(No Model.)

4 Sheets--Sheet 1.

A. F. PRESTON.

MACHINE FOR LASTING BOOTS OR SHOES.

No. 502,755. Patented Aug. 8, 1893.

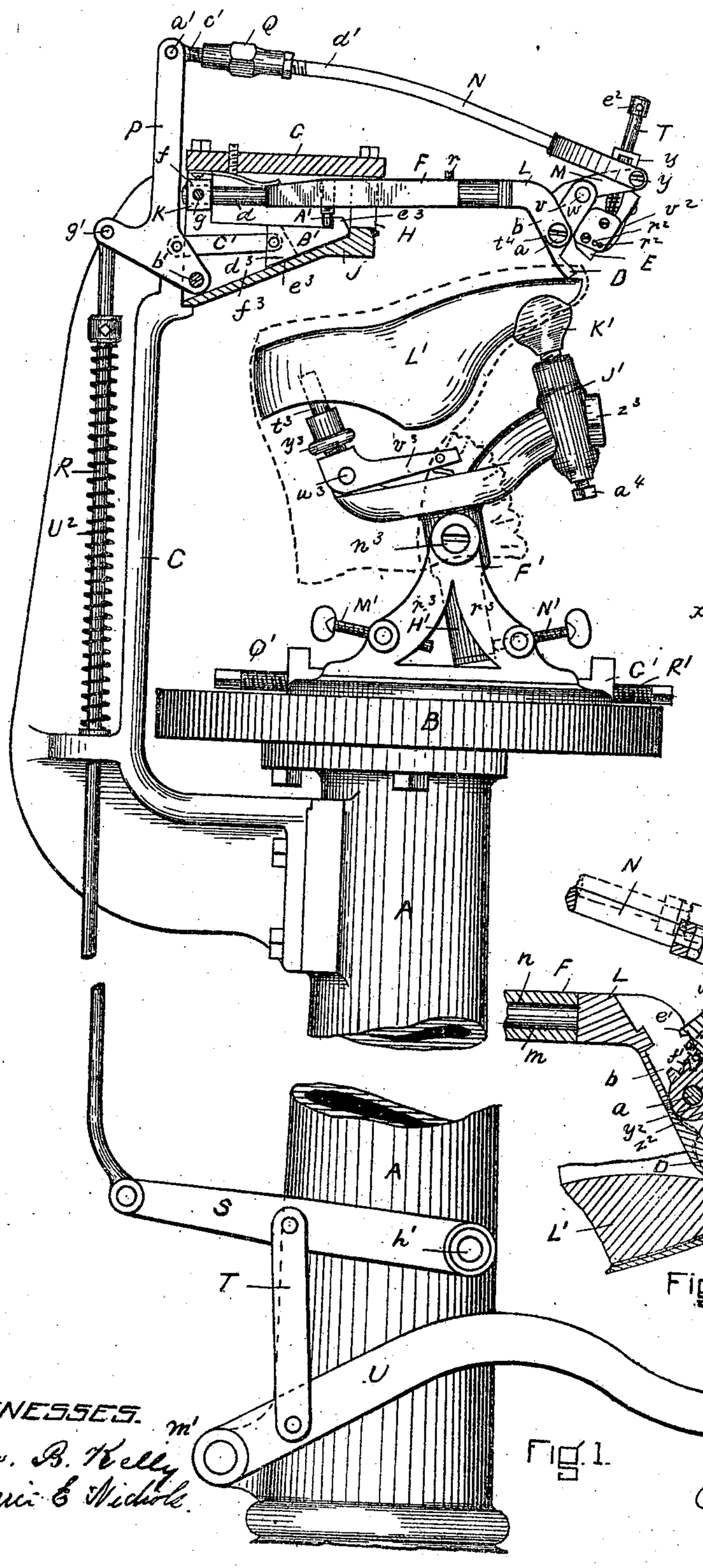

Fig. 1.

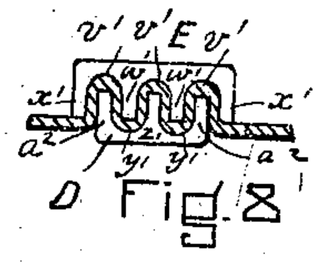

Fig. 8

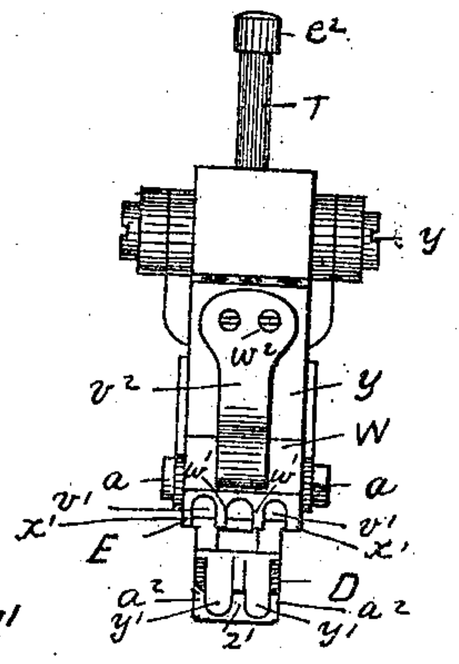

Fig. 7

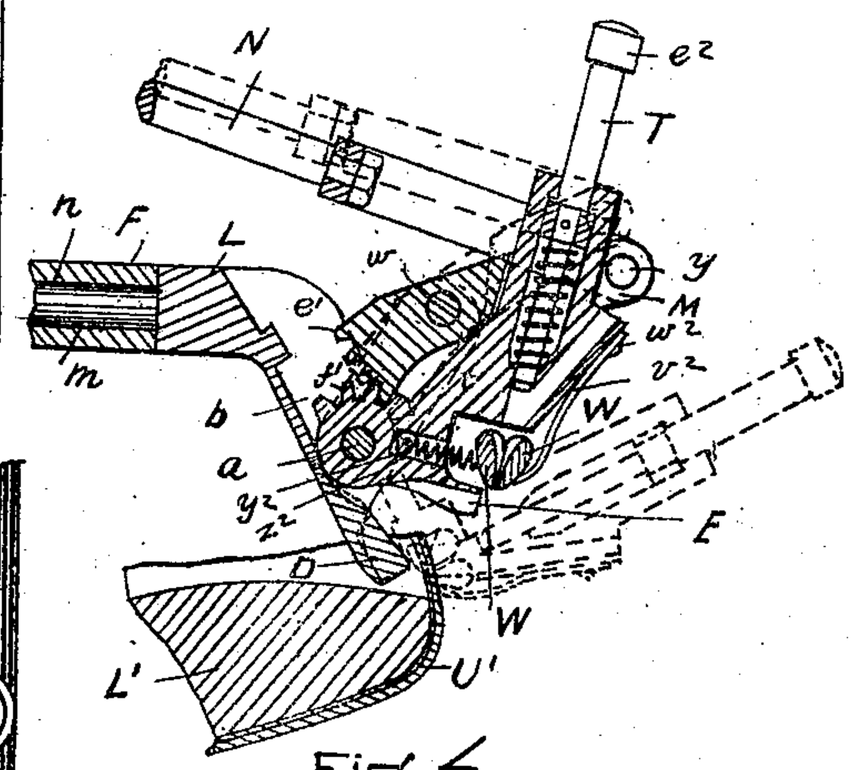

Fig. 6.

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(No Model.) 4 Sheets—Sheet 2.

A. F. PRESTON.

MACHINE FOR LASTING BOOTS OR SHOES.

No. 502,755. Patented Aug. 8, 1893.

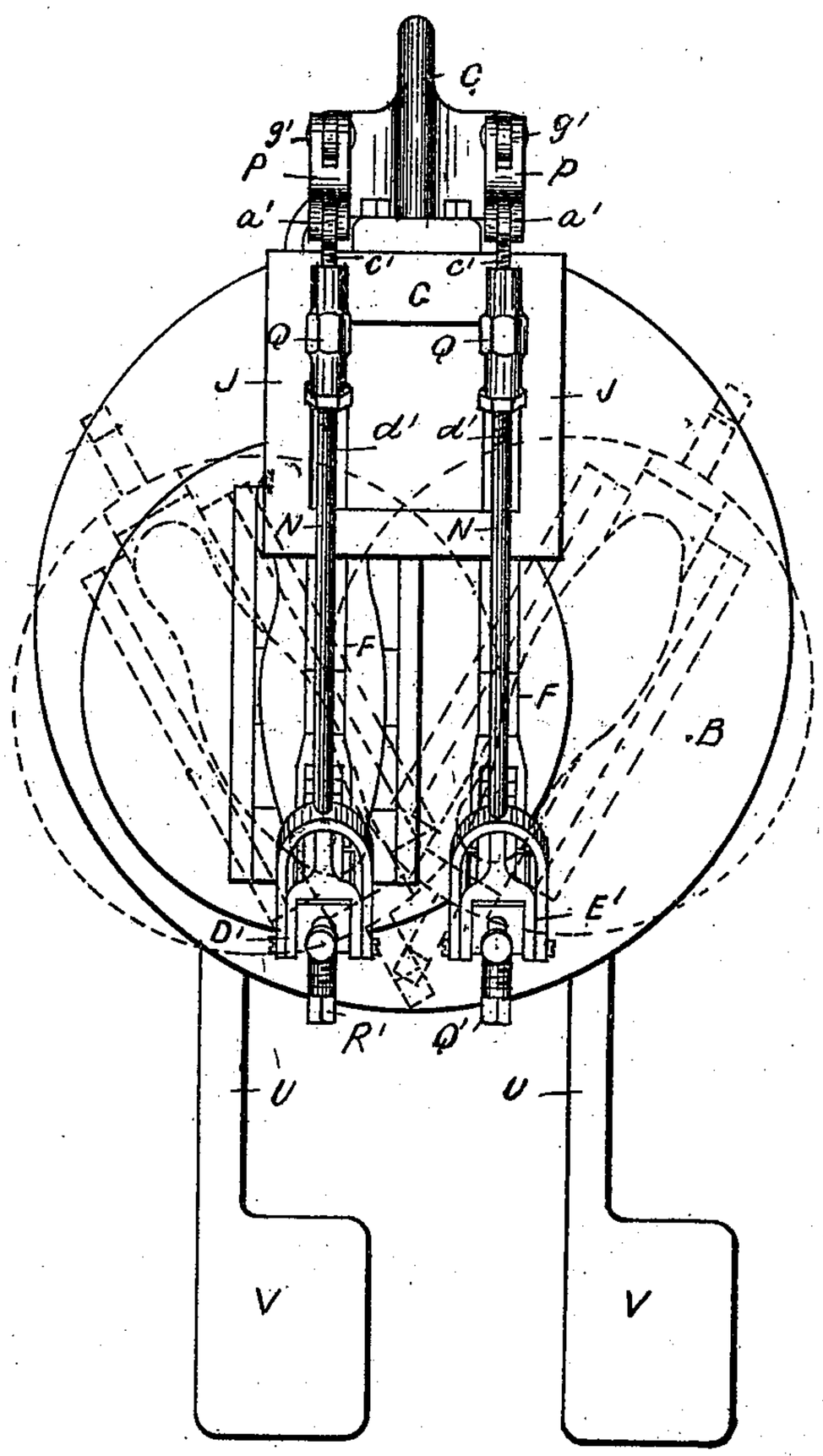

Fig. 2.

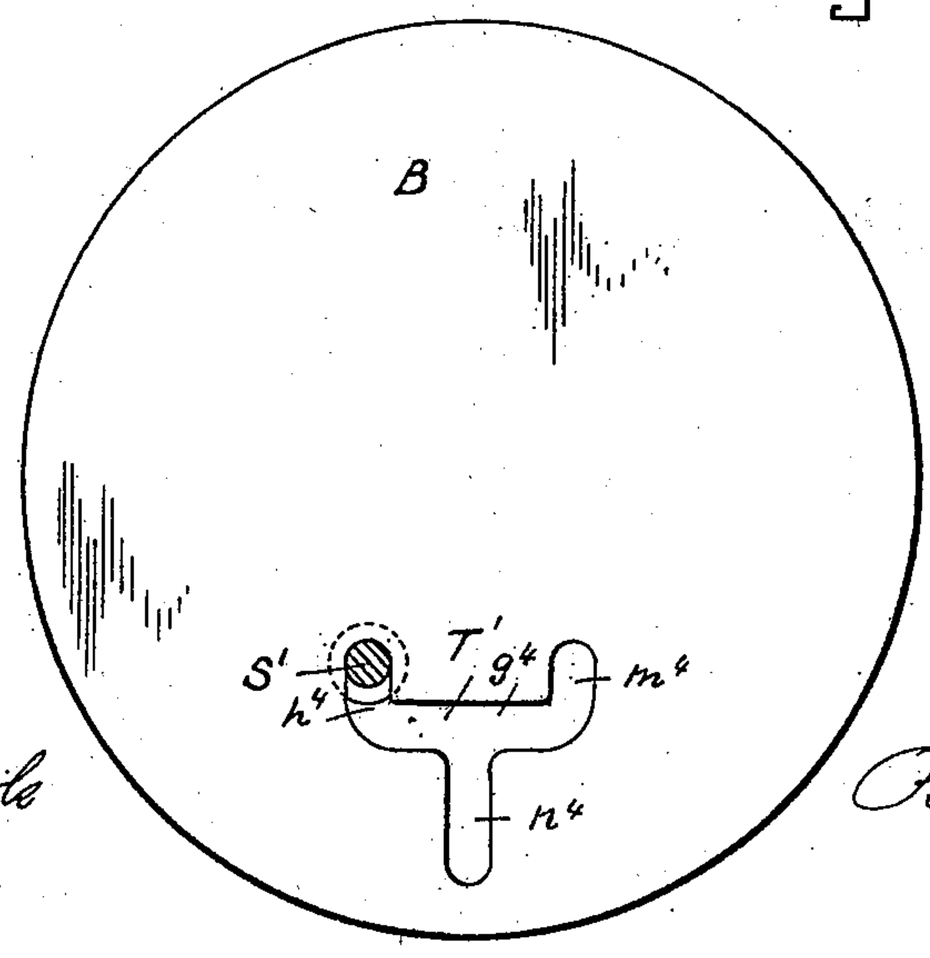

Fig. 3.

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(No Model.)

4 Sheets—Sheet 3.

A. F. PRESTON.

MACHINE FOR LASTING BOOTS OR SHOES.

No. 502,755. Patented Aug. 8, 1893.

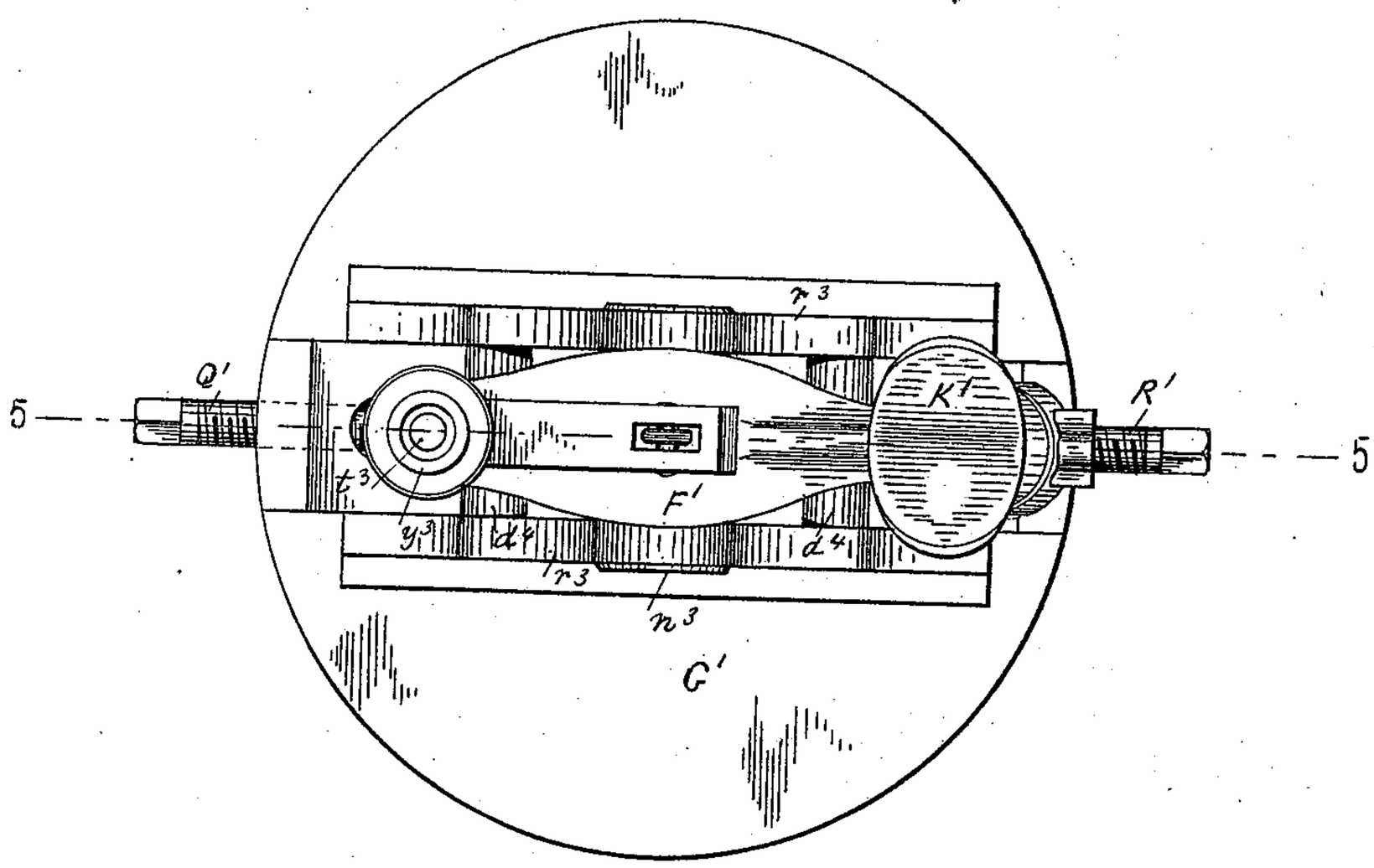

Fig. 4.

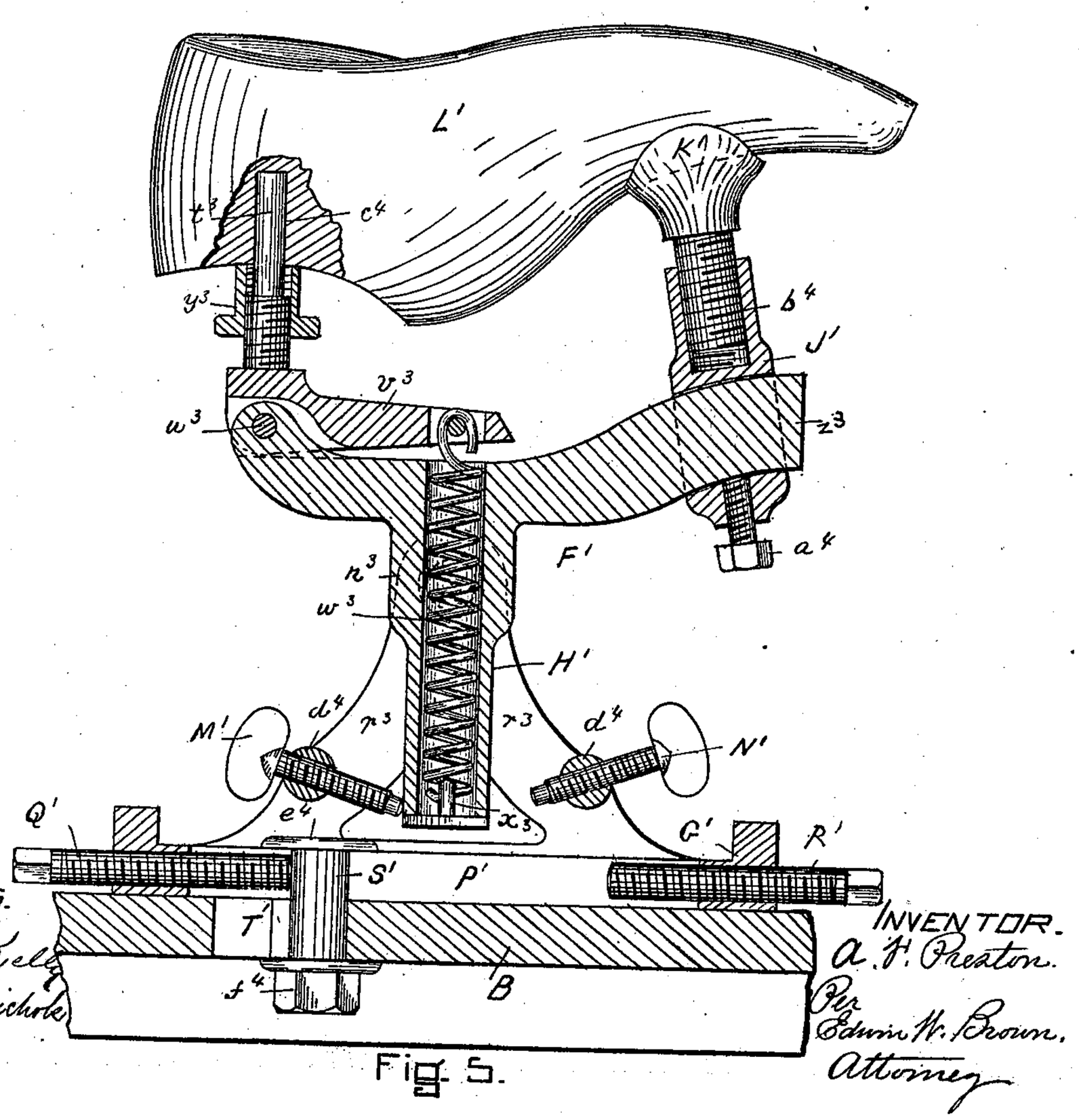

Fig. 5.

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A. F. PRESTON.

MACHINE FOR LASTING BOOTS OR SHOES.

No. 502,755. Patented Aug. 8, 1893.

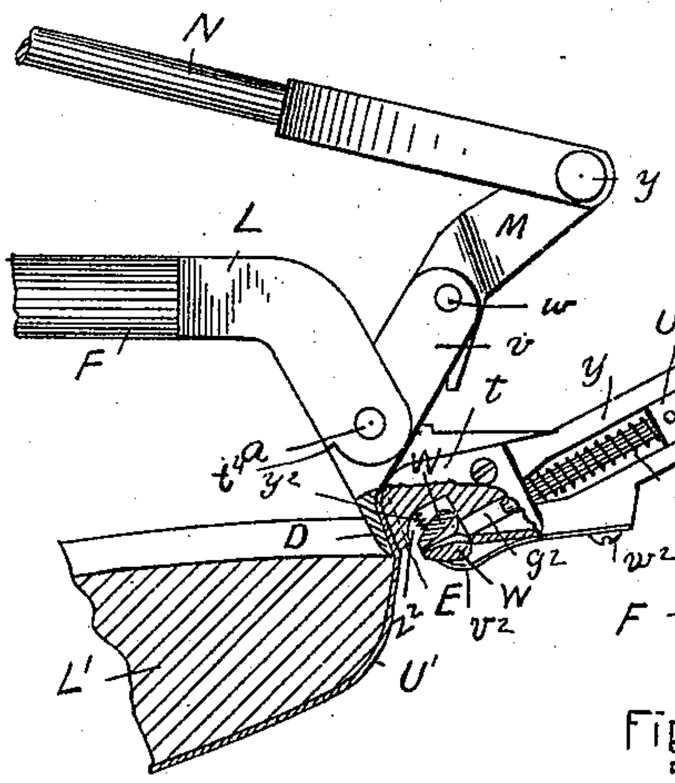

Fig. 9.

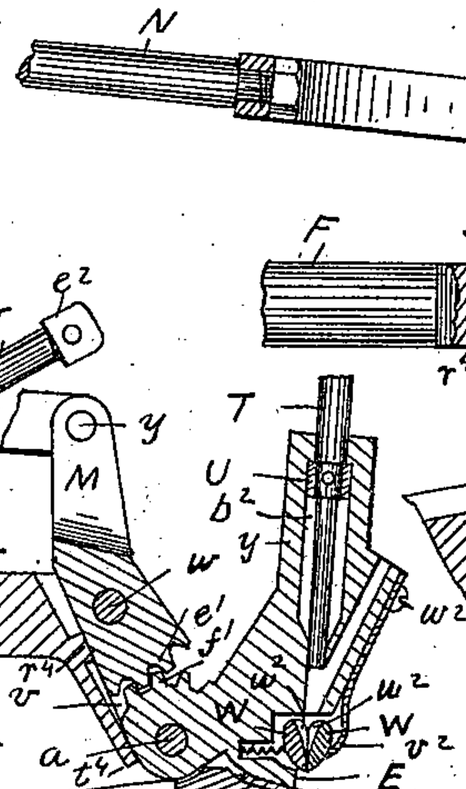

Fig. 11.

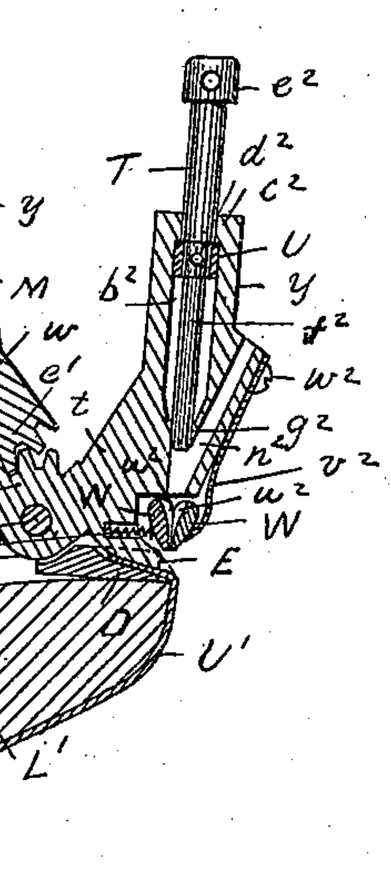

Fig. 10.

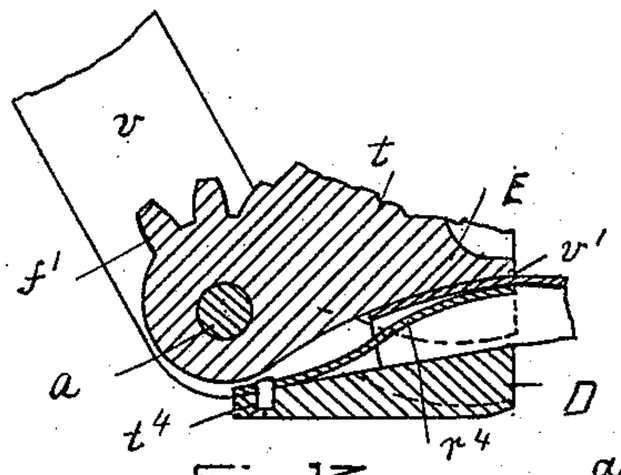

Fig. 13.

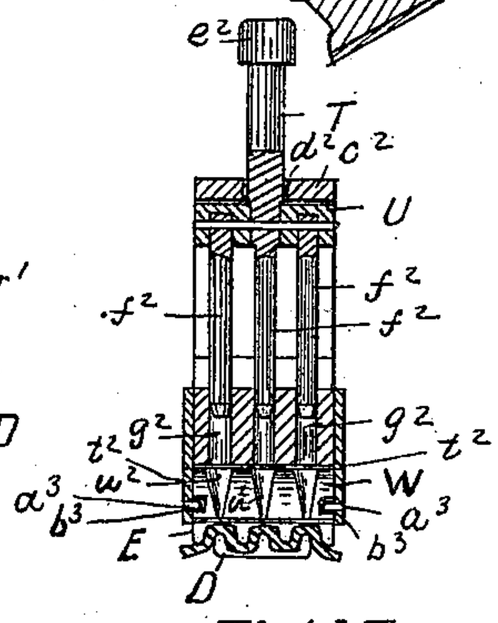

Fig. 17.

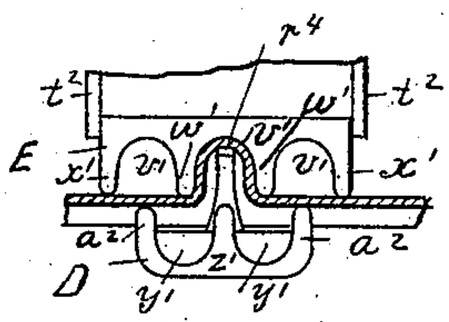

Fig. 14.

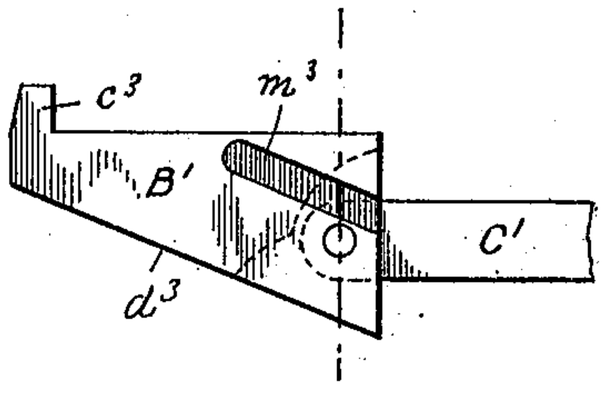

Fig. 15.

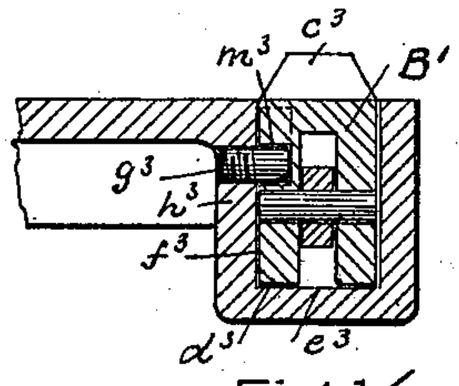

Fig. 16.

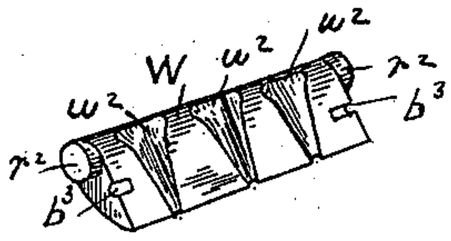

Fig. 12.

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UNITED STATES PATENT OFFICE.

ALBERT F. PRESTON, OF LYNN, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE COLUMBIAN LASTING MACHINE COMPANY, OF PORTLAND, MAINE.

MACHINE FOR LASTING BOOTS OR SHOES.

SPECIFICATION forming part of Letters Patent No. 502,755, dated August 8, 1893.

Application filed November 16, 1888. Serial No. 291,043. (No model.)

To all whom it may concern:

Be it known that I, ALBERT F. PRESTON, of Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Machines for Lasting Boots or Shoes, of which the following is a full, clear, and exact description.

This invention relates to a machine for lasting boots or shoes and more particularly for lasting the heel and toe of a boot or shoe, and is intended to be used in connection with a lasting machine for boots or shoes constructed and arranged to last first one side and then the other side of a boot or shoe and for which two applications for Letters Patent of the United States, Serial Nos. 248,894 and 257,231, have been allowed to me, and the invention consists of certain construction and arrangement of parts in a machine for lasting the heel and toe or other parts of a boot or shoe all substantially as hereinafter fully described.

In the accompanying sheets of drawings is illustrated a machine particularly intended for lasting the heel and toe of a boot or shoe in connection with a jack for holding the boot or shoe in which—

Figure 1, is a side elevation. Fig. 2, is a plan view. Fig. 3, is a detail plan view of the top of the stand or support. Fig. 4, is a detail plan view of the jack for holding the boot or shoe. Fig. 5, is a longitudinal section on line 5—5 Fig. 4. Figs. 6, 9, 10 and 11 are detail vertical sectional views of some of the working-parts of the lasting machine in different positions to be hereinafter referred to. Fig. 7, is a detail front view. Fig. 8, is a detail cross section. Fig. 12, is a detail perspective view of one of the working parts. Figs. 13 and 14, are detail sectional and front views respectively of the working parts. Fig. 15, is a detail side view. Fig. 16, is a cross section on line 16—16 Fig. 15. Fig. 17, is a detail vertical section.

In the drawings A, represents a post or standard having a horizontal bed plate B, an upright arm C, rigidly connected thereto and supported on a base not shown in the drawings, all preferably made of metal and arranged to support and carry the working parts of the present invention.

D, E represent two jaws each jaw being secured by a pivot *a*, to and between two arms *b*, *b* at the front end of a bar or holder F. This bar supports and carries the pair of jaws D, E, and it is square in cross section and disposed between the upper part G, and the lower part H, of a frame J, secured to the upright arm C, its rear end being round in cross section as at *d*, and fitting in a correspondingly shaped socket *f*, in a block K, arranged to swivel vertically on pivots *g*, turning in bearings in the back part of the frame J, by which the guide bar can freely move longitudinally backward and forward in the socket *f*, vertically by the swinging of the block K, and guided at its front end by the front of the frame J. The pivot *a*, of the jaws is in the front portion L, of the bar F, having a tongue *m*, round in cross section and fitting in a longitudinal socket *n*, in the front end of the main portion of the bar, and by this connection of the jaws with the guide bar they can be adjusted as to longitudinal projection therefrom and when adjusted they are secured from movement by a set screw *r*, this front portion being bent down at an angle as shown, for the better presentation of the jaws to their work. The upper jaw E, is pivoted by its pivot *a*, to its guide bar, by a vertical tongue or rib *t*, at its back which is disposed in a groove in the arm *v*, of the lower jaw D, on which pivot *a*, the upper jaw moves or swings vertically to and from the lower jaw and both jaws as one on their guide bar.

Pivoted at *w*, between the two upper arms *v*, of the lower jaw D, in the groove is an arm or lever M, which extends upward and somewhat forward in the form shown in the drawings, its upper end being forked and secured at such ends by a pivot *y*, to the forked ends of a pitman rod N, extending back therefrom above the frame J, and secured by a pivot *a'*, to the upper end of a lever or arm P, pivoted at *b'*, to the upright arm C. The pitman rod N, is in two parts *c'* and *d'*, which have screw threads on their contiguous ends and are connected together by a sleeve Q, having a right and left in-

ternal screw thread on its respective ends, by which turning the sleeve in one direction will lengthen and in the other or opposite direction will shorten the pitman rod. The lower end of the arm or lever M, pivoted to the arms of the lower jaw D, has a segment e', of a gear which engages with another segment f', of a gear on the tongue t, of the upper jaw E, so that as the arm or lever M, is swung backward or forward on its pivot w, it will through the segmental gears e', f', cause the upper jaw E, to swing on its pivot and respectively move to or from its lower jaw D, to close or open the two jaws. The arm or lever P, is connected by a pivot g', to the upper end of a pitman rod R, connected by a pivot to the end of a lever S, pivoted at h', to the standard which is connected by a pivot near its middle portion to one end of a rod T, pivoted by its lower end to a treadle U, pivoted at m', to the standard A, and extending to the front of the machine for operation thereof by its outer end V. The inner or operating face of the upper jaw E, is made with three longitudinal grooves v', having between them raised edges w', and outside raised edges x', and the inner or operating face of the lower jaw D has two longitudinal grooves y', having one raised edge z', between them and outside raised edges a^2. The raised edges z', of the lower jaw D, when the jaws are closed upon each other, project into the grooves v', in the upper jaw E, and the raised edges w', of the upper jaw project into the grooves y', in the lower jaw as shown more particularly in Figs. 8 and 14—so that when closed upon any flexible sheet material such as leather placed between them such material will be folded or creased back and forth or up and down as shown in cross section in Fig. 8. The upwardly extended arm y, of the upper jaw has an elongated transverse opening b^2, its upper wall or end c^2, having a central vertical socket d^2, through which projects and is adapted to move up and down or backward and forward therein a rod or pin T, having a head e^2, and within the elongated opening is a cross head or bar U, attached to the rod which fits and is adapted to freely move up and down in said elongated opening b^2, this bar having three depending rods or drivers f^2, arranged to move freely up and down in sockets g^2, in the lower front part of the jaw arm, their lower ends being slightly tapering: these rods serve as tack drivers to drive the tacks through the upper and inner sole after the upper has been drawn over the inner sole to secure it thereto. When the rod T, with its three pins or rods f^2, is pressed down the lower ends m^2, of the three rods or drivers pass down in front of the grooves v', in the upper jaw one to each groove.

In front of each socket g^2, of each rod or driver f^2, is an inclined passage n^2, its lower end opening thereto.

W, W are two plates above the jaw E, pivoted at r^2, to the sides of the frame t^2, of upper jaw so as to swing to and from each other within certain limits, or forward and backward, or from and to the vertical plane of movement of the driving rods. These plates each have a tapering groove w^2, on its inner face opposite to the other so that each two form a tapering or conical socket as shown in Fig. 10, just below its respective tube or passage g^2, into which socket the tack drops when put in the tube, and which holds the tacks in proper position for the tack drivers to drive them when desired: the plates when the drivers are forced down upon the tacks open from each other to allow the tacks, as well as the ends of the drivers to pass through and between them. A flat spring v^2, secured to the frame at w^2, and bearing by its free end against the outer one, and a spiral spring y^2, within a socket z^2, in the frame bearing against the inner one, act to keep them closed upon each other, in proper position to receive the tacks, in the same plane, and to prevent their movement beyond such plane, pins a^3, project one from each side frame t^2, and each plate has a slot b^3, in each end of its face which rest and bear against the pins a^3. The guide bar F, bears and rests by a screw A', screwing through the bar, upon a bar or block B', behind a rib or shoulder c^3, on the upper side at the front of this block, the block being located within the box frame and having an under inclined surface d^3, resting upon an upper inclined surface e^3, parallel therewith of the bottom part of the frame J. This block or bar is arranged to freely move backward and forward on its inclined bearing e^3, in a guide way f^3, of the frame and for such movements it is connected by a pitman rod C', pivoted by one end thereto and at its other end to the arm or lever P.

To prevent the block B', rising or being displaced accidentally from its seat on the inclined guideway, a pin g^3, screwed horizontally in the side wall h^3 of the guideway f^3, projects by its outer end into a groove or elongated slot m^3, in the block, which slot is parallel with the inclined surface d^3, of the block. See Figs. 15 and 16.

The machine illustrated in the drawings shows two sets of jaws and their connecting and operating mechanism, one set being a duplicate of the other, excepting as to the construction of the operating faces of the jaws, each set having a separate operating pedal. The jaws and their operating and connecting mechanism at the left, at D', in Fig. 2, are intended for operation on the toe of a boot or shoe, while the one at the right, at E', same figure, is intended for operation on the heel of a boot or shoe, the description, construction and operation of one answering for the other: the two being arranged in one machine or on one stand for convenience in changing from one to the other quickly, as the toe or heel is to be lasted, and for such convenience the jack F', is constructed and arranged for operation in connection therewith as will be now

described. This jack for holding the boot or shoe to be operated upon by the jaws, is constructed and arranged so as to present the toe of the boot or shoe to its proper lasting jaws at the left, and then to be swung around and properly present the heel of the boot or shoe to the other jaws, at the right, or vice versa, without removing the last with the boot or shoe thereon, from the jack and its construction and arrangement are as follows: the jack is pivoted at n^3, between two upright arms r^3, of a base G′, to swing vertically thereon, which base rests and is arranged to freely move back and forth on the upper surface of the bed plate B, of the standard A.

t^3, is a pin pivoted to the jack at u^3, and having an arm v^3, to which is attached at one end a spiral spring w^3, located in a chamber, in a downward extension H′, of the jack and secured by its other end to a pin x^3, in the bottom thereof. The pin t^3, has an external screw thread over which screws the nut y^3, on which the last rests when placed on the jack and the turning of which screw nut raises or lowers it on the pin and by which the height of the heel of the last can be adjusted. The end z^3, of the jack has a block J′, having an opening arranged to surround and fit over the end so it can move back and forth thereon, and having a set screw a^4, by which it can be secured in place when adjusted: it has a hollow rest K′, for the toe portion of the last, which is arranged by its extension to screw into a socket b^4, in the block as shown in Fig. 5. The pin t^3, is of a size to fit the usual hole or socket c^4, at the heel of the last L′. Placing the heel of the last by its socket on the pin t^3, and the toe in the hollow of the toe piece K′, as shown in Fig. 5, the tension of the spring serves by its pull upon the arm v^3, to hold the last firmly in place thereon, all as usual and as is well known.

In each cross piece d^4, between the two uprights r^3, is a thumb screw M′ and N′, arranged to screw through its cross piece, on a line or substantially on a line with a vertical circle, concentric with the pivot n^3, the inner ends of these screws projecting inward, and against which, one or the other, of the extension H′, of the jack as it is swung on its pivot can bear or rest, by which as either one or the other, is turned in or out, the toe or heel of the last can be elevated or depressed, and placed in a desired position for the better presentation of the boot or shoe to the lasting jaws or tools. The jack has an elongated slot P′, in its base plate, which slot is in the same vertical plane with the central vertical longitudinal line of the last when on the jack and screwing horizontally into each side of the base plate so as to project, one into each end of the slot P′, longitudinally, toward each other are screws Q′, R′, as shown in Fig. 5.

S′, is a pin passing loosely through this slot P′, having a head e^4, which is disposed across the slot P′, and bearing upon the upper side of the base plate, the pin also extending through a peculiarly arranged slot T′, in the bed plate B, and having a screw nut f^4, on its lower end screwing against a shoulder on the pin by which the pin is secured in place and kept from accidental escape, and yet can slide freely back and forth along the slot T′, in the bed plate B, and also the slot P′, in the base plate of the jack. The construction and line of this slot T′, is shown in Fig. 3, in plan view it having a portion g^4, extending transversely of the plate in relation to the front of the machine, and the longitudinal central vertical line of the jaws and their operating mechanism, and two right angular backward projecting portions h^4, m^4, one at each end of the portion g^4, and a central right angular portion n^4, extending toward the front.

The operation of the machine is substantially as follows: Move the jack forward upon its bed plate so that the pin S′, will move into and up to the front end of the portion n^4, of the slot or groove T′, which will bring the jack out from under and free of the lasting jaws, so that then the last with the boot or shoe thereon can be easily and conveniently placed in position on the jack without interfering with the jaws, and when so placed, to last the toe of the boot or shoe swing the jack on its pivot n^3, until its extension H′, bears against the screw N′, which elevates the toe of the boot or shoe into the position shown in Fig. 1, screwing out or in the screw N′, until the portion of the inner sole at the toe of the boot is in a horizontal or substantially horizontal plane, then move the jack on the bed plate B, the pin S′, sliding along the portions n^4, and g^4, of the slot or groove T′, into the portion h^4, against its farther end, the jack also moving by its slot P′, along over its pin S′, until its screw R′, abuts against said pin, which screw is turned in or out, (with the jack pin still abutting against the end of the slot) until the center of the circular outline or edge of the toe is under the jaws or vertically or substantially vertically over the center of the jack pin S′, when bearing against the farther end of the portion h^4, of the slot T′, all of which movements brings the boot or shoe at the toe in position for the proper action of the jaws on the upper of the boot or shoe, the upper U′ at the toe being then against the inner or operating face of the under jaw D, and between the two jaws substantially as shown in Fig. 1. Now press down the treadle connected to these jaws, which is at the left, see Fig. 2, which will through its connecting arms and rods swing the lever or arm P, back or to the left, and by the connecting rod N, to the arm of the lower jaw, will cause the upper jaw by its gear connection therewith assisted by its gravity, to swing on its pivot and fall down to and close upon the lower jaw, as shown in Fig. 9, grasping between the two jaws, the edge of the upper placed between them and folding and creasing the upper between the raised edges and grooves of the two jaws, as

shown in cross section in Fig. 8, this folding or creasing taking up at the toe the surplus leather over the end of the toe. When so closed, in the continued movement of the lever or arm P, the block B′, will move back and down its inclined bearing surface e^3, its rib or shoulder c^3 abutting and striking against the screw pin A′, of the jaw guiding bar F, and moving the bar backward and downward, so that the lower jaw will then rest upon the inner sole of the boot or shoe, as shown in Fig. 10: the movement thus far however does not pull the jaws backward but merely changes the plane of their pivotal connection with the bar in relation to the plane of their front ends from its elevated or angular position, shown in Fig. 9, into substantially a horizontal one, as shown in Fig. 10, or in other words, so that the line of grip of the jaws and their pivotal connections with their jaw guide bar will be in the line of the direction horizontally in which the jaw guide bar or the jaws are to be pulled or substantially in the same horizontal line, and the arm or lever M, of the jaws will have reached and abutted against its shoulder r^4, on the jaw guiding bar, as shown in Fig. 10, so that in the continued movement of the arm or lever P, and jaw guiding bar, the jaws will be pulled or moved back, and in such movement the jaws, grasping the edge of the upper will pull upon and stretch the upper firmly over the edge of the inner sole and hold it down upon the outer surface thereof, according to the stretch and tightness required of the upper over the inner sole, as shown in Fig. 11. A tack being now placed in each tube n^2, in front of the jaws, it drops down therein, in to the socket w^2 formed by the two plates, resting by its point on the upper side of each fold in the upper U′, and in position under its respective rod or driver f^2, which driver then being forced down by a blow from a hammer on its head e^2, or in any suitable manner, drives each tack through the respective fold of the upper, below the tube, into and through the inner sole and clinches it on the inner side of the inner sole. The upper being secured by the tacks, the treadle is allowed to rise which allows the spring U^2, encircling the pitman rod R, to act by its tension and move the lever forward and thus return all parts into their normal positions shown in Fig. 1. The jack is now swung upon the pin S′, into position for the jaws to act upon the opposite side or corner of the toe, (the jack otherwise being held in its other relative positions,) which is done in the same manner, and after the upper is secured or lasted on this side of the toe, and the parts all moved back to their normal positions, the jack is pulled forward on the bed plate, its pin S′, moving into the portions g^4, and m^4, of the slot T′, until it bears and rests in the farther end of the portion m^4, the jack being also turned half round so as to bring the heel in position for operation thereon. The jack is then swung on its pivot n^3, until its extension H′ abuts against the other screw M′, as shown in Fig. 5, and the screw being turned in or out until, (with the extension of the jack bearing against it) the surface of the heel is in a horizontal or substantially a horizontal position, the screw pin Q′, being pressed closely against the pin S′, and the pin S′, firmly against the farther end of the slot m^4, the screw Q′, then being turned in or out until, (with the screw pressing against the pin) the center of the outline or edge of the heel of the boot or shoe, is under the jaws or vertically over or substantially vertically over the center of the pin S′, which brings the heel in position for the right hand jaws E′, to last the upper at the heel in the same manner as herein described for the toe, and after one side or corner of the heel is lasted and the upper secured, the jack is turned sufficiently on its pivot S′, to last the other side or corner of the heel, the jack being otherwise held in its other relative positions. The jack when moved forward on the bed plate and the pin S′, along into the front portion n^4, of the slot T′, is out from under and clear of the jaws so that then the last can be easily and conveniently removed from the jack, and the last with another boot or shoe placed thereon without interfering with the jaws, when the jack can be moved again along the plate into position for the jaws to last its toe or heel as has herein been described.

The operation of each tool or set of jaws is precisely the same in each case, whether lasting the boot at the toe or heel, but for operation on the toe the jaws are constructed on their operating faces, differently, for the reason that being necessary to gather the leather of the upper more at the toe than at the heel, as is well known in lasting boots or shoes, the grooves v' and y', in the toe jaws are narrower and deeper than the same grooves in the heel jaws and to more firmly secure the grip or hold of the jaws upon the upper, the projections or edges w' and z', or bottoms of the grooves can be corrugated as desired. When the guide bar moves back the lower jaw abuts by its shoulder against the under shoulder t^4, of the bar F, by which through the last part of the backward movement of its pitman rod N, the upper jaw is swung up into its open position ready for the reception of the edge of the upper of the boot as described.

In closing the grooved jaws upon the upper, as the outer edges and grooves grasp the upper at the same time, as the inner ones, they are apt to bind or hold fast the upper between them, and either prevent it at its central portion from fully entering the inner grooves, or break or tear it at such place, and to obviate this trouble, the jaws are provided with an attachment as shown in Figs. 13 and 14, in which Fig. 13, is a detail longitudinal section of the jaws, and Fig. 14, a front view.

Secured to the lower jaw D, by a screw t^4, on the upper side of the inner edge z, is a flat spring r^4, and its free end projecting toward the front, and raised somewhat as shown in Fig. 13, more particularly and the operation of the same is as follows:—When the upper is inserted between the jaws it is placed between the upper jaw E, and this spring r^4, and lower jaw D, and as the jaws come together to close upon the upper, the spring by its free end forces the upper at its middle portion into the groove v, first, before it is pressed into the other grooves, while it is free to move between the outer edges and grooves, as shown in Fig. 14, and then as the jaws close upon each other the upper is easily afterward folded in the outer grooves of the jaws.

Having thus described my invention, what I claim is—

1. In a lasting machine, the combination with two jaws pivoted to a suitable support for operation substantially as described, a tube or tubes b^2, a rod or driver, one of said jaws provided with two pivoted plates W, having a groove or grooves u^2, on their contiguous faces and a pin or pins or projection, on the support for the plates to abut against for the purpose specified.

2. In a lasting machine, the combination with two jaws pivoted to a suitable support for operation substantially as described, a tube b^2, a rod or driver f^2, one of said jaws provided with two pivoted spring plates W, having a groove or grooves u^2, on their contiguous faces, a pin or pins or projection on the support for the plates to abut against substantially as and for the purpose specified.

3. The combination with two jaws, pivoted to a suitable support having grooved and raised edges on their contiguous or operating faces adapted to mesh or interlock with each other of a spring r^4, secured to the raised edge of one jaw to project into the contiguous groove of the other jaw for the purpose specified.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ALBERT F. PRESTON.

Witnesses:
EDWIN W. BROWN,
CARRIE E. NICHOLS.