A. E. JERRAM.

SOLE PRESSING MACHINE.

APPLICATION FILED MAR. 11, 1908.

1,011,349.

Patented Dec. 12, 1911.

5 SHEETS—SHEET 1.

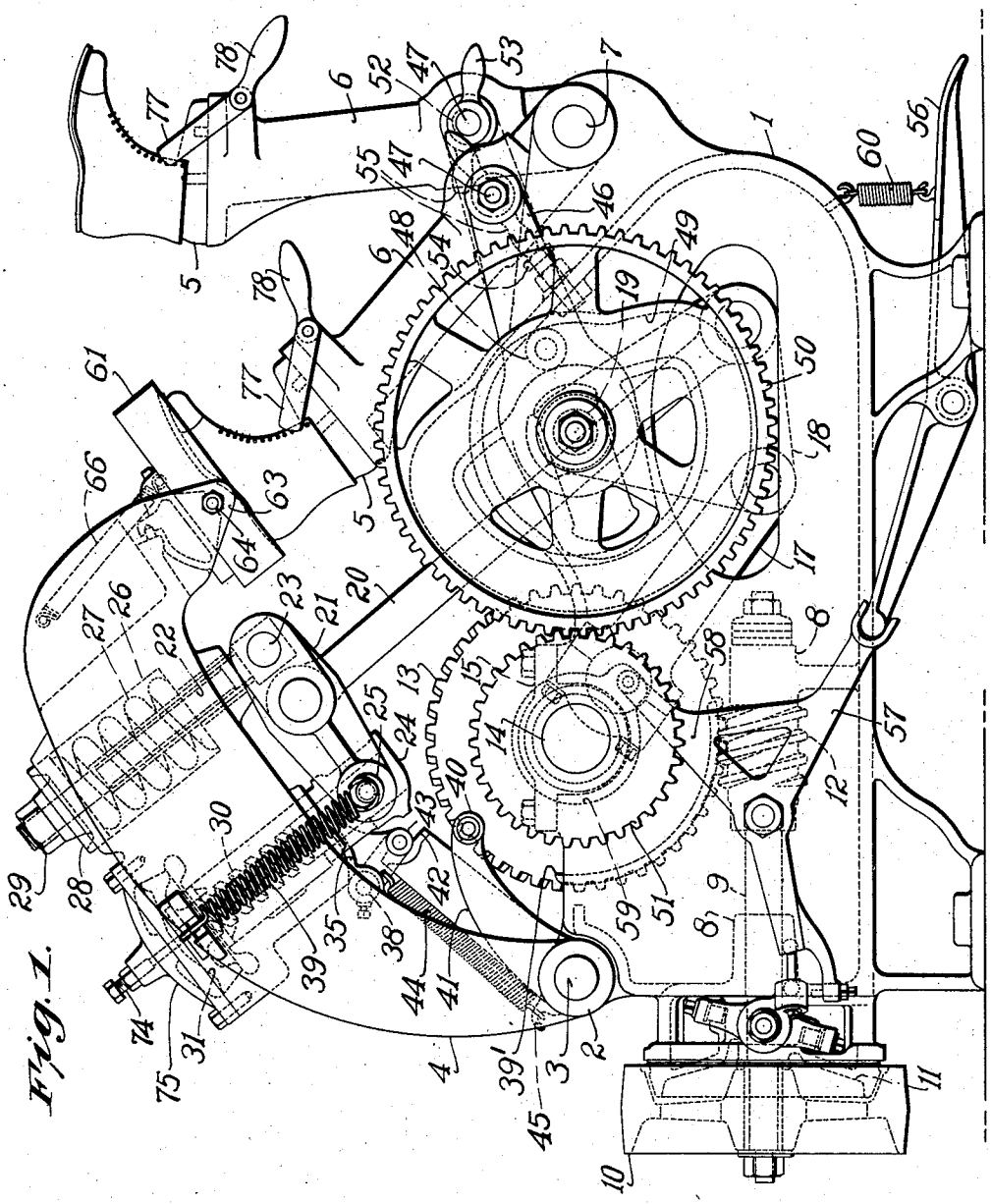

Fig. 1.

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Charles W. McDermott

Inventor:

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by his Attorneys

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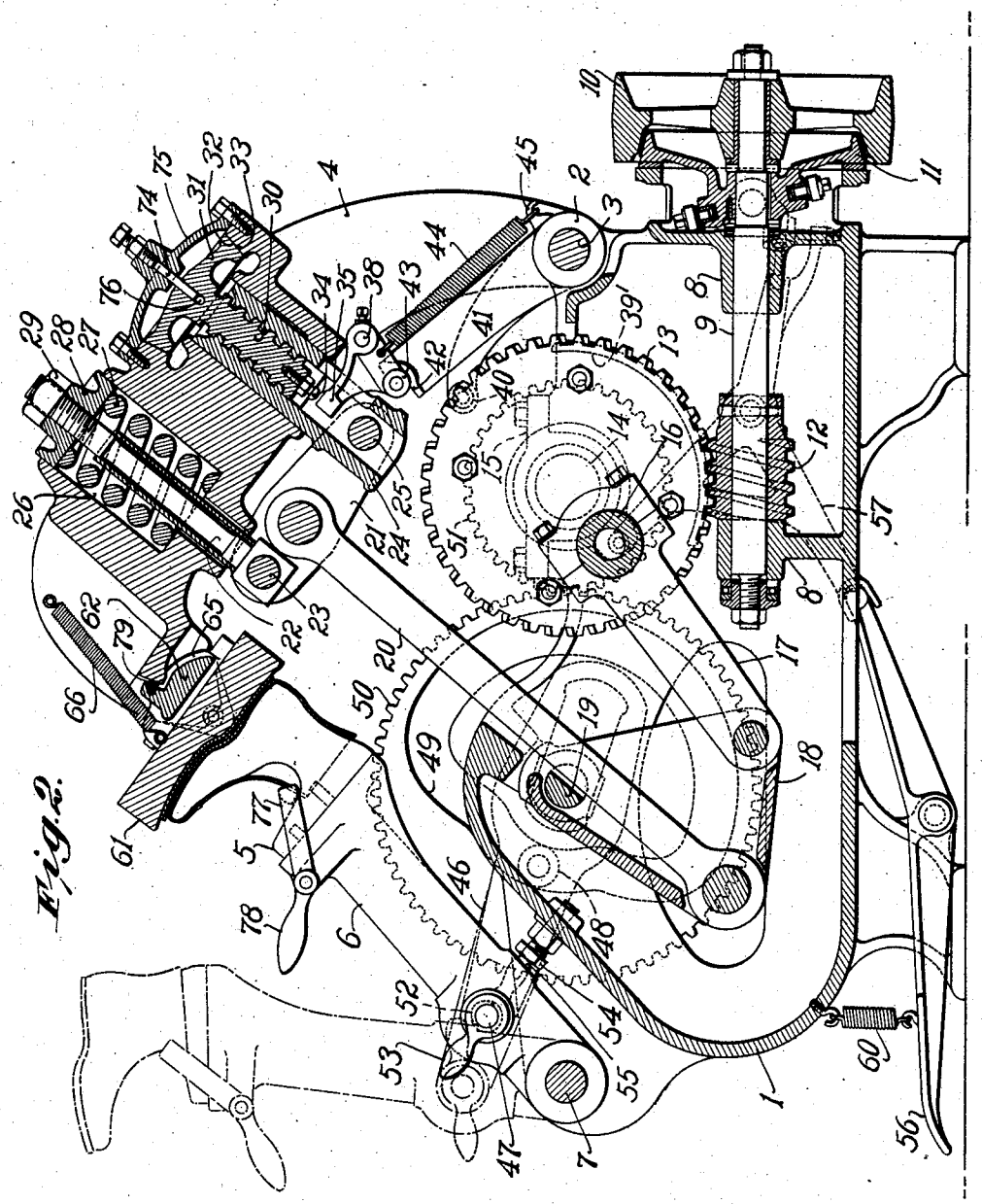

Fig. 2.

Witnesses:

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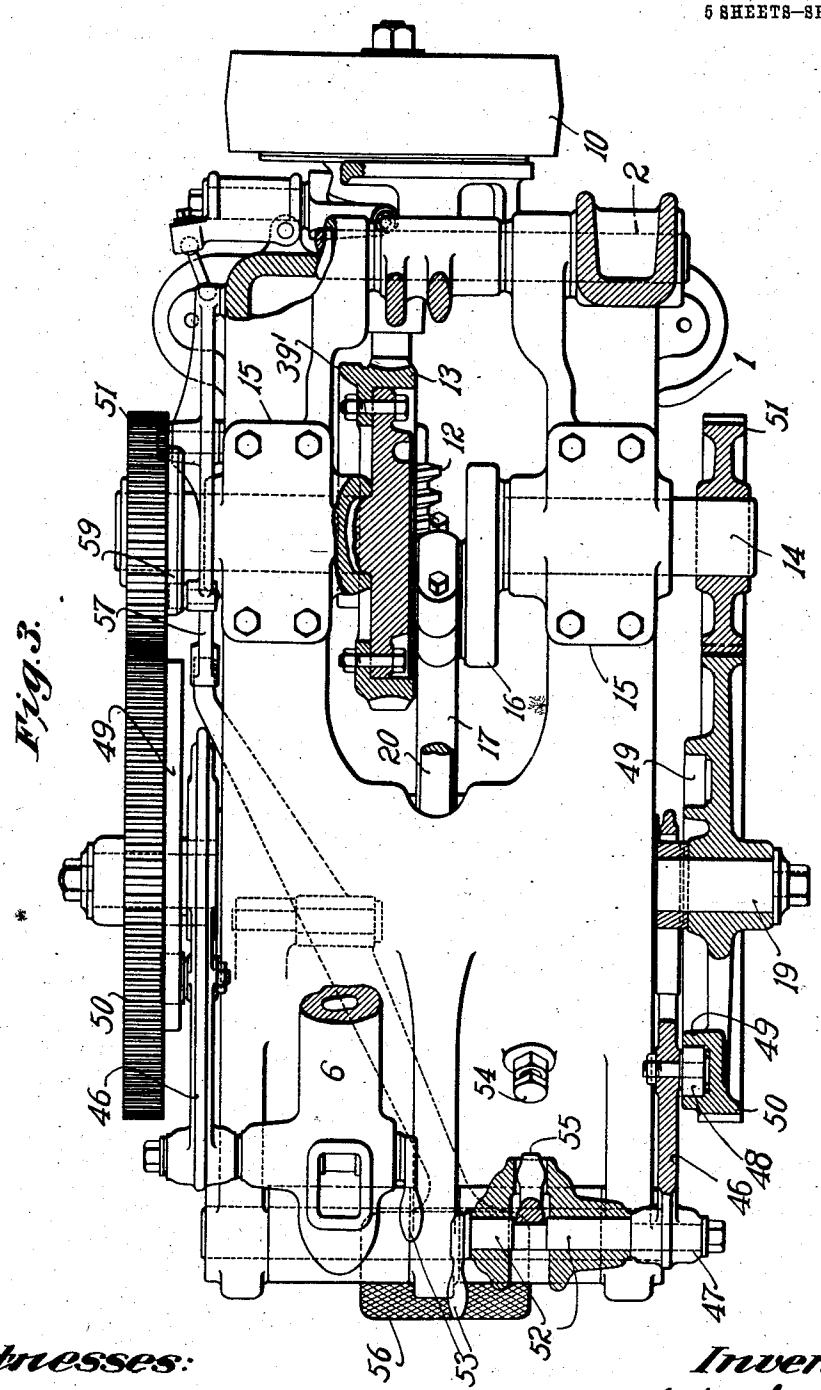
5 SHEETS—SHEET 3.

Fig. 3.



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5 SHEETS—SHEET 4.

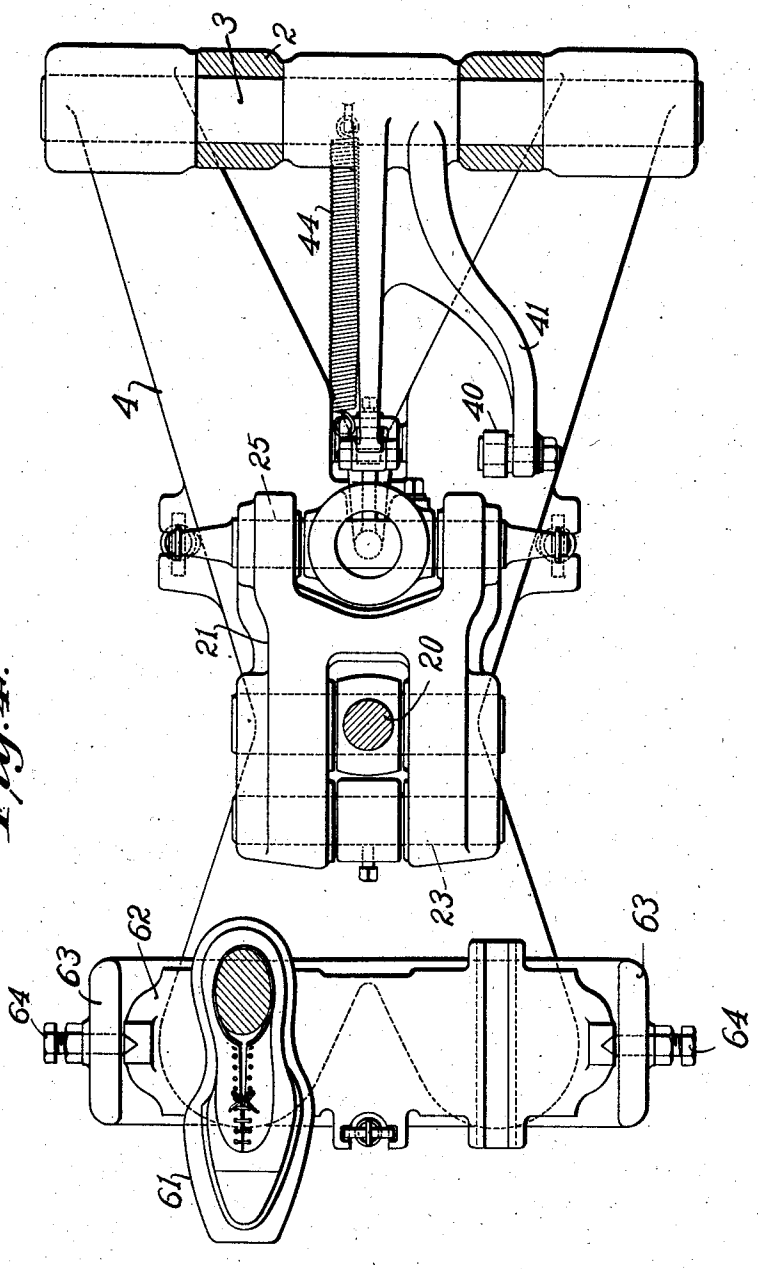

Fig. 4.

Witnesses:

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5 SHEETS—SHEET 5.

Fig. 5

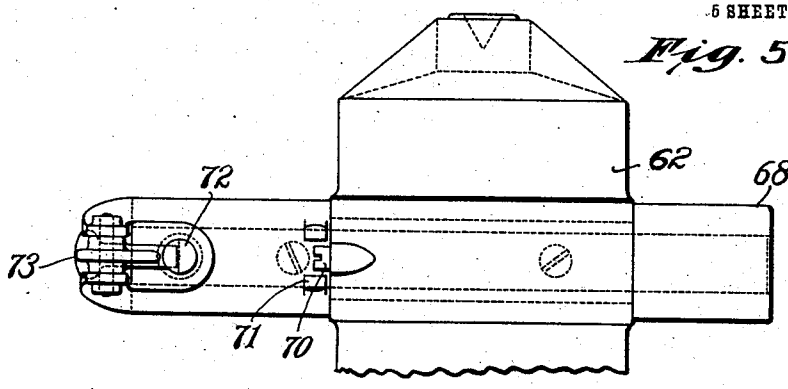


Fig. 6

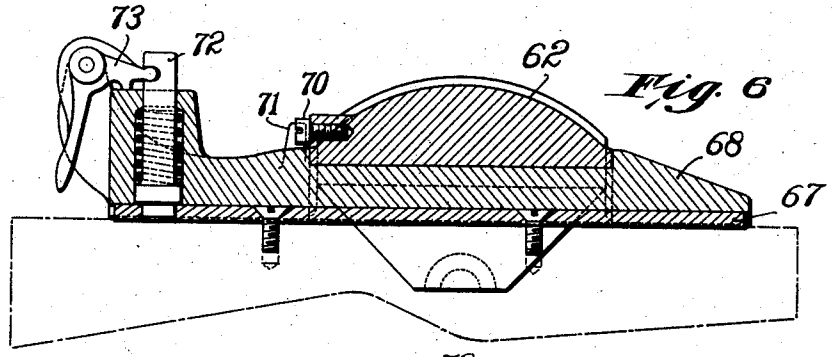


Fig. 7

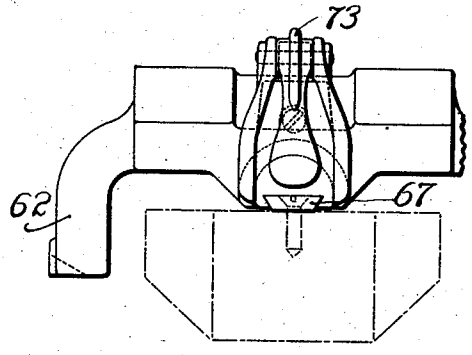
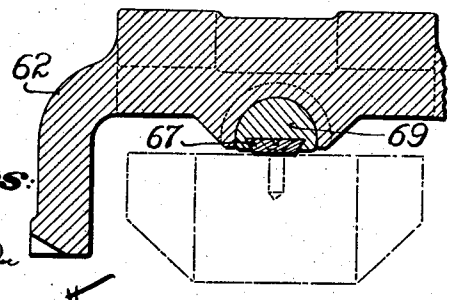


Fig. 8



Witnesses:

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UNITED STATES PATENT OFFICE.

ARTHUR E. JERRAM, OF LEICESTER, ENGLAND, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SOLE-PRESSING MACHINE.

1,011,349. Specification of Letters Patent. Patented Dec. 12, 1911.

Application filed March 11, 1908. Serial No. 420,306.

To all whom it may concern:

Be it known that I, ARTHUR E. JERRAM, a subject of the King of Great Britain, residing at Leicester, in the county of Leicester, England, have invented certain new and useful Improvements in Sole-Pressing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to sole pressing machines and more particularly to that class of machines which are known in the art as direct pressure sole pressing machines, in which all portions of a shoe sole are subjected to pressure simultaneously between a shoe supporting jack and a coöperating sole pressing form.

The object of the present invention is the provision of a light and cheap machine of simplified and improved construction which is convenient to operate, which will work satisfactorily at a greater speed than that which has heretofore been practicable, and which with less expenditure of power will perform the operation of pressing the soles of shoes in a more efficient manner than heretofore.

With this object in view a feature of the present invention contemplates the provision of a simplified and improved pressure regulating mechanism by which the desired amount of pressure is applied automatically to the sole of a shoe regardless of variations in the thickness of the soles of the shoes operated upon.

Another feature of the present invention contemplates mounting the jacks and forms so that they move in the arcs of circles and in directions substantially at right angles to each other whereby less separation of the form and jack is required to give sufficient clearance to enable the jack to be moved out of alinement with the form.

Other features of the invention consist in certain devices, combinations, and arrangements of parts hereinafter described and claimed the advantages of which will be obvious to those skilled in the art from the following description.

The machine hereinafter specifically described as embodying the several features of the present invention in their preferred form is provided with two shoe supporting jacks and two coöperating sole pressing forms. The jacks are mounted upon pivotally supported arms and are moved alternately into alinement with their coöperating forms, one jack being in a position conveniently accessible by the operator when the other jack is in sole pressing position. Both forms are mounted upon a form carrier, which carrier is mounted upon a pivotally supported frame. The jacks and the form carrying frame are so arranged with relation to each other that a jack when in alinement with its coöperating form supports the shoe with the surface of the sole at an angle of approximately 45° to the horizontal. Each jack moves in the same vertical plane as its coöperating form and the jack and form move in the arcs of circles and in directions substantially at right angles to each other. By reason of this arrangement the outer end of the form is raised more than the rear end during the upward movement of the form carrying frame so that less separation of the form and jack is required to give clearance for the outward movement of the jack than has heretofore been required in this class of machines. The jacks are moved into alinement with their coöperating forms by means of suitably shaped cams and intermediate connections, and the form carrying frame is raised and lowered each time a jack comes in alinement with its coöperating form by means of a crank shaft and suitable connections between the shaft and the form carrying frame. To enable the desired amount of pressure to be applied automatically to a shoe sole regardless of its thickness a lost motion device is provided in the connections between the crank shaft and the frame carrying the forms, and means are provided for locking this lost motion device to the frame after a form has been seated or embedded on a shoe sole.

The several features of the present invention will be clearly understood from an inspection of the accompanying drawings in which—

Figure 1 is a side elevation of a sole leveling machine embodying the same in their preferred form. Fig. 2 is a central longitudinal section of the machine. Fig. 3 is a plan view partly in section. Fig. 4 is an inverted plan view of the frame upon which the sole pressing forms are mounted. Fig. 5 is a detail plan view illustrating the pre-

ferred construction of sole pressing form and form carrier. Fig. 6 is a detail sectional view of the parts illustrated in Fig. 5. Fig. 7 is an end view of the parts illustrated in Fig. 5, and Fig. 8 is a detail sectional view taken on a plane at right angles to the plane in Fig. 6.

Referring to the drawings, the parts of the machine are mounted on a bed-plate or frame 1. The frame 1 supports in suitable bearings 2 a shaft 3, around which the form carrier frame 4 oscillates. The form carrier frame is constructed in the form of an X, (Fig. 4), and is pivotally mounted on the shaft 3 at the ends of its lower limbs. The jacks 5 are mounted on levers or arms 6 rotatable about a rod 7. Two such arms are provided in the machine, one for carrying a jack for a left shoe and the other for a right shoe. Supported in bearings 8 inside the frame 1 is a shaft 9 provided with a pulley 10 outside the frame 1, driven by any suitable power. On the shaft 8 is arranged a clutch 11 whereby the machine may be thrown into and out of operation. This clutch forms no feature of the present invention and therefore need not be described in detail. The shaft 9 carries a worm 12 meshing with a worm wheel 13 mounted on a shaft 14 which is supported in suitable bearings 15.

The shaft 14 is provided with a crank 16 to which is attached a link 17 connecting the crank to a frame 18. The frame 18 is of hollow prismatic form, the face toward the form carrier 4 being removed. It is supported so that it can rock on a shaft 19 and is connected to the form carrier 4 by means of a connecting rod 20. The connecting rod 20 is not directly attached to the form carrier 4, but is connected yieldingly thereto by a device having an automatically variable amount of lost motion. This device comprises a compensating lever 21 connected at one end to a rod 22 by means of a pin 23 and connected at the other end to a sleeve 24 by means of a pin 25. The rod 22 passes into a cylindrical chamber 26 in the form carrier 4. Within this chamber and surrounding the rod is a heavy spiral spring 27 held within the chamber 26 by a plate 28 and nut 29 upon the upper threaded portion of the rod. The sleeve 24 extends upward through the form carrier 4 and is internally threaded to engage a threaded rod 30 having a head 31, the surface 32 of which is adapted under certain conditions to form a braking surface against the side 33 of a corresponding recess in the carrier 4. The other end of the rod is provided with an adjustable screw 34 against which the end of one arm of a bell crank lever 35 pivoted at 38 to the carrier 4 is adapted to engage.

Further details of the machine will be described more fully hereinafter, but the general operation of the machine may now be described.

On the operator starting the machine the link 17 rocks the frame 18 to first raise the frame 4 and then lower it to a position in which a form makes contact with the sole of the shoe to be leveled. At the time the form engages the shoe the bell crank lever 35 is pressing on the screw 34 keeping the surface 32 of the rod 30 out of contact with the corresponding surface 33 in the frame 4 so that the rod 30 is free to rotate. As the oscillating frame 18 continues to move, power is transmitted through the connecting rod 20 and lever 21 to the sleeve 24. The lever 21 rocks about the pin 23 thus pulling the sleeve through the frame 4 and causing the rod 30 to rotate. In this manner a certain amount of lost motion is provided between the rod 20 and frame 4 and the form is pressed against the sole of the shoe with a yielding pressure. To obtain an initial pressure on the form and to bed it fairly before the final heavy pressure is applied to level the work, springs 39 (Fig. 1) are provided that couple the ends of the pin 25 to the form carrier frame 4. As the machine continues to operate, the bell crank lever 35 is moved, by mechanism to be described, out of engagement with the screw 34 as shown in Fig. 2 thereby allowing the surface 32 of the rod 30 to come into contact with the corresponding surface 33 in the frame 4 thereby locking the rod 30 on the frame 4. The rotation of the rod 30 is thus prevented and consequently the further withdrawal of the sleeve 24 from the frame 4. The power transmitted by the connecting rod 20 and lever 21 is now transmitted to the frame 4 through an unyielding connection formed by the sleeve 24 and rod 30 and through the heavy spring 27, and a final heavy pressure is applied to the sole of the shoe. The length of the arm of the compensating lever 21 on the side toward the rod 22 being less than that on the side toward the sleeve 24 the greater part of the power is transmitted from the connecting rod 20 to the frame 4 by means of the connection through the rod 22 and the spring 27.

For the purpose of operating the bell crank lever 35 in the manner described above, a projection 39′, formed on the edge of one face of the worm wheel 13 engages a roll 40 on one end of a bell crank lever 41. The end of the other arm of the bell crank lever 41 has a cam surface 42 adapted to engage with a roller 43 on the bell crank lever 35. A spring 44 connects an extension 45 from the lever 41 to an arm of the bell crank lever 35 and tends to bring the recessed portion of the cam face on the lever 41 into alinement with the roller on the bell crank. When the roll 40 is actuated by the projection 39 it moves the bell crank

lever 35 so as to bring it into engagement with the screw 34 and raise the rod 30 to disengage the surface 32 from the surface 33 of the frame 4 so that the sleeve 24 can be pulled down through the frame. The upward movement of the rod 30 is limited by a stop screw 74 adjustably mounted in a cap piece 75 secured to the frame 4 and projecting into a hole in the upper end of the rod. An antifriction ball 76 is provided at the lower end of the stop screw. Each lever or jack carrying arm 6 is moved by a connecting rod 46 pivotally connected to it at 47, this connecting rod being provided with a roller 48 adapted to be guided by a cam groove 49 formed on the side of a spur wheel 50. The spur wheels 50 are mounted on the shaft 19 and are driven by spur wheels 51 carried on the shaft 14. The arms 6 are moved from the position shown in dotted lines in Fig. 2 to the position shown in full lines. When an arm 6 is in the position indicated in dotted lines it is entirely clear of the frame 4, and a shoe can, therefore, easily be put in place on the jack. The cam grooves 49 on the spur wheels 50 are so arranged that the two arms 6 are moved forward alternately and consequently while one shoe is being leveled, another may be adjusted in position ready for the leveling process.

To enable either jack to be adjusted so that it will register exactly with its coöperating form when the form is brought into engagement therewith, each of the pivots 47 are provided with eccentric portions 52 in the arms 6 and a handle 53 is provided at the end of each pivot. By rotating either of the handles 53, an adjustment may be made in the pivotal connection of a connecting rod 46, and a change made in the position of the corresponding arm 6. To limit the forward movement of the arms 6 and insure accurate register of the jacks with their coöperating forms, adjustable stops in the form of stop screws 54 are fitted on the frame 1. These screws are arranged to engage abutment pieces 55 that are mounted in suitable holes in the arms 6 and are engaged at their inner ends by concentric portions of the pivot pins so that an adjustment of the arms 6 by rotating the pivot pins will not affect the position of the abutment pieces 55.

The jacks are removably mounted upon the arms 6 by means of pins projecting from the arms into holes in the bottom of the lasts. To lock the jacks rigidly to the arms a locking device 77 is mounted on each arm 6. This locking device is in the form of a bail or stirrup pivotally mounted upon the arm and arranged to swing over the base of the jack. Each locking device is provided with a handle 78 by which it can be operated conveniently.

The machine is thrown into operation by means of a treadle lever 56 which is pivotally connected to one arm of a clutch controlling lever 57. The lever 57 is provided with an arm 58 carrying at its end a roller, bearing against the inner surface of a cam 59, carried on the shaft 14. This cam is of such shape that after a complete revolution of the shaft 14 the lever 57 is permitted to move so as to throw the clutch out of operation. The treadle lever 56 is returned to initial position by means of a spring 60. Consequently it is merely necessary for the operator to depress the treadle lever to throw the machine into operation, the machine stopping automatically after each complete cycle of operations if the operator removes his foot from the treadle.

The two sole pressing forms, one of which is indicated at 61, are mounted upon a single form carrier indicated at 62. To support the form carrier 62, the frame 4 is provided with two downwardly projecting flanges 63, (see particularly Fig. 4) through which pivot screws 64 pass and support the carrier so that it is capable of an oscillating or tipping movement in the frame 4. The form carrier is provided with curved bearing surfaces as indicated at 65, Fig. 2, which engage or rest on correspondingly curved surfaces in the frame 4, these surfaces being concentric with the axis of the pivots 64. A spring 66 is connected at one end to the frame 4 and at the other end to the form carrier 62 and operates to tip the form carrier when a form is not in contact with a shoe so that the outer ends of the forms are above the position which they assume with relation to the frame 4 when either form is in contact with a shoe. This tipping of the form carrier permits a jack to be swung into position beneath its sole pressing form without liability of striking against the end of the form. The tipping movement of the form carrier is limited by a stop 79 engaging the frame 4 as indicated in Fig. 2.

In the construction illustrated in Figs. 1, 2 and 4 the forms are mounted directly on the form carrier 62, each form being provided with a dove-tailed strap or guide which is received in a corresponding dove-tailed slot in the lower surface of the carrier. The pivotal connection of the form carrier with the frame 4, above described, permits the forms to tip longitudinally and thus accommodate themselves to the longitudinal curvatures of the shoe sole or bottom of the last. It is desirable that the forms be so mounted as to be also capable of a lateral tipping movement so as to accommodate themselves to the transverse curvatures of the shoe sole, and in Figs. 5, 6, 7 and 8, a construction is illustrated by which this result can be secured. As illustrated in these figures, the strap 67 of each form is received in a dove-tailed slot formed in a

block 68, which block is provided with a semi-cylindrical portion 69, seated in a correspondingly shaped recess in the lower surface of the form carrier. Each form is thus permitted to tip laterally, and this lateral tipping movement, in connection with the tipping movement of the form carrier, permits each form to seat itself accurately upon a shoe sole. The lateral tipping movements of each form are limited by a stop screw 70 projecting from the form carrier between two lugs 71 on the block 68.

In Figs. 5, 6 and 7 is also illustrated a device for removably locking the form on the block 68, this device consisting of a spring-pressed plunger 72 mounted in one end of the block 68 and arranged to enter a hole in the strap 67. To raise the plunger a hand lever 73 is provided, pivotally mounted between ears projecting from the block 68, one end of the lever being received in a slot in the upper end of the plunger, and the other end of the lever extending into a position convenient of access by the operator.

The invention having been thus described, what is claimed is:—

1. A direct pressure sole pressing machine, having, in combination, a shoe supporting jack and a sole pressing form pivotally mounted to move in the same plane substantially at right angles to each other, and actuating mechanism therefor acting to bring them into alinement, and then subject the sole of a shoe on the jack to pressure.

2. A direct pressure sole pressing machine, having, in combination, a shoe supporting jack and a sole pressing form pivotally mounted to move in the same plane substantially at right angles to each other, and mechanism to move the jack into alinement with the form and then move the form toward the jack to press the sole of a shoe thereon.

3. A direct pressure sole pressing machine, having, in combination two pivotally mounted shoe supporting jacks, two coöperating sole pressing forms mounted to move in the same planes as the jacks at substantially right angles thereto, a pivotally mounted frame carrying the forms, and mechanism acting to move the jacks alternately into alinement with their coöperating forms and to move the form carrying frame to bring the forms alternately into engagement with the soles of shoes supported upon the jacks.

4. A direct pressure sole pressing machine, having, in combination, two pivotally mounted shoe supporting jacks, two coöperating sole pressing forms movable in the same planes as the jacks at substantially right angles thereto, a frame carrying the forms, cams and intermediate connections for moving the jacks alternately into alinement with their coöperating forms, and mechanism for moving the form carrying frame to bring the forms alternately into engagement with the soles of shoes supported upon the jacks.

5. A direct pressure sole pressing machine, having, in combination, a shoe supporting jack, a pivotally supported sole pressing form, actuating mechanism acting to move the jack into alinement with the form and then to move the form toward the jack to press the sole of a shoe, and means for holding the form in a tipped position while out of engagement with a shoe sole to give clearance for the jack.

6. A direct pressure sole pressing machine, having, in combination, two shoe supporting jacks, two coöperating sole pressing forms, a form carrier upon which both forms are mounted, means for pivotally supporting the carrier to allow it to tip when either form engages the sole of a shoe on a jack, and means for relatively moving the jacks and forms to bring the forms alternately into engagement with the shoes on their coöperating jacks.

7. A direct pressure sole pressing machine, having, in combination, a shoe supporting jack, a form carrier provided with a semi-cylindrical recess, a block fitted to said recess, and a sole pressing form secured to the block arranged to tip laterally therewith.

8. A direct pressure sole pressing machine, having, in combination, a shoe supporting jack, a coöperating sole pressing form, a jack carrier, mechanism for moving the jack carrier to bring the jack into alinement with the form and for then relatively actuating the jack and form to press the sole of a shoe, and means for adjusting said jack carrier with relation to its moving mechanism to cause the jack to register with the form.

9. A direct pressure sole pressing machine, having, in combination, two shoe supporting jacks, two coöperating sole pressing forms, mechanism for moving the jacks alternately into alinement with their coöperating forms, a frame carrying both forms, and mechanism including a yielding connection for moving the form carrying frame to bring the forms alternately into engagement with the soles of shoes supported upon the jacks.

10. A direct pressure sole pressing machine, having, in combination, a shoe supporting jack, a sole pressing form, a movable frame carrying one of said parts, a shaft and intermediate connections for actuating said frame to press the sole of a shoe, said connections including a rod mounted to slide in the frame, a rotatable rod having a screw threaded engagement with the sliding rod, coöperating brake surfaces on the frame and rotatable rod, and means for moving the rotatable rod to engage and disengage said braking surfaces

to lock and unlock the sliding rod and frame.

11. A direct pressure sole pressing machine, having, in combination, a shoe supporting jack, a sole pressing form, a movable frame carrying one of said parts, a compensating lever, a yielding connection between one end of the lever and said frame, a lost motion device connecting said frame and the other end of the lever, a shaft and suitable connections for actuating the compensating lever, and means for locking the lost motion device to said frame after the form has engaged a shoe sole.

12. A direct pressure sole pressing machine, having, in combination, a shoe supporting jack, a coöperating sole pressing form, a jack carrier, mechanism for moving the jack carrier to bring the jack into alinement with the form and for then relatively actuating the jack and form to press the sole of a shoe, an abutment piece movable with the jack carrier, a stop coöperating with the abutment piece to limit the movement of the jack carrier, and means for adjusting the jack carrier with relation to its moving mechanism and to said abutment piece to cause the jack to register with the form.

13. A direct pressure sole pressing machine, having, in combination, two pivotally mounted shoe supporting jacks, two coöperating sole pressing forms movable in the same planes as the jacks at substantially right angles thereto, a frame carrying the forms, a crank shaft and intermediate connections for moving the form carrying frame to bring the forms alternately into engagement with the soles of shoes supported upon the jacks, a shaft driven from the crank shaft, and mechanism actuated by said driven shaft and constantly connected to the jacks for moving the jacks alternately into alinement with their coöperating forms.

14. A direct pressure sole pressing machine, having, in combination, a shoe supporting jack, a coöperating sole pressing form, a pivotally mounted jack carrier, a cam and suitable connections for moving the jack carrier to bring the jack into alinement with the form, an abutment piece movable with the jack carrier, a stop coöperating therewith to limit the movement of the jack carrier and mechanism for relatively moving the jack and form when in alinement to press the sole of a shoe supported upon the jack.

15. A direct pressure sole pressing machine, having, in combination, a shoe supporting jack, a sole pressing form, a movable frame carrying one of said parts, an actuating rod, a shaft, connections between the shaft and the rod for actuating the rod to move the frame alternately in opposite directions to press the sole of a shoe supported upon the jack and to separate the jack and form, connections between the actuating rod and the frame including a lost motion device mounted to slide in the frame and means for locking said device to the frame after the form has engaged the shoe sole.

16. A direct pressure sole pressing machine, having, in combination, a shoe supporting jack, a sole pressing form, a movable frame carrying one of said parts, an actuating rod, a shaft, connections between the shaft and the rod for actuating the rod to move the frame alternately in opposite directions to press the sole of a shoe supported upon the jack and to separate the jack and form, connections between the actuating rod and the frame including a lost motion device, a spring acting on the lost motion device in opposition to the rod and means for locking the lost motion device after the form has engaged a shoe sole.

17. A direct pressure sole pressing machine, having, in combination, a shoe supporting jack, a pivotally mounted form carrier provided with a semi-cylindrical recess, a block fitted to said recess, and a sole pressing form secured to the block arranged to tip laterally with the block and to tip longitudinally with the block and form carrier.

In testimony whereof I affix my signature, in presence of two witnesses.

ARTHUR E. JERRAM.

Witnesses:
GRACE HOLMES,
JOHN RICHARD LAW.