No. 703,204. Patented June 24, 1902.

J. J. HEYS.

LEVELING MACHINE.

(Application filed Oct. 19, 1900.)

(No Model.) 5 Sheets—Sheet 1.

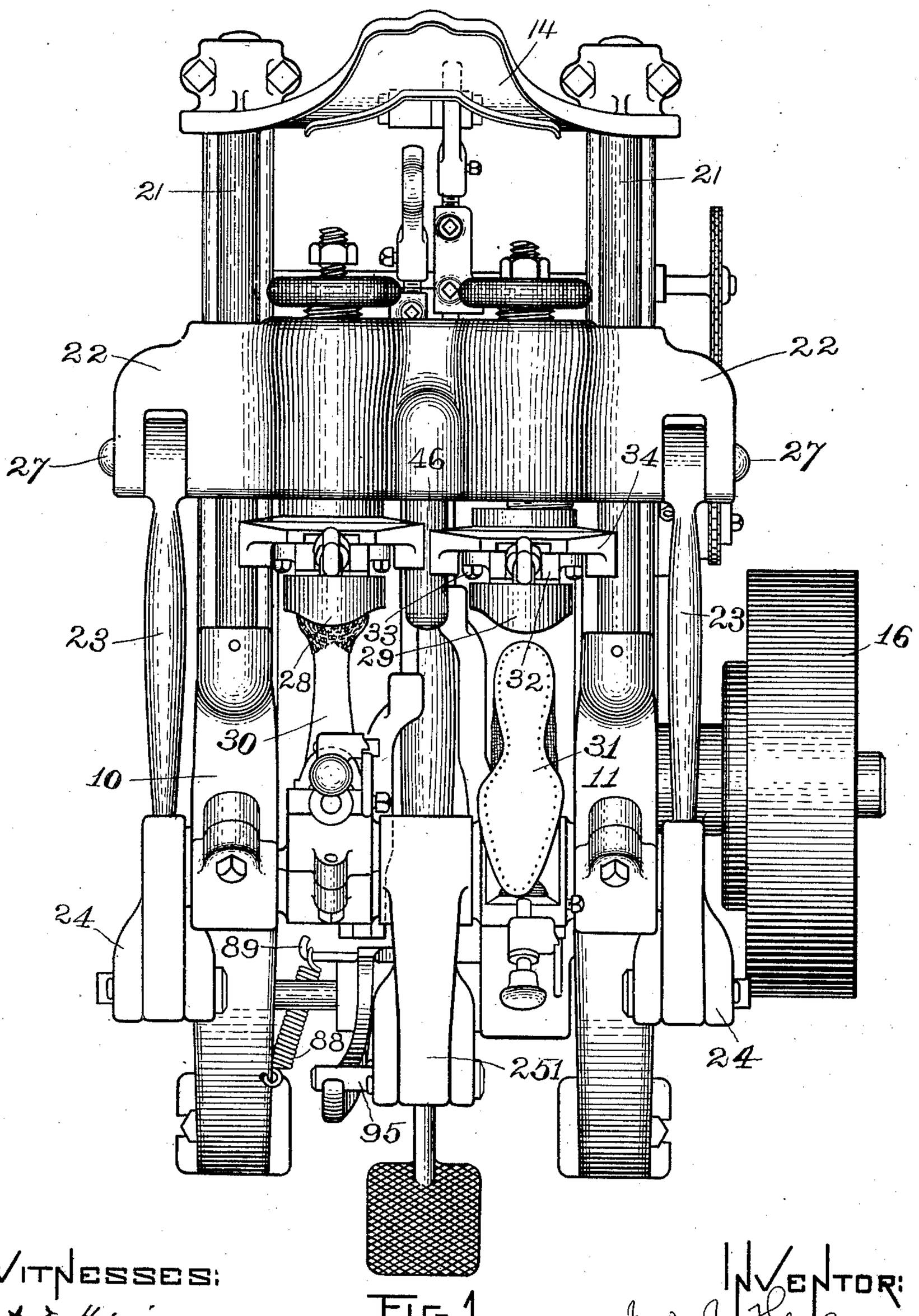

FIG. 1.

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D. Lazzetti

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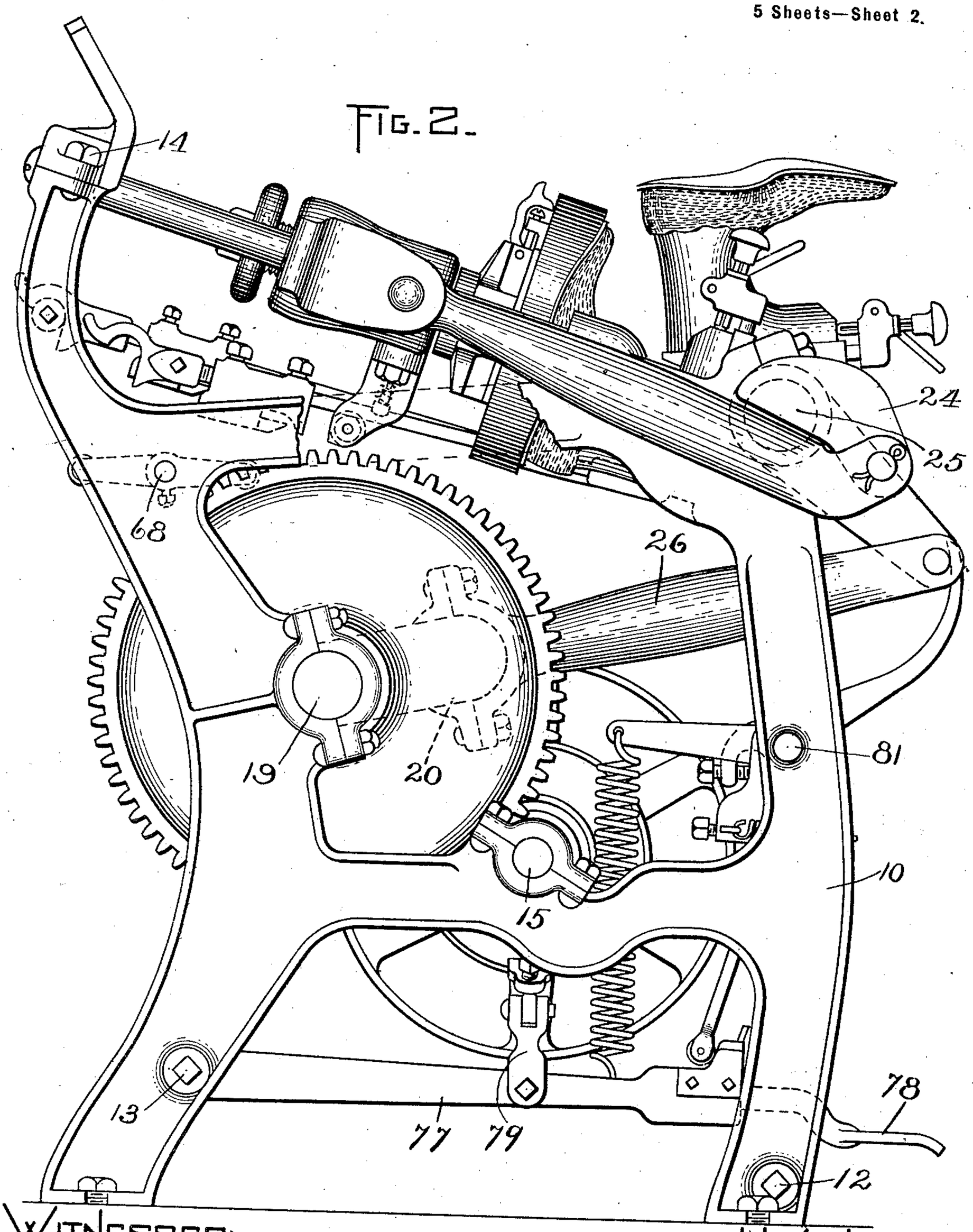
5 Sheets—Sheet 2.

FIG. 2.



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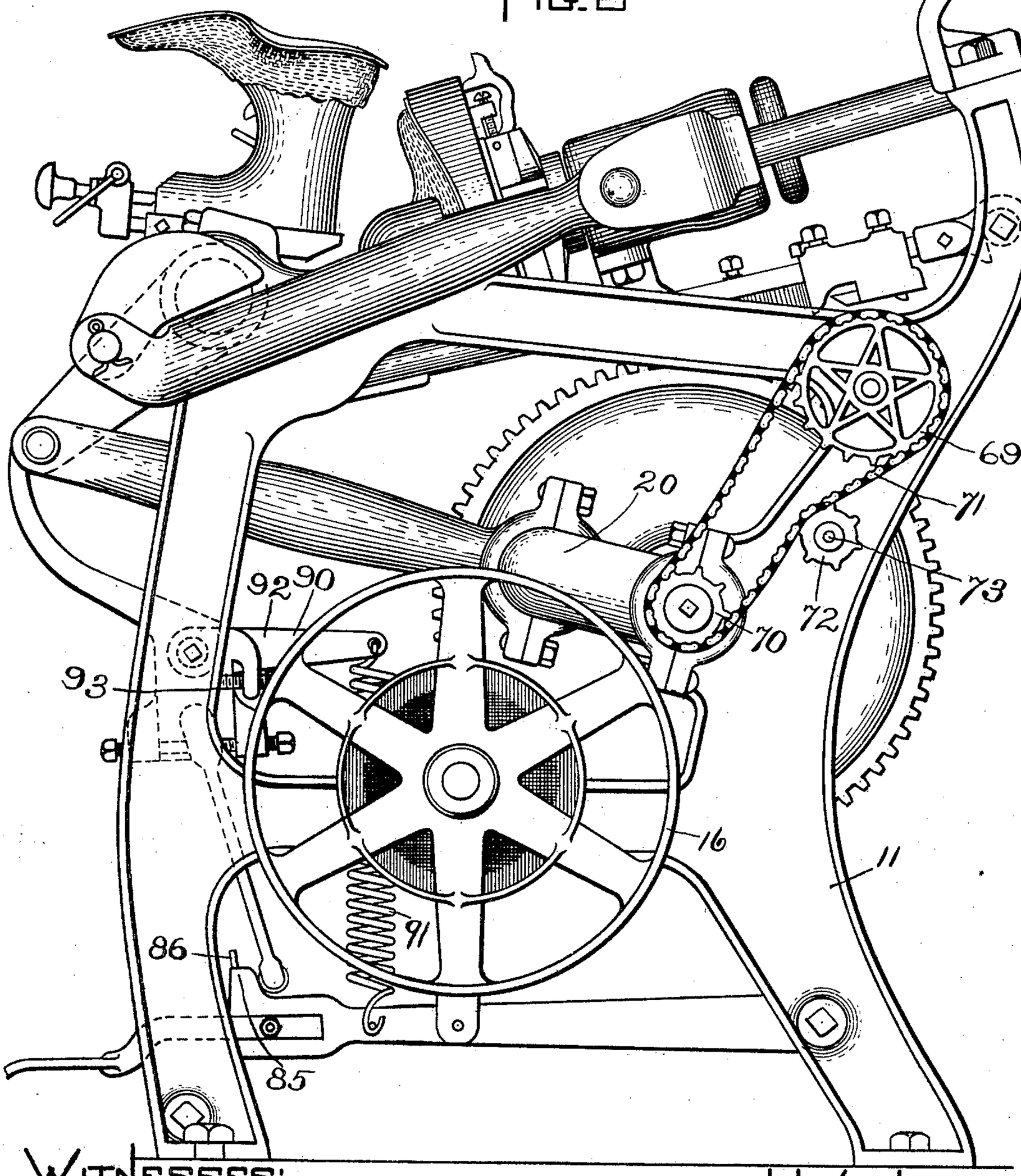
(No Model.) 5 Sheets—Sheet 3.

FIG. 3



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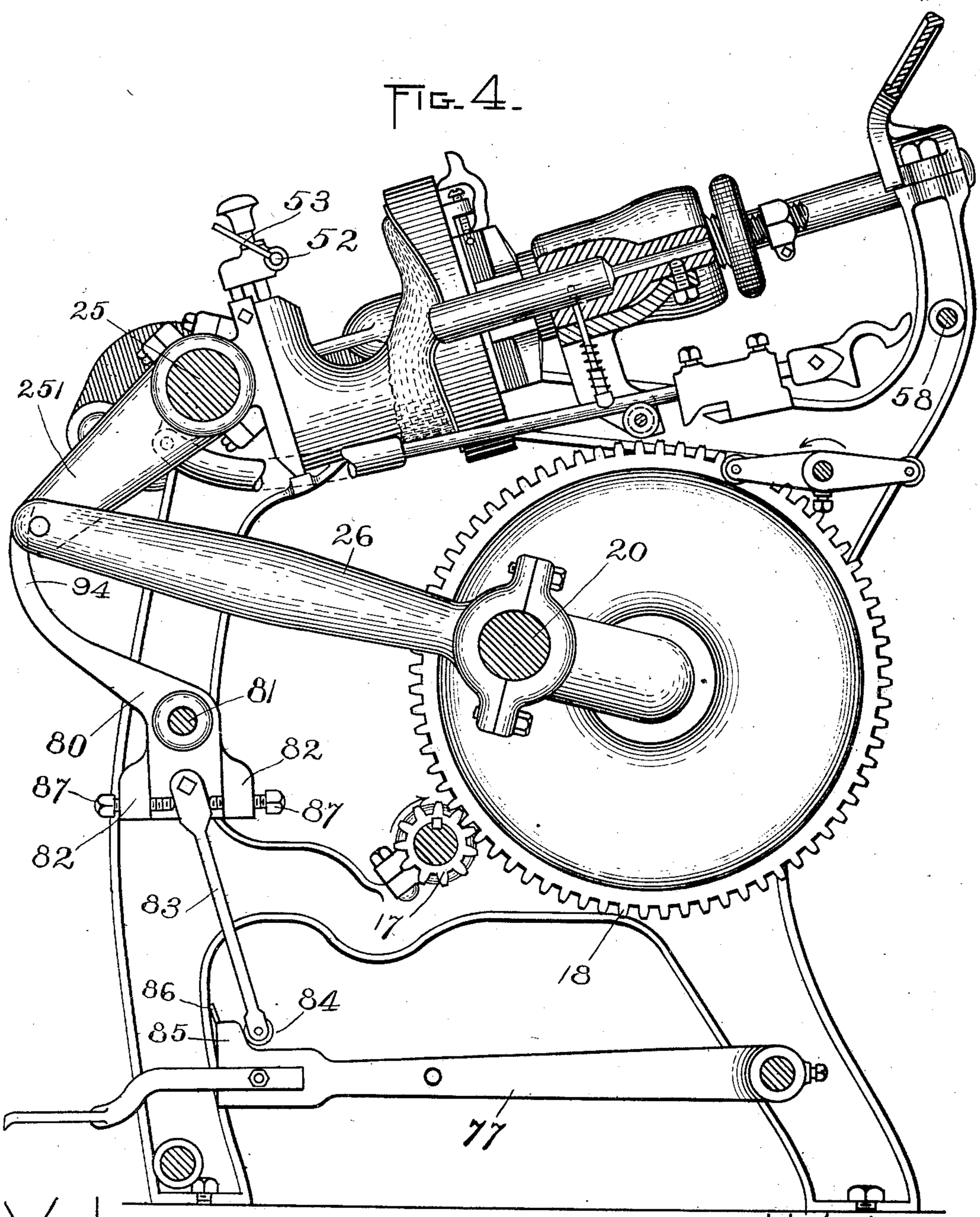
LEVELING MACHINE.

(Application filed Oct. 19, 1900.)

(No Model.)

5 Sheets—Sheet 4.

FIG. 4.



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LEVELING MACHINE.

(Application filed Oct. 19, 1900.)

(No Model.) 5 Sheets—Sheet 5

FIG. 5.

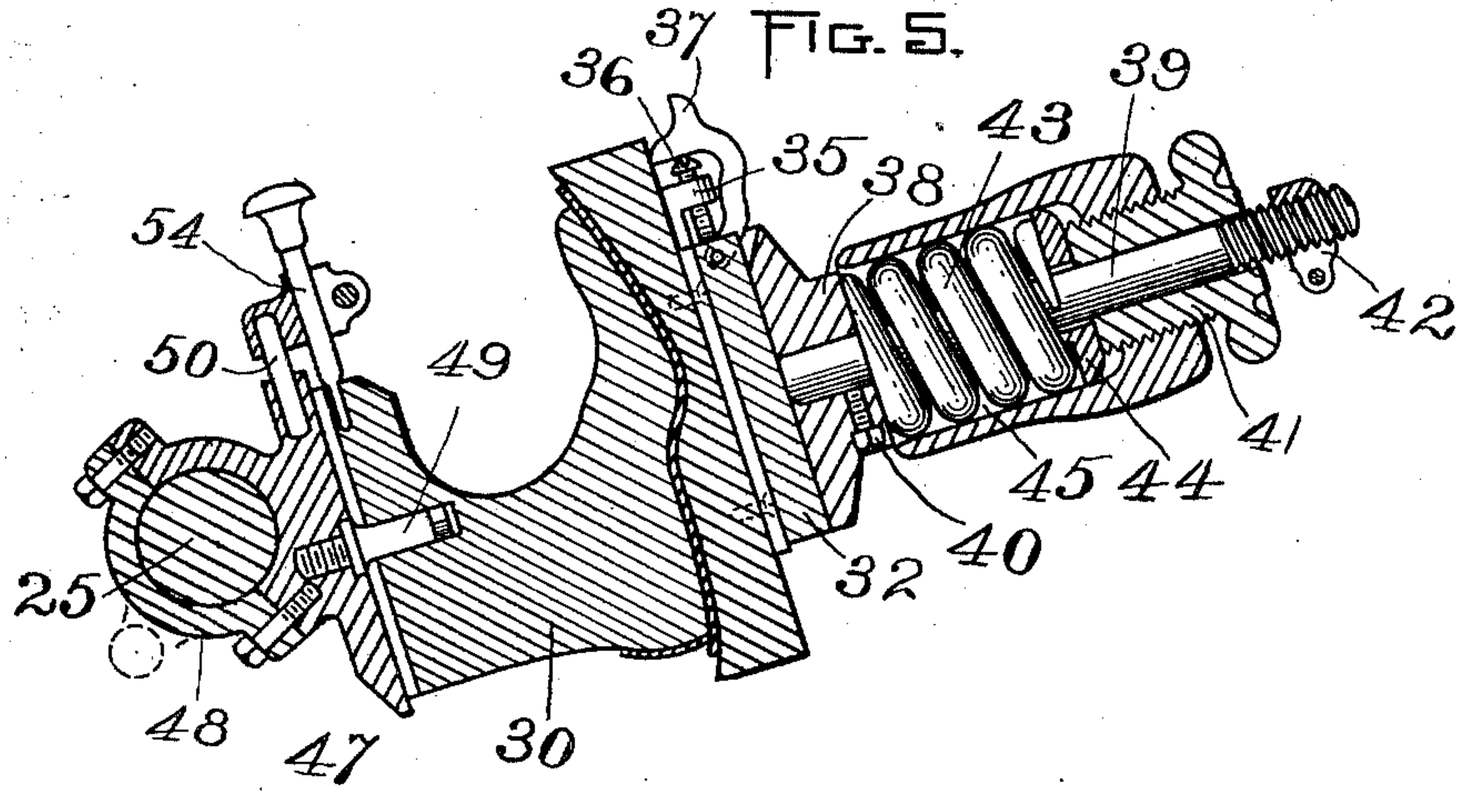

FIG. 6.

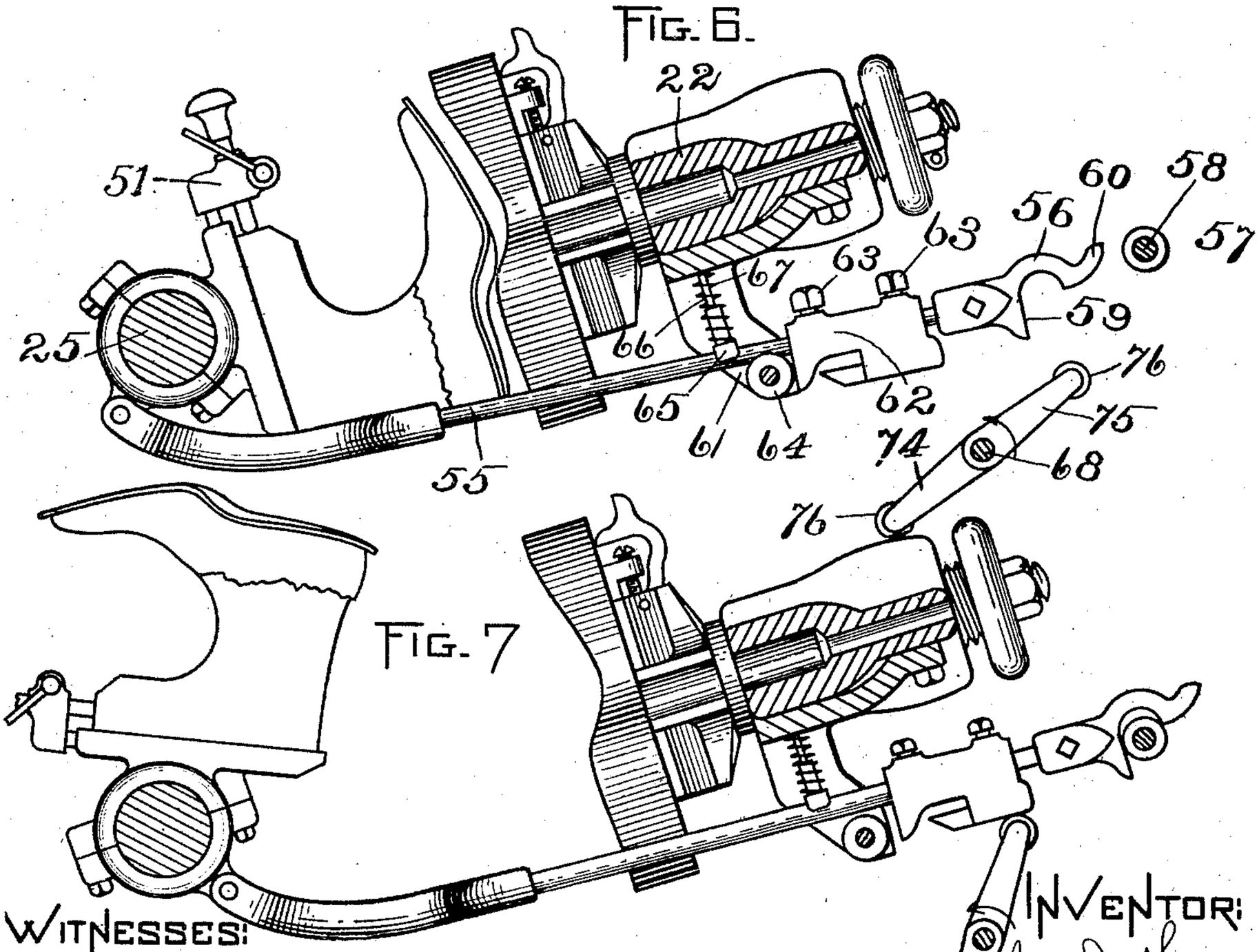

FIG. 7

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Their Attys

UNITED STATES PATENT OFFICE.

JOHN J. HEYS, OF LYNN, MASSACHUSETTS.

LEVELING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 703,204, dated June 24, 1902.

Application filed October 19, 1900. Serial No. 33,640. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. HEYS, of Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Leveling-Machines, of which the following is a specification.

This invention has relation to sole leveling or beating-out machines of the type wherein a shoe is placed upon a jack and the sole thereof is compressed between the jack and a complemental mold.

The objects of the invention are manifold, and among them I may mention the simplification of machines of the type referred to, the reduction thereof in size and weight, the enhancement of their efficiency, the increase in their working capacity, and the minimizing of danger to the operatives working thereon.

Other objects attained by this invention are hereinafter set forth in detail in connection with a description of the machine and the work performed thereby.

On the accompanying drawings I have illustrated a machine which embodies the invention and which I shall now describe; but it will be borne in mind that various changes may be made in its construction and operation without departing from the spirit and scope of the invention, that the phraseology which I employ is for purposes of description and not of limitation, and that I reserve the right to employ all known mechanical equivalents for the various parts of the machine where substantially the same results are accomplished by their employment.

Referring to said drawings, on which similar reference characters indicate like parts or features, as the case may be, wherever they occur, Figure 1 represents a plan view of the machine. Fig. 2 represents an elevation of one side of the machine. Fig. 3 represents an elevation of the other side thereof. Fig. 4 represents the machine in central longitudinal vertical section. Fig. 5 represents a longitudinal section through a jack and its complemental mold. Figs. 6 and 7 represent the tripping mechanism for releasing the jacks alternately.

Viewed as a whole the machine which I have elected to illustrate as embodying the invention comprises a main frame, (preferably,) two sets of jacks and molds, mechanism whereby the jacks are permitted to move by gravity into operative position (or a position of pressure) alternately, and mechanism for causing the compression of the sole of the shoe on the operative jack between the latter and its complemental mold. The mechanism which controls the movements of the jacks is such that one of them is always at rest, whereby simultaneous action never occurs, and hence the jack which is in operation or is in a position of clearance is maintained at rest a relatively long time, especially where the machine is working continuously, to permit the easy changing of the shoes thereon.

As will be subsequently explained, the power devices operate upon but one jack at a time and then only move it to a position of clearance, said jack, as has been previously stated, automatically falling at the proper time, according to the laws of gravitation, to a position of pressure. The jacks are latched in a position of clearance, and tripping mechanism is employed to unlatch them alternately, the power devices being utilized for restoring the jacks to latched position when the period of pressure has terminated.

The pressing or leveling of the shoe is accomplished after a jack is in a position of pressure by moving the mold toward the jack, the two molds being mounted upon a reciprocatory head or support, whereby they move simultaneously. This head is utilized in its movement to operative position for regulating the gravitating movement of the jack to a position of pressure, whereby said jack drops slowly and without a jar.

Referring to the drawings for a more specific description of the machine, the framework of the machine comprises two side standards 10 11, connected by tie-rods 12 13 and by a cross-brace 14, bolted to the upper portion of the standards. An initial power-shaft 15 is journaled at its ends in the standards, and on one end there is a loose belt-pulley 16. Suitable clutch mechanism is employed for connecting the pulley and shaft as occasion may require, and as any form may be employed I have not illustrated one in detail.

On the shaft 15 is a pinion 17, intermeshing with a large gear-wheel 18 on a shaft 19, journaled on the standards. The said shaft is provided with a crank 20, by which the molds

are moved into engagement with the jacks. Extending from the front portions of the standards to the rear portions thereof are two inclined guide-bars 21 21. Said bars extend upwardly and rearwardly and are clamped at their rear ends between the cross-braces 14 and the upper ends of the standards. Upon said bars is slidingly supported a cross-head 22, which is connected by connecting-rods 23 with bifurcated levers 24, rigidly secured to the ends of a rock-shaft 25, journaled in bearings in the front upper portions of the side standards. The levers 24 oscillate as the shaft is rocked to reciprocate the cross-head 22. Intermediate of its ends the shaft is provided with an arm 251, connected by a pitman 26 with the crank 20. Both the levers 24 and the arm 251 project downwardly, so that they oscillate through arcs below the rock-shaft, and their ends therefore do not extend far enough in front of the machine to incommode an operative at work thereon.

It will be observed from Fig. 1 that the cross-head 22 projects at its ends considerably beyond the guide-bars 21 and that the ends of the connecting-rods 23 are set in recesses, being pivoted upon the pins 27, which are passed into the cross-head. The rock-shaft 25 not only subserves the function of imparting movement to the cross-head, but likewise serves to support the jacks which are pivotally mounted upon it.

The molds, which are complemental to the jacks, are indicated at 28 29, the corresponding jacks being designated as 30 31. Each mold is removably attached to a block 32, secured by bolts 33 to a carrier 34. The block 32 has a dovetailed groove adapted to receive a tongue on the mold, said mold being provided with a lug 35, through which an adjusting-screw 36 is passed to abut against the end of the block and hold the mold in position. The swinging lock 37 is pivoted to the block to extend from the end of the screw 36 and hold the mold against accidental removal. The carrier 34 is formed with a round boss 38, into the center of which is passed a spindle 39, secured therein by a set-screw 40. The spindle of each mold-carrier is passed through the cross-head 22 and extends loosely through an externally-threaded nut 41, the end of the spindle being threaded to receive a lock-nut 42, which limits its movement toward the jack. The cross-head is formed with two sockets through which the spindles 39 pass, and in each socket there is a strong helical spring 43, which is coiled about the spindle and bears at one end against the boss 38 and at its other end against a washer 44, inserted between it and the end of the nut 41.

Half-way between the sockets 45, in which the springs 43 are arranged, a guide-bar 46 is inserted in the cross-head, it projecting forwardly from the cross-head and lying parallel to the guide-bars 21. Each of the mold-carriers is laterally extended and is grooved to take around the guide-bars 21 21 and 46, so that as the carriers move they slide in ways afforded by said guide-bars. On adjusting the nuts 41 the tension of the springs 43 may be increased or diminished, according to requirements. The molds are usually made of or lined with zinc, while the jacks are formed of iron.

Each jack is mounted upon a carrier, said carrier being indicated at 47 and being rotatively clamped upon the rock-shaft 25 by any convenient means, as a cap 48. Each carrier has a pin 49, adapted to enter a socket in the jack, and has secured on its front end a pin 50, to which a split clamp 51 is pinned. The clamp is adapted to be closed by a screw 52 and handle 53, and it embraces a locking-pin 54, which is passed through it at a right angle to the pin 49 to enter a socket in the jack and hold it against movement.

The disposition of the jacks and carriers is such that they will drop from an upright or vertical position by gravity, (the center of gravity thereof being in the rear of the vertical plane passing through the axis of the rock-shaft 25.) The jacks are adapted to move from an upright position to a position of pressure, in which the median lines of the jacks are parallel to the path of motion of the molds or to the line of pressure, and hence in order to hold them in upright position latching mechanism is employed, which is illustrated more particularly in Figs. 4, 6, and 7.

To each cap 48 of the carrier is pivoted a latching-rod 55, having on its extreme rear and free end a half-round latch 56, which is adapted to engage a roll 57, journaled on any convenient support, as upon a cross-rod 58, which may be supported at its ends by the standards 10 and 11. Said latch is preferably formed with an abrupt shoulder 59, which engages the roll and limits the movement of the jack when it reaches its position of clearance. So long as the latch engages the roll on the rod 58 the jack connected thereto is held against movement; but immediately upon disengaging the latch the jack drops rearward and downward until it is in position to exactly register with its complemental mold when the latter is forced against it.

The end of the latch may have an upwardly-curved end 60, as shown, by which when the rod is moved rearwardly it is lifted on coming into contact with the roll and is allowed to ride over and drop into engagement therewith.

In order to restore the rods to latched position, the cross-head 22 has an abutment or other suitable device, as an arm 61, the end of which is adapted to engage a clip 62, rigidly and adjustably secured by bolts 63 to the rod. The rod rests upon a roll 64, journaled upon an arm 61, and it is held yieldingly in engagement therewith by a suitable device, which may consist of a block 65 on a spindle 66 and a spring 67 encircling the spindle, said device insuring the engagement of the latch

with the roll. When the cross-head moves rearwardly, one or the other of the arms 61 engages a clip 62 and carries the latch-rod 55 rearwardly until the latch slides over and engages the roll 57.

To unlatch the jacks alternately, any suitable tripping mechanism may be employed. I have found it convenient to utilize a shaft 68, journaled in the standards and connected by sprockets 69 and 70 and a chain 71 with the crank-shaft 19. The sprockets 69 and 70 are in the ratio of two to one, so that the shaft 68 rotates once each two rotations of the crank-shaft. A sprocket 72 is journaled on a stud 73, projecting laterally from the standard 11 to take up slack in the chain. The shaft 68 carries two oppositely-extending arms 74 75, each of which carries on its end a roll 76. The roll on the arm 75 is adapted to engage the clip 62 on one latch-rod, while the roll on the arm 74 is adapted to engage the clip on the other latch-rod, the parts being so timed that the latching-arm lifts a latch-rod just as the cross-head begins its movement toward the position of pressure, whereby as the jack falls rearward the clip 62 engages the end of the bracket 61 and the downward movement of the jack is retarded. The path of motion of the cross-head is such that the jack reaches its position for pressure before its actual engagement with the mold. When the cross-head commences its upward and rearward movement, the jack is restored to a position of clearance by the arm 61 engaging the clip 62 and carrying the latching-rod rearwardly until the latch engages the roll on the rod 58. Each jack remains stationary in its upright position of clearance while the other is dropped to a position for pressure and is again raised to a position of clearance, so that a maximum period of time is given for the operative to take off the leveled shoe from a jack and to place another one upon it ready for leveling.

Although I have not illustrated the clutch mechanism which I employ, I have shown the mechanism for throwing it into and out of operation. The usual stop mechanism is employed in connection with the clutch mechanism; but as it forms no part of my invention I have not illustrated it. The clutch mechanism and stop mechanism are connected with a foot-lever 77, which is fulcrumed on the tie-rod 13 at the rear of the machine and extends forwardly, as shown in Fig. 3. Adjustably secured to the foot-lever is a treadle 78, which projects in front of the machine conveniently for the foot of the operative. The lever is connected by a link 79 with the clutch mechanism, so that when the treadle is depressed the stop mechanism is thrown out of operation and the pulley 16 is clutched to the shaft. To hold the treadle depressed during a complete rotation of the crank-shaft 19, I may employ any convenient device. As shown, a lever 80 is fulcrumed between its ends on a rod 81, passing through the end standards at the front of the machine, and at its lower end is provided with two flanges 82 82, between which is pivoted an arm 83, carrying a roll 84, adapted to swing forward and engage a projection 85 on the foot-lever. A stop 86 limits the forward movement of said roll. The position of the arm 83 with respect to the lever 80 may be varied by set-screws 87, passing through the flanges 82 and bearing against opposite sides of the said arm below its pivot. A spring 88 is connected at one end to the standard 10 and at its other end to a pin 89, projecting laterally from the arm 83. Also supported upon the rod 81 there is an arm 90, which projects rearwardly and is connected at its ends to the foot-lever 77 by a strong helical spring 91. The arm 90 has an auxiliary arm 92 connected or formed therewith, through which is passed a set-screw 93, bearing against the frame, whereby the adjustment of the set-screw varies the tension of the spring 91. The upper end of the lever 80 projects forwardly and upwardly, its upper end being indicated at 94 and being located within the path of the projecting end of the pivot-pin 95, which connects the pitman 26 with the arm 25.

The construction and location of the parts are such that upon depressing the treadle 78 the arm 83 moves forwardly under the tension of the spring 88 until the roll 84 lies upon the top of the projection 85. Upon removing the foot the treadle remains depressed until the crank has made a complete revolution and the pin 95 engages the end 94 of the lever 80, (the crank-shaft being at this time in the position shown in Fig. 4,) whereupon the said lever 80 is rocked to throw the arm 83 rearward, and thereby permit the foot-lever 77 to rise and throw the clutch mechanism out of and the stop mechanism into operation. The operative, however, by continuing to press his foot upon the treadle may cause a continuous rotation of the crank-shaft.

The operation of the machine is as follows: Assuming that the machine is at rest, with the jack 30 in a position of pressure and the jack 31 in a position of clearance, the operative places upon the last-mentioned jack a partially-formed shoe and depresses the treadle. The clutch mechanism is thereupon actuated to clutch the pulley 16 to the shaft 15, the crank 20 being at this time at its extreme of forward movement, and as the crank swings rearward the cross-head is carried rearward and upward, as has been explained. After the cross-head has moved far enough for the mold to separate from the jack the arm 61 engages the clip 62 of the latch-rod connected to the jack and forces it rearward until the finger 60 rides over the roll 57 and the latch drops into engagement therewith. The rearward movement of the rod swings the jack forward to vertical or upright position, where the operator can conveniently remove the leveled shoe, this oc-

curring during the first half-rotation of the crank-shaft. The jack 30 remains quiescent until the crank begins its forward movement, at which time the tripping-lever 74 engages the clip 62 of the other latch-rod and lifts it from engagement with the roll 57. The jack which is connected to said rod falls rearward until the end of the clip engages the adjacent arm 61 of the cross-head, and its descent is timed by the forward movement of the cross-head. The jack reaches its position of pressure prior to the cross-head reaching its forward extreme of movement, so that during the last portion of its forward movement the crank-shaft draws the mold on the cross-head with great pressure against the jack. As the arm 251 reaches its forward limit the pin 95 engages the lever 94 and releases the foot-lever 77, as previously explained, to stop the machine. In case the operative for any reason does not wish a jack to drop to a position of pressure he holds it against movement when its latch-rod is tripped until the lever 74 or 75 passes from under, whereupon the latch drops into engagement with its roll 57. In this way the operator may hold either jack against movement without stopping or interfering with the operation of the machine. This is one of the most important features of the invention, and so far as I am aware I am the first to have provided an automatic leveling-machine having provisions for manually preventing the engagement of the jack with the mold without stopping the machine.

Prior to the present time in duplex leveling-machines the jacks have been alternately operated and have been positively connected with the power devices, so that when one jack moved to a position of clearance the other moved to a position for pressure. The jacks are generally made of hard metal, such as cast-iron or steel, whereas the molds are covered with a zinc lining, and consequently when a jack comes in contact with its mold without the interposition of a shoe-sole the edge of the jack forms a groove in the lining and disfigures it. This groove of course becomes more and more accentuated as the jack at various times continues to engage the mold. The disfigurement of the mold is deleterious to the shoe, and the latter is improperly leveled and even at times disfigured by it.

With my invention all injury to the mold by contact of the jack therewith is entirely prevented, for the operator, by merely laying his hand upon the jack, may hold it in a position of clearance without affecting the machine or stopping the operation thereof. Another great advantage which is incident to the employment of the provisions which I have referred to arises from the fact that when the power is suddenly cut off, as at noon, the operator is enabled to hold the jacks against operation and prevent their being held for any length of time in a position of pressure. Where the shoe is permitted to remain under heavy pressure between the jack and mold, the leather is injured and blackened, and the sole becomes unfit for wear. With my machine, however, if the operator finds that the power is giving out or hears the noon whistle be may prevent one jack from moving into operative position and at the same time permit the other to move from a position of pressure to a position of clearance.

I may mention another advantage which is of practical importance—to wit, the saving of time in the removal of one pair of jacks from the machine and the insertion of another pair. In my machine by holding one of the jack-carriers against movement, so that they are both in a position of clearance, the operator may simultaneously remove the two jacks, taking one in each hand, and then replace them by two other jacks which he inserts in place simultaneously.

As indicated in the first part of this specification, numerous changes may be made in the machine without departing from the scope of the invention, for it is apparent that provisions other than those I have described in detail may be employed for preventing the operation of either or both jacks without materially altering the machine or its operation, and I regard any other mechanism that accomplishes the same purpose as equivalent to mine and as included within my invention.

Having thus explained the nature of the invention and described a way of constructing and using the same, although without attempting to set forth all of the forms in which it may be made or all of the modes of its use, I declare that what I claim is—

1. In a leveling-machine, two or more pivoted jacks, two or more reciprocating molds arranged to move in unison, automatic means for alternately moving each jack to a position of clearance and permitting its return to a position of pressure, and provisions whereby either jack may be prevented from being returned to a position of pressure without interfering with the motion of the molds or the leveling action of the active jack and its complemental mold.

2. A leveling-machine comprising an oscillatory jack, a complemental mold, power devices whereby the jack is swung from a position of clearance to a position for pressure, and provisions whereby said jack may be manually retained in a position of clearance irrespective of the movement of the power devices.

3. A leveling-machine comprising a reciprocatory mold, an oscillatory jack, power devices whereby said mold and jack are moved from their respective positions of clearance to positions of pressure, and provisions for holding said jack against movement during the operation of the mold.

4. A machine of the character specified comprising jacks and complemental molds, and automatic mechanism for causing said jacks to occupy in succession a position of clear-

ance and a position for pressure, with provisions whereby each jack is retained in a position of clearance while the other is moved from a position of clearance to a position for pressure and returned to original position.

5. A leveling-machine comprising a mold, a head carrying said mold and reciprocatory in approximately horizontal planes, a normally upright jack, and automatic means whereby said jack moves automatically from an upright position of clearance to a recumbent position for pressure.

6. A leveling-machine comprising a mold-carrier, a jack, and automatic means whereby said mold-carrier moves said jack to a position of clearance.

7. A leveling-machine comprising a mold-carrier, an oscillatory jack, and means whereby said mold-carrier moves said jack from a position for pressure to a position of clearance, that is at an angle to the plane occupied by the mold and jack when exerting pressure.

8. A leveling-machine comprising jacks and complemental molds, means for moving said molds toward said jacks, and automatic means for oscillating said jacks alternately to and from a position of clearance in succession.

9. A leveling-machine comprising a mold and a complemental jack, a reciprocatory mold-carrier, movable in lines inclined from the vertical, a pivoted jack-carrier having an upright position of clearance, and provisions whereby said jack-carrier is controlled in its movements by the mold-carrier.

10. A duplex leveling-machine comprising molds and complemental jacks, oscillatory jack-carriers adapted to have an approximately upright position of clearance and a recumbent position for pressure, a mold-carrier located with respect to the jacks whereby the mold complemental to an upright jack is out of contact therewith when the other mold and jack are in a position of pressure, means for reciprocating said mold-carrier, and means whereby said jacks alternately occupy a position for pressure.

11. A leveling-machine comprising an automatically-operated jack and a complemental mold, said jack being automatically movable to a position for pressure, and a latching device for holding said jack in a position of clearance.

12. A leveling-machine comprising automatically and alternately operated jacks and complemental molds, said jacks being movable to a position for pressure, latching devices for holding said jacks in a position of clearance, and tripping mechanism whereby said jacks are alternately released from the latching devices.

13. A leveling-machine comprising a jack and a complemental mold, a carrier for the jack movable to a position for pressure, a reciprocatory head for the mold, and means whereby said head regulates the movement of said jack-carrier to a position for pressure.

14. A leveling-machine comprising a jack and a complemental mold, a carrier for the jack movable to a position for pressure, a reciprocatory head for the mold, connections between said head and said jack-carrier whereby the latter is moved by the former to a position of clearance.

15. A leveling-machine comprising a jack and a complemental mold, arranged to have the lines of pressure inclined from the vertical, a pivoted jack-carrier movable to an upright position of clearance and overbalanced to fall automatically to a position for pressure, and mechanism for automatically latching said jack-carrier in and releasing it from a position of clearance.

16. A leveling-machine comprising a jack and a complemental mold, arranged to have the lines of pressure inclined from the vertical, a pivoted jack-carrier movable to an upright position of clearance and overbalanced to fall automatically to a position for pressure, a latch connected to said jack-carrier to hold it in a position of clearance, and means for tripping said latch.

17. A leveling-machine comprising a jack and a complemental mold arranged to have the lines of pressure inclined from the vertical, a pivoted jack-carrier movable to an upright position of pressure and overbalanced to fall automatically to a position for pressure, a latch connected to said jack-carrier to hold it in a position of clearance, means for tripping said latch, and a reciprocatory head for the molds, having provisions for moving the jack-carrier to a position for pressure.

18. A leveling-machine comprising a reciprocatory carrier having molds, oscillatory jacks complemental to said molds, a rock-shaft having an arm or arms connected to said carrier, a crank-shaft operatively connected to said rock-shaft, and provisions whereby at each reciprocation of the mold-carrier, one or the other of said jacks is moved to position to coöperate with its mold.

19. A duplex leveling-machine having a frame having side guides, a reciprocatory head carrying an intermediate guide, and independently-yielding mold-carriers on said head, each sliding between the intermediate guide and one of the side guides.

In testimony whereof I have affixed my signature in presence of two witnesses.

JOHN J. HEYS.

Witnesses:
MARCUS B. MAY,
C. C. STECHER.