

(No Model.)

4 Sheets—Sheet 1.

E. C. JUDD.
SOLE LEVELING MACHINE.

No. 537,774.

Patented Apr. 16, 1895.

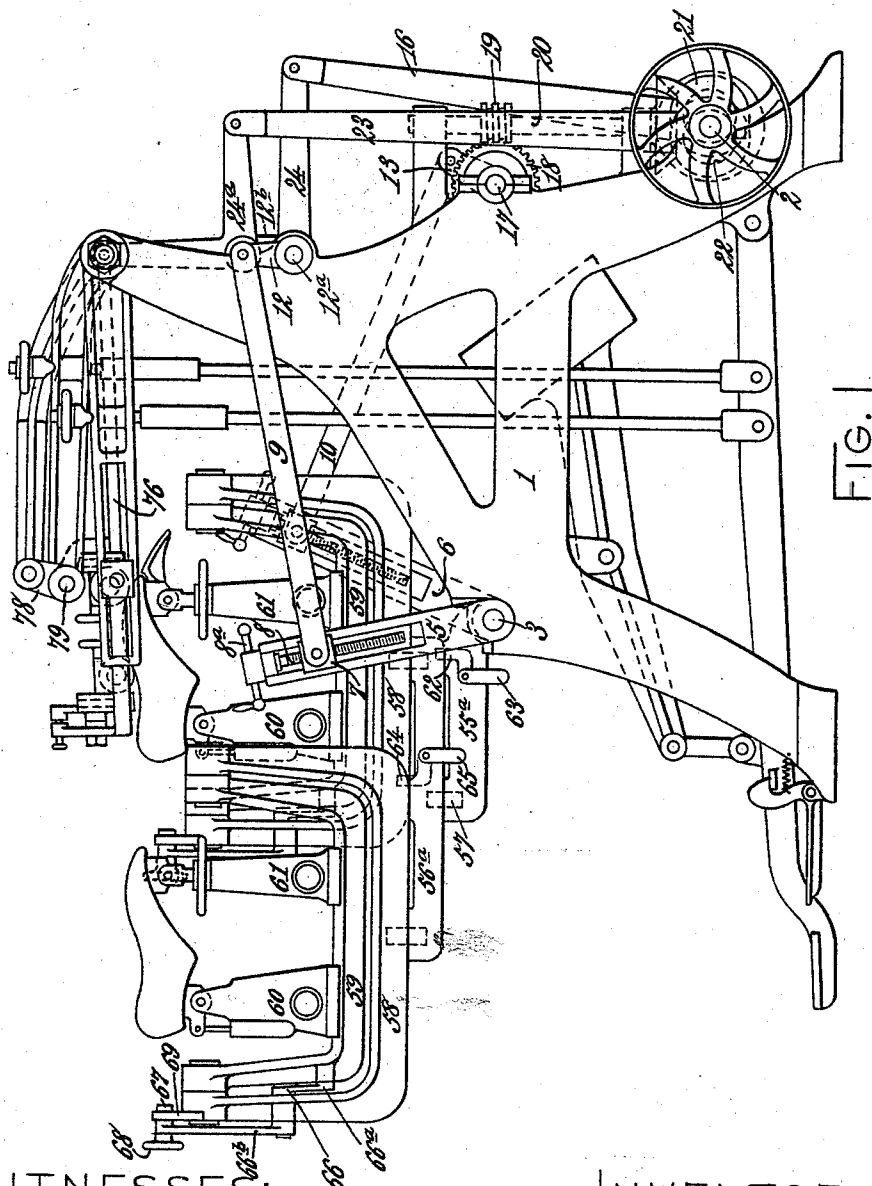


FIG. 1

WITNESSES:

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Robert Cruik.

INVENTOR:

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By *James L. Norris.*
Atty

(No Model.)

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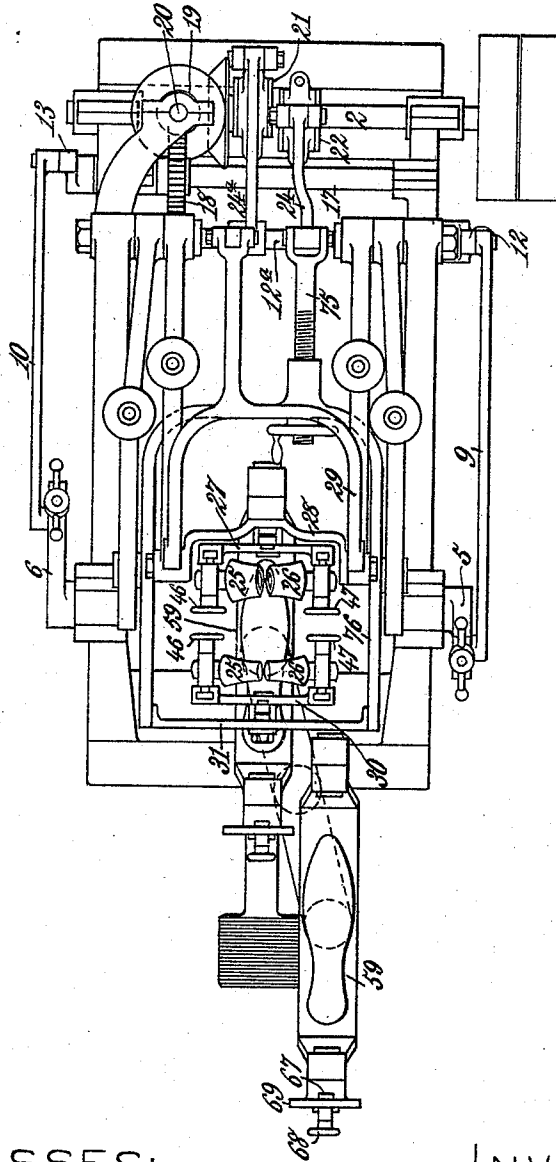


FIG. 2

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(No Model.)

4 Sheets—Sheet 3.

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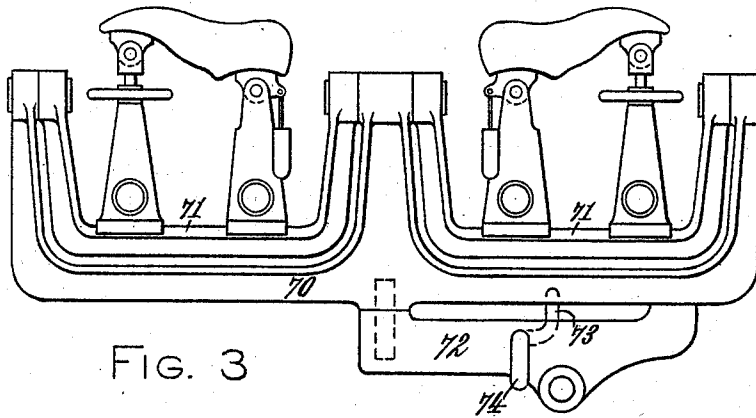


FIG. 3

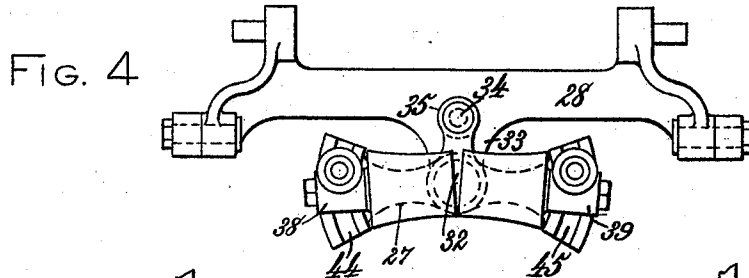


FIG. 4

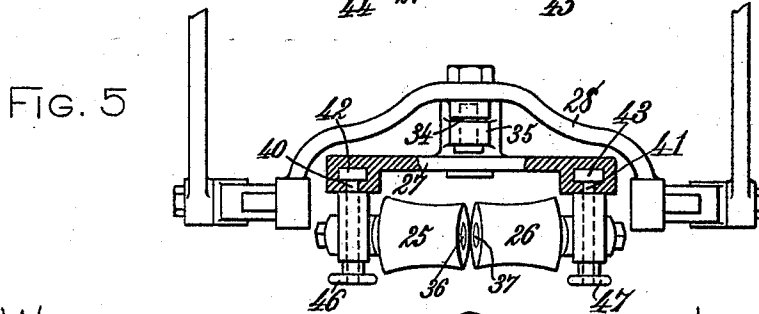


FIG. 5

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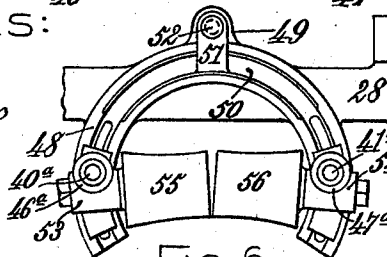


FIG. 6

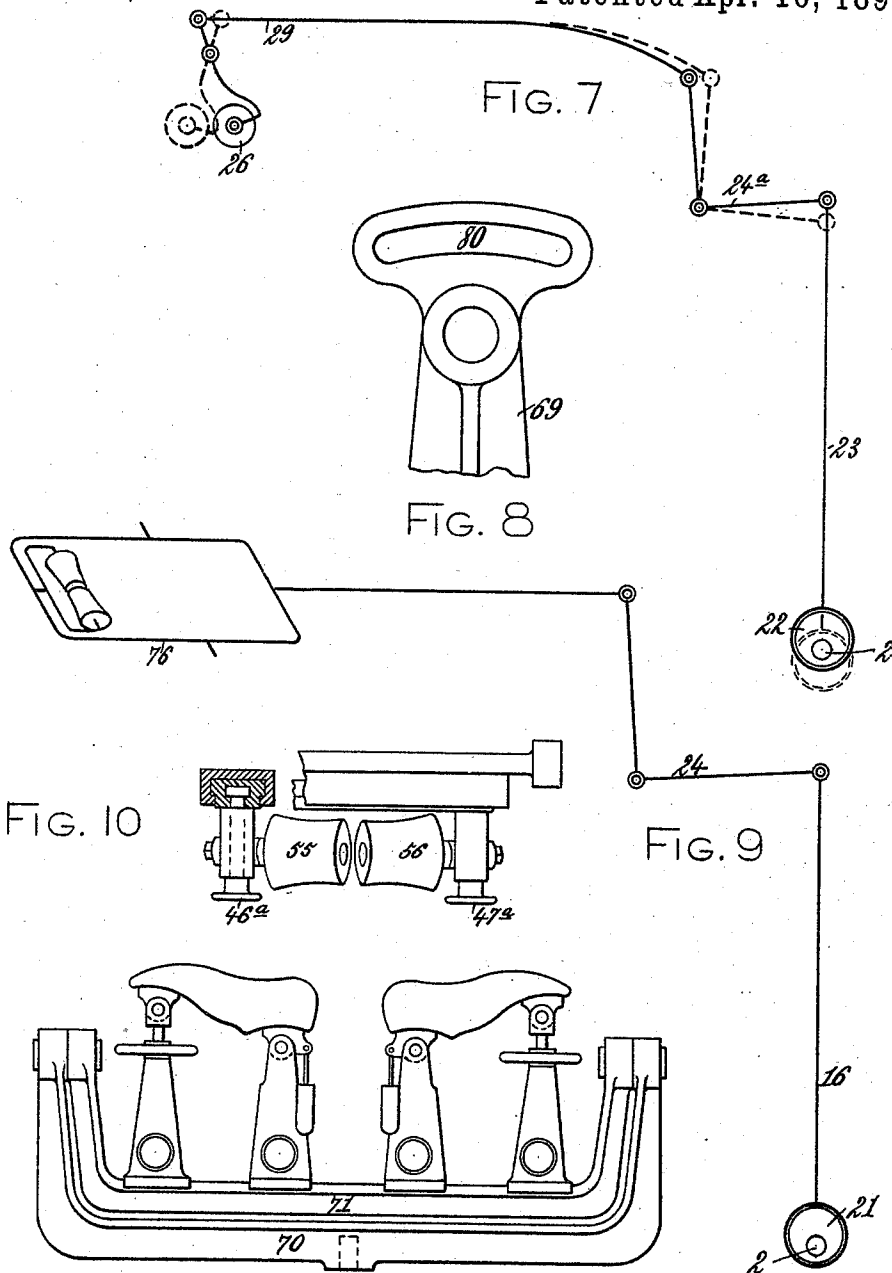
(No Model.)

4 Sheets—Sheet 4.

E. C. JUDD.
SOLE LEVELING MACHINE.

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Patented Apr. 16, 1895.



WITNESSES: FIG. 11

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UNITED STATES PATENT OFFICE.

EDWARD C. JUDD, OF BOSTON, MASSACHUSETTS.

SOLE-LEVELING MACHINE.

SPECIFICATION forming part of Letters Patent No. 537,774, dated April 16, 1895.

Application filed January 17, 1895. Serial No. 535,268. (No model.)

To all whom it may concern:

Be it known that I, EDWARD C. JUDD, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Sole-Leveling Machines, of which the following is a specification.

This invention relates to that type of sole leveling machines wherein a reciprocating or vibrating roller-leveler acts upon the sole of a boot or shoe carried by a longitudinally and laterally movable jack.

The chief object of the present invention is to provide a new and improved sole-leveling machine having twin jacks adapted to move laterally and longitudinally, and so constructed that while a boot or shoe on one jack is being acted upon by the sole-leveler, the attendant or operator can mount and prepare on the other jack another boot or shoe to be leveled, thereby increasing the efficiency of sole-leveling machines and producing a machine which is susceptible of rapidly leveling the soles of boots and shoes without loss of time.

The invention also has for its object to provide new and improved adjustable leveling-rolls adapted to act upon shoe soles which vary in contour or shape, also to conform to the angle at which the sole is presented and to equalize the pressure over the entire sole.

The invention also has for its object to provide a pair of leveling-rolls adapted to act simultaneously on opposite sides of the sole of a boot or shoe, and mounted on independent axles or shafts carried by bearings on a suitable support, which bearings can be independently adjusted and rigidly held after adjustment to vary the angle of inclination of the axles or shafts, and thus adapt the rolls to soles which vary in contour or shape, the construction being such that while the bearings of the axles or shafts can be held in fixed positions, the support which carries the bearings is adapted to freely rock or to be rigidly held in position as may be desired, whereby the leveling rolls are well adapted for operating on narrow and wide shoe soles and shoe-soles having a flat ball or fore part, and a curved shank, or a curved ball or fore part and a flat shank.

These objects are accomplished in the manner and by the means hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a side elevation of a sole-leveling machine embodying my invention. Fig. 2 is a top plan view of the same. Fig. 3 is a detail side elevation, showing a modified construction of the rotary support or turn-table for carrying the laterally swinging yokes which support the twin jacks. Fig. 4 is a detail front elevation of one pair of the leveling rolls and their carrier. Fig. 5 is a top plan view of the same, partly in horizontal section; Fig. 6, a front elevation, showing a modification of the devices for supporting and adjusting the leveling rolls. Fig. 7 is a diagram indicating the manner of vibrating the rolls which act on the ball or fore part of the sole. Fig. 8 is a broken detail view, to show the segmental slot in the arm or plate of each jack-carrying yoke for enabling the yoke to rock laterally. Fig. 9 is a diagram indicating the manner of vibrating the rolls which act on the shank of the sole. Fig. 10 is a sectional plan view of the modified construction exhibited by Fig. 6; and Fig. 11 is a modification of the turn-table and rocking jack carrier or yoke.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawings, wherein—

The numeral 1 indicates a main frame which may be of any suitable construction, and is provided with bearings in which a power-shaft 2 is journaled and adapted to be rotated through the medium of pulleys or otherwise. The main frame is also provided with bearings, in which is mounted a transverse rock-shaft, as at 3, provided at its ends, respectively, with longitudinally slotted crank-arms 5 and 6, carrying nuts 7 which are rendered adjustable through the medium of screws 8 actuated by suitable handles 8^a. The nuts are pivotally connected, respectively, with links 9 and 10, the link 9 being pivotally connected with a crank-arm 12, mounted on a shaft 12^a having a crank 12^b which carries a bell-crank 24^a, hereinafter referred to. The link 10 is pivotally connected with a crank-

arm 13, secured to or forming a part of a transverse shaft 17, on which is mounted a worm-wheel 18 engaging a worm 19 on a vertical shaft 20 adapted to be rotated by any suitable means, preferably by bevel-gear connections with the power-shaft, all in such manner that when the shaft 20 is rotated it imparts motion to the worm-wheel and shaft 17, thereby operating the link 10 to swing the arm 6 back and forth.

An eccentric 21 on the power-shaft 2 engages and operates the pitman 16, and a similar eccentric 22 on the power-shaft engages and operates a pitman 23. The pitmen 16 and 23 connect at their upper ends with bell-crank levers 24 and 24^a.

In the improved machine there are two pairs of sole-leveling rolls 25 and 26, one pair being adapted to act upon the shank of the sole, and the other pair upon the ball or fore part of the sole. The two pairs of rolls are similar in construction, and are mounted and operated in a similar manner. The pair of leveling rolls which acts upon the ball or fore part of the sole is carried by a support 27, pivotally mounted at its center on a carrier or head 28, adapted to be reciprocated or vibrated through the medium of a yoke 29. The pair of leveling rolls which acts upon the shank of the sole is arranged on a support 30, pivoted at its center to a carrier or head 31.

The construction and operation of the sole-leveling rolls will be better understood by reference to Figs. 4 and 5, which are detail views of the carrier or head 28, support 27, and the rolls 25 and 26, which act upon the ball or fore part of the sole. The support 27 is centrally pivoted, as at 32, to a pendent part 33 of the carrier or head 28, and therefore the support 32 is adapted to rock or oscillate laterally. The support 27 can however be rigidly locked in a fixed position, relative to the carrier or head 28, through the medium of a pin, as at 34, passing into engagement with the carrier or head 28, through an upwardly projecting arm 35, forming part of the support 27.

The shafts 36 and 37 of the rolls 25 and 26 are independent of each other, and are mounted in independent bearings 38 and 39, provided with bolts 40 and 41 having at their inner ends heads 42 and 43 adapted to traverse dovetailed segmental grooves 44 and 45, formed in the ends of the support 27. The outer ends of the bolts 40 and 41, are provided with hand-wheels or nuts 46 and 47, so that by loosening either hand-wheel or nut, the bearing to which the bolt of such hand-wheel is connected can be adjusted vertically and subsequently rigidly clamped in a fixed position by tightening up the hand-wheel or nut. By this means the bearings of the axles or shafts of the two rolls can be independently adjusted to any desired angle of inclination, for the purpose of adapting the rolls to shoe soles which differ in contour or shape. It is possible to operate the hand-wheels 46 and

47, while the machine is in operation for the purpose of adjusting the axles or shafts of the rolls to the desired angle of inclination. The two rolls act simultaneously upon opposite sides of the shoe-sole, for the purpose of leveling the same, and, as before stated, one pair of rolls acts upon the shank of the sole while the other pair acts upon the ball or fore part of the sole.

Inasmuch as the manner of supporting and adjusting the two pairs of rolls is the same in both instances, it is believed that the description of Figs. 4 and 5 is sufficient to give a clear understanding of the manner of carrying and adjusting both pairs of rolls.

If the pin 35 be withdrawn from engagement with the carrier or head 28, the support 27 is free to oscillate or rock for the purpose of conforming to the angle at which the shoe-sole is presented by the jacks hereinafter described, and also for the purpose of equalizing pressure over the entire sole. If the pin 34 be engaged with the arm 35 and carrier or head 28, the support 27 and the bearings 38 and 39 will be rigidly held in a fixed position relatively to the carrier-head 28.

In the modification, Figs. 6 and 10, the carrier or head 28 is provided with a plate 48 approximately circular in form and having a lug 49, and an arc-shaped groove or channel, in which an arc-shaped plate is adapted to work. The arc-shaped plate 50 is provided with an arm 51, and a pin 52 is adapted to engage the arm 51 with the lug 49, for the purpose of holding the arc-shaped plate 50 in a fixed position. If, however, the pin 52 is withdrawn from engagement with the lug 49, the arc-shaped plate 50 can slide in the arc of a circle within the groove of the plate 48. The bearings 53 and 54, Figs. 6 and 10, which carry the axles or shafts of the leveling-rolls 55 and 56, work in the ends of the arc-shaped plate 50, through the medium of bolts 40^a and 41^a, and hand-wheels 46^a and 47^a, similar to the bolts 40 and 41 and hand-wheels 46 and 47. After the axles or shafts of the rolls 55 and 56 are adjusted to the desired angle of inclination, the bearings carrying said axles or shafts can be rigidly clamped to the arc-shaped plate 50, and if the pin 52 be out of engagement with the lug 49, both bearings 53 and 54 will move in unison with the arc-shaped plate 50 whenever the latter moves circularly in the groove of the plate 48. If the pin 52 be engaged with the lug 49 the arc-shaped plate 50 will be held in a fixed position, and consequently the bearings 53 and 54 will also be held in a fixed position relatively to the plate 48 and carrier or head 28. The rock-shaft 3 carries a rocking-arm or frame 55^a, on the outer end of which is mounted a turn-table 56^a, preferably in the form of a comparatively narrow elongated bar. This bar is centrally pivoted, as at 57, to the rocking-arm or frame 55^a, and on the ends of the bar are centrally pivoted twin yokes 58, within which are pivotally suspended the laterally

oscillating or rocking twin jack-supporting yokes 59. The twin yokes 59 are each provided with a jack 60, 61, of any ordinary type, adapted to carry and support the lasts on which the boots or shoes are to be placed. The bar or turn-table 56^a is adapted to be locked in a stationary position through the medium of a locking-bolt 62, adapted to be operated by a suitable lever 63, and each yoke 58 is also adapted to be rigidly locked to the bar or turn-table through the medium of a bolt 64, adapted to be operated by a lever 65. The yokes 58 are each provided with a double armed pivoted lever, as at 66, one end 66^a of which engages the jack-supporting yoke 59, while the other end 66^b is provided with a bolt 67 having a hand-wheel 68. The bolt 67 is movable back and forth in a segmental slot 80, formed in an arm or plate 69, which constitutes a rigid part of the yoke 58, so that when the hand-wheel is tightened, the yoke 59 is rigidly locked to the yoke 58, and therefore the yoke 59 cannot oscillate or swing laterally. If, however, the hand-wheel 68 is loosened, the yoke 59 is free to oscillate or swing in a lateral direction. While the sole-leveling rolls are acting upon the sole of a boot or shoe, the yoke 58, which carries the yoke 59 of the jack which supports such boot or shoe, is locked to the bar or turn-table 56^a, and the latter is locked to the arm or frame 55^a. When the reciprocating link 10 rocks the shaft 3, the frame 55^a, and arms 5 and 6, are also rocked, and consequently the jacks are uniformly and slowly oscillated or rocked longitudinally, or in the direction of the length of the boot or shoe being operated on. In the construction illustrated in Figs. 1 and 2, the bar 56^a stands in an oblique direction while the leveling-rolls are acting upon the sole of a boot or shoe.

In the modification, Fig. 3, the bar or turn-table 70 is so shaped as to constitute two yokes within which the jack-supporting-yokes 71 are pivotally suspended, so that they normally stand in the same longitudinal plane. The bar or turn-table 70 is centrally pivoted to the arm or frame 72 which corresponds with the arm or frame 55^a, and the bar or turn-table 70 can be locked to the arm or frame 72 through the medium of a locking-bolt 73, actuated by a lever 74 constructed the same as the bolt and lever 62 and 63. In the modification, Fig. 3, the laterally oscillating or rocking jack-supporting yokes 71, may be provided with the devices described with reference to Fig. 1, or with any other suitable devices, for the purpose of locking either or both of them to the bar or turn-table 70.

The upwardly projecting arm of the bell-crank lever 24 is pivotally connected by an adjustable rod 75 with a yoke 76, on the front end portion of which the carrier or head 31 is mounted. The upwardly projecting arm of the bell-crank lever 24^a connects by a yoke 29 with levers 78 pivoted intermediate their

extremities, as at 79, connected at their lower end with the carrier or head 28, in such manner that when the yoke 29 is reciprocated, the levers 78 are vibrated, and consequently the rolls 25 and 26, which act upon the ball or fore part of the shoe-sole are vibrated. The reciprocating motion of the yoke 76, caused by the swinging of the bell-crank lever 24, imparts a reciprocating or vibrating motion to the rolls 25 and 26 which act upon the shank of the shoe-sole.

The peculiar action of the arms 5 and 6 with crank-arms 12 and 13, the latter being driven by the main power-shaft 2, constitutes a part of the subject-matter of my application for Letters Patent filed June 26, 1883, Serial No. 478,785, and therefore I do not deem it necessary to enter into a more detailed explanation of the same further than to say that as the shaft 3, with its connections, is oscillated, the longitudinal travel of the shank rolls is varied with respect to the fore part rolls.

It will be observed that the turn-table can be moved in a horizontal plane, and is so constructed, and is provided with such devices, that a pair of shoe-jacks can be mounted thereupon to rock or swing laterally as well as longitudinally; and that the construction is such that a shoe can be placed on one of the jacks and the turn-table rotated horizontally to a given point, which places the shoe under the sole-leveling mechanism, while the other jack will be placed in such position that it is free from all obstructions, and the attendant or operator can place thereupon and prepare another shoe in readiness to be presented to the sole-leveling mechanism when the turn-table is rotated.

By my invention the sole-leveling rolls are engaged almost constantly in performing the work of leveling the soles of the boots or shoes, and the attendant or operator can readily keep the jack supplied without any considerable labor.

The combination and arrangement of parts renders the machine susceptible of leveling the soles of boots and shoes far more readily than sole-leveling machines having a single jack.

While I have illustrated two jacks arranged in yokes supported by a rotatable bar or turn-table, I do not confine myself to two jacks, as a greater number can be employed.

In the example illustrated in the drawings the rotatable bar or turn-table is designed to be turned by hand, or manually, but I do not limit myself to this means of turning the bar or turn-table.

I am aware that prior to my invention a sole leveling machine has been provided with three jacks, capable of being successively placed under a sole-leveling roll by rotation in a vertical plane. In my invention the jacks rotate in a horizontal plane, and consequently they are in the best possible position for the

attendant or operator to carefully place the shoes upon the jacks and prepare them for the action of the leveling mechanism.

I believe that I am the first to provide a sole-leveling machine with sole-leveling mechanism and twin-jacks movable approximately in a horizontal plane, so that either can be moved beneath the sole-leveling mechanism while the other is free from obstruction and in convenient position for the attendant or operator to place a shoe thereupon and prepare it for the action of the leveling mechanism.

In acting on a sole having a flat ball or fore part and a curved shank, the carrier or head which supports the rolls acting on the ball or fore part can be locked against lateral rocking movements by a pin similar to the pin 34, Fig. 4, conversely in acting on a sole having a flat shank and curved ball or fore part. The carrier or head which supports the rolls for acting on the shank can be locked against lateral rocking movements by a pin similar to pin 34.

In operating on a narrow shoe, it is sometimes desirable and advisable to lock the jack against lateral swinging motions, and this can readily be effected through the medium of the hand-wheel 68, bolt 67, and segmentally slotted arm or plate 69. Sometimes a last is drilled at an angle, and it is desirable to set the jack at an angle to fulfill the conditions required, and this can readily be effected through the medium of the hand-wheel 68, bolt 67, and segmentally slotted arm or plate 69. Sometimes one pair of rolls take possession of a shoe-sole, and unless held in one position against laterally rocking motions, the shoe will be thrown out of position and unsatisfactory leveling will be the result. This can be avoided by permitting the carriers or heads, which carry the leveling rolls, to rock laterally by removing the pins 34, and locking a jack in the required position, or by locking one pair of rolls only. If the rolls or jack were rigid, as regards laterally swinging movements, there would be no yielding of the rolls or jack, and in operating on very fine work, the shoe would not be leveled uniformly.

With the attachments herein described and shown each shoe may be treated according to the conditions required, or as circumstances may demand.

In my invention one pair of rolls can be locked against lateral, oscillating movements, while the other pair can be permitted to oscillate or rock laterally, and consequently the non-laterally swinging rolls take possession of the shoe-sole, and the other pair of freely oscillating rolls acts in conjunction with the swinging jack to level certain kinds of shoes.

In operating on some kinds of shoes it is desirable to lock the yoke or yokes 59 against lateral oscillation, while the two pairs of leveling rolls are free to oscillate or rock laterally, so that they will pass over the shoe sole and operate on the same in a perfect manner.

It will be obvious that the yoke or yokes 59 can be locked against laterally swinging motions, while the two pairs of leveling rolls can be permitted to oscillate or rock laterally; also the two rolls acting on the ball or fore part of the sole can be locked against lateral oscillation while the yokes 59 and the rolls which act on the shanks of the soles are free to oscillate laterally, or the shank rolls may be locked against lateral oscillation, and the yokes 59 and the ball or fore part rolls permitted to swing laterally; also that the yokes 59 and the two pairs of rolls can be locked against lateral oscillation; and finally that the yokes 59 and the two pairs of rolls can be permitted to freely oscillate or rock laterally. By this mode of operation I am enabled to obtain all the adjustments necessary to meet every condition required, and render the rolls susceptible of leveling soles of various styles, patterns, or shapes.

Having thus described my invention, what I claim is—

1. The combination in a sole-leveling machine, of sole-leveling rolls, laterally oscillating or rocking twin-jacks movable in a horizontal plane to place either jack beneath the sole-leveling rolls, and locking devices for locking the jacks against lateral oscillating or rocking motion whenever desired, substantially as described.

2. The combination in a sole-leveling machine, of sole leveling rolls, a horizontally movable turn-table provided with laterally oscillating or rocking twin-jacks, and locking devices for locking the jacks against lateral oscillation or rocking motions whenever desired, substantially as described.

3. The combination in a sole-leveling machine, of sole-leveling mechanism, a turn-table provided with rotatable twin-jack holders or yokes which carry laterally oscillating or rocking jacks, and devices for locking said holders to the turn-table, substantially as described.

4. The combination in a sole-leveling machine, of sole-leveling rolls, a turn-table provided with jack-supports adapted to rotate horizontally on the turn-table, and means for oscillating or rocking the turn-table longitudinally, substantially as described.

5. The combination in a sole-leveling machine, of sole-leveling rolls, an oscillating or rocking support, a turn-table pivotally mounted on said support, and laterally oscillating or rocking jack-carriers provided with jacks and supported by the turn-table, substantially as described.

6. The combination in a sole-leveling machine, of sole-leveling rolls, a turn-table movable in an approximately horizontal plane, twin-yokes carried by the turn-table, laterally oscillating or rocking jack-carriers provided with jacks and mounted in said twin-yokes, and means for moving the turn-table longitudinally, substantially as described.

7. The combination in a sole-leveling machine, of vibrating leveling-rolls, a turn-table

ble movable in an approximately horizontal plane, pivotally mounted yokes carried by the turn-table, laterally oscillating or rocking jack-supporting yokes suspended in the pivotally mounted yokes, devices for locking the said jack-supporting yokes against laterally oscillating or rocking movements whenever desired, and devices for locking the pivotally mounted yokes to the turn-table, substantially as described.

8. The combination in a sole-leveling machine, of vibrating sole-leveling rolls, a rocking arm or frame, a turn-table mounted on said arm or frame and provided with laterally oscillating or rocking jack-supporting yokes provided with jacks, devices for locking the said yokes against laterally oscillating or rocking movements whenever desired, and mechanism for rocking the said arm or frame, substantially as described.

9. The combination in a sole-leveling machine, of vibrating leveling-rolls, and a plurality of laterally movable jacks mounted on a carrier or support which is movable in an approximately horizontal plane for bringing one jack into position under the vibrating leveling-rolls to be acted upon by the latter while the attendant or operator is placing and preparing another shoe on another jack, and means for operating said carrier or support to move the jacks longitudinally, substantially as described.

10. The combination in a sole leveling machine, of a support, a carrier or head pivotally

mounted on said support and provided with sole-leveling rolls, means for locking the carrier or head to said support, whereby the rolls can be permitted to oscillate or rock laterally, or be held locked against such lateral oscillation, substantially as described.

11. The combination in a sole-leveling machine, of a support, a carrier or head pivoted on said support and provided with sole-leveling rolls, the axes of which are adjustable to different angles of inclination, and locking devices for locking the carrier or head to said support, whereby the leveling rolls can be permitted to oscillate or rock laterally or be held rigid against such lateral oscillation, substantially as described.

12. The combination in a sole-leveling machine, of a suitable support, a carrier or head pivoted to said support and having segmental ways, bearings mounted in said ways, leveling rolls mounted on independent axles or shafts in said bearings, devices for adjusting the bearings in the ways to change the angle of inclination of the roll-shafts, and means for locking the carrier or head to said support, substantially as described.

In testimony whereof I have hereunto set my hand and affixed my seal in presence of two subscribing witnesses.

EDWARD C. JUDD. [L. S.]

Witnesses:

A. W. WORTHLEY,
SIMON K. COHEN.