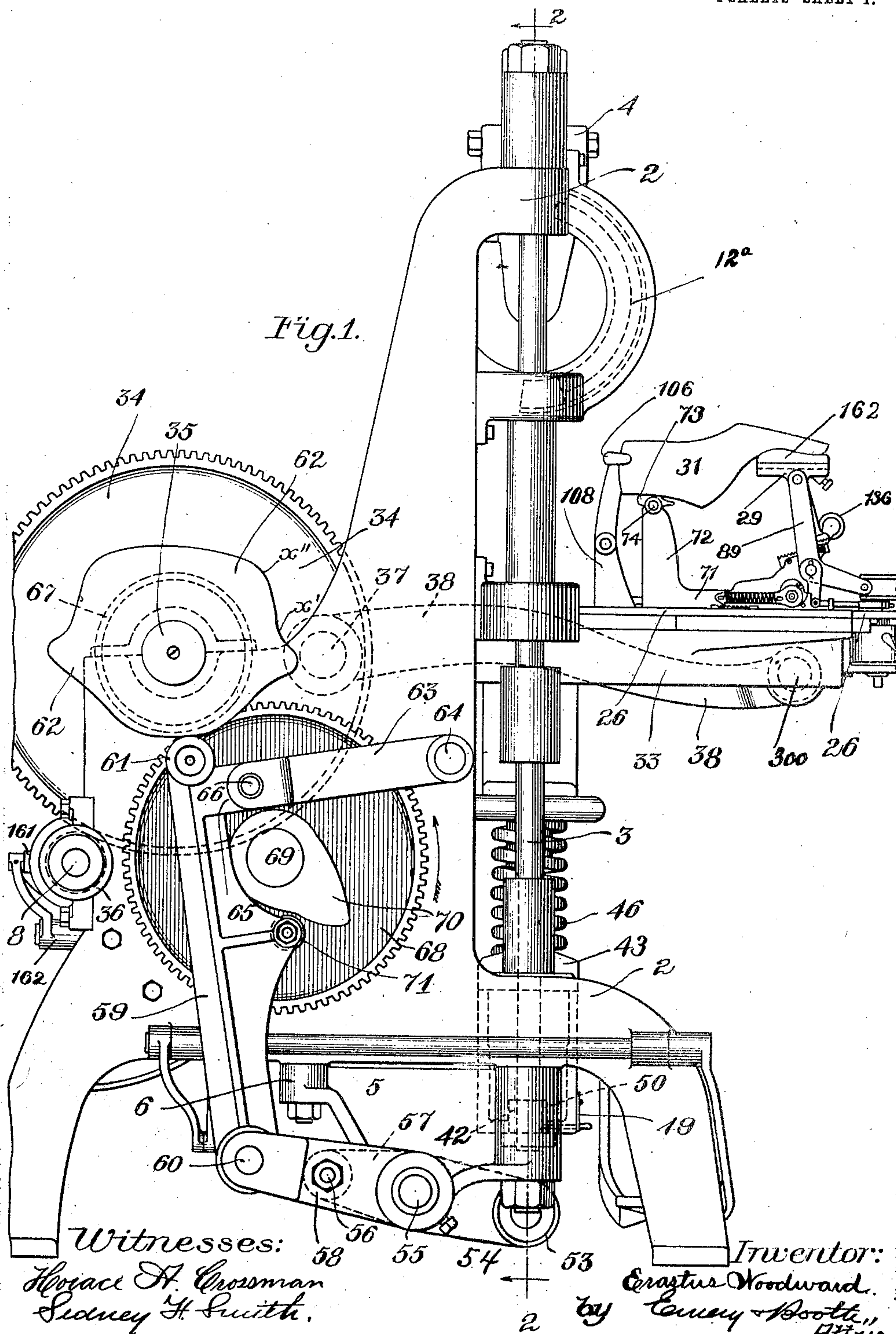


966,506.

E. WOODWARD.  
JACK FOR SOLE LAYING AND LEVELING MACHINES.  
APPLICATION FILED JULY 13, 1906.

Patented Aug. 9, 1910.

4 SHEETS—SHEET 1.



E. WOODWARD.

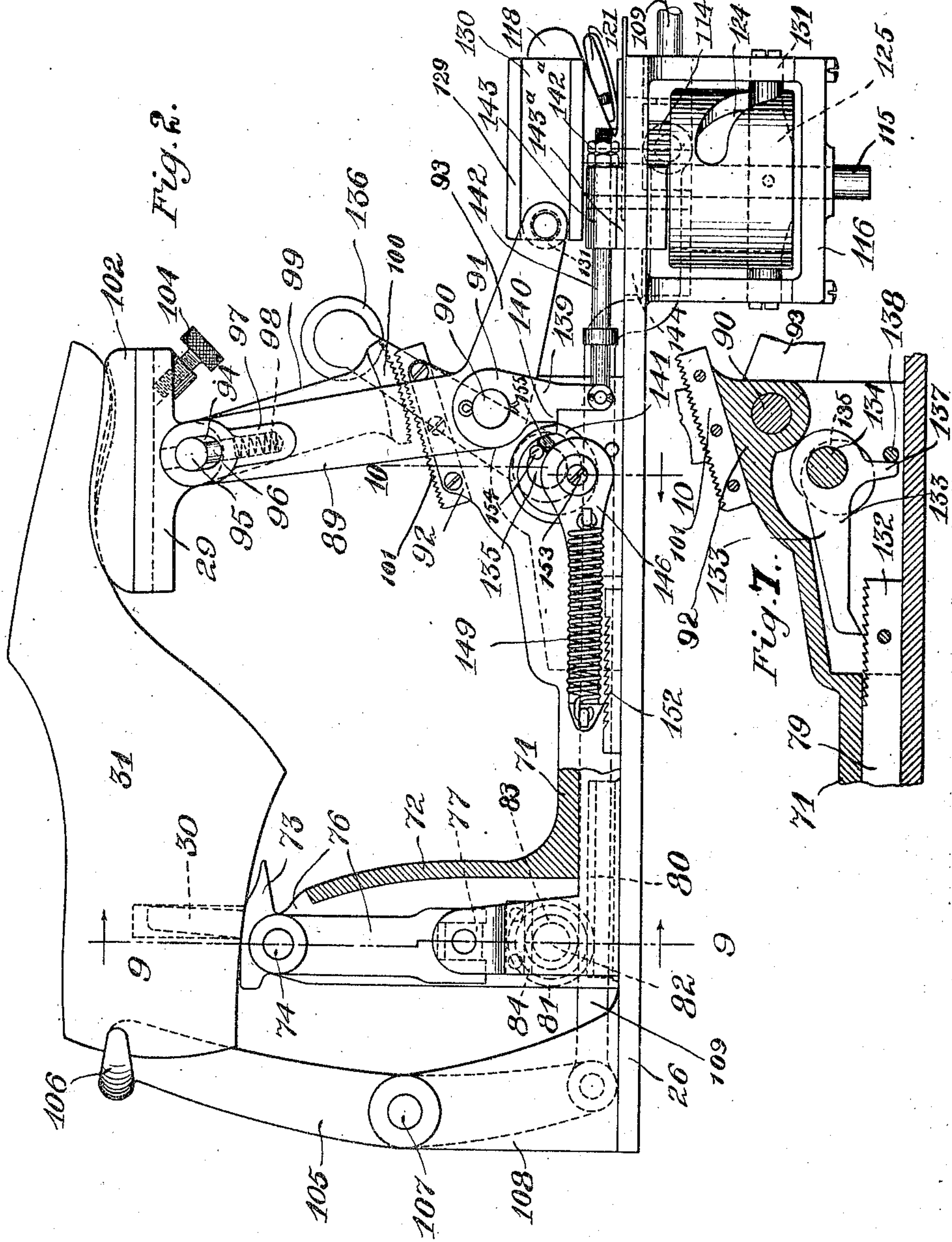
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4 SHEETS—SHEET 2.



Witnesses:  
 Horace A. Crossman  
 Sidney H. Smith.

Inventor:  
 Erastus Woodward  
 by Emory Booth,  
 Attys.



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4 SHEETS—SHEET 3.

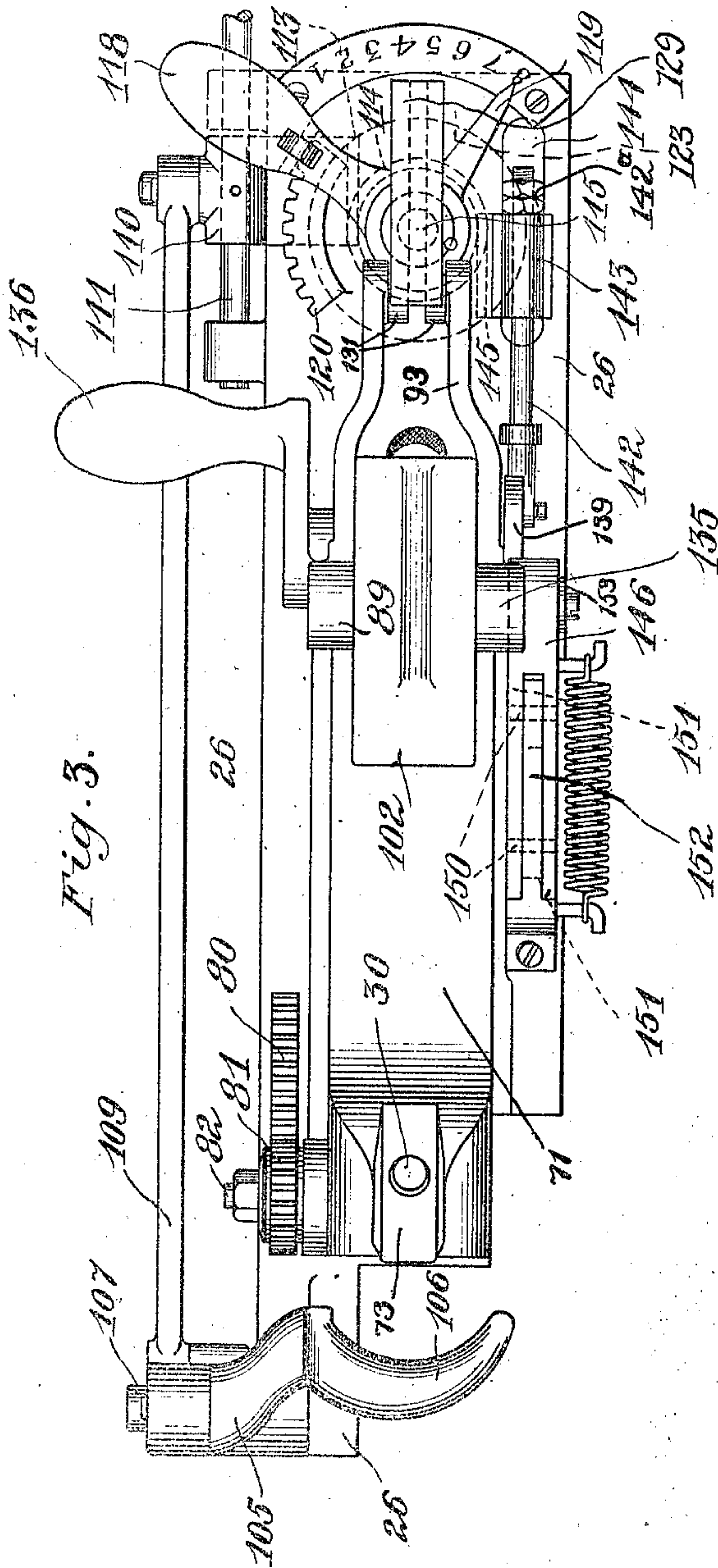


Fig. 3.

Witnesses:  
Horace H. Crossman  
Sidney H. Smith.

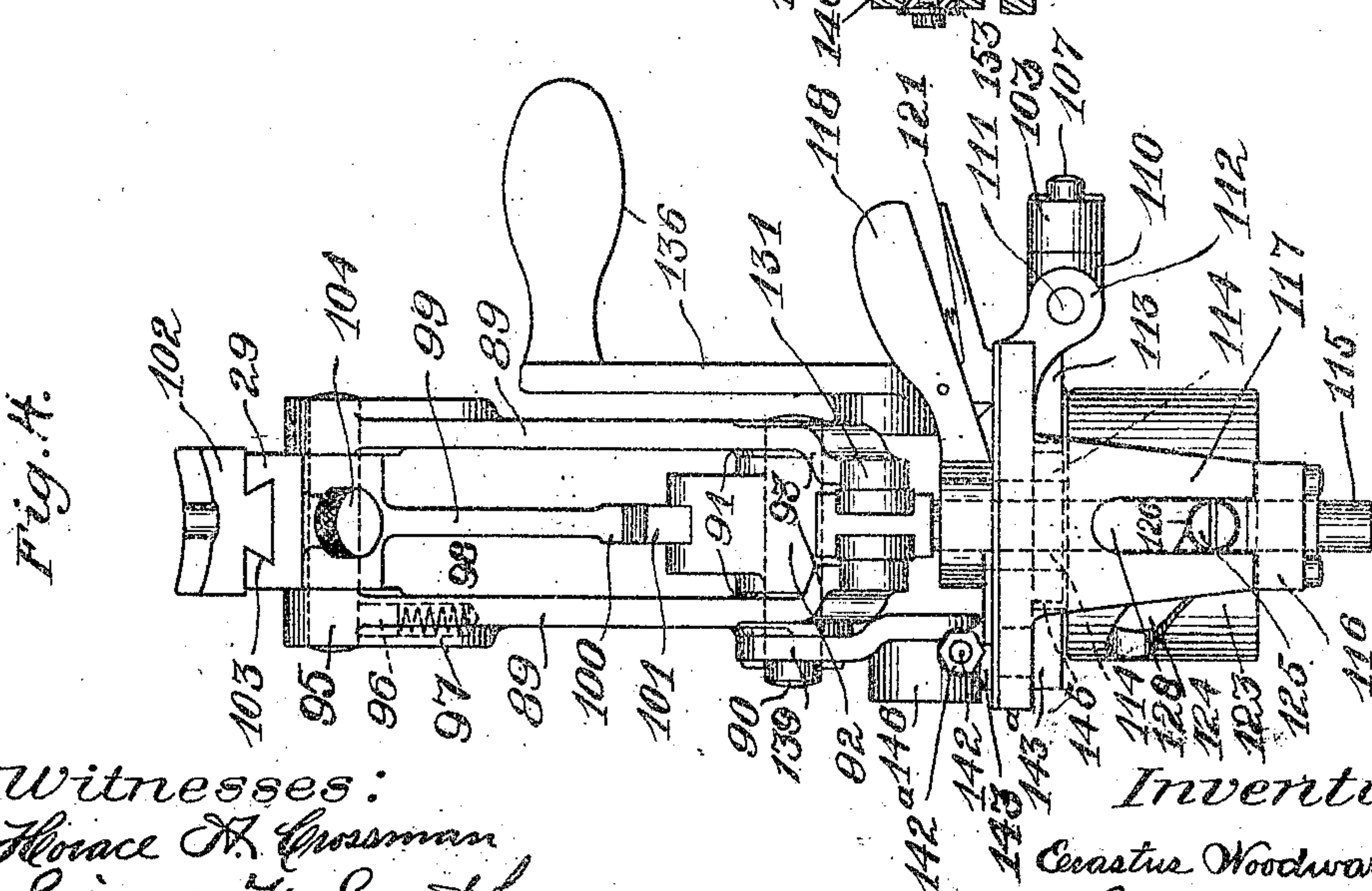
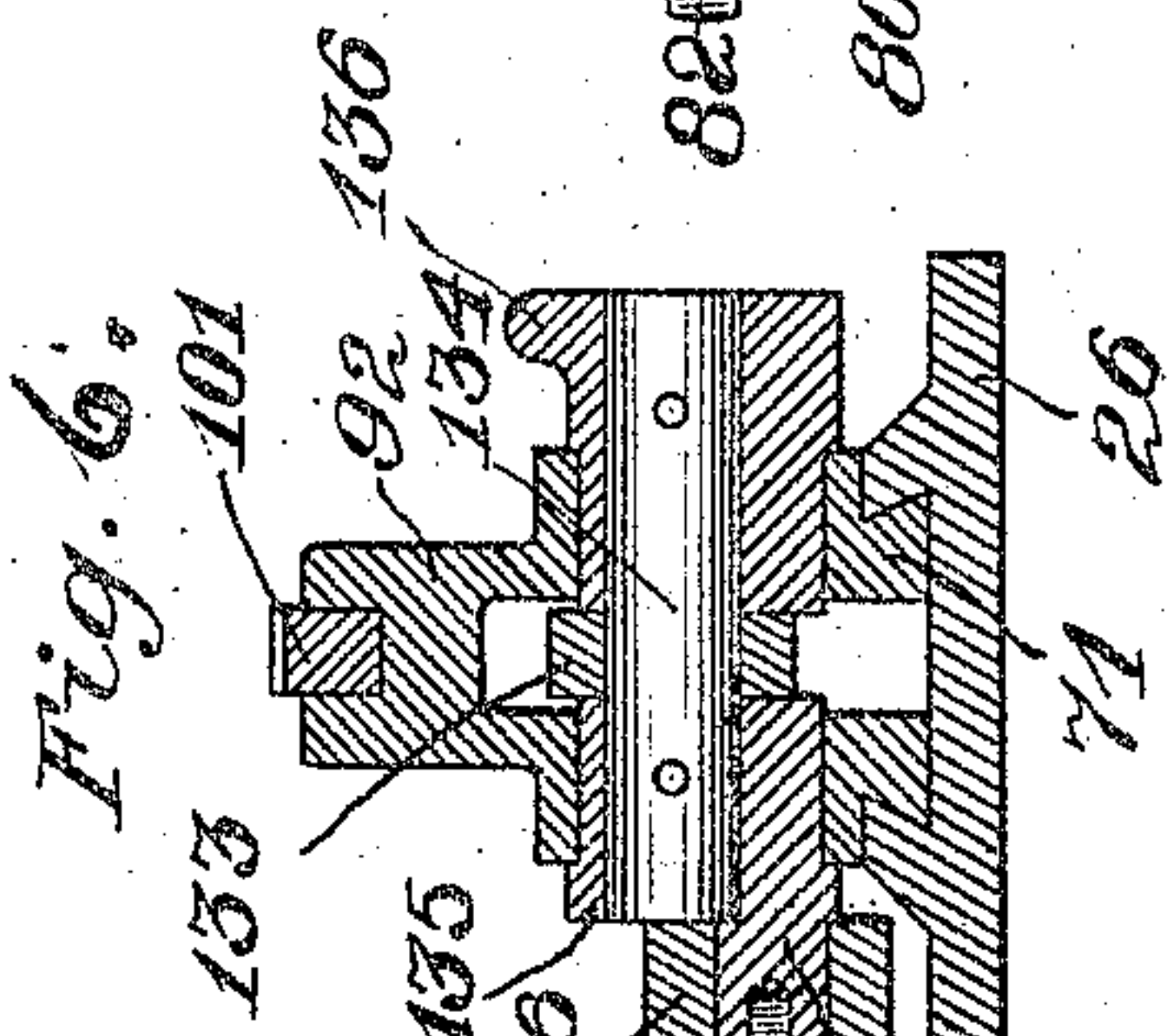
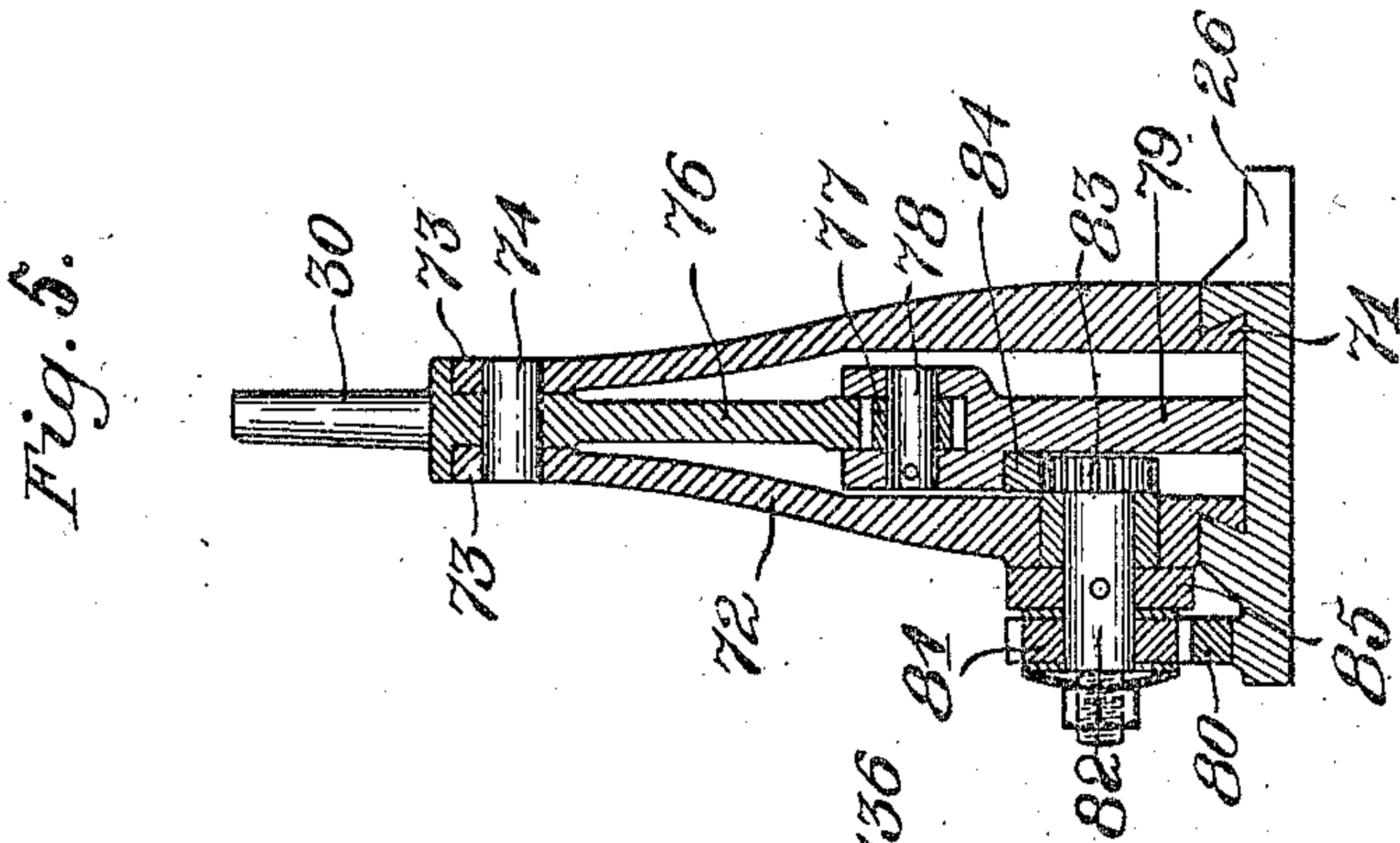
Inventor:  
Eugene Woodward  
by Emory Booth,  
Attys

E. WOODWARD.  
JACK FOR SOLE LAYING AND LEVELING MACHINES.  
APPLICATION FILED JULY 13, 1906.

966,506.

Patented Aug. 9, 1910.

4 SHEETS—SHEET 4.



Witnesses:  
Horace A. Crossman  
Sidney H. Smith

Inventor:  
Erastus Woodward.  
by Emory Booth,  
Attys.



# UNITED STATES PATENT OFFICE.

ERASTUS WOODWARD, OF SOMERVILLE, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THOMAS G. PLANT, OF BOSTON, MASSACHUSETTS.

JACK FOR SOLE LAYING AND LEVELING MACHINES.

966,506.

Specification of Letters Patent.

Patented Aug. 9, 1910.

Application filed July 13, 1906. Serial No. 326,008.

*To all whom it may concern:*

Be it known that I, ERASTUS WOODWARD, a citizen of the United States, residing at Somerville, in the county of Middlesex, State of Massachusetts, have invented an Improvement in Jacks for Sole Laying and Leveling Machines, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

The present invention relates to jacks for sustaining a lasted boot or shoe and particularly to jacks adapted to be used in connection with sole-leveling or laying machines for sustaining the lasted shoe during the sole-leveling or laying operation.

The invention has for its object to provide a novel form of jack which is adapted to receive any one of the different sizes of lasts and shoes, and to so position the lasted shoe supported thereby of whatever size that it will always be situated properly with reference to the leveling form of the machine to insure uniform and accurate work.

In operating on shoes of different sizes and widths, it is usually necessary to change the lasts for every change in size of shoe, but it is inconvenient to change the leveling form so frequently not only because of the greater bulk of the form and the difficulty in making the change, but principally because of the great cost involved in providing a form for each size and width. I find that if a jack of a proper construction is provided to properly present the shoes to the form, it is possible to level the soles of a large range of sizes by the use of only two or three forms of different sizes.

As well understood by those skilled in the art, laying and leveling forms and rolls have a working face shaped complementary to the surface of the sole to be treated, with a well defined line of separation between the forepart of the form and the projecting shank. This line of separation corresponds to the ball line of the shoe, so that if a series of shoes of different sizes are to be treated by a single form or roll, and each of the shoes are brought to a position with the ball line of the sole thereof disposed to register with the line of separation referred to, each of the series of shoes, notwithstanding their variation in size, may be properly treated by the

one form or roll. In devising a jack to secure the desired results I have taken advantage of the above fact, and accordingly have selected this ball line as an invariable point of reference to which all lasts must be brought relative to the jack and the said line of separation of the form, said jack being made adjustable for varying sizes of shoes in such manner that it will position any size of shoe with the ball line thereof at one invariable position to register with said corresponding line in the form.

The invention also comprehends certain novel features of construction by means of which the shoe is jacked and held in its jacked position, all as will be more fully hereinafter described and then pointed out in the claims.

In the drawings I have shown a sole-leveling machine having one form of my improved jack associated therewith, this form being that which I have selected for the purpose of illustrating the principle of the invention.

Figure 1 is a side elevation of a sole-leveling or laying machine having my improved jack thereon; Fig. 2 is an elevation of the left-hand side of the jack and its last-supporting and positioning devices; Fig. 3, a plan, and Fig. 4, a front elevation thereof; Figs. 5 and 6 are vertical sections taken respectively on the lines 9—9 and 10—10, Fig. 2; Fig. 7 is a longitudinal vertical sectional detail of the jacking mechanism of said jack.

The sole-leveling or laying machine herein illustrated comprises the frame 2 on which is mounted a driving shaft 8 having suitable clutch mechanism, not shown, for starting and stopping said shaft. This shaft has a gear 36 thereon which meshes with and drives a gear 34 carried by a shaft 35 also journaled in the frame. The gear 34 constitutes a crank disk and it has a crank pin 37 to which is pivotally connected one end of a pitman or link 38, the other end of which is pivotally connected at 300 to a last-supporting slide 26 which moves back and forth in ways formed in the table 33 of the frame. The frame also supports an oscillatory form 12 shown diagrammatically only in Fig. 1, and said form is arranged to be oscillated about its center of motion as the jack-supporting slide 26 is drawn in under



the form, said form acting during this operation on the sole of the lasted shoe and laying or leveling the latter as will be obvious.

5 The parts thus far referred to form no part of my present invention.

In order to make it possible for a single form 12<sup>a</sup> to be used successfully with a number of different sizes of lasts, I have provided a jack which can be adjusted to sustain any size of last and which when adjusted will always bring one invariable point of reference on the last, as, for instance, the ball line thereof, in one invariable point with relation to the jack and the form so that when the form acts on the lasts of different sizes, the portion of the form corresponding to the ball line of the last will always meet and register with the ball line of the sole of the shoe regardless of the size of the latter. This end is accomplished in the present invention by the following construction: The slide 26 has mounted thereon a carriage or saddle 71, see Figs. 2, 5 and 7, having at its rear end a suitable support or standard 72 to which is pivotally mounted at 74 a last block 73, the latter having extended therefrom the usual last pin 30 upon which the heel of an inverted last 31 is mounted, the pin freely entering the socket with which each last is provided, while the top or comb of the last rests on the last block 73. The saddle or carriage 71 also sustains the toe rest 29 on which the toe end of the last is supported, said toe rest being adjustable, and also being sustained in such a way that it will automatically find its proper bearing against the last when the latter is brought thereagainst, all as will be more fully hereinafter described. The saddle thus sustains both the toe and the heel end of the last and the longitudinal movement of the saddle on the slide 26 is that which brings the last always in the one invariable position above referred to, this position being determined by a positioning member 105 against which the heel of the last is brought by the sliding movement of the saddle, all as will be more fully hereinafter described. This movement of the saddle toward the positioning member is also utilized for jacking the last, and during the jacking of the last, the last pin is first swung forward toward the toe support thereby to measure or come to a bearing in the socket in the last, and then by a further movement to jack the last, as will be presently described. In order to thus jack the last by this movement of the saddle the last block has depending therefrom an arm 76, see Fig. 2, forked at its lower end to embrace a pivot block 77 on the upturned end of a horizontal actuating slide bar 79 which by its movement relative to the slide operates to give the required movement of the last

pin 30. The movement of the actuator slide 79 necessary to give the last pin 30 its movement first to measure the last socket and then to jack it is secured in the present embodiment by forming on the actuator slide 79 a horizontal rack 84, see Figs. 2 and 5, the teeth at the under side of which mesh with a pinion 83 fast on a short horizontal arbor 82 journaled in the support 72. The arbor at its outer end carries frictionally the pinion 81 which in turn meshes with a stationary rack 80 on the slide 26. Thus as the saddle is slid inwardly to carry the shoe into the invariable position referred to, the pinion 81 will run on its rack 80, see Fig. 5, and rotate said arbor 82, and its inner pinion, 83, thereby to cause the inner rack, 84, to outrun the saddle and by its relative movement to said saddle, cause the last block arm, 76, to be turned to tip the last pin forward to engage with the walls of the pin socket in the last and depress the toe of the last lightly upon the toe support, 29, provided for its reception. This movement of the last pin is only preliminary and necessary to cause it to measure or to be brought lightly in contact with the pin socket wall, the friction pin, 81, sliding on its arbor after this preliminary contact is obtained so as not to firmly jack the shoe at this time. This toe support, 29, which is mounted upon the front end of said carriage or saddle 71, is arranged for movement toward and from the last pin, 30, and vertically to accommodate the various sizes of lasts. To this end, the toe rest is carried at the upper ends of a pair of bell cranks, 89, (Figs. 2 and 4) pivoted at 90 to a vertical lug, 92, on said carriage, 71, their horizontal arms, 93, being elevated or depressed to swing rearwardly or forwardly the vertical arms of said bell crank, 89, thereby to adjust the support for different lengths of lasts and also, by the change in angularity of the arms, to effect approximate change in elevation of the support for the different sized lasts.

In any sole pressing machine especially where the sole pressing action is progressive as herein, it is desirable to support the last not only at the heel and at the extreme toe end, but also at a point under the spring near the ball, so as to guard against breaking down the last when the pressure comes wholly upon the unsupported ball or spring portions thereof. A support is therefore here provided for the fore part of the last at two points; at the toe and in the bend at about the instep of the last. The support may be made continuous or not as desired so long as these two points are supported. But the lines of lasts of different sizes vary materially and a two point support that would fit one last, might be entirely unfitted for a larger or smaller last and furnish only a single point of support thereto. To obviate



this, my invention comprehends pivoting, or otherwise adjustably mounting the toe support, so that it may readily turn or move to find a two point or continuous bearing on any last presented to it. To this end, the toe support, 29, referred to, is herein made longer than usual and is provided with a removable member or cap, 102 (Figs. 3-4), in order that a pad may be inserted that will present a toe seating face suitably shaped to the curve of the toe of the particular type of last for the time being operated upon and engage the same at least in the two points referred to. That this member may be removed and also adjusted longitudinally, the support or cap carrier, 29, is provided with ways, 103 (Fig. 4), in which a rib of the cap is slidably mounted, clamping screw, 104, retaining it in desired position. To permit this pad, whatever it may be, always to find its two points of bearing on the particular shoe presented to it, the toe support, 29, is pivotally mounted on the vertical arms of said bell cranks, whereby it is free to tip into any position necessary to find its two points or equalized bearing on the last resting upon it. For holding said toe support, 29, in the position into which it moves as the last toe engages and is finally seated thereon, to prevent the last from tipping up when pressure is brought upon the heel end or any other portion of the last, said support has a depending arm, 99, (Figs. 2 and 4) the lower end of which is provided with a segmental rack, 100, which overlies and is normally out of engagement with an inclined tangential rack, 101, secured to said carriage lug, 92, between said bell cranks, 89. To permit of the two racks being brought into locking engagement, the pad pivot, 95, is held in two vertical slots, 94, said pivot, 95, and its toe support being normally held elevated in said slots by spring pressed friction and bearing members, 96 (Fig. 2), slidably mounted in pockets, 97, at the sides of said bell crank arms, 89, with lifting springs, 98, seated at the bottom of said pockets under it to lift said members, 96, and the pad.

In positioning the last, the toe support first swings to adapt itself to the last toe as the latter is swung down upon it, the continued movement of the last toe, as in the final jacking operation, depressing said support bodily and causing said racks to interlock, thus holding the toe support rigidly in its adjusted position and preventing any displacement when the shoe is moved into pressure contact with the mold or form adjacent either end of said pad support.

For positioning the last on the jack to bring a predetermined point thereon, namely, the ball line of the sole, to the one invariable position referred to regardless of the size of the shoe, I have provided a position-

determining member or element herein shown as a heel gage 105, which positioning device is sustained by the slide and is situated so that the counter of the lasted shoe may be brought thereagainst by movement of the saddle 71. This heel gage is preferably adjustable so that its position may be shifted according to the size of the last to be supported on the jack. In the present instance, the heel gage, 105 (see Figs. 2 and 3) is a vertical pivoted lever having a curved horizontal arm, 106, at its upper end to embrace and center the counter of the shoe. This lever is fulcrumed at 107, intermediate the ends upon an upright, 108, at the rear end of said slide, 26, its lower end being pivotally connected to a horizontal link, 109, arranged on the right side of said slide (see Fig. 3). The outer end of this link is, in turn, pivotally connected to a collar, 110 (Fig. 3) formed on or secured to a horizontal rod, 111, slidably mounted in guides, 112, at the front end of said slide. On the inner side of said rod, 111, see Fig. 3, this collar is provided with a horizontal rack, 113, (Figs. 2-4) in mesh with a pinion, 114, fast on the hub of a drum, 123, (Figs. 2-4) journaled and constituting a guide for a central vertical spindle, 115, (Figs. 2-4) in turn slidably journaled at its lower end in a fore and aft horizontal cross plate, 116, supported at the lower ends of depending arms or hangers, 117 (Fig. 2) of said slide, 26, the hub of this drum projects through a bearing in the slide and is provided with an operating handle, 118, and a pointer, 119 the former retaining the drum in place and the latter moving over a scale bearing numbers from 1 to 8, or other index marks indicating the positions to which the pointer should be moved to place the heel gage in the required position for the different sizes of lasts. In the drawings, the several shoe supporting and positioning members are shown as supporting a number 8 last. For locking the spindle, 115, in the desired scale position, according to the last used, the slide, 26, is provided with a segmental rack, 120 (Fig. 3) and the handle 118, with a spring pressed latch member, 121, operable in grasping and pivoted on said handle, the lower or inner latching end, 122, of which engages said rack and holds the handle and spindle in adjusted position until elevated by grasping the handle to change the adjustment.

It is desirable that the toe support 29 should also be adjusted into positions corresponding to the different sizes of lasts in order that it may properly support a last of any size, and my present invention involves a construction whereby the adjusting of the toe support is done simultaneously with the adjusting of the heel gage. In the present embodiment further this simultaneous adjustment of the toe support and



heel gage can be effected at any position of the saddle, that is, the movement of the saddle on the slide toward and from the heel gage does not destroy the operative connections between the heel gage and toe rest whereby they may be simultaneously adjusted. To secure this end the drum 123 in the present embodiment, see Figs. 2 and 4, has a pair of diametrically opposite inclined slots, 124, in its cylindrical surface, in which is slidably mounted a horizontal cross head, 125, (Fig. 2) centered and secured on said spindle and adapted to elevate or depress the same by its vertical movements. The ends of this cross head are provided with rollers or other studs, 126, running in vertical guiding slots, 128, of the hangers, 117, to prevent rotations of the cross heads and they compel its vertical movement by rotation of the drum. When the handle is turned to a desired scale position, the drum is correspondingly rotated, and said inclined slots by their action on the cross head, 125, elevate or depress the same and its spindle the requisite distance to adjust the vertical position of the toe pad to correspond with the desired adjustment of the heel gage, 106, for the particular last that is to be used. Upon rotation of the drum the spindle slides freely through its hub and also through the bearing in the cross plate, 116. Its upper end has a head or block, 129, having horizontal grooves, 130, (Figs. 2 and 4) at its sides, to receive rollers, 131, carried by the front ends of the horizontal arm of said bell cranks, 89. As the spindle and its head are elevated or depressed, said grooves, 130, act on said rollers, elevate and depress said horizontal arm, as hereinbefore stated, and swing the toe support toward or from the heel gage and pin, an amount proportionate to the variation in the size or length of the last to be employed, and so as to bring the toe rest into desired supporting position for such last, as already pointed out. This movement of the handle, 118, simultaneously adjusts the horizontal location of the heel gage or socket, 106, and the horizontal and vertical position of the toe pad for the last indicated by the index mark, to which the handle has been moved, bringing the ball line of said last to the invariable position herein required.

To firmly and finally clamp or jack the shoe upon its support as the carriage or saddle, 71, is slid rearwardly to bring the counter of the shoe against the heel gage in the size position of the latter, or immediately following such movement, suitable jacking means are provided, in the present instance comprising a rack, 132 (Fig. 7), formed on the outer end of the horizontal actuator slide, 79, referred to as supporting the slide block, 77. This rack is adapted to be moved by a pawl, 133, (Fig. 7) formed as a bell crank and pivoted

at its elbow just below the inclined rack, 101, on a crank pin, 134 (Figs. 6 and 7) of a horizontal shaft, 135, journaled at its ends in said saddle, 71, and having a crank handle or jacking lever, 136, at its right end (Fig. 4), to rotate it. The short depending arm, 137, of this pawl lever (Fig. 7) normally bears against a stop pin, 138, which holds its horizontal arm elevated out of engagement with the rack, 132. In turning the operating handle or jacking lever, 136, inward, however, the crank pin, 134, is turned down and inwardly, causing the pawl, 133, (Fig. 7) to engage said rack, 132, and by further movement of the handle in the same direction, push said rack rearwardly and cause its vertical arm carrying the pivot block, 77, with it and positively tipping the heel pin, 30, farther outward to depress the toe of the last, first to depress and lock the toe pad by engagement of its racks, and then to clamp the shoe upon said toe rest, and effectively jack the same. During this operation the pinion, 83, and shaft, 82, are rotated, but the frictional engagement of said pinion with its shaft permits it to slip and turn idly on said shaft as it travels over its operating rack, 80. Obviously, however, the frictional engagement of the pinion with its shaft may be varied as desired to cause the pinion to also turn idly at any other time during the positioning of the shoe, for example, immediately following the measuring movement of the heel pin and the automatic seating contact of the shoe upon its toe support to permit the locking movement of its racks, the subsequent jacking movement, effectually clamping the shoe thereon. I prefer, however, to operate in the manner first described.

The mechanism is so arranged that immediately after the shoe is seated in its heel gage to bring the ball line to the position required it is firmly clamped upon its support or jacked. It is however desirable, to prevent the jacking handle, 136, turning to jack the shoe until the last pin has measured and taken up all slack between it and its heel pin socket, otherwise much if not all of the jacking movement of the pin might be lost and no jacking accomplished. To this end, said handle is prevented from turning when grasped by the operative to slide the carriage rearwardly while the last pin and socket measurement is taking place by a stop lever, 139 (Fig. 2) that depends from the left end of the bell crank pin, 90. Intermediate its ends this lever has an inwardly projecting shoulder, 140, to engage a radial projection or shoulder, 141, formed on the left end of the crank shaft, 135. The lower end of this lever is pivotally connected with a horizontal slide rod, 142, (Figs. 2 and 3) mounted on said jack carrying slide, 26, and passes through a sleeve, 143, on a flanged member, 130



143<sup>a</sup>, adapted to slide in a longitudinal slot, 144 (Fig. 3) in said jack slide. The flange of this member, 143<sup>a</sup>, is provided at one side with teeth, 145, meshing with the spindle pinion, 114, referred to as adjusting the heel socket. Any movement of said pinion to adjust said heel gage also slides said sleeve toward or from the carriage, 71, into desired adjusted position. In the inward sliding movement of the jack, this stop lever, 139, prevents any turning of the handle, 136, until the jack travel has, through the friction pinion and racks described, measured the last pin in the socket, after which the nuts, 142<sup>a</sup>, on said slide rod, 142, (Fig. 2) strike the outer end of said sleeve, 143, and cause said stop lever to be tripped from engagement with its locking shoulder on the crank shaft and permits the handle thereafter to turn and complete the jacking of the shoe after the latter is clamped into said heel socket or gage.

For holding the jack in adjusted size position on its carrying slide, 26, suitable locking mechanism is also provided, in the present instance, comprising a two arm pawl, 146, (Figs. 2 and 3) pivoted on an eccentric stud or crank pin, 153, of the handle operated shaft, 135, said pawl engaging a ratchet or rack, 152, in the slide, 26, a coil spring, 149, connecting said arms normally drawing them together. As herein shown, this pawl is provided with horizontal cross pins, 150, traveling in forked ends, 151, of said arms and which act as guides and stops to respectively direct and limit their longitudinal movements or relative sliding. The inner end of the pawl is provided with a depending tooth to engage said stationary rack, 152, on the slide, 26, permitting the carriage to slide rearwardly, but preventing its forward movement. As the carriage is moved rearwardly to cause the shoe to be seated against the heel gage clamp, 106, said pawl, 146, engages said rack and locks the carriage in position, while the continued movement of the handle completes the jacking of the last or shoe, and simultaneously by the rotation of the handle operated shaft, 135, moves the pawl pin, 153, to its outer dead center position. By this movement of the pin, the hubbed arm of the pawl is separated from the toothed arm in engagement with the rack, 152, against the tension of its spring, so that the carriage is held under spring pressure in inner position with its shoe thus yieldingly maintained against the positioning or heel gage member, 106. The pin, 153, being in or approximately at dead center position prevents the rotation of the handle shaft, 135, which might otherwise be produced by said spring, and thus locks the handle in jacked position, thereby preventing the reverse or outer movement of the actuator bar, 79, and consequent unjacking

of the shoe. Furthermore, the bearing surfaces of said shaft and its bearings produce sufficient friction to prevent the spring acting on said pin, 153, from rotating said shaft in the normal jacking position of said pin, so that it is immaterial whether it is moved to its exact dead center or not. To govern the movement of this pawl, 146, the left end of said shaft, 135, has a pin or stop, 154, (Fig. 2) adapted to engage a radial projection, 155, on the outer or lugged end of said pawl and normally holding the locking end of the pawl elevated out of engagement with its rack. When, however, the handle, 136, is turned inward to jack the last or its shoe, the forward movement of said pin permits the pawl to fall upon the rack and to interlock therewith. To unjack the shoe this handle is grasped and pulled outward, thereby turning it in the opposite direction and causing the elevation of the carriage locking pawl and unlocking the carriage permitting it to be moved forward. Immediately preceding this forward movement of the carriage, however, the pawl carrying stud or crank pin, 134, is turned upward and forward, so that the stop, 138, trips the pawl, 133, and releases the slide bar, 79. The forward movement of the carriage then operates to cause the pinion, 81, to run forward on the rack, 80, turning the last pin, 30, toward the heel gage, elevating the last toe, permitting the last to be readily removed and leaving said pin inclined rearwardly to facilitate applying a new last thereto. Obviously, however, there will be no change in the positions of the heel gage, 105, and the bell cranks, 89, until the size adjusting mechanism is again operated. It will furthermore be understood that in removing the last, the toe rest is released to swing into a position in which it may again operate to automatically seat the toe of a subsequently applied last.

The construction above described permits the saddle to be adjusted back and forth toward and from the heel gage without disturbing the adjustment of either the heel gage or the toe rest. It will be noted that the groove 130 extends horizontally so that as the saddle moves back and forth, the roll or projection 131 can play back and forth in said groove without effecting any change in the position of the toe rest. This groove and projection, however, constitute an operative connection between the adjusting devices for the heel gage and those for the toe rest which is effective in any position of the saddle.

To operate the machine the jack is first adjusted by turning the handle, 118, of the size adjusting mechanism so that the pointer, 119, is moved to the number corresponding to the size of last to be employed, and locked by releasing said handle. By this move-



ment the heel gage, 105, and toe support, 29, are each adjusted so that a lasted shoe mounted on the last will be brought to the one invariable position referred to and the stop sleeve, 143, will also be set in the proper position for releasing the operating handle, 136, of the jacking and carriage locking mechanism at the proper time. The lasted shoe is then applied by inserting the rearwardly pointing heel pin, 30, into the spindle hole of the last. The jack is then moved rearwardly preferably by pushing on the handle 136. During this movement the last pin is turned forward to measure and seat the last pin in the pin socket. After the pin socket has been measured, the handle is automatically released and permitted to turn automatically to lock the carriage in adjusted position and to complete the jacking of the shoe, firmly seating the same on the supports and in the heel gap or socket ready for action of the sole pressing form. The carriage and operating handle being then locked in position by the spring pawl, 146, and its pin 153, the lasted shoe is rigidly held in desired size position and is ready to be operated upon by the form.

While the jack herein illustrated and described is especially adapted for use in a sole-laying machine, yet the invention is not limited thereto, and the jack might be used in a sole-leveling or any other sole-pressing machine, or in fact might be used in other machines where it is desired to support a shoe while the latter is operated on.

I have described a single embodiment only of my invention and without limiting myself thereto or to the details thereof, I claim and desire to secure by Letters Patent:—

1. In a jack, a positioning device to engage one end of a last, a swinging support for the other end of the last, means to adjust said positioning device into different positions corresponding to the size of the last employed and to simultaneously swing said support about a center below the last.

2. In a jack, a last-positioning device for positioning a last from the heel end thereof, a swinging toe support, and means to swing the toe support simultaneously toward or from said positioning device to change the vertical and horizontal position of the toe rest.

3. In a jack, a last-positioning device to position a last from the heel end thereof, a swinging toe support, means to adjust the last-positioning device and the toe support simultaneously, the adjustment of the toe support being about a center below the bottom of the last and causing movement of the toe rest toward or from the positioning device and vertically.

4. In a jack for a sole-pressing machine, a swinging positioning device, a last-sup-

porting carriage or saddle movable toward and from said positioning device and provided with an adjustable toe rest and a last pin, and means for simultaneously swinging said positioning device and toe rest for a desired size of last.

5. In a jack, a last support comprising a last pin and a toe support, last-positioning means, said last support and positioning means being movable relative to each other, and means operative in any adjusted position of the last support to adjust simultaneously the positioning device and the toe support.

6. In a jack, a last-positioning device, a last support comprising a last pin and a toe support movable together toward and from the last-positioning device, and scale means operative in any adjusted position of the last support to adjust simultaneously said positioning device and toe support.

7. In a jack, a movable carriage or saddle having a last pin, a swinging and adjustable toe rest, means exterior to the carriage and operatively connected to the toe rest in any position of the carriage to adjust said toe rest independent of the last pin.

8. In a jack, a last-positioning device, a saddle movable toward and from the last-positioning device and sustaining an adjustable toe support, and means operative in any adjusted position of the saddle to adjust simultaneously the toe support and positioning device.

9. In a jack, a last-positioning device, a last support comprising means to support the last at both ends, said support and the positioning device being movable relative to each other, and means operated by such relative movement to jack the last.

10. In a jack, a last-positioning device, a last support comprising a last pin and a toe rest, said support and positioning device being movable relative to each other, and means operated by such relative movement to jack the last.

11. In a jack, a last-positioning device, a last support comprising a last pin and a toe rest, said support being movable toward and from the positioning device, and means rendered operative by such movement to jack the last.

12. In a jack for a sole-pressing machine, a positioning device, a last support having jacking means, said support comprising means to support both ends of the last and being movable relative to the positioning device into last size position one with the other, means for locking said support and positioning device in such relative position, and means for operating said jacking means while the last and positioning member are locked.

13. In a last support for sole-pressing machines, a jack provided with a movable heel



pin, means for effecting a measuring movement of said heel pin, and separate means for jacking the same.

14. In a last support for sole-pressing machines, a jack provided with means for positioning a shoe thereon and having a movable heel pin, means for effecting measuring movement of said heel pin, and separate means for jacking the same.

15. In a last support for sole-pressing machines, a jack having a last pin, hand controlled means and operative connections with said last pin to effect preliminary and final jacking of a shoe mounted thereon to secure the same against displacement when subjected to sole-pressing movements.

16. In a last support for sole-pressing machines, a jack provided with means for supporting a shoe, means for positioning said shoe, means for jacking it, and means for locking the same in said position during the jacking movements.

17. In a last support, a jack provided with a movable last pin, a toe support adjustable to a series of positions to accommodate lasts of different sizes, means for moving said pin for measuring and seating a last mounted thereon upon said toe support, and other means for jacking the same.

18. A jack for a sole-pressing machine comprising an automatically adjustable toe rest, and a device for automatically locking the same when the shoe is jacked.

19. In a jack for a sole-pressing machine, an adjustable toe rest provided with means to engage a last of desired size at both the toe and a point adjacent the bend thereof, and means operating automatically to adjust or adapt said toe rest to receive said last and to then lock said toe rest in adjusted position as the shoe is jacked.

20. A jack for a sole-pressing machine having a yieldingly-sustained pivoted toe rest, a movable last pin, means for turning the last pin to jack the shoe and depress the toe rest, and means to lock the toe rest when depressed.

21. A jack for a sole-pressing machine having a swinging support and a yieldingly-sustained toe rest pivoted thereto, and means to lock the toe rest against swinging movement when the toe is depressed.

22. In a jack for a sole-pressing machine, a last pin, a swinging support, a yieldingly-sustained toe rest pivoted to said support, and means to lock the toe rest when it is depressed.

23. A jack for a sole-pressing machine comprising a movable last pin a yieldingly-sustained pivoted toe rest and a device for automatically locking said toe rest in adjusted position when pressure is applied thereto in jacking the shoe.

24. In a sole-pressing machine, a jack, a last support, an adjustable toe rest connected

therewith provided with means to engage lasts of different sizes at both the toe and a point adjacent to the bend thereof, and means operating automatically as the shoe is jacked to adjust or adapt said toe rest to receive a last of desired size and to prevent displacement of either point of support while said last is being operated upon.

25. In a sole-pressing machine, a jack provided with a last-positioning device, a carriage provided with a last pin and toe rest and adapted to be moved toward and from said positioning device to bring said last into a given position, and means operable when the last is in said position and as a part of the positioning movement for jacking the same.

26. In a jack for laying or leveling machines, the combination of a last support comprising a heel pin and toe rest, a last positioning device, means for adjusting the toe rest and last positioning device relative to the heel pin for shoes of different sizes, said heel pin and toe rest being movable together toward the last positioning device to place the rear of the shoe against the positioning device with the ball line of the sole in the same position irrespective of the size of the shoe, and means for jacking the shoe in said position.

27. In a jack for laying or leveling machines, the combination of a saddle having a last pin and toe rest, a slide carrying said saddle, a last positioning device carried by the slide, means for adjusting the last positioning device and toe rest relative to the last pin for shoes of different sizes to position the ball line of the sole in the same position irrespective of the size of the shoe, and means permitting the saddle carrying the heel pin and toe rest to be moved rearwardly to place the rear of the shoe against the positioning device.

28. In a last positioning and supporting jack, a position-determining member, a toe rest, a last spindle, a last supported thereon, means simultaneously to move said position-determining member and said toe rest to accommodate lasts of different lengths and lock them in adjusted position, and means for moving said spindle toward the toe rest to jack the last.

29. In a jack, a longitudinally movable last support including a movable last pin and a toe rest, and means to move the last pin relative to the toe rest by the longitudinal movement of the last support.

30. In a jack, a longitudinally movable last support including a movable last pin and a toe rest, and means to move the last pin relative to the support by the longitudinal movement of the latter.

31. In a jack, a movable last support, a pivoted last pin sustained thereby and pivoted thereto, a toe support also sustained



thereby, and means to swing the last pin toward the toe support by the movement of the last support.

32. In a jack, a positioning device, a movable last support, a last pin pivotally sustained thereby, a toe support also sustained thereby, and means to move the last pin toward the toe support by movement of the last support toward the positioning device.

33. In a jack, a last support comprising a last pin and a toe support, a last-positioning device, said last support and last-positioning device being movable relative to each other thereby to position the last, and means operating to jack the shoe against the last-positioning device.

34. A jack for a sole treating machine comprising, in combination, a support, a last pin movably mounted on said support, a pivotally mounted toe rest, locking means for said toe rest, yielding means acting normally to maintain the locking means inoperative, and means to jack the shoe and cause said locking means to become operative.

35. A jack for a sole treating machine comprising, in combination, a support, a last pin movably mounted on said support, a pivotally mounted toe rest and a part to engage and support the shoe adjacent the instep, locking means for said toe rest, yielding means acting normally to maintain the locking means inoperative, and means to jack the shoe and cause said locking means to become operative.

36. A jack for sole treating machines comprising a last pin, a toe rest, and means for jacking a shoe thereon, means for pivotally and yieldingly supporting said toe rest, and a lock for holding the toe rest from swinging movement when the shoe is jacked.

37. A jack comprising a tilting last pin, a tilting toe rest, a lock for holding the toe rest in position to which it may be tilted, and yielding means acting to normally maintain the lock in inoperative position and permitting the lock to become operative when the toe rest is depressed in jacking the shoe.

38. A jack comprising a tilting last pin, a pivotally mounted toe rest, an arm carried by the toe rest and having ratchet teeth, locking teeth to cooperate with the ratchet teeth, means to yieldingly support the toe rest and normally maintain said teeth out of locking engagement, and means to tilt the last pin to jack the shoe and cause said teeth to engage.

39. In a last support, a jack provided with a movable last pin, a toe rest, means to swing the toe rest toward and from the last pin, a yielding support for said toe rest pivotally connected to said means, an arm depending from the toe rest and having ratchet teeth, and means to engage the ratchet teeth and lock the toe rest when it is depressed.

40. In a last support, a jack provided with a movable last pin, a toe rest, a movable pad carried thereby, means to swing the toe rest toward and from the last pin, a yielding support for said toe rest pivotally connected to said means, an arm depending from the toe rest and having ratchet teeth, and means to engage the ratchet teeth and lock the toe rest when it is depressed.

41. In a last support, a jack having a movable last pin, a toe rest, swinging arms for moving the toe rest toward and from the last pin, a toe rest support pivotally connected to and yieldingly sustained by said swinging arms, an arm depending from the toe rest, and means to lock said arm when the last pin is moved to jack the shoe.

42. A jack for a sole laying or leveling machine employing a traveling form, comprising means for sustaining the comb or top of the last, means for sustaining the toe of the last, means for engaging the rear of the shoe supported by the last, and means for adjusting said last named means and the toe sustaining means toward and from the last to invariably present the ball line of shoe soles of various sizes in position to register with the corresponding line of a laying or leveling form that the same form may move from the ball line in either direction over the shoe sole.

43. A jack for sole laying or leveling machines employing a traveling form, comprising means for receiving and holding a last, a back gage and a toe rest, and means for relatively moving the back gage and toe rest in accordance with the varying sizes of lasts to present the ball line of said lasts of different sizes in one and the same invariable position to register with the corresponding line on the form that a single form may move over shoe soles of varying sizes from the ball line in either direction.

44. A jack for sole laying or leveling machines, comprising a last pin to engage the pin socket of a last, a toe rest, means for causing relative movement of the last pin and toe rest to adjust the parts for sustaining lasts of different sizes, means for positioning lasts of different sizes sustained by the last pin and toe rest to place the ball line thereof in the same invariable position to register with the ball line of a form irrespective of the variation in the size of the lasts, and means for tilting the last pin and pressing the toe of the last on the toe rest for jacking the last in position.

45. A jack for sole laying or leveling machines, comprising a tilting last pin to engage the pin socket of a last, a toe rest, a back gage, means for adjusting the toe rest and back gage relative to the last pin for different sizes of lasts, and means permitting movement of the last pin and toe rest



rearwardly together to place the shoe against the back gage and position the ball line of the last in the same position to register with the corresponding line of the laying or leveling form irrespective of the size of the last.

46. A jack for sole laying or leveling machines, comprising a tilting last pin to engage the pin socket of a last, a toe rest, a back gage, means for adjusting the toe rest and back gage relative to the last pin for different sizes of lasts, means permitting movement of the last pin and toe rest rearwardly together to place the shoe against the back gage and position the ball line of the last in the same position to register with the corresponding line of the laying or leveling form irrespective of the size of the last, and means for tilting the last pin to jack the last in said position irrespective of its size.

47. A jack for sole laying and leveling machines, comprising a last pin, a swinging toe rest, a swinging back gage, means for relatively swinging said back gage and toe rest for lasts of different sizes and to bring the ball line of any size last in the same position to register with the corresponding line on a form, and means for relatively moving the toe rest and last pin to jack the shoe.

48. A jack for sole laying and leveling machines, comprising a tilting last pin, a swinging toe rest, a swinging back gage, means for relatively swinging the back gage and

toe rest for lasts of different sizes and to bring the ball line of any size last in the same position to register with the corresponding line on a form, and means for tilting the last pin to jack the last in said position.

49. A jack comprising a tilting last pin and toe support, a positioning device pivotally mounted to swing toward and from the last pin, means to swing the positioning device to positions determined by the size of the shoe to be treated to locate a line intermediate the ends of the sole in the same position irrespective of variations in the size of the sole, and means to tilt the last pin to jack the shoe.

50. A jack comprising a tilting last pin and a tilting toe support, a positioning device pivotally mounted to swing toward and from the tilting last pin, measuring means to swing the toe support and positioning device relative to the last pin to positions determined by the size of the shoe to be treated for locating a point intermediate the ends of the shoe in the same position irrespective of the size of the shoe, and means to tilt the last pin to jack the shoe.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ERASTUS WOODWARD.

Witnesses:

JOHN J. HEYS,  
HARRY T. McCURE.