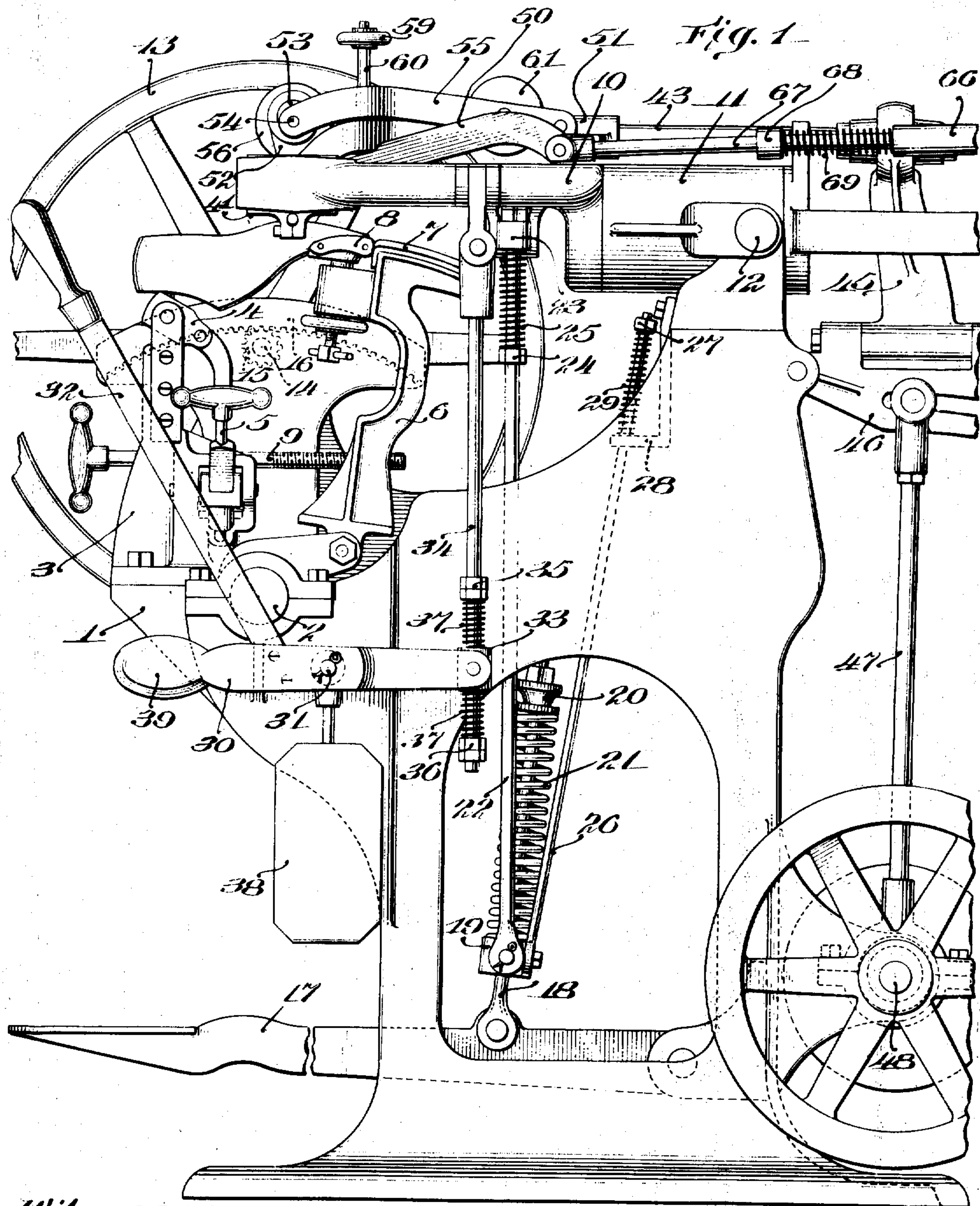


E. E. WINKLEY.
SOLE LEVELING MACHINE.
APPLICATION FILED JULY 28, 1905.

900,248.

Patented Oct. 6, 1908.

3 SHEETS—SHEET 1.



Witnesses:
Edward S. Day
Farnum J. Dorsey

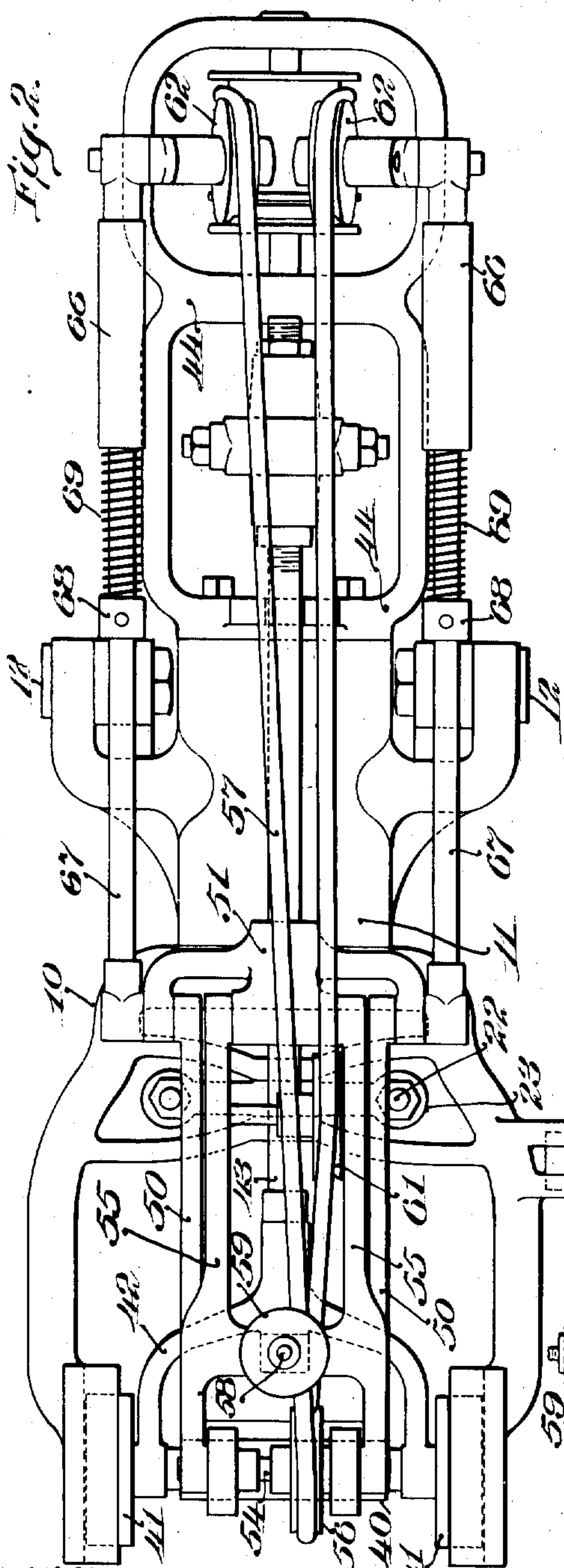
Inventor:
Eustace E. Winkley
by his Attorneys
Phillips Van Curen Fish

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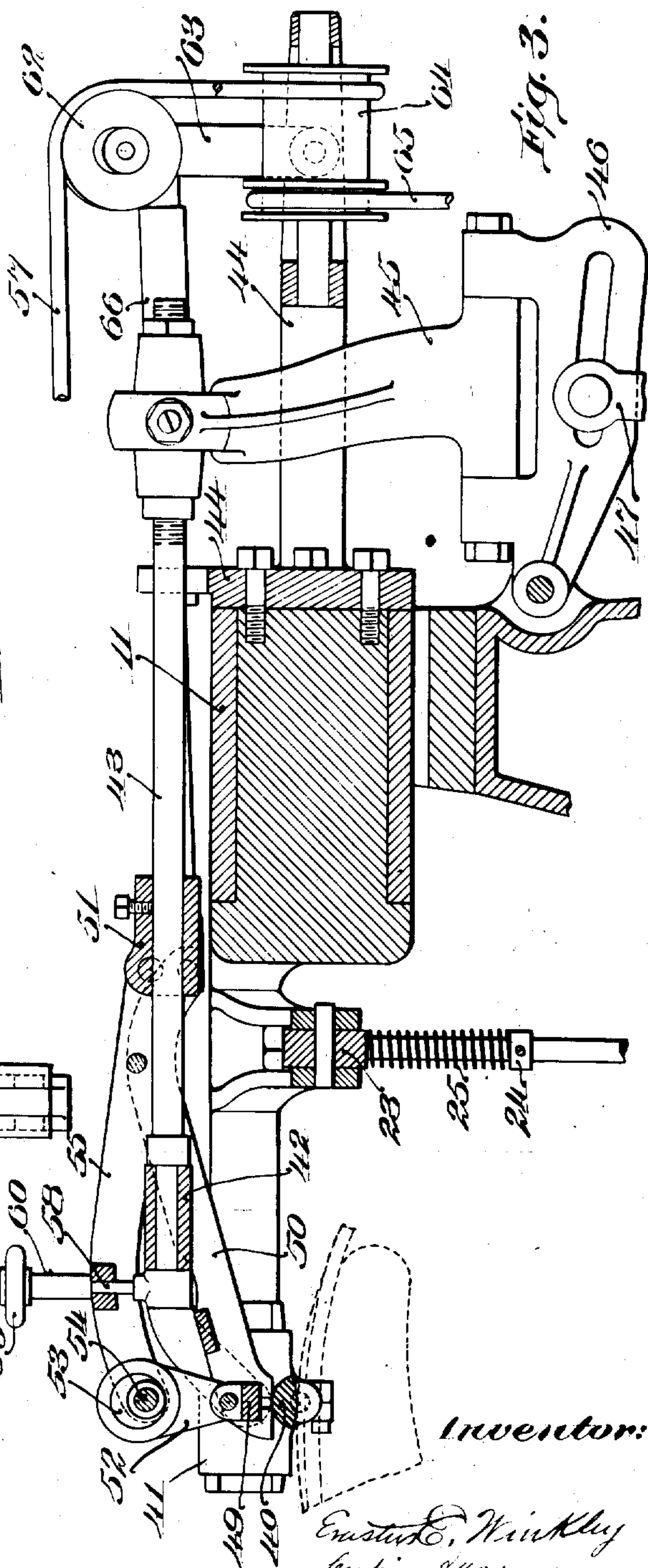
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3 SHEETS—SHEET 2.



Witnesses:
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3 SHEETS—SHEET 3.

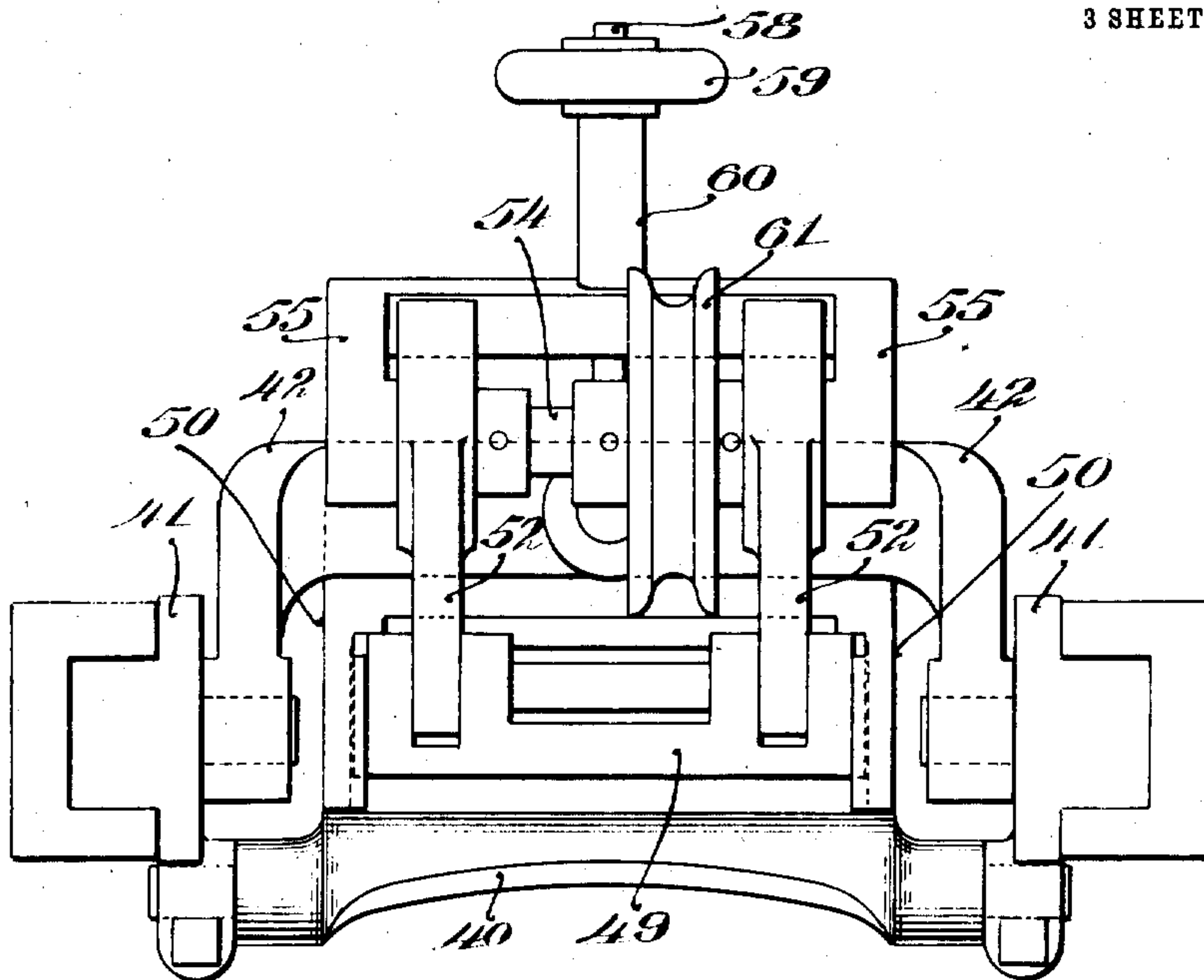


Fig. 4.

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UNITED STATES PATENT OFFICE.

ERASTUS E. WINKLEY, OF LYNN, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SOLE-LEVELING MACHINE.

No. 900,248.

Specification of Letters Patent.

Patented Oct. 6, 1908.

Application filed July 28, 1905. Serial No. 271,630.

To all whom it may concern:

Be it known that I, ERASTUS E. WINKLEY, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Sole-Leveling 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 leveling machines and particularly to machines for leveling turn shoes.

The sole of a turn shoe is thin as compared with the soles of other kinds of shoes and when the shoe is re-lasted after being turned, the sole is more or less wrinkled, particularly at the shank portion, and the stitches of the in-seam form elevations upon the surface of the sole. The operation of leveling the sole consists in pressing the elevations formed by the stitches of the in-seam down flat, in removing the wrinkles in the sole, and in causing the sole to conform to the shape of the bottom of the last. The hand method of leveling turned shoes consists in beating out the seam and in partially removing the wrinkles and conforming the sole to the bottom of the last by means of a hammer and in completing the leveling operation by rubbing the sole with a stick termed in the art a "long stick" or "rub stick", until the wrinkles are entirely removed and the entire sole is smooth and conforms to the shape of the last.

Vibrating roll sole leveling machines have been used for leveling turn shoes, although these machines are designed particularly for leveling welt shoes. The results attained by the use of these machines has, however, not been entirely satisfactory as the wrinkles are sometimes pressed into the sole instead of being removed and difficulty is experienced in completely obliterating the projections produced by the in-seam. Various other machines have also been utilized for leveling turn shoes, but so far as the applicant is advised, the work done by these machines has been inferior to that produced by the hand method of leveling.

The object of the present invention is to provide a machine by which the sole of a

turn shoe will be acted upon in substantially the same way as in the hand method of leveling and by which the leveling operation can be performed easily and quickly and as good results produced as when the leveling operation is performed by a skilled operator using the hand method.

A machine embodying the present invention comprises a shoe supporting jack and sole leveling mechanism relatively movable to transfer the point of operation of the leveling mechanism over the shoe sole. In accordance with the present invention the sole leveling mechanism is constructed and arranged to progressively smooth out the sole during the relative movement of the jack and leveling mechanism and to simultaneously deliver upon the sole a series of blows in a direction substantially perpendicular to the surface of the sole, so that the sole is acted upon in substantially the same manner as in the hand method of leveling.

In its broader aspects the invention contemplates the provision of any suitable form of leveling mechanism adapted to smooth out and hammer the sole in the manner above stated. The form of mechanism which it is preferred to use on account of its compactness and simplicity of construction and which has given satisfactory results in actual practice, comprises a single leveling device to contact with the surface of the sole and means for supporting and actuating the device to perform both operations of smoothing out and hammering the sole. This leveling device may be of any suitable form and any suitable mechanism for actuating the device to hammer the sole may be employed. It has been found, however, that the best results are secured when the device is actuated to impart sharp quick blows to the sole and in the preferred form of the invention this mode of operation is secured by the provision of a hammer arranged to deliver a series of blows in rapid succession upon the leveling device. In order that the action of the leveling device in smoothing out the sole may approximate as nearly as possible that of the hand operated rub stick or long stick, it is preferably constructed to exert a rubbing action upon the sole and in effect to constitute a rub stick. Also preferably a vibrating movement back and forth

over the sole is imparted to the leveling device.

The present invention will be clearly understood from an inspection of the accompanying drawings illustrating a machine embodying the same in its preferred form, which machine, in addition to the features of invention above referred to, also embodies certain novel constructions, combinations and arrangements of parts hereinafter described and claimed, the advantages of which will be obvious to those skilled in the art.

Referring to the drawings, Figure 1 is a view in side elevation of a sole leveling machine embodying the various features of the present invention in their preferred form, Fig. 2 is a plan view of the mechanism for supporting and actuating the sole leveling device, Fig. 3 is a central vertical sectional view of the mechanism illustrated in Fig. 2, and Fig. 4 is an end view of a portion of the mechanism illustrated in Figs. 2 and 3.

The shoe supporting jack is indicated at 1 and is pivotally mounted at 2 in the front portion of the frame of the machine so as to be capable of an oscillating movement to move the shoe supported upon the jack backward and forward longitudinally beneath the sole leveling device. The jack is provided with a rigid heel post 3, in the upper end of which is pivotally mounted a last pin carrier 4 which can be oscillated on its pivot by an actuating screw-threaded rod 5 in order to clamp the lasted shoe firmly on the jack. The toe post of the jack is indicated at 6, being pivotally mounted at its lower end and provided at its upper end with a rest 7, for the sole leveling device and with a vertically adjustable toe support 8 for the toe portion of the lasted shoe. The toe post 6 can be adjusted towards and from the heel post 3 to accommodate shoes of different sizes by means of a screw threaded adjusting rod 9.

The sole leveling device is mounted in a vertically swinging and laterally rocking bed 10, the front portion of which is in the form of a yoke and the rear portion of which is cylindrical and received in a bearing 11 pivotally mounted at 12 in the upper rear portion of the machine frame, the pivotal connection of the bearing 11 with the frame of the machine allowing the bed 10 to swing vertically and the engagement of the cylindrical portion of the bed with the bearing 11 allowing the bed to rock laterally.

During the operation of the machine the leveling device is pressed yieldingly against the sole of the shoe supported on the jack and the jack is oscillated and the bed 10 rocked laterally in order to subject those portions of the sole to be leveled to the action of the leveling device.

The oscillating movements of the jack are produced by means of a hand wheel 13 fast upon a shaft 14 journaled in the frame of the machine, to which is secured a pinion 15 meshing with a segmental rack 16 upon the jack.

To press the leveling device yieldingly against the sole of the shoe during the leveling operation a treadle and connections between the treadle and the bed 10 are provided. The treadle is indicated at 17 and is pivotally mounted at its rear end in the lower rear portion of the machine frame. To the treadle is pivotally connected a rod 18 which passes through a cross-head 19 and is provided at its upper end with an adjustable stop nut 20 between which and the cross-head 19 a coiled spring 21 is interposed. The cross-head 19 is connected by means of rods 22 to a cross-bar 23 pivotally mounted midway between its ends in webs connecting the arms of the yoke portion of the bed 10. The upper ends of the rods 22 pass loosely through the cross-bar 23 and are provided with nuts bearing upon the upper surface of the cross-bar. Below the cross-bar 23 the rods 22 are provided with collars 24 between which and the cross-bar coiled springs 25 are interposed. A depression of the treadle 17 thus tends to compress the spring 21 and through the cross-head 19, rod 22 and cross-bar 23 to swing the bed 10 downwardly and yieldingly press the leveling device against the sole of the shoe. A rod 26 pivotally connected at its lower end at the cross-head 19 and provided at its upper end with a stop nut 27 between which and a bracket 28 on the frame of the machine a coiled spring 29 is interposed serves as a means for counterbalancing the weight of the bed 10, the treadle 17 and the connections between these parts.

The lateral rocking movements are imparted to the bed 10 by means of a lever 30 pivoted at 31 on the frame of the machine and provided with a handle 32 projecting into a position to be conveniently grasped by the operator. At its end the lever 30 is provided with a pivotally mounted block 33, through which a rod 34 passes. The rod 34 is pivotally connected at its upper end to the bed 10 and at its lower end is provided with two collars 35 and 36 upon opposite sides of the block 33, coiled springs 37 being interposed between the collars and the block which absorb the vibrations of the bed 10 and prevent them from being transmitted to the handle 32. In order to enable the bed 10 to be rocked easily and to be securely held in position the lever 30 is provided with counterbalancing weights 38 and 39.

The parts so far described and also the mechanism hereinafter described for imparting vibrating movements longitudinally

of the shoe sole to the leveling device are constructed and arranged in substantially the same manner as the corresponding parts and mechanism of a well-known vibrating roll sole leveling machine, several forms of which are disclosed in the patents to Washburn Nos. 435,882 and 435,833, Sept. 2, 1890, and No. 561,035, May 26, 1896, to which patents reference is made for a complete disclosure thereof. In applying the present invention to this machine a leveling device supported in the bed 10 has been provided and means for actuating the leveling device to smooth out the sole of a shoe supported on the jack and simultaneously to hammer the sole with a series of blows delivered in a direction substantially perpendicular to the surface of the sole. The leveling device is indicated at 40 and is so shaped that during the relative movements of the leveling device and jack it smooths out the sole in the same manner as a rub stick in the hands of an operator and in effect constitutes an automatically actuated rub stick. The rub stick is pivotally mounted at its ends in bearings projected downward from blocks 41 mounted to reciprocate in guide-ways formed in the arms of the yoke portion of the bed 10. To the blocks 41 are pivotally connected the arms of a cross-head 42 mounted upon the forward end of a reciprocating rod 43. This rod passes through a slot in an upwardly projecting portion of a bracket 44 secured to the rear end of the cylindrical portion of the bed 10 and is pivotally connected at its rear end to an arm 45. The arm 45 is pivotally mounted in a lever 46 pivotally mounted on the upper rear portion of the machine frame and connected by a rod 47 to an eccentric strap surrounding an eccentric on the driving shaft 48. During the operation of the machine the shaft 48 is constantly rotated and through the connections above described imparts a rapid vibratory movement to the rub stick longitudinal of the shoe sole, the pivotal connection of the arm 45 with the lever 46 permitting the bed 10 to be rocked laterally without interfering with the vibrating movements of the rub stick.

The means illustrated in the drawings for actuating the rub stick to hammer the sole consist of a hammer 49 and mechanism for actuating the hammer to deliver a series of blows in rapid succession upon the upper surface of the rub stick. The hammer is mounted to reciprocate in vertical guide-ways formed in the forward ends of arms 50 resting upon the upper surface of the rub stick and pivotally connected at their rear ends to a cross-head 51 secured upon the rod 43. To the hammer are pivotally connected the lower ends of rods or straps 52, the upper ends of which are provided with bearings

engaged by eccentrics 53 upon a shaft 54. The shaft 54 is mounted in bearings in the forward ends of arms 55 pivotally mounted at their rear ends upon the cross-head 51. A belt pulley 56 is secured to the shaft 54, over which a belt 57 passes by means of which the shaft 54 is rotated at a high rate of speed. The eccentrics 53 on the shaft 54 act, through the rods 52, to impart rapid reciprocating movements to the hammer 49 and cause the hammer to deliver a series of blows in rapid succession upon the rub stick 40, the blows being transmitted by the rub stick to the surface of the sole in a direction substantially perpendicular to the surface of the sole. The bearings for the rub stick are slightly elongated in a vertical direction in order to allow the rub stick to move vertically under the force of the blows imparted by the hammer. To provide means for varying the force of the blows delivered upon the sole a rod 58 projects upwardly from the cross-head 42 through a cross-bar connecting the levers 55 and is provided at its upper end with an adjusting nut 59, between which and the cross-bar a sleeve 60 is interposed. The position of the shaft 54 with relation to the rub stick is thus determined by the sleeve 60 and nut 59, and by adjusting the sleeve and nut on the rod 58 the shaft 54 can be moved towards and from the rub stick so as to vary the force of the blow delivered by the hammer upon the rub stick and the distance to which the rub stick is depressed. The belt 57, by which the belt pulley 56 on the shaft 54 is driven, passes over an idler pulley 61 mounted on a shaft connecting the levers 55, over two idler pulleys 62 mounted in the upper ends of arms 63 pivotally connected at their lower ends to the bracket 44 and around a pulley 64 mounted in the rear portion of the bracket 44. The pulley 64 is driven from any suitable source by means of a belt 65 passing over the pulley. It will be apparent that the hammer 49 and shaft 54 are supported so as to be vibrated with the rod 43 and that consequently the hammer always remains directly above the rub stick in a position to contact with the rub stick during each of its downward movements. In order to allow the shaft 54 to be so vibrated and at the same time maintain the desired tension upon the belt 57 the arms 63 upon which the idler pulleys 62 are mounted are pivotally connected to sleeves 66 and rods 67 are provided pivotally connected at their forward ends with the cross-head 51 and having a sliding engagement with the sleeves 66 at their rear ends, each rod 67 being provided with a fixed collar 68 between which and a sleeve 66 a coiled spring 69 is interposed. The axis of the pulley 64, by which the belt 57 is driven, is located in alignment with the axis about which the bed 10 rocks

laterally so that the pulley is not displaced during the lateral rocking movements of the bed. The idler pulleys over which the belt 57 passes and the pulley 56 on the shaft 54 are all supported so as to move with the bed during its lateral rocking and vertical swinging movements and consequently these movements of the bed do not interfere with the operation of the mechanism for actuating the hammer.

The rub stick is provided with a working surface curved slightly in the direction of the longitudinal axis of the shoe and also curved transversely of the shoe to fit approximately the curvature of the sole at the fore-part of the shoe. In order to allow the rub stick to automatically accommodate itself to the longitudinal curvature of the shoe sole so that its working surface may have the same position with relation to the surface of the sole of the shoe during the entire leveling operation the working surface of the rub stick is arranged in line with or slightly above the pivotal axis of the rub stick. The upper surface of the rub stick is curved to form a portion of a cylindrical surface, the center of which is the pivotal axis of the rub stick. The oscillating movements of the rub stick in accommodating itself to the variation in the longitudinal curvature of the shoe sole do not, therefore, displace the upper surface of the rub stick with relation to the hammer, so that the rub stick is always depressed to the same extent by the hammer at all portions of the sole.

The operation of the machine illustrated in the drawings has been indicated in connection with the description given above of the construction and arrangement of the various parts and will be readily understood by those skilled in the art without a separate description thereof.

The nature and scope of the present invention having been indicated and a machine embodying the various features of the invention in their preferred form having been specifically described, what is claimed is:—

1. A sole leveling machine, having, in combination, a shoe supporting jack and means for applying pressure progressively to the sole of a shoe supported upon the jack to smooth out the sole and for simultaneously delivering a series of blows upon the sole in a direction substantially perpendicular to the surface of the sole.

2. A sole leveling machine, having, in combination, a shoe supporting jack and a sole leveling device relatively movable to transfer the point of operation of the leveling device over the sole of a shoe supported upon the jack and means for actuating said device to exert a progressive pressure upon the sole to smooth out the sole and for ac-

tuating said device to deliver upon the sole a series of blows in a direction substantially perpendicular to the sole.

3. A sole leveling machine, having, in combination, a shoe supporting jack and a rub stick relatively movable to transfer the point of operation of the rub stick over the sole of a shoe supported upon the jack, and means for actuating the rub stick to hammer the sole with a series of blows delivered in a direction substantially perpendicular to the surface of the sole.

4. A sole leveling machine, having, in combination, a shoe supporting jack and a rub stick relatively movable to transfer the point of operation of the rub stick over the sole of a shoe supported upon the jack, a hammer and means for actuating the hammer to deliver a series of blows upon the rub stick while in contact with the sole.

5. A sole leveling machine, having, in combination, a shoe supporting jack and a rub stick relatively movable to transfer the point of operation of the rub stick over the sole of a shoe supported upon the jack, means for vibrating the rub stick longitudinally of the sole while in contact therewith, a hammer mounted to vibrate with the rub stick and means for actuating the hammer to deliver a series of blows upon the rub stick.

6. A sole leveling machine, having, in combination, a shoe supporting jack and a rub stick relatively movable to transfer the point of operation of the rub stick over the sole of a shoe supported upon the jack, said rub stick being pivotally mounted to allow its working face to conform to the longitudinal curvature of the sole and being provided with a surface curved about the pivotal axis of the rub stick as a center, a hammer, and means for actuating the hammer to deliver a series of blows upon the curved surface of the rub stick.

7. A sole leveling machine, having, in combination, a shoe supporting jack, a bed mounted to swing towards and from the jack and to rock laterally, a rub stick and a hammer mounted on the bed, and mechanism mounted on the bed for actuating the hammer to deliver a series of blows upon the rub stick while in contact with the sole.

8. A sole leveling machine, having, in combination, a shoe supporting jack and sole leveling devices relatively movable to transfer the point of operation of the leveling devices over the sole of a shoe supported upon the jack, and mechanism for actuating the leveling devices to rub and hammer the sole.

9. A sole leveling machine, having, in combination, a shoe supporting jack and a sole leveling device relatively movable to transfer the point of operation of the leveling device over the sole of a shoe supported

upon the jack, means for maintaining said device in contact with the sole of the shoe and means for actuating the device to deliver a series of blows upon the sole.

- 5 10. A sole leveling machine, having, in combination, a shoe supporting jack, a sole leveling device adapted to rub and hammer the sole of a shoe supported upon the jack

and means for actuating the sole leveling device.

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

ERASTUS E. WINKLEY.

Witnesses:

FRED V. HART,

GEORGE T. HART, Jr.