

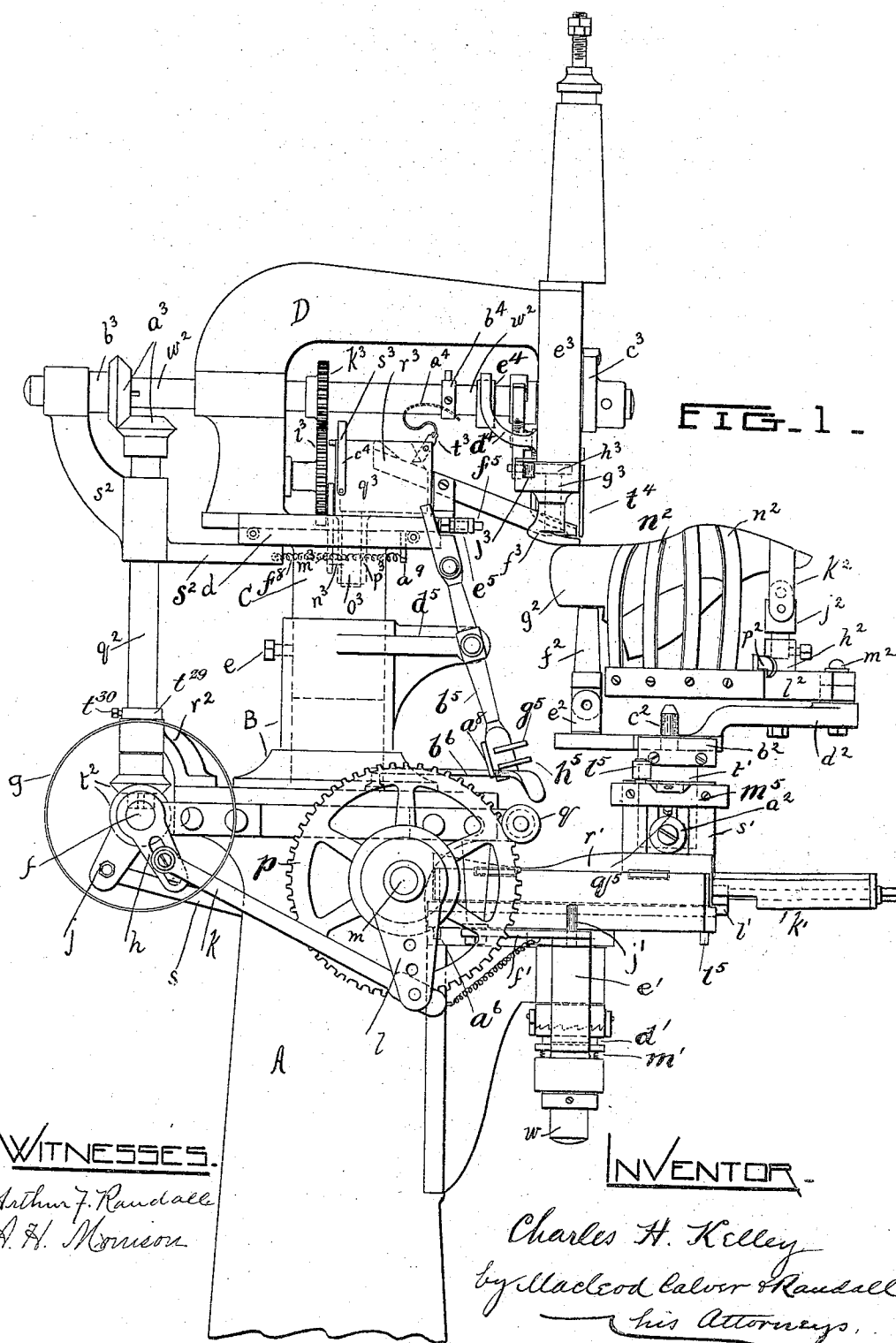
(No Model.)

C. H. KELLEY.
LASTING MACHINE.

3 Sheets—Sheet 1.

No. 529,390.

Patented Nov. 20, 1894.



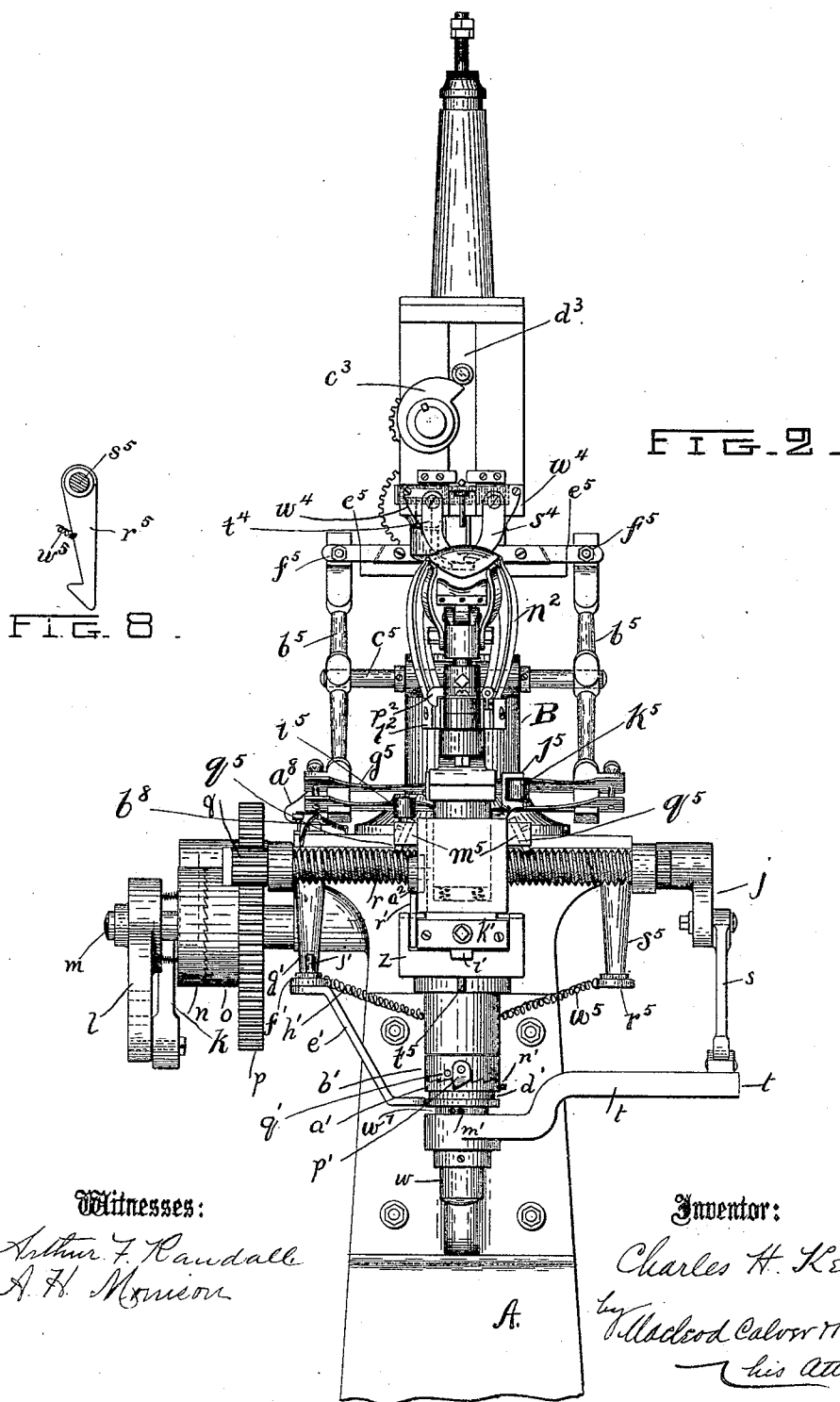
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3 Sheets—Sheet 2.

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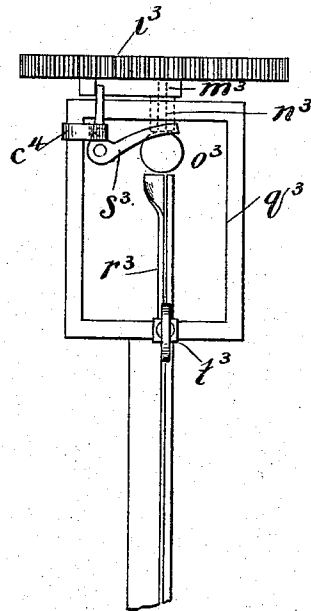
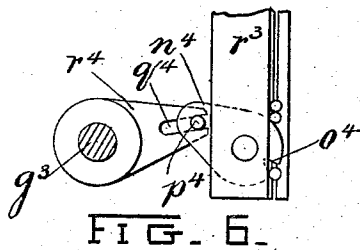
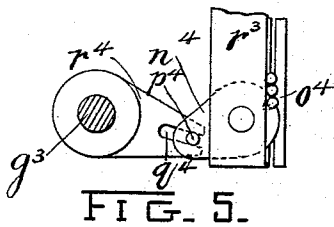
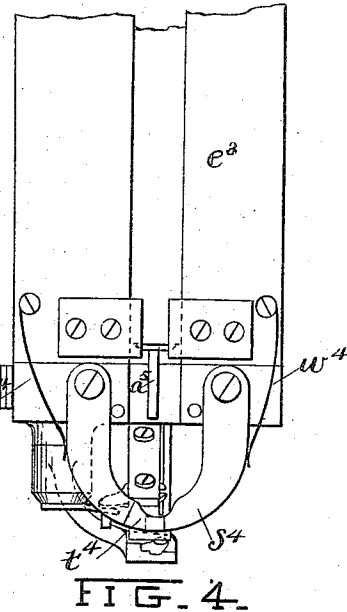
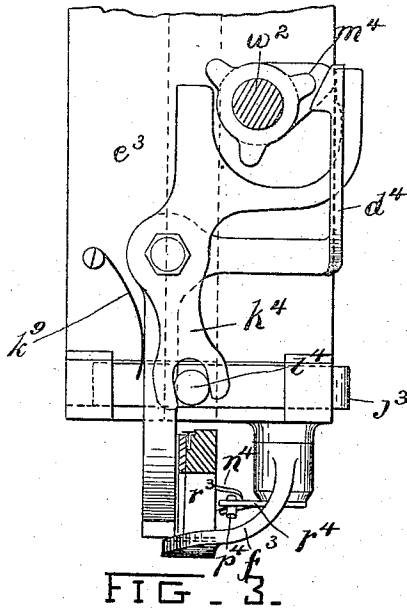
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3 Sheets—Sheet 3.

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WITNESSES.

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LASTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 529,390, dated November 20, 1894.

Application filed August 31, 1893, Serial No. 484,449. (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 Machines for Lasting Boots and Shoes, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has for its object to provide a compact, inexpensive and durable machine for lasting boots or shoes which shall be simple in construction, and easy of operation, and it consists in a machine constructed as hereinafter set forth, embracing mechanism whereby the upper is smoothly and evenly drawn over the last and held in position, devices whereby the jack is so moved as to present successive portions of the edge of the sole to the tacking mechanism, tacking mechanism and means for operating the tacking mechanism so as to automatically locate the same in proper position to drive successive tacks on the sole of a shoe of any shape or size, all as will be hereinafter more particularly described and the novel features 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 invention in the best form now known to me, and in the following description reference is had thereto.

In said drawings, Figure 1 is a side elevation of my machine, the upper portion only of the standard being shown, and Fig. 2 is a front view thereof. Fig. 3 is a rear side view of the lower portion of the head. Fig. 4 is a front view thereof. Fig. 5 is a plan view of the separator device whereby the lowermost tack in the raceway is separated from the succeeding tack. Fig. 6 is a similar view of the separator, showing the parts in a different position. Fig. 7 is a plan view of the hopper showing a portion of the raceway and also showing the device which transfers the tacks from the hopper to the raceway. Fig. 8 is a detail.

Lasting machines, as at present constructed, so far as known to me, are large and complicated, expensive in construction, and require not only skilled operators to obtain the best results but also require operators having con-

siderable physical strength so that only men are able to operate them. My machine is designed among other things to obviate these objections and to produce a simple and inexpensive machine which may be operated by a girl or woman.

At A is shown the standard of the machine which may be of any suitable material and of any desired shape. On top of the standard is firmly secured a hollow upright B preferably cylindrical in form in which is received the shank or support C of the bed *d*. The shank C may be raised or lowered, raising or lowering the bed *d*, and secured in any given position by means of a set screw *e*. The tack driving mechanism rests upon the bed *d* and is adapted to slide horizontally thereon during the operation of the machine, but said tacking mechanism and the connecting parts which operate the same have no vertical movement in the operation of the machine. The upper frame D which directly supports the tacking mechanism is of the goose neck shape shown and is mounted between gibs or ways on the bed *d* so that it may be moved horizontally thereon.

The main shaft is shown at *f* and is mounted in bearings in projections from the top of the standard A. A belt pulley *g* is placed on said shaft *f* by means of which power is applied to the machine. Said shaft *f* is provided at its opposite ends with cranks *h* *j*, the crank *h* being slotted lengthwise as shown in order that the connecting rod *k* may be adjustably secured thereto. The forward end of the connecting rod *k* is pivoted to a crank *l* which is provided with a series of holes lengthwise thereof, so that the connecting-rod may be adjusted with reference thereto. The crank *l* is fast on the shaft *m* which is mounted in bearings in the upright A. Rigidly secured on said shaft is one member *n* of a ratchet clutch mechanism, the other member of said clutch mechanism *o* being fast on the gear *p*. The member *o* and the gear *p* are mounted loosely on the shaft *m*. At each revolution of the crank *h*, the connecting-rod *k* is reciprocated, reciprocating the crank *l*, also the member *n* of the clutch mechanism, said member *n* being free to slip in one direction over the teeth of the other member *o* of the clutch mechanism, but engaging said clutch when

moving in the opposite direction, and thus moving the member *o* and gear *p* through part of a revolution at each reciprocation of the crank *l*. The gear *p* meshes with a pinion *q* formed on or fast to one end of the horizontal screw *r*. The screw *r* is mounted in bearings, which project from the top of the upright *A*, and extends across the front of the machine, as shown in Fig. 2, the purpose of the screw *r* being to actuate the jack carrier so that it will have an intermittent or step by step motion. The crank *j* at the opposite end of the shaft *f* is connected by means of a pivoted connecting rod *s* with the free end of a bent lever *t*, which is secured to a collar or sleeve *w*⁷ on the vertical shaft *w*, upon which the jack carrier bed *z* is mounted. On the upper end of the sleeve *w*⁷ is splined one member *a*⁷ of a ratchet clutch mechanism, the other member *b*⁷ of said mechanism, being fast on the said shaft *w*. The lever *t* is reciprocated at each revolution of the crank *j* and at each reciprocation of the lever the shaft *w* is turned through a part of a revolution, the member *a*⁷ of the clutch mechanism being free to move in one direction without moving the member *b*⁷ thereof, while by its movement in the opposite direction, the member *b*⁷ is moved, as will be clear. By means of the mechanism just described, the jack is rotated intermittently when the heel and toe of the shoe are being tacked. As the jack does not rotate except at such times as the heel and toe of the shoe are being tacked, the movement of the jack being in a right line while the sides of the shoe are subjected to the tacking mechanism, it follows that the clutch mechanism must be operative to turn the shaft *w* only at certain times, namely when the heel or toe of the shoe is reached.

For the purpose of throwing the clutch mechanism into and out of operation at other times, I secure the member *a*⁷ of the said mechanism in such manner that it will have a slight vertical movement on the sleeve *w*⁷, and I provide it with an annular groove *d*⁷ with which the free end of the lever arm or latch *e*⁷ engages when the member *a*⁷ is in its lowest position. When the end of the latch *e*⁷ is in the annular groove *d*⁷ the member *a*⁷ is held in its lowermost position and is thus out of operative relation with the other member *b*⁷ of the clutch mechanism, so that the arm *t* may at such times reciprocate without turning the shaft *w*. The latch *e*⁷ is of the shape shown in Figs. 1 and 2, and is fast to an arm *f*⁷ which is pivoted at the lower end of the downward projection *g*⁷ fast to the standard of the machine. The arm *f*⁷ is free to swing toward and from the jack carrier bed, but is drawn toward said bed by means of a spring *h*⁷ which operates to throw the free end of the latch *e*⁷ into the groove *d*⁷ whenever the member *a*⁷ is moved downwardly. For the purpose of releasing the latch *e*⁷ from the groove *d*⁷, I provide a pin *j*⁷ which is set in the arm *f*⁷ and projects upwardly therefrom in the path of

the portion *l*⁷ of the jack carrier *k*⁷. When the jack has moved a sufficient distance in a right line to tack the side of a shoe the end of the part *l*⁷ strikes the pin *j*⁷ forcing back the latch *e*⁷ and freeing it from the groove *d*⁷. As soon as the latch *e*⁷ is thus freed, springs *m*⁷ which are placed underneath the member *a*⁷ and between said member and the lever *t* act to force the member *a*⁷ upwardly into engagement with the other member *b*⁷ of the clutch. Reciprocations of the arm *t* are then effective to intermittently turn the shaft *w* and the jack, to present the heel or toe of the shoe to the tacking mechanism. When the jack has turned through one hundred and eighty degrees and the heel or toe has been tacked, the pin *n*⁷ which projects from the member *a*⁷ is brought into contact with the beveled end of one of the pivoted latches *p*⁷ which are on the upper member *b*⁷ of the clutch. The latches *p*⁷ are set in opposite sides of the clutch member *b*⁷ and are prevented from moving in one direction by pins *q*⁷. The pin *n*⁷ is thus forced to ride the beveled face of the latch and operates to force the member *a*⁷ of the clutch mechanism downwardly against the pressure of the springs *m*⁷ and when the groove *d*⁷ is opposite the free end of the latch *e*⁷ the spring *h*⁷ operates to throw the latch *e*⁷ into the groove *d*⁷ and the members of the clutch are thus held out of engagement while the other side of the shoe is being tacked. When the opposite end of the shoe is reached, the opposite end of the part *l*⁷ of the jack carrier is brought into contact with the pin *j*⁷ thus freeing the member *a*⁷ and allowing the clutch to again operate to turn the shoe while the opposite end or toe thereof is being tacked.

The jack mechanism upon which the shoe is carried while it is being presented to the tacking mechanism is supported upon the bed *z* which is mounted on the top of the vertical shaft *w*. The bed *z* is slotted lengthwise to form a slideway for the reception of the carrier *k*⁷, as also for the reception of the templet *r*⁷. The templet *r*⁷ is a counter-part of the vertical lengthwise curvature of the sole of the last and requires to be changed whenever a change is made in the style of last upon which the shoe is lasted, that is to say, whenever the vertical lengthwise curvature of one style of lasts differs from that of another. For lasts of different sizes no change of the templet *r*⁷ is required provided the lasts are of the same style or form. This templet is made of sufficient length to accommodate the largest last and may be used for lasts of smaller sizes of the same form or style. If a templet *r*⁷ was made for a last of smaller size of the same form and style it would not differ from the templet employed for the largest size except in length, the larger templet being extended somewhat at each end. On the carrier *k*⁷ is mounted a block or frame *s*⁷ within which is placed the shank or downwardly projecting portion of the jack support *t*⁷. The support

t' may slide vertically in the frame or block s' thus raising or lowering the last. On one side of the support t' is placed a friction roll a^2 which is set on a stud projecting from said support and which is vertically in line with the templet r' , and rests on the upper edge thereof as shown. As the sides of the shoe are being tacked, the carrier k' and the jack mechanism resting thereon move lengthwise of said carrier, across the front of the machine and the shape of the templet is such that as the high portion of the sole of the last is reached the jack mechanism will be correspondingly lowered as the roll a^2 moves downwardly into a depression in the templet r' . It will thus be seen that any vertical curvature of the sole of the last may be provided for by a templet of corresponding shape. The top of the support t' is provided with a side piece b^2 as also with a vertical pin c^2 which projects from the top of the support t' and which passes through a hole in the bed d^2 of the jack. By means of the pin c^2 and the side piece b^2 the jack may be quickly and accurately placed in position on the support t' . The bed of the jack is curved vertically as shown in Fig. 1 and is provided at the rear with a stud e^2 in which is pivoted a post f^2 which supports the heel of the last g^2 . The toe rest consists of a post h^2 having a vertically adjustable upper portion j^2 on which is pivoted the toe rest k^2 in the well known manner.

l^2 are horizontal arms which are pivoted at m^2 on the bed d^2 . The arms l^2 extend horizontally toward the heel of the last and are provided with vertical spring arms n^2 which spring inwardly toward the side of the last at their upper ends, and which at their lower ends are secured by screw bolts to the horizontal arms l^2 . A latch p^2 is pivoted to a lug on one of the arms l^2 and projects across as shown in Fig. 2 to the other arm. The latch p^2 is of such a length that when the arms are forced together so that the spring arms n^2 bear against the sides of the last, the hook of the latch p^2 will pass over the arm l^2 , and the latch will then hold the arms l^2 together and prevent their spreading.

After the parts of the shoe are assembled on the last, the last is placed on the heel rest f^2 and the arms l^2 are brought together and latched, forcing the upper ends of the spring arms n^2 into contact with the sides of the upper, and the last is then forced downwardly into position on the jack, the upper being rubbed and smoothed down and held in place tightly over the last by the rubbing and pressing action of the ends of the spring arms n^2 . The jack is then placed in the machine, the bed d^2 being put in place on the support t' , and the shoe is ready to be tacked.

For the purpose of operating the tacking mechanism, I provide a vertical shaft q^2 , which is journaled in bearings in projections r^2 s^2 which are secured to and project from the top of the standard and bed d respectively. The beveled pinions shown at t^2 , one of said

pinions being on the shaft f , and the other on the shaft q^2 are employed to drive said shaft. The pinion t^2 on the shaft q^2 is splined thereon to permit the shaft to be raised or lowered when the part C is vertically adjusted. The collar t^{20} is adjustably secured by the screw t^{30} on shaft q^2 above the bearing in the projection r^2 , and rests upon the latter to hold the shaft from descending. The horizontal shaft w^2 which is journaled in bearings in the goose neck D as also in the upwardly projecting end of the arm s^2 is driven from the shaft q^2 by means of the beveled gears a^3 . See Fig. 1. The gear a^3 which is on the shaft w^2 is keyed thereon so that said shaft w^2 may move endwise as the upper frame D slides on the bed d , the said gear a^3 being held in mesh with the beveled gear on the upper end of the shaft q^2 by means of the collar b^3 which is placed between said gear and the end bearing of the shaft w^2 . The shaft w^2 is provided at its forward end with a cam c^3 which is in contact with a friction roll on the front of the driver bar d^3 and as the shaft w^2 revolves the cam c^3 operates to raise the driver bar and after raising it to free it so that said bar may be forced down to drive a tack by means of a spring which operates upon its upper end in the well known manner, and which is not indicated in the drawings. The driver bar d^3 slides vertically in the head e^3 and is of the usual construction and operation. A presser and holder shown at f^3 is mounted on the lower end of a short vertical shaft g^3 which is journaled in the lower portion of the head of the machine. The upper end of the shaft g^3 is provided with a gear h^3 which is in mesh with a rack j^3 which slides horizontally in the rear lower portion of the head e^3 . The rack j^3 is actuated by means of a lever k^4 which engages a stud l^4 on the rear side of said rack. See Fig. 3. The lever k^4 is pivoted on said head and is forked at its upper end where it is engaged by a cam or short arm m^4 which is fast on the shaft w^2 . At each revolution of the shaft the lever is caused to vibrate and the rack to reciprocate, causing a reciprocation of the presser foot f^3 . The presser f^3 is thrown forward in the arc of a circle, and its free end strikes and rides over the edge of the last, carrying the edge of the upper inwardly over the last, pressing and smoothing it down thereon, and holding it until a tack is driven, the free end of said presser f^3 being so mounted and shaped as to slide over the edge of the upper, and being also bifurcated so that the tack may be driven between the prongs or bifurcations thereof. The shaft w^2 is also provided with a gear k^3 which is in mesh with a gear l^3 which is set on a stud fast on the upright portion of the upper frame D. A crank pin on the face of the gear l^3 serves to actuate the connecting bar m^3 which is pivoted at its upper end on said crank pin, and at its lower end to a pin n^3 , which projects from the vertical plunger o^3 which is free to move vertically in a case

or socket p^3 provided therefor on the bottom of the hopper q^3 . The case p^3 is slotted vertically to permit the vertical movement of the pin n^3 as the gear l^3 revolves. The hopper q^3 is provided with tacks, and the object of the rod or plunger o^3 is to carry the tacks upwardly in order that they may be thrown onto the upper end of the raceway r^3 , the upper end of the plunger o^3 being flat. As it passes downwardly below the level of the bottom of the hopper, the mass of tacks therein close over it and as it moves upwardly it carries a number of the tacks up to the level of the upper end of the raceway r^3 . When it has reached the upper end of its movement a wiper s^3 passes across its top and throws the tacks which have lodged thereon onto the upper end of the raceway. The wiper s^3 consists of a pivoted lever, one end of which sweeps across the top of the plunger o^3 throwing the tacks thereon on to the raceway. The lever s^3 is operated to throw the tacks off the plunger by means of an arm which projects upwardly from the rod or connection m^3 and which, as the gear l^3 revolves trips the tail end of the wiper s^3 . The wiper is moved in the opposite direction by means of the leaf-spring c^4 which is secured to the hopper and is bent over at the top and brought into contact with the said wiper s^3 as shown in Fig. 7. A clearer t^3 is pivoted, as shown, on the hopper q^3 so that its lower end projects very closely to the raceway r^3 . The clearer t^3 is provided with a bent spring a^4 which projects into the path of a pin or series of pins on a collar b^4 , on the shaft w^2 , and thus as the shaft revolves the clearer t^3 is shaken or caused to move on its pivot, and all tacks which are not properly in the raceway are cleared therefrom and fall back into the hopper. When the tacks are properly in place on the raceway the jarring of the machine causes them to travel down the raceway to its lower end where they are presented one by one to the driver in position to be driven into the shoe. To assist in jarring the raceway to insure the tacks traveling down the same, a lever d^4 is employed which is pivoted on the rear face of the head e^3 . The lower end of this lever strikes the side of the raceway near the lower end thereof when the lever is moved. The upper end of said lever is in the path of a cam e^4 on the shaft w^2 , and as the shaft revolves the lever is swung on its pivot causing the lower end of the lever as it flies back under pressure of spring k to strike the raceway and jar the same.

For the purpose of separating the tack at the lower end of the raceway from the next succeeding tack, I provide a separating device comprising a pivoted part or transferer n^4 , see Figs. 5 and 6, which is placed in the raceway underneath the top plate thereof in such position that as it is reciprocated its free end will move in the arc of a circle in the pathway of the tacks. Said free end of the part n^4 is notched as shown at o^4 , the

notch being large enough to receive a single tack. When the tack is in the notch o^4 its head rests on top of the raceway. That portion of its shank directly underneath the head is in the notch o^4 , and its point is in the bottom of the groove in the raceway, that is, the tack is in the same position which it occupies in the raceway except that directly underneath its head it is in contact with the transferer n^4 . At one end of its movement the transferer n^4 is in the position shown in Fig. 5, permitting the lowermost tack on the raceway to move into the notch o^4 , and at the other end of its movement it is in the position shown in Fig. 6, allowing the tack which has been transferred down the raceway to pass out of the notch o^4 and on toward the driver. Since the part n^4 acts on the tacks underneath their heads, the point of the part of the transferer n^4 formed by the notch o^4 readily passes between the tacks and separates them effectively transmitting with certainty one tack and only one to the driver. The tail of the part n^4 is provided with a pin p^4 which works in a slot q^4 in the arm r^4 . The arm r^4 is secured to the lower end of the short vertical shaft g^3 which actuates the foot f^3 and which is reciprocated by the rack j^3 , as previously described, so that at each reciprocation of said rack j^3 a single tack is transferred to the driver. After passing the transferer n^4 the tack passes from the end of the raceway into the jaws or holders $s^4 t^4$. See Fig. 4. The jaws $s^4 t^4$ are pivoted, as shown, on the lower end of the head e^3 and are held in their closed position by means of the springs w^4 . They are provided at their proximate ends with a small recess or cavity part of which is in one jaw, and part in the other, into which the tack slides from the raceway, and which is in line with the driver a^5 . When the driver descends striking the head of the tack, the tack is forced downwardly, the jaws $s^4 t^4$ spreading against the pressure of the springs w^4 and the tack is driven into the shoe. The jaws $s^4 t^4$ not only hold the tack in position, but serve to guide it while it is being driven.

As has been previously stated, the head D carrying the tacking mechanism slides horizontally on the bed d , which permits it to follow the curvature of the sides of the sole and thus to drive each tack into the proper position as the shoe is moved along in a right line by the jack carrier mechanism already described. As the horizontal movement of the tacking mechanism, that is, its movement toward or from a central line lengthwise of the sole, depends upon the shape and curvature of the sides of the sole, and as these vary in lasts of different shape and size, means must be provided for moving the tacking mechanism horizontally a proper distance to meet the requirements of lasts of different shapes. To effect this horizontal movement of the tacking mechanism I provide a pivoted frame comprising two side pieces b^5 which are connected by a central cross bar c^5 on which said pieces

b^5 are secured. The cross bar c^5 is mounted in bearings in a projection d^5 on the part B. This method of mounting the parts b^5 permits them to be vibrated or reciprocated as will be clear. The upper ends of these parts b^5 bear on adjusting bolts f^5 which are screwed into arms e^5 which project laterally from the base of the goose neck or frame D. The bolts f^5 may be adjusted relatively to the said arms e^5 and thus afford a means of adjusting the parts b^5 relatively to said arms e^5 and to the head D. The lower ends of the parts b^5 are slotted to receive the templets $g^5 h^5$ which are set therein and suitably secured in place. These templets correspond in curvature to the curves of the sides of the sole of the last, that is, they are a counterpart of the said curves in the same manner as the curvature of the templet r' is a counterpart of the vertical curvature of the sole of the last, and when a last of different curvature is employed, the templets $g^5 h^5$ may be readily removed and others of proper form put in their places. These templets $g^5 h^5$ are inexpensive in construction and may be readily formed by using an insole which will fit the last as a guide from which the proper shape of curvature may be obtained. The templet g^5 serves to actuate the head while one side of the shoe is being tacked, and the templet h^5 serves to actuate the head while the opposite side of the shoe is being tacked. The block s' of the jack carrying mechanism is provided at one side with an upward projection j^5 see Fig. 2, in which is journaled an anti-friction roll k^5 which as the jack carrying mechanism moves in one direction, while one side of the shoe is being tacked, bears against the templet g^5 , a spring f^5 being employed, if necessary to move the frame D rearwardly thus forcing the lower ends of the parts b^5 forward so that the said templet g^5 will always be in contact with the roll k^5 . The spring f^5 is preferably secured at one end to a pin a^9 underneath the base of the frame D and at the other end to a pin on the stationary projection s^2 . See Fig. 1. As the jack mechanism moves in a right line the said roll k^5 will, as it reaches a projecting portion of the templet operate to force back the lower ends of the frame pieces d^5 causing them to throw the tacking mechanism forward against the tension of spring f^5 and thus locating the driver in proper position over the last. After the heel or toe of the shoe has been turned another roll l^5 corresponding to the roll k^5 and also mounted on a projection from the part s' will come into contact with the templet h^5 which is of a shape to properly actuate the tacking mechanism to tack that side of the shoe. By this arrangement the machine may be readily changed to tack a shoe of any shape, it being only necessary to provide proper templets $g^5 h^5$ for the curvature of the sides of the last and a proper templet r' for the vertical curvature of the bottom of the last. On the opposite sides of the part s' of the jack carrying

mechanism, I provide projections m^5 in which are set bolts q^5 having pointed or thinned ends adapted to project into the threads of the screw r , so that as the screw revolves the jack carrying mechanism will be caused to travel in a right line so long as the end of either of the said bolts q^5 is in contact with the said screw. While the heel or toe of the shoe is being tacked, the jack mechanism is turning on its vertical axis, and neither of the bolts q^5 are in contact with the screw r . As soon, however, as the jack has swung around and the heel or toe has been tacked, one of the bolts q^5 is thrown into contact with the screw r and the jack mechanism is moved in a right line, while the side of the shoe is being tacked. In order to prevent the jack mechanism from recoil or moving back so as to move the bolt q^5 out of contact with the screw r , I provide an arm r^5 see Fig. 8 which is pivoted on a downward projection s^5 from the top of the standard A and which has at its free end a hook or notch which snaps over a pin t^5 on the under side of the bed z . The arm r^5 is held in contact with the pin t^5 by means of the spring shown at w^5 . Another pin a^6 see Fig. 1 corresponding to the pin t^5 is placed on the opposite end of the bed z and engages in like manner with a hook or notch on the lever f' so that at each half revolution of the jack mechanism the latch levers $r^5 f'$ snap over the said pins and steady the bed, preventing any recoil thereof and insuring proper contact of the bolt q^5 with the screw r .

To prevent the tacking mechanism from moving horizontally while the toe or heel is being tacked, I provide a lever b^6 which engages the inner edge of the hooked projection a^8 . See Figs. 1 and 2. This projection is secured to, and extends from, the lower end of one of the parts b^5 . A spring b^8 see Fig. 2, acts to draw the said lever b^6 inwardly out of engagement with the hook a^8 so that when the sides of the shoe are being tacked, said lever is out of engagement with said hook. When, however, the heel of the shoe is reached, a projection on a moving portion of the jack mechanism strikes the free end of the lever b^6 and throws it into engagement with the hook a^8 . The jack mechanism then turns on its vertical axis, freeing the engaging rolls from the templets $g^5 h^5$ and the tension of the spring f^5 which acts to draw the frame D rearwardly, moves the upper ends of the levers b^5 rearwardly, throwing the lower ends of the said levers forward and holds the lever b^6 in frictional contact with the hooked projection a^8 . As soon as the heel has been tacked the templet g^5 or h^5 is again engaged and pressed rearwardly slightly thus freeing the lever b^6 from the hooked projection a^8 . By this means the tacking mechanism is held in a fixed position when the heel or toe is being tacked.

The screw r is preferably provided with three threads to the inch, because the sizes of shoes vary by thirds of an inch, that is, a shoe of one size is a third of an inch larger than

the shoe of the next size smaller. When it is desired to last a shoe one size larger, the sliding jack carrier will require to be moved a distance equal to the width of one thread of the screw, so that the bolts q^5 will engage the screw r one thread farther toward the end of the said screw. This will accommodate a shoe one size larger since the bolt q^5 leaves the screw r to turn the heel always at the same point whether the shoe be larger or smaller. It will be seen that in this way the jack carrier may be readily set so that the bolt q^5 will engage the screw at a proper point to tack a shoe of any size, and if desirable a scale or gage may be provided on the movable jack carrier k' or on the fixed bed z by means of which the setting of the mechanism for a shoe of any length may be facilitated.

The distance at which the tracks are placed on the shoe will depend upon the distance which the shoe is fed forward at each feed movement, and this may be regulated as will be clear by adjusting the connecting rod h relatively to the cranks h and l . Cheap shoes in which the tacks are set farther apart may be tacked with great rapidity while the speed of the machine is not increased.

The jack which is shown and described herein has been made the subject matter of an application for United States patent, filed by me August 31, 1893, Serial No. 484,450.

What I claim is—

1. A lasting machine comprising tacking mechanism, a last support for holding a last carrying a shoe, means for automatically feeding said last-support past the tacking mechanism lengthwise of the last, means for moving the last-support vertically as it is fed horizontally to compensate for the vertical curvature of the sole, and means for moving the tacking mechanism horizontally nearer to or farther from the middle of the last, to drive the tacks at different distances from the said middle in a line following the contour of the edge of the last, substantially as described.

2. A lasting machine comprising tacking mechanism, a last-support for holding a last carrying a shoe, means for automatically feeding said last support past the taking mechanism lengthwise of the last, a templet corresponding to the horizontal curvature of the side of the sole, and an engaging device co-operating with said templet whereby the movement of the last-support along the line of feed occasions movement of the tacking mechanism horizontally nearer to or farther from the middle of the last, to drive the tacks at different distances from the said middle in a line following the contour of the edge of the last, substantially as described.

3. A lasting machine comprising tacking mechanism, a last-support for holding a last carrying a shoe, means for automatically feeding said last-support lengthwise of the last, a templet having a surface corresponding to the horizontal curvature of the side of the

last and engaged by a part moving with the last-support, and a movable support for said templet having operative connection with the tacking mechanism, whereby, as the last-support is fed and acts against the templet to move the latter and its support, the tacking mechanism is shifted horizontally nearer to or farther from the middle of the last to cause the tacks to be driven at different distances from the said middle in a line following the contour of the edge of the last, substantially as described.

4. A lasting machine comprising tacking mechanism, a last-support for holding a last carrying a shoe, means for automatically feeding said last-support lengthwise of the last, templets respectively having surfaces corresponding to the horizontal curvatures of the opposite sides of the last, and alternately acted against by parts moving with the last-support according as the respective sides of the last are presented to the tacking mechanism, and a movable support for the said templets having operative connection with the tacking mechanism, whereby the tacking mechanism is shifted horizontally nearer to or farther from the middle of the last to cause the tacks to be driven at different distances from the said middle in a line following the contour of the edge of the last, substantially as described.

5. A lasting machine comprising tacking mechanism, a last-support for holding a last carrying a shoe, means for automatically feeding said last support lengthwise of the last, templets respectively having surfaces corresponding to the horizontal curvatures of the opposite sides of the last and alternately acted against by parts moving with the last-support according as the respective sides of the last are presented to the tacking mechanism, a movable support for the said templets having operative connection with the tacking mechanism, whereby the tacking mechanism is shifted horizontally nearer to or farther from the middle of the last to cause the tacks to be driven at different distances from the said middle in a line following the contour of the edge of the last, and means for partially rotating said last-support on the arrival of the ends of the last at the tacking mechanism, whereby the sides and ends of the last are presented and fed to the tacking mechanism successively, substantially as described.

6. A lasting machine comprising tacking mechanism, a jack-device for supporting a last carrying a shoe, a support for said jack-device, means for automatically feeding said jack-device along its support past the tacking mechanism, the said jack-device and its support having combined therewith a templet corresponding to the vertical curvature of the sole, whereby as the jack device is fed along the support the jack and last are moved vertically on the said support to properly present the successive portions of the sole to the tacking mechanism, and means for shifting

said support to present the ends and sides of the last in succession to the tacking mechanism, substantially as described.

7. A lasting machine comprising tacking mechanism, a jack-device for supporting a last carrying a shoe, a rotatable support for said jack-device, means for automatically feeding said jack-device along its rotatable support past the tacking mechanism, the said jack-device and its rotatable support having combined therewith a templet corresponding to the vertical curvature of the sole, whereby as the jack-device is fed along its support the jack and last are moved vertically on the said rotatable support to properly present the successive portions of the sole to the tacking mechanism, and means for partially rotating said support on the arrival of the ends of the last at the tacking mechanism, whereby the sides and ends of the last are presented and fed to the tacking mechanism successively, substantially as described.

8. A lasting machine comprising tacking mechanism, a jack-device for supporting a last carrying a shoe, a rotatable support for said jack-device, means for automatically moving said jack-device along the said rotatable support past the tacking mechanism a templet affixed to said rotatable support corresponding to the vertical curvature of the sole and acting to move the jack vertically on the said rotatable support as the jack-device is fed along the support, and means for partially rotating said support on the arrival of the ends of the last at the tacking mechanism, whereby the sides and ends of the last are presented and fed to the tacking mechanism successively, substantially as described.

9. A lasting machine comprising tacking mechanism, a jack-device for supporting a last carrying a shoe, a support for the said jack-device, means for automatically feeding said jack-device along the support past the tacking mechanism, means for partially rotating said support on the arrival of the ends of the last at the tacking mechanism, whereby the sides and ends of the last are fed to the tacking mechanism successively, projections on the opposite sides of the jack-device, templets respectively corresponding to the horizontal curvatures of the opposite sides of the last and alternately acted upon by the said projections respectively as the jack-device is fed along its support, and a movable frame supporting said templets and engaging with the tacking mechanism to move the same horizontally toward and from the middle of the last, substantially as described.

10. A lasting machine comprising tacking mechanism, a jack-device provided with a vertically movable jack for the support of a last carrying a shoe, a support for said jack-device, means for automatically moving said jack-device horizontally along said support, a templet mounted on said support corresponding to the vertical curvature of the sole and acting to move the jack vertically as the

jack-device is fed along the support, means for partially rotating said support on the arrival of the ends of the last at the tacking mechanism, whereby the sides and ends of the last are presented and fed to the tacking mechanism successively, projections on the opposite sides of the last-carrying devices, templets respectively corresponding to the horizontal curvatures of the opposite sides of the last and alternately acted upon by the said projections, respectively, as the last-carrying devices are fed along their support, and a movable frame supporting said templets and engaging with the tacking mechanism to move the same horizontally toward and from the middle of the last, substantially as described.

11. The combination with shoe holding and tacking mechanism of the presser foot to press and hold the upper over the edge of the last, means for actuating said presser foot comprising a shaft on which the foot is mounted, a gear on said shaft, a rack engaging said gear and a cam-actuated lever engaging the rack, substantially as set forth.

12. A tack driving mechanism consisting of a driver, a raceway for delivering the tacks, and a hopper and means for supplying the raceway with tacks from the hopper, comprising a vertically movable plunger, adjacent the upper end of the raceway, a movable wiper arranged to sweep laterally across the upper end of the plunger and means for actuating the same, whereby when the plunger has reached the highest point of its movement the tacks thereon will be swept therefrom by the wiper onto the upper end of the raceway, substantially as set forth.

13. The combination with tacking mechanism of jack mechanism mounted upon a pivoted bed, means for feeding said jack mechanism along said bed, past the tacking mechanism a sleeve on the pivot of said bed, a ratchet clutch, one member of said clutch being on said pivot and the other on said sleeve, a reciprocating lever secured to said sleeve and suitable mechanism for actuating said lever whereby at each reciprocation of the lever the bed is swung on its pivot, substantially as set forth.

14. The combination with a jack mounted on a sliding carrier set in a pivoted support, means for actuating said sliding carrier relatively to said support, a ratchet clutch mechanism for swinging said jack mechanism on its pivot and mechanism intermediate said sliding carrier and said ratchet clutch whereby when the carrier is moved a given distance to present the sides of a shoe to the tacking mechanism, the ratchet clutch will be thrown into engagement to turn the jack mechanism on its pivoted support, to present the heel or toe of the shoe to the tacking mechanism, substantially as set forth.

15. The combination with the tacking mechanism of the sliding jack carrier a bed for said carrier having a shaft or pivot, means for slid-

ing said carrier on said bed past the tacking mechanism a sleeve on said shaft, a ratchet clutch, one member of which is mounted on said sleeve and is free to move vertically thereon into or out of engagement with the other member, springs for holding the vertically movable clutch member normally in engagement with the other member of the clutch, means for actuating said sleeve whereby to turn the bed on its pivot and present the heel or toe of the shoe to the tacking mechanism and a latch engaging an annular groove in said vertically movable clutch member to hold the same out of engagement with the other member of the clutch device, substantially as set forth.

16. The combination with the tacking mechanism of the jack mechanism a pivoted bed *z* upon which said jack mechanism is supported, means for sliding said jack mechanism on said bed past the tacking mechanism the pivot *w* of said bed, a sleeve *w'* on said pivot, a ratchet clutch, one member *b'* of said clutch being fast on the said pivot and the other member *a'* being splined on said sleeve and having a spring seat whereby it is normally held in engagement with the member *b'*, means for actuating said sleeve whereby to turn the bed on its pivot and present the heel or toe of the shoe to the tacking mechanism a latch pivoted on said member *b'* and provided with a beveled end and a pin on the member *a'* whereby at predetermined points in the revolution of the pivot *w* the clutch members will be disengaged and the revolu-

tion of the pivot *w* stopped, substantially as set forth.

17. The combination with jack mechanism mounted on a pivoted bed *z*, and means for turning said mechanism on its pivot, of projections at either end of said bed and spring impelled latches or arms *f'* for engaging said projections, whereby at the end of each half revolution of said bed, the bed is steadied and recoil prevented, substantially as set forth.

18. The combination with the tacking mechanism of a jack mechanism mounted upon a sliding carrier set on a pivoted bed, means for moving said carrier relatively to said bed, a ratchet clutch mechanism for moving said bed on its pivot, to present the heel or toe of the shoe to the tacking mechanism a latch for holding said clutch mechanism out of engagement while the sides of the shoe are being fed past the tacking mechanism, a spring for actuating said latch in one direction and a pin on said latch in the path of the jack carrier whereby when the jack carrier has reached the end of its movement on said bed the said latch will be tripped and the clutch mechanism thrown into engagement to rotate the bed on its pivot, substantially as set forth.

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

CHARLES H. KELLEY.

Witnesses:

WM. A. MACLEOD,
R. WALLACE.