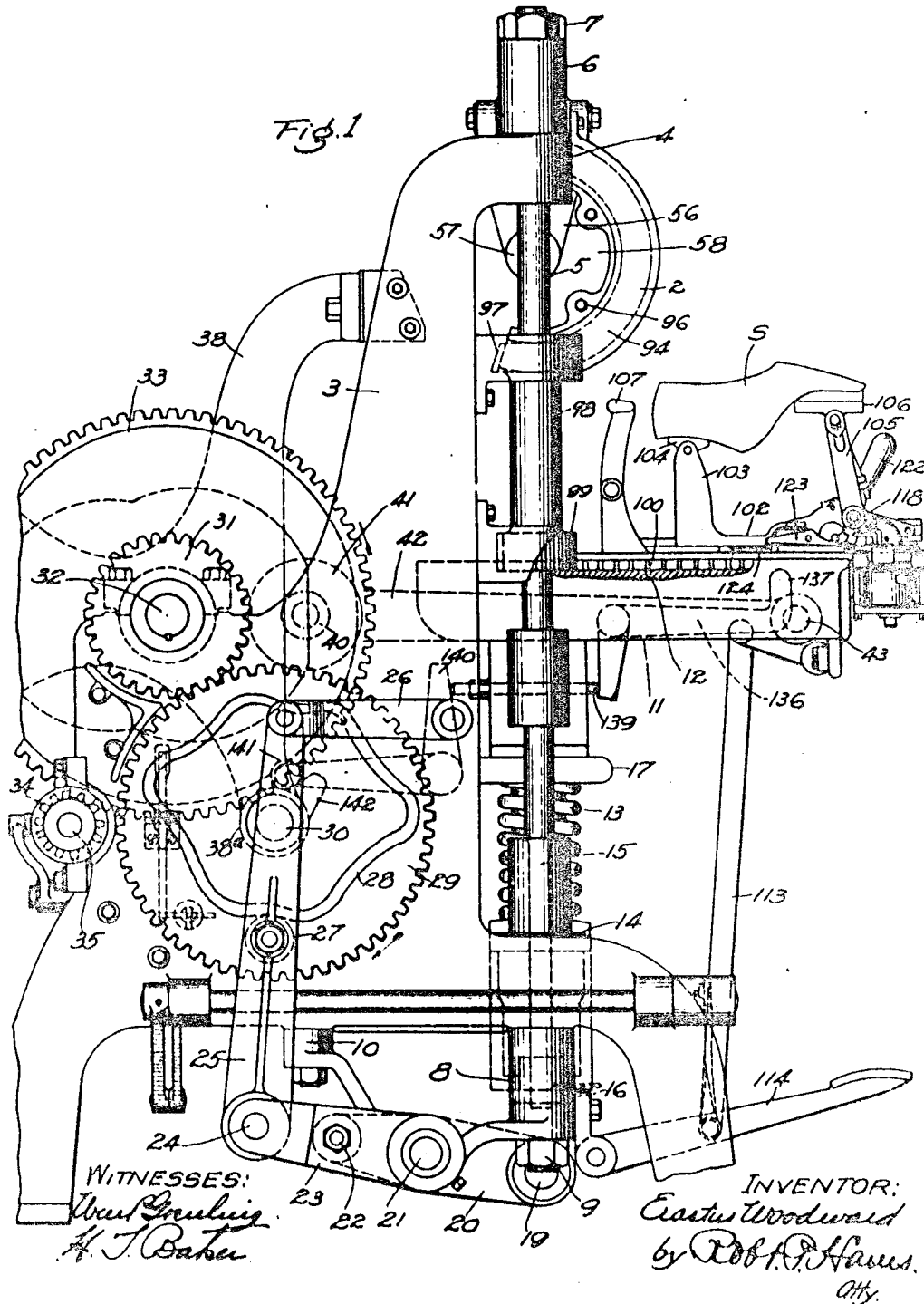


E. WOODWARD.
SOLE LAYING AND LEVELING JACK:
APPLICATION FILED MAR. 24, 1910.

1,048,627.

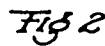
Patented Dec. 31, 1912.

4 SHEETS-SHEET 1.



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4 SHEETS—SHEET 2.



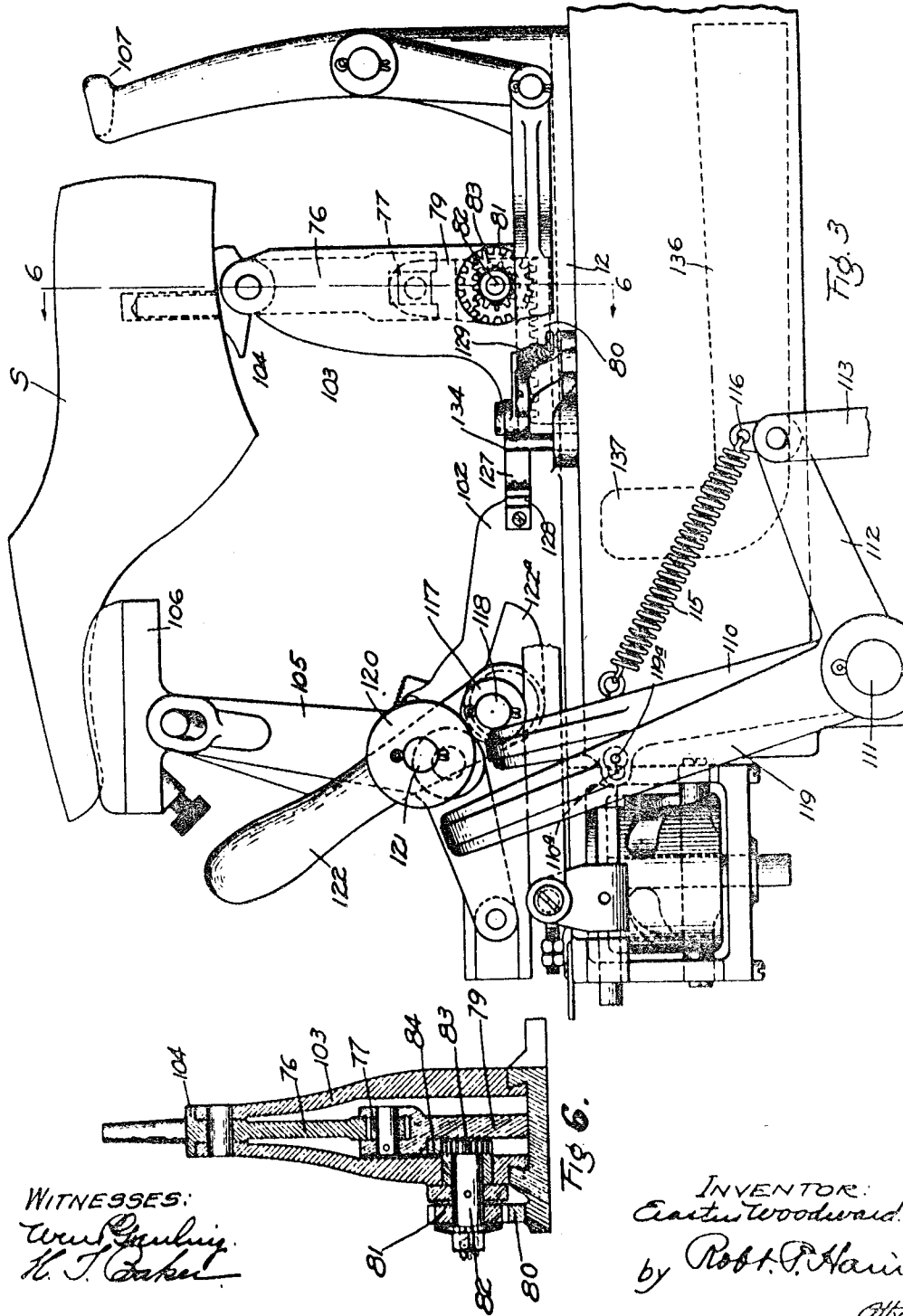
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4 SHEETS-SHEET 3.

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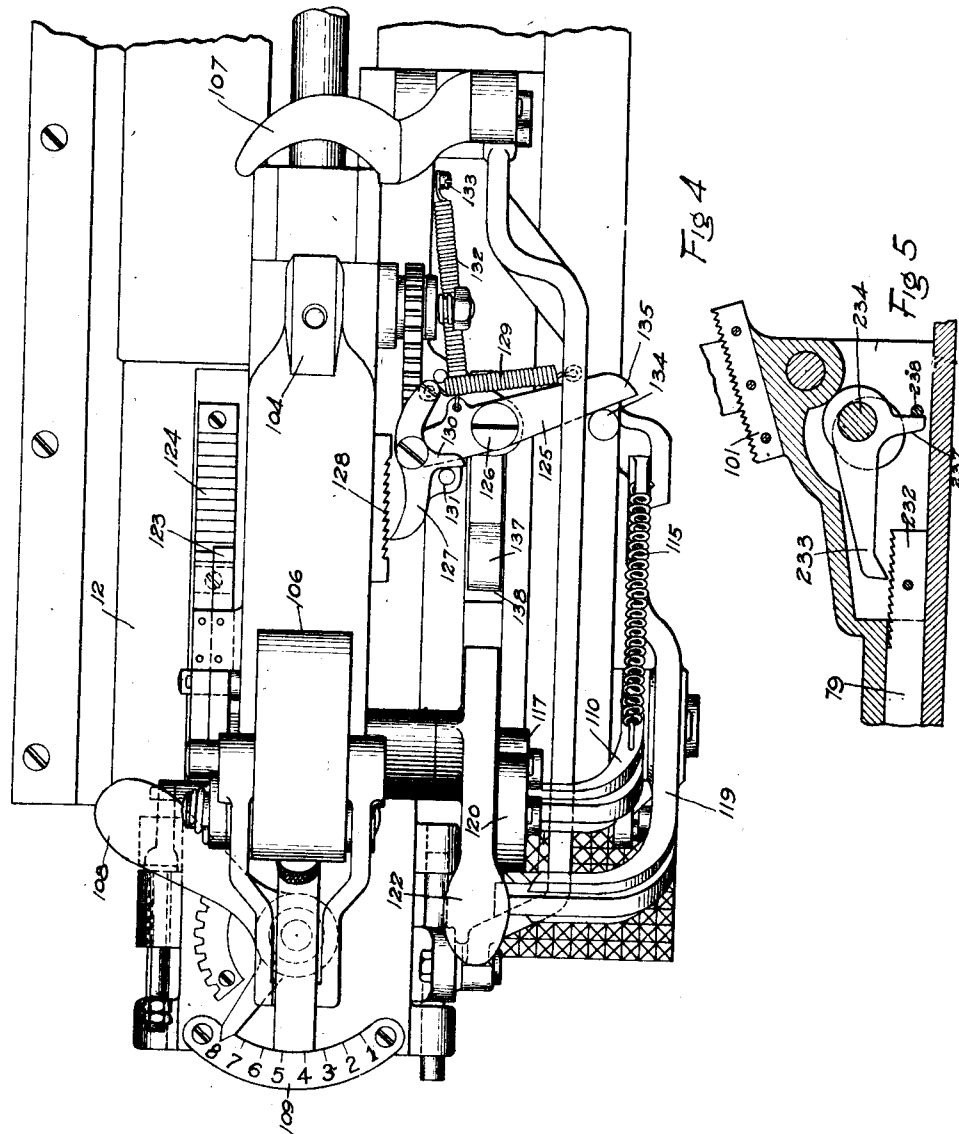
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

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SOLE LAYING AND LEVELING JACK.

1,048,627.

Specification of Letters Patent.

Patented Dec. 31, 1912.

Original application filed April 13, 1907, Serial No. 367,912. Divided and this application filed March 24, 1910. Serial No. 551,280.

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 and State of Massachusetts, have invented an Improvement in Sole Laying and Leveling Jacks, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The invention herein to be described relates to machines for treating the soles of boots and shoes, and more particularly to laying and leveling machines.

The present application is a division of a prior application, Ser. No. 367,912, for sole laying and leveling machines, filed April 13, 1907, now Patent No. 958,057, and the aims and purposes of the invention herein to be described are to provide a jack and its controlling and positioning means so that the shoe may be jacked at the commencement of the laying or leveling operation and may be automatically unjacked at the conclusion of said operation that the shoe may be presented to the operator in readiness to be removed from the jack.

The above generally stated objects and others which will hereinafter appear will best be understood from the following description and accompanying drawings of one form of means for carrying the invention into practical effect.

In the drawings:—Figure 1 is a side elevation, partly broken away, of a machine embodying one form of the present invention; Fig. 2 is an elevation and enlarged detail of the stationary cam and cooperating rotary cam that cooperate to impart suitable movements to the jack slide to position and present the jack to and from operative relation with the form; Fig. 3 is a left hand elevation of the jack to show the mechanism for jacking and automatically unjacking the last and its shoe; Fig. 4 is a general plan view of the jack represented by Fig. 3; and Figs. 5 and 6 are details of the jacking mechanism, Fig. 6 being a section on line 6—6, Fig. 3.

As pointed out in Patent No. 958,057 of which the present is a division, the machine may be provided with a plurality of work supporting jacks and cooperating

forms, two of such jacks and their cooperating forms constituting a twin machine, but each of said jacks and its form, however, being entirely independent of the other.

Referring to Fig. 1, the machine is provided with suitable side frames 3, having forwardly extending lugs 4, apertured to receive the outer vertical guide rods 5. The heads of these rods extend through the upper frame lugs 4 to receive the stationary cross head 6, and have nuts 7 threaded upon the projecting heads of said rods. The bases of said side frames are similarly tied together by a bottom girder 8 connected to the lower end of the guide rods 5 and to the frame by nuts 9, Fig. 1, said bottom girder having a pair of rearwardly extending side arms that are bolted to the side frame at 10, Fig. 1.

Referring to Fig. 1, the jack is represented as disposed opposite an oscillatory form 2, the combined movements of the jack and form cooperating to lay the sole of a shoe S mounted upon said jack. Said form 2 has a mold face, shaped in substantial accordance with the shoe sole to be treated.

The jack is carried on a jack slide 12, Fig. 1, mounted to slide horizontally on a table 11, which in turn is mounted to slide vertically between the guide rods 5, as in said prior patent. The table 11 is carried upon a spring 13 seated at its lower end upon a cross head 14 mounted to slide freely upon said guide rods. Within said spring is a rod 15, secured at its upper end to the table 11, said rod depending through the cross head 14 and having threaded upon its lower end a nut 16, Fig. 1, by which to limit the separation of said table and cross head. The normal tension of said spring may be varied, at will, by a hand nut 17 threaded upon the upper end of said depending rod 15 and against which the upper end of said spring is seated, as in said prior patent.

The cross head 14 is carried by a pair of vertical links, as pointed out in said prior patent, pivotally connected at their lower ends, as at 19, to the front end of a horizontal lever 20, Fig. 1, fulcrumed upon a horizontal pin 21 in the bottom girder 8. The rear end of this lever is connected by a pin 22 to a lever 23 standing beside it, the front end of the latter, Fig. 1, being ful-

crumed on the outer projecting end of the pivot pin 21. The movement of this lever 23 through said connecting pin 22 causes corresponding and simultaneous movements of the lever 20 to elevate or depress the cross head 14 connected therewith, thereby elevating the table supporting spring 13 and lifting the jack carrying table 11 to vertically present the jack to the form 2, as will be clear.

The table elevating lever 23 has jointed to it, at 24, an upright operating lever 25, supported at its upper end by a swinging link 26, connected with the frame. Between its ends, said upright operating lever has a roller stud 27 which underlies a cam 28 on the face of a wheel 29, fast on a horizontal shaft 30 mounted in the frame. This wheel 29 is geared to and driven by a pinion 31 on an upper shaft 32, also journaled in said frame. This upper shaft has a gear wheel 33, driven by a pinion 34 on the main drive shaft 35 of the machine, rotation of which, through the mechanism and cam described, causes appropriate elevation and depression of the jack carrying table.

It is desirable that the jack carrying slide be thrown forward after the table is depressed, and the present invention contemplates means to this end and means to automatically unjack the shoe as it moves into position to present the jack for convenient removal of the shoe and for the application of a new shoe, after which said slide should be drawn into the machine for presenting it to the laying or leveling form.

For moving the jack out and in there is provided the following mechanism: At its inner face the gear wheel 33 described is provided with a cam 36, Fig. 2, opposite which is a somewhat similar, but stationary cam 37, bolted to a vertical bracket 38 at the rear of the machine. The lower end of this bracket is formed to provide an intermediate or central bearing 38^a, Fig. 1, for the lower shaft 30, already described. The movable and stationary cams 36 and 37 described are provided respectively with facing cam grooves to receive respectively the oppositely extended rollers 40, Fig. 2, carried by the hubbed head 41 of a horizontal actuating rod 42, pivotally connected at its front end, Fig. 1, as at 43, with the jack slide 12 referred to. The stationary cam 37 which receives the inner roller 40 of said actuating rod acts as a guide to direct the movements of said roller, and hence to determine the movements of the connected jack slide, while the groove of the rotary cam acts upon the opposite roller to produce the desired movements, as in said prior patent. The stationary cam 37 is of general S shape and is provided at its opposite ends with movable switch tongues 44, 45 mounted respectively on short shafts 46, 47, which at their

outer ends have operating arms 48 acted upon by springs 49, which tend to retain said tongues normally in their full line position, Fig. 2. These positions are made adjustable by stop screws 50. Spring buffers are provided at 51 to cushion the spring actuated movements of said tongues. The cam 37 is also provided at its opposite ends with recesses or pockets 52, 53, each adapted to receive the roller 40. When the movable cam 36 is rotated, it causes the roller 40 on the opposite side of the head of the slide actuating rod 42 to be moved to the left, Fig. 2, causing said roller first to be moved directly to the left to clear the pocket 52, and then to be deflected by the tongue 44 up and along the upper run of the cam groove until it reaches the point thereon marked 54, Fig. 2, which is nearest to the center of the rotary cam. At this moment, the turning movement of the rotating cam brings into position to act upon its roller a concentric portion of its cam groove, marked 55 in Fig. 2, with the result that when the stationary cam roller 40 reaches the point 54 referred to, thus drawing the jack slide inward or to the left for substantially one half its stroke, the action of the said concentric part 55 of the rotating cam produces a pause or dwell in the movement of the roller 40 and the jack slide, during which dwell the high part of the cam 28 may depress the jack elevating arm 25, which acts to elevate the jack table and bring the shoe on the jack securely against the opposed form above it. After this has taken place, continued rotation of the cam 36 causes a resumption of travel of the roller 40 in the stationary cam until the limit of its travel at the left, Fig. 2, is reached, said roller engaging the switch tongue 45 and depressing it so that it may direct said roller into the pocket 53, after which said switch tongue springs back into its normal full line position. At this point the roller 40 has completed the inward movement of the jack slide, whereupon continued rotation of the cam 36 reverses the movement of the roll, causing said roll 40 now to be withdrawn from said pocket, the now elevated switch tongue 45 deflecting said roller down and along the lower rotary run of the stationary cam to its supporting position. On its return movement said roller 40 and its connected jack slide are caused again to dwell at the point 54^a, Fig. 2, corresponding nearly, but not necessarily, to the point 54 at which it pauses on its inward movement, the roller 40 at that instant being engaged by another concentric portion. This return pause or dwell gives opportunity for the cam 28 to drop the jack from its form preparatory to continued outer movement of the jack into shoe removing position, the switch tongue 44 yield-

ing to permit the roller to pass on said return and then to rise to its full line position.

The described arrangement of rotating and stationary cams is typical of one form of means to secure the sliding movement of the jack to and from its position beneath the form, and so far as the present invention is concerned, any appropriate means may be employed for moving the jack to and from such position, it being understood that the invention hereinafter claimed is not restricted to any particular means for this purpose.

The stationary cross head 6 is provided with hangers 56 for the supporting shaft 57 on which is mounted the oscillatory form carrier 58 to which the frame is secured.

Reference has been made to the fact that the form and its carrier are mounted for oscillatory movement produced at predetermined times in the operation of the machine. To secure this movement the outer side of the oscillatory carrier 58 is provided with a segmental gear 94, secured thereto by any suitable means, as bolts 96. The teeth of this gear are in mesh with a bevel gear 97, at the head of a sleeve 98, loosely mounted on the adjacent guide rod 5, the lower end of said sleeve having a gear 99 in mesh with a horizontal rack 100, Fig. 1, carried at the side of the jack slide 12.

In operation the horizontal movements imparted to the jack slide through the actuation of the rod 42 reciprocate the rack 100 to oscillate the gear 99, and thereby the carrier 58 and its form 2. This oscillatory movement is effected simultaneously with and corresponds to the movements of the jack slide, so that when the jack slide is brought to rest or has a dwell in its movement, there will be a corresponding dwell or rest in the movement of the form.

The form 2, of course, has a molding face adapted by its contact with the sole to mold the same to the desired shape or style, said face being complementary to the desired shape of the shank and forepart of the shoe. In the operation of the machine, as the jack is drawn by the action of said cams 36, 37 inwardly beneath but clear of the form, the latter is swung to bring it into the position shown.

A detailed description of the operation of moving the jack toward and from position with respect to the form will not be necessary herein, as the same is set forth in full in said prior Patent No. 958,057, and; moreover, the particular movements characterizing this feature of the construction are not necessarily essential to the present invention.

In operating upon shoes of different sizes and widths, while it is usually necessary to change lasts for every change in size or width of shoe, it is obviously inconvenient to change the form so frequently, not only

because of the greater bulk of the form and the difficulty and loss of time in making the change, but principally because of the great cost involved in providing a form for each size and width. It is a matter of individual judgment and preference how many sizes or widths of shoes shall be acted upon by one form. It has been found convenient to use, say three sizes of forms, and it has been found that even in the best grades of shoes the required quality of work may be performed thereby upon all the various sizes and widths of shoes, when a proper jack is provided therefor, which properly presents the shoes to the form. In providing a jack to secure this result, that is, to present each jack in predetermined position relative to the form, advantage is taken of the fact that the variations in length of the different sizes of lasts may be said to be divided between the toe and heel at either side of the ball line. This ball line, therefore, may be selected as the invariable point of reference to which all lasts may be brought by the jack, which latter is made adjustable so as to bring the ball lines of all shoes mounted thereon always into position to provide one invariable or predetermined position of the ball line relative to the form, whatever be the length of the last. This jack comprises a sliding carriage 102, slidably mounted on the jack slide 12 and having at its end a suitable support 103, Fig. 3, for an adjustable, pivoted last block and its heel pin 104, upon which the last is mounted in the usual manner. At its front end this sliding carriage 102 is provided with pivoted supporting arms 105 for an adjustable pivoted toe pad 106, upon which the toe of the last or shoe mounted thereon automatically seats itself and is supported. The jack slide is provided with a pivoted heel clamp or gage 107, which, together with the supporting arms of the toe pad, are simultaneously moved to predetermined size positions for the size of shoe to be operated upon by an adjusting handle 108, Fig. 4, and its connected mechanism. A scale 109, Fig. 4, is also provided for determining the position of said handle and the corresponding or appropriate size positions of the heel gage and toe support. The position of the heel gage determinately fixes the position of the ball line of the shoe when the jack carriage is moved to bring the heel or counter of the shoe into engagement therewith, as in my application, No. 326,008, filed July 13, 1906, now Patent No. 966,506. For sliding this jack carriage 102 rearwardly on the jack slide to bring the counter of the shoe into the desired size position, and for depressing the toe of the shoe upon its supporting pad automatically to seat the same thereon and also for jacking the shoe in position determined by such adjustment, suitable mecha-

nism is provided, which, as shown in the present form of the invention, is operated by starting the machine. The unjacking and reverse movements of the shoe or jack are effected automatically, leaving the jack in its front, shoe-removing and receiving position on its supporting table 11. These mechanisms and movements will now be described.

As hereinbefore noted, the carriage or saddle 102 sustains both the toe and the heel end of the last and the longitudinal movement of the carriage or saddle on its slide 12 is that which brings the last always into the one invariable position as determined by the positioning member 107 against which the heel end of the shoe or last is brought by sliding movement of the carriage or saddle. This movement of the carriage or saddle in a direction toward the positioning member is also utilized for jacking the shoe or 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 presently appear. In order to thus jack the last by this movement of the saddle, the last block has depending therefrom an arm 76 forked at its lower end to embrace a pivot block 77 on the upturned end of the horizontal actuating slide bar 79, Figs. 3 and 6, which by its movement relative to the slide operates to give the required movement to the last pin. The movement of the actuator slide 79 to give the last pin its movement, first to measure the last socket and then to jack it, is secured in the present embodiment of invention by forming on the actuator slide 79 a horizontal rack 84, see Fig. 6, the teeth at the under side of which mesh with the pinion 83 fast on a short horizontal arbor 82 journaled in the support 103, and the arbor at its outer end carries frictionally the pinion 81 which in turn meshes with the stationary rack 80 on the slide 12. Thus, as the carriage or saddle slides inward to carry the shoe into operative position, the pinion 81 will run on its rack 80 and rotate said arbor 82 and its inner pinion 83, thereby to cause the inner rack 84 to overrun the carriage or saddle, and, by its relative movement thereto, to 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 106. This movement of the last pin is only preliminary to cause it to measure or to be brought lightly into contact with the pin socket wall of the last, the friction pinion 81 sliding on its arbor after this preliminary contact is obtained, so as not to firmly jack the shoe at this time.

The toe support 105 and the positioning

member 107 are operatively connected to be swung toward and from each other by a suitable hand device, substantially the same as fully described in my prior Patent No. 966,506, to which reference may be had, such parts not being herein described in detail as they are described and claimed in the said prior application.

The jack and its carriage having been moved backwardly to bring the rear portion of the shoe or last against the positioning member and to preliminarily tilt the last pin, as hereinbefore described, it now becomes desirable to firmly and finally clamp or jack the shoe upon its support, to which end suitable jacking means are provided, those disclosed in the present case being substantially the same as the similar means shown and described in my prior Patent 966,506, and comprising a rack 232 formed on the outer end of the horizontal actuator slide 79, Fig. 5, referred to as supporting the slide block 77. This rack is adapted to move by a pawl 233, Fig. 5, formed as a bell crank and pivoted at its elbow, just below the inclined rack 101 which locks the toe rest, on a crank pin 234 and on the horizontal shaft 118 to which the jacking lever 122 is secured. The short depending arm 237 of this pawl lever 233 normally bears against a stop pin 238 which holds its horizontal arm elevated out of engagement with the rack 232. In turning the operating handle of the jacking lever inward, however, the crank pin 234 is turned down and inwardly, causing the pawl to engage the rack, and, by further movement of the handle in the same direction, push said rack rearwardly and cause its vertical arm to carry the pivot block 77 with it and positively tip the heel pin 30, all substantially as fully described in said prior Patent No. 966,506.

It is to be understood that while the particular means herein described for preliminarily tilting the last pin and then for finally jacking the shoe or further tilting the last pin are described as a convenient form of mechanism for jacking the shoe, the invention is not circumscribed by these details, but any form of jacking means may be employed within the true scope of the invention.

Referring to Fig. 3, the mechanism for moving the jack carriage 102 rearwardly upon and relative to the jack slide 12 for positioning the shoe with respect to the positioning member 107 and for preliminarily jacking the shoe comprises a rocking arm 110, loosely mounted on a stud 111 suitably journaled on the jack supporting table 11. Also mounted on this stud and behind the arm 110 is a bell crank lever 112, the short horizontal arm of which is connected by a vertical link 113 with the starting treadle 114, which extends forward to present its

tread within ready reach of the operative's foot. The vertical arm 110 is connected by a spring 115 with an ear 116 on the inner end of the short arm of the bell crank, so that as said arm is depressed, the arm 110, through said spring, swings to the right to bring its upper end, which extends inward horizontally toward the jack, into engagement with a roller 117, Fig. 3, loosely mounted on the jacking shaft 118 of the jack carriage 102. The inward swinging movement of this arm, through the action of said roller 117, slides the jack inwardly or rearwardly to bring the counter of the shoe into engagement with the heel gage 107, which positions the adjusted shoe supports to present said shoe in its predetermined size position relative to said form. The jacking of the shoe in this position, or, to express it differently, the depressing of the toe firmly upon the toe pad, is effected by rotating the jack shaft 118 positively, that is, to the right, Fig. 3. This, of course, may be done by hand, but as here shown this movement is produced by the action of the inturned end of the bell crank arm 119 on a roller 120, pivoted at 121 on the jack operating lever 122 which swings said lever rearwardly to rotate the jacking shaft and jack the shoe.

Upon starting the machine by the depression of the starting treadle, the link 113 is depressed and the bell crank is oscillated or rocked to swing the jack carriage positioning arm inward to cause engagement with the roller 117, moving the carriage rearwardly until stopped by the shoe counter bringing up against the heel gage 107 which, being in its adjusted size position, presents the shoe in such position. Further depression of the link 113 and the short arm of the bell crank 112, however, is then permitted through the action of the spring 115, which yields while the arm 110 remains stationary, to hold the carriage in its size position. The continued depression of this arm 112 swings its vertical arm 119 also rearward, and brings the head of said arm into engagement with the roller 120 and swings the same also rearward to produce the jacking movement of the last pin to depress and maintain the shoe firmly upon the toe support.

To lock the carriage in its predetermined size position to prevent displacement thereof after the treadle has been released, there is provided a pair of spring pressed pivoted pawls 123, Figs. 1 and 4, which are adapted to engage the teeth of a rack 124 on the side of the carriage and which hold it in the position upon the jack slide 12 to which it has been moved by the action of the arm 110. These pawls lock the jack carriage against reverse movement until the jacking shaft is turned in the reverse direction, to the left Fig. 3, to unjack the shoe, when a

projection 118' on the jacking shaft acts upon the ends of the pawls to lift them from the rack 124.

The rock arm 110 and the bell crank arm behind it are provided with suitable means, here shown as engaging pins 110^a, 119^a, whereby the bell crank 119, after having returned far enough to permit the shoe to be unjacked, picks up and also returns the arm 110 to the left, Fig. 3. Thus the jacking lever may be moved to unjack the shoe while the arm 110 still holds the carriage in place, following which said arm 110 is moved to the left, thereby permitting movement of the carriage 102 to its outer position on the jack slide. To produce this outward movement, which moves the shoe forward away from the heel gage, the jack slide is provided at its outer side, Fig. 4, with a horizontal pawl carrying lever 125 pivoted, as at 126, on a vertical pivot pin secured to the jack slide 12. At its inner end this lever is provided with a pivoted pawl 127 which is controlled by a spring 129 and drags over the teeth of a rack 128 on the jack carriage as the pawl carrying arm of said lever swings rearwardly in the positioning movement of the shoe under the form. During the operation of the machine and in reaching this position, the pawl engages an adjacent tooth of the rack to prevent relative or reverse movement between them and cause them to move together when the pawl carrying arm 125 is swung in the opposite direction during the forward movement of the jack, as presently will be described. This pawl, however, has a stop arm 130 which extends at right angles relatively to the pawl and is adapted to engage a stop pin 131 on the jack slide as said lever 125 is moved into the position shown in Fig. 4 to cause the disengagement of the pawl from said rack as the carriage reaches its outer position. The inner arm of this lever 125 is normally swung toward pawl engaging position by means of a coil spring 132 connecting said arm with a pin 133 on the jack slide. The jack table 11, at a predetermined point thereon, is provided with a vertical pin 134 with which the outer arm 135 of said lever 125 engages in the outward movement of the jack slide.

In operation, as the jack slide is moved inward, or to the right, Fig. 4, toward its inner position, the outer arm 135 of said lever 125 is drawn by its spring to the left. By this swinging movement of said lever, the pawl 127, through the action of its spring 129, is swung into engagement with the teeth of the rack and is caused to drag thereover until the jack slide reaches its innermost position, the pawl then resting in engagement with the rack and cooperating with the pawls 123 to lock the carriage against return movement during the laying

or leveling operation. Upon completion of such operation, the jack slide is moved outward, to the left, Fig. 4, the outer arm 135 of said lever 125, at a predetermined point in the sliding movement of the jack slide, engaging the stationary pin 134, causing the pawl arm of said lever to be swung to the left about its pivot 126, and swing said pawl also to the left, thereby to push said jack carriage outwardly with its shoe that has been unjacked during the same outward movement, thus moving them away from the heel clamp and causing the heel pin to tip to its upright position to facilitate removal of the shoe. The said lever 122 is swung to the left, Fig. 3, automatically to unjack the shoe by the outward or return movement of the jack which causes the cam extension 122^a of said lever, then in its downturned position, to engage the upturned and elevated end 137 of a bell-crank 136, to be described. This rearward swinging movement of the jacking lever, to the left, Fig. 1, causes its roller 120 to swing the arm 119 also to the left, during which the pin 119^a picks up the pin 110^a, to cause movement of the arm 110 away from the carriage roller 117 subsequent to the unjacking of the shoe, and permit the carriage to be moved to its outer position on the jack slide.

The bell crank 136, Fig. 1, referred to, is pivotally mounted on the jack table 11 and its horizontal arm is provided with the upturned end 137 which plays in a vertical slot 138 in the jack slide 12, Fig. 4. The depending short arm of this bell crank rests, under the action of gravity, against a pin 139, Fig. 1, horizontally slidable in the table 12. The opposite or rear end of this pin normally engages the vertical arm of a bell crank 140, Fig. 1, pivotally mounted on the frame. The long horizontal arm of this bell crank is provided with a roller 141, riding on the edge of a tappet cam 142 which, at the conclusion of the laying operation, elevates said arm, causing the vertical arm of said bell crank 140 to swing outward, and producing corresponding movement of said pin 139 and the depending arm of the bell crank 136. This movement elevates the vertical, up-turned end 137 of the bell crank 136 to place it in the path of the cam extension 122^a of the jack operating lever, so that as the jack slides outwardly at the completion of the laying movement and after the separation of the jack and form, said extension 122^a will engage said upturned end 137 and cause said lever to swing to the right, Fig. 3, to automatically unjack the shoe.

By the construction hereinbefore described it is apparent that the unjacking of the shoe is effected automatically, the jacking being effected by depression of the starting treadle and the unjacking by the outward movement of the jack to a position of

presentation. Obviously, the jacking of the shoe might be accomplished by hand manipulation of the handle 122, the jacking lever 119 under such conditions being dispensed with, if desired; and the unjacking of the shoe, under the conditions just mentioned, would still be effected by the outward movement of the jack to a position where the operator could readily remove a shoe from or place a shoe upon the jack. Furthermore, the construction described also provides means for unlocking the shoe and moving it away from the heel gage 107 to facilitate its ready removal when in shoe removing position, and, also, the application of the next shoe to be treated.

The operation of the machine will be clearly understood by those skilled in the art from the drawings and description herein, such parts of the machine not herein treated being definitely and fully described in the prior Patent No. 958,057, of which this is a division; the invention herein being more particularly directed to the jack and its associated elements whereby many of the operations heretofore performed by hand are effected automatically, such as the unjacking of the shoe as the jack moves to a position convenient for the operative to remove the shoe.

It will also be obvious, of course, that many changes may be made in the details of construction without departing from the invention, the broad character of which is definitely set forth by the claims.

What is claimed is:

1. In a machine for treating boots and shoes, the combination of a supporting frame, a table, a shoe support or jack having a last pin and toe rest and mounted to slide on said table, means for tilting the last pin for jacking the shoe on said shoe support or jack to hold the same for treatment, and means acting automatically to unjack the shoe as the support or jack is moved outward on said table.

2. In a machine for treating boots and shoes, the combination of a supporting frame, a table confined to movement in a vertical plane on said frame, a shoe support or jack having a tilting last pin and toe rest and mounted to slide on said table, a jacking lever for tilting the last pin to jack the shoe, and means acting automatically as the shoe support or jack is moved outward on said table for operating the jacking lever to tilt the last pin and unjack the shoe.

3. In a machine of the character described, the combination of a supporting frame, a table confined to movement in a single plane, a shoe support or jack mounted to slide on said table to carry the shoe to and from operative position, a tilting last pin, means for tilting the last pin in one direction for jacking the shoe on said shoe sup-

- port or jack to hold the same for treatment, and means acting automatically for tilting the last pin in the opposite direction for unjacking the shoe as the shoe support or jack is moved outward on said table. 70
4. In a machine of the character described, the combination of a supporting frame, a table, a shoe support or jack mounted to slide on said table and confined to movement in a single plane to carry the shoe to and from operative position, means for sliding the shoe support or jack on said table, means for jacking the shoe on said shoe support or jack to hold the same for treatment, and means acting automatically for unjacking the shoe as the shoe support or jack is moved outward on said table. 75
5. In a machine of the character described, the combination of a supporting frame, a table, a shoe support or jack mounted on said table and confined to movement in a vertical plane, means for jacking the shoe, means for moving the jack to and from operative position on said table, and means acting automatically as the jack is moved to inoperative position for unjacking the shoe. 80
6. In a machine of the character described, the combination of a supporting frame, a table, a laying or leveling form, means for confining the table movement in a direction toward and from the form, a shoe support or jack mounted on said table, means for jacking the shoe, means for moving the jack to and from operative position on said table, and means mounted on the table and acting automatically as the jack is moved to inoperative position for unjacking the shoe. 85
7. In a machine of the character described, the combination of a frame, a table, a shoe support or jack mounted on said table and having a tilting last pin, a jacking lever for tilting said last pin to jack the shoe, and means acting automatically to throw said jacking lever to unjacking position to reverse the tilted position of the last pin for unjacking the shoe as the shoe support is moved outward on said table. 90
8. In a machine of the character described, the combination of a frame, a table, a shoe support or jack mounted on said table and having a tilting last pin, a jacking lever for tilting said last pin to jack the shoe, means for locking the shoe in jacked position, and means acting automatically to throw said jacking lever to unjacking position for tilting the last pin for unjacking the shoe as the shoe support is moved outward on said table. 95
9. In a machine of the character described, the combination of a supporting frame, a table confined to movement up and down on said frame, a slide mounted on said table and carrying a shoe support or jack having a tilting last pin for jacking the shoe, means for moving the slide on said table to carry the shoe support or jack to and from operative position, and means acting as the slide is moved to inoperative position for automatically unjacking the shoe. 100
10. In a machine of the character described, the combination of a supporting frame, a table, a slide movable on said table, a jack mounted to move longitudinally on said slide, a back gage to limit the rearward movement of the shoe on said slide, means to jack the shoe, and automatic means acting to unjack the shoe as the slide is moved outward on said table. 105
11. In a machine of the character described, the combination of a supporting frame, a table, a slide movable on said table, a jack mounted to move longitudinally on said slide, a back gage to limit the rearward movement of the shoe on said slide, means to move the slide outward on said table, means to jack the shoe, and automatic means acting to unjack the shoe as the slide is moved outward on said table. 110
12. In a machine of the character described, the combination of a shoe support or jack, a slide on which said shoe support or jack is mounted for movement longitudinally relative to said slide, said support or jack having a tilting last pin and toe rest, a back gage, means for tilting the last pin to jack the shoe with its rear part against the back gage, means for moving the slide to carry the shoe support or jack to inoperative position, and means acting automatically to unjack the shoe as the slide is moved to inoperative position. 115
13. In a machine of the character described, the combination of a jack, a slide on which it is mounted for movement longitudinally, a back gage to determine the longitudinal backward movement of the jack on said slide, means for moving the slide longitudinally to carry the shoe to and from operative position, and means to automatically unjack the shoe as the slide moves to inoperative position. 120
14. In a machine of the character described, the combination of a jack, a slide on which it is mounted for movement longitudinally, a back gage to determine the longitudinal backward movement of the jack on said slide, means for moving the slide longitudinally to carry the shoe to and from operative position, means to automatically unjack the shoe as the slide moves to inoperative position, and means to move the jack outward on the slide as the slide moves outward. 125
15. In a machine of the character described, the combination of a table confined to movement in a vertical direction, a jack mounted on said table and confined to move longitudinally with relation thereto, means for jacking the shoe, and means for auto- 130

matically unjacking the shoe as the slide is moved outward on said table.

16. In a machine of the character described, the combination of a table, a jack including a last pin and toe rest mounted to slide on said table longitudinally with relation thereto, means to jack the shoe, and means connected to said table for automatically unjacking the shoe as the jack is moved outward with relation to said table.

17. In a machine of the character described, the combination of a table confined to vertical movement, a jack mounted on said table to slide longitudinally with relation thereto to and from operative position and having a tilting last pin, means for jacking the shoe by tilting the last pin in one direction, locking means for holding the shoe in jacked position, and means connected to said table to automatically unjack the shoe as the jack is moved outward on said table.

18. In a machine of the general character described, the combination of a table confined to movement in a vertical plane, a jack mounted to slide longitudinally with relation to said table to carry the shoe to and from operative position and having a tilting last pin, jacking means for jacking the shoe by tilting the last pin, and a trip mounted on the table and acting automatically to unjack the shoe by reversing the tilted position of the last pin as the jack is moved to inoperative position on said table.

19. In a machine of the character described, the combination of a table, a jack having a tilting last pin and toe rest and mounted to slide longitudinally with relation to said table to carry the jack to and from operative position, a jacking lever for tilting the last pin to jack the shoe, and a trip mounted in the path of said jacking lever to automatically unjack the shoe as the jack is moved on said table to inoperative position.

20. In a machine of the character described, the combination of a table confined to movement in a vertical plane, a jack having a tilting last pin and toe rest and mounted to slide longitudinally with relation to said table to carry the jack to and from operative position, a jacking lever for tilting the last pin to jack the shoe, a lock for holding the shoe in jacked position, and a trip mounted in the path of said jacking lever to automatically unjack the shoe as the jack is moved on said table to inoperative position.

21. In a machine of the character described, the combination of a supporting frame, a table, a slide movable longitudinally on said table, a jack carriage mounted on said slide and longitudinally movable

thereon, jacking means, means for automatically unjacking the shoe as the slide moves outward on the table, and means for moving the jack carriage on the slide as the latter moves outward on the table.

22. In a machine of the character described, the combination of a supporting frame, a table, a jack slide mounted on the table, a jack having a tilting last pin and toe rest carried by said slide, a jacking lever for tilting the last pin to jack the shoe, said lever having a trip engaging portion, and a trip for automatically throwing said jacking lever to unjacking position to tilt the last pin in the reverse direction.

23. In a machine of the character described, the combination of a supporting frame, a jack movable thereon and having a movable last pin, a treadle for directly jacking a shoe on said jack by movement of said last pin, and means for automatically unjacking the shoe.

24. In a machine of the character described, the combination of a supporting frame, a jack movable thereon and having a tilting last pin, a treadle for directly jacking a shoe on said jack by tilting said last pin, means for locking the parts in jacked position, and means for automatically unjacking the shoe.

25. In a machine of the character described, the combination of a supporting frame, a table, a slide movable longitudinally of said table, a jack carriage movable longitudinally of the slide, means to jack the shoe, means to automatically unjack the shoe, and means to move the jack carriage relative to the slide as the latter moves from operative position.

26. In a machine of the character described, the combination of a supporting frame, a table, a slide movable longitudinally of the table, a jack carriage movable longitudinally of the slide and having a toe rest and last pin, means to move the carriage in one direction on the slide to preliminarily tilt the last pin and seat the toe of the shoe upon the toe rest, jacking means, means to automatically unjack the shoe, and means to move the jack carriage outward on the slide as the latter moves outward.

27. In a machine of the character described, the combination of a supporting frame, a table, a slide movable longitudinally of said table, and a jack carriage having a toe rest and last pin and movable longitudinally of said slide, means to move the jack carriage longitudinally of the slide to preliminarily jack the shoe, said means acting thereafter to fully jack the shoe, and means to automatically unjack the shoe as the slide is moved to inoperative or outward position.

28. In a machine of the character de-

scribed, the combination of a supporting
frame, a table, a slide movable longitudi-
nally of said table, and a jack carriage hav-
ing a toe rest and last pin and movable
5 longitudinally of said slide, means to move
the jack carriage longitudinally of the slide
to preliminarily jack the shoe, said means
acting thereafter to fully jack the shoe,
means to unjack the shoe as the slide moves
10 toward inoperative position, and means

operative during said movement of the slide
to move the jack carriage relatively thereto.

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

ERASTUS WOODWARD.

Witnesses:

IRVING U. TOWNSEND,

AMELIA M. ROSS.

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