

(No Model.)

6 Sheets—Sheet 1.

C. H. KELLEY.  
LASTING MACHINE.

No. 529,653.

Patented Nov. 20, 1894.

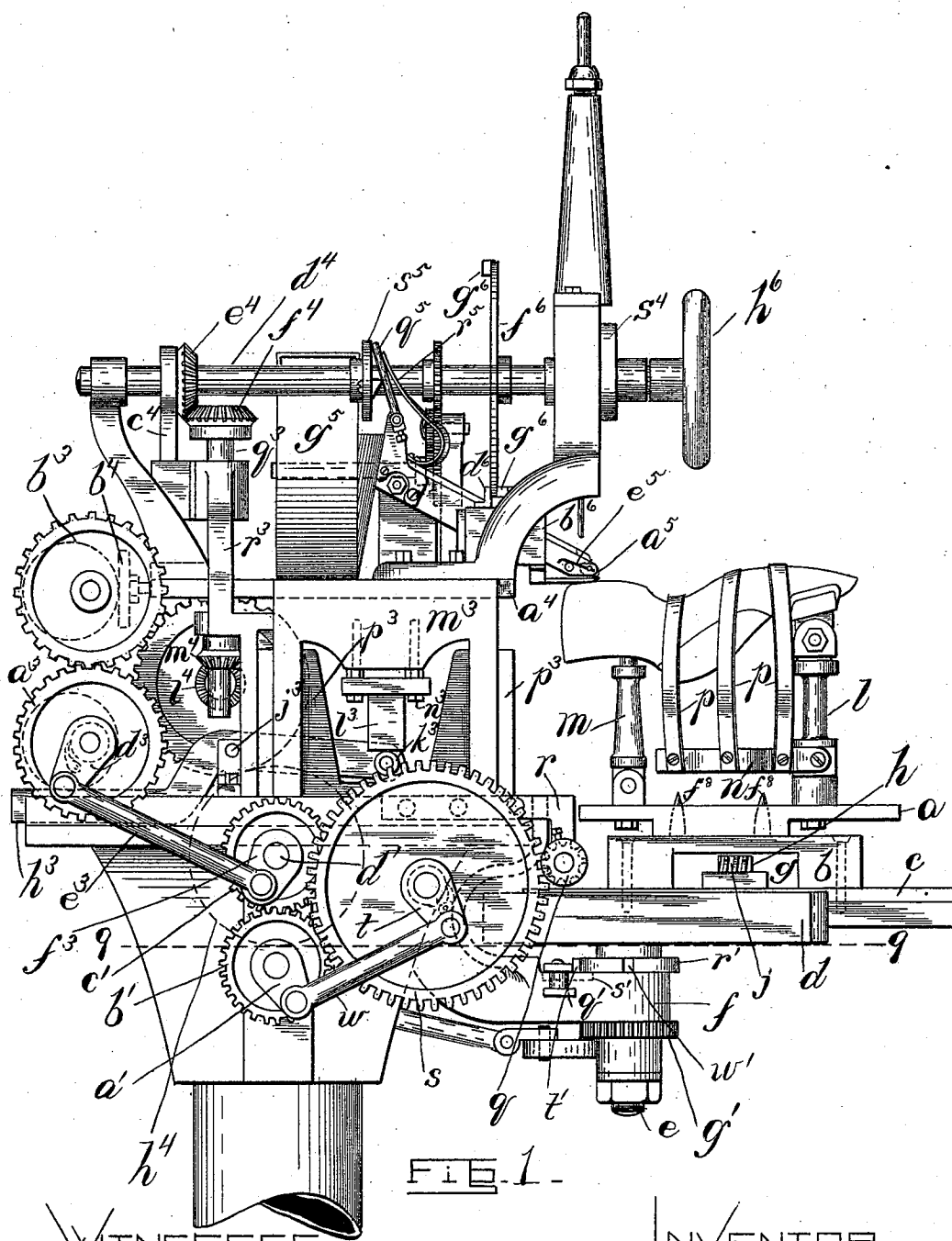


FIG. 1.

WITNESSES.

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INVENTOR.

Charles H. Kelley  
By Blackford Caldwell Randall  
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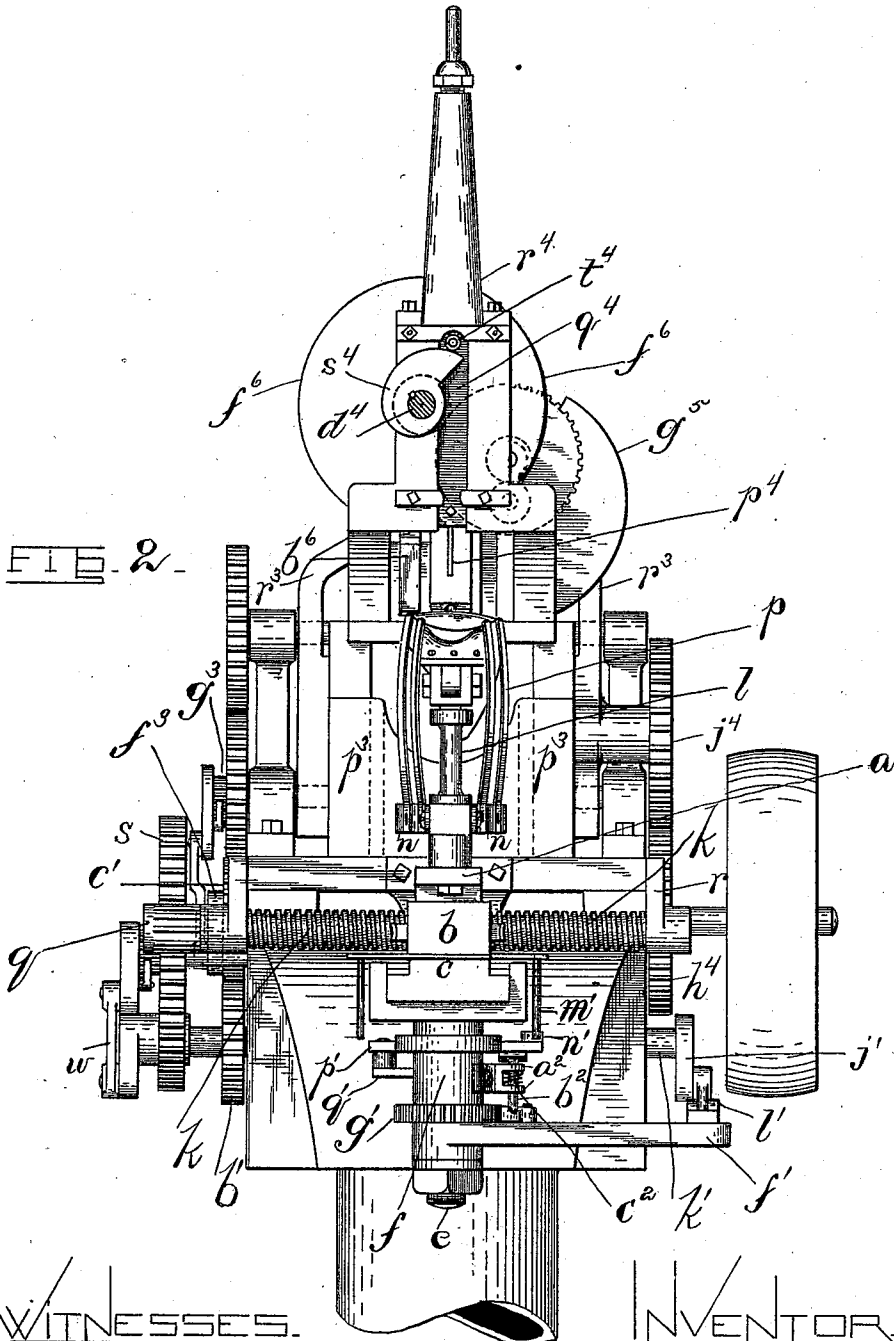
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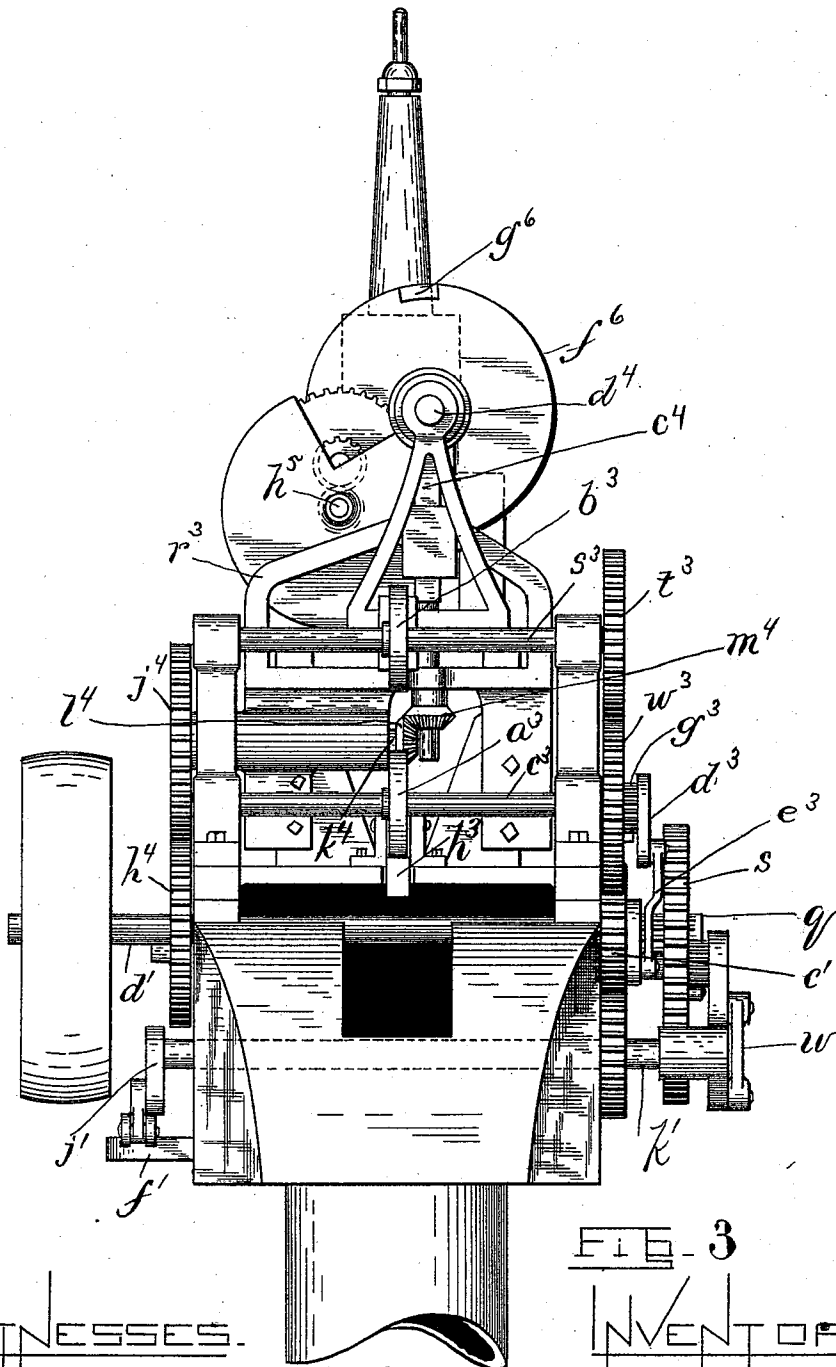


FIG. 3

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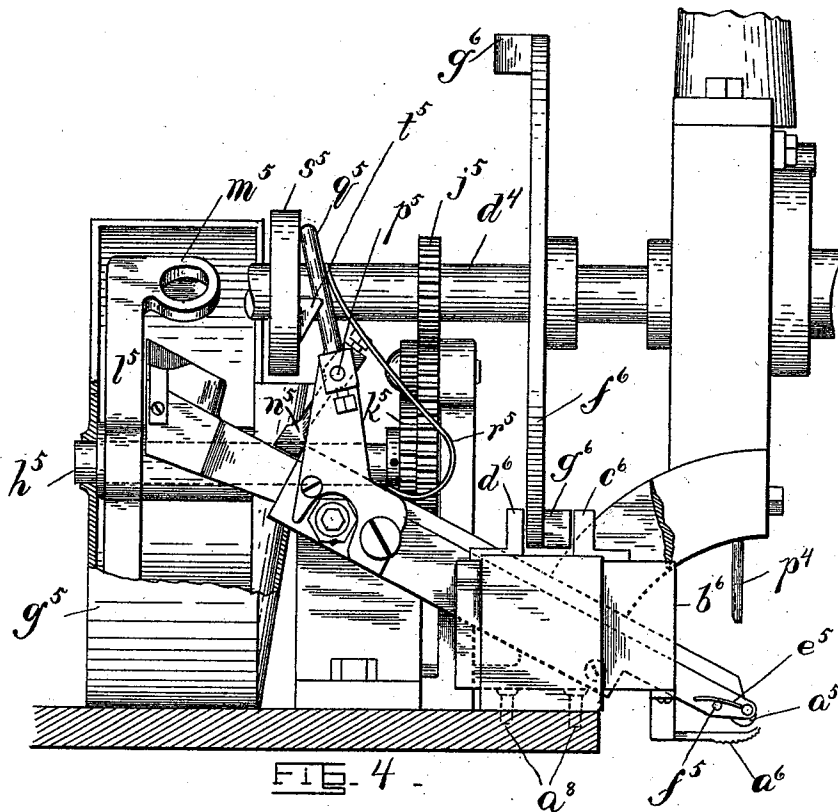


FIG. 4 -

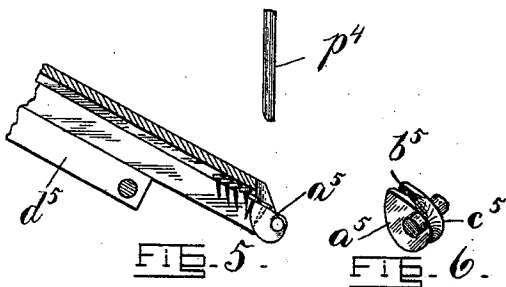


FIG. 5 -

FIG. 6 -

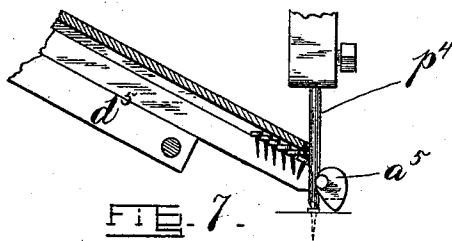


FIG. 7 -

WITNESSES -

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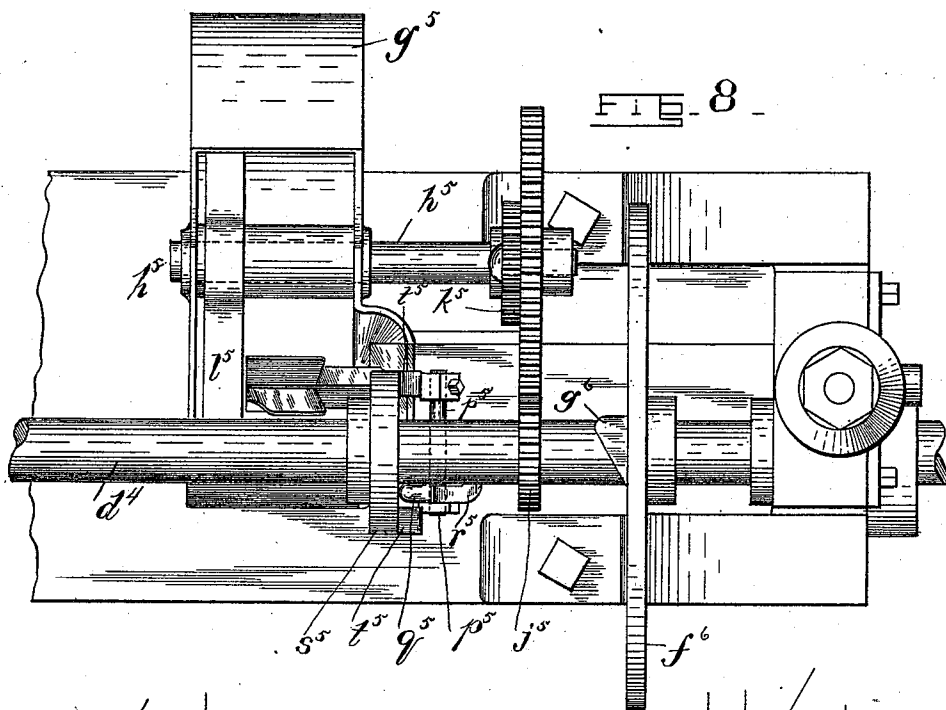
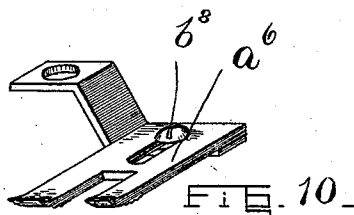
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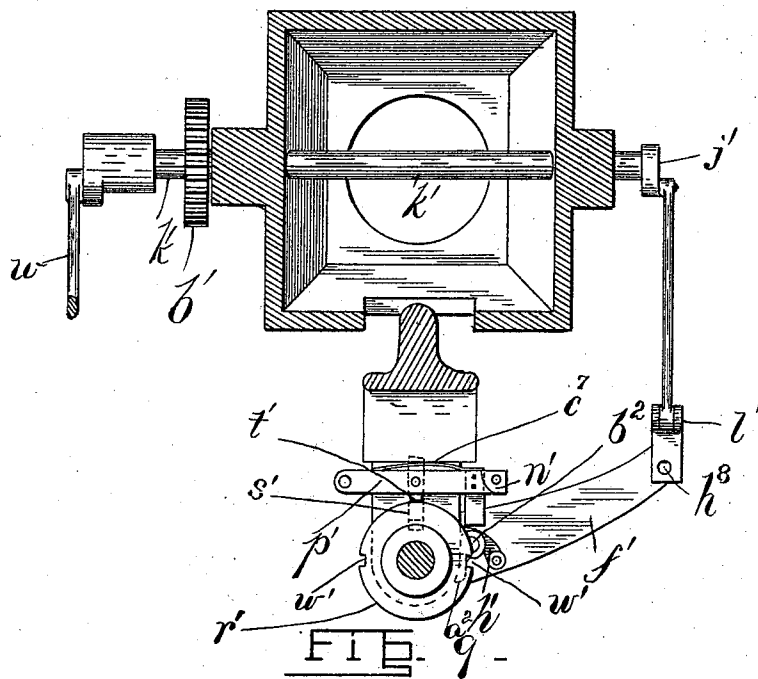
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# UNITED STATES PATENT OFFICE.

CHARLES H. KELLEY, OF REVERE, MASSACHUSETTS.

## LASTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 529,653, dated November 20, 1894.

Application filed December 20, 1892. Serial No. 455,780. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES H. KELLEY, a citizen of the United States, residing at Revere, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Boot or Shoe Lasting-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has for its object an improvement in lasting machines for boots and shoes and it consists of an organized machine embodying mechanism for holding the shoe after it has been assembled on the last, forcing the edge of the upper over the edge of the last, tacking the edge of the upper in this position and presenting successive portions of the edge of the upper to the tacking device in order that the entire edge of the upper may be properly secured in place.

The invention further consists in certain details of construction and arrangement of the various parts of the mechanism all of which are pointed out in the claims which are appended hereto and form a part hereof.

In the accompanying drawings I have shown my device in the best form now known to me, and in the following description of my invention I will refer to said drawings, using like letters of reference to designate like parts throughout the same.

In said drawings, Figure 1 is a side elevation of my machine, the standard being broken away. Fig. 2 is a front elevation thereof. Fig. 3 is a rear elevation thereof. Fig. 4 is a side elevation enlarged and partially broken away showing the tack-delivering mechanism. Figs. 5, 6 and 7 are details designed to show the construction and operation of the tack-holding and separating devices. Fig. 8 is a plan view of that portion of the device shown in Fig. 4. Fig. 9 is a plan view partially in section of the parts below the line 9—9 Fig. 1. Fig. 10 is a perspective view of the arm or presser-foot which smoothes down and holds the edge of the upper while it is being tacked, said view also showing the offset portion of the arm by means of which it is secured to the sliding plate by which it is actuated.

I will first describe the mechanism by means of which successive portions of the edge of

the upper are presented to the tacking device. The parts of the shoe being properly assembled on the last, the last is placed upon a jack which is shown in Figs. 1 and 2. This jack consists of a base *a*, which is set upon a block *b* and secured thereon by the pins *f*<sup>8</sup>, said block *b* being secured to a sliding block *c* which is adapted to slide in a recess or groove formed lengthwise of the support *d*. The support *d* is set on a short vertical shaft *e* which is journaled in an arm *f* which projects from the frame of the machine. The block *b* is cut away as shown at *g*, Fig. 1, to accommodate a cross-piece *h* which is rigidly secured on a block fast to the part *c*. Each end of the cross-piece *h* is provided with a series of teeth shown at *j*, Fig. 1, which are adapted to engage with the screw *k*, Fig. 2. On the base-piece *a* are secured two uprights or rests *l m*, the upright or rest *l* being constructed in the usual manner and provided at its upper end to receive the toe of the last and the upright or rest *m* being in the form of a pivoted support adapted to receive the heel of the last and to secure the same rigidly in place. On the upright *l* are pivoted spring-arms *n* one of said arms being on each side of the upright *l* as shown more clearly in Fig. 2. The arms *n* are provided with vertical spring-fingers *p* which are slightly curved and which are adapted to bear at their upper ends against the sides of the upper on the last to smooth the upper over the last and to hold in place thereon.

When the last on which the shoe has been assembled is placed on the jack the heel of the last is placed on the support *m*, the toe of the last extending upwardly and the support *m* being swung backwardly on its pivot. The last is then brought downward into the position shown in Fig. 1, with the toe resting on the toe support or rest. In bringing it to this position, the upper ends of the spring fingers *p* strike the upper and as the last is forced down they spread apart rubbing against the upper and smoothing it over the last. The spring of the fingers *p* enables them to act in this manner, as does also the spring of the arms *n*, the latter enabling the arms *n* to be sprung apart or separated farther from each other on the opposite sides of the last. The holder or piece *d* which carries the jack and

its mechanism may be swung on the stud or shaft *e*, which is journaled in the arm *f* through an entire circle so that the entire edge of the upper around the heel and toe and along the sides of the shoe may be presented to the tacking mechanism. When the shoe is ready to be tacked the first tack is driven at one side of the toe. In Figs. 1 and 2, the parts are represented in the position which they occupy when the shoe is about half tacked. When the tacking is begun the parts of the jack mechanism are in a position at right angles or substantially so to the position in which they are shown in said Figs. 1 and 2 and the mechanism is such that the last is caused to travel along in substantially a right line to present successive points of the upper along the sides of the shoe to the tacking device. It is then turned through a half-circle around the heel and then travels in a right line to present the other side of the shoe to the tacking device and then swings through another half-circle when the toe is tacked. If therefore the tacking operation is to be commenced at one side of the toe which is desirable, the block *d* is swung around from the position shown in Figs. 1 and 2, until it is parallel with the screw shaft *k*. In this position the teeth *j* upon one side of the cross-piece *h* are in engagement with the screw *k*. If now the screw is caused to rotate the sliding block *c* and the jack mechanism which is mounted on it will be moved endwise in a line parallel with the screw *k*. The distance which the said parts are carried at each feed movement, and correspondingly the distances apart at which the tacks are driven along the sides of the shoe may be varied by varying the thread of the screw and the shape of the teeth *j* as will be obvious. I prefer, however, to vary the feed occasioned at each movement of the screw *k* by adjusting the connection *w*, and thus varying the extent to which the gear *s* is moved at each revolution of the crank *a'*. The connection *w* may be adjusted to effect this object by shifting the pivot by means of which it is secured to the arm *t* to a point nearer to or farther from the shaft on which said arm *t* is secured. As the jack mechanism is moved in this manner its movement must be intermittent inasmuch as it must stop each time a tack is driven. I have found it essential for the best results that in rounding the heel or toe the feed movement should be shorter than when the sides are being presented to the tacking mechanism, and that the extent of the feed movement in rounding the heel or toe of a shoe should remain unaffected by any change that is made in the mechanism which acts to move the jack devices endwise of the last, in order that the arrangement of the tacks at the heel and toe may not be disturbed. To this end I provide independent mechanism for turning the jack-supporting device at the heel and toe, the same being constructed to impart to the same the predetermined extent of feed movement

that is deemed most suitable for locating the tacks and the plaits in the edge of the upper at the heel and toe.

For the purpose of rotating the screw *k*, which causes the jack to move in a right line, I have provided a pinion *q*, which is fast on the end of the screw-shaft *k*, the said shaft being journaled in projections *r* from the frame. A gear *s* mounted on a stud on the frame of the machine, engages the pinion *q*, as will be clear from Fig. 1. A projection or boss on the gear *s* carries a lever or arm *t* mounted loosely thereon, said lever or arm being provided with a pawl *t'* which engages with a ratchet *s'* on the boss of the said gear *s*. By this device, the arm *t* will cause the gear *s* to revolve when said arm is moved in one direction—that is through one half of each revolution of the crank arm *a'*, while the gear is stationary when the arm is moved in the opposite direction, through the other half of each revolution of said crank arm. On the arm *t* is pivoted a connection *w*, the other end of which is pivoted to an arm *a'*, which is fast on the hub of the gear *b'*. The gear *b'* is in mesh with a gear *c'* which is fast on the main driving shaft *d'* of the machine. As the main shaft revolves the gear *b'* is caused to revolve carrying with it the crank-arm *a'*. This causes the gear *s* to be revolved through one half of the revolution of the gear *b'* while throughout the other half of the revolution of said gear *b'*, the gear *s* is stationary. In this way the screw *k* is given an intermittent movement, as will be clear.

When the screw moves it causes the jack mechanism to travel forward, and when it stops, a tack is driven. In this way successive portions of the edge of the upper are presented to the tacking device and secured in place. When the heel of the last is reached, the jack mechanism must swing through half a circle and must move intermittently, and with a considerably shorter feed movement than that which customarily is occasioned when the sides of the shoe are being tacked. This slow movement at the heel and toe is very important since it allows the upper to be plaited down evenly at these points and as the plaits are closer together than along the sides, the plaiting and smoothing down are much more difficult to do than usually is the case throughout those portions of the shoe which are comparatively straight and where the plaits are not frequent or large.

For the purpose of turning the jack at the heel or toe, I provide an arm *f'* which is journaled loosely on the vertical stud or shaft which carries the jack mechanism. On this shaft or stud is rigidly secured a ratchet *g'* and co-operating with this ratchet is a pawl *h'* which is pivoted on the arm *f'*. The arm *f'* is reciprocated by means of a crank-arm *j'* on the shaft *k'*, said crank being connected to said arm *f'* by means of a pivoted link *l'* pivoted at one end on the crank pin and at the other to an arm or plate extending rear-

wardly from the arm  $f'$  and secured by a vertical pivot  $h^3$  to said arm  $f'$ . It will be clear that as the arm  $f'$  is moved backward during one half of each revolution of the crank  $j'$  the stud  $e$  and the jack mechanism will be turned, while when the arm  $f'$  is moved in the opposite direction the pawl  $h'$  will slip over the teeth of the ratchet  $g'$  and the stud  $e$  and jack mechanism will remain stationary. In this way the heel of the shoe is rounded, the movement being comparatively slow and giving ample time for the proper plaiting down and placing of the upper, while the intervals of rest allow time for a tack to be driven.

While the jack is moving in a right line and until the tacking mechanism is over the beginning of the curve of the heel, the pivoted support  $d$  is held locked from rotation. The arm  $p'$  Figs. 2 and 9 pivoted on the projection  $q'$  from the arm  $f'$  is provided with a spring  $c'$  which tends to force it toward the disk  $r'$  which is fast on the stud or shaft  $e$ . Underneath the arm  $p'$  is placed a slide  $s'$  which is secured to said arm  $p'$  by means of a pin. The slide  $s'$  moves in a recess on top of the arm  $f'$  and is provided with a tooth or projection  $t'$  which fits the notches  $w'$  in the periphery of the disk  $r'$ . The said disk  $r'$  is provided with two notches  $w'$  on opposite sides of the said disk. The engagement of said tooth or projection with either of said notches locks the pivoted support from rotation as aforesaid. For the purpose of throwing into operation the mechanism just described which turns the shoe when the heel is reached, a downwardly projecting piece  $m'$  is secured to each side of the traveling bed  $c$  which carries the jack mechanism. When the jack has moved in a right line until the tacking mechanism is over the beginning of the curve of the toe or heel, one of the pieces  $m'$  comes in contact with a beveled projection  $n'$  on the pivoted arm  $p'$ , thereby moving said arm in a manner to act upon slide  $s'$  and withdraw its tooth or projection  $t'$  from the notch  $w'$  which it occupies, thereby unlocking the pivoted support.

When the jack mechanism is moving in a right line—that is when the machine is tacking the sides of the shoe the pawl  $h'$  must be held out of contact with the ratchet  $g'$  in order that the movement of the arm  $f'$  will not cause the stud or shaft  $e$  which supports the jack mechanism to turn. For the purpose of keeping the pawl  $h'$  out of engagement with the ratchet  $g'$  except when the heel or toe are being tacked, I provide a projection  $a^2$  on the arm  $f'$  and in a vertical hole therein I secure a pin  $b^2$  which by means of the spring  $c^2$  is normally held up out of the path of the pawl  $h'$ . The upper end of the pin  $b^2$  is beveled and is so located that when the lever arm  $p'$  is moved, moving the slide  $s'$  and unlocking the disk  $r'$  it will free the pin and allow the spring  $c^2$  to raise the pin out of engagement with the pawl  $h'$  so that the pawl will then engage with the ratchet. When the jack

mechanism has been turned through a half circle the tooth  $t'$  will snap into the other notch  $w'$  on the disk  $r'$ , the lever  $p'$  will force the pin  $b^2$  downwardly freeing the pawl  $h'$  from its ratchet and the jack mechanism will then be moved in a right line while the other side of the shoe is being tacked. As will be obvious, the downwardly projecting piece  $m'$  may be set at any point upon the sliding base  $c$  and thus the tripping of the lever arm  $p'$  and the operation of the mechanism which has been described for turning the jack when the heel or toe of the shoe has been reached, may be governed, and shoes of different lengths accommodated. After the heel has been turned the teeth at the opposite end of the cross-piece  $h$  will engage the screw  $k$  and the other side of the shoe will be intermittently fed forward under the tacking devices. As the sole of a shoe is curved the tacks along the sides thereof are not all in the same plane, either vertically or horizontally. This necessitates both a horizontal and vertical movement of the tacking device, and the amount of vertical and horizontal movement of the tacking device will obviously vary in accordance with the shape of the last. To provide for these movements, I employ cams which are shown at  $a^3$  and  $b^3$ , Fig. 3. These cams are splined on their shafts and while only one cam is shown on each shaft, a number may be provided varying in shape and if a different shaped shoe is to be tacked, a cam of corresponding shape may be slipped into operative position on the shaft. The same cam may also be used for lasts of different shape by clamping a strip on its periphery of a proper shape, thus in effect changing the periphery of the cam. This method of changing the throw of a cam is not new and will not require a more detailed description.

The cam  $a^3$  serves to move the tacking mechanism vertically. It is mounted on a shaft  $c^3$  which is provided at one end with a crank  $d^3$  which is journaled loosely thereon and which is connected by means of a pivoted connecting-rod  $e^3$  with a crank  $f^3$  which is fast to the shaft  $d'$ . The connection  $e^3$  may be adjusted to vary the movement of the cam  $a^3$  in the same manner as may the connection  $w$ . The crank  $d^3$  is provided with a pawl  $d^{3a}$  which engages a ratchet  $g^3$  which is fast on the shaft  $c^3$ . By this arrangement the shaft  $c^3$  is caused to revolve throughout one half of each revolution of the shaft  $d'$ . The rotation of the shaft  $c^3$  causes the cam  $a^3$  to revolve and to depress the rear end of the lever  $h^3$ . The lever  $h^3$  is pivoted at  $j^3$  between uprights on the frame of the machine and is forked at its forward end and provided with anti-friction rolls  $k^3$  one of which is shown in Fig. 1, which bear against blocks  $l^3$  which are secured one at either side of the vertically moving supporting frame  $m^3$ . The blocks  $l^3$  are secured by means of bolts  $n^3$  which pass through flanges on said blocks and by means of which said blocks  $l^3$  may be vertically adjusted.

The supporting frame  $m^3$  upon which the tacking mechanism is mounted is arranged to slide vertically inside the corner posts or uprights  $p^3$ . If desired a counter-balance may be attached to the end of the lever  $h^3$  in the well-known manner so that the weight of the tacking mechanism will be largely taken from the cam  $a^3$  and the wear of the cam will thus be lessened. This is, however, not essential to the operation of the machine. The vertical shaft  $q^3$  by means of which power is communicated to the tacking mechanism is journaled in the stationary upright support  $r^3$  and is adapted to slide vertically therein to accommodate the vertical movement of the tacking mechanism. The upright  $c^4$  through which the upper shaft  $d^4$  passes is also arranged to slide vertically in a socket in the lateral extension of the support  $r^3$  to permit of the vertical movement of the tacking mechanism.

The horizontal or forward and backward movement of the tacking mechanism is obtained in a similar manner by means of the cam  $b^3$  heretofore referred to. This cam is mounted on a shaft  $s^3$  which is driven by means of the gear  $t^3$  from the gear  $w^3$  on the shaft  $c^3$  and is thus given the same intermittent movement which is communicated to the said shaft  $c^3$ . The frame which supports the tacking mechanism is mounted on a table or base  $a^4$  which slides horizontally on the support  $m^3$ . At the rear of this table a vertical plate  $b^4$  is mounted on a screw bolt so that it may be adjusted toward or from the said table or base  $a^4$ . As the cam  $b^3$  revolves it presses against the plate  $b^4$  and forces the tacking mechanism forward horizontally. The forward movement of the arm hereinafter referred to which smooths the edge of the upper over the edge of the last and holds it in position while a tack is being driven operates to force the tacking mechanism rearwardly and thus to keep the plate  $b^4$  always in contact with the cam  $b^3$ .

It will be understood that the vertical and horizontal movement of the tacking mechanism are comparatively slight, the irregularity of the line of tacks along the side of a shoe being slight even when lasts of the most irregular form are employed. For the purpose of operating the tacking mechanism, I provide a gear  $h^4$  which is set on the main shaft  $d'$  and which is in mesh with a gear  $j^4$  which is fast on a horizontal shaft  $k^4$  which is journaled in a projection from the stationary frame of the machine. See Fig. 3. The shaft  $k^4$  is connected by means of beveled gears  $l^4$   $m^4$ , see Fig. 1, with the vertical shaft  $q^3$  which is adapted to slide vertically in bearings in the stationary upright  $r^3$ . The upper end of the shaft  $q^3$  is connected by means of the beveled gears  $f^4$   $e^4$  with the horizontal shaft  $d^4$  which is journaled in supports projecting from the upper movable frame of the machine. As previously stated the upright  $c^4$  moves vertically in a slot in a lateral projec-

tion from the stationary upright  $r^3$  to permit of the vertical movement of the tacking mechanism. The shaft  $d^4$  passes through the upright  $c^4$  and the latter serves to hold the beveled gear  $e^4$  in mesh with the gear  $f^4$  when the tacking mechanism moves rearwardly. The driver  $p^4$  is secured in a driver-bar  $q^4$  which is arranged to slide vertically in a post or upright  $r^4$  at the front upper part of the machine. The driver-bar  $q^4$  is forced downwardly by means of a spiral spring which is secured thereto in the well-known manner and which is placed within the post  $r^4$ . For the purpose of raising the driver, a cam  $s^4$  is secured on the upper shaft  $d^4$  and engages a roll  $t^4$  set on a stud on the face of the driver-bar. As the shaft  $d^4$  revolves the driver is raised, and when the projecting portion of the cam passes the roll  $t^4$  the driver is forced downwardly to drive the tack. The driver  $p^4$  is beveled slightly at the driving end, the bevel being at the rear side of the driver. This is important as it enables the driver to serve as a separator, that is the flat end of the driver operates to drive the tack which is held in the pivoted holder  $a^5$  and the beveled portion of the driver forces back the next succeeding tack, separating it from the tack in the holder. The holder is of the irregular-cam shape shown in Fig. 6, and is grooved at  $b^5$  to hold a tack and at  $c^5$  to accommodate the driver when the driver is down. The holder is provided with trunnions, so that it may be pivoted between the sides of the race-way  $d^5$  at the lower end thereof and one of the trunnions is provided with a spring  $e^5$  which bears on a pin  $f^5$  set in the side of the race-way. The tack in the holder lies in an inclined position as shown in Fig. 5.

When the driver descends and strikes the tack in the holder, the holder swings on its pivot and the tack is delivered in a vertical position to the stock. The farther descent of the driver causes the parts to assume the position shown in Fig. 7, in which the holder is swung still farther on its pivot, the driver lying in the groove  $c^5$  and serving to hold the tacks in the race-way and prevent their leaving it. As soon as the driver is raised the spring  $e^5$  causes the holder to follow the driver up so that when the driver is clear of the holder, the holder will be back in its normal position shown in Fig. 5, and will be ready to receive the next succeeding tack. I have found this arrangement for delivering the tacks one by one and driving them into the stock to be simple and efficient and not likely to get out of order. The race-way  $d^5$  is of well-known construction and I prefer to make it adjustable so that the two halves may be separated to a greater or less extent by means of an adjusting screw, thus providing for differences in the size of the tacks which may be employed. The hopper from which the tacks are delivered from the race-way is shown at  $g^5$  and consists of a stationary box, prefer-

ably of approximately cylindrical form. A shaft  $h^5$  is journaled in the hopper and is operated from the upper shaft  $d^4$  by means of a train of gears of which the gear  $j^5$  is on the shaft  $d^4$  and the gear  $k^5$  is on the shaft  $h^5$ . The intermediate gears are used for the purpose of reducing the speed. The shaft  $h^5$  is provided with one or more arms  $l^5$  which are provided with buckets  $m^5$  which carry the tacks in the hopper upwardly and drop them on an extension of the race-way which projects inside the hopper.

For the purpose of clearing or knocking off the tacks which do not assume the right position at the top of the race-way, I provide a reciprocating-arm  $n^5$  which is pivoted at  $p^5$  in an upright plate which is secured at the side of the race-way. On the pivot  $p^5$  is also secured an upwardly extending piece  $q^5$  which by means of the spring  $r^5$  is pressed against the face of the disk  $s^5$  which is mounted on the shaft  $d^4$ . The disk  $s^5$  is provided with beveled projections  $t^5$  set on the face thereof and as the disk revolves the arm  $q^5$  is thrown forward, said arm being moved in the opposite direction by means of the spring  $r^5$ . This gives a quick vibratory movement to the lower end of the arm  $n^5$  and causes it to knock off any tacks which are not in proper position on the race-way and it also jars the race-way causing the tacks to move down the same. The end of the arm  $n^5$  is a sufficient distance from the race-way to allow the heads of the tacks to pass.

For the purpose of smoothing the upper down and pressing and holding it tightly over the edge of the last while the tack is being driven and preparatory thereto, I provide an arm or presser-foot  $a^6$  which is flanged at its forward end as shown in Fig. 10, and which extends forward toward the last directly beneath the end of the race-way. This arm is roughened slightly at its forward end to better seize the upper and is offset as shown and is secured to the horizontally sliding plate  $b^6$  which is arranged to slide in ways secured by screws  $a^8$ , see Fig. 4, on the base or table  $a^4$ . The upper edge of the plate  $b^6$  is provided with projections  $c^6$   $d^6$  which projection either side of the periphery of a disk  $f^6$  which is set on the shaft  $d^4$ . The disk  $f^6$  is provided with beveled projections  $g^6$  which are set on opposite faces of the disk as shown and at opposite sides thereof. As the disk  $f^6$  revolves, the plate  $b^6$  is moved forward and backward and the arrangement is such that the plate  $b^6$  moves forward forcing the forward foot  $a^6$  as soon as the jack mechanism stops and just before a tack is driven. The forward branched end of the foot  $a^6$  is curved upwardly slightly so that it will move over the edge of the upper. The foot  $a^6$  is preferably constructed in two parts so that it may be lengthened or shortened to accommodate shoes and uppers of different

sizes. It may be adjusted by means of the screw  $b^8$  as will be clear from Fig. 10. The hand-wheel shown at  $h^6$  Fig. 1 is simply provided as a convenient means for moving the parts of the mechanism by hand in case that may be necessary to bring them to a certain position when the machine is not in operation.

What I claim is—

1. A lasting machine embracing a jack-device for supporting a last having a shoe applied thereto, a support for said jack device, devices for laying the edge of the shoe-upper over the sole of the last into position for being tacked down, tacking mechanism, a train of actuating devices engaging with the jack device and operating to move the latter upon the support therefor in a direction lengthwise of the last, and a separate train of actuating devices having independent operative connection with the said support and constructed to turn the same in rounding the heel and toe of the shoe, substantially as described.

2. A lasting machine embracing a jack-device for supporting a last having a shoe applied thereto, a support for said jack device, devices for laying the edge of the shoe upper over the sole of the last into position for being tacked down, tacking mechanism, a train of actuating devices engaging with the jack device, operating to move the latter upon the support therefor in a direction lengthwise of the last, and having capacity for adjustment to enable the length of the feed movements to be varied as desired, and a separate train of actuating devices having independent operating connection with the said support and constructed to turn the same in rounding the heel and toe of the shoe, the feed movement occasioned thereby being unaffected by the adjustment of the actuating devices first mentioned, substantially as described.

3. The combination with tacking mechanism, of a jack for supporting the shoe, a jack-supporting block having oppositely positioned teeth fitted to engage alternately with the head of a feed-screw according as the parts are shifted to present opposite edges of the last to the tacking mechanism, a support on which the block is fitted to slide past the tacking mechanism, independent actuating means connected with the said support and adapted to rotate the same, and means for bringing said independent actuating means into action on the arrival of the end of the last at the tacking mechanism, substantially as described.

4. The combination, in a lasting machine, with tacking mechanism, of jack-mechanism, a bed on which said jack-mechanism is mounted to slide, means for sliding said jack-mechanism along said bed, a ratchet connected with said bed, a pawl for engaging with said ratchet, means for reciprocating said pawl, and means for rendering said pawl in-

operative to move the ratchet during the sliding movement of the jack-mechanism, and rendering it operative when an end of the last has been presented to the tacking-mechanism to produce at such time a rotatory movement of the bed and jack-mechanism, substantially as described.

5. In a lasting machine embracing tack-delivering and driving mechanism, the combination therewith of a jack mounted on a sliding block set in a pivoted support, means for actuating said sliding block relatively to said support, a pawl and ratchet mechanism for swinging said jack mechanism on its pivot means for preventing the pawl from engaging the ratchet while the side of the last is being presented to the tacking mechanism and mechanism intermediate said sliding block and said pawl and ratchet mechanism whereby when the sliding block is moved a given distance to present the side of a shoe to the tacking mechanism, the pawl of the pawl and ratchet mechanism will be thrown into engagement with the ratchet to turn the jack mechanism on its pivoted support to present the heel or toe of the shoe to the tack-mechanism, substantially set forth.

6. The combination in a lasting machine with jack mechanism mounted on a pivot or vertical shaft  $e$  of the notched disk  $r'$ , a projection for engaging the notches on said disk, actuated by a spring-impelled arm, a pawl and ratchet mechanism for rotating said shaft or pivot  $e$ , and a pin intermediate said arm and said pawl whereby when the said arm is thrown forward by its spring the pawl is held out of engagement with the ratchet, substantially as set forth.

7. The combination in a lasting machine with a jack mechanism mounted upon a sliding block set on a pivoted support, means for moving said block relatively to said support, mechanism for rotating the jack mechanism on its pivot, and a downwardly projecting movable arm secured on said sliding block and operating to throw said jack rotating mechanism into or out of engagement, whereby by adjusting the downwardly projecting arm on the sliding block the jack mechanism may be caused to rotate at any point in the movement of the sliding block to accommodate shoes of various lengths, substantially as set forth.

8. The combination in a lasting machine with a vertical shaft which supports the jack mechanism of a ratchet on said shaft, a reciprocating arm carrying a pawl normally engaging said ratchet, means for reciprocating said arm, and a spring-actuated pin and mechanism for operating the same whereby the pawl is held out of engagement with the ratchet when the jack mechanism is moving in a right line, substantially as set forth.

9. In a lasting machine the combination with a vertically movable supporting frame carrying a tacking mechanism, of a cam-actuated lifting-lever and adjustable blocks  $b^3$  intermediate said lifting-lever and the vertically movable supporting frame whereby said frame may be adjusted relatively to said lever, substantially as set forth.

10. In a lasting machine in which the tacking mechanism is movable vertically and horizontally in right lines, the combination therewith of intermittently operated cams for moving said tacking mechanism vertically and horizontally, the shafts of said cams being geared together and operated by means of a reciprocating arm carrying a pawl engaging a ratchet on one of said cam shafts, said arm being actuated by means of a connecting-rod, connecting said arm with a revolving crank arm, substantially as set forth.

11. In a lasting machine in which the tacking mechanism is movable vertically in a right line, the combination therewith of an intermittently actuated cam for moving said tacking mechanism in one direction and a reciprocating foot engaging the upper on the last which operates to move the tacking mechanism in the opposite direction, substantially as set forth.

12. A tack driving mechanism comprising a hopper and a race-way for delivering the tacks, a spring-actuated pivoted holder to receive a tack from the end of the race-way, and a driver having the rear portion of its driving end beveled, whereby as the driver passes downward between the holder and the lowermost tack in the race-way it will operate to separate the lowermost tack in the race-way from the tack in the holder, substantially as set forth.

13. A tacking mechanism comprising a race-way for delivering the tacks, a pivoted holder mounted at the lower end thereof and grooved to receive a tack from the race-way, and on the opposite side to accommodate the driver, and a driver located rearwardly of the axis of the pivoted holder whereby when a tack is driven the driver may pass downwardly behind the axis of the holder, substantially as set forth.

14. A tacking mechanism embracing a driver, an inclined race-way for delivering the tacks, and a holder pivoted at right angles to the line of delivery of the tacks, having its upper surface normally standing in line with the race-way and having a recess or groove therein formed to hold a tack at right angles to the line in an inclined position preparatory to its being driven, said holder being shaped as shown whereby when it is swung through a portion of its movement the tack will engage with and be driven straight into the material, substantially as set forth.

15. In a lasting machine the combination  
with the shoe holding mechanism and with  
tack delivering and driving mechanism of the  
smoothing and holding foot  $a^6$ , the sliding  
5 plate  $b^6$  having projections  $c^6$   $d^6$  and the co-  
operating disk  $f^6$  having projections  $g^6$  and  
means for rotating said disk, substantially as  
set forth.

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

CHARLES H. KELLEY.

Witnesses:

WM. A. MACLEOD,  
ROBT. WALLACE.