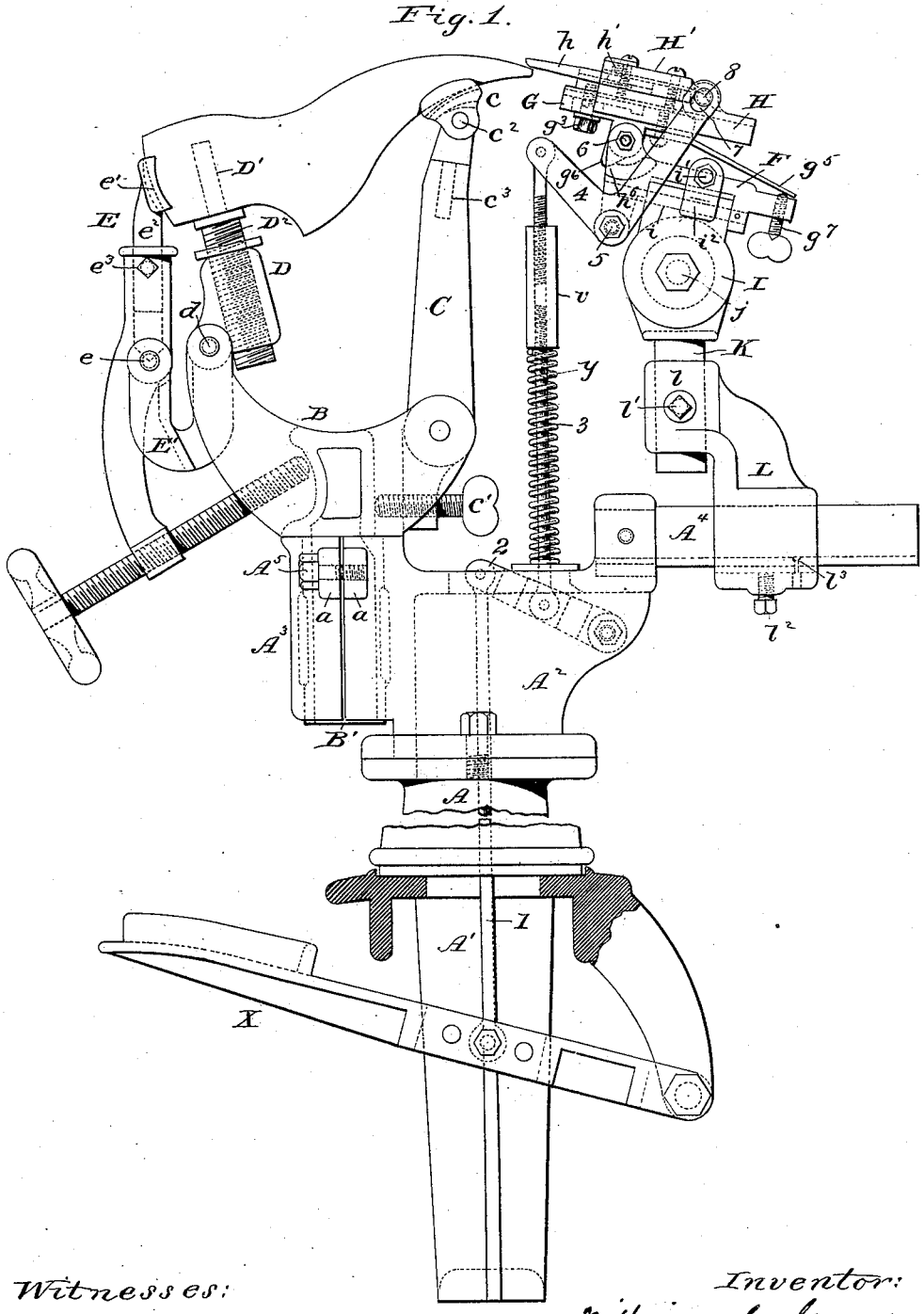
(No Model.) 3 Sheets—Sheet 1.

W. C. CROSS.

MACHINE FOR LASTING BOOTS OR SHOES.

No. 343,440. Patented June 8, 1886.

Fig. 1.



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Inventor:
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by his attorney
M. Allen Dale

(No Model.) 3 Sheets—Sheet 2.

W. C. CROSS.

MACHINE FOR LASTING BOOTS OR SHOES.

No. 343,440. Patented June 8, 1886.

Fig. 4.

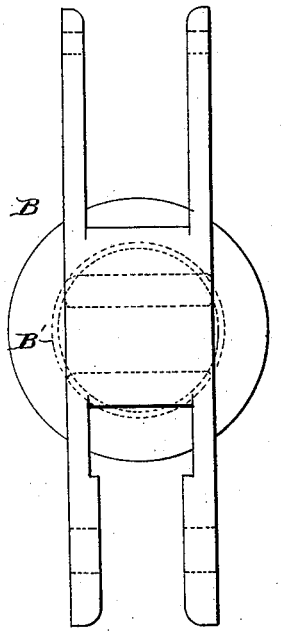


Fig. 2

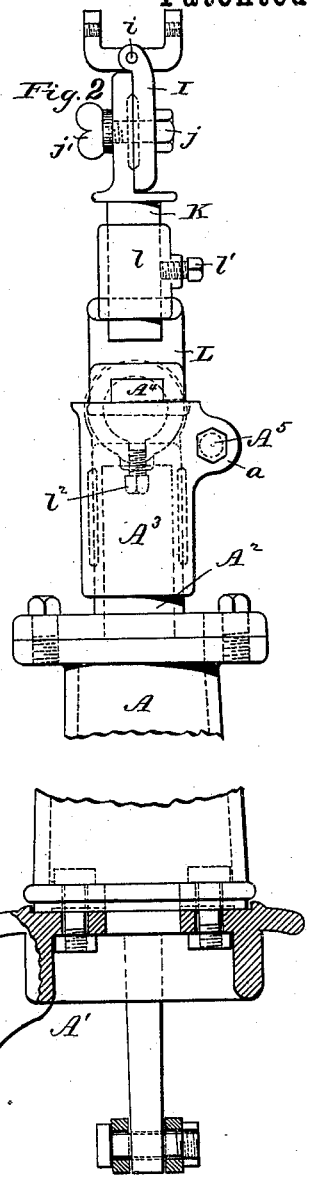
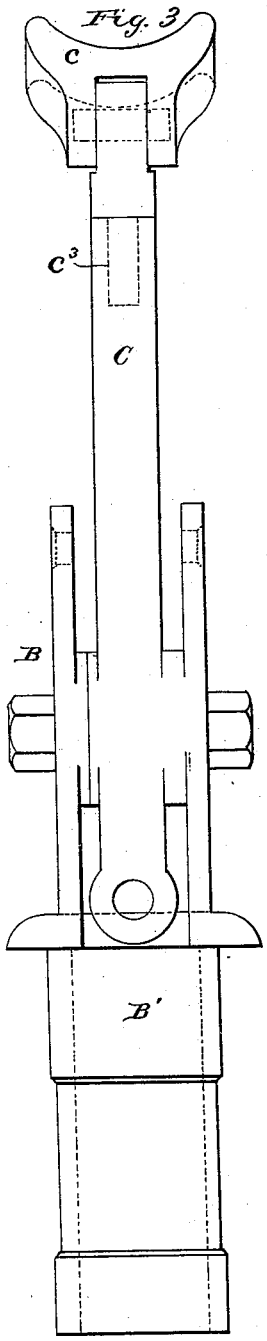


Fig. 3



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(No Model.) 3 Sheets—Sheet 3.

W. C. CROSS.

MACHINE FOR LASTING BOOTS OR SHOES.

No. 343,440. Patented June 8, 1886.

Fig. 6.

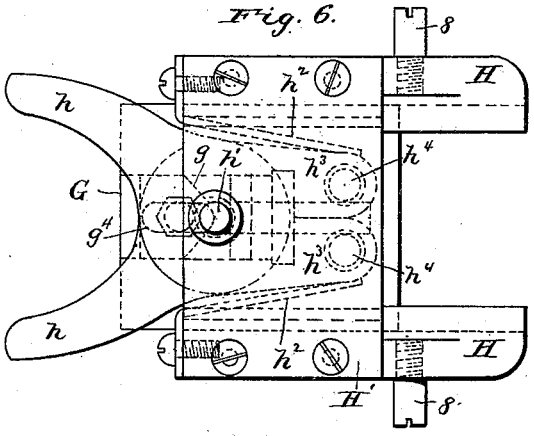


Fig. 5

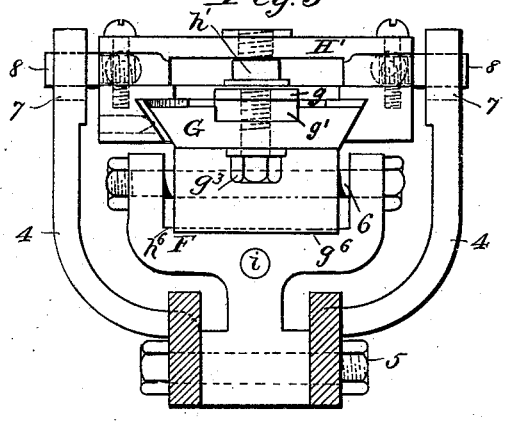
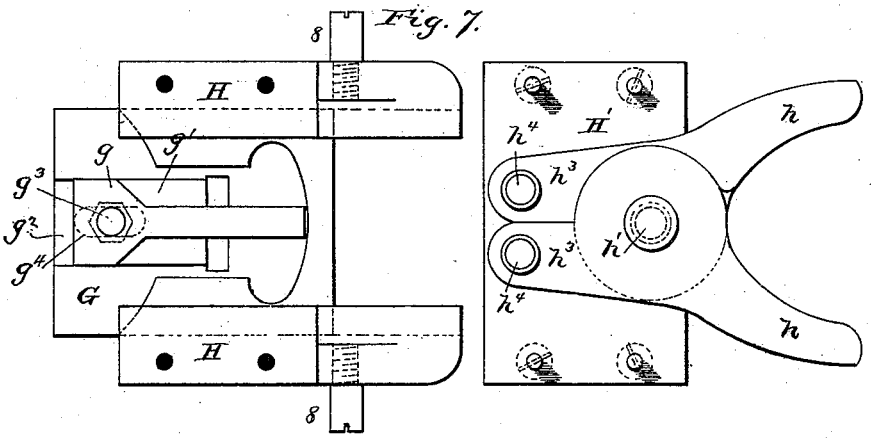


Fig. 7.



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UNITED STATES PATENT OFFICE.

WILLIAM C. CROSS, OF BOSTON, MASSACHUSETTS.

MACHINE FOR LASTING BOOTS OR SHOES.

SPECIFICATION forming part of Letters Patent No. 343,440, dated June 8, 1886.

Application filed December 23, 1885. Serial No. 186,553. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. CROSS, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Machines for Lasting Boots and Shoes, of which the following is a specification.

The machine in which my invention is embodied has been designed, principally, with reference to the needs of that system of lasting boots and shoes in which a draw-cord around the edge of the upper is employed as the means whereby the said edge is gathered in and folded down upon the last; but the improvements contained in it are also applicable, in the main, to lasting-machines generally.

The jack which forms part of my improved machine comprises, as usual heretofore, a toe-rest and a heel-post; but over and beyond these devices it also contains what I term a "heel-clamp," which at a point below the bottom of the last bears from the rear against the heel of the last and the upper thereon. Hitherto, so far as I am informed, it has been customary, after the upper has been properly adjusted upon the last, to drive a tack through the upper into the rear portion of the heel of the last, in order to prevent this portion of the upper from being unduly drawn up over and upon the bottom of the last in the operation of lasting. The heel-clamp, which I make part of the jack, takes the place and performs the function of this tack or nail, thus obviating the necessity of using the latter. I also prefer to so arrange it that it shall have the further function of forcing the last up against the toe-rest, thus performing the work that has hitherto been performed solely by the heel-post, and taking off from the latter much of the strain to which it is subjected in jacks as heretofore constructed. In connection with the jack I make use of wipers, which wipe down upon the bottom of the last the toe portion of the upper. Such an organization, broadly considered, is shown and described in my Letters Patent No. 324,304, of August 11, 1885, and is not here claimed.

My improvements consist in combining the jack and toe-wipers in such manner that the jack may as a whole turn on a vertical axis independently of the toe-wipers and their supporting-standard. In this way I am enabled, either before or after using the toe-wipers, to bring the jack, independently of the wipers, to a position in which the last and upper can most conveniently and readily be reached by the workman. A further advantage of this arrangement is that in the operation of lasting the toe portion of the upper the work will center itself between the jaws or wipers.

The several parts of the jack itself and of the wiper-operating mechanism and wiper-supporting standard are all made and arranged so as to be susceptible of the various adjustments needed to bring the parts into proper operative relation to one another, no matter what may be the different shapes of lasts and kinds and thicknesses of material operated on.

The nature of my improvements and the manner in which the same are or may be carried into effect can best be explained and understood by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a lasting-machine embodying the various features of my invention in their preferred forms, with the base or supporting tripod in section. In this figure the last is represented as mounted and in place in the jack. Fig. 2 is a front elevation of the frame of the machine, with the jack and the wipers, their supporting-slide and bed and actuating mechanism removed. Fig. 3 is a rear elevation of the jack, on a larger scale, with the heel-post and heel-clamp removed. Fig. 4 is a plan of the jack with the heel-post, heel-clamp, and toe-rest removed. Fig. 5 is a front elevation of the wiper-slide, bed, bed-carrier, and slide-actuating levers, with the wipers removed. Fig. 6 is a plan of the wiper-slide and bed. Fig. 7 is a plan of the same with the cap of the slide removed and turned back.

The several parts of the machine are all mounted on a hollow post, A, terminating at its lower end in a base or tripod, A′. Up through the post passes the connecting-rod 1, jointed at its lower end to a pivoted treadle, X, which, through the rod 1 and other suitable intermediaries, actuates the wiper-slide. On top of the post is bolted the head A^2, which supports the various working parts. It is provided at front with a vertical socket, A^3,

and at rear with a rearwardly-projecting horizontal stem or rod, A^4. The socket A^3 is split vertically, so as to be expansible, and its opposite edges are provided with ears *a*, through which passes the screw A^5, by which the socket may be tightened upon the stem B′ of the jack-frame B, which is mounted and adapted to turn or swivel in it. In practice the screw is tightened just enough to prevent the jack from turning too freely, and in the operation of lasting the toe portion of the upper, after the jack has adjusted itself to the jaws or wipers, the screw may be tightened, so as to fasten the jack in that position.

The jack-frame has pivoted between ears in its rear end the toe rest lever or standard C, and carries at its front the pivoted heel-post D and heel-clamp E. The toe-rest lever below its pivot is provided with an adjusting-screw, *c′*, which bears against the jack-frame and serves to adjust the tilt of the toe-rest standard, and at its upper end it is provided with the toe-rest proper, *c*, which is preferably pivoted at c^2 to tilt back and forth on a horizontal axis, and also is preferably mounted upon a stem, c^3, swiveling vertically in the standard C. The object of this construction is to permit the toe-rest proper to be reversed end for end, in case it is made higher on one side than the other, as it is required for lasts of some shapes, thus permitting it to be used for both rights and lefts of lasts of such shapes.

The heel clamp E and heel-post D may be pivoted to the jack-frame independently of each other. I prefer, on the whole, however, to employ the arrangement illustrated in the drawings, and represented more particularly in Fig. 1—that is to say, to pivot the heel-post to the jack-frame at *d* and to pivot the heel-clamp at *e* between ears on the front arm of the U-extension E′ of the pivoted heel-post. The heel-clamp at its upper end has a bearing-face or pad, *e′*, preferably made of rubber or other yielding material, shaped and adapted to fit and bear against the rear of the heel of the last and of the upper thereon; and this pad or bearing-face is preferably mounted on a stem, e^2, mounted and vertically adjustable in a socket in the upper end of heel-clamp E, so that the height of the pad may be varied, said stem being held in its adjusted position by set-screw e^3. In the end of the heel-clamp E, below its pivot *e*, is an adjusting-screw, which bears against the jack-frame, and by turning which the heel-clamp can be forced against the heel of the last and the upper thereon, thus binding the latter at that point in place upon the last without the use of tacks or nails. The heel-clamp serves also, under the arrangement shown, to force the last toward and down upon the toe-rest, the heel-post partaking of this movement. I prefer to mount the heel-post proper, D′, in its support D, so that it may be vertically adjustable, which result can conveniently be effected by screw-threading the stem D^2 of the post D′ and screwing it into a correspondingly screw-threaded socket in the post D, as seen in Fig. 1.

The stem B′ vertically swivels in the split socket A^3, as before said, so that the jack, as a whole, can turn upon said stem as an axis, and this independently of the wipers and their support and actuating mechanism, which will be presently described.

I remark that while the arrangement and construction of the heel-clamp shown in the drawings are on the whole preferred by me in practice, yet that clamp may be constructed and arranged in various other ways. What is essential is that the clamp should bind the upper to the heel of the last, and thus be a substitute for and perform the office of the tacks or nails, which hitherto, so far as I am informed, have been employed for the purpose; and I believe that a lasting-jack provided with a clamp or presser having this function is new with me. By its use the time and material required for tacking the upper to the heel at this point is saved, and the upper itself during the lasting operation is held at the heel much better and more efficiently than heretofore has been practicable.

I pass now to a description of the toe-wipers and parts related thereto.

The connecting-rod 1, at its upper end, is jointed to a lever, 2, pivoted in the hollow head A^2, and having jointed to it a second connecting-rod, 3, hung at its upper end on a cross-pin extending between the lower arms of two angle or elbow levers, 4, pivoted at 5 to opposite ends of the carrier F, to which is jointed on a longitudinal cross-pivot at 6 the bed G of the slide H, which carries the wipers. The upper arms of the elbow-levers 4 extend up one on each side of the slide H, and into slots 7 in said arms extend the pins 8, projecting laterally from the slide. The slide in its under face has an undercut longitudinal groove, and in this groove fits the correspondingly-shaped upper part of the bed G, which thus forms a dovetailed way on which the slide fits and can move back and forth. Its forward movement is effected by depressing the treadle X against the stress of a coiled spring, *y*, which encircles connecting-rod 3, and is held between a shoulder on said rod above and the head A^2 below. The depression of the treadle compresses this spring, and the latter, when pressure from the treadle is removed, moves the slide back to its first position. The rod 3 is a two-part rod, its contiguous ends being screw-threaded in opposite directions, and being joined by a right and left screw-threaded sleeve, *v*, by turning which the working length of the rod can be increased or lessened at pleasure, in order to adjust the normal position of the treadle. The slide is composed of two parts—the base H and the cap H′. Within the cap are pivoted, at *h′*, the wiper-jaws *h*, normally spread apart by springs h^2, attached to the cap and pressing against the shanks h^3 of the jaws in the rear of the pivot. From the rear end of each shank projects downwardly a

pin, h^4, said pins being on opposite sides of the cam-piece g, attached to the upper face of the bed G and projecting into the interior of the slide. This cam-piece is provided with inclines so shaped (as seen in Fig. 7) as to cause the closing of the wipers when they advance; and in order to vary the point at which this closure shall begin during the forward movement of the slide I make the cam adjustable longitudinally of the bed G. This adjustment can be accomplished in various ways. One simple arrangement, as shown in the drawings, is to attach the cam to a base-plate, g', mounted and adapted to slide back and forth in a recess, g^2, in the bed, said slide being held in its adjusted position by a set-screw, g^3, projecting through a slot, g^4, in the bed into the plate g'. The adjustment, in order to effect the best results, should be such that when the wipers advance they should begin to close at about the time they meet the upper or the line of the last, above which the toe portion of the edge of the upper projects. This adjustment, together with that hereinafter described, by which the plane of advancing movement of the wipers is brought into general correspondence with the plane of that portion of the bottom of the last upon which said wipers wipe down the upper, I deem, on the whole, the most essential of the various adjustments which I provide for the wipers and the parts more immediately related thereto. I remark, however, that I do not here claim separately the combination of the toe-wipers with a cam longitudinally adjustable to vary the time at which the toe-wipers during their forward movement shall commence to close, this feature being reserved by me for another application for Letters Patent filed May 7, 1886, Serial No. 201,467. A spring, g^5, interposed between the bed G and the carrier H, tends to tilt the front of the bed downwardly, the extent of this movement in such direction being determined by a toe, g^6, on the bed which brings up against a stop, h^6, on the carrier. An adjusting-screw, g^7, determines the tension of the spring. The object of this provision is to permit the bed and the parts which it carries to adapt themselves to variations in the last or in the thickness of material operated on.

It not unfrequently happens that the bottom of the last may be higher on one side than on the other, in which case the wipers should be capable of tilting in a plane inclined laterally from the horizontal. To provide for this contingency, as well as to adapt the wipers for use under all conditions with right and left lasts, the carrier F is connected to its support I by a horizontal longitudinal joint pin or rod, i, on which it can tilt laterally. It is maintained in its adjusted position by set-screws i', which screw through ears i^2 on the support and bear against opposite sides of the carrier, so as to fix it in its adjusted position.

The carrier-support I is adjusted to tilt back and forth upon a horizontal transverse pivot, j. It is this adjustment by which in the present instance I am enabled to bring the plane of advancing movement of the wipers into correspondence with the plane of that portion of the bottom of the last with which said wipers co-operate. This adjustment is easily and conveniently effected at the point indicated. I do not wish, however, to be understood as restricting myself to effecting the adjustment at said point, because, obviously, it may be provided for otherwise.

In order to effect the adjustment upon the pivot j, the portion of the carrier-support through which said pivot passes is formed as a disk, as is also the corresponding portion, K′, of the stem K that upholds the carrier-support. These two disks are corrugated or roughened on their interior opposite faces, and preferably have interposed between them an annulus of leather or other suitable material. The pivot j is a headed bolt, and on its screw-threaded end is a thumb-nut, j'. By loosening this nut the support J is left free to turn on its pivot, and by tightening the nut the support will be held fast in its adjusted position.

It is desirable to make the wipers vertically adjustable to lasts of different heights or thicknesses. This adjustment is conveniently provided for by making the stem K vertically movable in a socket, l, of a supporting-bracket, L, in which it is held in adjusted position by a set-screw, l'. It is also desirable that the wiper mechanism should have capacity to move to and from the lasting-jack, in order to be properly set for operation in connection with lasts of different lengths. Provision is conveniently made for this adjustment by mounting the bracket L upon the horizontal rod A^4 in such manner that it can slide back and forth on the same, being held in its adjusted position by a set-screw, l^2. In case the rod A^4 is cylindrical the bracket can have a spline-and-groove connection, l^3, with said rod, so as to be incapable of turning thereon.

This concludes my description of the mechanical construction and arrangement of the several portions of the machine. The mode of operation of the same has been sufficiently indicated in the foregoing description to render unnecessary further explanation. It is sufficient to say that the lasting operation generally is to be performed preferably by the use of the draw-cord, with which the upper, as hereinbefore indicated, should be provided, and that the toe-wipers are to be employed as adjuncts in the operation of drawing up and folding down upon the bottom of the last the toe portion of the upper.

I can by the use of the draw-cord and of the heel-clamp dispense entirely with all tacks or nails heretofore required in the operation of lasting boots and shoes, although in some cases I may prefer to, and in practice do, use a nail or two to secure the upper to the insole at the shank of the last.

In conclusion, I remark that I do not de-

sire to be understood as restricting myself to the specific details hereinbefore shown and described, because it is manifest to those skilled in the art that the same can be widely varied in many particulars without departure from my invention; but

What I deem to be new herein and of my own invention is—

1. In machinery for lasting the uppers of boots and shoes, a lasting-jack having a heel-clamp consisting of a pad or presser, and mechanism for positively moving the same toward and away from the heel of the last, carried by and forming an integral part of the jack arranged and adapted to bear against the rear portion of the heel of the last, below the sole of the same at that point where the lasting-tack which unites the upper to the last is usually driven, and to take the place and perform the office of said tack, substantially as and for the purposes hereinbefore set forth.

2. In a lasting-machine, the combination of a toe-rest, a heel-post movable to and from the toe-rest, and a heel-clamp arranged and adapted both to bind the upper upon the rear face of the heel of the last and to force and hold the last below the sole upon the toe-rest, substantially as hereinbefore set forth.

3. In a lasting-machine, the combination, with the jack-frame and toe-rest, of the heel-post pivoted to said frame, and the heel-clamp pivoted to said heel-post, under the arrangement and for operation substantially as hereinbefore shown and set forth.

4. In a lasting-machine, the combination of the heel-post, the toe-rest, the heel-clamp, and their supporting-frame swiveled in its supporting-base to turn upon a vertical axis, substantially as and for the purposes hereinbefore set forth.

5. In a lasting-machine, the combination, with the jack-frame, of a toe-rest-carrying stem swiveled to turn on a vertical axis, and a toe-rest jointed to said frame on a horizontal axis, substantially as hereinbefore set forth.

6. In a lasting-machine, the combination, with the jack-frame, of a pivoted toe-rest standard, a toe-rest-supporting stem vertically swiveled in said standard, and a toe-rest jointed to said stem on a horizontal axis, substantially as and for the purposes hereinbefore set forth.

7. In a lasting-machine, the combination, with toe-wipers and mechanism for operating the same, of a lasting-jack pivoted to turn as a whole upon a vertical axis independently of said wipers, substantially as and for the purposes hereinbefore set forth.

8. In a lasting-machine, the combination, with toe-wipers and mechanism for operating the same, of a lasting-jack comprising a heel-post, a toe-rest, a heel-clamp, and a supporting-frame swiveled to turn upon a vertical axis independently of said toe-wipers, substantially as and for the purposes hereinbefore set forth.

9. In a lasting-machine, the combination, with a lasting-jack, of longitudinally-reciprocating pivoted toe-wiper jaws, and means, substantially as described, whereby the plane of longitudinal movement of said jaws may be varied to correspond with the plane of the bottom of the last, and whereby the closure of the jaws may be effected sooner or later, as desired, during their forward movement, substantially as and for the purposes hereinbefore set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 17th day of December, A. D. 1885.

WILLIAM C. CROSS.

Witnesses:
MARCELLUS BAILEY,
GEO. R. KELSO.