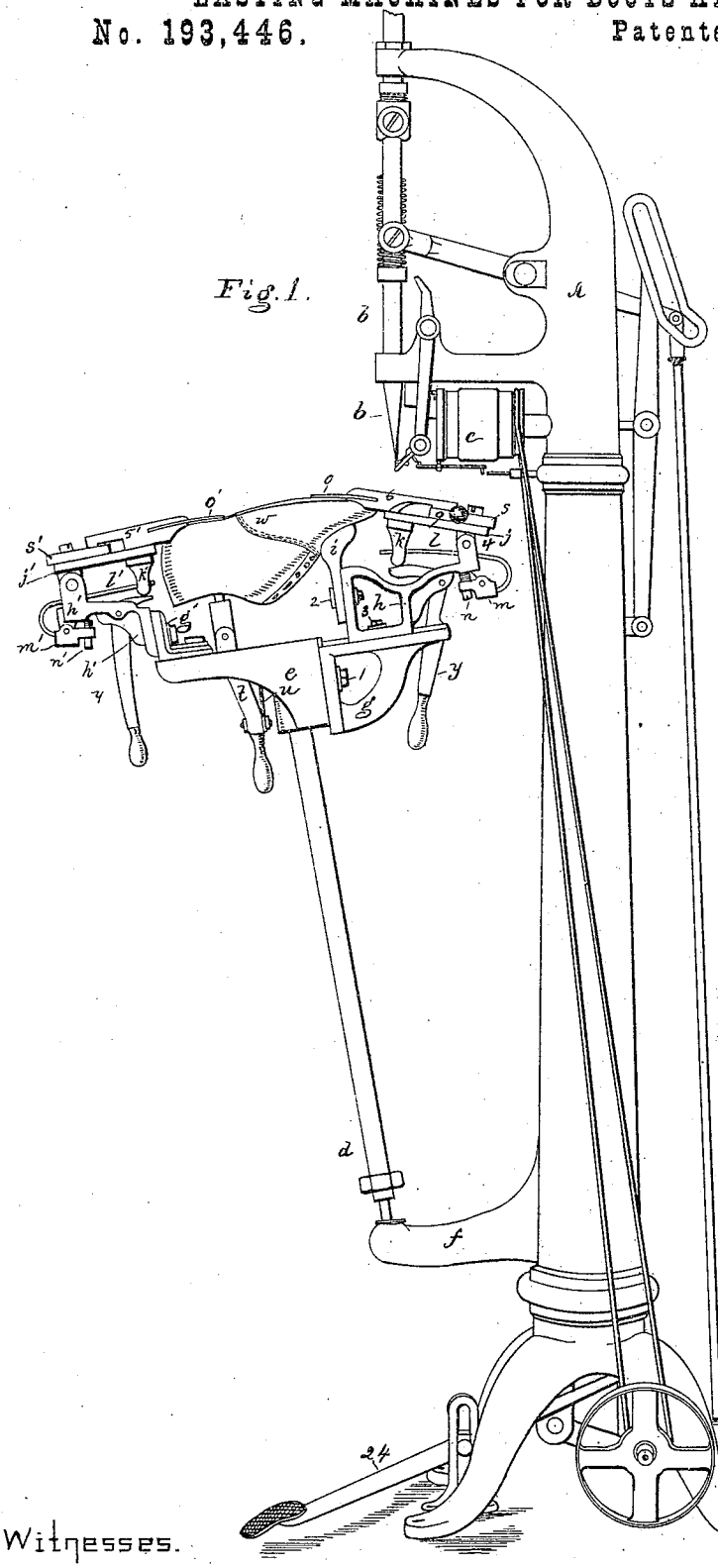
2 Sheets—Sheet 1.

# J. W. HATCH.

## LASTING MACHINES FOR BOOTS AND SHOES.

No. 193,446. Patented July 24, 1877.

Fig. 1.




Witnesses.

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2 Sheets—Sheet 2.

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## LASTING MACHINES FOR BOOTS AND SHOES.

No. 193,446. Patented July 24, 1877.

*Fig. 2.*

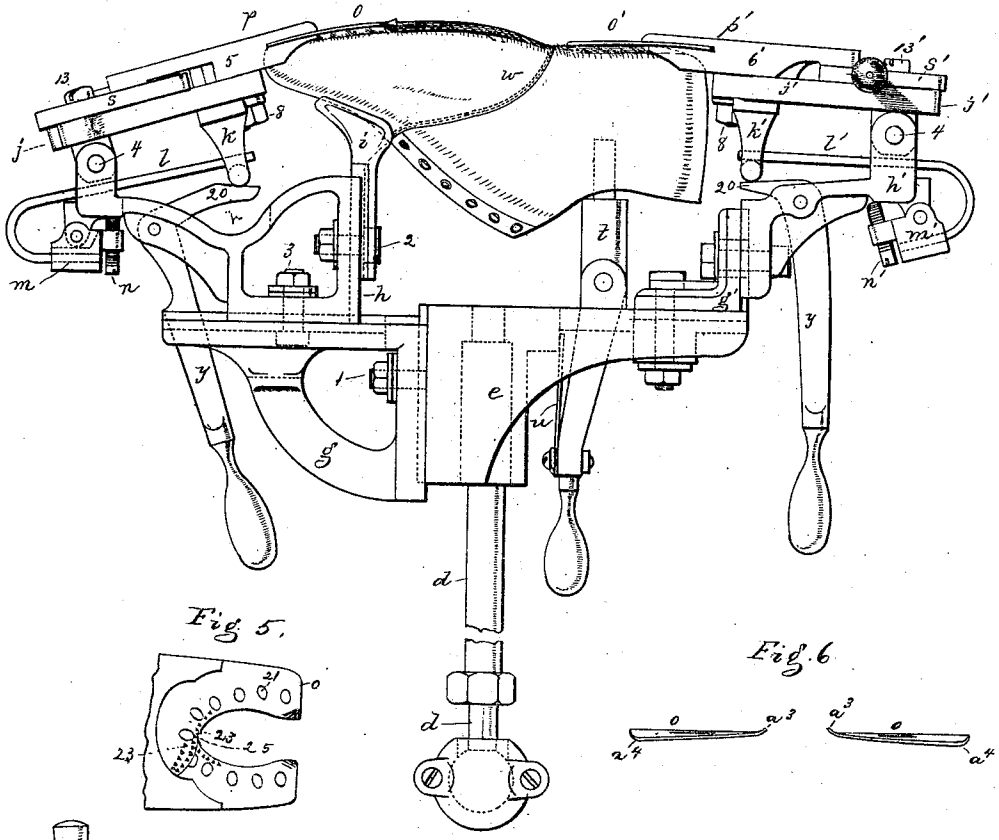


*Fig. 5.*



*Fig. 6.*



*Fig. 3.*

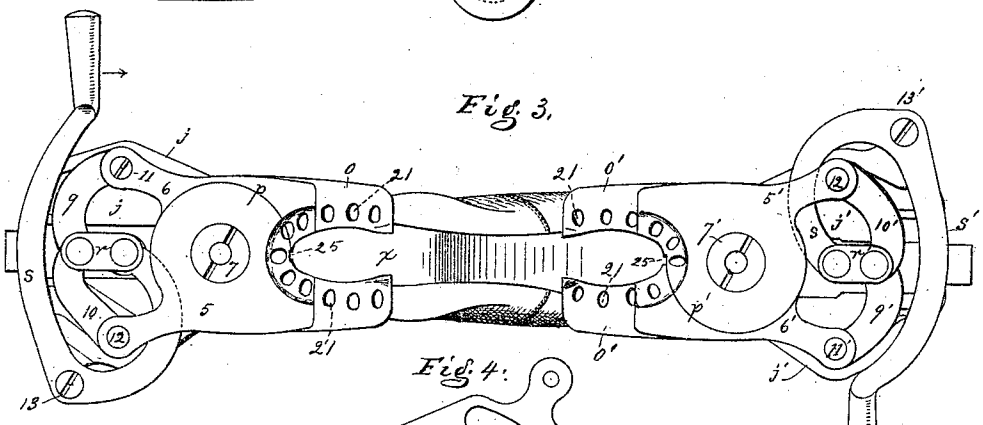
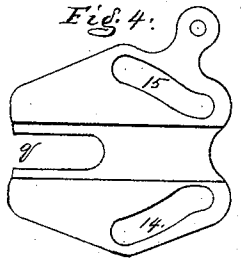


*Fig. 4.*



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# UNITED STATES PATENT OFFICE.

JESSE W. HATCH, OF ROCHESTER, NEW YORK.

## IMPROVEMENT IN LASTING MACHINES FOR BOOTS AND SHOES.

Specification forming part of Letters Patent No. **193,446**, dated July 24, 1877; application filed February 27, 1877.

*To all whom it may concern:*

Be it known that I, JESSE W. HATCH, of Rochester, in the county of Monroe and State of New York, have invented an Improvement in Mechanism for Lasting Shoes or Boots, of which the following is a specification:

This invention relates to mechanism for lasting shoes or boots to be soled in any usual way.

The invention consists in the combination, with the toggle-joint and the crimping or pulling jaws that draw the upper about the sole and last, of a lever and link to operate the toggle-joint; also, in crimping-jaws or pullers, in combination with a pivoted supporting-plate, slotted to guide the pivot of the jaws, and with a spring to regulate the downward pressure of the plate and jaws, substantially as described; also, in the employment of crimping or pulling jaws, having openings in their acting faces back from their edges, to operate substantially as described and set forth, and to permit the passage of a tack adapted to be driven by a driver; and, also, in a lasting mechanism supported upon a movable rod or jack, adapted to be presented to a tacking mechanism, whereby a shoe may be lasted and tacked in a single machine.

Figure 1 represents my improved lasting devices adapted to a machine for automatically driving tacks or nails into the upper, and holding it in position. Fig. 2 is a side view of the lasting devices mounted upon a revolving jack, the jack-standard being shortened to save room upon the drawing. Fig. 3 is a top view; Fig. 4, a detail of the supporting-plate, and Fig. 5 an under-side view of the crimping-jaws for the toe. Fig. 6 shows the elastic working portions of one pair of the jaws or pullers in front view.

The drawing, Fig. 1, represents my invention embodied with a tacking machine known as the "magnetic tacking-machine," and constructed substantially in accordance with United States Letters Patent Nos. 143,388, 152,927, and 156,047, to which reference may be had.

The main standard (herein marked A) of the tack-driving mechanism, the hammer *b*, the feeding-cylinder *c*, tack-presenting mechanism, and the rod *d* for supporting my lasting devices, are all substantially as described in such patents, the driver being a magnetic driver. The foundation-casting *e*, upon which are secured the different portions of the lasting devices, is attached at the upper end of the rod *d*, having at its lower end a ball-joint to fit an opening or socket in an arm, *f*, of the frame of the tack-driver. At one end of this casting *e* is attached, by a screw, 1, a bracket, *g*, arranged at its top to receive and guide a standard, *h*, to which is adjustably secured, by a bolt, 2, a toe-rest, *i*. The standard *h* is made horizontally adjustable by means of a bolt, 3. At one end this standard has pivoted to it, at 4, a supporting-plate, *j*, that supports and guides the pair of crimping-jaws for the toe. This supporting-plate is provided with a lug, *k*, or equivalent, which is engaged by a spring, *l*, attached to, in this instance, a pivoted block, *m*, provided with a screw, *n*, or equivalent device, for adjusting the block *m* to increase or lessen the action of the spring upon the supporting-plate, and consequently the pressure of the pullers or working portions *o* of the jaws *p*, composed of two members, 5 6, pivoted together by a pivot, 7, extended through a slot, *q*, in the plate *j*, a nut, 8, preventing the jaws from rising as the pivot 7 reciprocates in such slot, when the jaws are moved backward and forward and opened and closed by the action of the toggle-lever, composed of the members 9 10, pivoted upon pins 11 12 of the members 6 5 of the jaw. The central portion of the toggle-lever is connected by a link, *r*, with one end of lever *s*, pivoted at 13. The pins 11 12 extend through slots 14 15 in the supporting-plate, the slots acting as guides for the pivots, to insure the movement of the jaws in a right line as they are reciprocated and closed and opened.

The jaws so far described are for fitting the upper about the toe of the last. At the opposite end of this casting *e* is attached a horizontally-adjustable bracket, *g'*, and to *g'* is attached a rest, *h'*, to which is pivoted a second supporting-plate, *j'*, adapted to sustain the crimping or pulling jaws *p'*, composed of members 5' 6', operated by toggle-lever 9' 10' and lever *s'*, constructed and operated as the corresponding parts of the toe-fitting devices, the parts just referred to, and represented at

the right of Figs. 2 and 3 and at the left of Fig. 1, being adapted to fit or pull the quarter of the shoe about the heel of the last.

Lifting-levers *y*, pivoted on the portions *h h'*, and provided with toes 20, act upon the lugs *k* or *k'* to elevate the supporting-plate *j* or *j'* and jaws *p* or *p'*, to introduce or remove the shoe and last. When the levers *y* are not pressed toward the rod *d* the springs *l* and *l'* act to press the acting portions *o o'* of the jaws *p p'* down firmly upon, or in a path to engage, the upper and fit or pull its edges over the last.

The upper to be lasted is properly placed upon a last supported upon a pivoted last-pin *t*, provided with a handle and a spring, *u*, to hold the toe of the last pressed forward toward the toe-rest *i*. The handle upon the pivoted last-pin aids the operator in placing the heel and toe in correct position with relation to the movement of the jaws, and in removing and replacing the last. When the last is put in place with an upper, *w*, and an insole, *x*, thereon, as shown in the drawings, (the jaws *p p'* having been drawn back away from the last, and the acting portions *o o'* thereof being opened,) the operator seizes the hand-levers *s* and *s'* and moves them in the direction of the arrows, such movement straightening the toggle-levers, at the same time moving the jaws longitudinally and closing them.

In United States Letters Patent heretofore granted to me, and numbered 173,405, I show jaws for lasting; but such jaws have notches formed in their concaved edges for the reception of tacks. As the concaved edges of these jaws meet the upper at the edges of the last and fold the bottom edges thereof closely about the last, working from the outside toward the central line of the last in all directions, it is obvious that the edges of the upper will be fitted and crimped to conform to the curvature of the last. The full portions of the edges of the upper rise, or bunch, or curve upward opposite these notched portions in the concaved edge of the jaws, presenting convex portions or bunches not firmly supported upon the insole, and when a tack is driven therein it is liable to glance upon this convexed or bunched portion of the edge. This difficulty is a very serious one in practice when the tacks are being driven by hand, as they are now done.

To overcome this difficulty the concaved working-edges of the working members *o o'* of the jaws (these members being made of spring-metal, and elastic rather than rigid, as in such patent) are made without notches for the reception of the tacks, but instead are provided with holes 21, made therein, back from their concaved working-edges. The portions of the concaved edges immediately opposite the holes—preferably elongated holes—operate upon the edges of the upper, and prevent the formation of bunches in the edges of the upper, or prevent it buckling up and presenting a convex surface at the point at which the tack is to be driven. This construction of the working-edges of working members of the jaws enables the edges of the upper to be held down firmly against the insole at the points where the tacks are to be driven.

In using a magnetic hammer for driving tacks it will be remembered that the face of the magnet does not possess any considerable power to hold the tack against lateral movement, and if the leather or edge of the upper into which a tack held by a magnet was to be driven was bunched up, the tack would be diverted from its straight path, and, not being provided with a holding or guiding tube for the tack or nail, it could not be driven with any degree of certainty; but with jaws constructed with holes, as described, and with edges to bear upon the edges of the upper in advance of the holes, the upper edges are kept smooth, and the tack or nail can be readily driven straight through the substance of the edge of the upper. The under sides of the jaws for the toe (see Fig. 5) are provided with serrations or rasp-like points 23, that engage the edge of the upper and aid the working portions *o* in drawing or wiping its edges over the edge of the last, and in holding such edges in position to receive the tacks or nails driven through the holes 21.

When the concaved working-edges of the working members are formed as herein described, it is possible to last a shoe with a narrower or less portion of the edge of the upper bent over upon the inner sole than is the case when notched jaws are employed, and stock is therefore saved.

When the shoe is properly drawn and fitted to the last, as above described, the operator moves the jack (the rod permitting it to be moved at will in either direction) so that the holes 21 will come in line with the end of the hammer or nail-driver rod, and the hammer will then be thrown down, driving a tack or nail through such hole into the upper and inner sole, confining them in position to be subsequently united by any usual process of nailing, sewing, or pegging. After the upper is tacked to the inner sole the jaws are withdrawn and the last is removed from the pin *t*.

I prefer, in connection with my lasting devices, (shown in Figs. 2 and 3,) to employ a magnetic hammer; but it is understood that a hammer or driver-rod not magnetized might be used in connection with suitable devices to operate the driver-rod and present the tacks to be driven. The driving-rod will be so operated as to drive a tack, then to rise from its lowest position, and then to rest until a new opening, 21, is placed under the driver or hammer, when the operator will again, through a lever, 24, or equivalent, connect the driver-operating devices with the constantly-rotated pulley of the machine, which will drive another tack, after which the driver will then again rest, and so on.

The under side of the jaws for the toe-portions of the upper is provided with a space

(represented at 25, Figs. 3 and 5) for the reception of the seam, extending from the toe up along, over, and in the direction of the length of the foot, such a seam being common in ladies' cloth shoes and in some leather shoes. This provision obviates pulling the seam portion of the upper more than the other adjacent portions.

The elastic working portions *o* of the jaws or pullers are turned or curved upward at their inner corners $a^3$, and the jaws, from their their inner concave to their outer convex edges $a^4$, incline downward.

This construction of the jaws permits them to rest, at their upturned or elevated inner corners, upon the upper when preparing the work for the operation of the jaws in pulling the upper over the last, and also prevents the inner corners of the jaws cutting the upper, and as the jaws are closed the outer lower edges $a^4$ press harder and harder on the upper turned over the last.

I claim—

1. Crimping-jaws or pullers to push and draw over the uppers of boots and shoes, when provided with holes, substantially as described, back of the working-edges of the jaws, to permit tacks or other fastenings to be driven for the purpose of securing the upper to the inner sole.

2. Crimping-jaws or pullers to draw over and plait in the uppers of boots and shoes preparatory to lasting the same, in combination with a toggle-joint and a lever and link to operate the toggle-joint and jaws, all substantially as described.

3. A pair of crimping-jaws, connected by an elongated pivot, 8, and provided with backwardly-extended portions 5 6, having pins, in combination with a pivoted supporting-plate, provided with slots *q*, 14, and 15, and with mechanism to longitudinally reciprocate the jaws above the supporting-plate, to operate substantially as described.

4. Crimping-jaws or pullers to draw over and plait in the uppers of boots and shoes, in combination with the pivoted supporting-plate, slotted at *q*, to guide the jaws, and the adjustable spring to regulate the downward pressure of the plate and jaws, substantially as described.

5. Crimping-jaws or pullers to draw over and plait in the uppers of boots and shoes preparatory to lasting the same, in combination with the pivoted supporting-plates and lifting-levers to elevate or depress the plates and jaws, substantially as described.

6. The pivoted supporting-plate, in combination with the crimping-jaws or pullers and pivot 7, adapted to move in the slotted portion *q* of the plate, substantially as described, and for the purposes set forth.

7. The vertically-adjustable toe-support and its laterally-adjustable rest *h*, in combination with crimping-jaws or pullers, to adjust the shoe up and down, backward and forward, with relation to the jaws, substantially as and for the purpose described.

8. Crimping-jaws or pullers to push and draw over and plait in the uppers of boots and shoes, in combination with an automatically-operated hammer or driver, to drive tacks or nails through holes made in the working portions of the jaws, substantially as described.

9. The crimping-jaws and mechanism to operate them, to push and draw over the edge of the upper at both the heel and toe, in combination with a rod provided with a ball-like termination or end, to permit the rod and lasting devices to be moved freely in any direction to present the heel and toe of the shoe or boot to a tack-driving mechanism, substantially as described.

10. The elastic crimping-jaws or pullers, provided with elevated inner corners to rest upon the uppers at the edge of the last, and made lower at their outer edges than at their inner edges, to operate substantially as described.

11. The combination, in a lasting-machine, of the following instrumentalities, viz: a pivoted supporting-plate, a pair of crimping-jaws, loosely connected therewith, mechanism to reciprocate the jaws longitudinally with reference to the plate, and to close the jaws as they are moved forward, and a spring to hold the pulling portions of the jaws and forward end of the pivoted plate pressed downward, so that the pulling portions bear with a yielding pressure upon the upper to pull it over the inner sole.

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

J. W. HATCH.

Witnesses:
W. P. WOLFE,
JACOB URHLIN.