(No Model.) 4 Sheets—Sheet 1.

# W. J. FAHNLEY & E. H. TAYLOR.

## HEEL MAKING MACHINE.

No. 446,334. Patented Feb. 10, 1891.

Fig. 1.

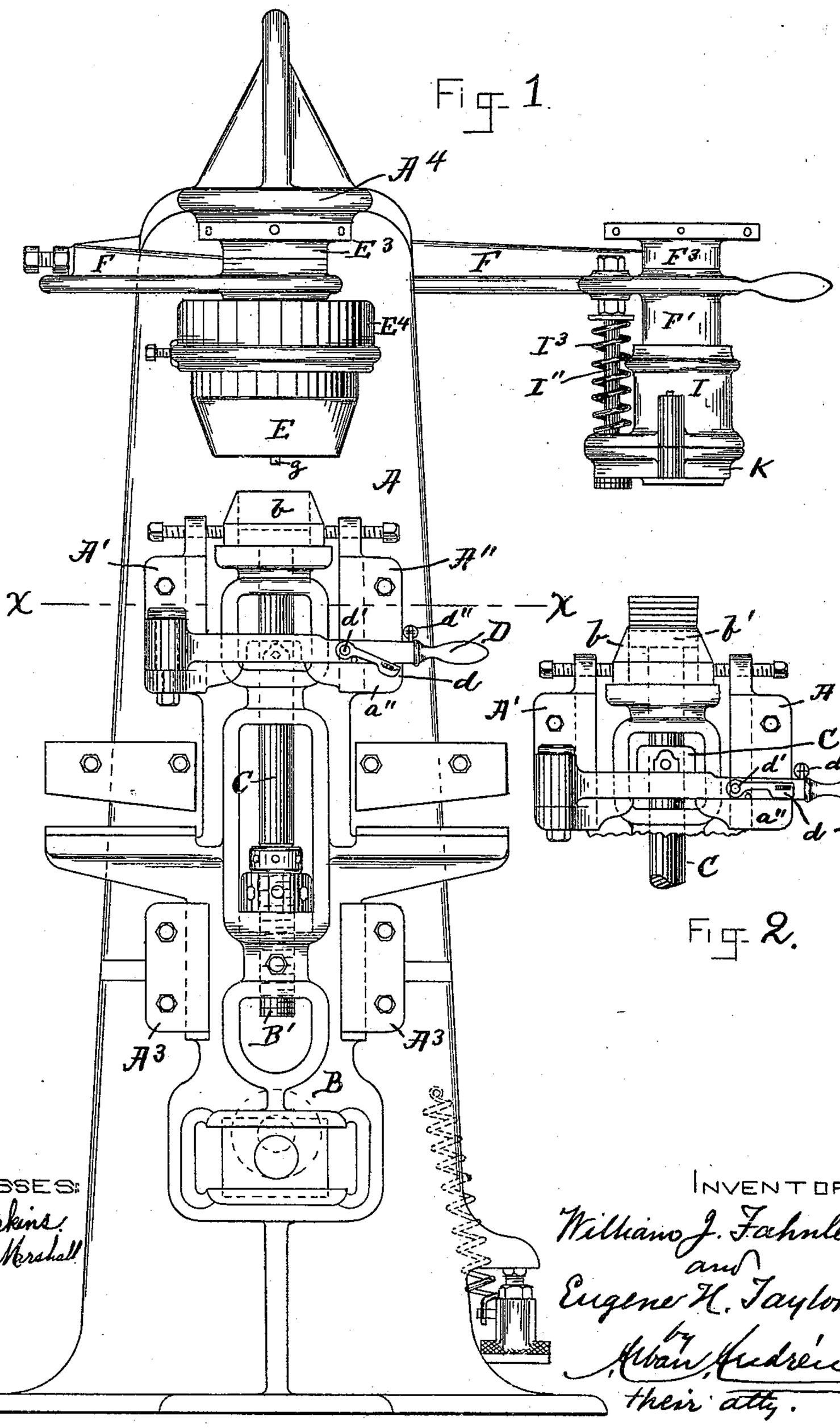





Fig. 2.

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by Albert Andrews
their atty.

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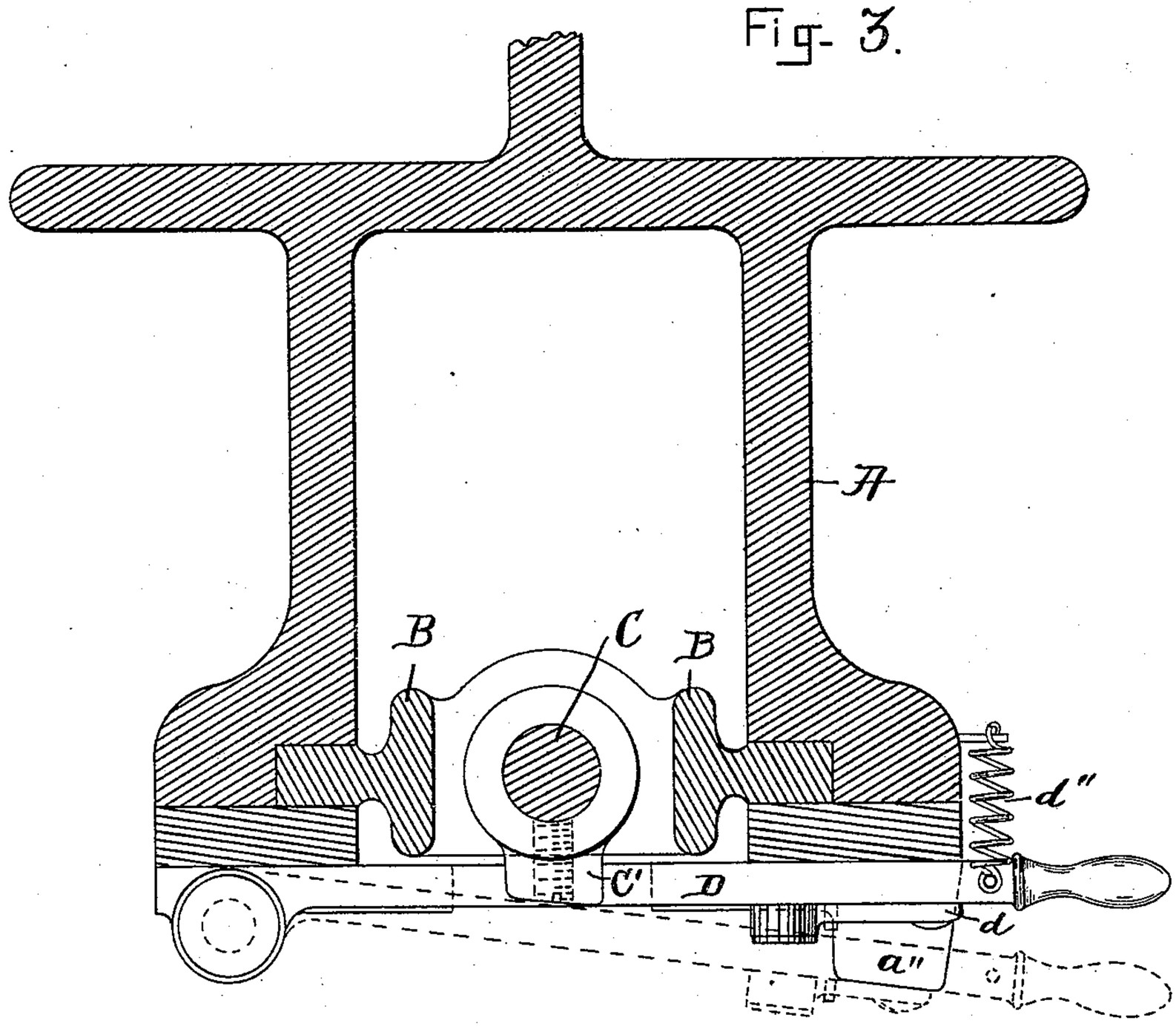
Fig. 3.



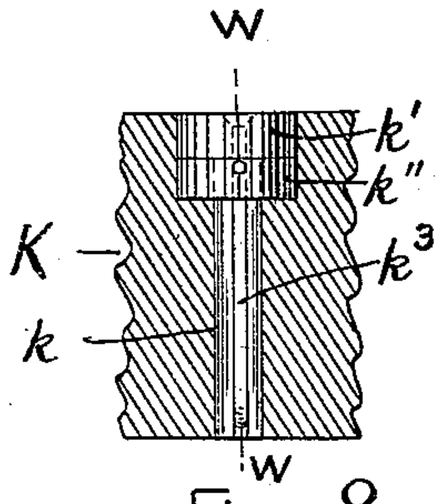




Fig. 8.

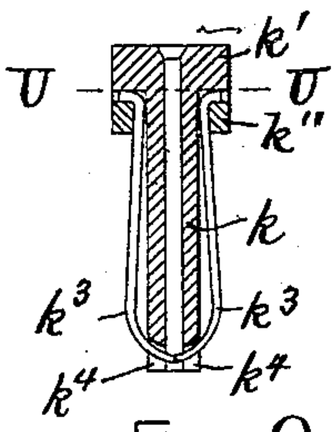



Fig. 9

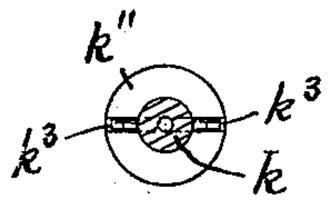



Fig. 10.

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# W. J. FAHNLEY & E. H. TAYLOR.

## HEEL MAKING MACHINE.

No. 446,334. Patented Feb. 10, 1891.

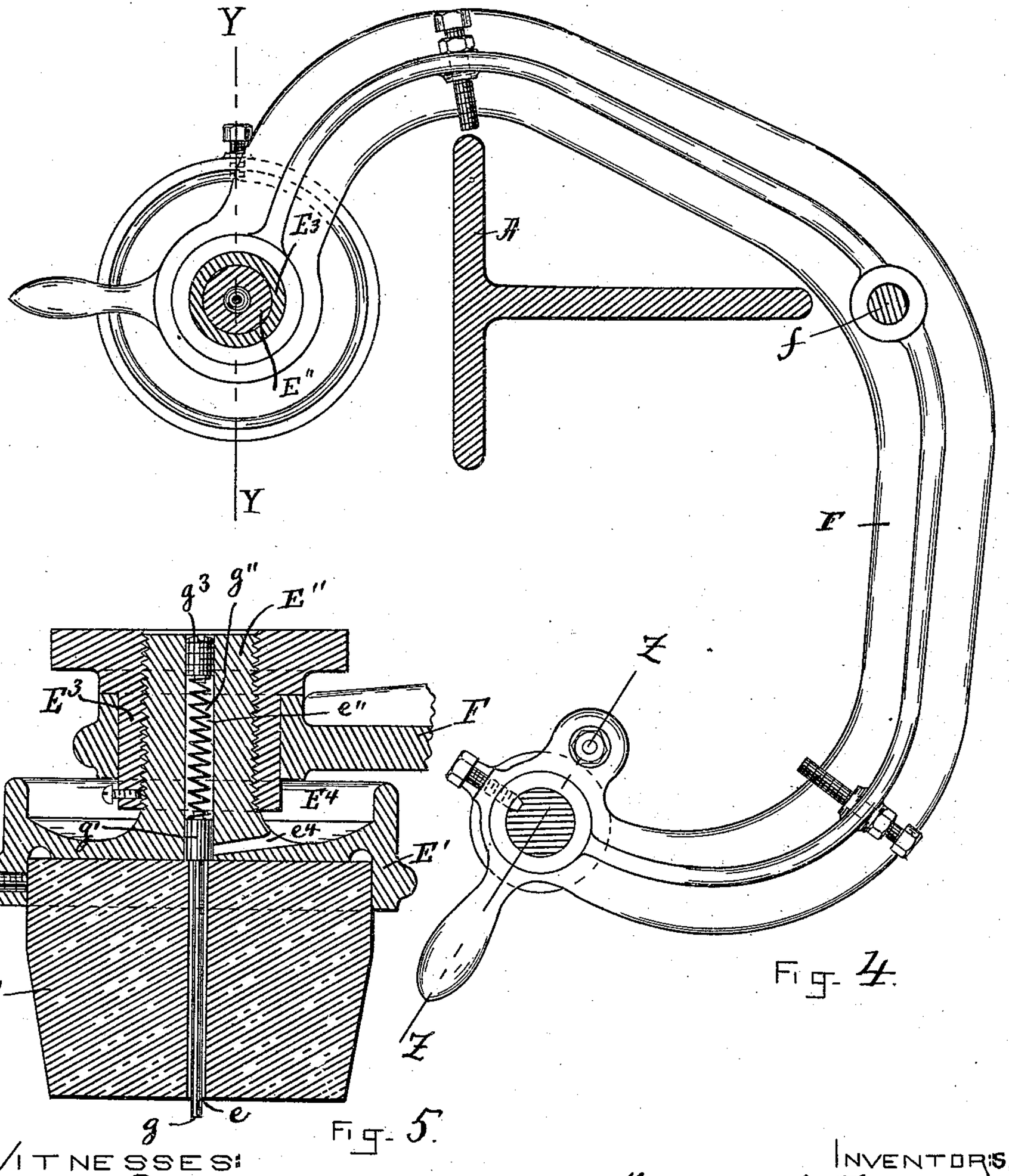


Fig. 4.




Fig. 5.

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(No Model.) 4 Sheets—Sheet 4.

# W. J. FAHNLEY & E. H. TAYLOR.

## HEEL MAKING MACHINE.

No. 446,334. Patented Feb. 10, 1891.

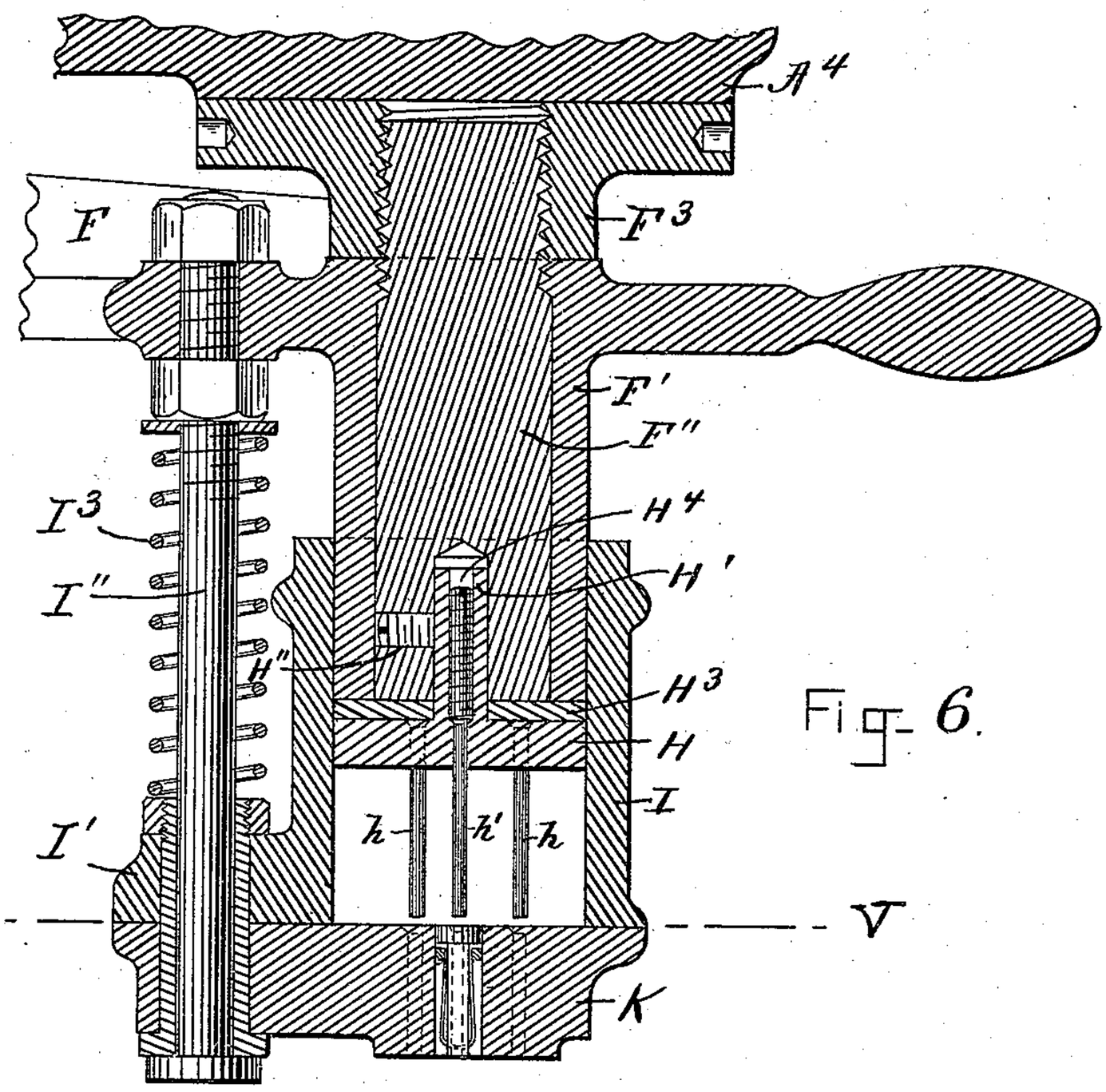


Fig. 6.

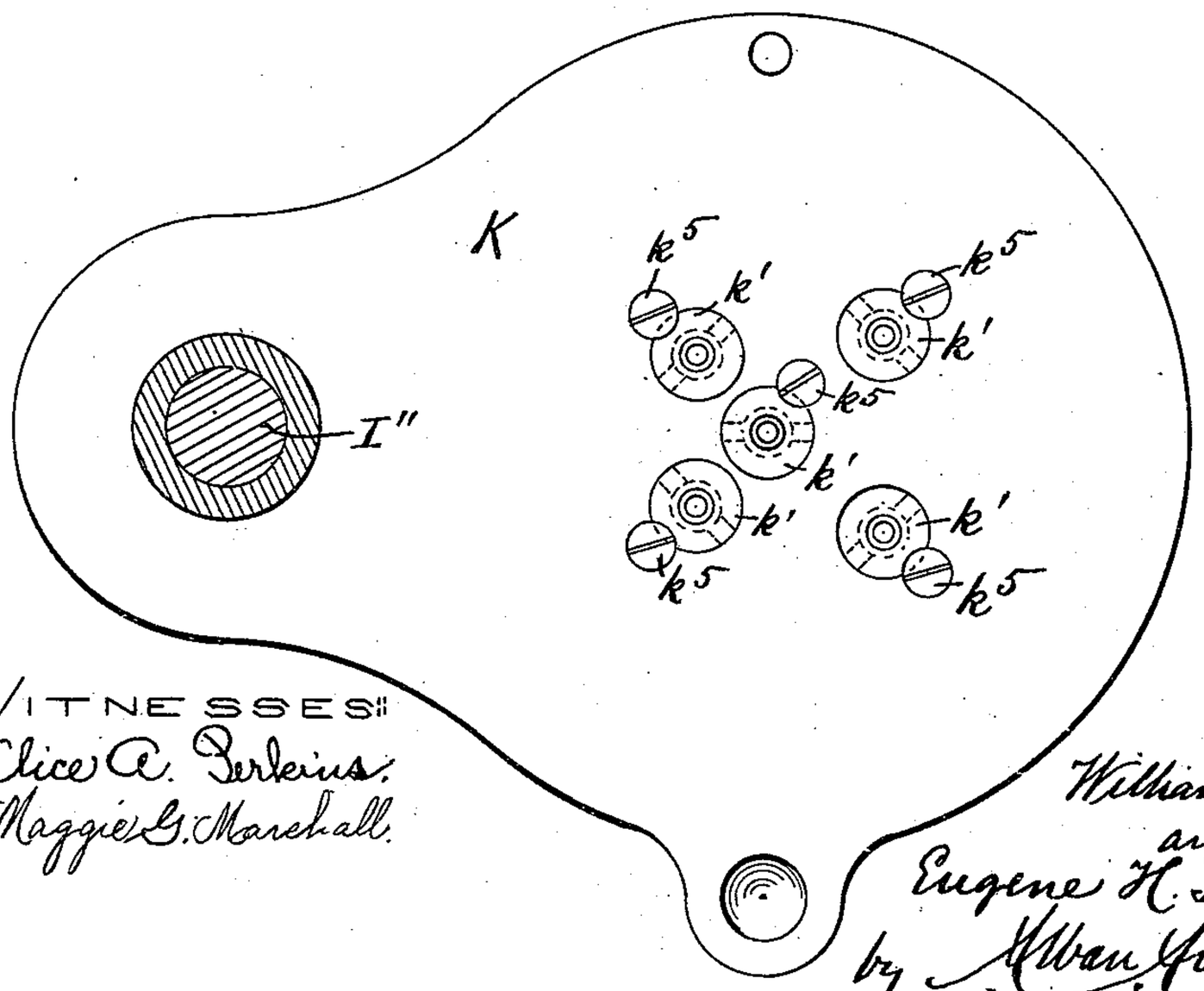


Fig. 7.

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# UNITED STATES PATENT OFFICE.

WILLIAM J. FAHNLEY AND EUGENE H. TAYLOR, OF LYNN, ASSIGNORS TO JOHN Q. A. WHITTEMORE, OF BOSTON, MASSACHUSETTS.

## HEEL-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 446,334, dated February 10, 1891.

Application filed November 20, 1890. Serial No. 372,057. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM J. FAHNLEY and EUGENE H. TAYLOR, both citizens of the United States, and residents of Lynn, in the county of Essex and State of Massachusetts, have jointly invented new and useful Improvements in Heel-Making Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in heel-making machines for the purpose of making heels for boots or shoes; and it consists in an improved pasting device for the purpose of applying paste or suitable adhesive substance to the heel-lifts during the operation of dieing out the same.

The invention further consists in an improved nailing device for the purpose of nailing the heel-lifts together; and the invention finally consists in mechanism for discharging the heel from the die after it is finished.

The invention is carried out as follows, reference being had to the accompanying drawings, wherein—

Figure 1 represents a front elevation of the improved heel-making machine. Fig. 2 represents a detail front view of the heel-discharging device, showing the finished heel in the act of being ejected from the die. Fig. 3 represents an enlarged cross-section on the line X X shown in Fig. 1. Fig. 4 represents a plan view of the swinging arm that carries the cutter-block, pasting mechanism, and nail-driving device, parts of which are shown in section. Fig. 5 represents a vertical section on the line Y Y in Fig. 4, showing the cutter-block and its pasting device. Fig. 6 represents an enlarged section on the line Z Z in Fig. 4, showing the nail-driving mechanism. Fig. 7 represents a horizontal section on the line V V in Fig. 6, showing the swinging nail-loader and its nail-receiving dies. Fig. 8 represents a detail side elevation of one of the nail-dies. Fig. 9 represents a central longitudinal section on the line W W shown in Fig. 8, and Fig. 10 represents a cross-section on the line U U shown in Fig. 9.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

A is the frame of the machine, having secured to it the guides A′ A″ $A^3$ $A^3$, in which is up and down movable the die-carrier B, as is usual in machines of this kind.

*b* is the heel-die, as usual resting on the upper end of the die-carrier B and secured to the latter in any suitable or well-known manner. Within the said heel-die is located the nail-clinching plate *b′*, resting on the upper end of the rod C, having its lower end supported on a vertically-adjustable screw B′, secured in an adjustable manner to the die-carrier B, as shown in Fig. 1. In connection with said die-carrier and die we use a heel discharger or ejector for the purpose of throwing the heel out of the die when finished, and this heel-discharging device is constructed as follows: To the stationary guide A′ is pivoted the hand-lever D, provided at or near its free end with a latch *d*, that is hung at *d′* to said hand-lever and normally occupies the position as shown in Fig. 1, in which position its lower end is brought against the front of a projection *a″*, attached to or forming a part of the guide A″, as shown in Fig. 1, for the purpose of holding said lever D out of operative position during the making of the heel, as indicated by dotted lines in Fig. 3. *d″* is a suitable spring attached to the hand-lever D and the frame A for the purpose of automatically swinging said lever to its operative position (shown in full lines in Fig. 3) as soon as the latch *d* is raised and liberated from the projection *a″*, as shown in Fig. 2. C′ is a collar or projection secured to the rod C, as shown in Figs. 1, 2, and 3, for a purpose as will hereinafter be described.

The operation of this heel-ejector device is as follows: After the die *b* has been filled with heel-lifts and the latter nailed together, the latch *d* is disengaged from the projection *a″*, as shown in Fig. 2, causing the spring *d″* to swing the hand-lever D inward to the position shown in full lines in Fig. 3. As the die-carrier moves downward, the collar or projection C′ on the rod C comes in contact with the hand-lever D, by which the said rod C is held stationary during the downward movement of the die-carrier and its die *b*, causing the heel to be ejected from said die, as fully

shown in Fig. 2. After the heel has been removed, the hand-lever D is pulled outward to the normal position shown in dotted lines in Fig. 3 and retained in such position by the dropping of the latch *d* in front of the lug or projection *a''*, as shown in Fig. 1.

E in Fig. 5 is the cutter-block, as usual, secured in its upper end to the metal socket or holder E', the latter having an upwardly-projecting screw-threaded shank E'', surrounded by a nut $E^3$, journaled in a vertical perforation in one end of the arm F, which is pivoted at *f* to the machine-frame A, as is common in this kind of machines. In connection with said cutter-block we use a pasting device for the purpose of automatically pasting the upper side of each heel-lift as it is being died out, so as to cause it to adhere to the next heel-lift in the series, and the said pasting device is constructed as follows: The upper end of the socket E' is made in the form of a cup or chamber $E^4$, adapted to contain the paste or adhesive substance used for sticking the heel-lifts together. *e''* is a vertical perforation through the socket-shank E'', and $e^4$ is a passage leading from the bottom of the paste-receptacle $E^4$ to the lower end of the perforation *e''*, as shown in Fig. 5. In a line with the perforation *e''* is made through the cutter-block E preferably a somewhat smaller perforation *e*, through which passes loosely the valve-stem *g*, having a valve *g'* in the upper end, which is normally held in a closed position against the upper end of the cutter-block E or other valve-seat preferably by means of a spring *g''*, located in the perforation *e''* between the top of the valve *g'* and the under side of an adjustable screw-plug $g^3$, screwed into the upper end of the hollow shank E'', as shown in Fig. 5. The lower end of the valve-stem *g* projects slightly below the lower edge of the cutter-block E, as shown in said Fig. 5.

In dieing out the heel-lifts the arm F is swung into position, as shown in Figs. 1 and 4, in which position the upper end of the nut $E^3$ is brought directly below the head $A^4$ of the frame A, as usual. The heel-blank is then placed on top of the die *b*, and as the machine is started the said die is moved upward against the under side of the cutter-block E, causing the heel-lift to be cut by the die, and at the same time causing the valve-stem *g* to be raised slightly by contact with the heel-lift, by which the valve *g'* is raised above its seat, and thereby allowing a small quantity of the paste or adhesive substance to pass from the receptacle $E^4$ through the passage $e^4$ and vertical perforation *e* to the top of the heel-lift that is being died out. The valve *g'* is automatically closed by the influence of the spring E'' as soon as the die *b* descends, and the next heel-lift is caused to adhere to the previously-pasted one, and so on during the operation of the machine.

The improved nailing device is constructed as follows: To one end of the swinging arm F is secured, or made in one piece with it, the vertical sleeve F', in which is located the cylindrical spindle F'', having a screw-threaded upper end, on which is screwed the nut $F^3$, as shown in Fig. 6. To the lower end of the spindle F'' is secured the vertically-perforated driver-block H, having a central shank H' adapted to be inserted within a central bore in the lower end of the spindle F'', as shown in Fig. 6. The shank H' is preferably secured to the spindle F'' by means of a set-screw H'' or other suitable or equivalent device. Between the under side of the spindle F'' and the upper side of the driver-block H is preferably located a hardened-steel washer $H^3$, against which the upper ends of the drivers *h h h* are made to rest. *h'* is the central driver, passing through a central perforation in the driver-block H, and having its upper end resting against the lower end of the adjustable screw $H^4$, screwed through the shank H', as shown in Fig. 6.

I is a sleeve surrounding the sleeve F' and adapted to be moved upward thereon during the nailing operation. Said sleeve I has a perforated ear I', which is guided on a pin I'', having its upper end secured to the arm F, as shown in Fig. 6.

$I^3$ is a spring surrounding the pin I'' for the purpose of automatically holding the sleeve I in its lower normal position, as shown in Fig. 6.

K is the loader pivoted on the vertical pin I'' (or a sleeve surrounding the same) and adapted to be swung in and out of operative position relative to the drivers *h* and *h'*. The loader K has a series of vertical perforations adapted to receive the perforated driver-tubes *k*, each of which has an annular flange *k'* in its upper end, and below such flange is located a ring or collar *k''*, Figs. 8, 9, and 10, to which is attached or connected a pair of diametrically-opposed springs or yielding nail-dies $k^3$ $k^3$, the lower ends of which are guided in notches or recesses $k^4$ $k^4$ in the lower end of each driver-tube *k*, as shown in Fig. 9, which springs serve to hold the nail placed in the driver-tube until driven by the driver, during which operation the said springs will yield sufficiently to allow the nail to pass between them.

$k^5$ $k^5$ are screws by means of which the driver-tubes are secured to the loader K, as shown in Fig. 7.

The loader K is filled with nails simply by swinging it to one side on the pin I'' and placing the nails in the driver-tubes, after which the loader is swung into its normal position and locked by any well-known mechanism to the under side of the sleeve I, in which position the driver-tubes are held centrally below their respective drivers. The nails are driven through the heel held in the die *b* by swinging the nailing device to the position originally occupied by the cutter-block, and as the heel-die and its heel are moved upward the loader K and the sleeve I

are caused to yield upward against the influence of the spring $I^3$, causing the nails to be driven through the heel by coming in contact with the stationary drivers *h h'*. After a heel has been nailed the loader K is automatically moved by the influence of its spring $I^3$ to its normal position (shown in Fig. 6) as soon as the upward pressure on the heel and its heel-die is released. The now finished heel is then expelled from the heel-die, as hereinbefore described, and the cutter-block is swung into the position previously occupied by the nailing device, and so on during the operation of making the heels.

Having thus fully described the nature, construction, and operation of our invention, we wish to secure by Letters Patent and claim—

1. In a heel-making machine, a reciprocating die-carrier and heel-die, and a heel-extractor rod adapted to pass through the latter and having a collar or projection, combined with a movable gate or lever adapted to arrest the downward motion of the said extractor-rod when the heel is being expelled from the heel-die, substantially as described.

2. In a heel-making machine, a reciprocating die-carrier and heel-die secured to it, and a heel-extractor rod carried by said carrier and adapted to move upward independently of the latter and having a collar or projection, combined with a pivoted gate or lever having a latch or locking device for normally holding it out of operative position, and a spring for moving it into operative position when released, substantially as specified.

3. In a heel-making machine, the herein-described pasting device, consisting of a vertically-perforated cutter-block having secured to its upper end a paste-receptacle, and a channel connecting the latter with the cutter-block perforation, combined with a valve for closing the paste-delivery, said valve having a stem extending through the cutter-block perforation and adapted to be raised by the heel-lifts as they are being died out, substantially as and for the purpose set forth.

4. In a heel-making machine, a reciprocating nail-die combined with the nailing device, as described, consisting of a spindle or support carrying a driver-block having the rigidly-secured drivers *h h h'*, a vertically-yielding sleeve or guide I, and the pivoted loader K, having a series of nail-tubes provided with the yielding nail-loaders $k^3$ $k^3$, substantially as and for the purpose set forth.

5. In a heel-making machine, the combination, with a spindle or support carrying a driver-block having nail-drivers, of a vertically-yielding sleeve or guide I, a loader K, yielding with the sleeve or guide, a driver-tube *k*, having notches or recesses $k^4$ $k^4$ at its lower end, the annular rest-ring *k''*, and the laterally-yielding spring-dies $k^3$ $k^3$, secured in their upper ends to said ring *k''* and having their lower ends adapted to project through said recesses $k^4$, substantially as and for the purpose set forth.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, on this 8th day of November, A. D. 1890.

WILLIAM J. FAHNLEY.
EUGENE H. TAYLOR.

Witnesses:
ALBAN ANDRÉN,
ALICE A. PERKINS.