

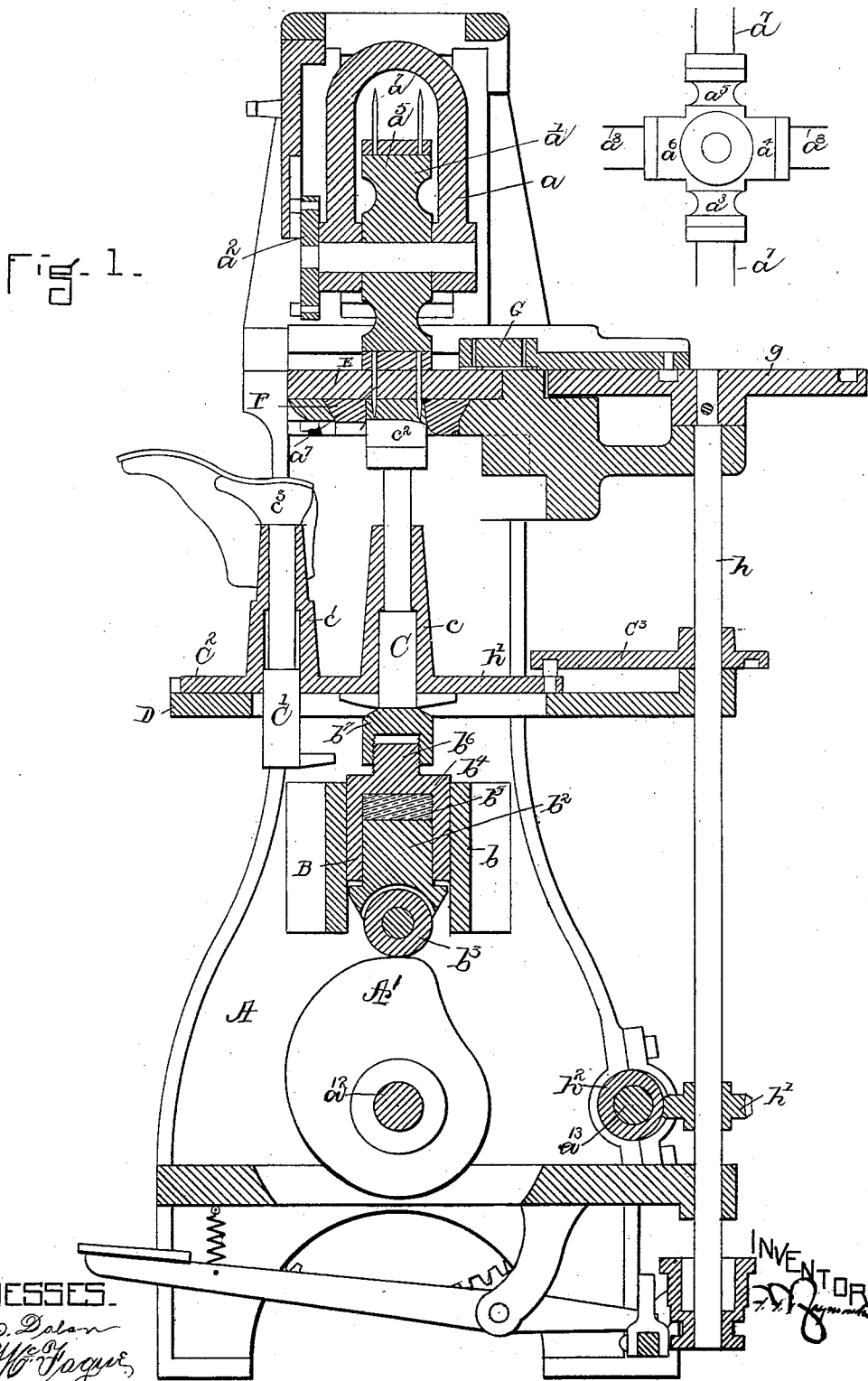
(No Model.)

4 Sheets—Sheet 1.

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

No. 569,517.

Patented Oct. 13, 1896.



WITNESSES.

S. M. Dolan
W. W. Fague

INVENTOR
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(No Model.)

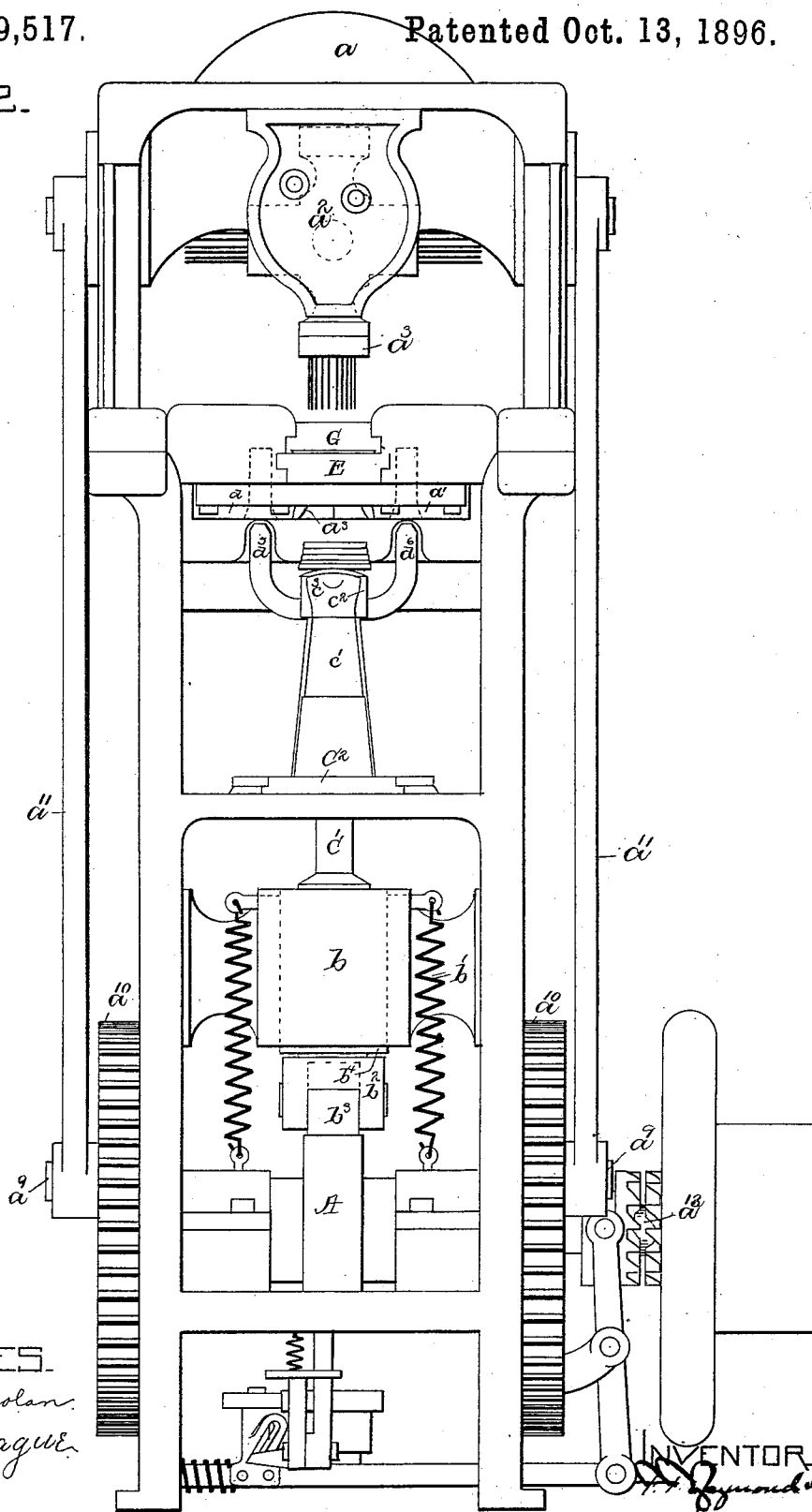
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Fig. 2.



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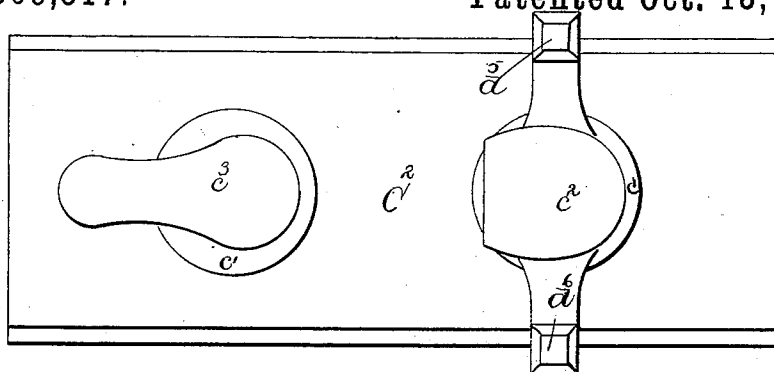


Fig. 3.

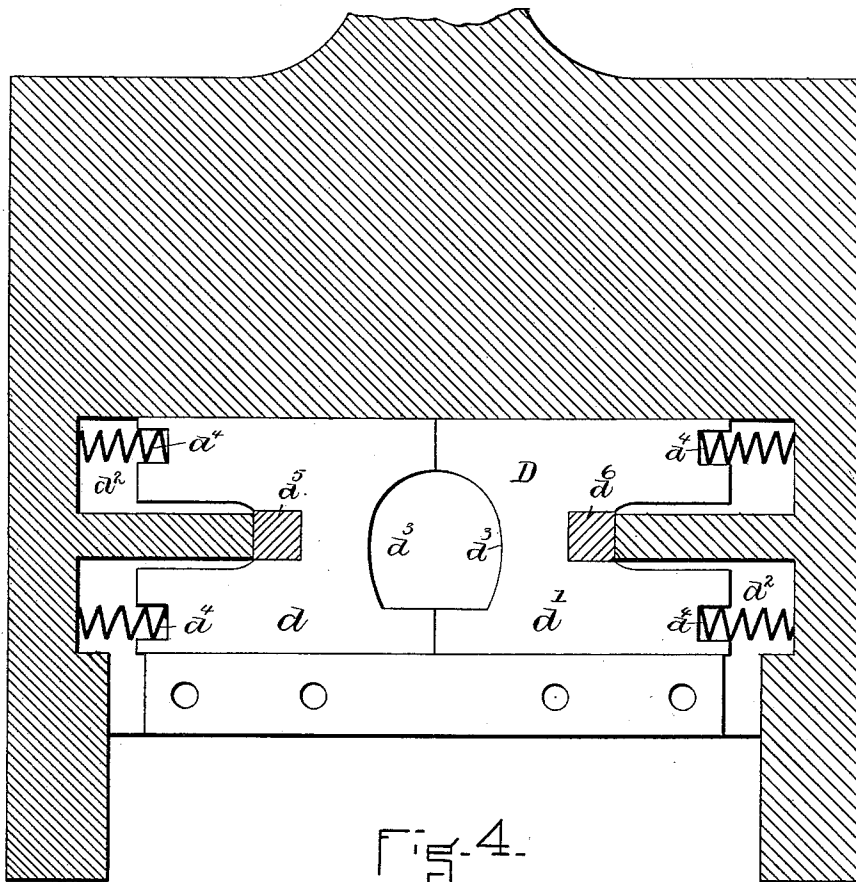


Fig. 4.

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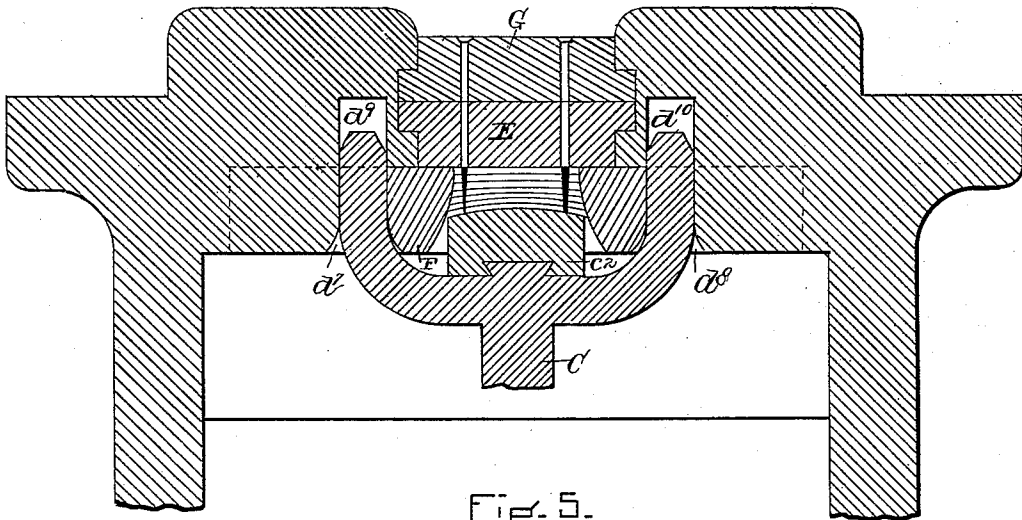


FIG. 5.

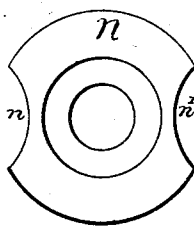


FIG. 6.

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UNITED STATES PATENT OFFICE.

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HEEL-NAILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 569,517, dated October 13, 1896.

Application filed February 20, 1892. Serial No. 422,317. (No model.)

To all whom it may concern:

Be it known that I, FREEBORN F. RAYMOND, 2d, a citizen of the United States, residing at Newton, in the county of Middlesex and State of Massachusetts, 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 or attaching machine having combined with it heel-molding mechanism embracing a heel-former and heel-compressing die for molding the sides and seat of a heel-blank before it is attached to the boot or shoe, which molding devices act in conjunction with a pricking mechanism for pricking holes in the said heel immediately subsequent to its compression, and also a support or jack for the boot or shoe, shaped to be moved into position occupied by the heel former or support to hold the boot or shoe during the subsequent attachment of the pricked compressed heel-blank to it.

It further relates to the construction of the compressing-die in two or more horizontally-movable sections which are adapted to be moved into operative or closed position and held in such position during the forming or molding of the heel-blank and then to be unlatched or released during the attachment of the formed heel-blank to the boot or shoe, whereby the breaking down of the sole, counter, and heel-seat of the boot or shoe during the attaching action of the machine is prevented.

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

In the drawings, Figure 1 is a view in vertical central section of a machine having the features of my invention. Fig. 2 is a view in front elevation thereof. Fig. 3 is a view in plan of the jack. Fig. 4 is a view in plan of the dies and in horizontal section of the table or bed supporting them. Fig. 5 is a view in vertical section to further illustrate the heel-molding mechanism. Fig. 6 is a view in plan of the stop-cam.

A represents the frame of the machine. It preferably is solid or integral in its principal parts.

a is a cross-head upon which is mounted a rotary head a' . This rotary head is automatically turned by the automatic turning mechanism a^2 , which is like that described in the Patent No. 467,242. The rotary head preferably has four arms $a^3 a^4 a^5 a^6$. The arms $a^3 a^5$ each support a gang of awls a^7 of the same arrangement. The arms $a^4 a^6$ each support a gang of drivers a^8 of the same arrangement. The cross-head a is reciprocated by the crank-pins a^9 on the gears a^{10} and the connecting-rods a^{11} . (See Fig. 2.) The gears a^{10} are on the cam-shaft a^{12} , and they are connected with pinions on the main or pulley shaft a^{13} . Cam A' is the pressure-cam. It imparts vertical movement to a slide pressure-head B , the pressure-head being held in a guiding-box b , bolted or otherwise secured to or forming a part of the frame of the machine. Springs b' , connected with the pressure-head, act in opposition to the pressure-cam. The pressure-cam may have any desired time. It makes one revolution to every reciprocation of the cross-head. For ordinary use it is timed to move the pressure-head upward slightly in advance of the time when the awls reach their lowest level and to hold the pressure-head in this position until the awls begin their upward movement, then permits the pressure-head to drop quickly. The shape of the cam so constructed is represented in Fig. 1. I would not be understood, however, as limiting the invention to this shape.

The pressure-head B includes a pressure slide-block b^2 , upon the lower end of which is a cam-roll b^3 , resting against the pressure-cam, a section b^4 , which is carried by the section b^2 , being separated therefrom by a block b^5 of rubber or its equivalent. The section b^4 carries a threaded upward extension b^6 , which receives the threaded adjustable head b^7 , upon which the spindles $C C'$ of the jack are alternately or successively supported.

D is the intermediate table of the machine. Upon this is mounted the jack-plate C^2 , which carries the post c , supporting the spindle C ,

and the post c' , supporting the spindle C' . The spindle C supports the heel-seat former c^2 , and the spindle C' the last or work-support c^3 . The spindles C C' are so located or arranged and held that upon a movement of their supporting-plate C^2 first one is brought into operative position with the pressure-head B and the rotary head a' and then the other.

In the ordinary use of the machine, whether the heel-blank is to be molded in solid dies or whether a heel-seat is simply to be molded in the heel before it is attached to the soles of the boot or shoe, the spindle C is brought into position to be moved by the pressure-head. This brings the heel-seat former c^2 beneath the templet E and die F into operative relation with them. The heel having been placed upon the former, the machine is started, and the reciprocation causes the heel to be moved by the heel-seat former forcibly against the templet E and into the die, and the heel-seat is thus molded or formed and the sides of the heel compressed. The awls immediately descending form holes in the heel for the reception of the nails. The machine then comes to rest, the jack-plate C^2 is moved and the spindle C moved out of operative relation with the pressure-head and templet, and the spindle C' moved into operative relation therewith, thereby bringing the last or work-support c^3 and the boot or shoe carried thereby into operative relation with the templet and nailing devices, and a previously-formed heel is then attached to the soles of the boot or shoe. Another reciprocation of the machine moves the last or work-support, boot, or shoe, with the heel, against the templet, and holds them there while the nails are being delivered to the heel by the nail-carrier G and driven into the heel by a gang a^8 of drivers upon one of the arms of the rotary head, the machine making one more reciprocation and then coming to rest. The movement of the slide-plate C^2 , instead of being by hand, as above specified, may be automatic, in which case the action of the machine is continuous, or, in other words, it is not stopped between the molding of the heel and its attachment to the boot or shoe, and in Fig. 1 I have represented the slide-plate C^2 as connected with a cam C^3 upon the vertical shaft h by means of a slide-bar h' , having a cam-pin which enters a cam-groove in the cam C^3 at one end, and connected with the slide-plate C^2 . This cam is constructed to move the plate C^2 , after the reciprocation of the awls, inward from the front of the machine sufficiently to move the spindle C out of operative relation with the pressure-head and the spindle C' into operative relation therewith, and after the attaching of the heel to return the plate to its original position immediately before the stopping of the machine.

When the machine is organized to make two stops, one for each reciprocation of one group of awls and one group of drivers respectively, the stop-cam N has two stopping-

recesses n n' , as represented in Fig. 6. The nail-carrier G preferably is moved into and out of operative relation by a cam g upon the vertical shaft h . The vertical shaft h is connected with the pulley-shaft a^{13} by a worm-wheel h' upon the vertical shaft h and the worm h^2 upon the pulley-shaft a^{13} , and the vertical shaft h has one revolution for every two revolutions of the cam A' and two reciprocations of the cross-head a .

The die F , I have represented as made in two parts or sections which are adapted to be moved toward and from each other. The primary object of this movement is not, preferably, for the purpose of compressing the heel-blank, but for the purpose of permitting the release or withdrawal of the heel-blank from the die, and also for the purpose of preventing injury to the boot or shoe during the attachment of the compressed heel-blank to its soles. I do not, however, confine my invention to this especial form of die, but may employ one the sections of which are movable laterally for the purpose of exerting compression upon the heel-blank as well. The die shown, however, acts as a solid die and not as a die the compressing action of which is obtained by the horizontal movement of its sections. To reach this end the die is made in sections d d' and are arranged and held in slides or guideways d^2 upon the under side of the upper bed or table of the machine. Each of the sections has a portion d^3 of the wall forming the die-cavity and a rearward extension which forms a slide-block. They are held together by light pressure-springs d^4 , (see Fig. 4,) the pressure being only enough to retain the compressed heel-blank in place, this pressure being exerted on the dies when they are not locked together by means of the bolts or locks d^5 d^6 , which are carried by the spindle C , and which respectively enter holes d^7 d^8 in the two sections d d' , and also holes d^9 d^{10} in the upper bed, which are in continuation of the holes d^7 d^8 , thereby rigidly holding the dies in closed relations to each other while the heel-blank is being compressed, the bolts or locks d^5 d^6 being of sufficient length to enter the holes d^7 d^8 and d^9 d^{10} before the under surface of the former comes in contact with the heel-blank, and thereby holding the sections of the dies closed during its molding or compressing action, and releasing the sections of the die after such molding or compressing action, in order that the heel may be easily removed from it.

The operation of the machine is as follows: The heel is placed upon the heel-seat former c^2 , the heel-seat former and its actuating-spindle of course being in operative relation with the pressure-head and templet. The machine is then started, the heel molded, the heel-seat formed by the heel-seat former, and the heel pricked. The heel-seat former then falls or moves downward, the jack-plate C^2 is moved to bring the spindle C' into operative relation with the pressure-head and templet,

If the die be employed, the pricked heel is held centrally in position to be attached to the soles of the boot or shoe carried by the last or work support. Another reciprocation of the machine is then made, the nails fed forward by the carrier to the holes of the templet, and driven through them into the heels and soles of the boot or shoe, the spindle C' and last or work support occupying the place previously occupied by the spindle C and the heel-seat former c², and the heel-seat former and spindle C then being moved out of operative position and being inoperative. In other words, when the spindle C is operative the spindle C' is not, and vice versa.

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 sectional compressing-die and mechanism for holding or moving the sections while the heel is being compressed, and a separate mechanism for holding said sections after the heel is compressed, with light pressure, substantially as and for the purpose described.

2. The combination in a heel-nailing machine of a sectional die, locking devices for locking the sections of the die together and springs for holding the sections of the die together when not otherwise locked, as and for the purposes described.

3. The combination in a heel-nailing machine of a reciprocating gang of awls and

a reciprocating gang of drivers adapted to be reciprocated in successive order through the holes of the common templet, a pressure-head, a slide-plate carrying two operative spindles, one of which supports a heel-seat former, and the other a last or work support interposed between the pressure-head and the templet, as and for the purposes described.

4. The combination in a heel-nailing machine of a common actuating-cam or power-applying device and pressure-head and two spindles C C' and mechanism by means of which they are successively operated by said pressure-head, and the heel-pricking and nail-driving devices, substantially as described.

5. The combination of the pressure-head and heel-pricking devices, the pressure-head and heel-nailing devices, the slide-plate having two spindles or work-supports and means for automatically moving each of them into and out of operative relation with the pressure-head, substantially as described.

6. In a heel-nailing machine the combination of the former, the movable die, the former-actuating spindle and die-locks carried by said spindle, substantially as described.

FREEBORN F. RAYMOND, 2D.

In presence of—

J. M. DOLAN,
M. McFAGUE.