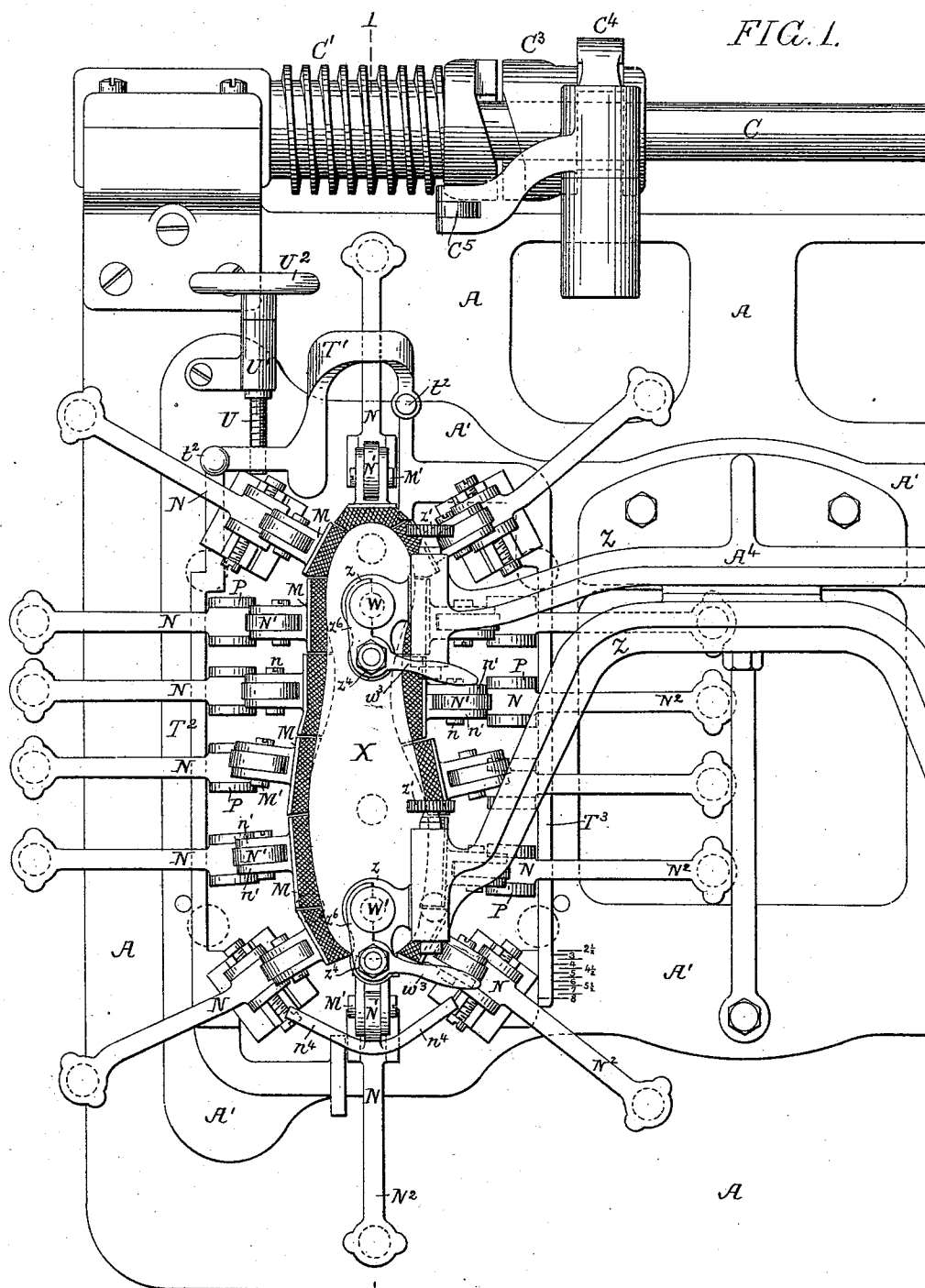


8 Sheets—Sheet 1.

No. 542,199.

Patented July 2, 1895.



Witnesses:
Alex. Barkoff
Murray LeBoyer

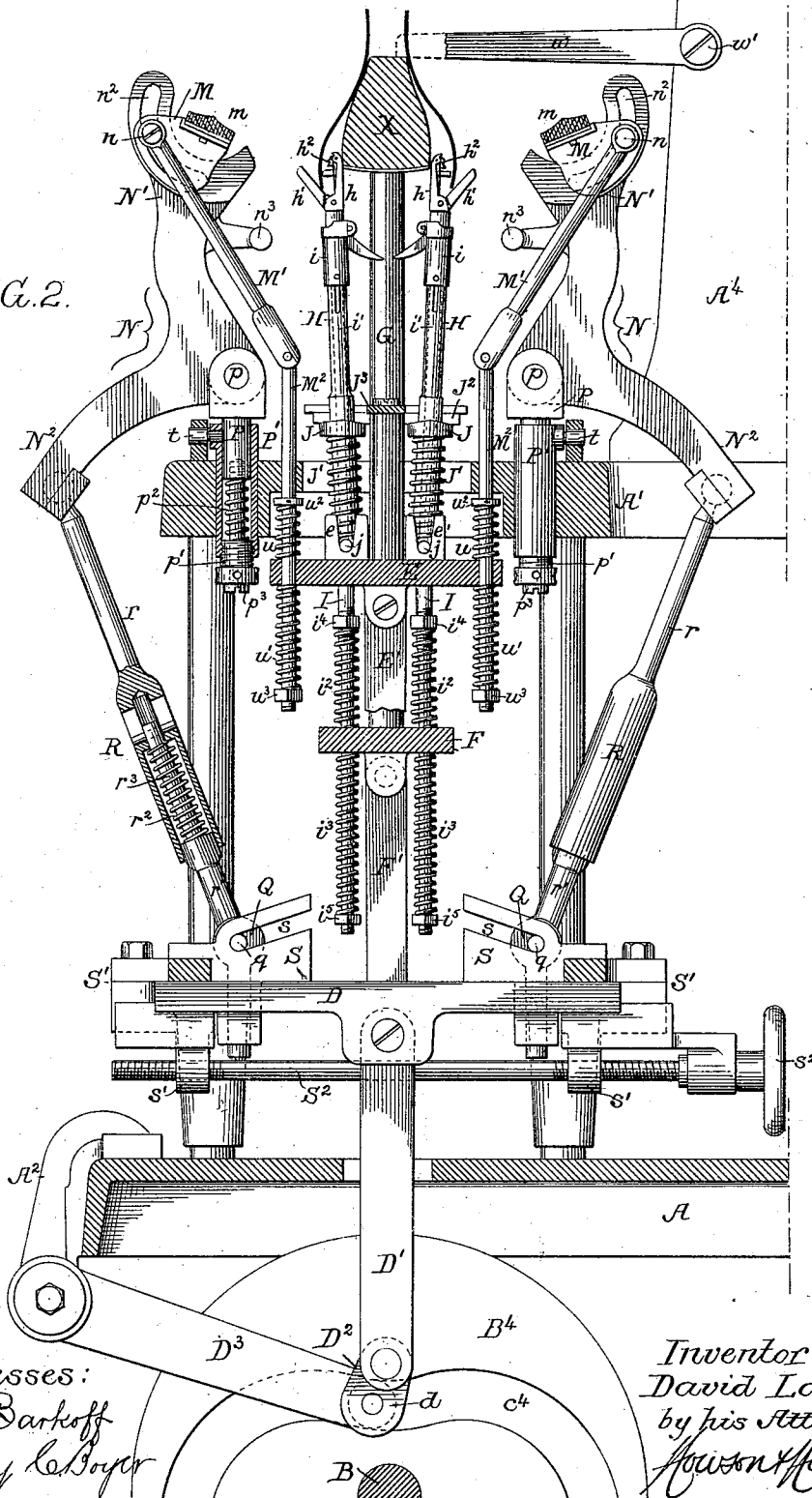
Inventor:
David Lake
by his Attorneys
Howson & Howson

D. LAKE.
LASTING MACHINE.

No. 542,199.

Patented July 2, 1895.

FIG. 2.



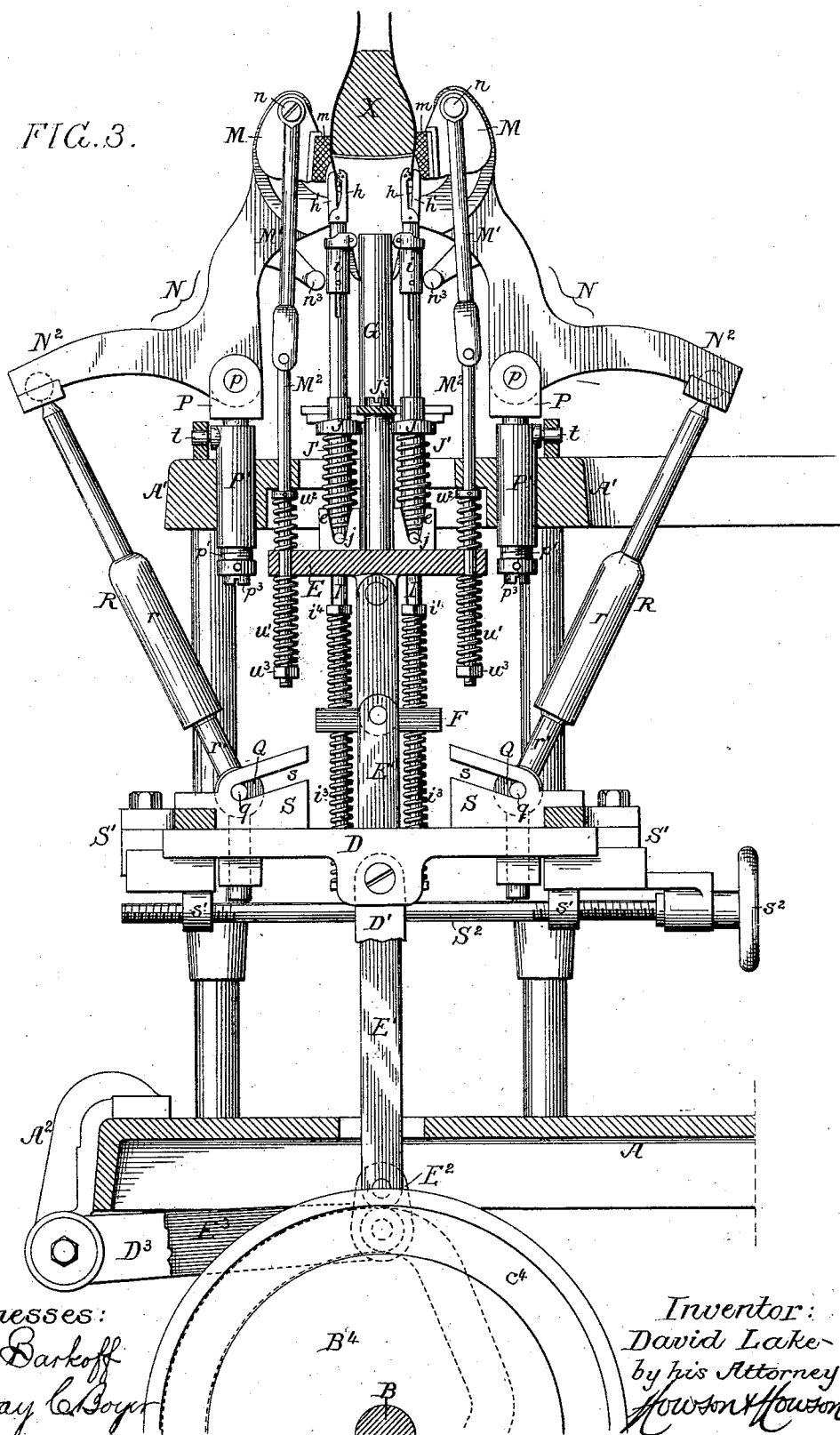
Witnesses:
Alex. Barkoff
Murray C. Boyer

Inventor:
David Lake
by his Attorneys
Housen & Housen

8 Sheets—Sheet 3

No. 542,199.

Patented July 2, 1895.



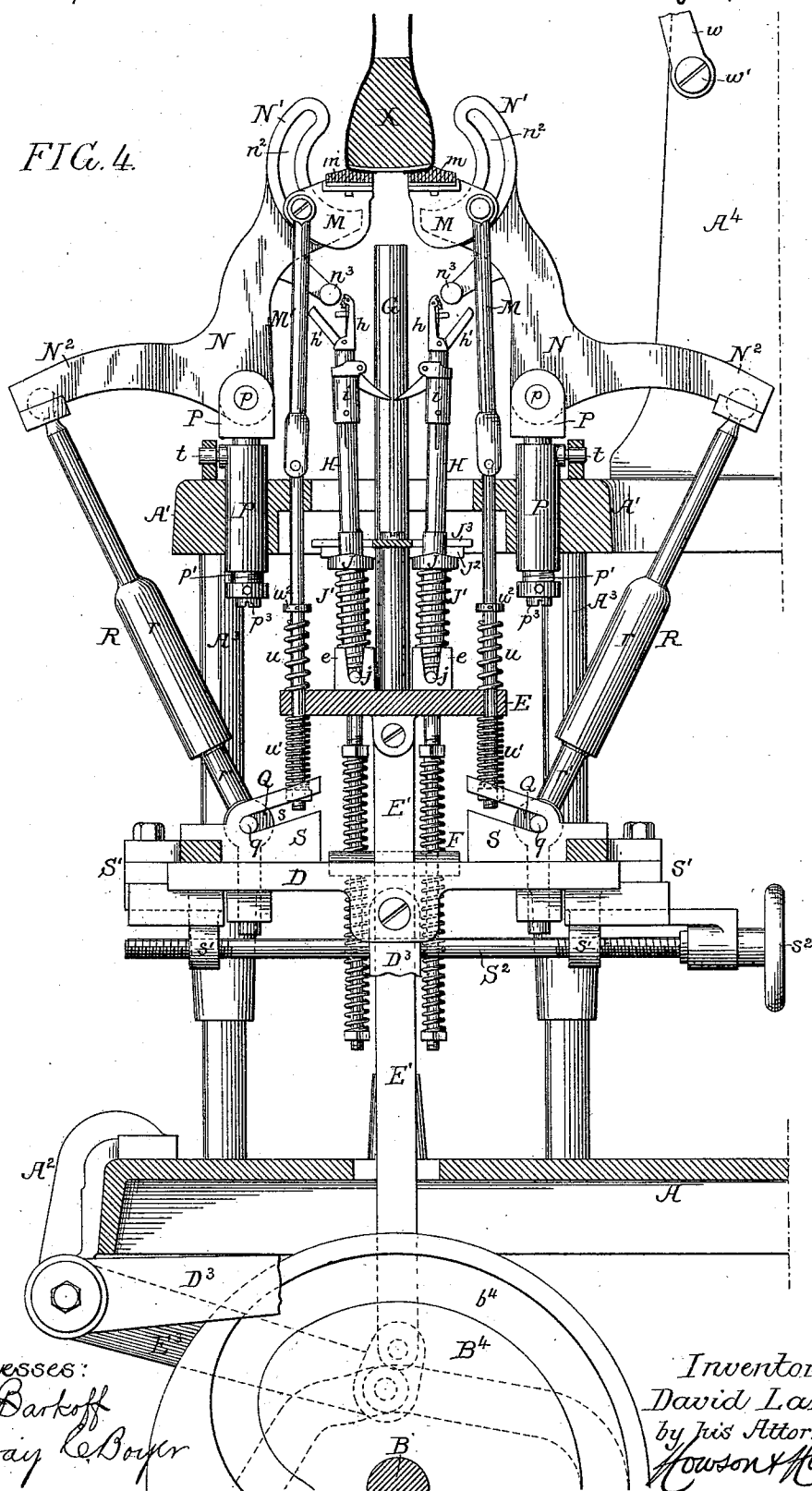
Witnesses:
Alex. Barkoff
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Inventor:
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No. 542,199.

Patented July 2, 1895.



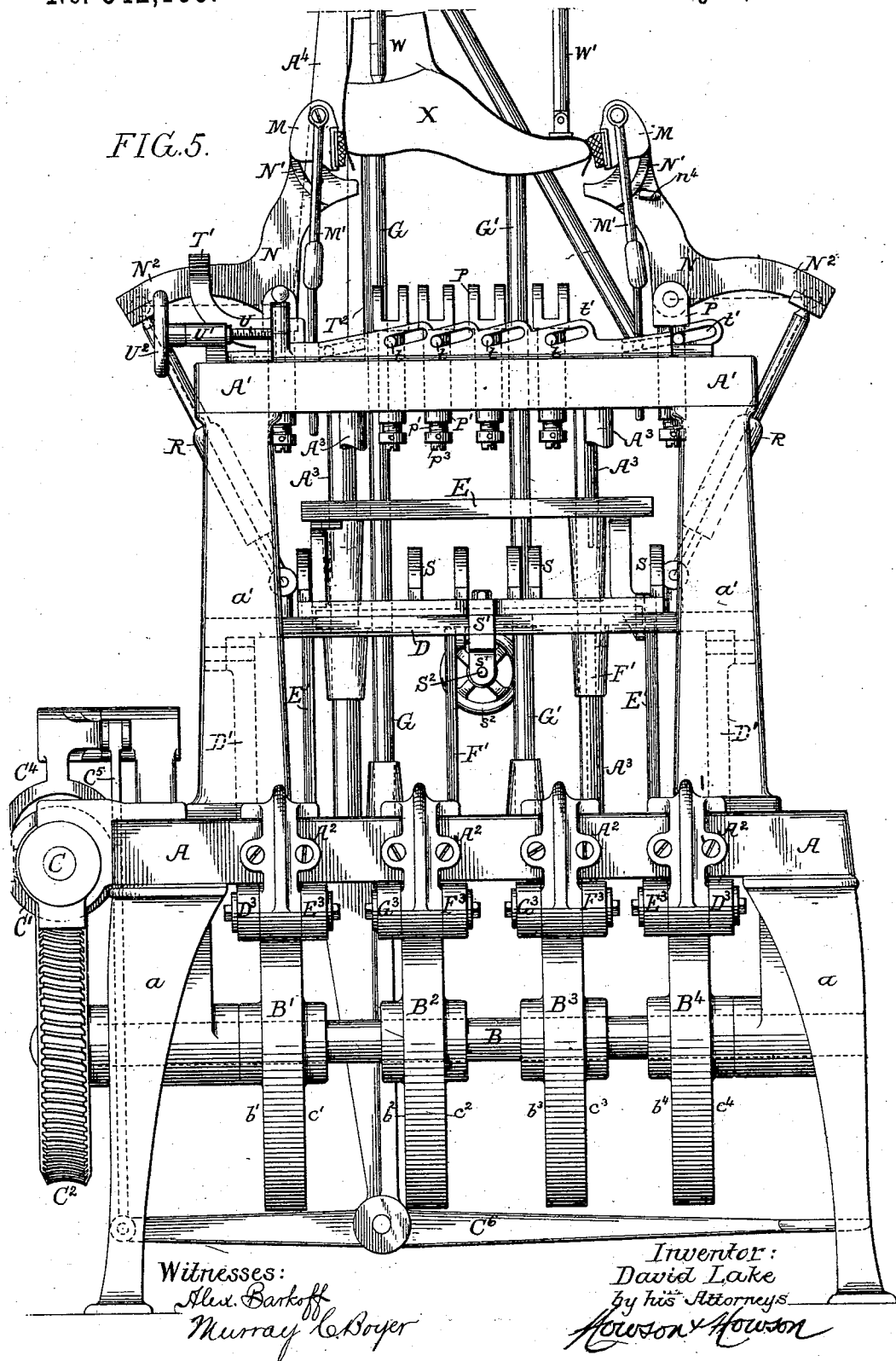
Witnesses:
Alex. Barkoff
Murray C. Boyer

Inventor:
David Lake
by his Attorneys
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D. LAKE.
LASTING MACHINE.

No. 542,199.

Patented July 2, 1895.



(No Model.)

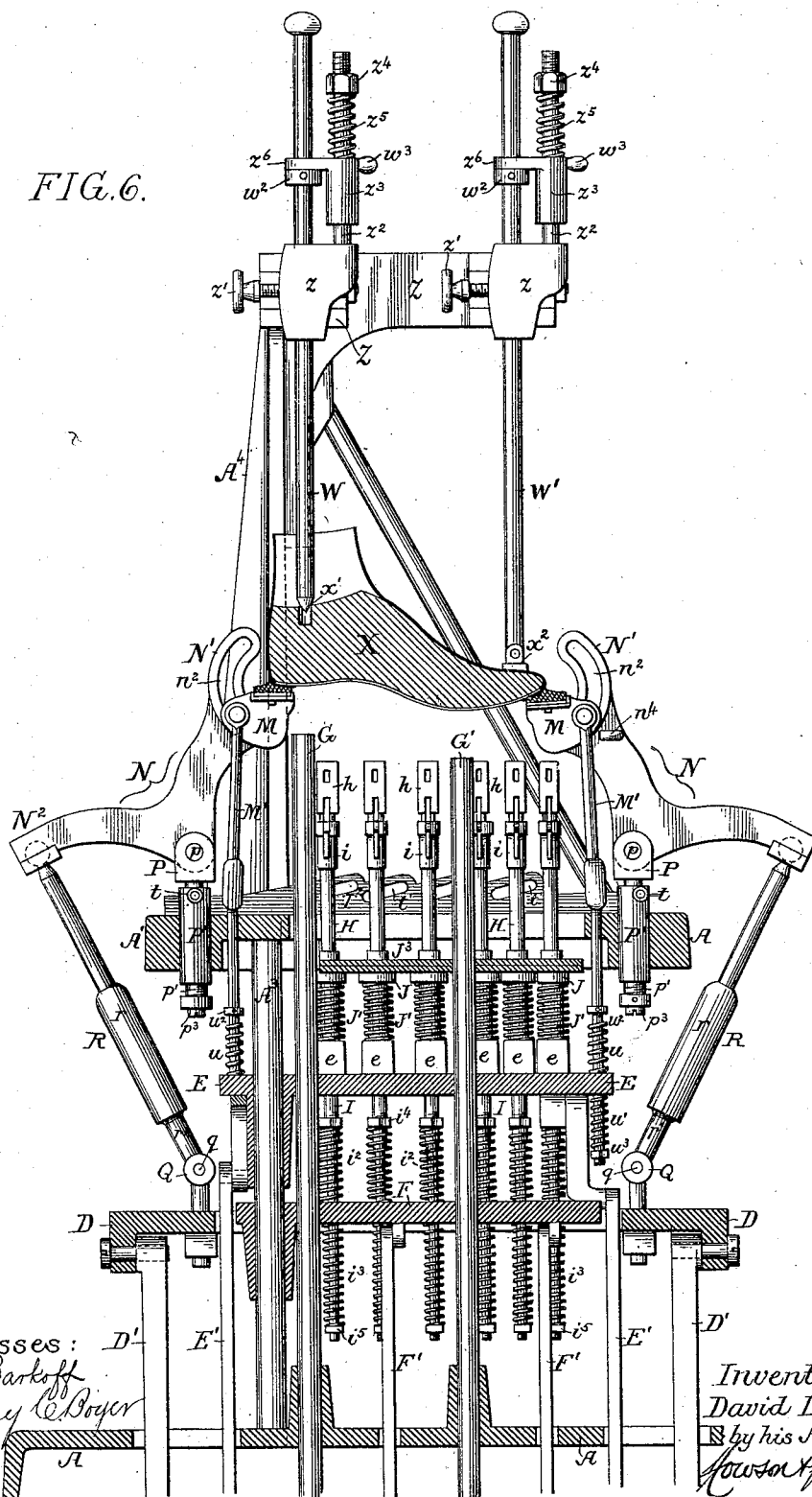
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D. LAKE.
LASTING MACHINE.

No. 542,199.

Patented July 2, 1895.

FIG. 6.



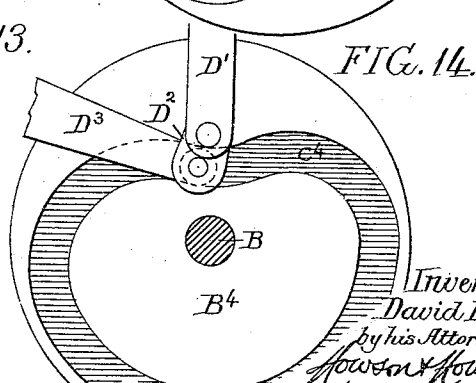
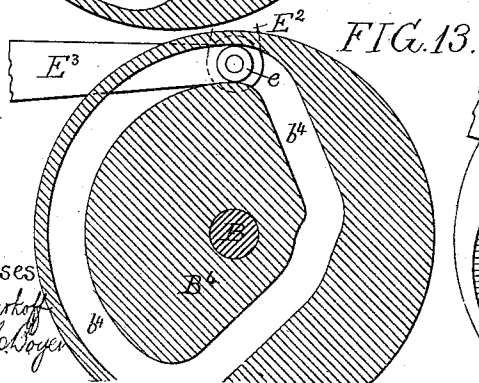
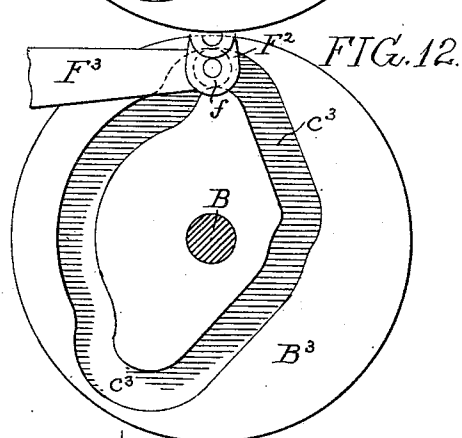
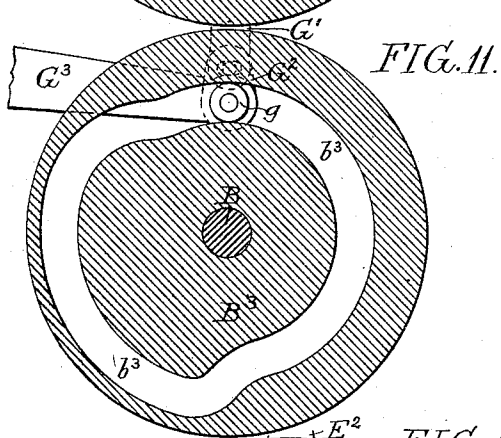
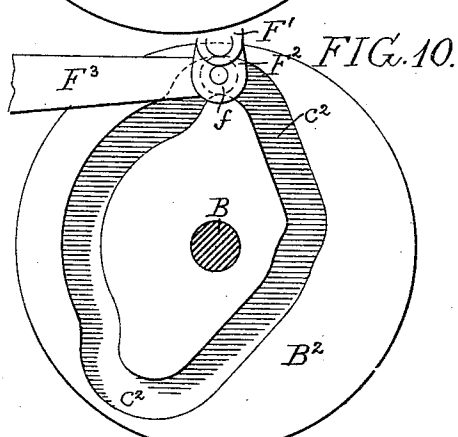
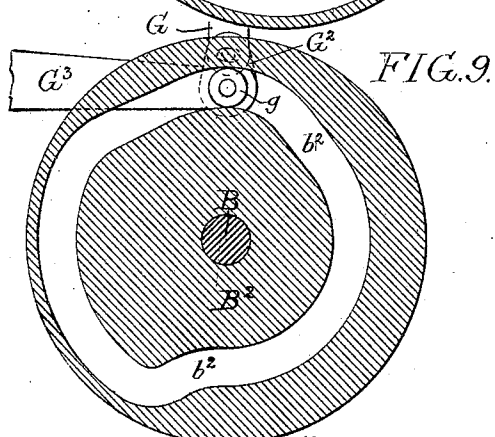
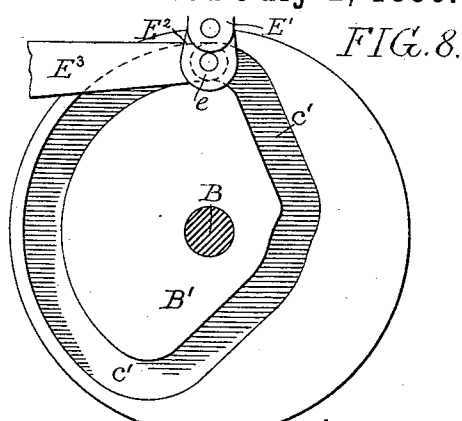
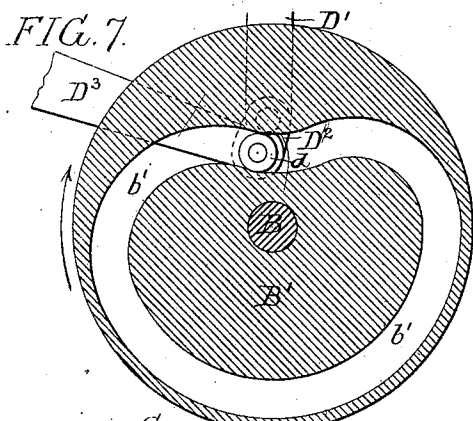
Witnesses: D'
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Inventor:
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D. LAKE.
LASTING MACHINE.

No. 542,199.

Patented July 2, 1895.



Witnesses
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(No Model.)

8 Sheets—Sheet 8.

D. LAKE.
LASTING MACHINE.

No. 542,199.

Patented July 2, 1895.

FIG. 15.

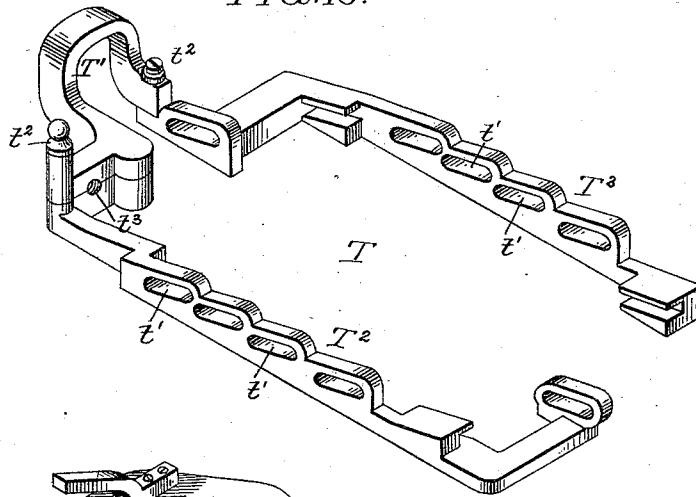


FIG. 16.

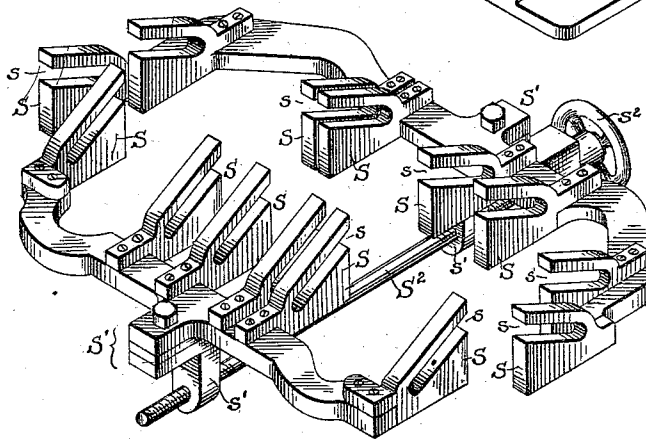


FIG. 17.

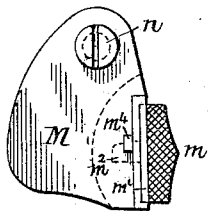


FIG. 18.

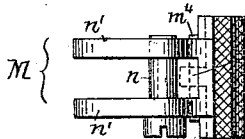


FIG. 20.

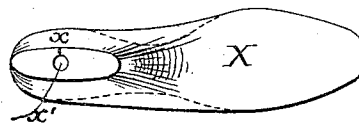
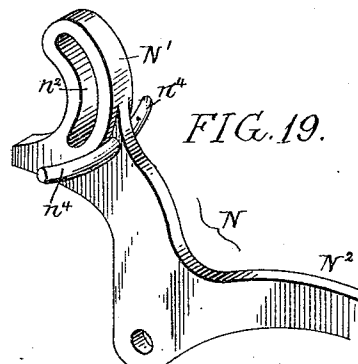


FIG. 19.



Witnesses:
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UNITED STATES PATENT OFFICE.

DAVID LAKE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE AMERICAN LASTING MACHINE COMPANY, OF CAMDEN, NEW JERSEY.

LASTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 542,199, dated July 2, 1895.

Application filed July 27, 1891. Renewed October 18, 1894. Serial No. 526,320. (No model.)

To all whom it may concern:

Be it known that I, DAVID LAKE, a citizen of the United States, and a resident of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented certain Improvements in Lasting-Machines, of which the following is a specification.

My invention is based on the improvements in lasting-machines made by Whiffen, Lake & Lake, and for which application for Patent was filed in the Patent Office on October 14, 1889, Serial No. 326,932. The object of my invention is to simplify the construction of the machine and to make the several parts adjustable in series, so as to last shoes of different sizes and shapes. This object I attain in the following manner, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of my improved lasting-machine with the last in position. Fig. 2 is a transverse sectional view showing the different parts open to receive the last and upper. Fig. 3 is a transverse sectional view showing the upper grasped by the nippers, the last forced into the upper, and the presser-pad pressing at the sides. Fig. 4 is a transverse sectional view showing the nippers released and the presser-pads pressing the upper against the insole on the last. Fig. 5 is a side view of the machine with some of the parts removed. Fig. 6 is a longitudinal section of the upper part of the machine on the line 1 2, Fig. 1. Figs. 7 to 14 are views of the different lifting and pressing cams. Fig. 15 is a perspective view of the lifter-carrier for adjusting the height of the presser-pads. Fig. 16 is a perspective view of the shifters for controlling the lateral movement of the presser-pads to adapt the machine to shoes of different styles. Figs. 17 and 18 are detached views of the presser-pads and carriers. Fig. 19 is a perspective view of the front presser-pad-carrying lever, and Fig. 20 is a plan view of the last.

Before describing the details of the invention I will give an outline illustration of the working of the machine.

The machine has indicator-marks in two places, one in connection with the presser-pad lifters and the other in connection with the

presser-pad shifters. The lifters regulate the pads to accommodate a last for different-sized shoes, and the shifters are regulated to accommodate lasts of different shapes, but the operating mechanism remains the same for all styles and shapes of shoes.

The presser-pads themselves are numbered and lettered for the different sizes and shapes of shoes, so that if a No. 4 shoe is to be lasted, style D, the lifter is moved to the "four" index and the shifter to the "4" index, and a set of "4-D" pads are placed in their respective positions around the last-support. The last is now placed on the supports and the upper placed over the last, the edge of the upper passing into the open jaws of the nippers around the last. The machine is then put in motion, the grippers first closing upon the edges of the upper, merely holding the upper by friction, and the last is forced up into the upper by the movable last-support, moving the upper in the jaws until a certain point near the edge of the upper is reached, when the jaws take a positive hold upon the upper, the last-support moving to its final position, at which point the upper is tightly drawn over the last. The presser-pads then bear upon the sides of the upper at the lower edge of the last, the nippers are released from the upper, and the presser-pads turned under the upper, so as to force it against the under side of the last or insole, it being understood that the insole and inner edge of the upper are coated with cement prior to the adjustment of the last in the machine, as fully set forth and claimed in an application filed by me on the 26th day of September, 1894, Serial No. 524,137. The stop-rods which press upon the upper portion of the last are then moved to allow the shoe to be withdrawn from the machine, after which the operation can be repeated on another last and upper.

Referring to the drawings, A is the base of the machine, mounted on suitable supports or legs *a*, and A' is the table, mounted on legs or standards *a'*, secured to the base A, as clearly shown in Fig. 5. It will be noticed that in the present instance all the prime movers are slides adapted to slide vertically on ways on the frame. These slides are moved

by cams B' $B^2B^3B^4$ on the cam-shaft B . Both faces of the cams have cam-grooves cut in them, as clearly shown in Figs. 7 to 14.

D is the pad-plate, by which the pads are moved toward and from the last. This plate is connected to levers D^3 by connecting-rods D' and links D^2 , as clearly shown in Fig. 2. Each lever D^3 has a pin or roller d , one entering the cam-slot b' , Fig. 7, and the other entering the cam-slot c^4 , Fig. 14. These two cam-slots are cut alike, so as to give the same vertical motion to the plate D .

E is the gripper-plate, on which are mounted the series of grippers, to which are connected the series of presser-pad blocks, the vertical reciprocating motion of this plate not only lifting the grippers, but also turning the presser-pads on the last. This plate is connected to levers E^3 by rods E' and links E^2 . A pin or roller e on each lever enters the cam-slot c' and cam-slot b^4 , Figs. 8 and 13.

F is the jaw-plate, to which are connected the jaws of the nippers, the vertical motion of the plate opening and closing the jaws. This plate is connected by links F^2 and rods F' to levers F^3 , pins or rollers f on the levers F^3 F^3 entering the cam-slots c^2 and c^3 , Figs. 10 and 12.

G G' are the last-supporting rods, which are adapted to move vertically in suitable bearings, which are connected by links G^2 to levers G^3 , rollers or pins g on the levers G^3 G^3 entering the cam-slots b^2 and b^3 , Figs. 9 and 11. These two cams can be cut out of line with one another, if necessary, so as to give the toe portion of the last a different movement from the heel portion.

The several levers E^3 , F^3 , and G^3 are attached to brackets A^2 , secured to the base A of the machine.

A^3 are vertical guide-rods, on which the plates D , E , and F slide, as clearly shown in Fig. 5.

H H are hollow spindles, each carrying at its upper end a fixed head h , to which is pivoted a jaw h' , and pivoted to this head or to the jaw h' is a jaw h^2 , having a smooth surface and a serrated or roughened surface. Around the heel portion of the upper I prefer to place the jaw h^2 on the fixed jaw of the head h , while around the toe portion I prefer to place the jaw h^2 on the movable jaw h' . A sleeve i acts upon the jaw h' , this sleeve i being carried by a rod i' , (shown by dotted lines in Fig. 2,) which is connected to a rod I , passing freely through the gripper-plate E and through the plate F . On each jaw-rod I are springs i^2 i^3 , the spring i^2 being confined between a nut i^4 and the plate F and the spring i^3 being confined between the plate F and a nut i^5 , one spring being confined on one side of the plate F and the other spring being on the opposite side of said plate. These springs can be adjusted by their respective nuts, so that more or less pressure can be applied to the jaws; but in case of accident the

springs will yield sufficiently to prevent any breakage of the jaws.

The spindles H H are carried by the gripper-plate E and have pins j j , which are adapted to bearings e' on the plates E to allow the spindles to have free movement toward and from the last.

J J are collars loose on the spindle H , and between them and the pins j are springs J' , which tend to keep the collars up against the bearings J^2 , carried by projections J^3 on the plate E . The under sides of these bearings J^2 are slightly V-shaped on the line of the pivot-pins j , and the upper sides of the collars J are also V-shaped to correspond to the cut of the bearings J^2 , so that, while the grippers can have free movement laterally toward and from the last, they are always returned to the normal position, as clearly shown in Fig. 2. The slots in the cams which operate these two plates E and F are so timed that the plate F moves first to close the jaws, after which the plate F returns to open the jaws and the plates E and F are lowered, so that the jaws will clear the pressers.

No special arrangement is necessary to adjust the series of jaws for different sizes and shapes of shoes, as sufficient play is allowed for the purpose.

I will now describe the presser-pad arrangement. The presser-pads m are carried by blocks M , to which they are secured, as clearly shown in Figs. 17 and 18. These presser-pads are preferably made of rubber and are backed with a metallic plate m' , having a grooved lug m^2 , through which passes a locking pin or bolt m^4 . Hence by operating this bolt the pad can be readily removed from the block M and another pad substituted therefor. Passing through the block M is a pivot-pin n , the two wings n' of the block passing on each side of a curved arm N' of a lever N . This curved arm has a curved slot n^2 , through which the pin n passes and by which the block is guided. The lever N is pivoted at p to a vertically-adjustable post P , the arm N^2 of the lever being connected by a ball-joint to a post Q by a connecting-rod R , made in two parts r r' , and between these two parts is a spring r^2 , adapted to the spindle r^3 on the part r' . The lower portion of the part r forms a casing for the spring, as clearly shown in Fig. 2, so that there will be a yielding pressure on the pad when forced against the upper.

S' S' are two slides situated on each side of the machine and adapted to slide toward or from each other on the pad-plate D , and on these slides are bearings S , in which are inclined slots s .

The posts Q are adjustable in the pad-plate D and have pins q q , which are adapted to the inclined slots s in the bearings S , and the slides S' have lugs s' , in which are screw-threaded orifices, to which is adapted a screw-rod S^2 , having a hand-wheel s^2 , by which it is turned, so that by turning this screw-rod

S^2 in one direction the slides S are moved apart and the pivot-points of the connecting-rods R are raised, consequently throwing the pads nearer to the center of the machine, while if a reverse motion is imparted to the screw-rod S^2 the slides are drawn together and the pads are moved away from the center of the machine, owing to the fact that the pivots of the rods R are lowered. Hence by this mechanism the pads are adjusted to accommodate different shapes of shoes.

The posts P , carrying the pivot-pins of the levers N , are adapted to sockets P' , which have their bearings in the table A' . Each post is adjustable vertically in its socket by means of a screw-plug p' , between which and the end of the post is a spring p^2 , surrounding a rod, p^3 , screwed into the shank of the post, as clearly shown in Fig. 2. Thus each post P can be adjusted separately to make up for irregularities and for wear. On each socket is a pin t , and each pin is adapted to an inclined slot t' in a yoke-frame T , Fig. 15, which I term the "lifter." To the yoke proper T' are connected the arms T^2 T^3 , in which are the inclined slots t' , these arms being secured to the yoke proper by pins or by bolts t^2 . A screw-stem U , mounted in bearings U' on the table A' , is adapted to a threaded opening t^3 in the lifter T , and this screw-stem is provided with a handle U^2 , on turning which the lifter can be moved on the table, and owing to the inclined ways t' , in which the pins t of the sockets P' rest, the sockets, posts, levers, and presser-pads are raised and lowered and the pads are thus adjusted to accommodate lasts of different sizes.

The lifter-frame can be constructed in a different manner from that herein shown without departing from my invention; but for convenience I construct it as described above.

Connected to the pin n of each block M , or to any convenient point on the block, is a rod M' , connected to a vertical rod M^2 , which passes through ways in the table A' and through ways in the gripper-plate E . Springs u u' are mounted on this rod M^2 above and below the plate E , and nuts u^2 and u^3 are adapted to the threaded portions of the rod, so that the tension of the springs can be regulated and the rod M^2 adjusted vertically to accommodate the block M . This rod M^2 turns the block M from the position shown in Fig. 3 to the position shown in Fig. 4, and the presser-pads are thus moved up to the last by the pad-plate D , acting on the levers, and after the pads are in position against the upper on the last the gripper-plate E is lowered, consequently carrying with it the arms M^2 and M' , which turn the block under the last, as above mentioned.

On each lever N is a bumper n^3 , which pushes the gripper-bar that is directly in front of the lever by which it is carried, so that the gripper will not be in the way of the presser-pads when acting.

On the toe presser-lever shown in Fig. 1 are

two arms n^4 , which project on each side of the lever, as clearly shown in Fig. 19. These arms are for the purpose of enabling the operator to get a purchase on a fixed portion of the machine with a pair of hand-nippers, which he uses in drawing the toe of the upper over the last while the nippers of the machine are drawing the remainder of the upper over the last, as I have found that a much more satisfactory result is obtained by having the attendant draw down the upper on each side of the toe by hand-nippers, while it gives the attendant sufficient to do to keep him at the machine, and thus prevent bad work by neglect of the operator.

The cam-shaft B is driven from a driving-shaft C through the medium of a worm C' and a worm-wheel C^2 . The worm C' is loose on the shaft C , but can be clutched thereto by a clutch C^3 , a clutch-lever C^4 being in engagement with the clutch and connected by a rod C^5 to a treadle C^6 . (Shown in Fig. 5.)

On a standard A^4 is an arm w , pivoted at w' , which is for the purpose of guiding the operator in placing a last on the machine, as it will be understood that the heel of the last must be set in a certain position on the last-support, and by having the indicator-arm w the last X , Fig. 20, can be marked, as shown at x , when first applied to the machine, so that it can always be set in the same position in respect to the arm w , and the abutment-rods W W' can be adjusted accordingly, the abutment-rod W fitting the ordinary orifice X' in the heel portion of the last, Fig. 20. The abutment-rod W' has a shoe x^2 , which rests upon the toe portion of the last, as clearly shown in Fig. 6. Each rod is adapted to bearings z , carried by arms Z , projecting from the standard A^4 . The bearings are adapted to slide on the arms Z , and adjusting-screws z' are mounted in bearings on the arms and adapted to nuts on the bearing z , so that on turning these screws the rods can be moved toward or from each other, and thereby adjusted for lasts of different lengths. On each bearing z is a rod z^2 , on which slides a sleeve z^3 , and between the sleeve and a nut z^4 is a spring z^5 . Projecting from the sleeve z^3 is an arm z^6 , and through the arms on each sleeve pass the abutment-rods, and on each abutment-rod is a fixed collar w^2 , so that it will be seen, on referring to Fig. 6, that the abutment-rods W W' are forced upon the last by the spring z^5 , but will yield for any independent vertical motion of the last. Each sleeve z^3 is provided with a handle w^3 , Fig. 1, so that by simply turning this handle the arm z^6 can be thrown out clear of the rods to allow for the free adjustment of the abutment-rods.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The combination in a machine for last-ing boots and shoes, of the vertically movable last support, the grippers arranged on each side of the support, a vertically movable plate

to which the grippers are secured, a plate to which the movable jaws of the nippers are attached, pressing pads arranged around the nippers and last support and connected to the gripper plate, levers carrying said pads, a vertically moving plate attached to said levers, and mechanism for moving said plates and last support, substantially as specified.

2. The combination in a machine for lasting boots and shoes, of the last support, a series of grippers, a series of independent pressing pads arranged around the last support, and a series of lifters controlling the height of the series of pressing pads, said lifters being connected together whereby they can be operated from a single point to raise or lower the pressing pads to accommodate lasts of different sizes.

3. The combination in a machine for lasting boots and shoes of the last support, the series of nippers, and the series of independent pressing pads arranged around the last support, with a series of shifters connected together and controlling the lateral movement of the series of pressing pads, whereby the machine can be adjusted to lasts of different shapes.

4. The combination in a lasting machine, of the last support, a last having an indicator mark thereon, mechanism for drawing down and turning the upper against the last, a holding or pressing foot at the top of the last, a gage arm on a fixed portion of the machine, and mechanism for adjusting the holding foot longitudinally in respect to the last whereby it can enter the cavity in the last when the gage is in line with the mark on the last, substantially as and for the purpose set forth.

5. The combination in a lasting machine, of the last support, the gripper, pivoted levers slotted at one end, a pad carrier adapted to said slotted levers, operating mechanism connected to the opposite arm of each lever for giving the forward push to the pad carrier, and mechanism connected to the block whereby the carrier is drawn down and turned under the last, substantially as and for the purpose specified.

6. The combination in a lasting machine, of the last support, a pivoted bell crank lever, a cam at its upper end, a block adapted to the upper end of the lever and to the cam, a presser pad on said block, a vertically movable plate D connected to the opposite end of said lever, a cam and a pin adapted to said cam and connected to the plate, substantially as described.

7. The combination of the last support, the pads, levers carrying said pads, mechanism for operating said levers, posts to which the levers are pivoted, sockets for said posts, with

means for vertically adjusting the posts in the sockets, substantially as described.

8. The combination of the last support, the pads, levers carrying said pads, mechanism for operating said levers, posts to which the levers are pivoted, sockets for said posts, with means for vertically adjusting the posts in the sockets, and a lifter engaging with a number of the sockets whereby the posts and their levers and pads can be adjusted vertically in unison, substantially as described.

9. The combination in a lasting machine, of the last support, the toe presser pad, a lever carrying said pad, and mechanism for operating said lever, the lever having two arms acting as fulcrums for hand pinchers, substantially as and for the purpose set forth.

10. The combination in a lasting machine, of the last support, pads, levers carrying said pads, a vertically movable plate, a rod connecting the lever to said plate, bearings having inclined ways therein, pivot pins connecting the rods to the plate, said pins being adapted to the inclined ways in the bearings, bars to which the bearings are attached and a screw rod passing through lugs on said bar, whereby the bars are moved toward the center of the machine on turning the screw rod, thereby raising the pivots of the rods connected to the levers, substantially as and for the purpose described.

11. The combination in a lasting machine, of the frame, cam shaft, mechanism for driving said shaft, a series of face cams on said shaft, a series of levers having pins adapted to the grooves in the face cams, the last supporting rods, the gripper plate, the jaw plate, and the pad plate, said plates and rods being connected to their respective levers, the grippers carried by the gripping plate the jaws of which are acted upon through the medium of the jaw plates, presser pads and levers therefor, said levers being connected to the pad plate, the whole arranged and operated substantially as described.

12. The combination in a lasting machine, of the last support, lasting mechanism, abutment rods pressing on the last, bearings for said abutment rods adjustable in the direction of the length of the last, a sleeve for each abutment rod, having an arm which can be moved in the path of said rod, a post carrying said sleeve, and a spring tending to force the sleeve down, substantially as described.

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

DAVID LAKE.

Witnesses:

LEON LAKE,
CHARLES CADIGAN.