No. 701,412. Patented June 3, 1902.

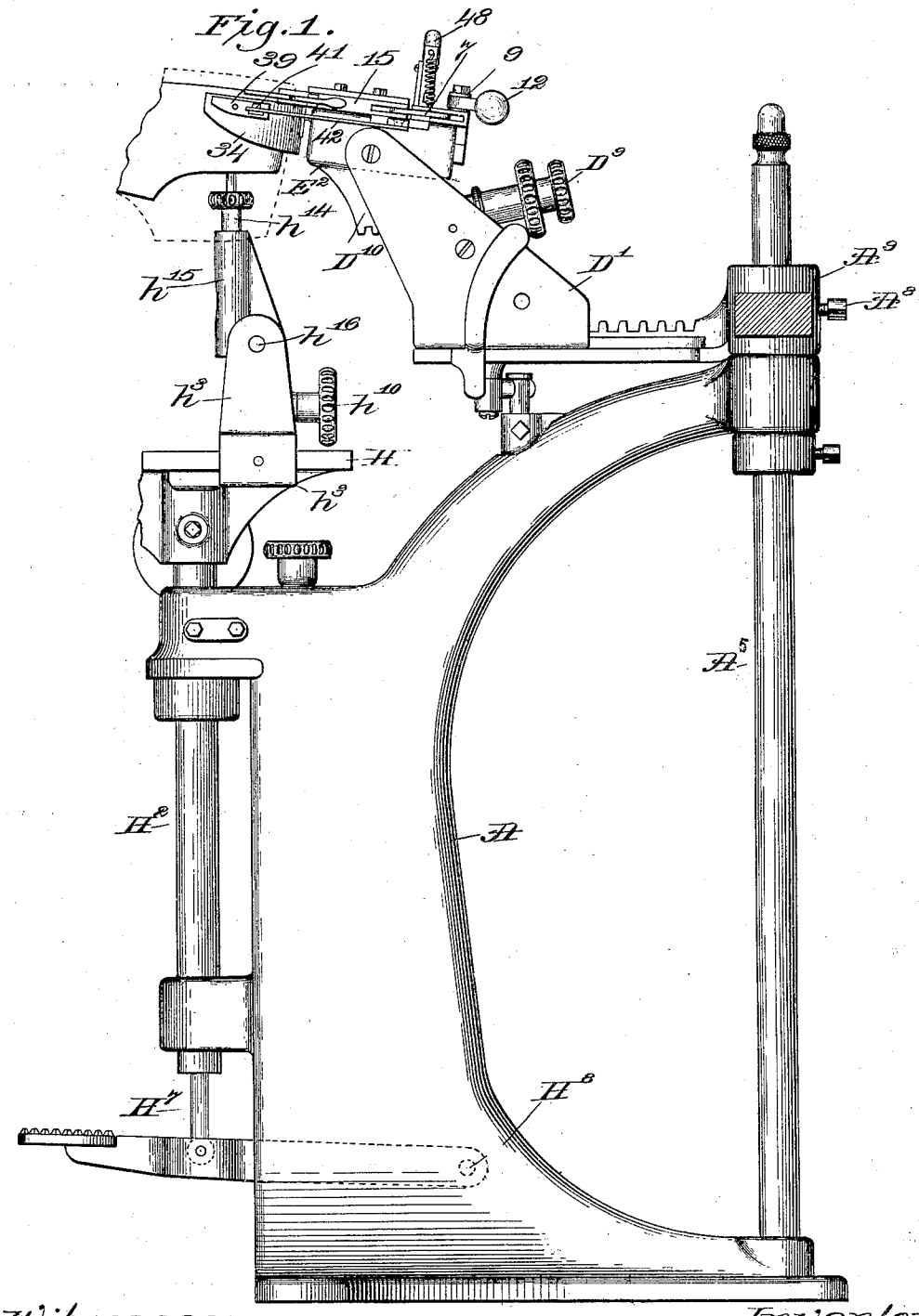
S. SNOW.

LASTING MACHINE.

(Application filed June 25, 1900.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.



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

No. 701,412. Patented June 3, 1902.

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LASTING MACHINE.

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(No Model.) 3 Sheets—Sheet 2.

Fig. 3.

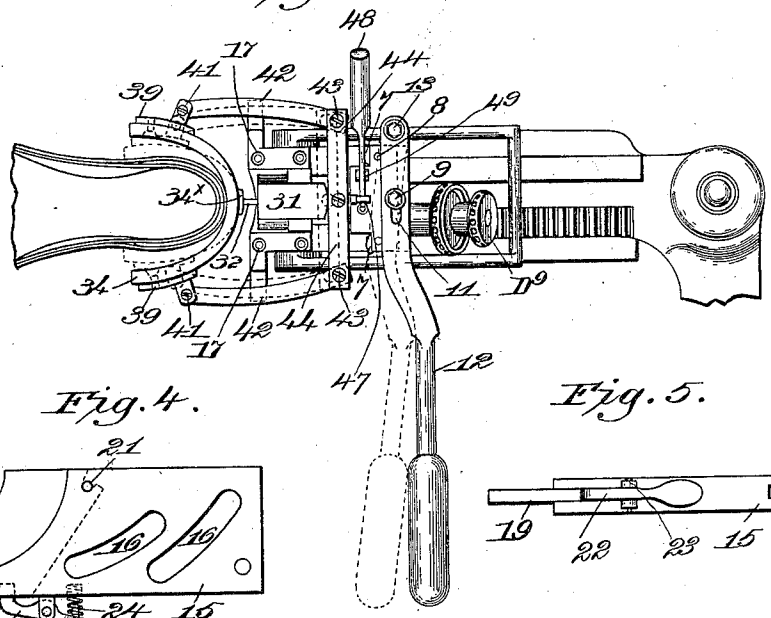
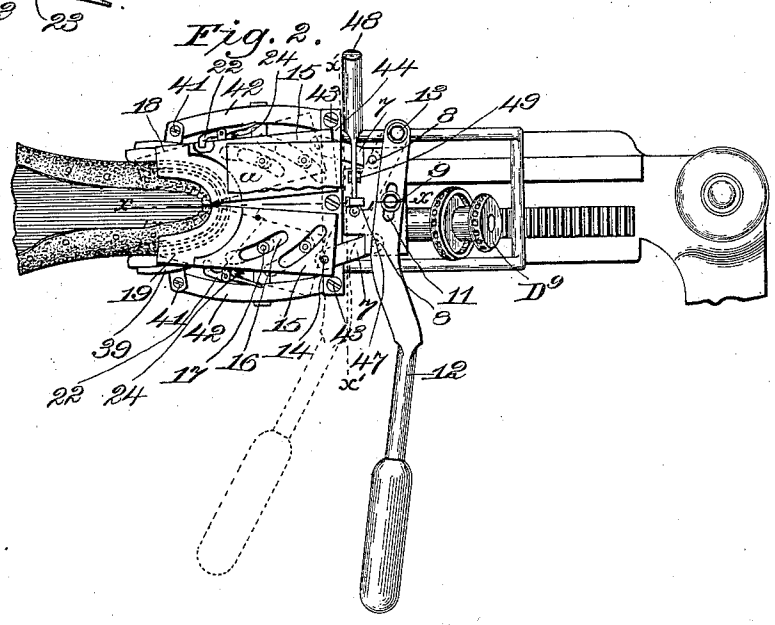


Fig. 4.

Fig. 5.

Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

Fig. 6.

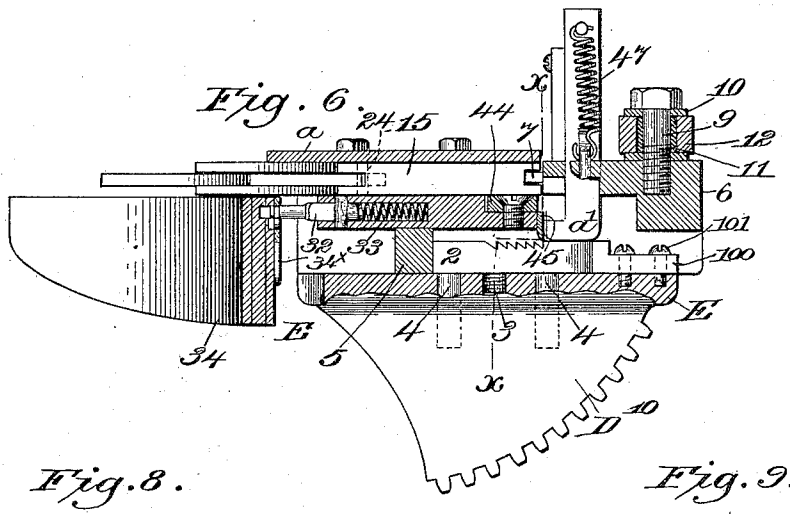


Fig. 8.

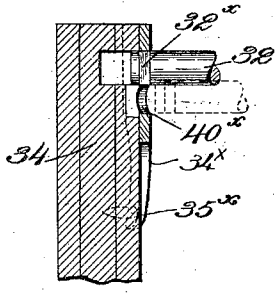


Fig. 9.

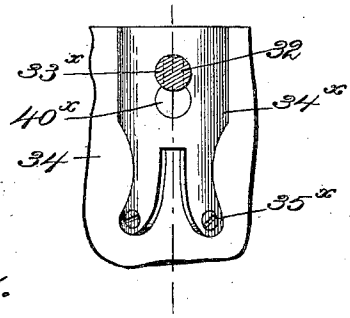


Fig. 7.

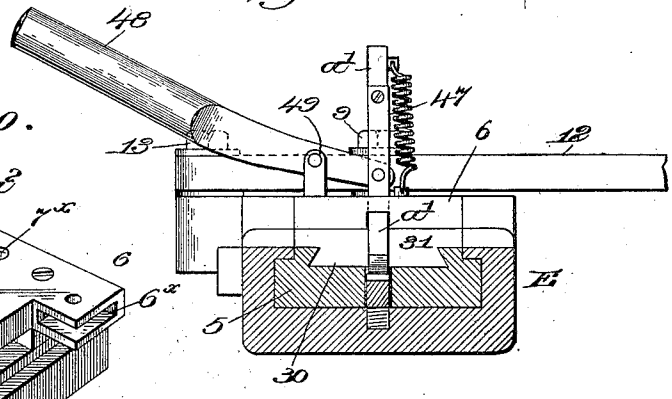
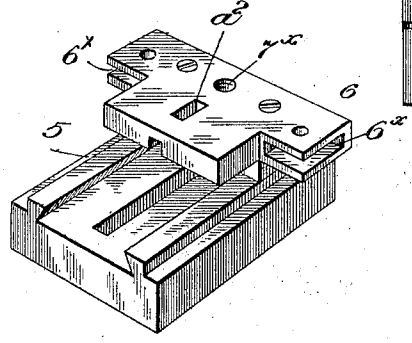


Fig. 10.



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UNITED STATES PATENT OFFICE.

STEPHEN SNOW, OF EVERETT, MASSACHUSETTS, ASSIGNOR TO PEERLESS MACHINERY COMPANY, OF CHARLESTON, WEST VIRGINIA, AND NEW YORK, N. Y.

LASTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 701,412, dated June 3, 1902.

Application filed June 25, 1900. Serial No. 21,397. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN SNOW, a citizen of the United States, residing at Everett, county of Middlesex, State of Massachusetts, have invented an Improvement in Lasting-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention has for its object to improve the end lasting means in a lasting-machine for boots and shoes.

The invention herein contained is intended as an improvement on the class of lasting-machines represented in United States Patent No. 193,446, dated July 24, 1877. In machines having crimping-jaws made, as described in said patent, to lay the upper over upon the inner sole supported by the last the jaws have to be changed to adapt the machine to right and left lasting. Herein for crimping or laying the upper on the inner sole I employ two sliding plate-carriers provided with crimping-plates detachably secured thereto, and to change from right to left lasting I invert and transpose the said plates—as, for instance, the plate used to meet the upper of a right-foot shoe at the right hand of a line drawn through the last from toe to heel is turned over or inverted when a left-foot shoe is to be lasted and the turned-over plate is transposed, so that it meets the upper at the left-hand side of said line, the other plate of the pair being in a like manner overturned and transposed or changed in position to act on the other side of a left-foot shoe. There is necessarily a difference in the curvature of the concaved acting edges of the two plates used to crimp the upper at the end of the last, and I have found that by inverting and transposing said plates in their carriers right and left foot shoes may be lasted equally well, and this change of position of plates may be easily and quickly made. I have provided the machine with an end clamp composed, preferably, of flexible material, which may be leather, secured at its ends to ears pivoted upon levers in turn pivoted upon an evener-bar pivoted upon an intermediate slide. The tipping guideway has roller or other studs which enter diagonal slots in the plate-carriers, and said carriers are moved forward for crimping and returned into their inoperative position by links connected with a main slide. These slides have coacting with them a coupling, which is effective to insure their movement substantially in unison while the end clamp is being moved into position to embrace the upper at the end of the last, and the clamp having been seated the coupling is disengaged, and thereafter the crimping-plates may be moved forwardly and lay the upper on the inner sole, and this done the crimping-plates are retracted and the clamp is withdrawn from the upper. These two carriages are represented as moved by one and the same hand-lever.

Figure 1 in side elevation represents a sufficient portion of a lasting-machine to enable my invention to be understood. Fig. 2 is a top or plan view of part of the machine represented in Fig. 1 to illustrate particularly my improvements, the parts being shown as in their operative position, part of the cover-plate *a* being broken away. Fig. 3 is a similar view to Fig. 2 with the plate-carriers and crimping-plates removed. Figs. 4 and 5 are respectively plan and edge views of one of the plate-carriers with a plate. Fig. 6 is an enlarged section in the line *x*, Fig. 2. Fig. 7 is a cross-section in the line *x'*, Fig. 2. Fig. 8 is a section through the middle portion of the clamp and its connected locking-plate, it showing part of the clamp-sustainer. Fig. 9 is a view looking at Fig. 8 from the right. Fig. 10 is a detail showing the main slide detached.

In the drawings, A represents a column sustaining a spindle H^2, jointed to a treadle H^7, pivoted at H^8. The spindle has at its upper end a head or track H, upon which in practice is mounted a carriage h^3, having a stud h^{16}, upon which is pivoted a lever-arm h^{15}, carrying a last-holding pin h^{14}, adjustable in said lever-arm. The position of the lever-arm is variable to put the last-holding pin more or less out of a vertical line by means of a worm-screw h^{10}. The column also in suitable bearings sustains a rocking spindle A^5, having connected to it by a set-screw A^8 the hub A^9

of a two-armed carrier, said carrier supporting in practice two carriages D′, each carriage having pivotally mounted upon its upper end a guideway E, provided at its lower end with a toothed sector D^{10}, which is engaged by a suitable worm on a shaft having at its end a hand-wheel D^{9}, the rotation of said shaft tipping the guideway upon the carriage to place the crimping-plates to be described in the proper line of travel to properly coact with the shoe to be lasted.

The parts so far described are substantially those illustrated in application, Serial No. 15,183, filed on the 2d day of May, 1900, and no claim is made to any of said before-named parts, and instead of the particular parts so far described I may employ any other equivalent devices commonly used or found in lasting-machines.

The invention to be herein described relates, among other things, to the end clamp and actuating means and to the peculiarly-constructed toe-crimping plates and their carriers, and while I have illustrated my invention as applied to the heel end of a last it will be understood that it is equally applicable to the lasting of the toe, and especially it will be understood that the provision for inverting and transposing the plates used for crimping or wiping the upper over upon the inner sole is of greater advantage in toe than in heel lasting.

In accordance with my invention I provide the guideway E with a toothed block 2, forming part of a coupling, it being sustained yieldingly upon a spring 3 and being guided vertically in its movements by suitable dowel-pins 4, represented as entering holes in the guideway. The guideway receives in it a main slide 5, (shown detached in Fig. 10,) said slide being open at its center and provided at its rear end with an upwardly-extended portion 6, suitably slotted at $6^{\times}$ to receive the ends of like links 7, which surround pins 8 in said ears. The central portion of the part 6 has a threaded hole $7^{\times}$ to receive a stud 9, provided, preferably, with a roller 10, which in practice enters a slot 11 in a hand-lever 12, pivotally mounted upon a stud-screw 13, fixed to the guideway E. The forward ends of the links 7 are connected by pins 14 with the crimping-plate carriers 15, each having, as represented, a plurality of curved slots 16, which receive roller or other studs 17, erected on the guideway E, said carriers when slid horizontally under the cover-plate *a*, by the movement of the lever 12, moving in a diagonal line and causing the crimping-plates 18 19, connected with the crimping-plate carriers, to move over the ends of the last in such a direction that the concaved edges 20 of said plates act upon the upper to lay the same on the inner sole by an inward movement, which causes the upper to be laid snugly against the edge of the last whatever the conformation of the end thereof on which the inner sole rests. The crimping-plates 18 19, one of which is shown on a larger scale in Fig. 4, present each an acting edge 20. These plates have each notches, one of which engages a stud 21, while the other notch is engaged by a locking device 22, represented for convenience as a lever pivoted at 23 and acted upon by a spring 24, the plate being consequently connected detachably with said carrier, said locking device holding the plate in working position. The acting edges 20 of these plates differ in curvature, and this curvature varies according to the particular shoe to be lasted—that is, different styles of shoes require different styles of lasts and the edge 20 must be correspondingly shaped. These plates in practice are or may be lettered on one side by the letter "R" (see Fig. 4) to represent when the plates are put in with "R" uppermost that they are adapted to last a right-foot shoe and when inverted they are adapted to last a left-foot shoe. I have demonstrated by experiment that plates shaped to properly last a right shoe may be made to last a left-foot shoe, provided the plates are inverted and transposed—that is, suppose the plates were in position with the letter "R" uppermost. Now to last a left-foot shoe it is only necessary to engage the locking device, turn it to release the plates, remove the plates, and take, say, for instance, the plate used to contact with the part of the last at the right-hand side of a line drawn through the last from toe to heel, invert it and put it into the opposite carrier, so that that plate in its transposed and inverted position will act upon a part of the upper at the opposite side of the line drawn from the heel to the toe of the last from that it acted upon when it was used for right-shoe lasting. It will of course be understood that where there is no particular variation in the shape of the last at the inner side of the toe of right and left foot lasts then the plates may be used without change for right and left foot lasting.

The main slide 5 is provided (see Fig. 7) with a dovetailed way to receive, as represented herein, a dovetailed foot 30 of an intermediate slide 31, represented as bored at its upper end next the last-holding pin to receive loosely the shank of a clamp-sustainer 32, made other than round, which enters said bore, the rear end of the clamp-sustainer being acted upon by a spring 33, contained in said bore. The front end of the sustainer 32 is shown as notched at opposite sides, as at $32^{\times}$, said notches being entered by the edges $33^{\times}$ (see dotted lines, Fig. 9) of a plate $34^{\times}$, connected by screws $35^{\times}$ with the middle portion of the end clamp 34, the latter being flexible and composed, preferably, of a plurality of layers of leather. Connecting the sustainer 32 with the clamp detachably enables the clamp if injured or worn to be removed quickly from the machine and another one to be substituted without taking the machine to pieces. The plate $34^{\times}$ has a peculiar-shaped slot—that is, it has a round end or eye $40^{\times}$, out

from one side of which is extended a slot. The round eye receives the end of the sustainer 32, and the engagement of the plate with the sustainer is effected by depressing the plate, causing the sustainer to enter the slot leading from said eye. The ends of the clamp 37 have applied to their outer side ears 39, which are connected with the clamp by suitable screws or rivets. The ears 39 receive stud-screws 41, which are embraced by like links 42, jointed at 43 to an evener 44, pivotally connected with the intermediate slide, so that as said slide is moved the clamp is also moved, the evener permitting the ends of the clamp to be self-adjusting to any variations in shape of the sides of the last. The sustainer made other than round prevents any twisting or rocking movement of the clamp at the point where it is sustained loosely in the intermediate slide. The intermediate slide has suitably fixed to it at its outer or rear ends (see Fig. 6) a tooth 45, which is engaged by the teeth of the block 2, the latter being permitted to rise under the action of spring 3 after the intermediate slide 31 has been moved forward to put the clamp into its operative position. The intermediate slide 31 is moved forwardly by the action against its rear end of a coupling a', to be described, acted upon by the part 6 of the main slide 5, said coupling being at such time interposed between said main and the intermediate slides, causing the two slides to be moved in unison until the clamp embraces firmly the last and the upper thereon, the coupling acting to depress the block 2.

In operation let it be supposed that a last has an upper thereon and that the inner sole is laid upon the tread of the last and that the last has been put in position on the last-holding pin h^{14}. In this condition the clamp occupies the position Fig. 3, and the crimping-jaws occupy their inoperative position, with the edges 20 of the plates outside of and not in contact with the upper, and in this condition the lever 12 will occupy its full-line position, Fig. 3. Turning the lever from its full-line position, Fig. 3, into its dotted-line position will start forwardly toward the last both the main and the intermediate slides, the two slides moving substantially at the same speed until the clamp is seated firmly against the upper at the end of the last. As the clamp becomes seated it is thereafter necessary to move the carriers and their plates forward to turn the upper over the inner sole, while the clamp remains substantially at rest, holding the upper firmly, and to do this the main slide must be free to be moved without moving the intermediate slide, and to do this the coupling a', heretofore referred to, must be raised or moved to uncouple the slides. The coupling a' in the form in which I have chosen to represent it in Figs. 6 and 7 is a bar the shank of which is free to slide vertically in a hole a^2 in a portion of the upward extension 6 of the main slide 5. This bar is normally depressed in its operative position, as shown in Fig. 6, by a contractile spring 47, one end of which is fixed with relation to the main slide, the other end being fixed to a projection extending from the shank of said coupling. The spring 47 is strong enough to depress the block 2 while the two slides are being moved forward in unison. The coupling, however, may be lifted when desired through the hand-operated lever 48, pivoted at 49. When the lever 12 is being moved from its full into its dotted line position, Fig. 3, the coupling occupies the position Fig. 6, and consequently the end of the coupling acting against the rear end of the intermediate slide 31 moves that slide forward in unison with the main slide and with the carriers having the crimping-plates. When the clamp has been seated, as described, the operator will through the hand-lever 48 lift the coupling to put it in its inoperative position with relation to the intermediate slide, the lifting of said coupling enabling the block 2 to rise and engage by one of its teeth the tooth 45, and he will then pull the lever 12 into the dotted-line position, Fig. 2, and during this movement of said lever the coupling rides over the top of the intermediate slide and only the plate-carriers and the crimping-plates are moved forwardly into the full-line position, Fig. 2, which completes the lasting of the upper clamped about the end of the last.

This invention is not limited to a coupling of the particular form shown when used in connection with the other parts of the machine, for as I believe that I am the first to provide a machine employing a main slide adapted to operate crimping-plates and an intermediate slide having a clamp mounted thereon with a coupling to connect the two slides, the said coupling occupying its operative position when the two slides are moved to seat the clamp upon the upper, and to provide means to thereafter move said coupling into its inoperative position or release it from the main slide, so that the crimping-plates may be further moved to lay the upper over the inner sole on the last, I desire to claim the same broadly without being limited in any way except as in the appended claims.

The crimping of the upper over upon the inner sole and the tacking of the overlaid edge of the upper to the inner sole completes the end lasting, and thereafter the lever 12 is moved from its dotted-line position, Fig. 2, into its full-line position, Fig. 3, and during the first part of this movement the plates are removed off the overlaid upper, and the clamp is then retracted, leaving the parts in their normal position ready to again go through the operation hereinbefore described. As the lever 12 is moved backwardly the coupling when it arrives in position to drop from the end of the intermediate slide is depressed by the spring 47, causing it to meet the toothed block 2 and depress it, compressing the spring 3, and releasing the teeth of

the block from the tooth 48, thus permitting the intermediate slide to be moved backwardly with the main slide, the spring 33 aiding in this return.

By the term "coupling" as herein employed I mean to include any device which may be interposed between or made to coöperate with the main and intermediate slides to cause them to be moved in unison, the coupling during this movement occupying what I shall designate as its "normal" or "operative" position, said coupling being capable of being moved into inoperative position whenever the clamp has been seated on an upper on the last, the plate-carriers and crimping-plates thereafter completing their movement, the crimping-plates coming into their operative position. This coupling also, as herein shown, performs another function—that is, it acts to depress the toothed block 2 against its spring 3 while the coupling occupies its normal or operative position and whenever the intermediate slide is to be released to enable it to be moved into its inoperative position.

I have provided the guideway E with a stop 100, connected therewith by suitable screws 101, and said stop forms an abutment for the end of the block 2, thereby relieving the studs 4 from strain.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a lasting-machine, a pair of plate-carriers, two crimping-plates one for each carrier, said crimping-plates varying one from the other in the curvature of their acting edges, and means for connecting said plates detachably with said carriers that they may be disengaged from one carrier, overturned, and transposed to the other carrier to enable right and left foot shoes to be lasted.

2. In a lasting-machine, a pair of plate-carriers, combined with crimping-plates detachably mounted in said carriers and having each a concaved edge, said crimping-plates differing one from the other in the contour of their acting edges, each plate being capable of being detached, transposed to the other carrier, and inverted to provide for right or left shoe lasting.

3. In a lasting-machine, a plate-carrier slotted at one end, a plate concaved at one edge and notched and inserted in the slot of the plate-carrier, said notch engaging a projection of said carrier, and means acting upon said plate to lock it in the carrier.

4. In a lasting-machine, a plate-carrier slotted at one end, a plate concaved at one edge and notched and inserted in the slot of the plate-carrier, said notch engaging a projection of said carrier, combined with a spring-controlled latch to engage and effect the retention of the plate in the carrier.

5. In a lasting-machine, crimping-plate carriers, attached crimping-plates, a main slide, a lever, and connections between said slide and said carriers to move the same; an intermediate slide, a clamp mounted thereon, a coupling adapted to be interposed between said two slides, it occupying its operative position when the two slides are moved to seat the clamp upon the upper, and means to thereafter move said coupling into its inoperative position to release it from said main slide that the plate-carriers and their crimping-plates may be further moved to lay the upper over the inner sole on the last.

6. In a lasting-machine, crimping-plate carriers, attached crimping-plates, a main slide, a lever, and connections between said slide and said carriers to move the same; an intermediate slide, a clamp mounted thereon, a coupling adapted to be interposed between said two slides, it occupying its operative position when the two slides are moved to seat the clamp upon the upper, means to thereafter move said coupling in its inoperative position that the plate-carriers and their crimping-plates may be moved to lay the upper over the inner sole on the last, and a device under the control of said coupling to lock said intermediate slide in position, to maintain the clamp against the upper on the last holding the plate-carriers from lasting movement.

7. In a lasting-machine, a slide, a connected clamp, a spring-pressed notched block over which said slide is movable, a tooth on said slide to engage a notch of said block; and means to move said block that it may engage the tooth of the slide, or be made to retire from said tooth as and for the purposes set forth.

8. In a lasting-machine, a flexible clamp to embrace the end of the last, means to sustain the ends of the clamp, and clamp-sustaining means intermediate the ends of said clamp and independent of the means for sustaining the ends of the clamp, said clamp being connected detachably with said intermediate clamp-sustaining means.

9. In a lasting-machine, a flexible clamp having attached to it between its ends a slotted plate, combined with a sliding clamp-sustaining device having slots engaged loosely with said plate to sustain the central portion of the clamp detachably.

10. In a lasting-machine, crimping-plates, carriers for said plates, a slide operatively connected with said carriers, an intermediate slide, a clamp to embrace the end of the last, an evener mounted on said intermediate slide, links connected at one end with said evener and at their other ends with said clamp, means to move the slide connected with said carriers, a coupling to couple the said slides together that they may be moved together until said clamp embraces the upper on the end of the last, and means to then move the coupling to release the slide carrying the clamp while the slide moving the crimping-plates is further moved to meet the upper and lay it over upon the inner sole on the bottom

of the last, and means to lock the clamp in its clamping position while the crimping-plates complete their operative movement.

11. In a lasting-machine, crimping-plates, carriers for said plates, a slide operatively connected with said carriers, an intermediate slide, a clamp to embrace the end of the last, an evener mounted on said intermediate slide, links connected at one end with said evener and at their other ends with said clamp, means to move the slide connected with said carriers, a coupling to couple the said slides together that they may be moved together until said clamp embraces the upper on the end of the last, and means to then move the coupling to release the slide carrying the clamp while the slide moving the crimping-plates is further moved to meet the upper and lay it over upon the inner sole on the bottom of the last, and means to lock the clamp in its clamping position while the crimping-plates complete their operative movement, and means to depress the locking device to unlock the slide for moving the clamp, that it may be moved backwardly after the completion of the action of the crimping-plates.

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

STEPHEN SNOW.

Witnesses:

MARGARET A. DUNN,

MABEL PARTELOW.