

No. 635,196.

C. C. SMALL.
PRESS.

Patented Oct. 17, 1899.

(Application filed May 28, 1898.)

(No Model.)

4 Sheets—Sheet 1.

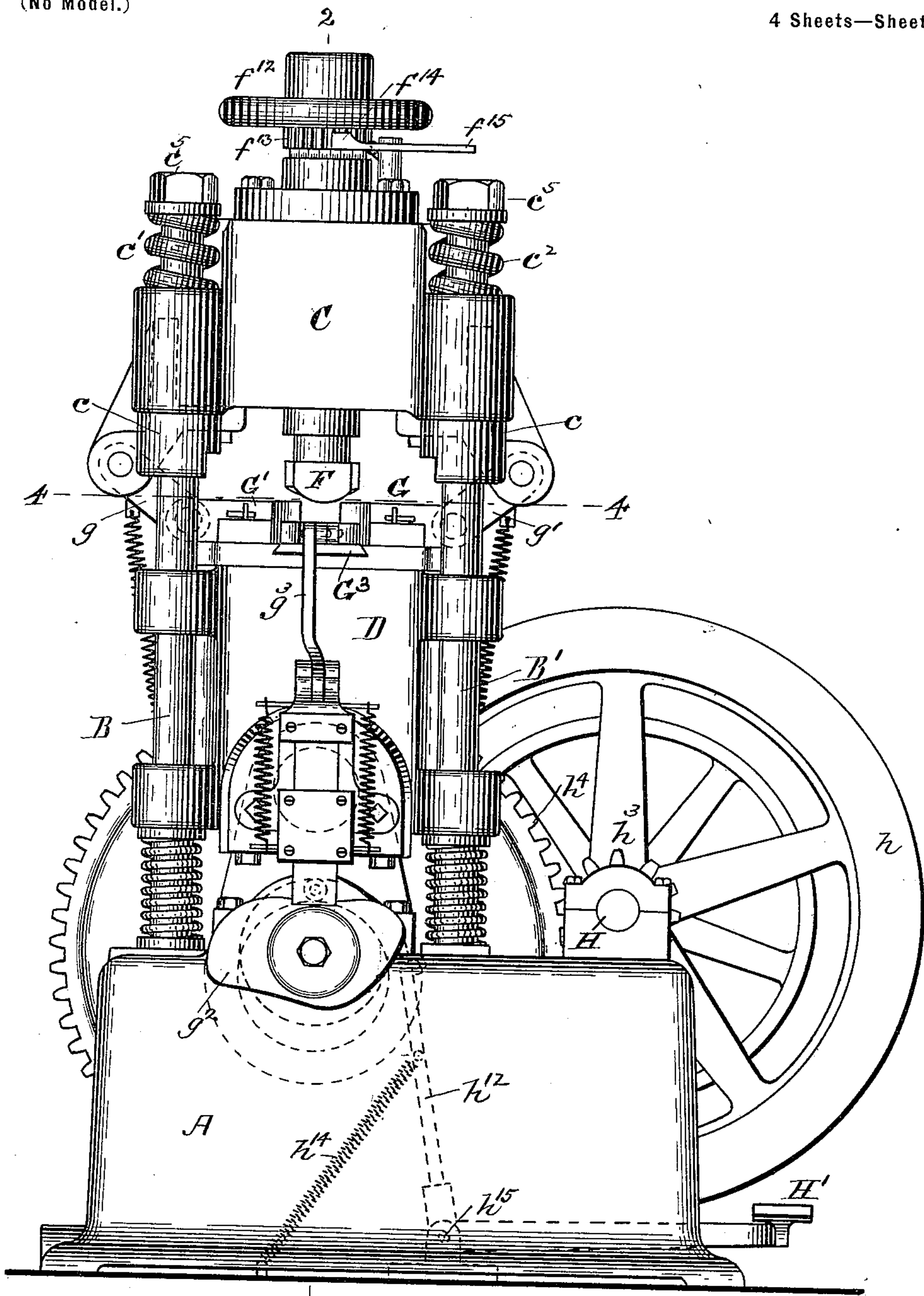


Fig. 1 - .

WITNESSES

WITNESSES
~~W. H. Dyer~~ 2
 J. M. Dyer.

INVENTOR

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4 Sheets—Sheet 2.

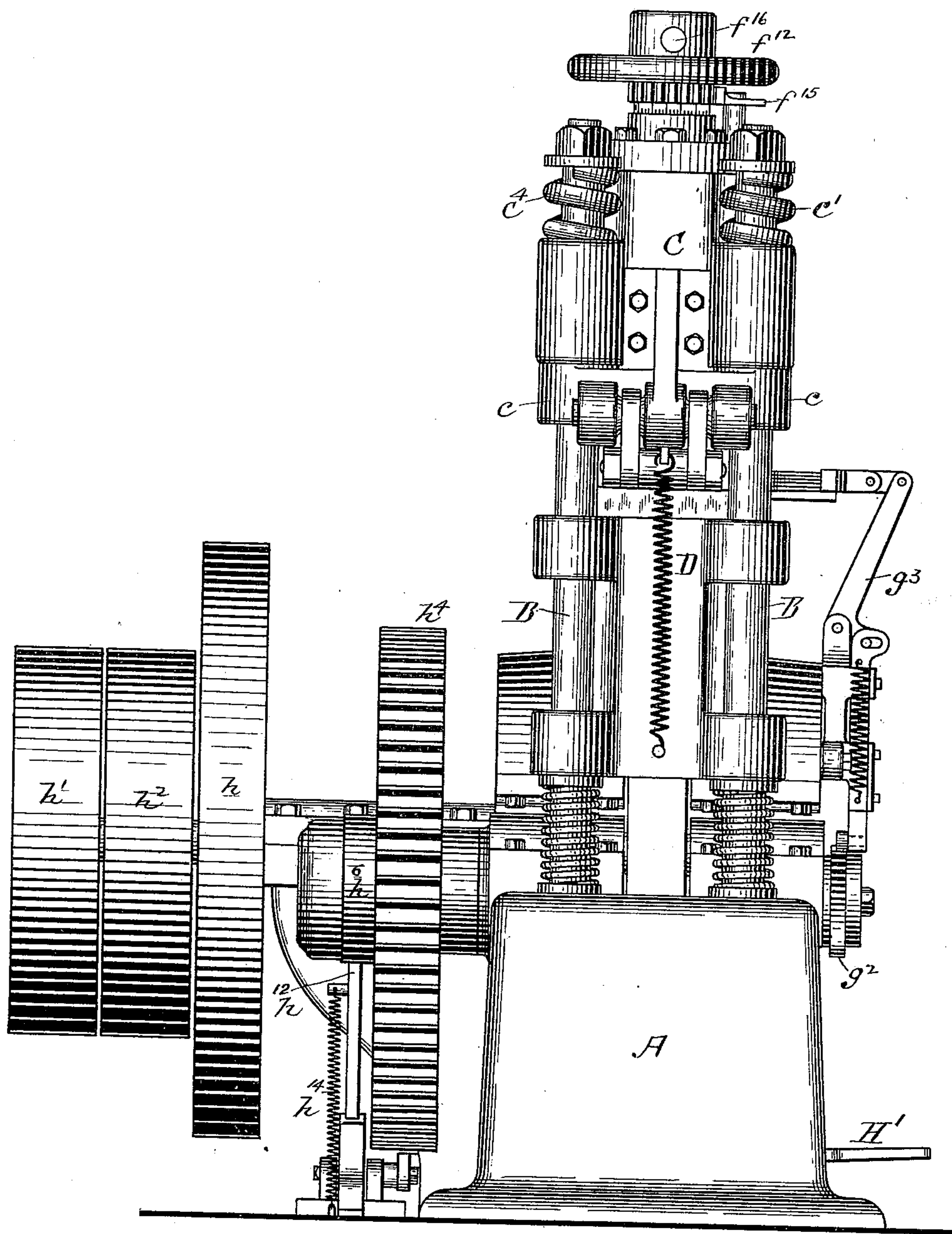


FIG. 2.

WITNESSES

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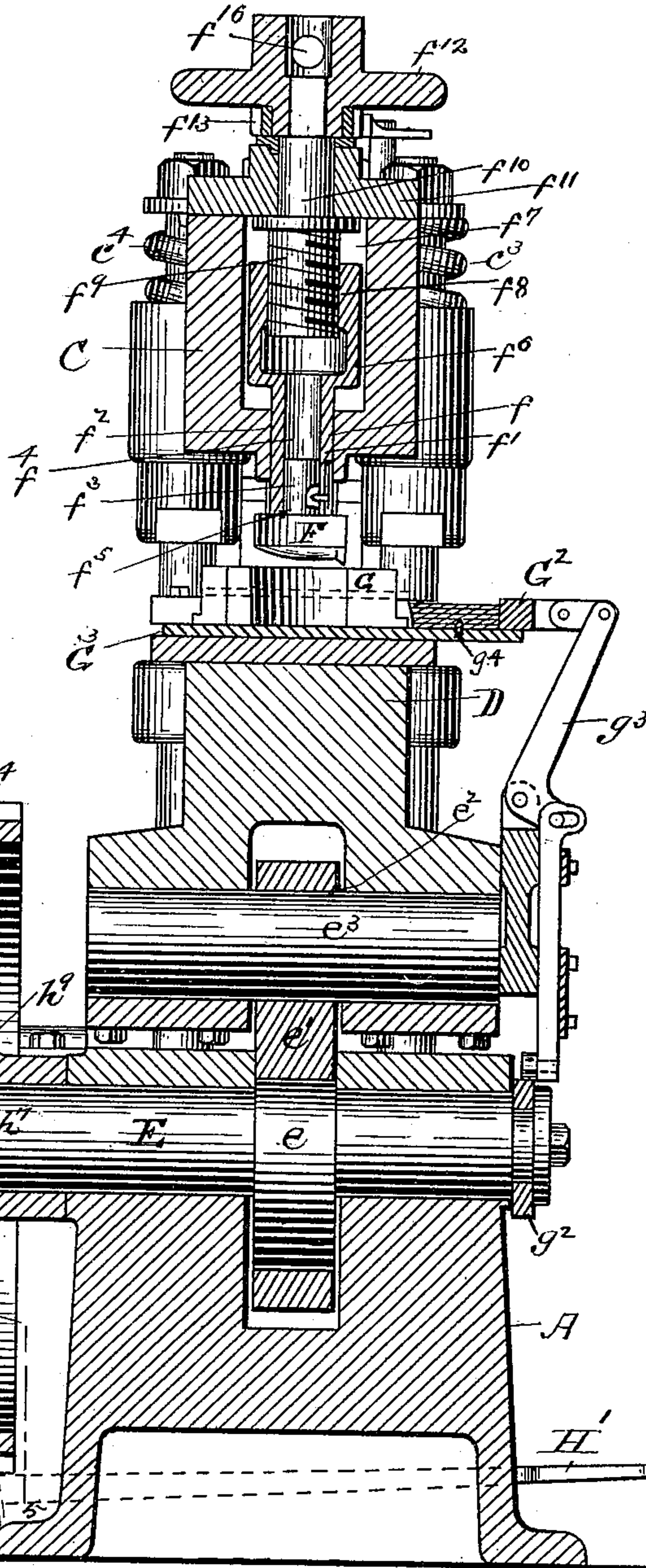
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Chester C. Small

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4 Sheets—Sheet 4.

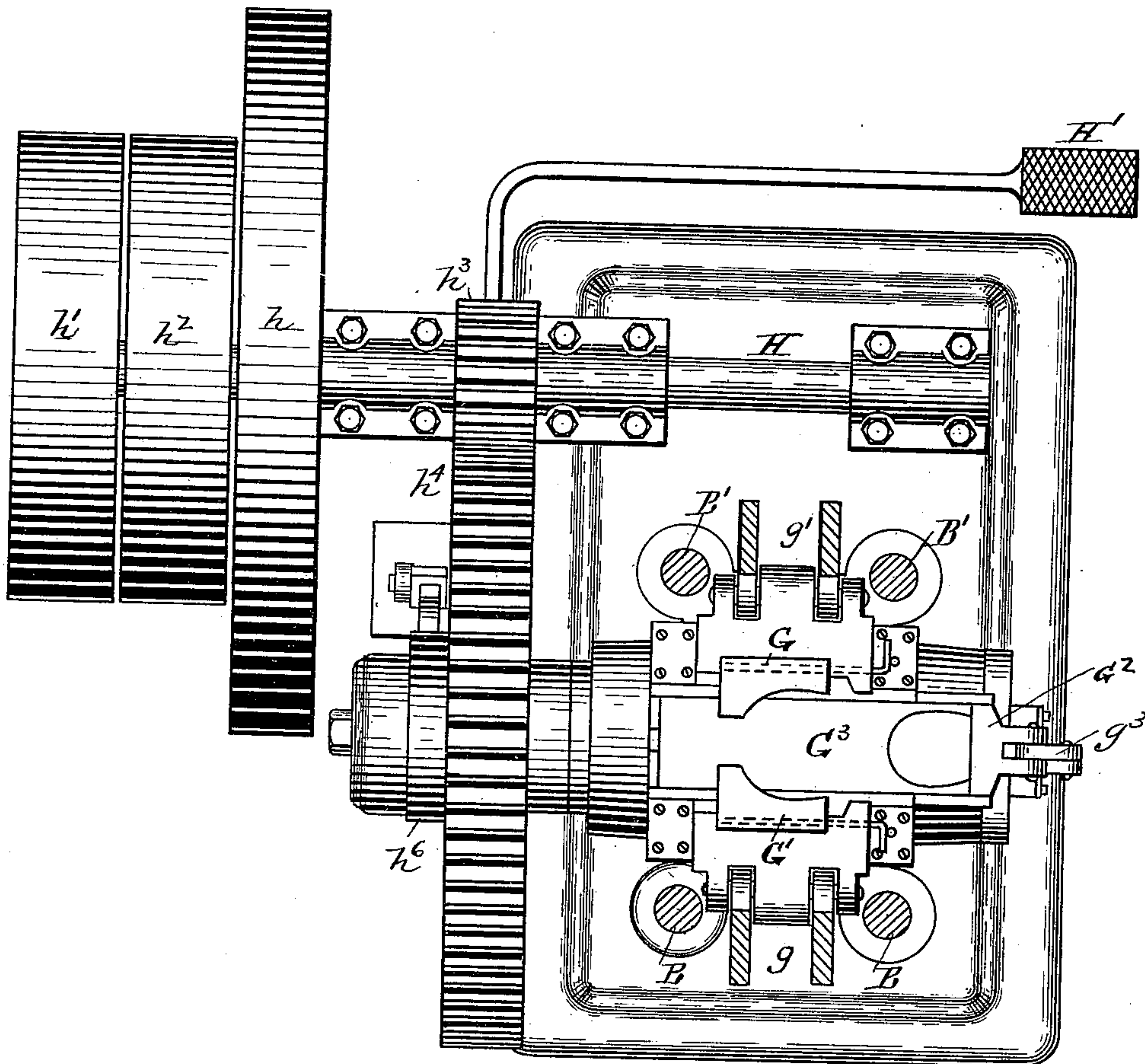


Fig. 4.

WITNESSES

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Chester C. Small

UNITED STATES PATENT OFFICE.

CHESTER C. SMALL, OF NEWTON, MASSACHUSETTS, ASSIGNOR TO THE
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PRESS.

SPECIFICATION forming part of Letters Patent No. 635,196, dated October 17, 1899.

Application filed May 28, 1898. Serial No. 681,994. (No model.)

To all whom it may concern:

Be it known that I, CHESTER C. SMALL, 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 Presses, 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 Patent No. 575,040, granted January 12, 1897, to F. F. Raymond, 2d, and Charles H. Fogg for improvement in presses. The said patented invention describes a press especially adapted for molding or compressing heels. It was organized to run continuously, it fed the heel-blank upon a stationary plate by a horizontally-movable breast-block, and it had no means for relieving an excess of pressure in compressing a hard or thick heel, whereby breakage was prevented. Its former was not readily adjustable to heels varying in height and pressure was communicated to the pressure-head by a cam which lifted it, but did not return it. The present invention seeks to overcome some of the deficiencies occasioned by the said construction, and the machine herein described is provided, first, with a mechanism which compels the stopping of the machine after each heel has been compressed and the compressed heel delivered to an available position, from which it can be removed and an uncompressed heel substituted therefor; second, it also comprises means for starting the machine after the uncompressed heel has been placed upon a carrier; third, it is also provided with an improved means for actuating the pressure-head in both directions; fourth, it is provided with improved devices for vertically adjusting the heel-seat former; fifth, it is provided with means for providing the upper cross-head, which is stationary at ordinary working pressures, with a slight relief yielding movement upon any unusual excess of pressure; sixth, it has improved devices for feeding the heel to the die and for removing it from the die.

Referring to the drawings, Figure 1 is a view in front elevation of the machine pro-

vided with my improvements. Fig. 2 is a view thereof in left side elevation. Fig. 3 is a view thereof, principally in vertical central section, from front to rear. Fig. 4 is a view in horizontal section upon the dotted line 4 4 of Fig. 1 and in plan of parts below said line. Fig. 5 is a view upon the dotted line 5 5 of Fig. 3.

From the base A there extend upward two side pairs of stationary rods B B', which hold at their upper end a head C, commonly stationary, and which also serves to tie the upper ends of the rods together. There is also mounted upon the lower parts of the rods the vertically-movable pressure-head D. This head instead of being actuated by a cam upon the main shaft E of the machine is moved positively upward and downward by the eccentric e upon the said main shaft and the eccentric link or connection e', the lower end of which forms an eccentric-strap and the upper end of which has the hole e², through which a large pin e³, carried by the head D, extends. This construction is an improvement upon the cam and cam-roll of the patented machine in that it is simpler, less expensive, and is positive in both directions, drawing down the head as well as elevating it. The upper head C is mounted upon the rods B B' between the stationary collars c on the rods below the head C and the coiled springs c¹, c², c³, and c⁴ upon the upper ends of the rods B B' above the head, there being one upon each rod and at the corner of the head. Each of these springs is compressed against the head and held by a washer and a compressing and holding nut c⁵, which screw upon the threaded upper end of its rod. The springs are compressed to such a tension as to hold the head C under all ordinary pressures stationary, only permitting said head to yield slightly upon an excess of pressure and for the purpose of permitting the power to act continuously during the compression and also to prevent the machine from breaking.

The head C has suspended from it the heel-seat former F, which is attached thereto by a slide f. The lower end f' of this slide is cylindrical in form and passes through a cylindrical hole f² in the lower part of the head,

and it projects below the under surface of the head and is adapted to receive the pin f^3 of the heel-seat former, which enters a hole f^4 therein, and to permit the upper surface f^5 of the former to bear against its under surface. The slide f has an enlarged cylindrical section f^6 , which is contained in the enlarged cavity f^7 of the head. This enlarged section forms a nut having an interior screw-thread f^8 , and it is adapted to be moved vertically to vertically adjust the heel-seat former by means of the screw f^9 , carried by the head, having a thread which engages the thread of the nut and also having a spindle f^{10} , which projects through the cap-plate f^{11} of the head and is adapted to be turned by the hand-wheel f^{12} , fastened to its upper end. The screw is secured to the cap-plate in a manner to prevent endwise movement. The pitch of the screw-thread, the screw, and the nut is quicker than is commonly employed in order that the heel-seat former may be adjusted by a relatively small movement of the wheel f^{12} and of the screw and also for the purpose of permitting the quick and relatively easy release of the former in case the machine should be substantially stopped by too great pressure. The pitch of the thread is so quick that it is desirable that there be used a lock for locking the screw and heel-seat-former slide after the screw has been moved to adjust the slide, and this lock is represented as obtained by means of a ratchet-wheel f^{13} on the handle or screw-spindle and a detent-pawl f^{14} pivoted to the cap-plate f^{11} to engage the ratchet-teeth and having the handle or arm f^{15} .

The press is represented as provided with the laterally-movable side-compressing dies G G' . These dies are carried upon the vertically-movable head D and are closed and opened by the links g g' , as described in the application Serial No. 619,574, filed January 18, 1897.

The heel is fed toward and from the side dies by the die breast-block G^2 and an under slide-plate G^3 . The breast-block and slide-plate are moved by the cam g^2 and intermediate lever g^3 , in the manner specified in said application, and the breast-block coöperates with the side dies and the die-holders, as described in said application.

The section of the slide-plate G^3 in front of the breast-block G^2 forms the bottom of the die when in its innermost position, and it preferably has one or more spurs g^4 , (see Fig. 3,) upon which the heel is compressed and by which the heel is held to the plate after it has been compressed and during its forward movement from the side dies. The machine is adapted to be stopped, with the breast-block and plate G^3 drawn outward or forward away from the side dies and to a position at the front of the machine, where they remain stationary until the machine is started. This permits the convenient removal at that point of a compressed heel and the safe placing of an uncompressed heel on the plate

in front of the breast-block while the machine is at rest.

The starting and stopping mechanism is applied to the shaft E . This is for two reasons. One is because the said shaft turns slowly as compared with its actuating-shaft H , and therefore offers favorable conditions, and the other is because it starts and stops much less weight than if the balance-wheel were started and stopped for each heel fed and compressed. In other words, it permits the balance-wheel h , the pinion h^3 , and large gear h^4 on the shaft E to be continuously rotated, thereby maintaining the power of the machine and applying it at the closest point to the work. The gear h^4 also forms one member of a clutch, the other member of which is upon the shaft E and is adapted to be thrown into engagement with the gear member by the treadle H' . Any suitable form of clutch may be used. In the one which I have shown the gear h^4 has a central recess h^5 , which fits over portions of an oscillating sleeve h^6 , and this sleeve is mounted upon an enlargement h^7 of the shaft E , and the enlargement is formed by a sleeve or collar shrunk or otherwise attached to the shaft. It has within the recess h^5 the inclined surfaces h^8 , which serve upon the turning of the sleeve h^6 to force or move the rolls h^9 , which are held in the recesses h^5 , between the enlargement of the shaft and the wall of the recess h^5 against the said wall, where they serve to clamp the gear h^4 to the shaft. The rolls are moved to make this engagement by the partial turning of the sleeve h^6 in one direction, and they disengage the gear from the shaft by being moved by the said sleeve in the opposite direction. The rolls are contained between the laterally-extending arms h^{10} of the sleeve, the arms being separated by recesses of sufficient size to contain the rolls. The sleeve h^6 itself is turned upon the enlargement of the shaft by the springs h^{11} upon the withdrawal of the holder h^{12} by the action of the treadle, the said holder operating to hold stationary the said sleeve h^6 with the rolls h^9 out of operative or clutching engagement. The spring h^{11} is a C-shaped spring, one end of which is attached to the sleeve h^6 , its free end tending to hold the parts in engagement against the action of the holder h^{12} . The movement of the holder h^{12} outward or away from the shaft releases the ring h^6 and permits the springs to move it sufficiently to cause the rolls to be forced by the inclines into clutching engagement with the gear-wheel. The holder h^{12} is returned to its original position upon the release of the treadle, and its upper end then comes into line with the shoulder h^{13} of the sleeve and serves to stop further rotation of the sleeve, thereby disengaging the rolls from their clutching relation to the gear-wheel and storing up power in the sleeve-operating springs. The holder h^{12} is automatically moved into this clutching position by the spring h^{14} upon the

release of the treadle. The treadle is pivoted at h^{15} , and the holder is attached to its inner end to project upward from it and to be vibrated by it. This clutch mechanism is not new with me and is well known by those skilled in the art.

In use the heel to be compressed is placed upon the slide G^4 immediately back of the breast-block G^2 while the machine is stationary and when the breast-block and slide are in their foremost positions or in the position represented in Fig. 3. The former F , it will be understood, is stationary. The pressure-head D is then in its lowest position and the side dies are wide open. The operator then puts his foot upon the treadle and, depressing it, causes the machine to be set in operation by engaging the gear-wheel h^4 with the shaft E . The wheel being rotated turns the feed-cam g^2 and the eccentric e , thereby moving inward the plate G^3 and the breast-block G^2 at the same time that the pressure-head D is moved upward. The cam g^2 is so timed that the plate G^3 and the breast-block have completed their inward feeding movement before the head D has reached the end of its upward movement, and this permits the further upward movement of the head D to cause the side dies to be closed upon the breast-block and the heel, and the heel thus held to be brought practically at the same time into contact with the former, whereby the sides of the heel and its lower and upper surfaces are subjected to a simultaneous compression, which shapes the sides and forms a seating-cavity in its upper end. The operation of the machine continuing the head D is moved downward, the side dies opened, and the plate G^3 and breast-block moved forward with the compressed heel, which is then held to the plate by the pointed stud g^4 . The machine then comes to rest and the operator removes the compressed heel from the feed-plate and places another uncompressed one upon it while the machine is at rest.

If a heel is fed which from its density or height would otherwise cause a breakage of parts, the former F and upper head C then yield slightly upward to the excess of pressure over that ordinarily required.

The height of the former is adjusted and fixed by the hand-wheel f^{12} . If the machine should become stuck during its compressing action because of excess of pressure, then the former may be promptly and readily released by unlatching the former-adjusting screw and turning the screw backward either by the hand-wheel f^{12} or by means of a long lever, the end of which may be inserted into the hole f^{16} in the upper part of the screw or the handle. The treadle H' is immediately released upon the starting of the machine that the holder h^{12} may be returned to catch the sleeve and then actuate the clutch and disengage it from the gear h^4 , whereby the machine is stopped at the end of a single rotation of the shaft.

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

1. In a press of the character specified, the combination of the rods B, B' , the head C normally stationary thereon, the relief-springs c', c^2, c^3, c^4 , each surrounding one of said rods and bearing upon the upper side of the head, and spring holding and adjusting nuts c^5 located above said springs, a heel-blank holding and presenting mechanism consisting of a horizontally-sliding plate having a breast-block and opening and closing dies adapted to inclose the sides of the blank, and means whereby said dies are operated, and means whereby said sliding plate is moved horizontally and vertically, all as and for the purposes set forth.

2. In a machine of the character specified, the head C carrying the heel-seat former and means for adjusting and releasing said former, consisting of a vertically-movable block carried by the head, and to which the former is secured said block being provided with a nut having a thread of quick pitch and an adjusting-screw to engage said nut, and means for locking said screw, in combination with means for holding the heel-blank and giving it a vertical movement toward and from said former, as and for the purposes set forth.

3. In a machine of the character specified of the head C , a block supported thereby and adjustable therein, a heel-seat former mounted upon the end of said block, means such as a nut and screw of quick pitch for moving and releasing said block, and a lock for locking the screw in its adjusted position in combination with means for presenting and compressing a heel-blank against said former, as and for the purposes set forth.

4. The combination in a heel-compressing machine of the head C , the former F , the vertically-movable pressure-head D , the opening and closing dies, the sliding plate G^3 , the breast-block G^2 , the shaft E connected with the pressure-head D and with the breast-block and slide-plate to operate them as specified, the constantly-rotating gear h^4 and a clutch between said gear and the shaft, and a treadle for starting the operation of said clutch, as and for the purposes described.

5. The combination in a heel-compressing machine of the former F , the head C , the opening and closing dies, the vertically-movable pressure-head D , the breast-block G^2 and slide G^3 , the shaft E connected with the vertically-movable pressure-head D , and with the breast-block and slide-plate G^3 to operate them as specified, and a stop-motion mechanism adapted to stop the machine with the breast-block and heel in the forward position, the dies in their open position and the pressure-head depressed.

CHESTER C. SMALL.

Witnesses:

F. F. RAYMOND, 2d,
J. M. DOLAN.