(No Model.) 3 Sheets—Sheet 1.

J. A. HORTON.

SOLE PRESSING OR LEVELING MACHINE.

No. 584,590. Patented June 15, 1897.

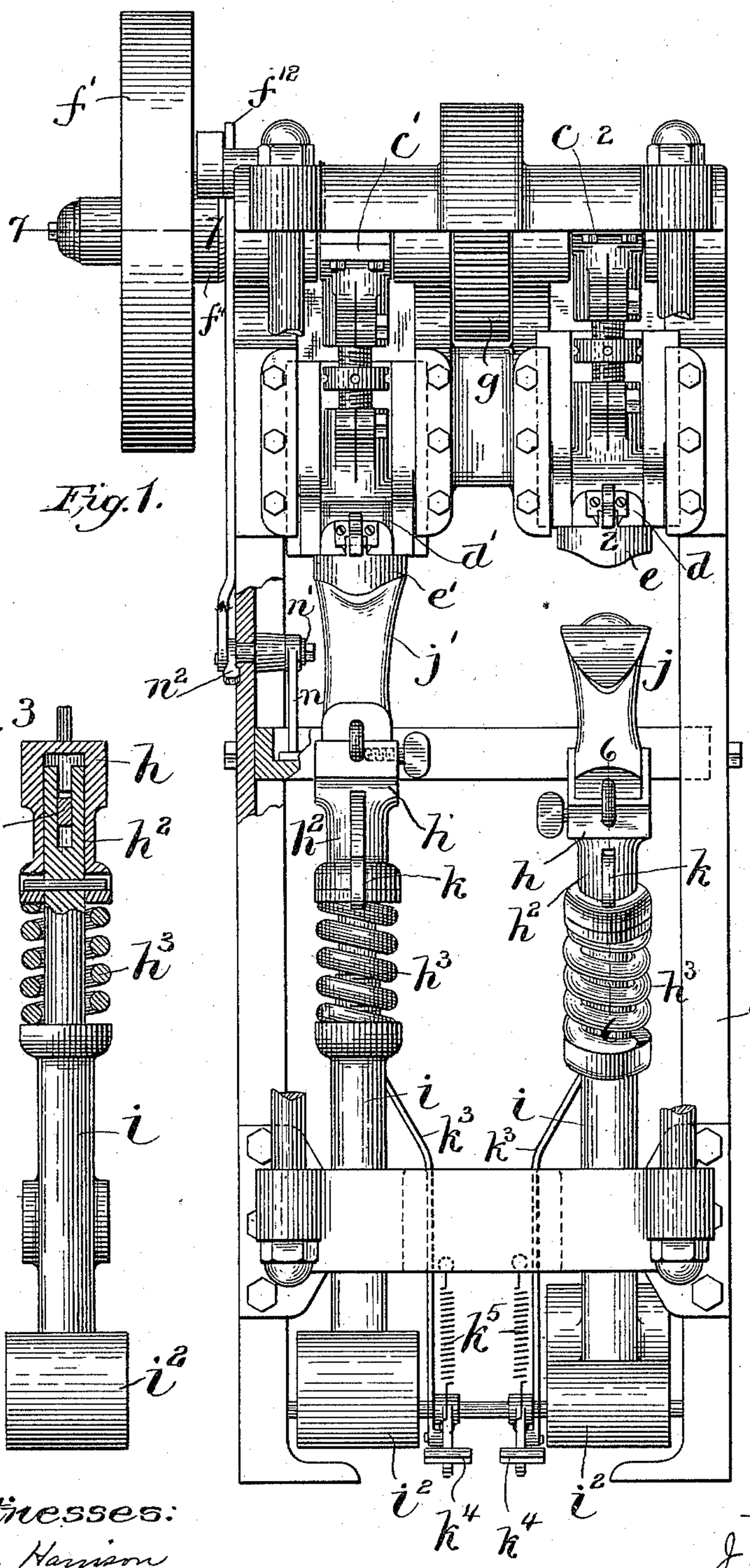

Fig. 1.

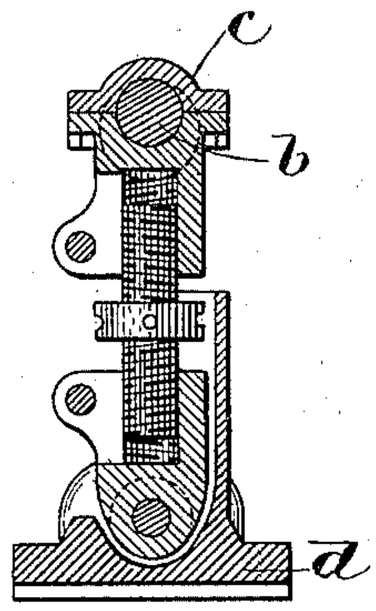

Fig. 2.

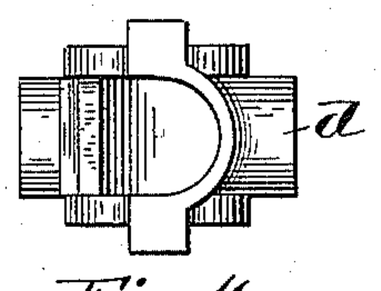

Fig. 4.

Fig. 3

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P. W. Pezzetti

Inventor:
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Attys.

(No Model.) 3 Sheets—Sheet 2

J. A. HORTON.

SOLE PRESSING OR LEVELING MACHINE.

No. 584,590. Patented June 15, 1897.

Fig. 9.

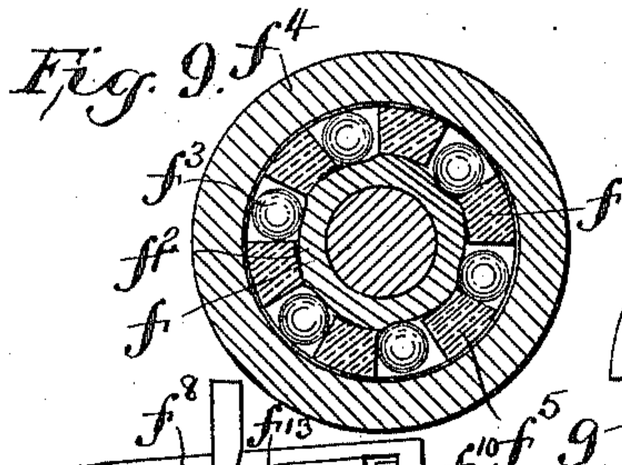


Fig. 8.

Fig. 5.

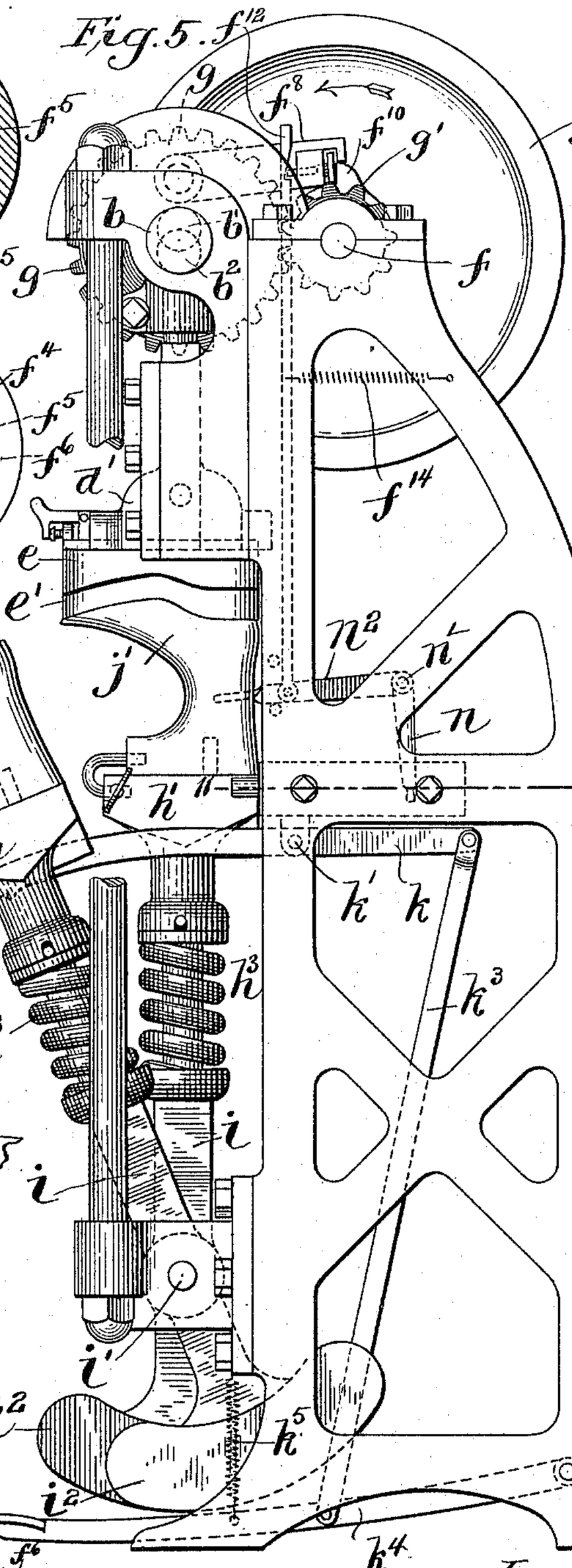


Fig. 10.

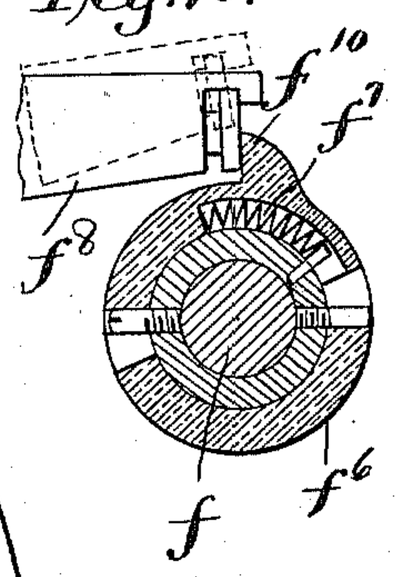


Fig. 6

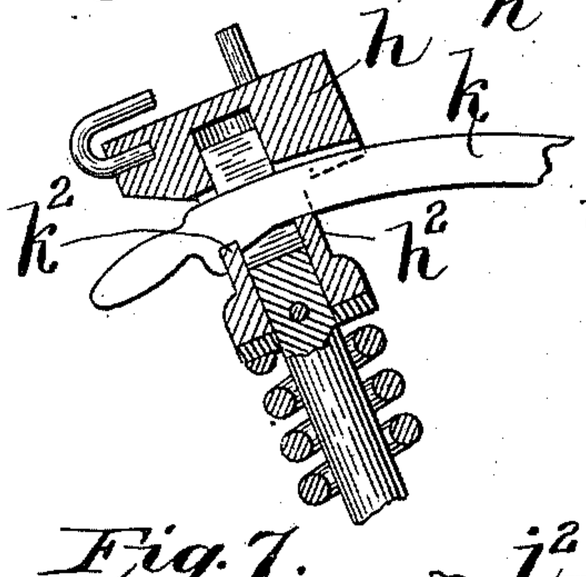
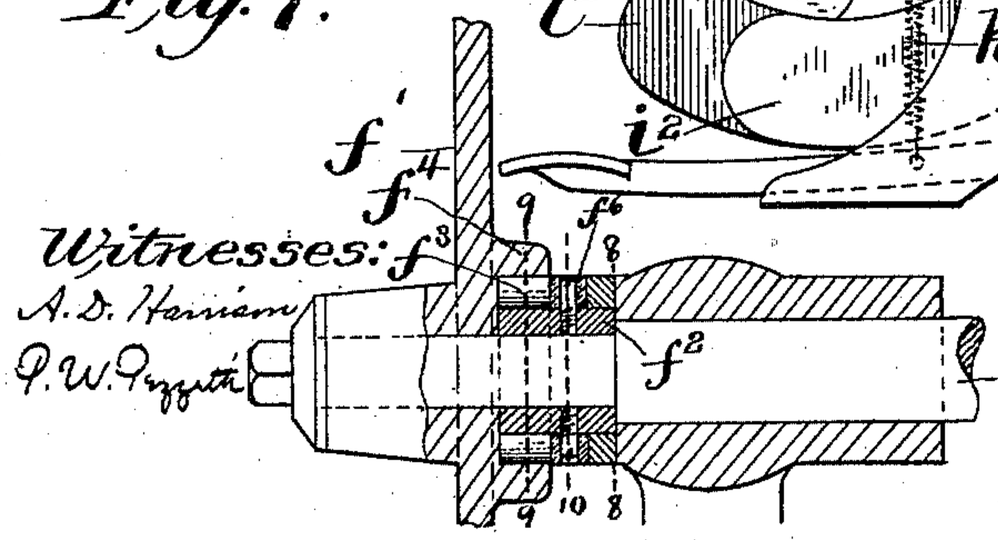


Fig. 7.



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(No Model.) 3 Sheets—Sheet 3.

J. A. HORTON.

SOLE PRESSING OR LEVELING MACHINE.

No. 584,590. Patented June 15, 1897.

Fig. 11.

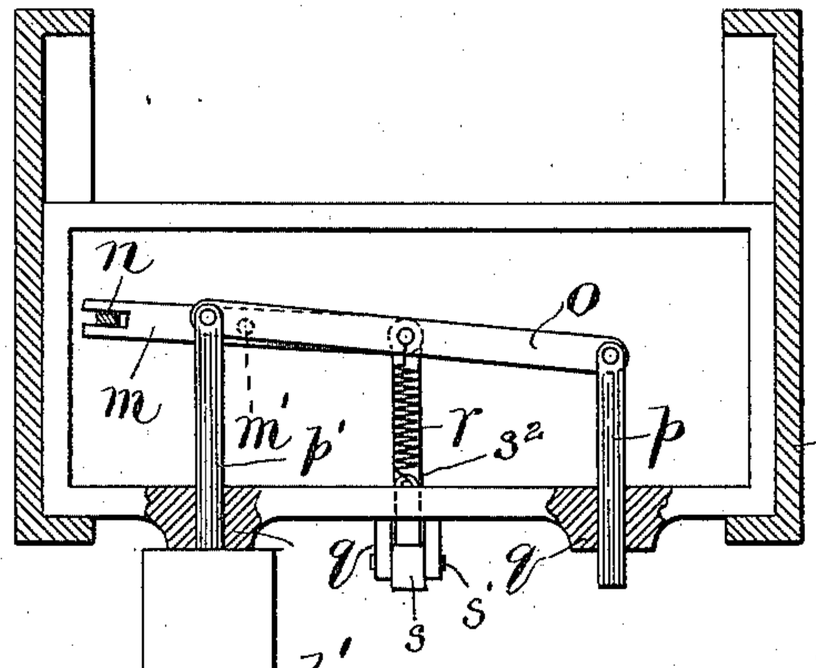


Fig. 12.

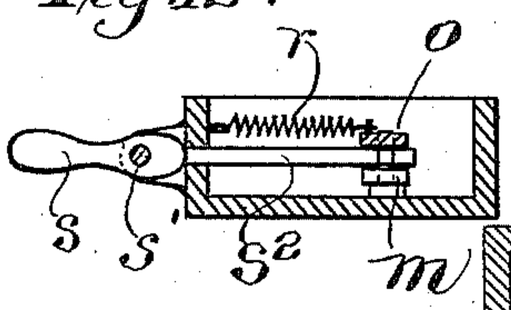


Fig. 12a.

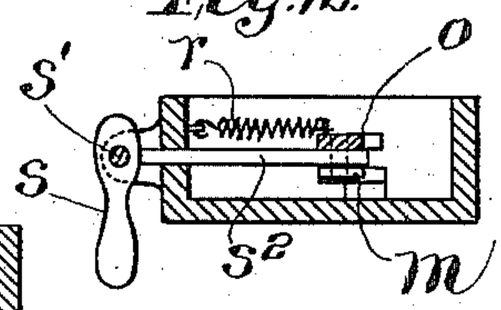


Fig. 11a.

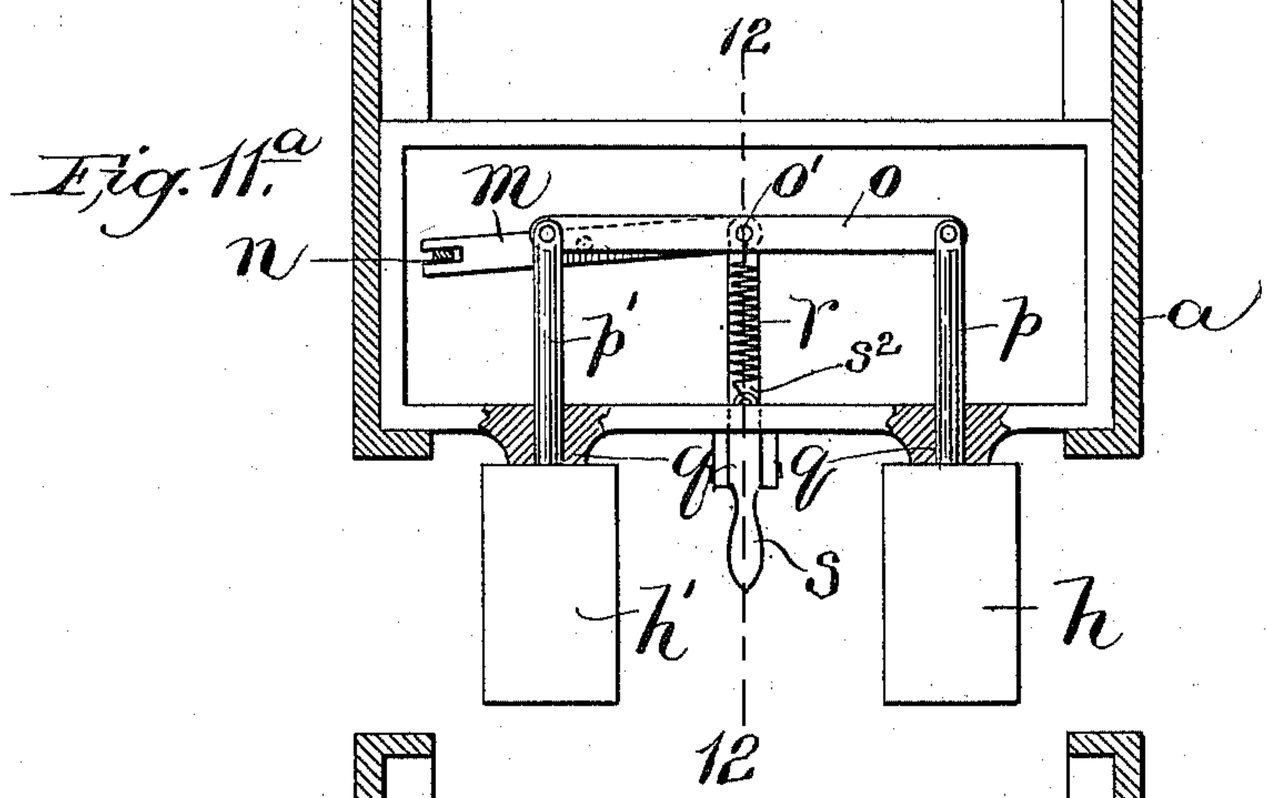
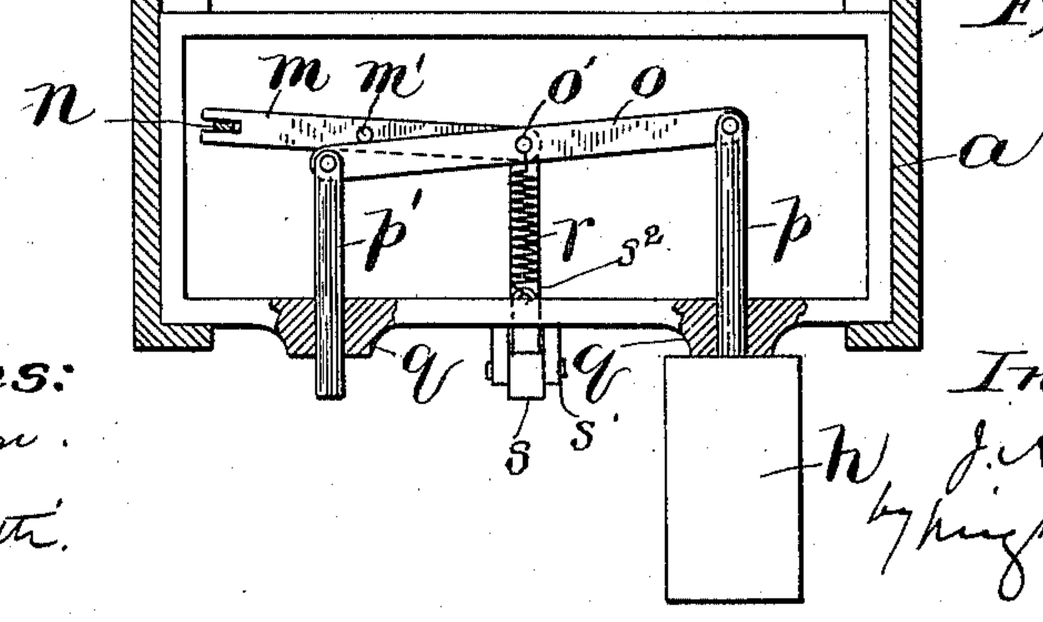


Fig. 11b.



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UNITED STATES PATENT OFFICE.

JAMES A. HORTON, OF READING, MASSACHUSETTS.

SOLE PRESSING OR LEVELING MACHINE.

SPECIFICATION forming part of Letters Patent No. 584,590, dated June 15, 1897.

Application filed September 25, 1896. Serial No. 606,910. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. HORTON, of Reading, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Sole Pressing or Leveling Machines, of which the following is a specification.

This invention relates to direct-pressure machines for beating out or leveling soles of boots and shoes by the use of two molds and two jacks, one mold and jack being in position of pressure while the other mold and jack are separated to permit the removal and application of the work.

The invention has for its object to simplify the construction and reduce the cost of machines of this character, and to provide a machine adapted to be rapidly and conveniently operated.

To these ends the invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a front elevation of a machine embodying my invention. Fig. 2 represents a section on the line 2 2, Fig. 1. Fig. 3 represents a partial front elevation and partial section of one of the jack-carriers. Fig. 4 represents a plan view of one of the mold-carriers. Fig. 5 represents a side elevation of the machine. Fig. 6 represents a section on line 6 6 of Fig. 1. Fig. 7 represents a section on line 7 7 of Fig. 1, the section being extended beyond the said line. Figs. 8, 9, and 10 represent sections on lines 8 8, 9 9, and 10 10, Fig. 7. Fig. 11 represents a section on line 11 11, Fig. 5. Figs. 11^a and 11^b represent views similar to Fig. 11. Figs. 12 and 12^a represent a section on line 12 12, Fig. 11^a.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a* represents the supporting-frame, in the upper portion of which is journaled a double-throw crank-shaft *b*, having two cranks *b'* b^2 (shown in dotted lines in Fig. 5) arranged at opposite sides of the axis of the shaft, so that when one is elevated the other is depressed. On said cranks are mounted boxes *c c'*, from which are suspended the carriers *d d'*, supporting the sole-shaped molds *e e'*.

f represents a shaft which is journaled in bearings in the frame *a* beside the crank-shaft *b* and connected therewith by a gear *g*, affixed to the crank-shaft, and a gear *g'*, affixed to the shaft *f*.

f' represents a driving-pulley which is loosely mounted upon the shaft *f* and is connected with said shaft by a clutch which is constructed to impart rotary movement from the driving-pulley to the shaft when the pulley is rotated forward, or in the direction indicated by the arrow in Fig. 5.

The preferred construction of the clutch is shown in Figs. 7, 8, 9, and 10, said clutch comprising a collar f^2, affixed to the shaft *f* and provided on its perimeter with a series of faces which are somewhat eccentric to the axis of the shaft, a series of loose friction rolls or balls f^3, interposed between the collar f^2 and an internal annular face constituting the inner surface of a flange f^4 on the hub of the loose pulley *f'*, and a series of fingers or projections f^5, interposed between said rolls and formed on a collar f^6, which has a limited independent rotary movement upon the shaft *f* and is normally pressed by a spring f^7, Fig. 10, in the direction required to cause the fingers f^5 to force the rolls f^3 into the narrower portions of the irregular space between the collar f^2 and the flange f^4, thus causing the rolls to bind upon the said flange and collar and lock the pulley *f'* to the shaft *f*.

A detent f^8 is pivoted at f^9 to the frame of the machine and is normally in position, as shown in Figs. 5, 8, and 10, to bear upon a shoulder f^{10} on the collar f^6 and thus hold said collar back from the position into which it is normally forced by the spring f^7, so that the rolls f^3 are normally loose between the collar f^2 and flange f^4. The clutch above described is of substantially the construction shown in Letters Patent No. 260,394, granted to me July 4, 1882.

The stop f^8 is arranged to arrest the rotation of the shaft, as above described, when the cranks *b b'* are in the positions shown in Fig. 5, one being at the highest and the other at the lowest point in its movement. A notched rod f^{12}, operated by means hereinafter described, engages a tooth f^{13} on the detent f^8, so that when said rod is raised the detent is also raised and releases the collar f^6, which

makes the clutch connection between the pulley f' and shaft f operative, so that the shaft is rotated until the clutch connection is again made inoperative by contact of the projection f^{10} with the detent f^8. The rod f^{12}, which is normally pressed against the tooth f^{13} by a spring f^{14}, is displaced by a pin or projection f^{15}, Fig. 8, affixed to the shaft f, just after the projection f^{10} has passed the end of the detent f^8, the detent being thus released from the position to which it was raised by the rod f^{12} and allowed to drop to its clutch-arresting position, so that when the shaft has made a complete rotation the projection f^{10} is arrested by the detent and the clutch made inoperative. The gears g g', connecting the shaft f with the crank-shaft b, are proportioned so that the crank-shaft makes a half-rotation to every complete rotation of the shaft f. Hence the crank-shaft is stopped at every half-rotation with one mold raised and the other depressed.

h and h' represent two jack-supporting beds or tables, each of which is mounted on an elongated arm or lever i, pivoted at i' to the supporting-frame, each bed and lever constituting a jack-carrier which is adapted to oscillate toward and from the frame a. Each jack-carrier is entirely independent of and disconnected from the other, so that the carriers are adapted to be moved independently. Jacks j j' are detachably secured to the beds h h' and are arranged, when the carriers are moved inwardly, to coöperate with the molds e e' in beating out or leveling the soles of shoes placed on said jacks. Each bed h has a sleeve h^2, which has a limited vertical movement on the accompanying lever i and is yieldingly supported by a spring h^3, said springs permitting the jacks to yield slightly to the downward pressure of the molds. The arms i are provided with weights i^2 at their lower ends which are sufficiently heavy to overbalance the jacks and the upper portions of the arms, so that each jack normally stands in a vertical position.

k k are levers which are pivoted at k' to the frame a and have curved outer portions which pass through slots in the sleeves h^2 and have notches k^2, Fig. 6, formed to engage the lower ends of said slots to lock the jack-holders in their forward or outward position. The levers k k are connected by rods k^3 k^3 to treadles k^4 k^4, said treadles and rods being so arranged that by depressing a treadle the outer portion of the accompanying lever k and the jack-bed thereon will be raised to press the jack against the accompanying mold when the operator desires to adjust the mold to the jack, as hereinafter described.

Springs k^5 normally raise the treadles and depress the outer portions of the levers k, holding the latter normally in position to engage the sleeves h^2, as shown in Fig. 6.

In Figs. 11, 11^a, and 11^b I have shown clutch-operating mechanism adapted to be actuated by the jack-carriers to make the clutch operative by the act of moving a jack to position under the accompanying mold. Said mechanism, as here shown, comprises, first, a horizontal lever m, pivoted at m' to the frame a and engaged at one end with an arm n, which is connected, as hereinafter described, with the detent-operating rod f^{12}; secondly, a lever o, pivoted at o' to the opposite end of the lever m; thirdly, two pins p p', pivoted to the ends of the lever o and movable in guides q q in the frame a, and, fourthly, a spring r, which normally holds the levers m o in position to project the outer ends of the pins p p' through the guides q q. The pin p is arranged in the path of one jack-carrier and the pin p' in the path of the other jack-carrier, and said carriers and pins coöperate in the manner presently described in operating the clutch.

The arm n, engaged with the lever m, is affixed to one end of a rock-shaft n', which is mounted in a bearing in the frame a. To the other end of said rock-shaft is affixed an arm or lever n^2, and to said arm or lever the lower end of the detent-operating rod f^{12} is connected.

The operation is as follows: We will assume that the jack j' has been swung inwardly to place under the accompanying mold e', the latter being depressed to coöperate with said jack, and that the other jack j is swung forward, the accompanying mold e being raised, all as shown in Figs. 1 and 5. The levers m and o and pins p p' are now in the position shown in Fig. 11, the pin p' being retracted by the carrier of the jack j', while the pin p is projected. The operator, having placed a shoe on the jack j, swings the latter to place under the mold e, and thus causes the bed h to strike the projected pin p and push the same inwardly. The other pin p' is now held by the bed h', and therefore acts as a fixed fulcrum, on which the lever o is caused to swing by the inward movement of the pin p. This movement of the lever o is imparted through the pivot o' to the lever m, which is thus caused to swing on its pivot m' from the position shown in Fig. 11 to that shown in Fig. 11^a, this movement being sufficient to impart an upward movement to the detent-operating rod f^{12} through the arms n and n^2. The clutch is thus allowed to connect the driving-pulley with the shaft f, a half-rotation of the crank-shaft b being the result, at the end of which the clutch becomes inoperative, and the crank-shaft stops with the mold e depressed upon the jack j and the mold e' raised. The jack j' is thus released and is swung forward by the operator, thus releasing the pin p', which is projected, as shown in Fig. 11^b, by the stress of the spring r, the lever m returning to the position shown in Fig. 11 and permitting the descent of the detent-operating rod f^{12}. After another shoe has been placed upon the jack j' the operator swings it to place under the mold e', and in so doing moves the pin p' to cause another half-rotation of the crank-shaft. The operation is

thus continued, the inward movement of each jack making the clutch operative and causing the depression of the accompanying mold and the elevation of the other mold.

Each jack when swung outward is locked by one of the levers *k*, and when swung inwardly to place may be raised by the coöperation of a treadle k^4 with the same lever. It will be observed, however, that the treadles k^4 have nothing to do with the operation of the clutch and the starting of the crank-shaft. The said treadles are in fact used only when the operator desires to slightly elevate the jacks above their operative positions for the purpose of accurately adjusting the molds to the jacks before fastening the molds to their carriers. This adjusting operation is performed as follows: The pins *p p'* are both retracted and held by any suitable means, such as a cam-lever *s*, pivoted at *s'* to the frame *a*, and a rod or link s^2, pivotally connected with the lever *o* and held by the spring *r* yieldingly against the cam-lever. When the cam-lever is in the position shown in Figs. 11^a and 12, it forces the link s^2 and pins *p p'* inwardly, as shown in Fig. 11^a, so that the inward movement of the jack-carriers will not operate the clutch. Both jacks being in their outward position, the operator swings one of the jacks inwardly under the raised mold and then raises the jack, thus bringing the sole on said jack into contact with the mold and holding it there by the accompanying treadle while he adjusts the mold accurately to the sole. He then secures the adjusted mold and then adjusts the other mold to the shoe on the accompanying jack in the same way, after which the pins *p p'* are released by depressing the cam-lever *s*, as shown in Fig. 12^a, and the machine is operated in the manner above described.

It will be seen that the independent jack-carriers moved in and out by the operator and the clutch-operating mechanism actuated by the movement of each jack-holder to its operative position enable the machine to be rapidly and conveniently operated and materially simplify its construction as compared with other machines of this character employing two jacks and two molds alternately operated.

While the treadles are preferred as a means for conveniently adjusting the molds to the jacks, they have no part in the ordinary operation of the machine, being used only when the molds and jacks are first installed.

The employment of an automatically-acting clutch, such as that described and shown, which requires only the displacement of a detent to make it operative, enables the crank-shaft to be started without muscular effort on the part of the operator, there being practically no resistance offered by the pins *p p'* to the inward movement of the jacks. For this reason I prefer an automatic clutch to one operated positively by the inward pressure of the jacks by the operator. I am the first, however, so far as I am aware, to provide a machine of this character with clutch actuating or starting mechanism adapted to be operated by the movement of the jacks to their operative positions. Hence I do not limit myself to the particular clutch mechanism nor to the particular form of jack-actuated clutch-starting mechanism shown and described.

It will be seen that the spring *r*, by exerting an outward pressure on the pin *p'*, forces forward each jack when it is released by the raising of the accompanying mold.

It will be seen that the loose spring-pressed collar f^6 and its fingers f^5, interposed between the balls f^3, constitute a clutch-controlling device which automatically engages the balls with the faces on the shaft and driving-pulley and is adapted to be moved by the detent f^8 to disengage the balls from said faces. This clutch mechanism has the following advantage when combined with the molds, the mold-carriers, double-throw crank-shaft, driving-shaft, and loose driving-pulley, namely: The clutch is made operative and inoperative instantaneously, owing to the slight and almost imperceptible movement of the controlling device required to move the balls into and out of engagement with the faces between which they are interposed. Hence the crank-shaft can be stopped instantaneously at any point of its rotation and without regard to the load or pressure imposed on the clutch by the pressure of the molds on the jacks, the balls being adapted to be moved out of engagement with the surfaces between which they are interposed by a comparatively slight pressure.

I claim—

1. In a machine of the character specified, the combination of suitable molds and jacks, two mold-carriers, mechanism for moving the same simultaneously in opposite directions, said mechanism including a clutch having provisions for automatically stopping said carriers at each extreme of their movement, two independently-movable jack-carriers, and clutch-starting mechanism operated by said jack-carriers.

2. In a machine of the character described, the combination of suitable molds and jacks, two mold-carriers, mechanism for moving the same simultaneously in opposite directions, said mechanism including a loose driving-pulley and an automatically-acting clutch having provisions for automatically stopping the mold-carriers at each extreme of their movement, two independently-movable jack-carriers, and clutch-releasing mechanism operated by said jack-carriers.

3. In a machine of the character specified, the combination of suitable molds and jacks, two mold-carriers, mechanism for moving the same simultaneously in opposite directions, said mechanism including a double-throw crank-shaft, a loose driving-pulley, and an intermediate automatically-acting clutch, a detent adapted to disconnect said clutch at

each half-rotation of the crank-shaft, two independently-movable jack-carriers, and detent-displacing mechanism operated by said jack-carriers.

4. In a machine of the character specified, the combination of suitable molds and jacks, two mold-carriers, mechanism for moving the same simultaneously in opposite directions, said mechanism including a clutch having provisions for automatically stopping said carriers at each extreme of their movement, two independently-movable jack-carriers mounted to oscillate on fixed centers, and clutch-starting mechanism operated by the inward movements of said jack-carriers.

5. In a machine of the character specified, the combination of suitable molds and jacks, two mold-carriers, mechanism for moving the same simultaneously in opposite directions, said mechanism including a clutch having provisions for automatically stopping said carriers at each extreme of their movement, two independently-movable jack-carriers mounted to oscillate on fixed centers, and means for locking said jack-carriers in their outward position.

6. In a machine of the character specified, the combination of suitable molds and jacks, two mold-carriers, mechanism for moving the same simultaneously in opposite directions, two independently-movable jack-carriers mounted to oscillate on fixed centers, said carriers including supports such as the levers *i*, and jack-beds loosely connected with said supports and having an independent vertical movement thereon, and means for alternately raising and releasing said jack-beds and the jacks thereon to bring the jacks temporarily into contact with the molds and allow their separation from the molds.

7. In a machine of the character specified, the combination of suitable molds and jacks, two mold-carriers, mechanism for moving the same simultaneously in opposite directions, said mechanism including a clutch having provisions for automatically stopping said carriers at each extreme of their movements, two independently-movable jack-carriers mounted to oscillate on fixed centers, said carriers including jack-beds having an independent vertical movement, curved levers pivoted to the supporting-frame and extending through the jack-beds, said levers having provisions for locking the jack-carriers in their outward position, and jack-lifting treadles connected with said levers.

8. In a machine of the character specified, the combination of suitable molds and jacks, two mold-carriers, mechanism for moving the same simultaneously in opposite directions, said mechanism including a double-throw crank-shaft, a loose driving-pulley, and an automatically-acting clutch, a detent adapted to automatically disconnect the clutch at each half-rotation of the crank-shaft, two independently-movable jack-carriers, pins or slides normally held in the paths of said jack-carriers, and connections between said pins and the detent, whereby motion is imparted to the detent by the inward movement of each jack-carrier.

9. In a machine of the character specified, the combination of suitable molds and jacks, two mold-carriers, mechanism for moving the same simultaneously in opposite directions, said mechanism including a double-throw crank-shaft, a loose driving-pulley, and an automatically-acting clutch, a detent adapted to automatically disconnect the clutch at each half-rotation of the crank-shaft, two independently-movable jack-carriers, pins or slides normally held in the paths of said jack-carriers, a lever *o* connecting said pins, a lever *m* pivoted centrally to a fixed support and at one end to the lever *o*, and connections between the opposite end of the lever *m* and the detent.

10. In a machine of the character specified, the combination of suitable molds and jacks, two mold-carriers, mechanism for moving the same simultaneously in opposite directions, said mechanism including a double-throw crank-shaft, a loose driving-pulley, and a clutch comprising a series of eccentric faces on the shaft, an internal annular face on the loose pulley surrounding said series of faces, a series of loose rolls interposed between the annular face and the series of faces, a controlling device adapted to automatically engage said rolls with the faces between which they are interposed and to disengage the rolls from said faces, a detent adapted to automatically displace the controlling device and rolls at each half-rotation of the crank-shaft, and means for displacing the detent to permit the rolls to return to their operative position.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 20th day of July, A. D. 1896.

JAMES A. HORTON.

Witnesses:
C. F. BROWN,
A. D. HARRISON.