

(No Model.)

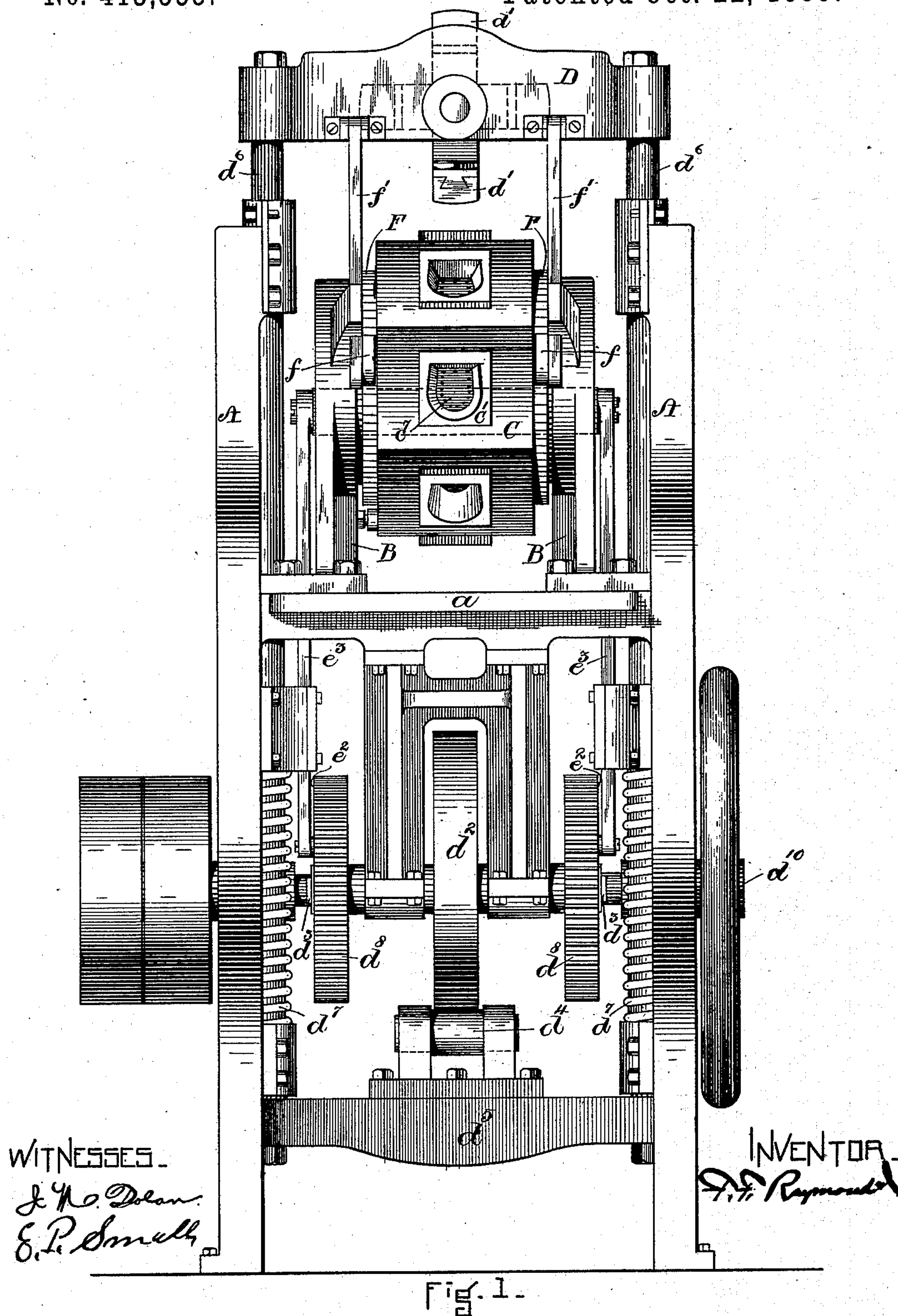
4 Sheets—Sheet 1.

F. F. RAYMOND, 2d.

HEEL FORMING AND LOADING MACHINE.

No. 413,553.

Patented Oct. 22, 1889.



N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.)

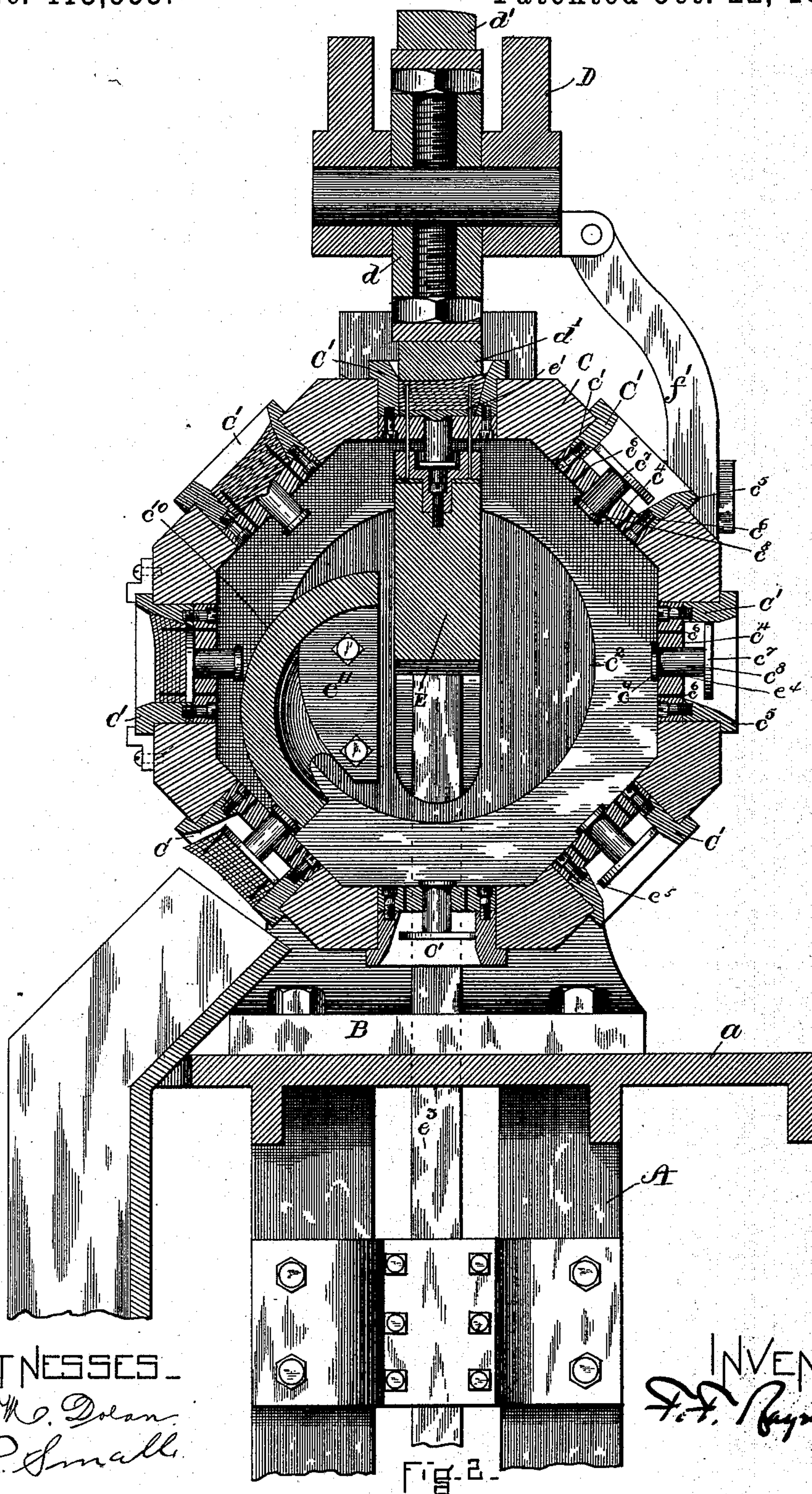
4 Sheets—Sheet 2.

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WITNESSES

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Fig. 2.

(No Model.)

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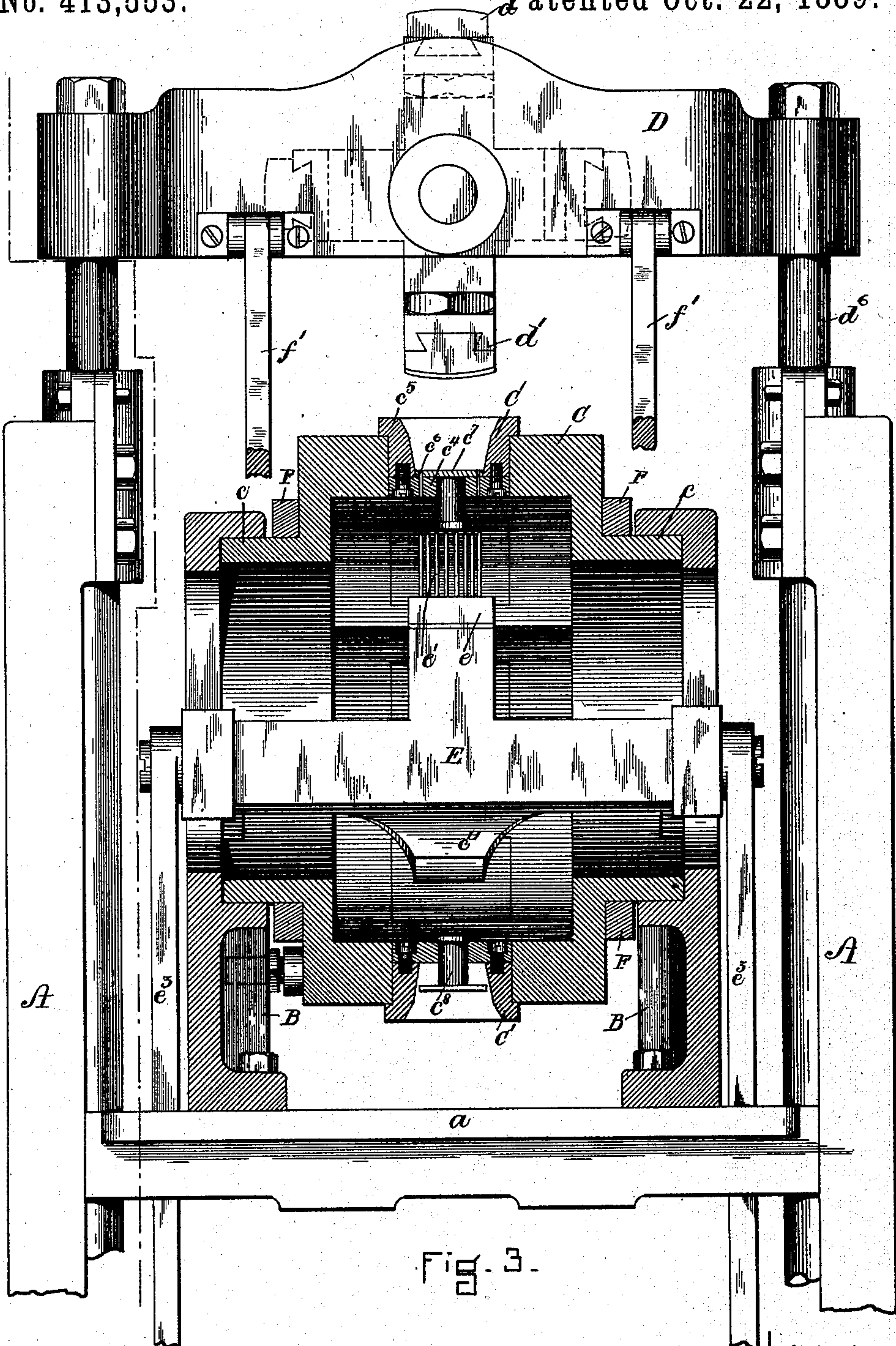


Fig. 3.

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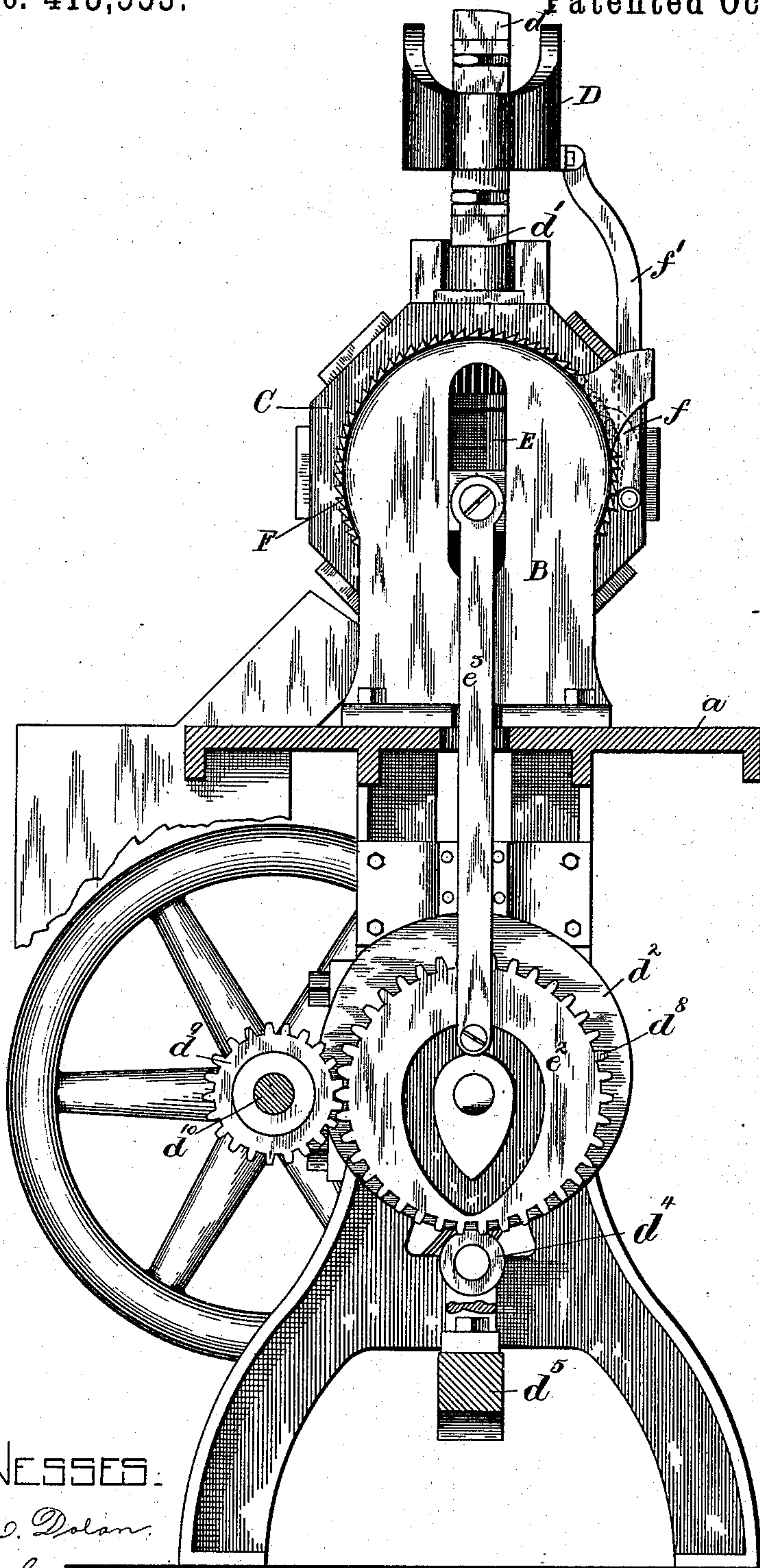
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Fig. 4.

UNITED STATES PATENT OFFICE.

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

HEEL FORMING AND LOADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 413,553, dated October 22, 1889.

Application filed March 8, 1888. Serial No. 266,577. (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 Forming 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 description, in explaining its nature.

The invention is an improvement upon that described in my patent, No. 376,754, dated January 24, 1888; and it comprises means whereby the heel-blank is compressed, and while held compressed is immediately punctured or pricked by the operation of a gang of awls which are caused to enter the heel-blank while it is held compressed, the movements of the compressing-block and of the awls being obtained from one shaft through the medium of cams or analogous instrumentalities and suitable connecting devices.

It further comprises the combination of the compressing-block or former operated by a cam or equivalent mechanism, whereby it is caused to rest at the end of its compressing movement, while the awls are caused to enter the heel-blank to prick or puncture it, with said awls also operated by a cam or equivalent device for causing their movement to take place, as above specified, with a carrier having a number of die-blocks, which are adapted to be moved successively into operative position with the formers and the awls.

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

In the drawings, Figure 1 is a view in front elevation of a machine having the features of my invention. Fig. 2 is a view in vertical section across the machine from front to back, showing the central and upper parts of the machine enlarged as compared with Fig. 1. Fig. 3 is a view, part in vertical section from side to side of the machine and part in front elevation, of the central and upper parts of the machine, enlarged to further illustrate its construction and operation. Fig. 4 is an elevation to the right of the dotted vertical line of Fig. 1.

A is the frame of the machine.

a is a table or bed, upon which is erected a bracket or support B for the rotary die-carrier C.

D is a reciprocating head. It preferably carries a rotary head d , having a number of arms, each of which supports a heel-seat former d' . The reciprocating head D, instead of being reciprocated by means of a crank and pitman, as described in my said patent, is moved by a cam d^2 upon the shaft d^3 , this cam bearing upon an anti-friction roll d^4 , carried by the lower cross-head d^5 , and the lower cross-head is connected with the upper cross-head D by means of the rods d^6 . The cam d^2 is preferably an edge cam and is so represented, and is shaped to move the cross-head D downward quite rapidly, and to hold it depressed for a portion of its rotation and then permit it to be returned to its original position by the springs d^7 . The shaft d^3 is connected with the pulley-shaft by means of the gears d^8 on the shaft d^3 , and the gears d^9 on the pulley-shaft d^{10} . The die-carrier C is hollow and has the large cylindrical bearings or trunnions c at each end, which are supported by bearings upon the brackets B, (see Fig. 3,) and it supports the die-blocks C' , which are carried in the holes c' , formed therein, and are secured to it by bolts or in any other desired way.

In the cavity or space c^2 of the carrier C, I have arranged a cross-head E, (see Figs. 2 and 3,) which supports the block e , carrying the gang or group of awls e' . This cross-head E is moved or reciprocated by means of two cams e^2 —one in each of the sides of the gear-wheel d^8 —and these cams are connected with the cross-head E by means of actuating-rods e^3 . The cams are so timed as to lift the cross-head, and therefore the awls, while the cross-head D is stationary in its depressed position, and preferably to withdraw them before the cross-head D begins to lift or has lifted any appreciable extent. The die-carrier C is adapted to be automatically turned to move one die out of operative position with the former and awls and another die into operative position therewith upon the upward movement of the cross-head D, and after the awls have been withdrawn from the die by

means of the ratchet-wheels F upon the die-block carrier C and the slide-bars f , carrying pawls f' , which engage the ratchet-teeth of the ratchet-wheels, and said pawls are attached to the cross-head D. A certain amount of lost motion is provided between the cross-head and the operating-pawls to permit the cross-head D to be moved upward sufficiently to enable the former to clear the die before the rotation is imparted to the die-carrier C. Each die C' has its end plate c^4 removable from the section c^5 and provided with perforations c^6 . It also has the plate or diaphragm c^7 upon the end of a stud c^8 , which stud extends through a hole in the plate c^4 and has a flange c^9 on its lower end. This stud is longer than the hole, and is adapted to come into contact with the surface c^{10} of the discharger c^{11} upon the rotation of the die-holder, which causes the diaphragm to be moved downward in the die sufficiently to throw or remove the heel-blank therefrom. (See Fig. 2.) This piece c^{11} extends across the cavity c^2 of the die-carrier and is bolted to the brackets B.

In operation the heel-blank is placed in a die and the die-carrier moved to bring the die into operative position with the heel-former and awls, and the heel-former is then caused to descend, compressing the heel-blank in the die and resting at the end of the downward movement. The awls e' have meanwhile been moved upward by the cross-head E and now enter the heel-blank, forming the holes therein, and are withdrawn therefrom, and at the same time the heel-seat former is moved upward, and the die-carrier C upon the clearing of the awls and heel-seat former from the die is rotated to bring the next die in order into operative position with the former and awls. The awl-holding block e has a cavity or hole e^4 of sufficient size to receive the end of the stud c^8 when the awls are in their highest position. (See Fig. 2.) The awl-block is removed from the cross-head E through any one of the holes c' , formed in the carrier C, and is attached to the cross-head E by means of a screw e^5 . (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 heel-blank compressing and pricking machine, the combination of a solid die-block C' , having a die-cavity with an enlarged mouth and perforations or holes in its bottom, through which the awls are adapted to be driven, a support for the die-block, a heel-former, and means, as set forth, for operating the same—such as a cam—and suitable connecting mechanism, substantially as described, whereby it is moved toward the cavity of the die and then held stationary, and a gang or group of awls movable to enter the holes of the die-block while the heel-blank is held compressed in the cavity thereof by the former, as and for the purposes described.

2. In a heel-blank compressing and pricking

machine, the combination of a solid die-block C' , having a die-cavity with an enlarged opening and a bottom having holes or perforations through which the awls are driven, a holder for the die-block, as set forth, a heel-former, a cross-head carrying said former, a cam of the construction set forth for imparting to said cross-head a movement toward the die-block and then holding it stationary for a period of time, a head carrying a block supporting a gang or group of awls upon the side of the die-block opposite that upon which the heel-former is located, and an actuating apparatus connected with the cross-head supporting the heel-seat former, and the cross-head supporting the awl-carrying block, constructed to provide the cross-heads with movements in relation to each other and to the die-block, as specified, and for the purpose described.

3. The combination of the die-block carrier C, the dies C' , carried thereby, the cross-head E, the awl-block e , and the awls e' , supported thereby, the shaft d^3 , the cams d^2 and e^2 , connected with the cross-head E and adapted to impart motion to the cross-head and to the awls, as specified, substantially as described.

4. The combination of the rotary die-carrier C, having the cavity c^2 , the dies C' , supported thereby, the former or compressor d' , controlled as to the time of its operation by a cam, and said cam, the cross-head E, arranged in the cavity c^2 of the die-carrier, the awl-block e , and awls e' , carried thereby, and one or more cams for governing the time of movement of said cross-head E relatively to that of the heel-seat former or compressor d' , substantially as described.

5. The combination of the die-carrier C, having the interior cavity c^2 , and the trunnions c , with the brackets B and the dies C' , supported by said carrier, substantially as described.

6. The combination of a pressure-block or former d' , means for imparting to it alternate movements of reciprocation and rest—such as a cam—a reciprocating gang of awls arranged opposite the pressure-block or former to co-operate therewith upon the same heel, and a heel-blank carrier having a number of heel-blank holders, and means for providing it with a progressive movement in one direction to bring each holder in successive order to a position between the pressure-block or former and the awls, substantially as described.

7. The combination of the cross-head D, the former or pressure-block d' , the lower cross-head d^5 , the connecting-rod d^6 , the cam d^2 , with the cross-head E, the cams e^2 , the connecting-rod e^3 , and the gang or group of awls e' , and the rotary carrier C, the heel-holders C' , supported thereby, the ratchet-wheels F, the pawls f , and the slide-rod f' , connecting them with the head D, substantially as described.

8. The combination of a reciprocating pressure-block or former, a reciprocating gang of awls, a heel-blank carrier, and automatic mechanism, substantially as described, to provide the carrier with a progressive movement in one direction to carry heel-blanks in successive order to a position between the pressure-plate or former and the awls, substantially as described.

FREEBORN F. RAYMOND, 2D.

In presence of—

J. M. DOLAN,
E. P. SMALLS.