No. 720,171. PATENTED FEB. 10, 1903.

B. E. MORRISON.

SPRING HEEL SEATING MACHINE.

APPLICATION FILED JUNE 17, 1899.

NO MODEL. 4 SHEETS—SHEET 1.

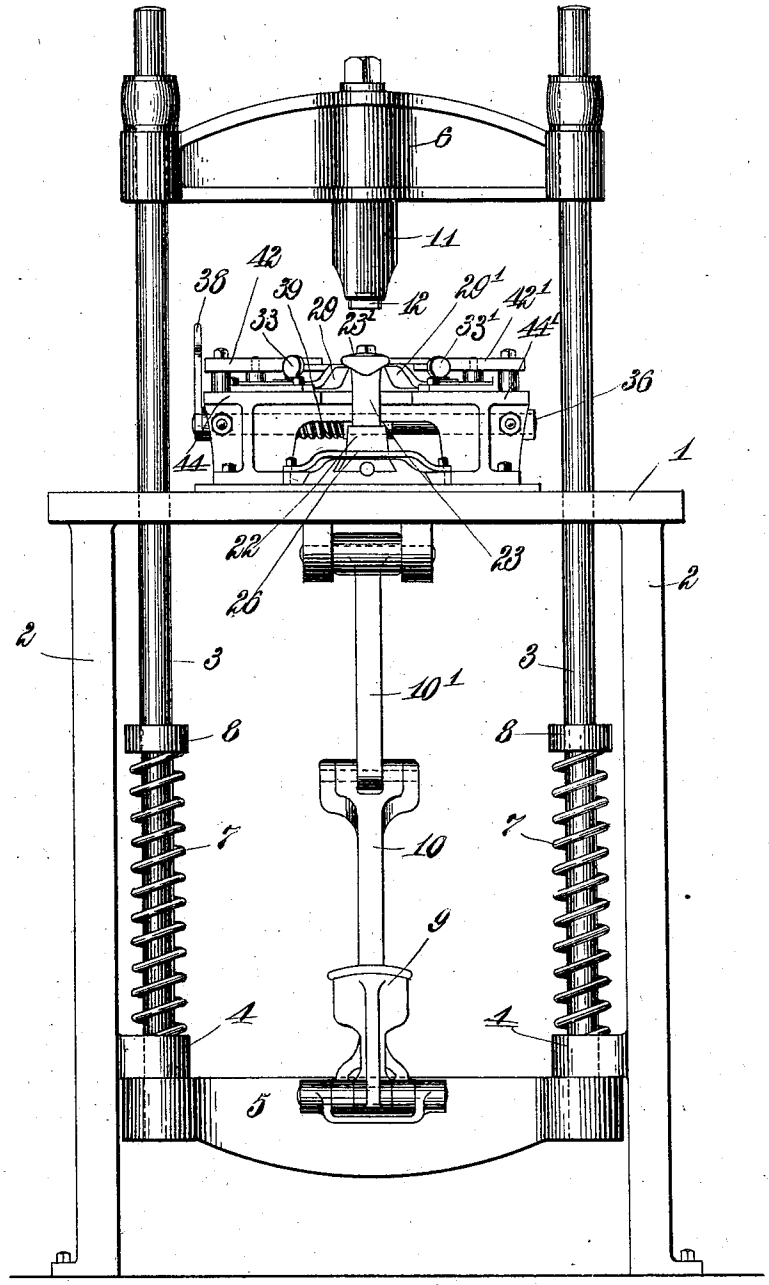


FIG-1-

WITNESSES-
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Wm. H. Jamum.

INVENTOR-
Burton E. Morrison,
by his atty,
Louis H. Harriman.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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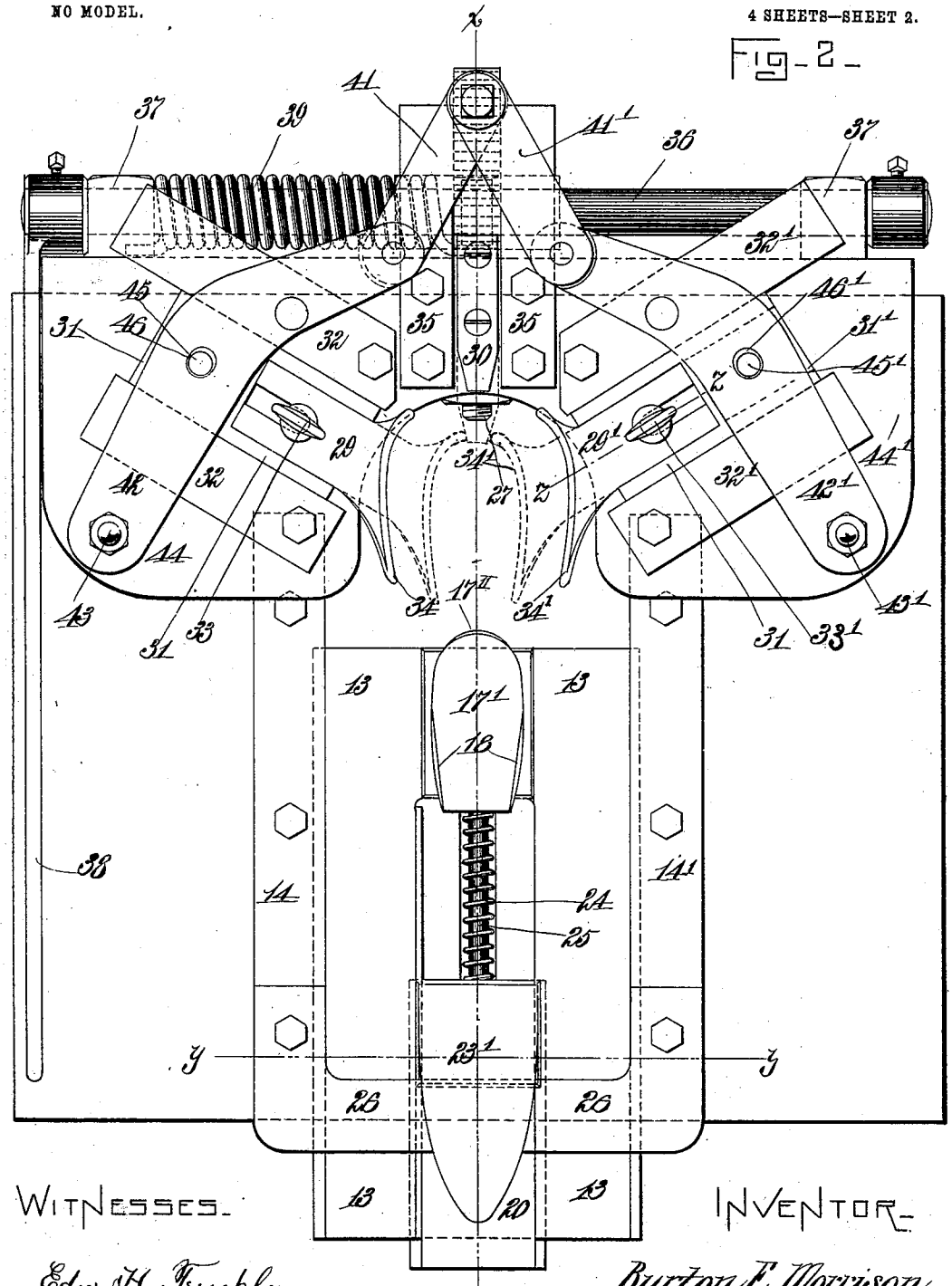
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NO MODEL. 4 SHEETS—SHEET 2.

Fig. 2.



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NO MODEL. 4 SHEETS—SHEET 3.

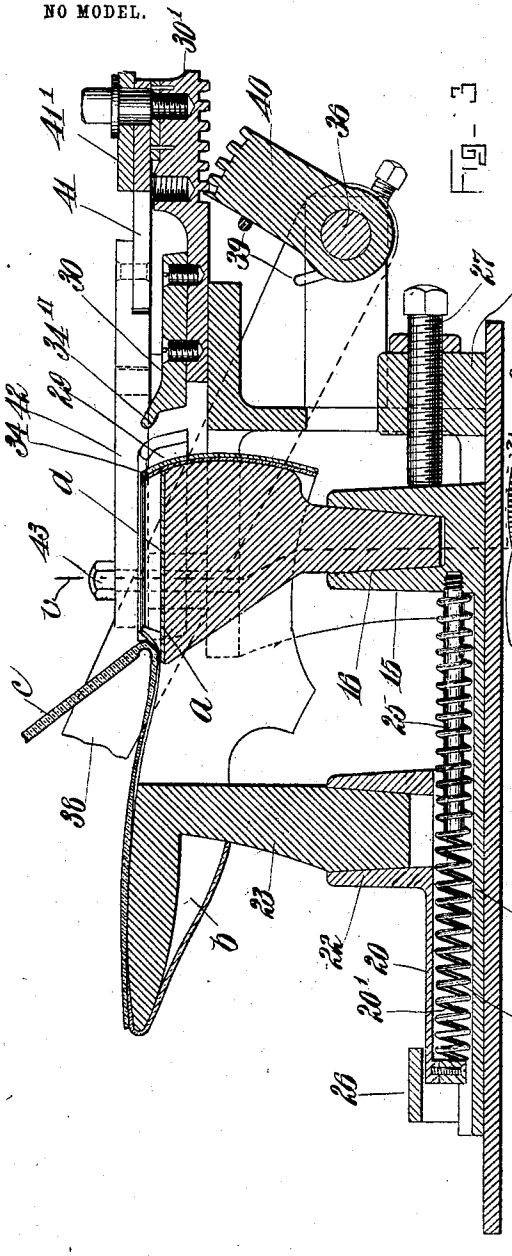


FIG. 3.

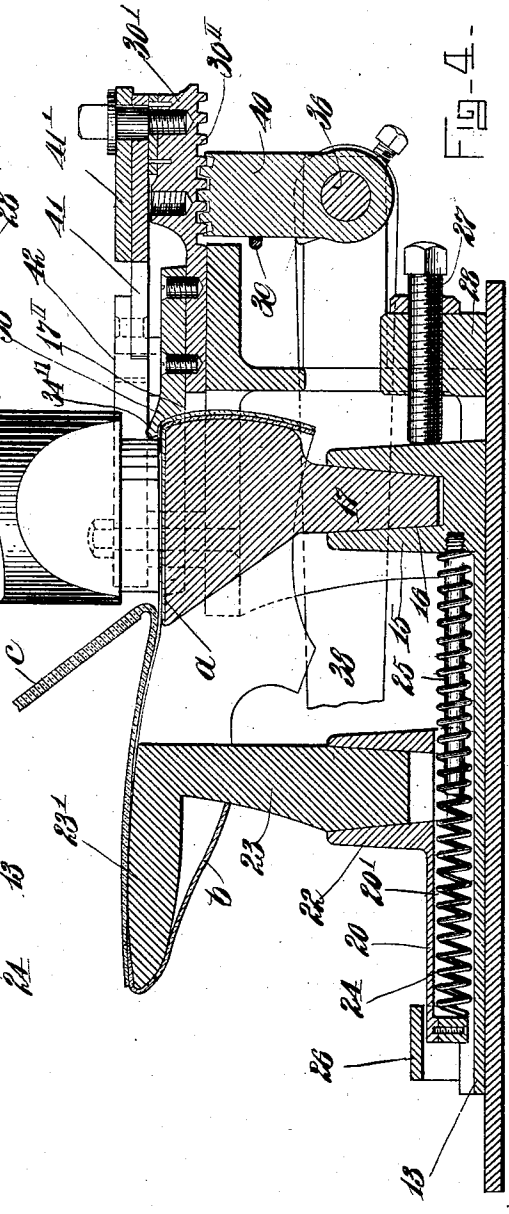


FIG. 4.

WITNESSES.

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SPRING HEEL SEATING MACHINE.

APPLICATION FILED JUNE 17, 1899.

NO MODEL. 4 SHEETS—SHEET 4.

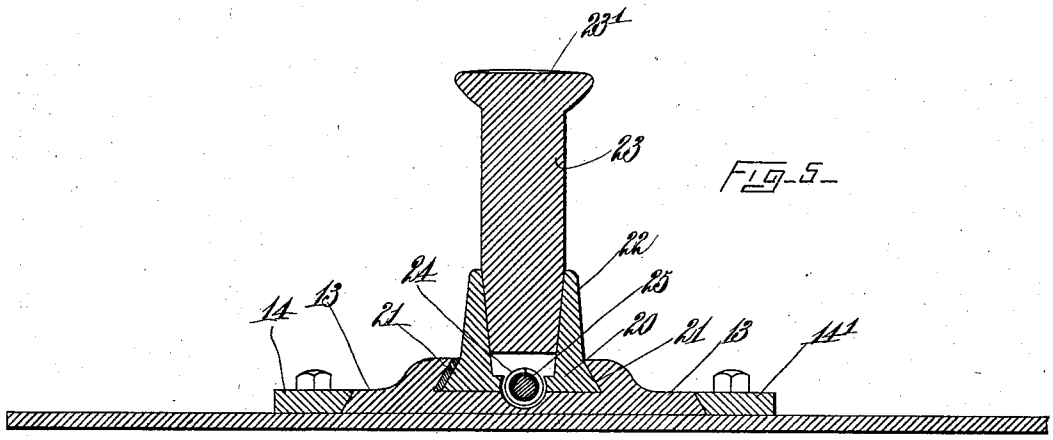


Fig. 5.

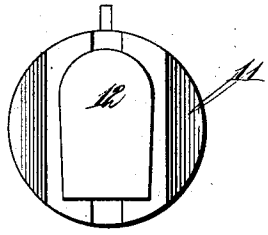


Fig. 6.

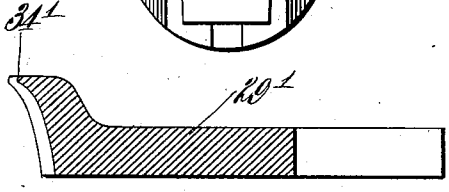


Fig. 7.

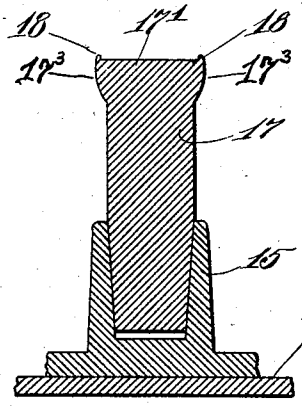


Fig. 8.

WITNESSES—

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UNITED STATES PATENT OFFICE.

BURTON E. MORRISON, OF HAVERHILL, MASSACHUSETTS, ASSIGNOR TO MORRISON SHOE COMPANY, OF CONCORD, NEW HAMPSHIRE.

SPRING-HEEL-SEATING MACHINE.

SPECIFICATION forming part of Letters Patent No. 720,171, dated February 10, 1903.

Application filed June 17, 1899. Serial No. 720,967. (No model.)

To all whom it may concern:

Be it known that I, BURTON E. MORRISON, a citizen of the United States, and a resident of Haverhill, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Spring-Heel-Seating Machines, of which the following is a specification.

The object of my invention is to provide certain means to be used in making spring-heel turn-shoes which will materially reduce their cost of manufacture and will also provide a shoe which is considerably improved in appearance over those made by old methods and appliances.

For a thorough understanding of my invention I will first briefly explain in a general way the method now employed in making shoes of the character above referred to.

What are generally known as "spring-heel shoes" are those in which the heel part of the sole is "sprung" over the heel proper, forming the top lift of the heel, and owing to their peculiar nature it has been practicable to use but little improved machinery in their manufacture. The usual method of making turn-shoes of this character is as follows: The shoe is lasted and the upper is sewed to the sole up to the breast of the heel, after which the shoe is turned. The next step under the old process is to relast the shoe. After relasting, the inner lift, which is a lift of similar shape but somewhat longer than the heel, is tucked under the sole, counter, and upper, so that it will rest on the heel of the last. The upper, counter, and lining are then drawn up tight and bent over on the inner lift and nailed thereto—that is, the heel part is lasted, forming the heel-seat. This part must be done by a skilled and experienced laster. The shoe is then beaten out with a hammer, and the heel is placed on the heel-seat and nailed in place by hand. The heel of the sole is then slugged onto the heel, after which the shoe is finished in the usual way.

According to my invention instead of immediately relasting the shoe after it is turned I place it upon a jack the heel of which is somewhat smaller than the heel part of the original last. The upper, lining, and counter are then bent in over the inner lift, which latter is placed on the heel of the jack before the shoe is placed thereon. The heel is then placed on the edge of the upper, which has previously been bent in, a few nails are driven through the heel, upper, counter, and inner lift, so that the parts will not become misplaced, and then the shoe is removed from the jack and the above-mentioned parts are all secured together in a nailing-machine. If desired, however, the heel may be completely nailed in place by hand before the shoe is removed from the jack. After the heel has been nailed the heel of the sole is slugged onto the heel, preferably in a slugging-machine. Before the shoe is finished it is relasted or drawn on the original last, and as the heel-seat was formed on a jack the heel of which was smaller than that of the original last the heel part of the shoe, being moist or "in temper," will be stretched, removing all wrinkles.

With the old process, in which the heel is lasted on the original last, it is by no means easy to so last the heel that the upper will be stretched tight when the shoe is finished; but by my process a perfectly-finished shoe is always assured. It is also much easier to form the heel-seat on the jack than on the original last, as the heel of the jack is small for the heel of the shoe, and therefore the upper does not have to be drawn in especially tight. Moreover, the old process of lasting on the original last requires the employment of a skilled and experienced laster, while a comparatively unskilled workman may form the heel-seat on the jack. Superior results are also secured by nailing on the heel in a machine with the last removed instead of nailing it on while the shoe is on the last. Not only is the shoe awkward to handle while on the last in either a nailing or a slugging machine, for the reason that it must be supported upon a jack of some sort, but in nailing on the heel some of the nails are liable to be deflected outwardly by the heel-iron of the last instead of being turned inwardly and properly clenched, as they will be when driven against the concave top of the supporting-post now usually employed in nailing-machines. With the form of jack which I employ it is a very easy matter to remove the shoe after it has been placed there-

on; but in the old process of relasting immediately after the shoe is turned it would take too much time to remove the shoe from the last after the heel was lasted in order that the heel could be nailed and slugged off the last and relast the shoe again.

For a more complete understanding of my invention attention is called to the accompanying drawings, in which—

Figure 1 is a front elevation of the complete machine. Fig. 2 is a plan of the mechanism carried on the table of the machine. Figs. 3 and 4 are vertical cross-sections taken on the line $x\ x$ of Fig. 2, Fig. 3 showing the wipers in their withdrawn or inoperative position and Fig. 4 showing them brought forward so that they grasp the shoe. Fig. 5 is a cross-section on the line $y\ y$ of Fig. 2. Fig. 6 is a bottom plan view of the molding-block. Fig. 7 is a detail cross-section of one of the wipers, taken on the line Z Z of Fig. 2. Fig. 8 is a detail cross-section of the heel-post, taken on the line V V, Fig. 3.

The same reference characters refer to identical parts throughout all the views.

Referring first to Fig. 1 for an understanding of the general arrangement of the machine, the table 1 is supported on legs 2. Rods 3 pass through lugs 4 and up through the table 1. A cross-head 5 is secured to the lower ends of these rods below the lugs 4, and a cross-head 6 is adjustably secured to the upper ends thereof. Springs 7 encircle said rods 3 and are compressed between lugs 4 and collars 8 on the rods, so that cross-head 5 is normally drawn up against lugs 4, holding cross-head 6 in its extreme elevated position. Any well-known means may be employed to draw down the cross-heads—as, for example, a treadle 9 is pivoted on cross-head 5 and connected to toggle-levers 10 10′, such arrangements being common in molding, stamping, or similar machines. The mechanism thus far described forms no part of my invention and is well known in the classes of machines just referred to. Carried by cross-head 6 is a plunger 11, which carries a molding-block 12 on the lower end thereof. This block 12 is removably secured in a dovetail groove formed in the lower end of the plunger and is made in the form of a heel having a flat bottom and vertical sides, as shown in Figs. 4 and 6.

Secured on the table 1 of the machine is the mechanism shown in plan in Fig. 2 and in cross-section in Figs. 3, 4, and 5. This mechanism comprises a jack for holding the shoe and a set of wipers for forming the heel-seat. The jack is supported on a plate 13, which is adapted to slide in the dovetail groove formed by the ways 14 14′. The rear end of this plate carries a centrally-arranged socket-piece 15, having an angular tapered hole 16 in the top thereof. The heel-post 17 is adapted to fit in hole 16, so that it will not turn therein. The top 17′ of the heel-post is flat and of the same shape as the inner lift usually employed—that is, it is of the same shape as the heel, excepting that it is somewhat longer. The back 17″ and sides 17^3 of the heel-post are formed in the same shape as the back and sides of the heel of shoe. At each side of the top of the heel-post are small upwardly-projecting flanges 18, which extend divergently from the front to about the middle thereof. The height of these flanges is about equal to the thickness of the inner lift, and they are arranged so that the inner lift will fit between them and be held against forward or lateral movement on the top of the heel-post after it has been laid thereon. A slide 20 is arranged in a dovetail groove 21 in the upper side of plate 13, said groove extending from near the front end thereof back to the socket-piece 15. The rear end of slide 20 is formed with a socket-piece 22, having an angular tapered hole therein, which is adapted to receive the toe-post 23 and hold the same against rotation. The top 23′ of this toe-post is formed in the shape of the toe of a shoe. A hole 20′ extends longitudinally of slide 20 from the rear end to a point near the front thereof and forms a chamber for the reception of a spring 24, which bears against the end of this hole at one end and is carried by a rod 25, which is fixed into the front side of socket-piece 15, said spring bearing against said socket-piece at its opposite end, so that it will operate to press the heel and toe parts of the jack apart. A strap 26 extends over the ways 14 14′, so as to engage the socket-piece 22 when the jack is drawn forward, and acts as a stop to limit the outward movement of the jack. A set-screw 27, which passes through the lug 28 on the table of the machine, is adapted to engage socket-piece 15 and limit the backward movement of the jack.

The wiper mechanism for forming the heel-seat consists of two side wipers 29 29′ and a back wiper 30. The side wipers are adjustably and removably connected to slides 31 31′, which are arranged in dovetail grooves between ways 32 32′. The wipers 29 29′ are arranged to be adjusted in grooves formed in the slides 31 31′. Clamping-bolts 33 33′ are adapted to hold the wipers in place when they have been moved to the desired position. Each of these wipers 29 29′ has a broad face which is preferably slightly curved or concaved vertically, as shown in Figs. 3 and 7, to correspond to the curve of the upper and counter directly above the heel. (See Fig. 7.) The faces of the wipers 29 29′ are also shaped horizontally to correspond precisely with the shape of the heel portion of the shoe directly above the heel. The upper edge of each wiper is provided with a lip or flange 34 34′, which projects nearly horizontally. (See Figs. 3 and 7.) The face on the under side of each of these lips merges into the curved face of the wiper, as shown. The back wiper 30 slides in a dovetail groove formed by ribs 35 and is provided with a rearward extension 30′,

which has a rack 30″ on the under side thereof. This back wiper is shaped vertically practically like the side wipers and has a horizontally-projecting lip 34″ at the upper edge. A shaft 36 is supported in lugs 37 in the rear of the support for the wipers and is provided at one end with a lever 38, which extends forward, so as to be within easy reach of the operator. A spring 39 on shaft 36 is arranged so as to rotate the shaft and normally keep the lever raised. The segment of a pinion 40 is secured to shaft 36 and is arranged so as to engage the rack 30″. Links 41 41′ are pivoted at one end to the ends of levers 42 42′. These levers are fastened at 43 43′ to a fixed support 44 44′. Pins 45 45′ project upwardly from slides 31 31′ and loosely engage apertures 46 46′ in levers 42 42′. It will now be apparent that when the lever 38 is pressed downwardly the segmental rack 40 will be moved forward, carrying with it the rear wiper 30. This same movement will cause the links 41 41′, which are pivotally connected to wiper 30, to swing levers 42 42′ on their respective pivots 43 43′, carrying the slides 31 31′ and with them the side wipers 29 29′. These wipers are so arranged that when they are forced together and have reached their extreme inner position the rear ends of the side wipers will meet the adjacent sides of the rear wiper, so that the space inclosed by the edges of the lips of the wipers will be in the form of the heel of the shoe, as shown in dotted lines in Fig. 2. The bottom of the block 12 is shaped so as to exactly fill this space when it is lowered, as shown in Fig. 4.

The manner of using the above-described machine is as follows: After the shoe has been sewed as far as the breast of the heel and has been turned it is ready to be placed on the jack of the machine. The jack is drawn to the front of the table, and the inner lift *a* is placed on the top of the heel-post of the jack so that the lift fits snugly up against the flanges 18 on the top of the heel-post. The heel-post is then drawn forward, forcing the toe-post against the stop 26, compressing the spring 24, and bringing the heel and toe posts near together, so that the shoe *b* may be readily slipped thereon, as shown in Figs. 3 and 4. When the heel-post is released, the spring 24 will force the heel-post back, stretching the shoe tight and drawing it into shape, as if it had been drawn onto the original last. The jack is then pushed back against the stop-screw 27, where the heel part of the shoe will occupy a position directly between the side wipers. The lever 38 is then depressed, forcing the wipers together, the projecting lips of which will bend or throw in the upper counter and lining toward the center of the heel over the inner lift. These wipers not only perform the function above set forth, but the broad faces thereof also mold the counter or heel-stiffening, so that it is curved or shaped down to the point at which it is attached to the heel. As the counter is then moist or in temper, and therefore easily molded, it will remain in shape perfectly after once being molded by the faces of the wipers, and the shoe is then more nicely shaped at this point than is possible with old metheds. The plunger, with its block 12, is then lowered by pressure upon the treadle or by any well-known automatic means, and, as previously stated, the block completely fills the space inclosed by the edges or the lips of the wipers. The parts are arranged so that the block will press downwardly solidly on the inner lift, pressing the upper and counter beyond the lips of the wipers down flat. The heel-seat is thus formed and the parts of the shoe will stay in place perfectly, as there is no strain on them while the die is lifted, the wipers withdrawn, and the jack drawn forward. After this has been done the operator places the heel on the heel-seat thus formed and drives a tack through each side of the heel, which passes through the upper, counter, and inner lift and is clenched on the inner side of the inner lift by being driven against the metal heel-post of the jack. The two parts of the jack are then drawn together, as when the shoe was placed thereon, and the shoe removed. The two tacks in the heel hold all parts in position while the shoe is taken to a nailing-machine, and the heel, upper, counter, and inner lift are all secured together in the same nailing operation. It is obvious that the heel might be completely nailed in place by hand before it is removed from the jack, although the nailing-machine does more satifactory work, particularly when the shoe is off the last, and when used materially reduces the cost of the shoe. The most important point is that I am enabled to nail the heel-seat and nail on the heel all in one nailing operation, while previously it has been necessary when the heel was relasted on the original last to first nail the heel-seat and then nail on the heel. After the heel has been nailed in place the heel of the sole is slugged onto the heel and the shoe relasted and finished in the usual way.

As both the heel and toe posts are readily removable, posts having different-sized heads may be used in the same jack without loss of time. The same size of heel and toe posts may be used for four full sizes, if desired, so that but few different sets are necessary. The side wipers and the block of the plunger are also made readily removable, so that they may be changed for different sizes of shoes, although one set may be used for several different sizes, as in the case of the heel and toe posts of the jack.

The flanges on the heel-post of the jack aid very materially in producing a uniformly-perfect shoe, as they insure perfect adjustment of the inner lift. In making shoes by the old process the inner lift is often skewed to one side, so that it makes a bunch in the upper

over the heel; but when the heel is lasted on my jack the inner lift is always sure to be secured precisely in the middle of the shoe.

Although I have described my heel-lasting mechanism as preferably used in connection with the particular form of jack shown and described, yet it will be clear that this mechanism could be effectively used to last the heel of a shoe which is on the original last. This could obviously be accomplished by substituting a form of jack which would hold a last for the jack which is designed to hold the shoe alone. For this reason I do not wish to restrict myself to the particular combination of jack and lasting mechanism which I show.

From the above description it will be seen that I reduce the cost of the shoe for various reasons. By lasting the heel on a form of jack which is smaller than the heel of the original last I am able to dispense with the services of an experienced laster, a comparatively unskilled workman being capable of doing the work, and as the shoe is stretched when finally relasted, the leather being still in temper, a better-finished shoe is produced. As the upper is not stretched when the heel is lasted, it will stay in place, so that the heel-seat may be nailed and the heel nailed on in one operation instead of two. A large saving is therefore made at this point. The greater facility with which the shoe may be handled while the heel is being nailed and slugged in a machine adapted for that purpose gives another important saving. The lasting mechanism described reduces the cost of manufacture below the hand process to a large extent and in addition produces a uniformly better shoe, as the counter and upper directly above the heel are more uniformly shaped or molded.

Having described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is as follows:

1. A machine for forming heel-seats on spring-heeled shoes, comprising a suitably-shaped support for the heel of the shoe, projections on the upper surface thereof for holding an inner lift in a middle position thereon, and wipers which are adapted to simultaneously engage opposite sides of the heel portion of the shoe and bend in the upper upon the inner lift.

2. A machine for forming heel-seats on spring-heeled shoes, comprising a suitably-shaped support for the heel of a shoe, converging flanges on the upper surface thereof which are adapted to engage the edges of an inner lift to hold it in position, and wipers which are adapted to engage opposite sides of the heel portion of the shoe, and bend the upper in on the inner lift.

3. A machine for forming heel-seats on spring-heeled shoes, comprising a suitably-shaped support for the heel of a shoe, means carried thereby for holding the inner lift against forward movement thereon, and wipers which are adapted to engage the opposite sides of the heel portion of a shoe and bend the upper in on the inner lift.

4. A heel-lasting machine, having a support for the shoe, wipers for bending in the upper at the heel portion thereof and a plunger for pressing down the upper after it has been bent in by said wipers and while it is held thereby, said plunger being adapted to engage the upper directly beyond the edge of the wipers for the purpose set forth.

5. A heel-lasting machine having a support for the shoe, side wipers having projecting lips which are shaped corresponding to the side of the heel of the shoe, a back wiper having a projecting lip, connections between said wipers for forcing them inwardly simultaneously, said parts being arranged so that the rear ends of the lips of the side wipers will meet the ends of the back wiper when in their innermost position, a die which is adapted to completely fill the space inclosed by said wipers when in said innermost position, and means for pressing said die onto the heel-seat of the shoe.

6. A lasting-machine having a support for the shoe, wipers for bending in the side of the upper, and a plunger for pressing the edge of the upper flat while it is held in the bent-in position by the wipers.

7. A heel-lasting machine having two side wipers which are adapted to simultaneously engage the sides and rear portion of the heel respectively, projecting lips on the edges of said wipers, connections between said wipers for causing them to grasp the shoe simultaneously, said lips on said wipers being so formed and arranged that they inclose a space corresponding to the shape of the heel when in their operative position, and a plunger which is adapted when lowered to completely fill said inclosed space.

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

BURTON E. MORRISON.

Witnesses:
E. G. MORRISON,
LOUIS H. HARRIMAN.