(No Model.)

3 Sheets—Sheet 1.

M. L. HANSEN.

LASTING MACHINE.

No. 422,774. Patented Mar. 4, 1890

Fig. 1.

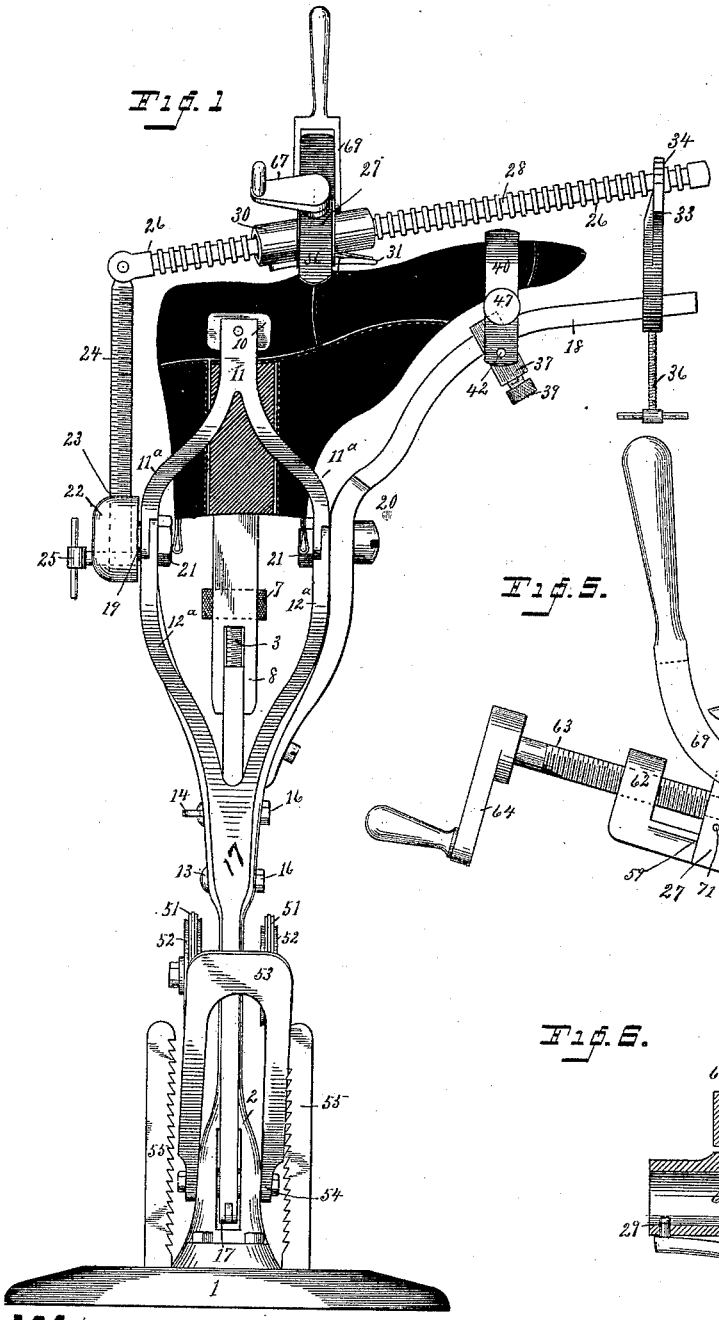


Fig. 5.

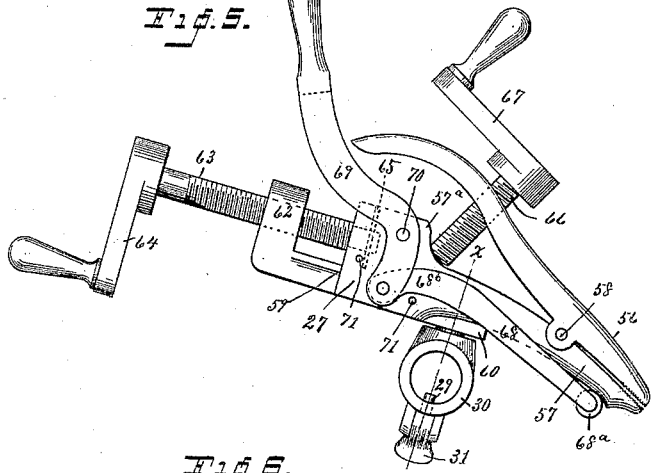
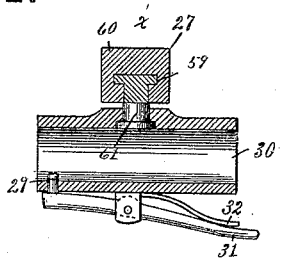


Fig. 6.



Witnesses

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Inventor

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(No Model.) 3 Sheets—Sheet 2.

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Fig. 2.

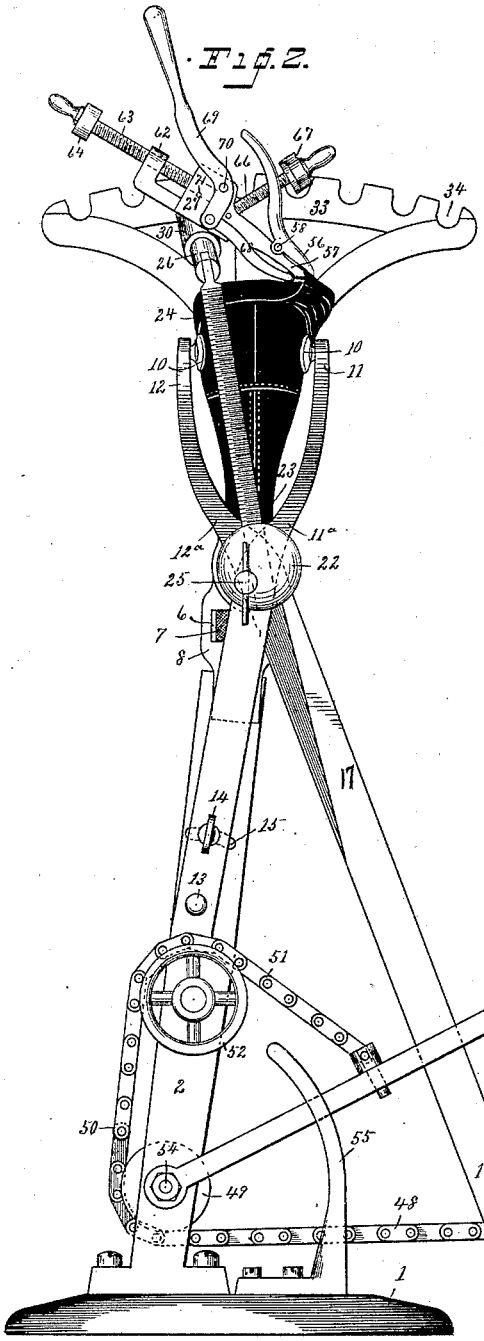

Fig. 3.

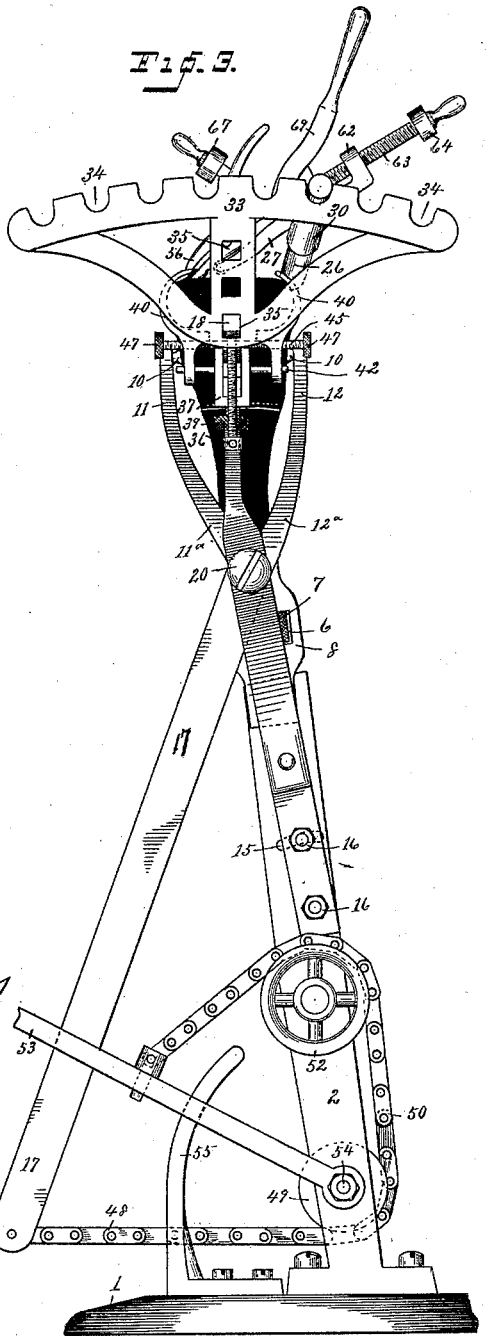

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Fig. 4.

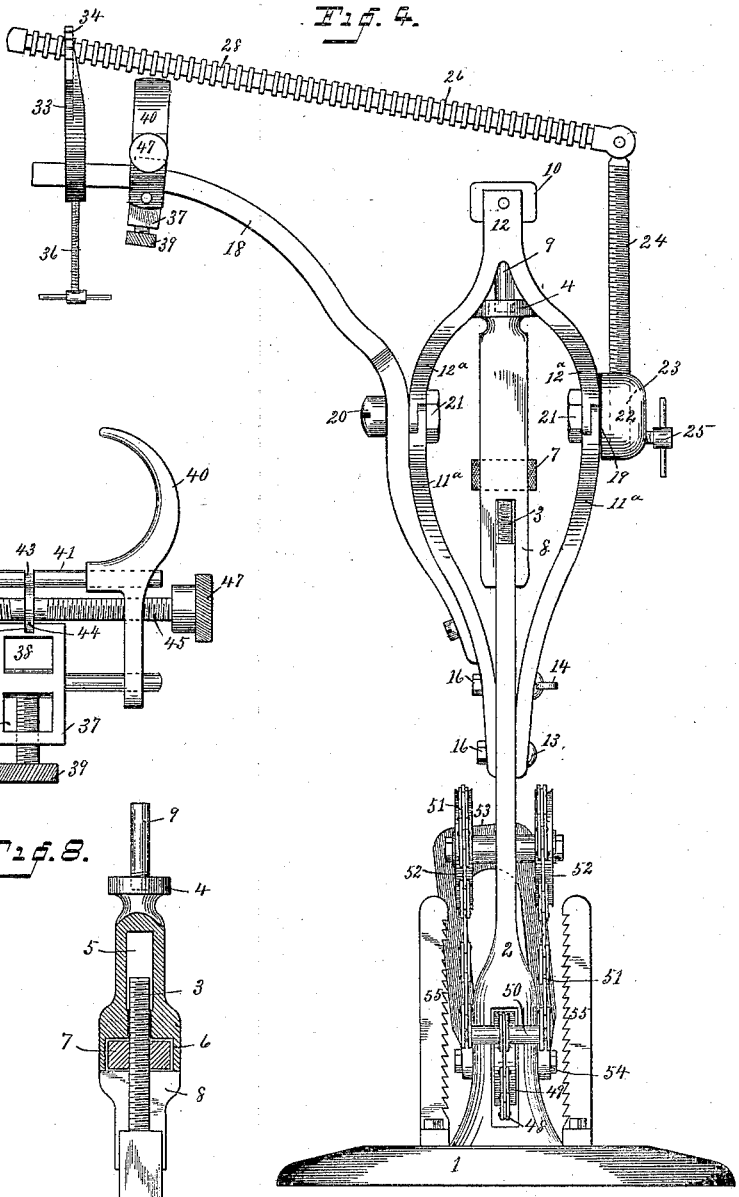


Fig. 7.

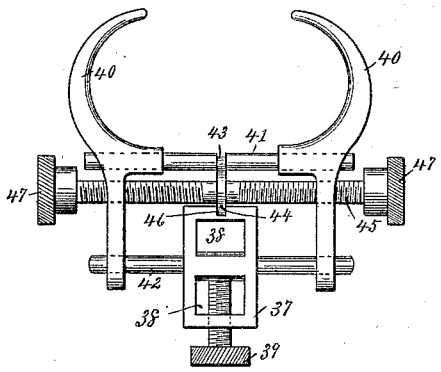
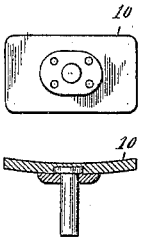


Fig. 8.

Fig. 9.



Witnesses
C. M. Newman,
A. P. Munson.

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Mads L. Hansen
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UNITED STATES PATENT OFFICE.

MADS L. HANSEN, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR OF ONE-HALF TO THE ARMSTRONG MANUFACTURING COMPANY, OF SAME PLACE.

LASTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 422,774, dated March 4, 1890.

Application filed July 1, 1889. Serial No. 316,156. (No model.)

To all whom it may concern:

Be it known that I, MADS L. HANSEN, a subject of the King of Denmark, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Lasting-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to produce a strong, durable, and easily-operated machine for lasting shoes which may be readily adjusted and adapted to all sizes and classes of shoes, and which will perform this difficult and expensive operation as neatly and perfectly as it can be done by hand, in a mere fraction of the time that is required to do it by hand, and much quicker than it can be performed by any machine heretofore in use.

With these ends in view I have devised the simple and novel construction of which the following description, in connection with the accompanying drawings, is a specification, numbers being used to denote the several parts.

Figure 1 is a side elevation of the machine complete and in operative position, the stretcher being shown as in the act of drawing the upper of a shoe over the last. Figs. 2 and 3 are respectively rear and front elevations, the position of the parts corresponding with Fig. 1; Fig. 4, an opposite side elevation from that in Fig. 1, the last, shoe, and stretcher being removed; Fig. 5, an elevation of the stretcher detached; Fig. 6, a section on the line x x in Fig. 5 of the slide by which the stretcher is carried; Fig. 7, an elevation of the clamp detached; Fig. 8, a detail view, partly in section, illustrating the manner in which the carrier for the last is raised and lowered; and Fig. 9 illustrates in rear elevation and in section one of the swiveled clamping-plates by which the heel of the shoe is grasped.

Similar numbers denote the same parts in all the figures of the drawings.

1 denotes the base of the machine, which is ordinarily a casting made sufficiently heavy to hold the machine firmly in place, and which may, if preferred, be bolted rigidly to the floor, and 2 is a standard projecting upward therefrom and provided at its upper end with a reduced threaded portion 3.

4 denotes a carrier for the last, which is provided with a central opening 5, which receives threaded portion 3 of the standard, but is not threaded to engage therewith, a socket 6, which receives burr 7, threaded to engage the threaded portion of the standard, and at its lower end with side pieces 8, which rest against the upper portion of the standard and give stability to the carrier. It will be noticed (see Figs. 1, 4, and 8) that the opposite sides of the burr project out from the socket, so that the burr may be readily turned to raise and lower the carrier. In the top of the carrier is a pin 9, the lower end of which is threaded (see dotted lines, Fig. 8) to engage the top of the carrier. This pin is adapted to engage a hole ordinarily made in the top of the ankle portion of the last. Should it be desired, however, to operate the machine in connection with lasts not provided with this hole, pin 9 is removed from the carrier.

It will of course be readily understood by those familiar with the art that when the operation of lasting is performed in the manufacture of shoes the insole is ordinarily tacked to the last, and the last and insole are placed within the upper, which is then tacked or cemented to the insole to hold it securely in place. The shoe is then ready to be placed in the machine for the operation of lasting.

The last does not appear in the drawings; but I have shown in Figs. 1, 2, and 3 the bottom of the upper as drawn over the last in the usual manner and as ready to be stretched into its permanent position by the operation of the machine.

In use the last, with the insole and upper secured thereto, is placed upon the carrier, as indicated in the drawings, and the sides of the heel of the shoe are grasped by swiveled clamping-plates 10, carried by the right and left holding-arms, which are denoted, respectively, by 11 and 12. Both of the holding-arms are bifurcated, the branches thereof being denoted, respectively, by 11^a and 12^a. The branches of the right holding-arm diverge below the pivotal point of the clamping-plate, (see Fig. 1,) and then converge again and ter-

minate on opposite sides of the standard, as clearly shown in Fig. 4. These branches are secured to the standard by a bolt 13, passing through holes in said branches and through the standard, and by a finger-bolt 14, also passing through holes in said branches and through a curved slot 15 in the standard, both bolts being provided at their opposite ends with nuts 16, whereby the parts are held in position after adjustment. (See Figs. 2 and 3.) The branches of the left holding-arm (denoted, specifically, by 12^a) diverge in the same manner as the branches of the right holding-arm and cross the branches 11^a of the right holding-arm, and then converge again and are united in a shank 17, which extends downward nearly to the base. (See Figs. 2 and 3.) The function of this shank will presently be explained.

18 denotes an angular supporting-arm, the lower end of which is riveted firmly to the back branch of the right holding-arm, and the other end of which curves upward and forward, for a purpose presently to be explained.

The branches of the holding-arms are pivoted together by back and front pivots, denoted, respectively, by 19 and 20. The front pivot 20 passes through the front branches of the two holding-arms at their point of intersection, and also through the supporting-arm. The back pivot 19 passes through the back branches of the holding-arms at their point of intersection. Both of said pivots are threaded at their inner ends and are held in place by nuts 21. At the outer end of pivot 19 is a block 22, which is provided with a transverse opening 23.

24 denotes a stud, which is vertically adjustable in the opening in the block. As shown in the drawings, this stud is screw-threaded to engage a corresponding thread in opening 23, the height of the stud being adjusted by turning it up or down in the opening. It will of course be apparent that if preferred the stud may move freely up and down in the opening and be locked in position by a set-screw or in any suitable manner. This, being an obvious mechanical construction, is not deemed to require illustration. The pivot by which block 22 is carried turns freely in the branches, so as to give any required amount of oscillatory movement to the stud. When the block and stud have been suitably adjusted, they are locked in position by a set-screw 25, passing through the block and engaging the front branch of either of the holding-arms. These holding-arms are operated to cause plates 10 to clamp the heel of the shoe in the manner which I will now describe. I have used the terms "right" and "left" as applied to the holding-arms to indicate the portion of said arms above the pivots. As the branches of the arms cross each other, it will be apparent that below the pivotal points the lower end of the arm which I have termed the "right holding-arm" will be on the left, as seen in Fig. 2, and the lower portion of the arm which I have termed the "left holding-arm" will be at the right, as seen in Fig. 2.

It will of course be readily understood that in using a machine of this class in factories a large number of a single size and style of shoes are lasted at a time. In adjusting to a certain size of shoes the right holding-arm is given the desired adjustment by loosening the nut upon finger-bolt 14, and then tightening it up after the arm has been placed in proper position.

48 denotes a chain, one end of which is connected to the lower end of the shank 17 of the left holding-arm, which appears at the right in Fig. 2. The other end of this chain passes partially around a pulley 49 at the base of the standard, and is connected to a cross-piece 50.

51 denotes chains connected to the opposite ends of the cross-piece, which then extend upward and over pulleys 52 on opposite sides of the standard, the opposite ends of said chains being connected to bifurcated treadle 53, the arms of which inclose standard 17, the lower ends of said arms being pivoted to the standard. A single pivot (denoted by 54) is used to support the opposite ends of the treadle, and pulley 49, which is shown as recessed into the standard.

55 denotes racks which extend upward from the base on opposite sides of the treadle, the teeth thereof being adapted to be engaged by the treadle when the latter is pressed down to clamp the heel of the shoe between the pivoted plates at the upper ends of the holding-arms. The teeth of these racks are made to alternate, so as to give increments of adjustment equal to one-half of the length of the teeth.

It should be understood that cross-piece 50 and chains 51 are not essential features of construction, as it is obvious that chain 48 may be extended upward, pass over a single pulley socketed in the standard in the same manner as pulley 49, and then connected in any suitable manner to the treadle. I preferably, however, use the cross-piece and the two chains connected to the treadle, as I have found this construction to work satisfactorily in use. The forward portion of the shoe is held in position to be operated upon by an adjustable sliding toe-clamp carried by a block 37, which slides upon the angular supporting-arm. This block is provided with two or more openings 38, both of which correspond in shape with and are adapted to receive the angular supporting-arm. A set-screw 39 passes through the block and engages the arm to lock the toe-clamp in position thereon. The clamp proper consists, essentially, of two curved arms 40, which engage the opposite sides of the shoe, as is clearly shown in the drawings. These arms are carried by upper and lower rods 41 and 42, upon which they are adapted to slide. Rod 42 is held rigidly in the block, its ends extending outward therefrom and being engaged by the shanks of the

arms. The upper rod 41 is provided with a circular groove 43, which is engaged by a disk 44 upon a right-and-left-threaded screw 45, said disk also engaging a groove 46 in block 37, whereby all of the parts are held securely in position. The right and left threaded portions of screw 45 pass, respectively, through the shanks of arms 40, each end of said screw being provided with a finger-piece 47 for convenience in operation. It will be seen that when the screw is rotated in one direction the arms move away from each other, and when rotated in the opposite direction they move inward and grasp the shoe firmly, the disk engaging the grooves in the block and the upper rod acting to hold the screw and arms central at all times. When it is desired to adjust the height of the toe-clamp, set-screw 39 is loosened, the block removed from the supporting-arm, and the latter then passed through another of the openings in the block. Longitudinal adjustment is secured by sliding the clamp along the supporting-arm. After the clamp has been placed in the proper position it is locked there by tightening up set-screw 39. As already stated, in changing from one size of shoes to another—as, for instance, when used in small shops—the right holding-arm may be adjusted by loosening the nut on finger-bolt 14. When used in large shops, however, the only movements ordinarily required in removing a lasted shoe and placing an unlasted shoe in position to be operated upon are an upward movement of the treadle to open the clamping-arms and a movement of screw 45 to open arms 40. These movements permit the lasted shoe to be readily removed from the machine. The unlasted shoe, properly secured to the last, is then placed upon the carrier, screw 45 tightened to cause the arms of the toe-clamp to engage the forward portion of the shoe, and the treadle pressed downward to cause the heel of the shoe to be firmly grasped by the clamping-plates. The treadle is then locked in position by engagement with one of the racks.

The lasting of a shoe is performed in the manner which I will now describe. At the upper end of stud 24 is pivoted the stretcher-rod 26, upon which the stretcher 27 is adapted to slide. This rod is provided with circular depressions 28, adapted to be engaged by a pin 29, projecting inward from a lever 31, pivoted to the outer side of a sleeve 30, to which the stretcher is pivoted, so as to oscillate freely. The inner end of the pin passes through a hole in the sleeve and is held in engagement with one of the circular depressions by a spring 32. When it is desired to adjust the sleeve longitudinally, the rear end of the lever is pressed down, which raises the pin and allows the sleeve to slide upon the stretcher-rod. The instant the lever is released the spring acts to force the pin into engagement with one of the circular depressions in the stretcher-rod and locks the stretcher against longitudinal movement. In use it should be understood that the sleeve and stretcher turn freely upon the stretcher-rod.

33 denotes a rest carried by the supporting-arm, by which the forward end of the stretcher-rod is supported in use. This rest is provided with a number of depressions 34, adapted to receive the stretcher-rod, thereby giving ample adjustment to the rod, so that the stretcher may be placed in any position on either side of the shoe. This rest may of course be of any suitable construction. For convenience, the upper portion thereof, in which the depressions are formed, is curved outward. In order to provide for vertical adjustment of the rest, should it be required, the shank thereof is provided with two or more angular openings 35, corresponding in shape with the angular supporting-arm, either of which is adapted to receive said arm. The rest is locked in position, after adjustment as to height, by a set-screw 36, which passes through the shank of the rest and engages the supporting-arm. The stretcher consists of upper and lower jaws, (denoted, respectively, by 56 and 57.) These jaws are pivoted together, as at 58. At the rear end of the lower jaw is a block 57^a, having in its under side ways 59, which are engaged by carrier-block 60, which in turn is connected to block 30 by a pivot 61, which permits the entire stretcher to oscillate freely on the sleeve. At the rear end of the carrier-block is a stump 62, which is threaded to receive a screw 63, the outer end of which is provided with a crank 64 for convenience in operation, and the forward portion of which is reduced and passes through the block at the rear end of the lower jaw. The reduced portion of the screw is provided with a groove, which is engaged by pins 65, driven through block 57^a, and engaging the groove. (See dotted lines in Fig. 5.) It will be seen, therefore, that as the screw is held against longitudinal movement in block 57^a and engages a corresponding thread in stump 62, the stump itself being held against longitudinal movement by being locked to the stretcher-rod, when the screw is rotated, both jaws are necessarily moved either forward or backward. The jaws are preferably serrated in the usual manner, so as to give a firm hold upon the upper, which is caused to be firmly clamped by a screw 66, which passes through the upper jaw and engages block 57^a upon the lower jaw. This screw is provided with a crank 67 for convenience in operation. 68 denotes a lifter, which consists, essentially, of a cross-piece 68^a, which may, if preferred, be provided with a roller and arms 68^b, one only being shown. These arms are riveted to the ends of the cross-piece and lie on opposite sides of the lower jaw, their rear ends being pivoted to the arms of a bifurcated lever 69, said lever being pivoted to block 57^a, as at 70, and its oscillation limited by pins 71 in block 57^a.

The operation of stretching the upper over the bottom of the last—that is, the operation

of lasting proper—is performed as follows: The shoe is placed in the machine in the manner already described, the forward portion of the shoe being caused to be grasped by the toe-clamp by rotation of screw 45, and the heel portion of the shoe being clamped between plates 10 by pressing the treadle downward. The stretcher-rod, with the stretcher upon it, is placed in proper position to permit the engagement of the upper by the jaws of the stretcher, the forward end of said rod being supported by the rest, as already explained. The jaws of the stretcher being in the open position, the upper and lining are placed between them and screw 66 rotated in the proper direction to clamp the upper and lining firmly between the jaws. Screw 62 is then rotated in the proper direction to move the jaws backward, stretching the upper into position. In certain portions of the shoe—as, for instance, in stretching the upper over the widest portion of the last—instead of having the entire strain upon the upper in the backward direction it, is desired to have the strain upward from the bottom of the last. This result is accomplished by pressing lever 69 downward—that is, toward the left, as seen in Fig. 2. This forces the cross-piece forward between the insole and the lower jaw, raising the jaws and causing the strain upon the upper to be upward and backward instead of directly backward, as when the lifter is not used. It will be seen that any desired amount of strain may be placed upon the upper. As each portion is stretched it is secured in place in any suitable manner, ordinarily by short tacks driven through the upper and the insole. As soon as the stretched portion of the upper has been secured in place the upper is released by loosening screws 63 and 66. The stretcher may then be moved forward or backward on the stretcher-rod by releasing the pin on the sleeve from engagement with one of the circular depressions in the rod. If it is desired to stretch a portion of the upper upon the opposite side, the position of the stretcher-rod is shifted in the rest. When it is desired to change the position of the rear end of the stretcher-rod, block 22 is oscillated more or less, as may be required. It will be seen that I am thus enabled to place the stretcher in any position where it can possibly be required, that the upper is gripped by the movement of a single screw, and that the stretching operation is performed by the operation of another screw, assisted, if required, by the movement of the lever controlling the lifter.

Should it be desired at any time, the machine may be used in any of the other operations in manufacturing shoes—as, for example, in stitching, soling, nailing, &c.—without change, as a jack, the shoe being held by the toe-clamp and clamping-plates in the manner already fully described.

It will of course be understood that the various details of construction may be varied to a considerable extent without departing from the principle of my invention.

I claim—

1. In a machine of the class described, the combination, with a carrier for the last, of bifurcated holding-arms whose branches cross and are pivoted together, and clamping-plates swiveled to said arms, whereby the heel of the shoe is firmly grasped.

2. In a machine of the class described, the combination, with a carrier for the last and holding-arms which cross and are pivoted together and are provided at their upper ends with swiveled clamping-plates to engage the heel of a shoe, of a treadle, a chain connected to said treadle passing over pulleys and connected to one of the holding-arms, and a rack adapted to be engaged by the treadle to hold said parts in position after the shoe has been grasped.

3. In a machine of the class described, the holding-arms which cross and are pivoted, as shown, in combination with the standard, to which one of said arms is adjustably secured, the treadle, and a chain extending from the other clamping-arm, passing over pulleys and connected to the treadle, substantially as and for the purpose set forth.

4. In a machine of the class described, the standard having a threaded portion at its upper end, in combination with the carrier having a central portion, through which said threaded portion passes without engagement, and a socket 6, and a burr lying in the socket and engaging the said threaded portion, whereby the carrier may be raised or lowered.

5. In a machine of the class described, the standard and a holding-arm adjustably secured thereto, in combination with another holding-arm, said arms crossing and being pivoted together, substantially as shown, pulleys on said standard, a treadle, and chains extending from said treadle over the pulleys and connected to the lower end of the swinging holding-arm.

6. In a machine of the class described, the swiveled clamping-plates, pivoted holding-arms, by which they are carried, and mechanism, substantially as described and shown, for operating the holding-arms, in combination with oscillatory block 22, a stud vertically adjustable in said block, and a stretcher-rod pivoted to said stud.

7. In a machine of the class described, the standard having a curved slot, a bifurcated holding-arm secured thereto by bolts 13 and 14, one of which passes through said slot, and a supporting-arm secured to said holding-arm, in combination with a swinging bifurcated holding-arm, the branches of said arms crossing and being pivoted together, substantially as described.

8. In a machine of the class described, the combination, with supporting-arm 18, of a toe-clamp adapted to slide on said arm and con-

sisting, essentially, of arms 40, and a right-and-left-threaded screw, whereby said arms are operated to clamp or release the shoe.

9. In a machine of the class described, the combination, with the supporting-arm, of a block 37, having two or more openings to receive the supporting-arm, whereby said block may be adjusted vertically, a set-screw for locking the block after adjustment, arms 40, carried by said block, and a right-and-left-threaded screw for adjusting said arms.

10. In a machine of the class described, the combination, with block 37, having groove 46, rod 42 in said block, and rod 41, having groove 43, of arms 40, which slide on said rods, and a right-and-left-threaded screw engaging said arms, respectively, and having a disk at its center engaging said grooves, whereby the parts are retained in position.

11. In a machine of the class described, the combination, with the stretcher-rod and the supporting-arm, of a rest having two or more openings to receive the supporting-arm, whereby said rest is made vertically adjustable, and a set-screw for locking it in position after adjustment.

12. In a machine of the class described, the stretcher-rod having circular depressions, in combination with the stretcher, a sleeve adapted to slide on said rod, to which the stretcher is pivoted, and a spring-actuated pin adapted to lock the sleeve and stretcher against longitudinal movement on said rod, but leaving it free to oscillate thereon.

13. In a machine of the class described, the combination, with the stretcher-rod and a sleeve adapted to slide and to oscillate thereon, of a stretcher pivoted to said sleeve, and consisting, essentially, of a carrier-block 60, jaws pivoted together and adapted to slide on said block, and a screw engaging the carrier-block and connected to one of said jaws, whereby they are moved backward or forward.

14. In a machine of the class described, the stretcher consisting of carrier-block 60, having stump 62, the lower jaw having block 57^a, ways in said block engaged by the carrier-block, a screw engaging the stump and connected to said block, an upper jaw pivoted to the lower jaw, and means, as a screw 66, for clamping said jaws firmly together.

15. In a machine of the class described, the carrier-block having stump 62 and jaw 57, adapted to slide on said block, in combination with jaw 56, a pivot connecting said jaws, a screw 66, for clamping said jaws together, and a screw 63, engaging the stump and connected to one of the jaws, whereby they are moved backward or forward.

16. In a machine of the class described, the combination, with the supporting-arm and the rest and toe-clamp carried thereby, of adjustable stud 24, the stretcher-rod pivoted thereto, sleeve 30, adjustable on said rod, and the stretcher pivoted to said sleeve.

17. In a machine of the class described, the stretcher, sleeve 30, pivot 61, whereby the stretcher is connected to the sleeve, and spring-actuated pin 29, in combination with the adjustable stretcher-rod having circular depressions 28, adapted to be engaged by said pins, as and for the purpose set forth.

18. In a machine of the class described, the combination, with the standard and the bifurcated holding-arms, the branches of said arms crossing and being connected by pivots, of block 22, carried by one of said pivots, a set-screw for locking said block in position, a stretcher and stretcher-rod, and a stud vertically adjustable in said block, to which said rod is pivoted.

19. In a machine of the class described, the combination, with the standard, a bifurcated holding-arm adjustably secured thereto, and the supporting-arm secured to said holding-arm, of another bifurcated holding-arm, the branches of said arms being crossed and pivoted together, swiveled plates carried by said holding-arms, which engage the heel of the shoe, mechanism, substantially as described and shown, for operating the swinging holding-arm, and a toe-clamp carried by the supporting-arm.

20. In a machine of the class described, the bifurcated holding-arms, the branches of which are crossed and pivoted, the standard to which one of said arms is pivoted, and the supporting-arm connected to said holding-arm, in combination with operating mechanism, substantially as described and shown, whereby the other holding-arm is operated, a toe-clamp upon the supporting-arm, and an adjustable rod carrying a stretcher, substantially as described.

21. In a machine of the class described, the holding-arms which cross and are pivoted, the standard to which one of said arms is pivoted, and the supporting-arm connected to said holding-arm, in combination with operating mechanism, substantially as described and shown, whereby the other holding-arm is operated, a toe-clamp and a rest upon the supporting-arm, adjustable stud 24, the stretcher-rod pivoted to said stud and adapted to engage the rest, and the stretcher carried by said rod.

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

MADS L. HANSEN.

Witnesses:
A. M. WOOSTER,
ARLEY I. MUNSON.