

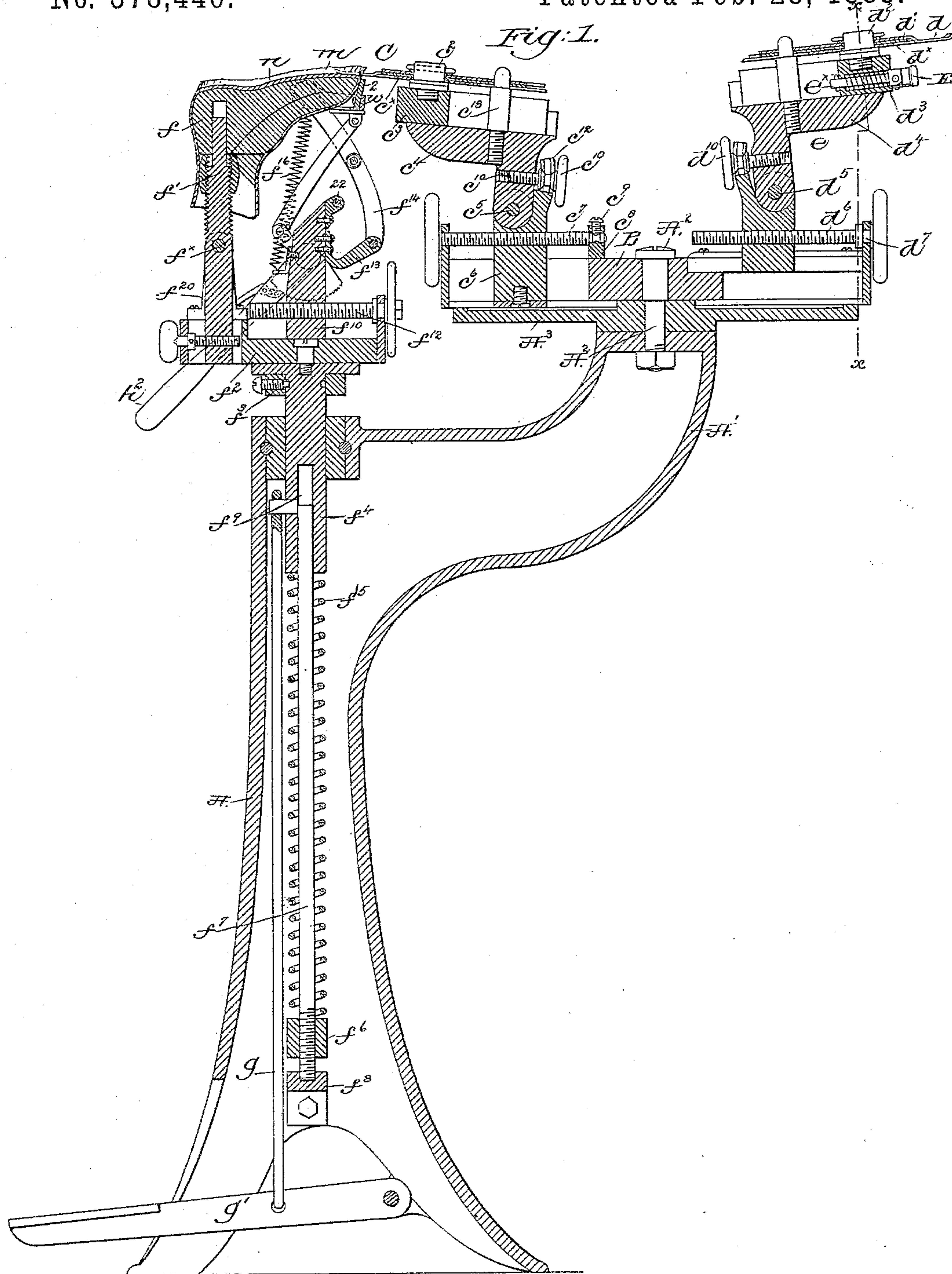
(No Model.)

2 Sheets—Sheet 1.

J. W. HATCH.  
LASTING MACHINE.

No. 378,446.

Patented Feb. 28, 1888.



Witnesses.

Frederick A. Emery.  
Howard J. Eaton.

Inventor.

Jesse W. Hatch.  
By Crosby & Gregory, Attys

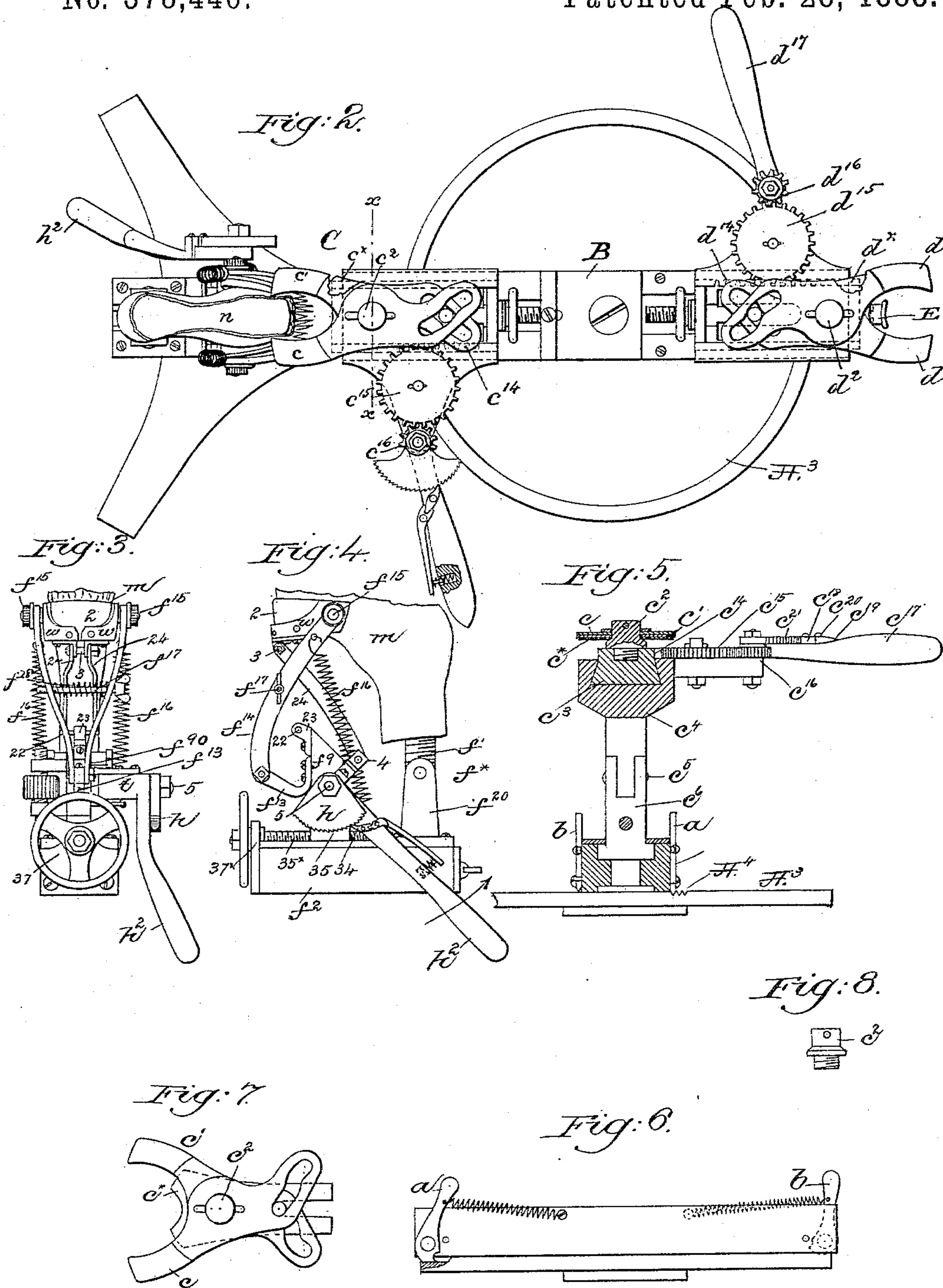
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Fred A. Emery.  
John F. C. Primrose.

Inventor.  
Jesse W. Hatch.  
by Crosby & Gregory, attys



# UNITED STATES PATENT OFFICE.

JESSE W. HATCH, OF ROCHESTER, NEW YORK.

## LASTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 378,446, dated February 28, 1888.

Application filed May 31, 1887. Serial No. 239,749. (No model.)

*To all whom it may concern:*

Be it known that I, JESSE W. HATCH, of Rochester, county of Monroe, and State of New York, have invented an Improvement in Lasting-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to improve that class of lasting-machines wherein the upper is laid over upon the inner sole by means of jaws, the last and upper thereon being mounted upon a jack.

In this invention I employ jaws composed of two plates, but with them I have combined crimping-slides, and at the same time I so modify the shape of the jaws and the time of their movement that the crimping-slides first act upon the upper at the toe and heel of the last to lay the upper over upon the inner sole, and thereafter, in the forward movement of the crimping-slide, or after the crimping-slide has come substantially to rest or is coming to a position of rest, the jaws act to lay the sides of the upper over upon the inner sole at the rear of the toe and between the heel end of the inner sole and the shank. The upper of the shoe to be lasted prepared, as will be described, by cement, or as described in my application, Serial No. 227,659, is placed over the last-holding spindle of a jack, and thereafter the last is applied to the top of the said spindle and the upper is drawn up above the level of the bottom of the last by means of pinchers in the hand of the operator engaging the toe of the upper. In this condition the upper is acted upon by a combined vamp and toe wiper which is raised against the vamp at or near the ball of the last, and while the said wiper is in contact with the said vamp it is moved forward from the ball of the last to and about the toe, stretching the upper and fitting the vamp to the last, and then the inner sole properly cemented, as will be described, with cement, is laid upon the bottom of the last. The inner sole having been applied, the cemented edges of the upper at and along the ball of the last at one side is grasped by pinchers and pulled up and over upon the inner sole, where it is held by the thumb of the operator, while the pinchers held in the other hand are taken from the upper and used

as a hammer to strike the upper near its edge to set the same. This done, the same thing is repeated along the opposite edge of the last, and thereafter the crimping-slide and the toe-jaws are moved forward and made to act first upon the toe to lay it over upon the inner sole, and then upon the edges of the upper between the toe and ball of the last, the said slide and jaws being left in such position to hold the overturned edges of the upper closely down upon the inner sole. The operator now again takes the pinchers and draws up the upper about the shank of the last, first at one and then at the other side of the last, and then the heel or quarter part of the vamp and the stiffener within it is acted upon by the heel-crimping slide and its accompanying heel-jaws, as will be described. The block on which the heel-lasting jaws slide is provided with a counter-holder to impinge against the quarter and hold it and the stiffener within it up snugly against the last, while the jaws act to lay the quarter and stiffener over upon the inner sole. The counter-holder is jointed so as to permit it to rise and fall somewhat with the shoe as the latter is moved vertically below the jaws when pressure is being applied to the spindle of the jack.

The particular mechanical features in which my invention consists, as well as the method invented by me, will be hereinafter especially pointed out in the claims at the end of this specification.

Figure 1 is a vertical section of a lasting-machine embodying this invention; Fig. 2, a top or plan view of Fig. 1, the jaws being partially broken out to show the crimping-slides under them; Fig. 3, a right-hand end view of the upper part of the jack illustrated in Fig. 1, chiefly to show the toe-wiper; Fig. 4, a right-hand side elevation of Fig. 3; Fig. 5, a partial section of Fig. 1 in the line *x x*, looking to the right; Fig. 6, a detail, to be referred to, of the rotating table and bed and locking devices. Fig. 7 is a detail showing the toe-jaw and crimping-slide under it as they appear when the jaw is spread open and the jaw and slide are ready to be started forward to act upon the toe of the upper pulled above the bottom of the last, and Fig. 8 shows separately one of the studs on which the jaws turn.

The standard A and its arm A' constitute



the frame-work for the working parts. The arm  $A'$  has attached to it by a shouldered bolt,  $A^2$ , a bed,  $A^3$ , having at suitable intervals notches  $A^4$ , (see Figs. 5 and 6,) which are engaged by a lever, as  $a$  or  $b$ , pivoted upon a table,  $B$ , whenever it is desired to lock the said table firmly in position with its toe or heel crimping jaws opposite the jack to be described, the table, as herein shown, being adapted to be rotated upon or about the bolt  $A^2$  as a center. The bed referred to has three notches, either of which may be entered by that one of the levers,  $a$  or  $b$ , next the jack. The levers are made to enter a middle notch when a straight last is being used, and one or the other of the outside notches, according to whether a right or left boot or shoe is being lasted.

For lasting the toe I employ a toe-crimping slide,  $c^x$ , and above it a pair of jaws,  $c$   $c'$ , all carried by a stud,  $c^2$ , erected upon a sliding plate,  $c^3$ , free to slide in a block,  $c^4$ , pivoted at  $c^5$  on a carriage,  $c^6$ , having a foot which may be made movable in a guideway or slot of the table  $B$  by means of a screw,  $c^7$ , one end of which (see Fig. 1) enters a lug,  $c^8$ , of the table, the screw having an annular groove which is entered by a screw,  $c^9$ , leaving the screw  $c^7$  free to be rotated to thus adjust the carriage  $c^6$ .

The block  $c^4$  has screwed into it a screw,  $c^{10}$ , provided near its head with a shank having a  $\nabla$ -shaped annular groove, (see Fig. 1,) which is seated in the forked upper end of an ear,  $c^{12}$ , of the carriage  $c^6$ , the material of the ear entering the said groove, permitting the screw to be rotated, yet not to be moved longitudinally; but the screw is free to be moved up and down in the forked upper end of the said ear, and it does so move whenever the screw  $c^{10}$  is rotated to adjust the block  $c^4$  with relation to the carriage  $c^6$ , which is frequently necessary in order to adapt the jaws to the longitudinal curvature or spring of the bottom of the last, especially at the toe and heel thereof. The block  $c^4$  has erected on it a stud,  $c^{13}$ , which enters slots (see Fig. 2) in the tails of the plates  $c$   $c'$ , as usual, the said stud also first passing through a longitudinal slot of the toe-crimping plate  $c^x$ .

The slide-block  $c^3$ , of dovetail shape, (see Fig. 5,) is provided at one side above the block  $c^4$  with teeth  $c^{14}$ , to be engaged by the teeth of an intermediate gear,  $c^{15}$ , engaged by a pinion,  $c^{16}$ , secured to or actuated by a lever, as  $c^{17}$ , movement of the said lever by the hand of the operator enabling both the crimping-slides and jaws to be moved forward, a pawl-controlling lever,  $c^{19}$ , pivoted at  $c^{20}$  on the said lever  $c^{17}$ , normally acting to cause one end of a pawl,  $c^{18}$ , to remain in engagement with a stationary ratchet-toothed plate,  $c^{21}$ , to thus hold the hand-lever, and consequently the jaws and slide, in any position in which they may be left by the operator when he takes his hand from the said lever.

The shoulders of the studs  $c^2$  and  $d^2$ , where they support the crimping-slide and jaws

above them, are rounded, beveled, or shaped substantially as shown in Figs. 5 and 8, to thus enable the said slide and also the jaw above it to rock more or less in order that the said slide and jaw may accommodate themselves to slight differences in the height of the outer or inner side of the last and to slight inequalities in thickness of the stock.

For lasting the heel I employ a heel-crimping slide,  $d^x$ , and a pair of jaws composed of slotted plates  $d$   $d'$ , all mounted on a common stud,  $d^2$ , of a slide-plate,  $d^3$ , which enters a groove in the block  $d^4$ , pivoted at  $d^5$  on a carriage,  $d^6$ , made adjustable longitudinally on the table  $B$  by a screw,  $d^7$ . The slide-block  $d^3$  is toothed at  $d^{14}$ , as described of the slide-plate  $c^3$ , and is moved horizontally when it is desired to close and open the jaws by an intermediate, gear  $d^{15}$  gear,  $d^{16}$ , and hand-lever  $d^{17}$ . The guide-block  $d^4$ , pivoted at  $d^5$ , is made adjustable about the said pivot by a screw,  $d^{10}$ , constructed, as described, of the screw  $c^{10}$ . The slide-block  $d^3$  is provided at its outer end with a counter holder or presser composed chiefly of a head,  $E$ , pivoted upon or jointed to a sliding shank,  $e^x$ , surrounded by a spring,  $e$ , which normally acts to force the holder outward. The last  $f$  is held on a heel-pin,  $f'$ , pivoted at  $f^x$  on stands  $f^{20}$ , erected upon a head,  $f^2$ , free to rotate on a stud-screw,  $f^3$ , at the top of a spindle,  $f^4$ , entering a collar,  $f^5$ , in the upright  $A$ , all forming a jack.

The spindle  $f^4$  is sustained by a spiral spring,  $f^{15}$ , resting on an adjusting-nut,  $f^6$ , which may be rotated on a threaded part of the guide-rod  $f^7$ , attached to a stand,  $f^8$ , of the upright  $A$ , the said guide-rod entering loosely a hole,  $f^9$ , in the spindle  $f^4$ , the said spring normally acting to lift the jack, the strength of the spring being adjusted by turning the nut  $f^6$ .

The jack may be lowered by a link,  $g$ , and treadle  $g'$  whenever desired, which is done when the shoe with the upper upon it is placed next the guide-blocks  $c^4$  or  $d^4$ , preparatory to causing the crimping slides and jaws to lay the upper over upon the inner sole, the foot being removed from the treadle as soon as the crimping-slide is moved far enough forward to catch the upper over the inner sole, the removal of the foot from the treadle enabling the spring  $f^{15}$  to act and exert an upward pressure on the last to measure the pressure of the slide and jaws on the upper, the stronger the spring the greater the friction between the slide and jaws and the upper, and vice versa. The spindle is depressed when it is desired to withdraw the slide and jaws and remove the shoe or change its position to enable a heel to be lasted after a toe has been lasted. The head receives the foot  $f^{10}$  of a carriage,  $f^{20}$ , made adjustable by a screw,  $f^{12}$ . The carriage  $f^{20}$  has attached to it a lug,  $f^{13}$ , on which is pivoted the arms  $f^{14}$ , which hold the pivots for the combined vamp and toe wiper  $w$ , composed, as herein shown, of two pieces of metal, (see Figs. 3 and 4,) having suitably riveted or attached to them a piece of



sole-leather or other flexible material, 2, the top edge of the latter being adapted to bear first against the material constituting the vamp or upper of the shoe to be lasted at or near the ball of the last or at a point back of the toe of the last, the combined vamp and toe wiper being thereafter moved forward in contact with the upper by devices to be described, the wiper traveling along the vamp or upper to the toe of the last, thus stretching or pulling the upper forward about and fitting it snugly to the last and to the toe thereof.

The arms  $f^{15}$  have connected to them strong springs  $f^{16}$ , which normally act to keep the vamp and toe-wiper pressed backward toward or against the toe of the upper on the last, or against a stop or pin, as 22, in an ear, 23, a rod,  $f^{17}$ , and spring  $f^{18}$ , (see Fig. 3,) enabling the said vamp and toe-wiper to be contracted or to be spread apart, according to the width of the last or of the shoe being lasted. The metallic frame of the toe-wiper has jointed thereto by a bolt, 3, two links or rods, 24, pivoted to an ear, 4, of a rocking sleeve,  $t$ , mounted in the head of the carriage  $f^{20}$ , the sleeve turning on a stud, 5.

The rocking sleeve  $t$  has attached to it a lever-handle  $h^2$ , the movement of which in the direction of the arrow in Fig. 4, the arms  $f^{14}$  then resting against the stop 22, causes the rods 24 to lift the edge of the combined vamp and toe-wiper against the upper, and as the rods 24 continue to move they cause the said wiper, borne closely against the upper, to travel forward, drawing or pulling and fitting it about the last until the wiper arrives in the position Figs. 1, 3, and 4, a pawl, 34, carried by the hand-lever  $h^2$ , engaging the stationary ratchet-toothed sector  $h$  and causing the combined vamp and toe-wiper to remain in position where left by the operator, and hold the upper after its edge has been pulled up above the bottom of the last by pinchers, and also while the upper is being acted upon by the devices employed to crimp or lay the edges of the upper over upon the inner sole about the toe and along the sides of the inner sole, as described.

The toe having been lasted, the jack is depressed by the treadle in order that the toe-crimping slide or plate and the jaws may be retracted, the toe-wiper is lowered, the jack rotated half around to bring the heel of the last in position to be lasted, and the table is rotated to bring the heel-lasting jaws in working position. The lower end of the heel-pin  $f'$  is tapped for the insertion of a screw, 35 $\times$ , which, provided with a suitable neck and collar, 35, is inserted loosely in a hole in the ear or cross-plate 37 $\times$  of the base  $f^2$ , rotation of the screw 35 $\times$ , its longitudinal movement being restrained, resulting in tipping the heel-pin, so as to place the heel and toe ends of the bottom of the last more or less out of true horizontal plane, according to the shape of the last, the class of upper being lasted, and the extent of the upper to be acted upon by the toe-wiper.

The sole-leather part 2 of the toe-wiper is set with its edge uppermost to wipe the vamp to the last and hold the whole toe of the upper in position on the last all around the same while the operator turns the upper over on the inner sole.

To avoid the use of tacks for lasting, they being very objectionable, especially in fine or in the better class of shoes, I have devised a method of holding the upper to the inner sole by means of cement.

The cement used contains rubber, and is applied to not only the inner sole, but also to the edges of the vamp or its lining, and preferably the edges of the vamp and lining will be stitched or cemented together. The cement so applied is permitted to stand long enough for the cement to become tacky, so that when the cemented surfaces are brought together they adhere readily and retain their hold.

I have herein described a method of lasting shoes; but the same is not herein made the subject of claim, except when the wiping of the vamp and toe, as described, is made one of the steps, for claim to other parts of the method is made in another application for United States patent filed by me March 13, 1887, Serial No. 238,089, the said application also describing the further steps of applying the outer sole.

The combined vamp and toe wiper herein shown and its actuating mechanism are not herein broadly claimed, for the same is made the subject of claim in another application, Serial No. 237,566, filed by myself and Joseph Pitcher, May 9, 1887.

I claim—

1. In a lasting-machine, a pivoted spring-supported lasting-jack, combined with a movable table located at one side the pivot of the jack, and the independent heel and toe lasting appliances mounted thereon, opposite which the heel and toe of the last may be placed in succession by the rotation of the jack, substantially as described.

2. In a lasting-machine, the guide-block  $c^4$ , the slide-block  $c^3$  therein, having teeth and a stud,  $c^2$ , the jaws pivoted on the said stud and lever  $c^{17}$ , combined with gearing between the said lever and slide-block, and with a ratchet-plate and pawl to hold the slide-block in place, substantially as described.

3. In a lasting-machine, a jack to hold a shoe to be lasted, and a slide-plate having a stud,  $c^2$ , provided with a rounded or beveled seat, combined with a pair of jaws, the said rounded or beveled seat permitting the said jaws to tip and adapt themselves to the bottom of the last, substantially as described.

4. In a lasting-machine, a jack to hold the shoe to be lasted, and a slide-plate,  $c^3$ , having a stud,  $c^2$ , combined with a crimping-slide, a pair of crimping-jaws, and means to actuate them, whereby the crimping-slide is made to act upon the toe of the upper and lay it over upon the toe of the inner sole prior to the action of the said crimping-jaws upon the upper



at the sides of the last back of the toe and between the toe and ball of the last, substantially as described.

5 5. The table B, the adjustable carriage thereon, the pivoted guide-block having the ear  $c^{12}$  thereon, the slide-block, and jaw, combined with the screw  $c^{10}$ , to adjust the guide-block on the said carriage, substantially as described.

10 6. The rotating jack, the table pivoted at one side of the center of rotation of the jack, the carriage thereon, the guide-block, slide-block, and heel-carrying jaw, combined with the counter-holder E, located just below the heel-jaws to impinge against and hold the counter or heel of the upper to the last while the plates of the heel-jaw lay the counter over on the inner sole, substantially as described.

20 7. The jack, its spindle  $f^4$ , spring  $f^{15}$ , to support the jack, and link  $g$ , connected to the said spindle and the treadle, combined with a table and with toe or heel jaws, to operate substantially as described.

25 8. A guide-block, a toothed slide-block therein, jaws pivoted thereon, and an intermediate gear in engagement with the slide-block, combined with a lever and gear moved by it to actuate the said intermediate gear, substantially as described.

9. The head, a heel pin or standard to support the last, and the shank or rod, combined with a spring,  $f^{15}$ , to support the head, and with a treadle to depress the rod and head, substantially as described. 30

10. The head, a heel pin or standard to support the last, and the shank or rod, combined with a spring,  $f^{15}$ , the rod  $g$ , connected to the shank, the treadle, and the nut  $f^6$ , to adjust the said spring, substantially as described. 35

11. In a lasting-machine, a guide-block, a slide-block therein, a pair of jaws, and means to move them, combined with a jointed counter or upper holder, E, located just below the said jaws, to operate substantially as described. 40

12. The jack, the notched bed, and the table, and toe or heel jaws, and means to operate them, combined with a lever or locking device to co-operate with the notched bed according to the boot or shoe to be lasted, substantially as described. 45

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

JESSE W. HATCH.

Witnesses:

G. W. GREGORY,  
B. DEWAR.