

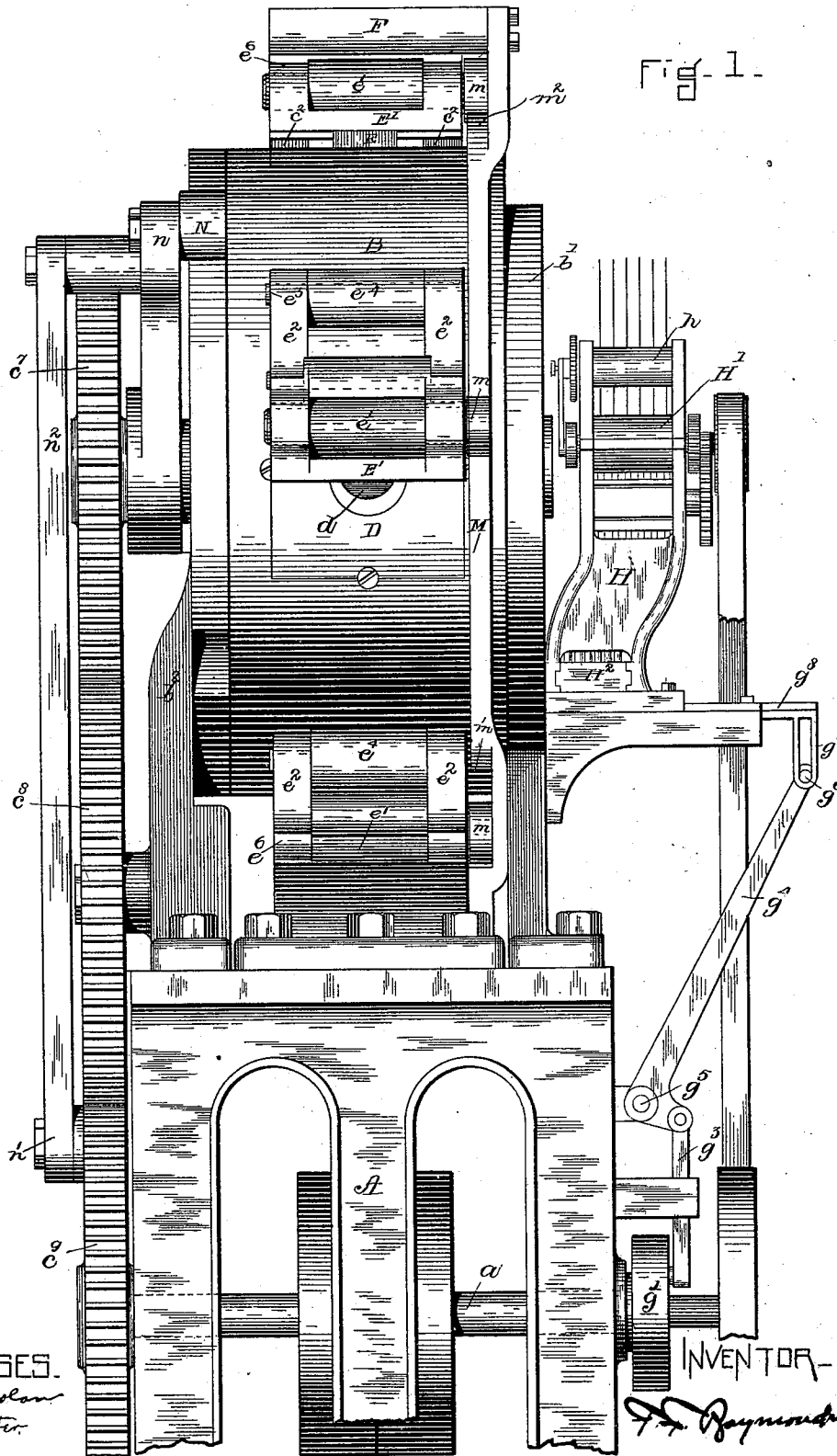
(No Model.)

4 Sheets—Sheet 1.

F. F. RAYMOND, 2d.
HEEL COMPRESSING AND LOADING MACHINE.

No. 544,771.

Patented Aug. 20, 1895.



WITNESSES.
J. M. Dolan
A. P. Porter.

INVENTOR-

F. F. Raymond

(No Model.)

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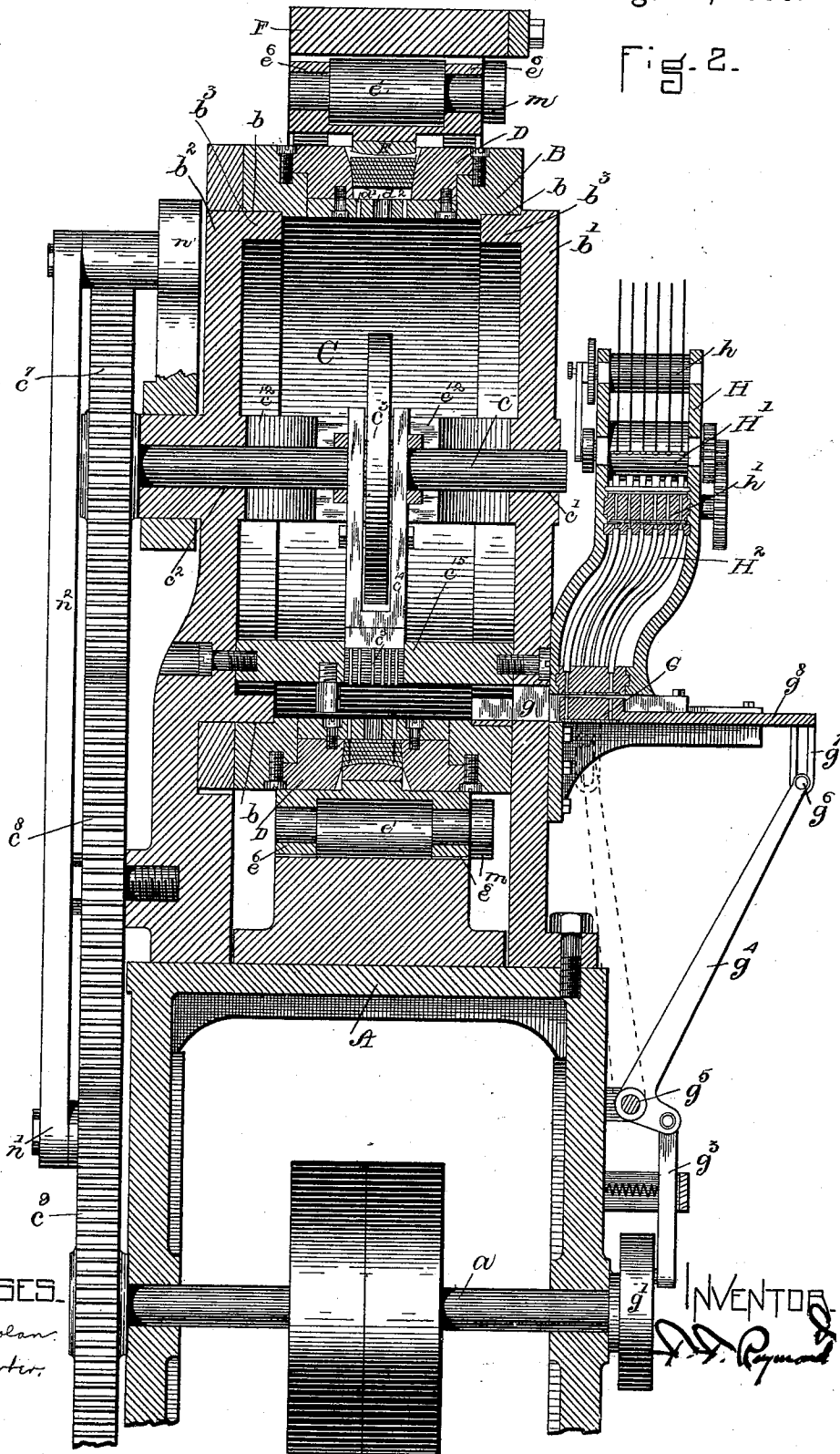
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Fig. 2.



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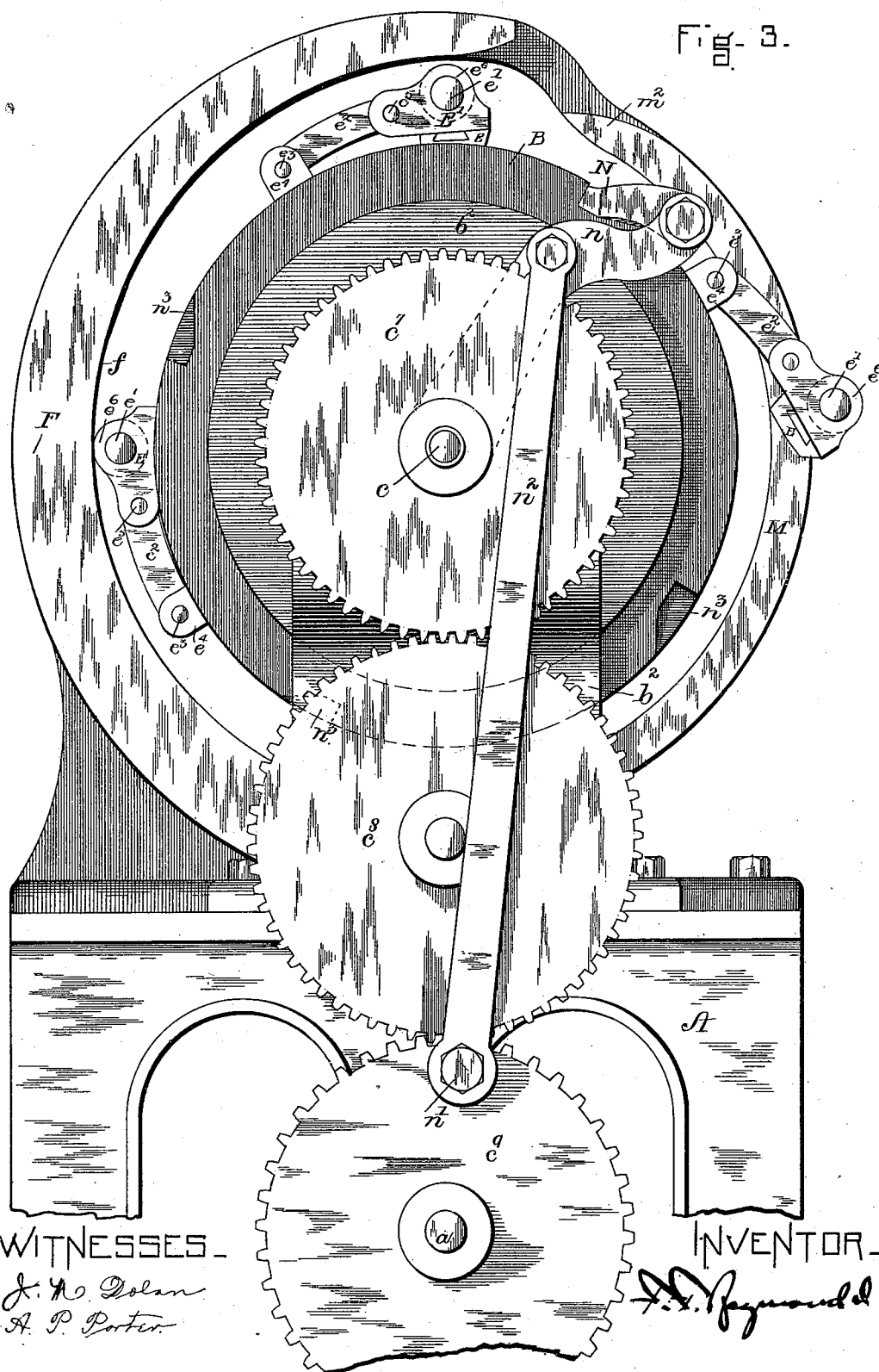
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Fig. 3.



WITNESSES.

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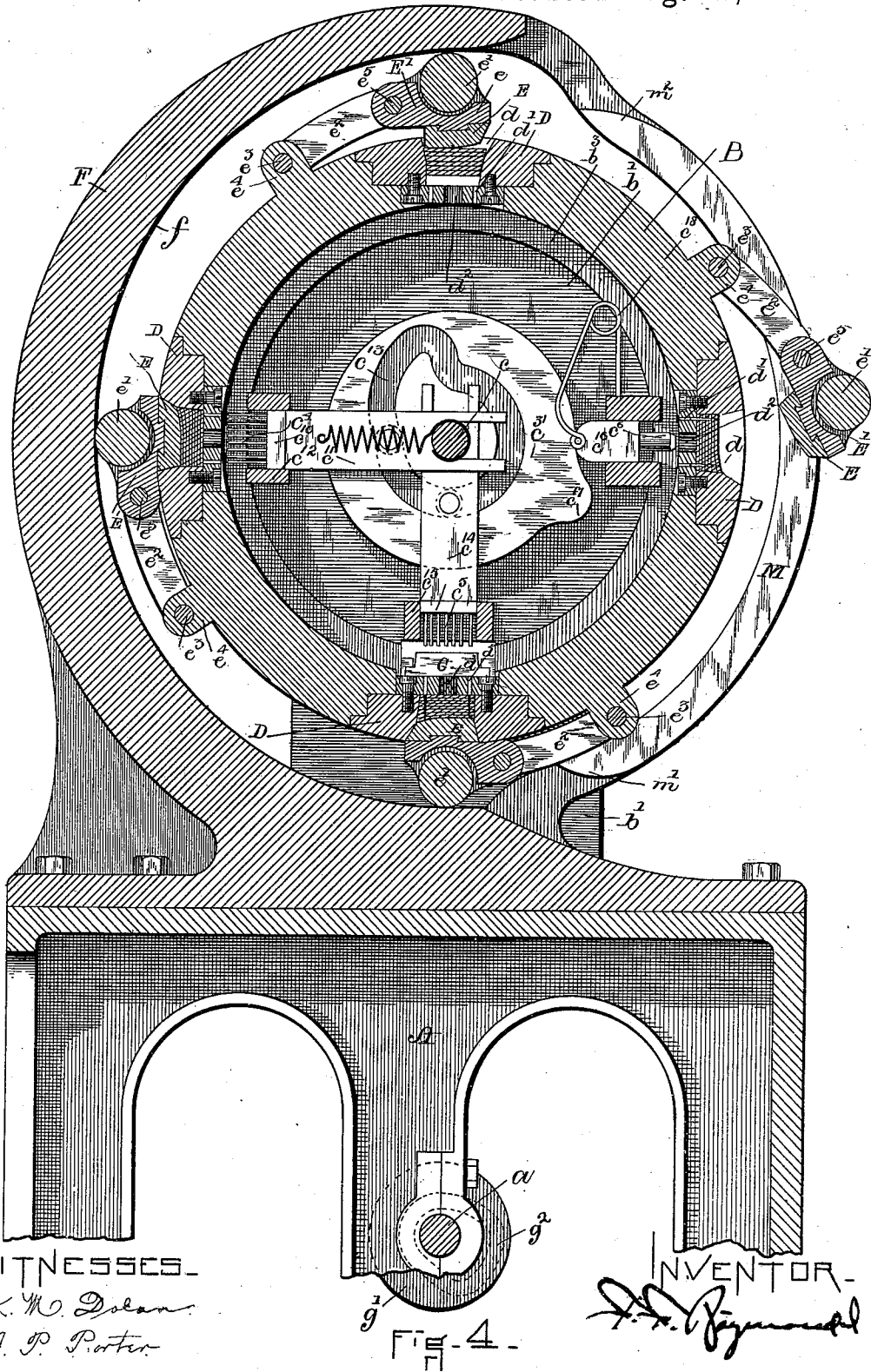
4 Sheets—Sheet 4.

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HEEL COMPRESSING AND LOADING MACHINE.

No. 544,771.

Patented Aug. 20, 1895.



UNITED STATES PATENT OFFICE.

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

HEEL COMPRESSING AND LOADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 544,771, dated August 20, 1895.

Application filed July 27, 1889. Serial No. 318,944. (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 Compressing and Loading 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 an apparatus for compressing and loading heel-blanks comprising the rotary cylinder carrying one or more compressing-dies and former for each die movable in relation to its cavity by means of a suitably-shaped bearing-abutment, against which the former is brought in contact as the die is rotated; also to an arrangement within the cylinder carrying the die-blocks or apparatus for pricking holes in the heel-blank from the die.

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

In the drawings, Figure 1 is a view in front elevation of the central and upper parts of the machine. Fig. 2 is a vertical section of the said central and upper parts of the machine, taken from side to side thereof. Fig. 3 is a view in elevation of one side of the central and upper parts of the machine. Fig. 4 is a vertical section thereof taken from front to back of the machine.

A is the base of the machine.

α is the shaft to which preferably power is communicated.

B is a cylinder provided with bearings b upon the brackets b' b^2 , which brackets are bolted to the bed of the base and have inward-extending circular sections b^3 , which serve as bearing pieces or trunnions upon which the cylinder B is rotated. The cylinder has the cavity C, and across this cavity there extends a shaft c , which has bearings in the brackets b' b^2 at c' c^2 , and which carries a cam c^3 for operating the gang of awls c^4 , the gang of drivers c^5 , and the ejector c^6 . The shaft c is rotated by means of the gear c^7 upon one end thereof, the intermediate gear c^8 , and the gear c^9 upon the shaft α .

The cylinder B is represented as carrying

the four die-blocks D, each of which has the die-cavity d and the perforations d' , through which the awls, nails, and drivers are moved, and the hole d^2 , through which the ejector c^6 passes in throwing the loaded heel-blank from the die. These die-blocks are fastened in recesses or holes formed in the cylinder in any desired way, and there is attached to the cylinder, to be rotated with it, a former E for each die-block. This former is removably secured to a former-carriage E', which comprises a block e carrying an antifriction-roll e' , and preferably secured to the cylinder by means of a link e^2 , pivoted at e^3 to a lug e^4 , and connected by a pivot e^5 with the block e . The block has bearings e^6 for the shaft of the roll e' . (See Fig. 2.)

F is the pressure-applying plate or abutment. It is secured to the base of the machine and has a surface f which is placed eccentrically in relation to the circle or path upon which the outer edge of the cylinder B rotates to cause the former-carriage E' and the formers to be moved gradually inward as they travel or move in relation to the same, the rolls e' of course bearing against the said surface f in successive order. The awls c^4 are mounted upon a block c^{10} , which is removably secured to the plunger or slide c^{11} . This slide is arranged to be reciprocated in a suitable bearing-hole in the cross-plate c^{12} by means of the cam-groove c^{13} in the cam-disk c^8 . The slide also has a bearing upon the shaft c , the end of the slide being formed as a yoke to straddle the shaft. The drivers c^5 are also removably secured to a slide c^{14} . This is also reciprocated by the cam-groove c^{13} , and, like the slide c^{11} , it has a yoke which straddles the shaft c . The slide c^{14} also has a bearing in the cross-plate c^{15} . The ejector c^6 is mounted upon a slide-block c^{16} and is moved by the cam projection c^{17} outwardly, and is returned by the spring c^{18} . Nails are fed to the holes or perforations of the die by means of the nail-carrier G, which is automatically moved through the hole g in the bracket b' to a position to deliver nails beneath the driver and into the holes of the die-block, which shall then be beneath it. It may be automatically moved in any desired way, and I have represented it as so moved by means of a cam-disk g' upon the shaft α , having a cam-groove g^2 , the slide-

arm g^3 , the right-angle lever g^4 , pivoted at g^5 and connected at its upper end by means of a stud g^6 with a slotted hanger g^7 attached to the plate g^8 carrying the nail-carrier. The nail-carrier is supplied automatically with nails from the nail-supplying apparatus H, which preferably consists essentially of these elements: A number of pairs of nail pointing and severing rolls H^1 ; wire-feeding rolls h , adapted to feed a number of wires and to make simultaneously, or practically simultaneously, a nail from the end of each wire; a nail-receiving block h' , which is automatically moved to bring its holes in register with the throats through which the nails are delivered from the rolls, and which is automatically returned to deliver its nails to the distributor H^2 , and the said distributor adapted to receive the nails from the nail-receiving block and to deliver them to a nail-carrier. These features are described in an application for Letters Patent of the United States of even date herewith, and I would say I prefer to use this form of automatic nail-supplying device because, by making nails from a number of wires, I am enabled to produce a large number very quickly, substantially as quickly as they are needed for use in the machine. I would not be understood, however, as limiting myself to this particular form of nail-supplying mechanism.

Each former-carriage E' preferably has in addition to the roll e' a roll m attached to one end of the shaft of the roll e' and which serves in connection with a side guide M extending from the point m' to the point m^2 (see Fig. 4) to hold the former and former-carriage open or away from the die during the movement of each die from its lowest position to very nearly its highest position, so that the die is open or uncovered automatically both to permit the loaded heel-blank to be ejected therefrom and also the insertion of a new blank to be formed and loaded.

The machine preferably is organized to stop at each quarter-revolution of the die-cylinder. The cylinder is represented as alternately rotated and brought to rest by means of a feed-pawl N, mounted upon the lever n , which is pivoted upon the shaft c , the crank n' , and the connecting-rod n^2 , the crank imparting to the lever an oscillating or reciprocating movement, first causing the pawl n to engage with one of the four notches n^3 in the side of the cylinder and then moving it forward a quarter of a revolution, so that for every full revolution of the crank n' the die-cylinder is moved a quarter-revolution in half the time of the revolution of the crank and is at rest for the remainder of the time. I would say that I do not confine myself to this particular mechanism for rotating the cylinder but may use any mechanical equivalent therefor.

In operation the heel-blanks are placed in the dies in successive order, and upon the rotation of the cylinder the former is caused to be moved forcibly against one end of the same

by the movement of the cylinder in relation to what may be called the "curve compressing wedge or cam" f , and this movement of the dies to secure the compression of the heel-blanks brings each compressed heel-blank in turn in line with the gang of awls and with the nail-loading devices, and each heel-blank is first submitted to the operation of the awls c^4 , which while the die-cylinder is at rest makes a rapid movement through the holes in the die-block and pricks the heel-blank while it is under compression. The cylinder is then moved, bringing the compressed but unpricked blank in line with the awls, while the compressed and pricked blank is moved into position to be loaded, and the cylinder coming to rest the awls operate to form the holes in one blank while the drivers are actuated to drive the attaching-nails into another blank. The nails have previously been automatically fed by the nail-carrier into a position beneath the drivers. A further rotation of the cylinder causes the heel-former to be released from the die and to be automatically removed from it to open the die and bring a loaded heel-blank before the ejector, a pricked and compressed heel-blank beneath the drivers, and a compressed heel-blank in line with the awls, and at the next operation of the machine a loaded heel-blank is ejected from the die, a compressed and pricked heel-blank is automatically loaded, and a compressed heel-blank pricked.

It will be observed that the pressure upon the heel-blank from the first action of the former during the pricking by the awls and the loading by the drivers is continuous, and that it may be varied as to intensity by varying the inclination or relation of the wedge or cam surface f in relation to the cylinder; that this produces a very powerful and slow and continuous compression which produces a very-nicely compressed heel-blank. It will be observed, further, that the awls and drivers are worked from the interior of the die-carrying cylinder.

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

1. In a heel compressing machine, the combination with a movable die support, of one or more die blocks carried thereby, a former for each die pivoted to said movable support and adapted to compress the heel blanks in said dies, and a cam in proximity to said movable die support against which the said formers bear during a portion of their travel and are thereby forced into said dies, substantially as described.

2. In a heel compressing machine, the combination with a rotary cylinder, of one or more dies mounted thereon, a former for each die carried by said cylinder and arranged in proximity to said die, a cam arranged eccentrically to the said cylinder against which the formers are moved as the cylinder rotates, and a reciprocating gang of awls co-operating

with said dies and formers, substantially as described.

3. In a heel compressing and loading machine, the combination with a rotary cylinder, of one or more dies mounted thereon, formers for said dies carried by said cylinder and arranged in proximity to said dies, a cam placed eccentrically to the path of movement of the cylinder, against which the formers are moved as the cylinder rotates, and a reciprocating gang of awls and a reciprocating gang of drivers co-operating with said dies and formers, substantially as described.

4. In a heel compressing and loading machine, the combination with a rotary cylinder, of one or more dies mounted thereon, a former for each die carried by said cylinder, a cam arranged in proximity to said cylinder against which the formers are moved as the cylinder rotates, and a reciprocating gang of drivers co-operating with said dies and formers, substantially as described.

5. In a heel compressing and loading machine, the combination with a rotary cylinder, of one or more dies mounted thereon, a former for each die carried by said cylinder, a cam arranged in proximity to said cylinder against which the formers are moved as the cylinder rotates and a reciprocating gang of awls, an automatic nail supplying apparatus, and a reciprocating gang of drivers, all co-operating with said dies and formers, substantially as described.

6. In a heel blank forming machine, the combination with a rotary cylinder, of one or more dies mounted thereon, a former for each die pivotally mounted on said cylinder in proximity to said dies, a cam eccentrically placed relatively to said cylinder, against which the pivoted formers move as the cylinder rotates, a reciprocating gang of awls and a reciprocating gang of drivers co-operating with said dies and formers to form a heel blank, a heel blank ejector, and means for actuating said awls, drivers and ejector, substantially as described.

7. In a heel compressing and loading machine, the combination with a vertically rotating cylinder having one or more dies mounted in its periphery, of formers co-operating with said dies, carriages for said formers, connected with said cylinder, rollers mounted in said carriages, and a cam arranged in proximity to said cylinder against which said rollers bear as the die cylinder rotates, and causes the said formers to be forced into the dies.

8. In a heel compressing and loading machine, the combination with a moving die support, of a series of dies mounted thereon, a former in proximity to each die, a carriage for each of said formers and a link connecting said carriages, with the die support, substantially as described.

9. In a heel compressing and loading machine, the combination with a rotary die carrying cylinder, of a movable former mounted on said cylinder, a cam arranged in proximity

to said cylinder so as to force the movable former into the die, and a guide to engage a projection on the said former and lift it from the die during a portion of the travel of the cylinder, substantially as described.

10. The combination of the rotary die cylinder having one or more die blocks mounted thereon, the formers movable in relation to the die block and adapted to hold the heel blank in the die cavity during the pricking and loading thereof, and a reciprocating gang of awls, and a reciprocating gang of drivers and their actuating devices contained in the cavity of the cylinder and adapted to be moved outward from its center to operate to prick the heel blank, and to drive the attaching nails therein, substantially as described.

11. The combination of the rotary cylinder having one or more die blocks mounted thereon, a former for holding the heel blank in the die during the operation of the nail driving devices, and a reciprocating gang of drivers contained in the cavity of the cylinder, and a nail carrier for presenting nails to the nail driving devices, as and for the purposes described.

12. In a heel compressing, pricking and loading machine, the combination with a rotary carrier supporting one or more dies and means for automatically turning it to present the dies with their contained heel blanks successively to the pricking and loading devices, of formers mounted on said rotary carrier adjacent to said dies, means for moving said formers toward the die cavities, a gang of awls and a gang of drivers and means for automatically reciprocating said awls and drivers in relation to said die or dies.

13. In a heel compressing and loading machine, the combination with the block carrying cylinder, of the die blocks mounted thereon, the formers for compressing the heel blank arranged adjacent to said die blocks, the gang of awls c^4 , the gang of drivers c^5 and their supporting blocks arranged to move toward and from said die blocks, the cam c^8 having the cam groove c^{13} and the cam pins connecting the supporting blocks c^{10} , c^{14} with said cam groove, substantially as described.

14. In a heel compressing and loading machine, the combination with the vertically rotating die block carrier, of a reciprocating gang of drivers c^5 , a cam c^8 for automatically moving said drivers toward and from the die blocks, an automatic nail carrier G to carry nails from a nail supplying apparatus to the said gang of drivers, and the nail supplying apparatus adjacent to said nail carrier.

15. In a heel compressing and loading machine, the combination with a nail carrier G arranged in proximity to the nail drivers, of the cam g' having a cam groove g^2 , and means for driving said cam, the slide g^3 connected with said nail carrier G, and the lever g^4 connected with said slide g^3 and operated by the said cam g' to reciprocate the nail carrier G, substantially as described.

16. In a heel compressing and loading machine, the combination with a cylinder or carrier provided with notches n^3 and having die blocks mounted thereon, of the former carriage E' carried thereby, the formers E mounted on said carriage, the cam or spiral wedge f arranged adjacent to said carrier so as to act on said formers E, the pawl N adapted to engage the notches n^3 , and the pawl lever n , crank n' and link n^2 , for actuating said pawl, to N, substantially as described.

FREEBORN F. RAYMOND, 2D.

In presence of—

J. M. DOLAN,

A. P. PORTER.