

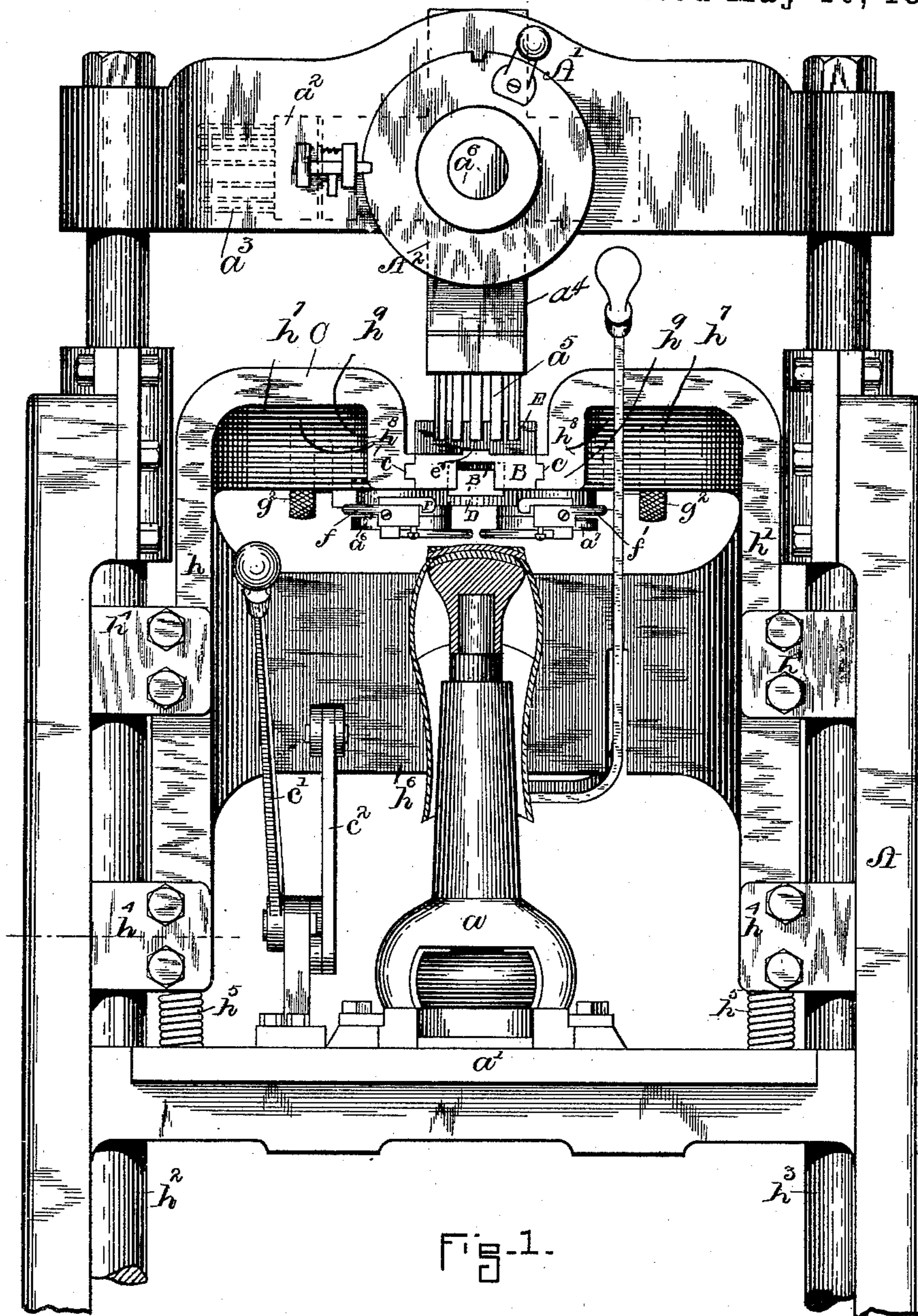
(No Model.)

5 Sheets—Sheet 1.

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

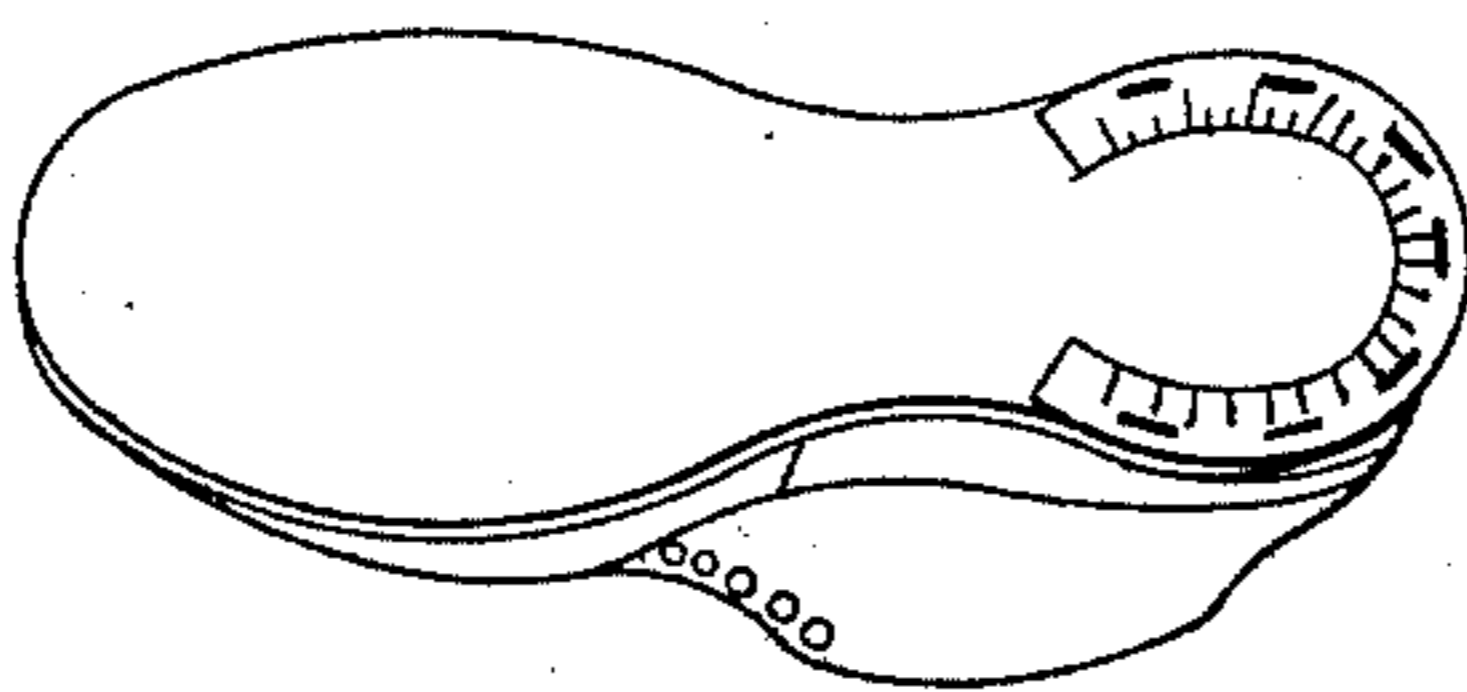
No. 474,408.

Patented May 10, 1892.



WITNESSES.

J. W. Dolan
A. E. McDonald.



INVENTOR.

F. F. Raymond.

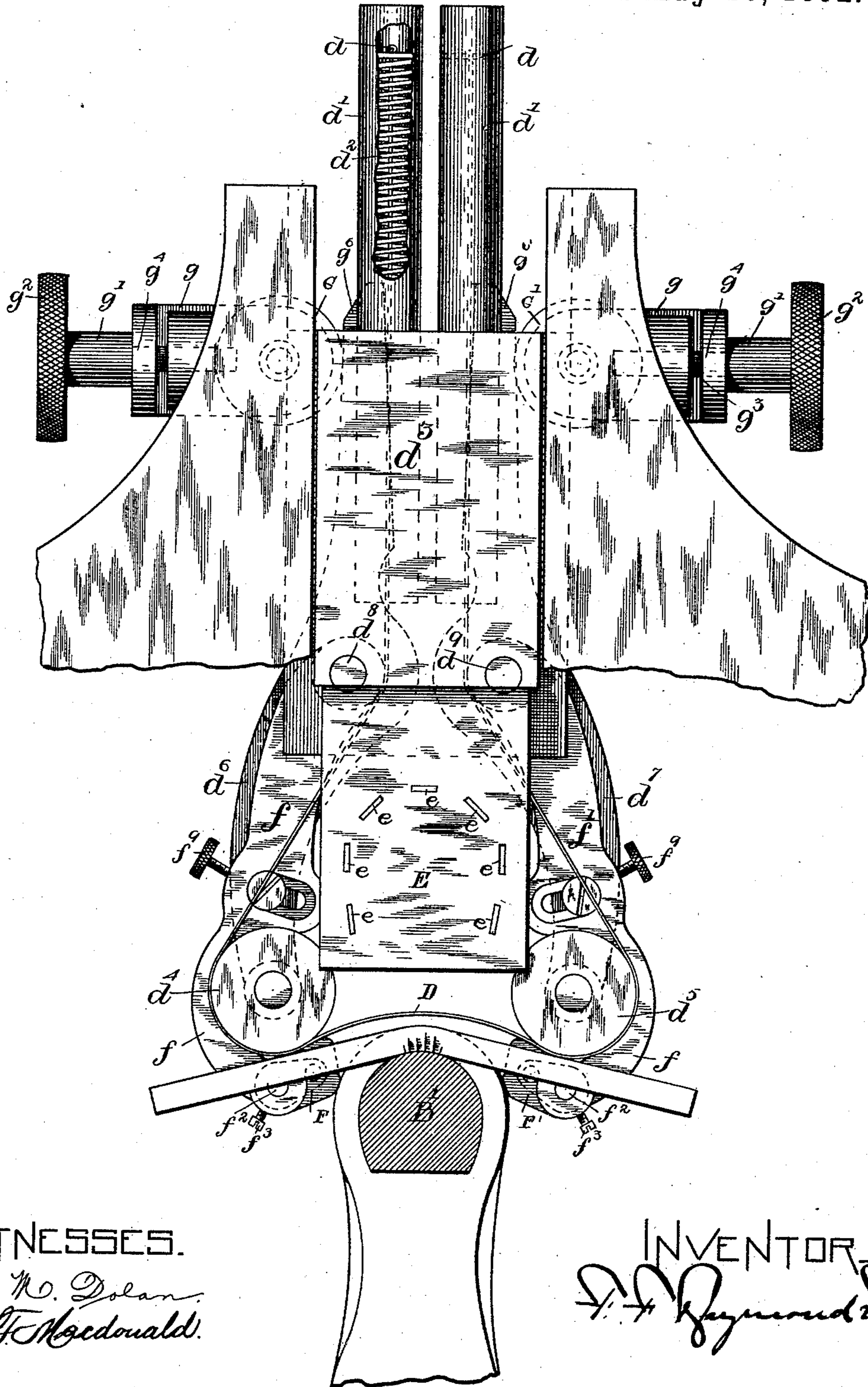
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5 Sheets—Sheet 3.

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

No. 474,408.

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WITNESSES.

J. R. Dolan.
A. F. Macdonald.

INVENTOR
F. F. Raymond

Fig. 3.

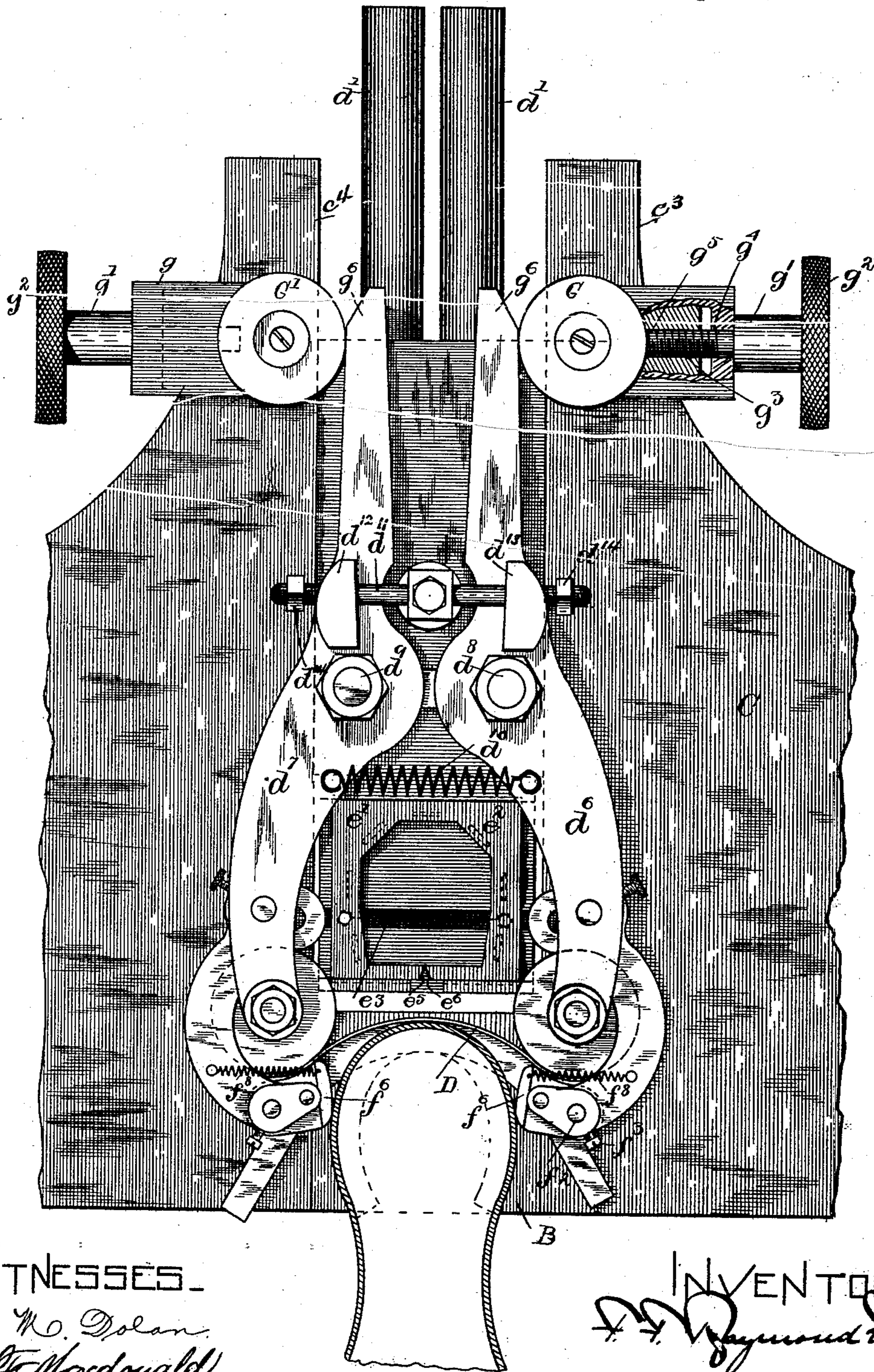
(No Model.)

5 Sheets—Sheet 4.

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

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WITNESSES.

J. M. Dolan.
A. F. McDougal.

INVENTOR

Raymond D.

Fig-4-

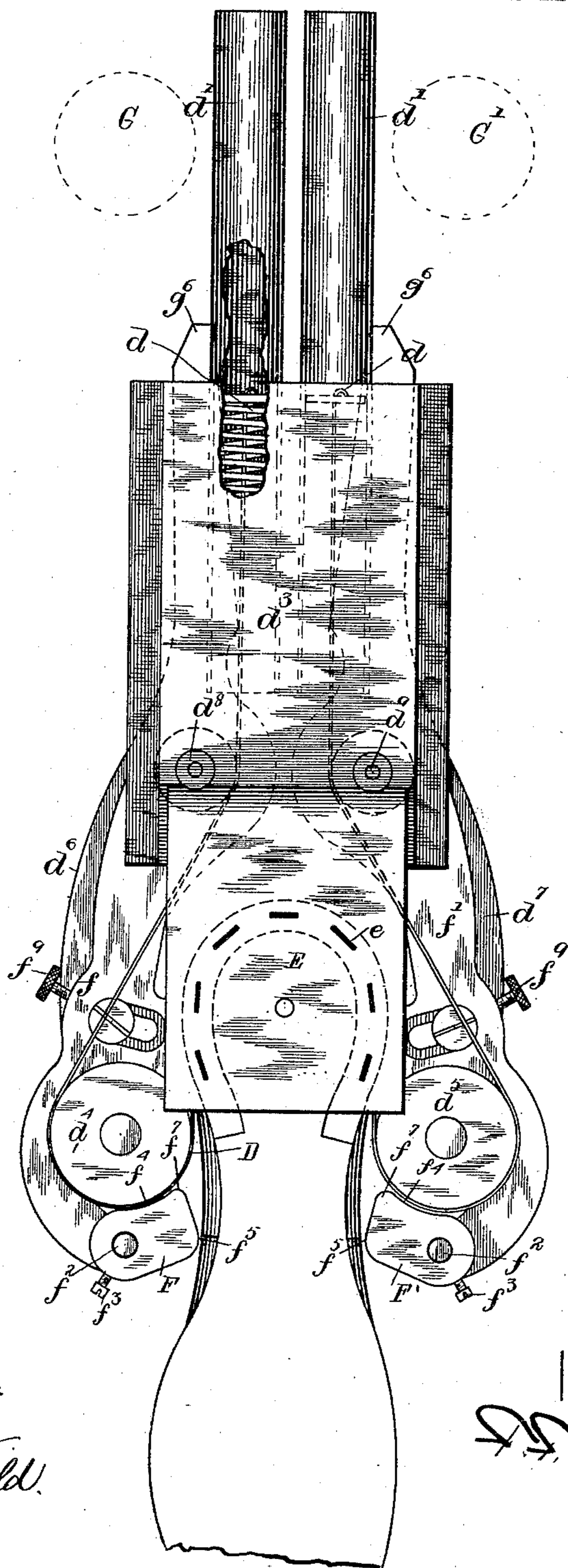
(No Model.)

5 Sheets—Sheet 5.

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

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WITNESSES.

J. W. Dolan.
A. F. McDonald.

INVENTOR-

F. F. Raymond

Fig. 5.

UNITED STATES PATENT OFFICE.

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

HEEL-RANDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 474,408, dated May 10, 1892.

Application filed February 11, 1889. Serial No. 299,513. (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, have invented a new and useful Improvement in Rand Forming and Attaching 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 is an improvement upon that described in my application for Letters Patent filed April 16, 1887, Serial No. 234,989; and it relates to various improvements in construction and organization, all of which will hereinafter be fully described.

Referring to the drawings, Figure 1 is a view principally in front elevation of the central and upper parts of a machine having the features of my invention. Fig. 2 is a view principally in vertical section of the central and upper parts of said machine, taken from front to back. Fig. 3 is a view principally in plan upon a line immediately above the surface of the fastening-carrier. Fig. 4 is a view in plan reversed of a portion of the mechanism, to which reference will hereinafter be made. Fig. 5 is a view in plan of parts of the operative mechanism, to which reference will hereinafter be made. Fig. 6 is a view in perspective of the templet and former. Fig. 7 is a view in vertical section thereof. Fig. 8 is a cross vertical section taken through the nail or fastening carrier. Fig. 9 is a view in perspective of a randed shoe. Fig. 10 is sectional detail.

A represents the frame of the machine; a , a sliding jack having a horizontal sliding movement in suitable ways upon the bed a' . A' is a cross-head, which is provided with a reciprocating movement, substantially as specified in Patent No. 316,894, and which bears or carries a head A^2 , which has an arm a^2 , carrying a gang or group of awls a^3 , and an arm a^4 , carrying a gang or group of drivers a^5 . The head is attached by the shaft a^6 to the cross-head A' , and is adapted to be oscillated or turned to bring the awls and drivers alternately into operative position. In Fig. 1 the drivers are represented in such position.

B is the templet. (See Figs. 1, 2, 6, and 7.) It is represented as detachably secured to the

table C, having side ribs which extend into horizontal grooves or recesses formed in the sections c of the table C. (See Fig. 1.) The templet is secured in place by a spring-pin or in any other desired way. It has the holes b , through which the fastenings are driven, and in the drawings they are represented as long horizontally or from side to side to receive a staple-fastener. The templet-block supports a rand-former B' , which comprises a block b^2 of metal set in a recess b^3 , extending upward from the under surface of the templet and attached thereto by pins or studs b^4 (see Fig. 2) in a manner to have a vertical yielding movement in relation to the templet, a spring b^5 forcing it downward from the templet, so that a section b^6 of its side immediately adjacent to its lower edge is caused to be normally below the under surface b^7 of the templet. (See Figs. 2 and 7.) The blocks b^2 is of a shape upon its section b^6 to provide a former, against which the edge of the rand shall be brought in contact as it is fitted to the heel end of the outsole of the boot or shoe to which it is to be attached. The under surface b^8 of the former-block may be made slightly concave, if desired. The surface b^7 of the templet surrounding the former-block preferably is level or flat, and it serves to flatten down, consolidate, and shape by vertical pressure the rand upon the outsole and also the rand, outsole, upper edge, counter-edge, and insole in relation to the bottom of the last or heel support.

To form or shape the rand about the rand-former B' , the templet is moved downward by depressing the table C by means of the lever c' and link c^2 sufficiently to bring the under surface of the rand-former upon the upper surface of the outsole. A forming-strap D is caused to be moved horizontally against the outer edge of the rand and in a forward direction in relation to the templet and rand-former block, whereby the rand is caused to be folded or turned about the edge of the block in the cavity or space between the under surface b^7 of the templet and the upper surface of the outsole.

The forming-strap D preferably is a steel tape in one piece, each end d of which is confined in a long tube d' , (see Figs. 3 and 5,) in which it is movable lengthwise the tube in opposition to the long coil-spring d^2 . These

tubes are secured to the under surface of a slide d^3 , to be horizontally movable therewith, and the steel tape extends from the front ends of these tubes about the rolls $d^4 d^5$, carried at the forward ends of the levers $d^6 d^7$, respectively. The lever d^6 is pivoted at d^8 to the under surface of the slide d^3 and the lever d^7 is pivoted at d^9 to the under surface of said slide, and the two levers are drawn toward each other by means of a spring d^{10} , (see Fig. 4,) and the extent of their closing movement or the movement of the rolls toward each other may be limited by the rod d^{11} , also fastened to the under surface of the slide and bearing-nuts, and one end of which extends through a hole in a lug d^{12} , formed on the lever d^7 , and the other end through a hole formed in the lug d^{13} on the lever d^6 . The ends of the rod are screw-threaded and receive the nuts d^{14} . The rolls $d^4 d^5$ are always set to be open or separated slightly from each other, and the tape or forming-strap D passes around the front edge of each and across the opening between the two. The slide d^3 also has the nail or fastening carrier E, which preferably is secured thereto to be removable therefrom, and which has the holes e for receiving the fastenings, which holes are represented as closed by means of the slide-plates $e' e^2$, the two plates being drawn toward each other upon the under surface of the nail-carrier by a spring e^3 to close the holes and being automatically separated to open them when the carrier has been moved into position over the templet by means of the wedge e^4 , (see Fig. 6,) against the sides of which the edges $e^5 e^6$ of the front part of the said slide-plates $e' e^2$ are brought in contact. The slide-plate d^3 also supports or carries the levers $f f'$, which are pivoted at $d^8 d^9$, respectively, to the slide d^3 , and they carry at their forward ends the rand-supports F F', respectively. (See Fig. 5.) These rand-supports preferably are made vertically adjustable in relation to the ends of their supporting-levers, and this vertical adjustment is represented as obtained by means of a pin or stud f^2 , upon which the supports F F' have a horizontal partially turning or swinging movement, and the set-screws f^3 , the studs or pins f^2 entering the holes in the ends of their respective levers, and the set-screws locking the studs at any desired elevation thereto, the supports F F', as above said, being free to rotate or turn upon the pins.

The rand-supports F F' preferably are shaped substantially as represented in Fig. 5—that is, each has a curved edge f^4 upon the side next the roll and a rounded or curved end f^5 toward the shoe, the said end f^5 preferably having a downward extension or lip f^6 to bear against the edge of the outsole. The supports are held to their respective levers so that the points or sections f^7 extend inward and against the edge of the roll, but in a manner to yield, and this result is obtained by means of the spring f^8 , which attaches the

inner end f^7 of the support to its supporting-lever. (See Fig. 4.) This permits each of the supports F F' to move in relation to the rolls or tape-supports $d^4 d^5$, and the heel of the boot or shoe to follow or rather to move in advance along each edge of the shoe from the heel end thereof of the rand which they support and which is being formed about the former by the strap or tape D, which is caused to conform to the shape of the former, as well as to the shape of the edge of the sole at the heel end by the rolls $d^4 d^5$. These supports F F' are also made vertically adjustable upon their respective levers to vary the height of their upper surface, upon which the rand rests, and also their level in relation to the level of the upper surface of the outsole. A thick rand demands that the supports be moved downward and a thin rand that they be moved upward. This vertical adjustment is represented as obtained by means of a pin f^2 and the set-screws f^3 , as above specified.

The extent of inward movement of the supports F F' and the lever ends in relation to the rolls is adjusted or regulated by the set-screws f^9 , (see Fig. 5,) these set-screws acting against projections extending downward from the roll-levers, which in Fig. 5 are represented as screws. The tape D preferably is of a width sufficient to lap upon the edge of the outsole and to extend above it to the under surface of the templet-plate, and the rolls $d^4 d^5$ are of a width sufficient to properly carry said tape. This permits the same tape to be used for all thicknesses of rands, and the under edge or lower part of said tape preferably extends below the surface of the rand-supports F F'.

As heels vary in width, it is desirable that the rolls $d^4 d^5$ and the rand-supports be made adjustable in relation to each other, so that for the narrower heels the rolls may be located before they are moved upon the edge of the sole sufficiently close to each other and that for the wider heels they may be moved farther apart. It is also desirable that they should be held at such a position in relation to each other that they will move on the sole-edge from a point at each rear corner of the sole, and from that point to be held against the edge of the sole by yielding pressure. These results are obtained by carrying upon the backward-extending sections $c^3 c^4$ of the table C the horizontally-adjustable lever-holders G G'. Each lever-holder is represented as an anti-friction roll and as mounted upon a slide-block g , which slide-block is horizontally movable upon the lower surface of its respective holding-arm by the screw-stud g' , the screw-stud having a hand-wheel g^2 and a screw g^3 , which passes through an arm g^4 , in which it is free to turn without being moved and into the threaded hole g^5 in the slide-block. These lever-holders are so located that the ends g^6 of the roll-levers, which preferably are tapered or inclined, come in contact with them at about the instant the rolls $d^4 d^5$ leave the edge of the sole, and they

are held by these holders until the rolls are moved forward, when the ends g^6 clear the holders and permit the spring d^{10} to hold the rolls together and upon the sole-edge; but by setting the holders toward each other by means of their adjusting-screws the rolls $d^4 d^5$ are caused to be moved farther apart, and by moving them from each other the rolls are caused to be held nearer each other.

It is desirable that the levers come in contact with the holding-blocks upon their backward movement, and also of the rolls or tape-supports and the slide which carries them immediately upon the rolls leaving the heel end of the sole, the heel end of the sole acting to hold the rolls in a position to permit the ends of the levers to enter the space between the two holders, and on the other hand, upon the forward movement of the slide, rolls, and levers the holders act to keep the rolls separated from each other sufficiently to close upon the edge of the heel and until they are in a position to close upon said edge, so that for the remainder of their forward movement they are held separated by the sole.

The operation of the machine is substantially as follows: The rand is placed upon the rand-supports in front of the rolls and tape when they are in their back position. The shoe is mounted upon the last or work support and moved under the rand-former and templet-plate, the heel end of the outsole preferably not being permanently attached to the insole. The templet and rand-former are then moved downwardly until the under surface of the rand-former comes in contact with the upper surface of the sole, when the rand is moved toward the rand-former by the movement of the slide d^3 . This movement of the slide causes the inner edge of the rand at about the center of its length to come in contact with the rear end or surface of the former, and the rand is fitted to the outsole by forming or turning it from its center toward each end about each side of the former, the former governing the location of the inner edge of the rand upon the sole and the tape or strap governing the relation which its upper edge bears to the edge of the sole. If the former is of suitable size and the rand of suitable width, then the outer or thick edge of the rand is brought flush with the edge of the outsole. If the rand and outsole are to be pricked before the attaching fastenings are driven, then the awls are caused to make a reciprocation.

In the operation of the machine, the templet and rand-former having been moved downward by the hand-lever upon the work and the rand having been formed about the former, the drivers act to drive the fastenings through the holes of the templet into the rand and work, and the surface of the driver-holding block also acts to communicate to the templet, at the end of its downward movement a pressure or blow, whereby the rand is flattened forc-

bly upon the work, and, if desired, the outsole beaten out or formed to the surface of the work-support or last.

For certain kinds of work the drivers may be dispensed with and the templet be imperforate, and the rand in such case is secured to the outsole by glue or cement applied to the under surface of the rand or to the upper surface of the sole. The templet then acts as a pressure-block for setting or pressing the rand upon the sole.

I prefer that the table C have side extensions $h h'$, by which it is mounted upon the side rods $h^2 h^3$, which operate the cross-head A' , the table being secured to said rods by the boxes h^4 , (see Fig. 1,) which are bolted to the side extensions $h h'$, and the table is moved downward in opposition to the springs h^5 , which rest upon the bed a' and bear against the under surface of each of the side extensions $h h'$. The table also has the angle cross-piece or connection h^6 . (See Figs. 1 and 2.) The table is also provided with the wide opening h^7 , (see Figs. 1 and 2,) which opening extends upward upon each side of the templet and rand-forming devices to form the sections h^8 . The front edge h^9 of the upper part of the table extends forward from the remainder of the table, the upper sections h^{10} of the table extending upwardly from these advanced or forward sections and also downwardly. (See Fig. 2.) By thus constructing the table a sufficient support is provided the templet B and the rand-forming block, while the other rand-forming devices are so exposed or situated that the rand can easily be mounted upon the rand-supports while they are in their back position or that represented in Figs. 2 and 3. The cavity or opening h^7 extends entirely through the table. (See Fig. 2.) The fastening-carrier and the rand-forming devices are mounted upon the same slide, and the slide is represented as moved horizontally in the table C by means of the lever M, which is pivoted at m and which is connected with the slide by means of the hanger m' , the link m^2 , connecting the end of the lever with the hanger, and the link m^3 , connecting the end of the hanger m' with the lugs m^4 , extending downward from the slide. (See Fig. 2.)

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

1. In a rand-forming mechanism, a block having a forming or pressing surface for flattening the rand, and a former, substantially as described, movable vertically in relation to the operating-surface of the first-named block, the edge of which former determines the curve of the rand, substantially as described.

2. The combination, in a randing device, of a support for the work, a pressure-block, and a yielding former-block, substantially as described, the edge of which determines the

curve of the rand and which blocks are movable vertically relatively to the support, substantially as described.

3. In a randing appliance, a templet having holes through which fastenings are driven, and a yielding rand-forming block, substantially as described, having a yielding or vertical movement in relation to the templet, substantially as described.

4. In a randing-machine, a templet-block having holes through which fastenings are driven and a chamber or cavity for the reception of the rand-forming block, with said rand-forming block formed to fit said chamber or cavity and secured to the block to be movable in relation thereto, and a spring for moving the former from the said templet-block, substantially as described.

5. The combination, in a rand-forming device, of a support for the work, a templet having holes through which the rand-attaching fastenings are driven, a vertically-movable forming-block, substantially as described, and a reciprocating gang of drivers, substantially as described.

6. In a randing-machine, the combination of a work-support, a templet-plate having a rand flattening or compressing surface, a vertically-movable rand former, substantially as described, and a gang of drivers carried by a reciprocating block, the surface of which forms a hammer for delivering a compressing action to the templet, substantially as described.

7. The combination, in a rand-attaching machine, of a work-support, a templet having holes through which rand-attaching fasteners are driven, a former, substantially as described, vertically movable independently of the templet, a reciprocating gang or group of awls, and a reciprocating gang or group of drivers, substantially as described.

8. The combination of the templet-block having the cavity or hole b^3 with the vertically-movable rand-former B' , having a spring-holding recess and attached to the templet-block to be movable vertically in relation thereto, with the spring b^5 , held in said recess, substantially as described.

9. The combination, in a randing-machine, of the templet B, the table C, having the extensions h h' , the side rods h^2 h^3 , boxes h^4 , and randing devices, as set forth.

10. The combination, in a randing-machine, of the templet B, the table C, mounted upon the side rods h^2 h^3 , the said side rods, and springs h^5 , substantially as described.

11. The combination, in a randing-machine, of the table C, the templet B, arranged to slide upon the side rods h^2 h^3 , said side rods, a spring or springs h^5 , and the table-depressing lever c' , substantially as described.

12. The combination, in a randing-machine, of the table C, the templet B, supported thereby, the table being arranged to slide upon the side rods h^2 h^3 , the said side rods, a cross-head

A' , and gang or group of drivers a^5 , mounted thereon, substantially as described.

13. The combination, in a randing-machine, of a table C, having the cross-section h^6 , and the upper sections h^{10} h^9 , shaped to support the templet B in a forward position, substantially as described.

14. The combination, in a randing-machine, of the table C, having the sections h^9 h^{10} and c^3 c^4 , the two sections h^9 and c^3 c^4 being separated from each other to form a guideway for the slide carrying or supporting the fastening-carrier, with said slide and said fastening-carrier, substantially as described.

15. The combination, in a randing-machine, of the table C, having the sections h^9 h^{10} and c^3 c^4 , the two sections h^9 and c^3 c^4 being separate from each other to form a guideway for the slide, said slide supporting the rand-curving devices, and said rand-curving devices, substantially as described.

16. The combination, in a randing-machine, of table C and the suspended templet B, the table having the cavity h^7 h^8 and randing devices, substantially as described.

17. In a randing-machine, the forming strap or tape D and mechanism for moving it about the heel end of the outsole, with the rand-forming block B' and templet or block B, substantially as described.

18. The combination of the rand-forming strap movable in relation to the rand-forming block and heel end of the outsole, as specified, the said rand-forming block, and the templet or pressure block vertically movable in relation to the rand-former block, substantially as described.

19. The combination of the rand-forming strap or tape movable in relation to the rand-former block and heel end of the outsole, as specified, the rand-former block, the templet or pressure block having a vertical movement relatively to the rand-former block, and the reciprocating head to come in contact with the templet-block and move it forcibly downward, substantially as described.

20. The combination of the forming strap or tape, the rand-forming block, the templet having a vertical movement in relation to the rand-forming block and provided with holes through which fastenings are driven, a gang of fastening-drivers, and a pressure-head upon which said drivers are mounted, substantially as described.

21. The combination of the rand-forming tape or strap movable in relation to the rand-forming block and heel end of the outsole, as specified, the rand-forming block, the templet having holes through which fastenings are driven vertically movable in relation to the rand-forming block, the fastening carrying slide, the gang of drivers, and the reciprocating head supporting the same, substantially as described.

22. The combination of the work-support, the rand-forming block B' , the extensible rand-

forming tape or strap D, mounted upon two horizontally-movable supports, a slide having a horizontal movement upon which said supports are mounted, a spring for drawing said supports toward each other, and gaging devices for holding said supports at any desired distances apart during the first portion of the outward or forward movement of the slide and which then operate to release the supports to permit them to close upon the sides of the sole of the boot or shoe and to remain closed thereon during the remainder of the movement of the slide, substantially as described.

23. The combination of the extensible tape or strap D, its separable supports, a spring for closing or drawing toward each other said supports, a slide upon which said supports are mounted, and gages for determining the time of release of said supports, substantially as described.

24. The combination of the extensible strap or band D, the separable supports therefor horizontally movable, a spring or other yielding force acting to draw said supports toward each other and gages for holding said supports separated in opposition to said spring, and means for adjusting the position of said gages in relation to each other, substantially as described.

25. The combination of the extensible band or strap D, the supports $d^4 d^5$, mounted at the ends of the levers $d^6 d^7$, said levers pivoted to the slide d^3 and having the beveled or inclined end d^6 with the gages or holders G G', substantially as described.

26. The combination of the extensible strap or band D of a width to extend upon the edge of the outsole of the boot or shoe in applying the rand thereto, and a separable and horizontally-movable roll $d^4 d^5$ of a width equal to or greater than that of the strap or band and extending below the upper surface of the sole of the boot or shoe and adapted to bear upon the edge thereof, substantially as described.

27. The combination of the extensible strap or band D, its separable supports having a horizontal movement imparted to them, and rand-holders in front of said strap and supports and each of which has a flat surface below the upper edge of the strap or band to support a rand while it is being formed, substantially as described.

28. The combination of the extensible strap or band D, its separable supports, and devices for imparting to them a horizontal movement, with the independently-movable rand-supports for supporting the rand-rests in front of said strap and supports, substantially as described.

29. The combination of the extensible strap or band D, its separable and horizontally-movable supports, and rand-rests vertically movable in relation to said supports, substantially as described.

30. In a randing-machine, the combination of an extensible strap or band, its separable and horizontally-movable supports, and rests having devices in connection therewith, as set forth, for moving the same lengthwise and crosswise over the line of the horizontal movement of said rests, substantially as described.

31. The combination of the extensible strap or band, its separable and horizontally-movable supports, a spring for closing said supports upon the boot or shoe, the rand-rests, their supports, and a spring for closing them upon the boot or shoe, substantially as described.

32. The combination of the extensible strap or band, the separable and horizontally-movable supports therefor, the rand-rests, their independent supports, and stops for adjusting or varying the extent of movement of the rests in relation to the supports, substantially as described.

33. The combination of the work-support, the rand-former, the templet vertically movable in relation to the rand-former, the separable and horizontally-movable rolls $d^4 d^5$, and the separable and horizontally-movable rand-rests, substantially as described.

34. The combination of the work-support, the rand-former, the templet, the separable and horizontally-movable supports $d^4 d^5$, the extensible strap or band D, and the separable and horizontally-movable rand-rests having downwardly-extending sections which bear upon the sole edge, substantially as described.

35. The combination, in a randing-machine, of the last or work support, the rand-former block, and the templet, with the separable and horizontally-movable rand-rests, substantially as described.

36. The combination, in a rand forming and setting machine, of a work-support, a rand-forming block, the edge of which determines the inner curve of the rand, a templet having a vertical movement in relation to the rand-block to compress or flatten the rand, rand feeding, forming, and holding devices, a reciprocating gang of drivers, and a pressure-block to force the templet upon the rand, substantially as described.

FREEBORN F. RAYMOND, 2D.

In presence of—

J. M. DOLAN,

A. F. MACDONALD.