail-supplying mechanism E, the slide-plate d^{10} moved to open its holes, and the nail-supplying mechanism set in operation to automatically feed nails to the holes d^9 of the carrier.

I would say that this device for carrying and driving the attaching-nails may be used without a templet for certain classes of work, in which event the nails would be delivered directly to the work and driven directly therein without the employment of any additional templet than that provided by the holes of the carrier D. I would further say that I do not confine myself to the specific mechanism herein described for operating the templet-lever b. In lieu thereof, the lever or pivoted plate or support b may be connected directly with an actuating-cam, as represented in Fig. 7.

By making the templet B movable in the manner specified a very powerful compressive force is obtained and one that can be utilized before the awls are caused to puncture the heel-blank.

Instead of forming the templet B as a separate block and detachably securing it to the end of the lever or pivoted plate or support b, it may be formed in the end of the lever plate or support by drilling the necessary holes through the same.

I would here say that the heel-blanks and top lifts may be automatically fed into position between the templet and last or work-support, as described in my application filed April 16, 1887, or in the application of C. C. Small, filed April 19, 1887.

The templet is constructed of such proportion and is so timed in its movements as not to interfere in any manner with the proper operation of a breasting-knife mounted as hereinbefore referred to.

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

1. In a heel-nailing machine, a rocking templet formed on or supported by a pivoted lever, plate, or jaw and provided thereby with a movement to and from the last or work-support, as and for the purposes specified.

2. In a heel-nailing machine, the combination of a last or work-support with a rocking templet B, mounted on or formed in a pivoted plate, lever, or support, and said pivoted plate, lever, or support adapted to have movement imparted to its end to cause the templet to be moved toward and from the last or work-support, as and for the purposes specified.

3. In a heel-nailing machine, the combination of the last or work-support, a rocking templet B, mounted upon or formed in the end of a lever, and a cam connected with the end c^3 of the said lever, as and for the purposes specified.

4. The combination, in a heel-nailing machine, of the last or work-support, a templet B, mounted upon a lever pivoted plate or support b, the cam C, and intermediate connecting mechanism, comprising the lever c', the toggle c^7, connected with and operated by the lever, the slide bar or block c^8, and a link connecting the slide-block with the end of the said lever or support b, as and for the purposes specified.

5. The combination, in a heel-nailing machine, of the lever b, supporting at its end a templet having an arm b^3, the slide-block c^8, operated substantially as specified, and an intermediate adjustable connection between the slide-block and the end of the lever, substantially as described.

6. The combination of the lever b, supporting at its front end the templet B, the slide-block, and means, substantially as shown, for varying the line or point to which the templet B is moved, as and for the purposes specified.

7. The combination, in a heel-nailing machine, of a lever b, the templet B, supported thereby, the slide-head c^8, and the connection between the slide-head and the lever, comprising the parts c^{11} c^{12}, having oppositely-arranged screw-threads formed upon their contiguous ends, and an adjusting-nut c^{10}, as and for the purposes described.

8. The combination, in a heel-nailing machine, of the rocking templet B, having the movement in relation to the last or work-support specified, the last or work-support, and nail-driving devices, substantially as described.

9. The combination, in a heel-attaching machine, of a rocking templet B, pivoted to have movements in relation to the last or work-support imparted to it, substantially as specified, the last or work-support, and the nail-carrier D, substantially as described.

10. The combination, in a heel-attaching machine, of a rocking templet provided with a movement relative to the last or work-support, substantially as specified, the last or work-support, a gang or group of awls, the nail-carrier, and a gang or group of drivers adapted to be moved successively into operative position in relation to the templet, and then to be operated, substantially as specified.

11. The combination, in a heel-attaching machine, of a rocking templet provided with movements in relation to the last or work-support, as specified, said last or work-support, the nail-carrier D, and the gang or group of drivers d^3, substantially as described.

12. In a heel-attaching machine, the combination, with a suitable automatic nail-supplying apparatus, of a nail-carrier D, movable in the arc of a vertical ellipse from the nail-supplying apparatus to the point of driving, and whose holes are open when in its highest position and closed during the remainder of its rotation by devices set forth, and held closed until the time of driving, as described.

13. The combination, in a heel-attaching machine, of the rotary nail-carrier D, the slide-plate d^{10}, spring d^{11}, and projection d^{13}, substantially as described.

14. In a heel-nailing machine, a rotary nail-carrier D, having a horizontally-moving slide-plate for covering and uncovering the nail holes or apertures therein, controlled in its movements by mechanism as set forth, and adapted to be automatically opened when in its highest vertical position, automatically closed during its rotation, and again opened at the time of delivering, as described.

15. The combination of a reciprocating head D^2, carrying a rotary head D', the nail-carrier D, movable in relation to the arm d of the rotary head, as specified, the drivers d^3, and the slide-plate d^{10}, having a vertical and rotary movement and adapted to be moved to cover and uncover the holes of the carrier D, as and for the purposes specified.

16. The combination, in a heel-attaching machine, of the reciprocating head D^2, the rotary head D', carried thereby, an arm d, supporting a gang or group of drivers d^3, a nail-carrier D, carried by said arm d, its hole-covering plate d^{10}, adapted to be moved to uncover its holes to receive and discharge nails, and a suitable automatic nail-supplying apparatus, substantially as specified.

FREEBORN F. RAYMOND, 2D.

In presence of—
J. M. DOLAN,
FRED. B. DOLAN.