

(No Model.)

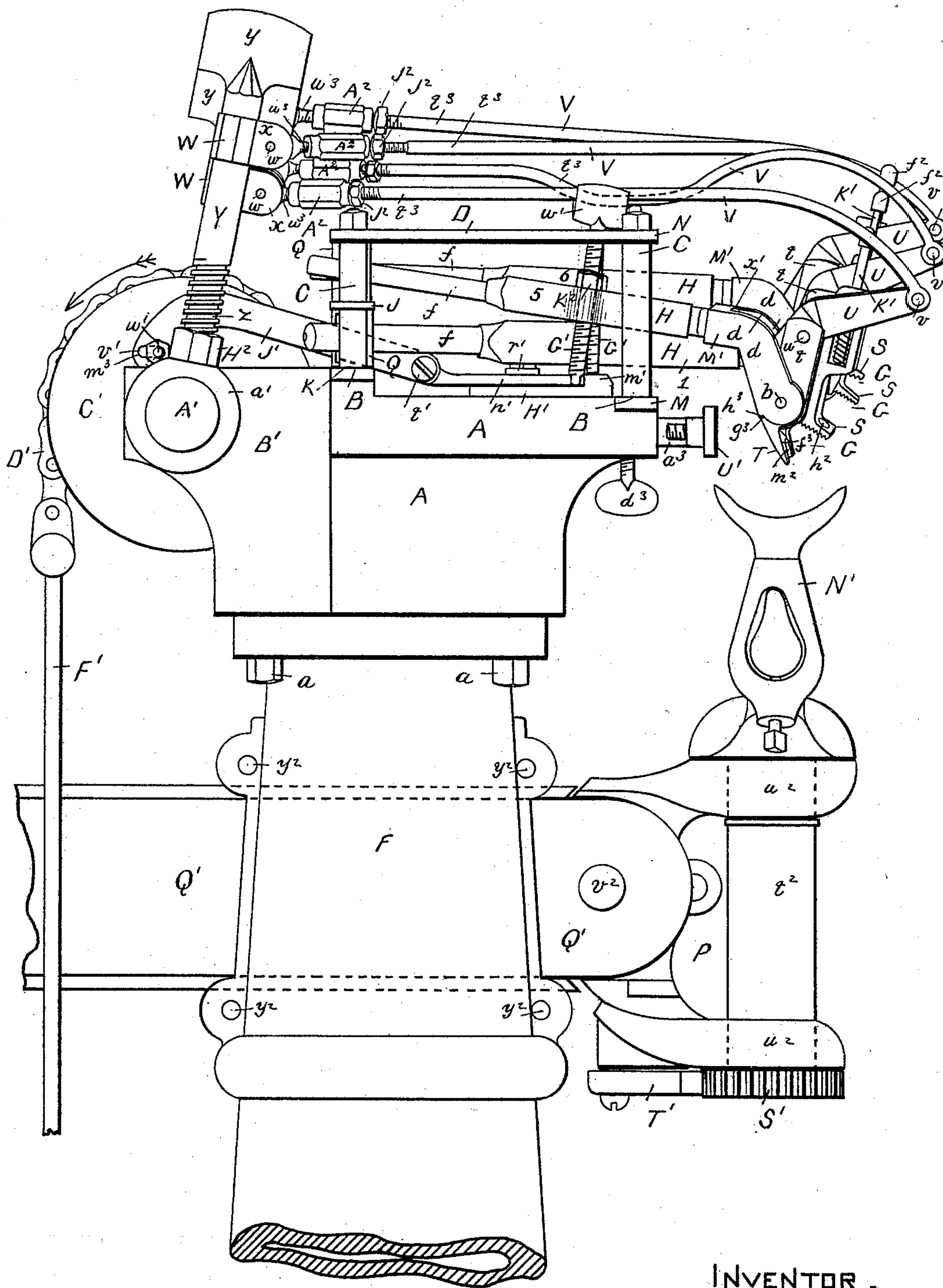
5 Sheets—Sheet 1.

A. F. PRESTON.

LASTING MACHINE FOR BOOTS OR SHOES.

No. 395,630.

Patented Jan. 1, 1889.



WITNESSES.

Percy Bryant.
C. C. Nichols.

Fig. 1.

INVENTOR.

Albert F. Preston

per *Edwin W. Brown*
Attorney.

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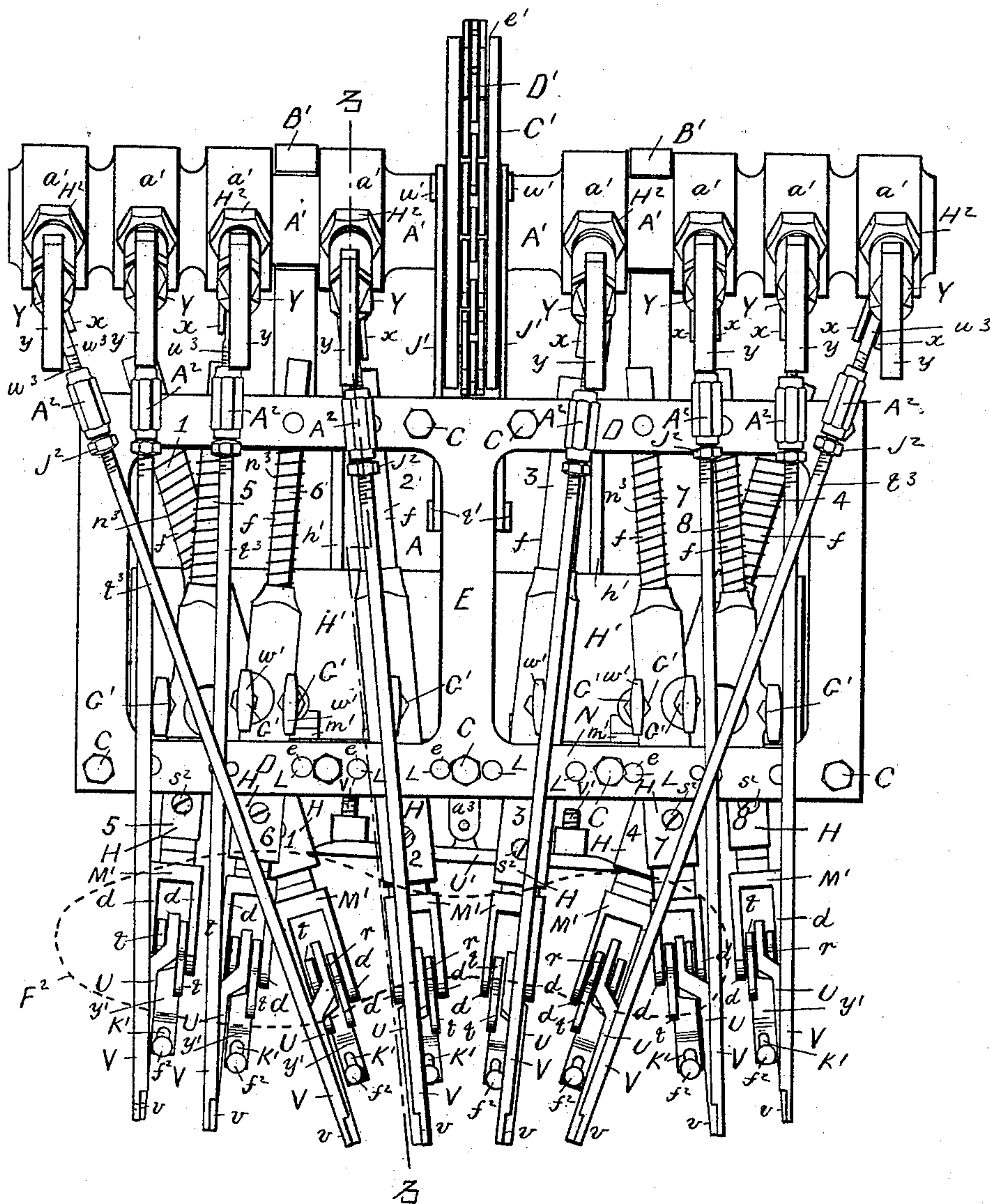


Fig. 2.

WITNESSES.

Percy Bryant.
C. E. Nichols.

INVENTOR.

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(No Model.)

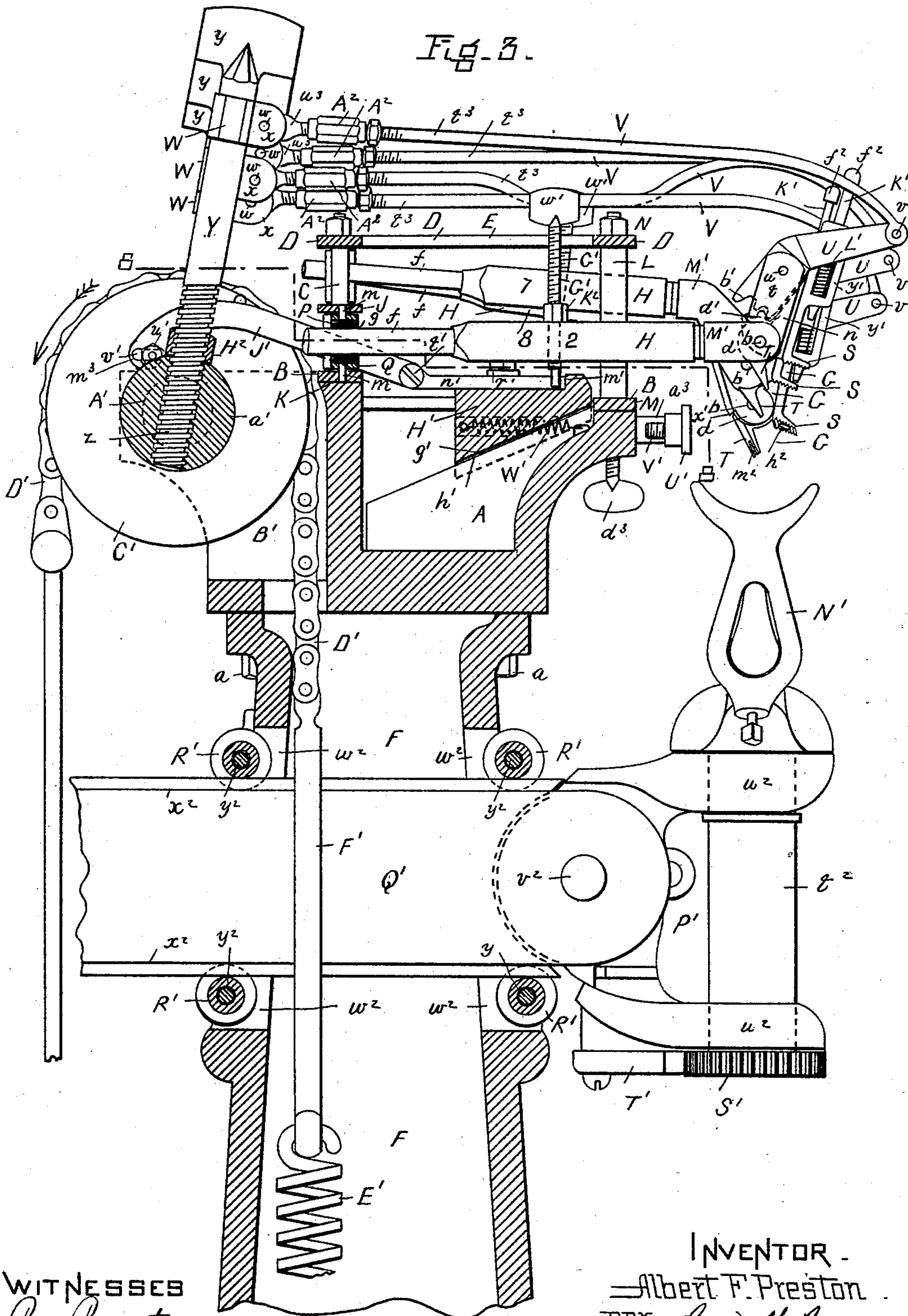
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WITNESSES
Percy Bryant.
C. Edmonds.

INVENTOR -
Albert F. Preston.
per Edwin W. Brown.
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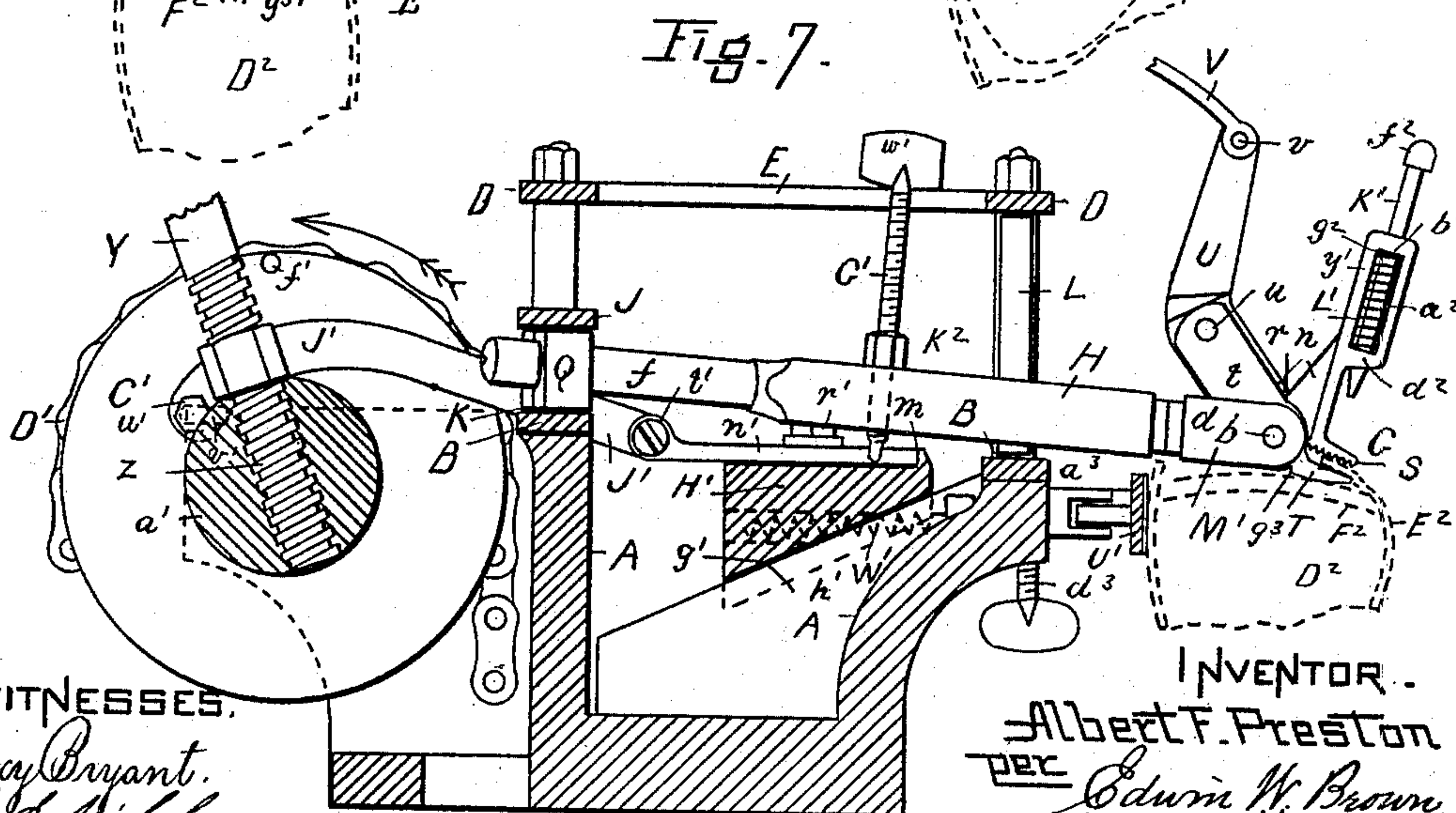
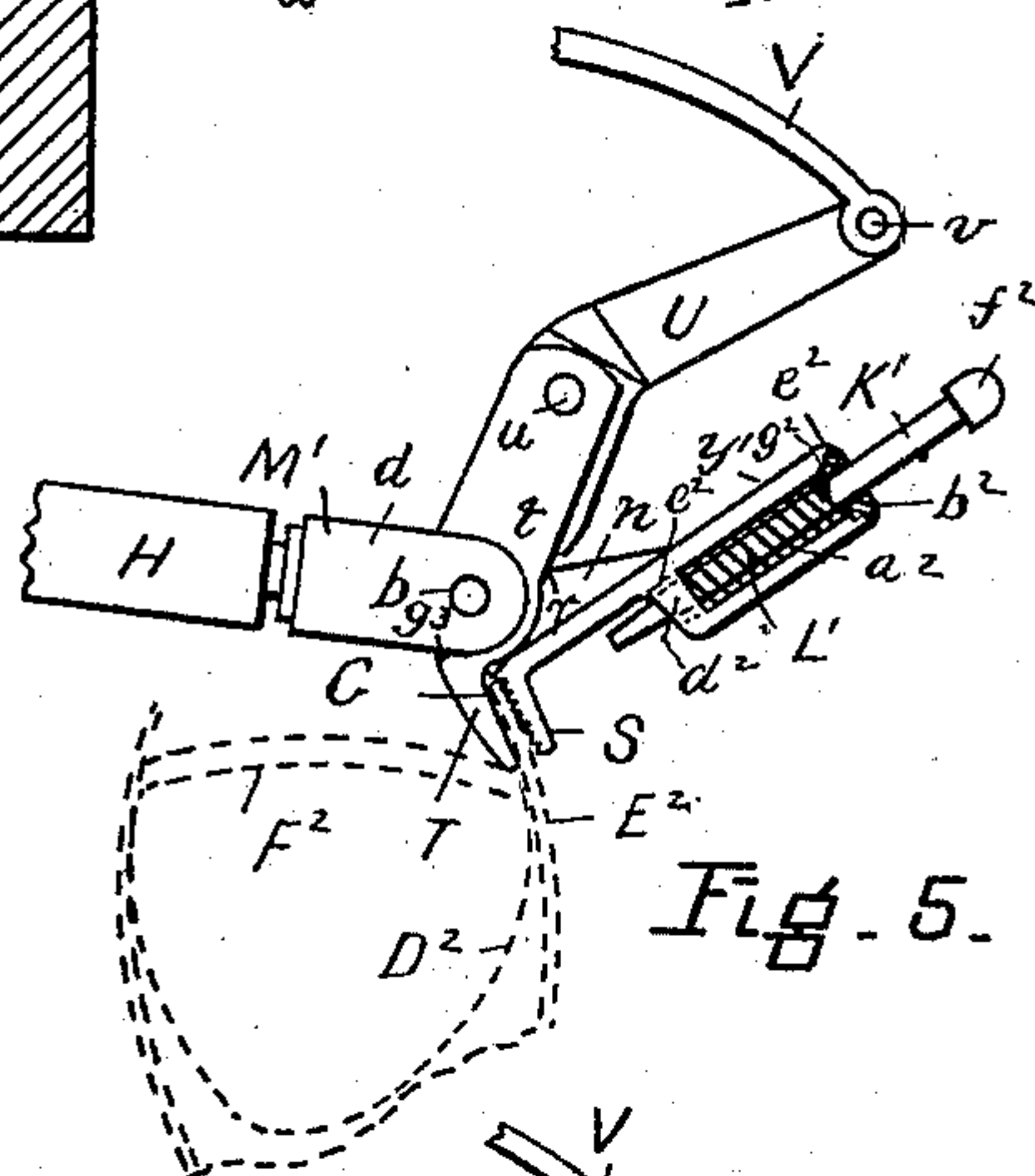
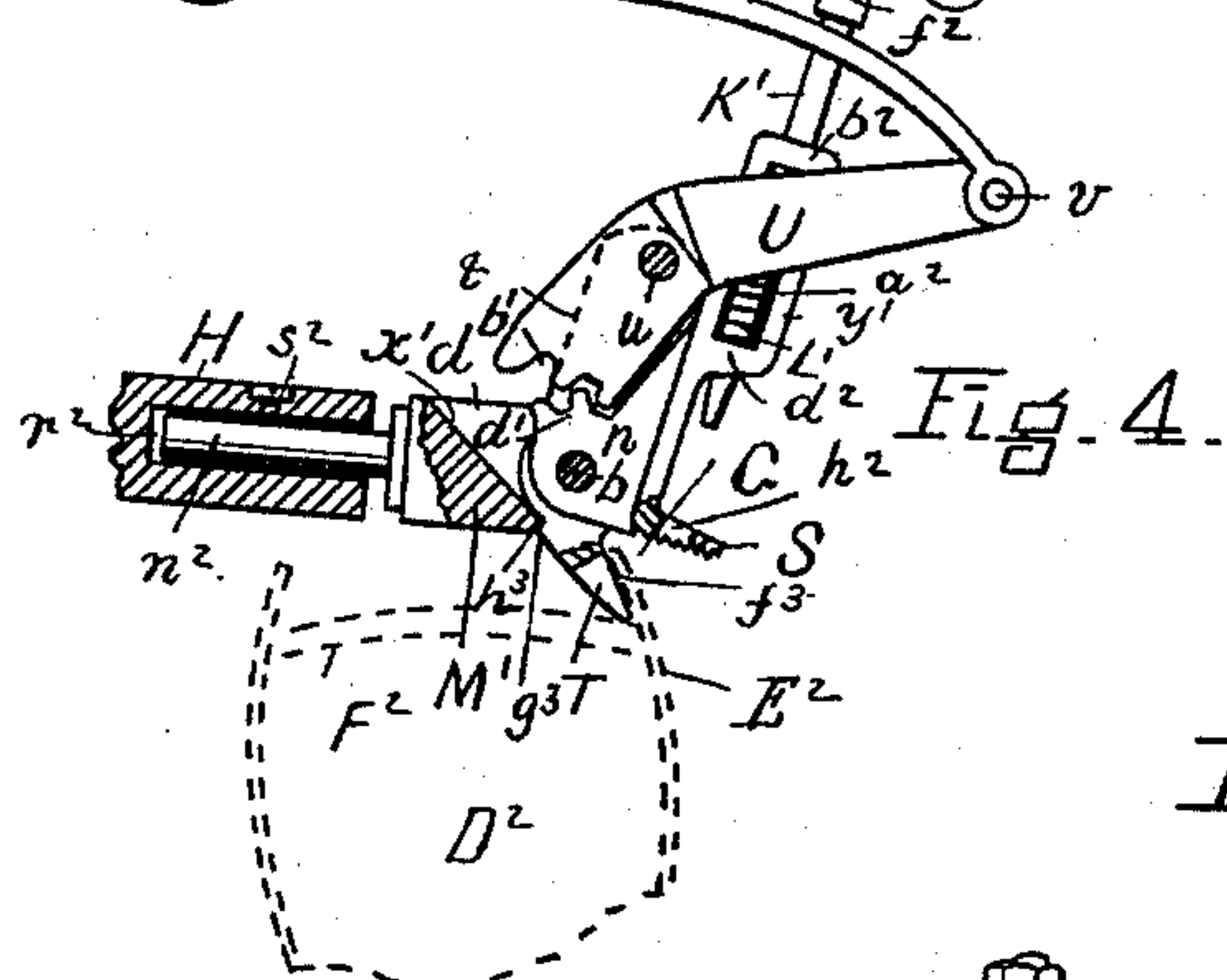
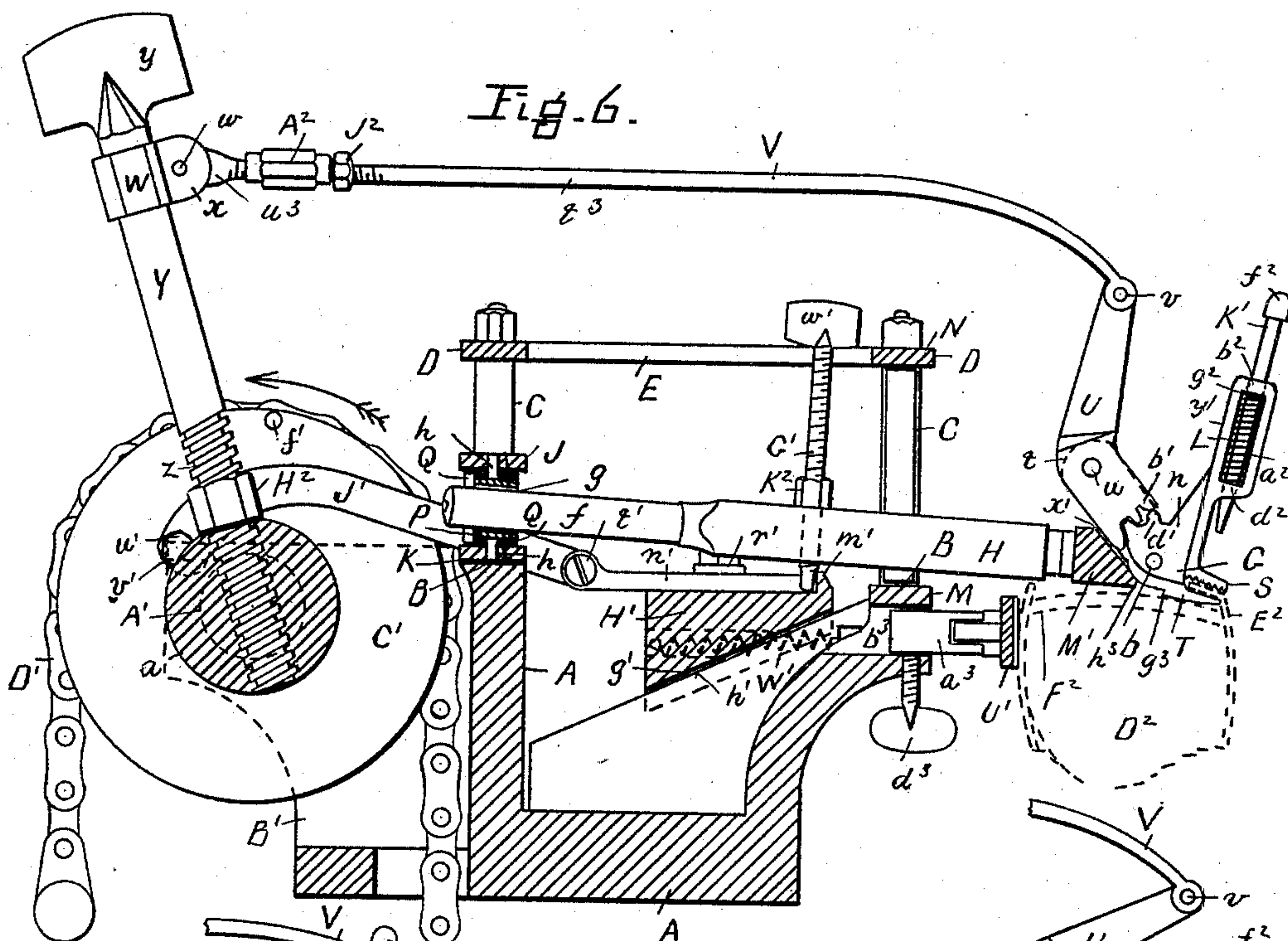
5 Sheets—Sheet 4.

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5 Sheets—Sheet 5.

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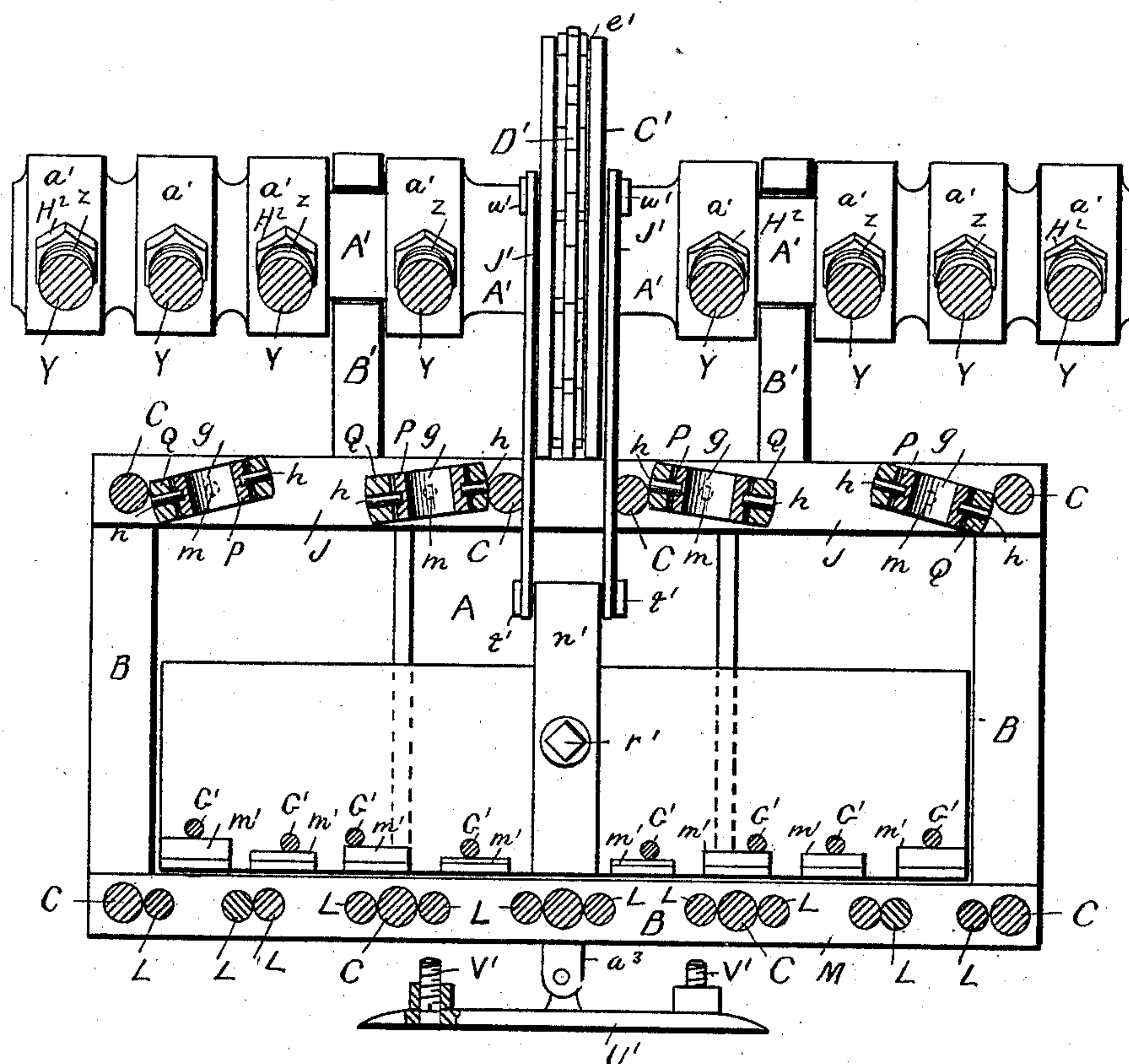


Fig. 8.

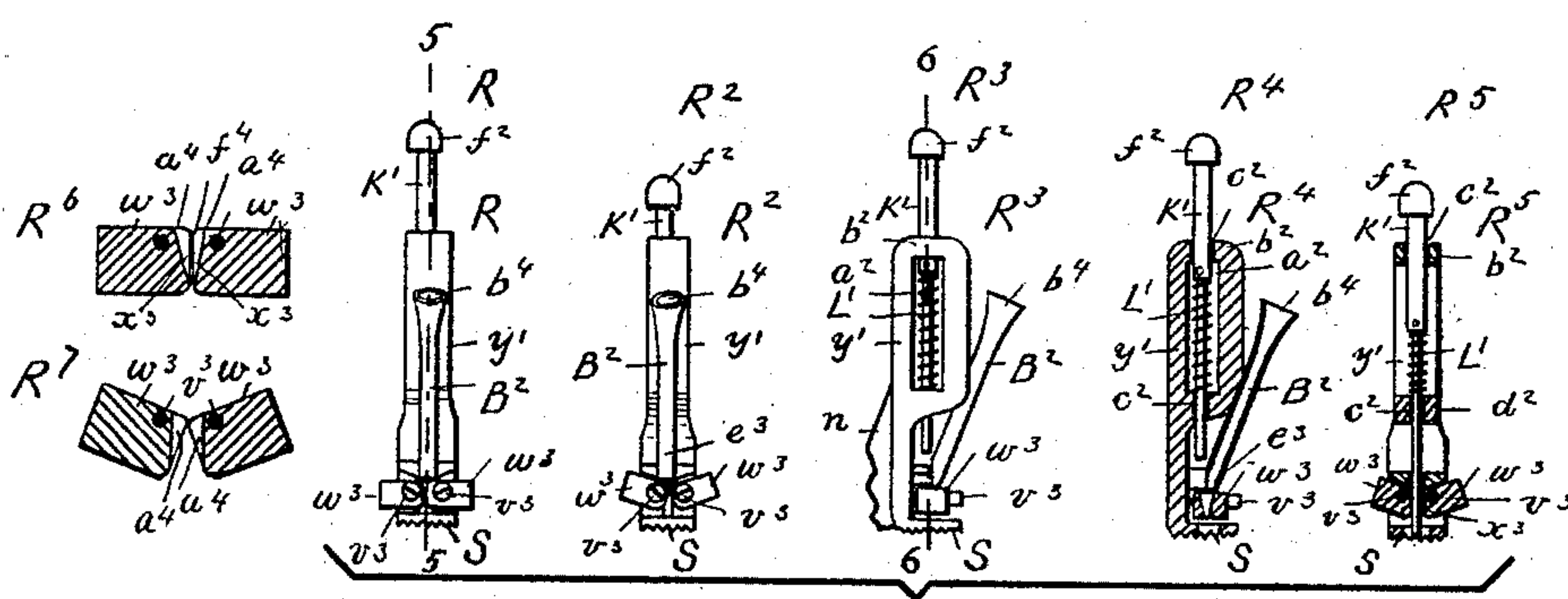


Fig-9-

WITNESSES.

Percy Bryant
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INVENTOR.

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per Edwin W. Brown
Attorney.

UNITED STATES PATENT OFFICE.

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

LASTING-MACHINE FOR BOOTS OR SHOES.

SPECIFICATION forming part of Letters Patent No. 395,630, dated January 1, 1889.

Application filed December 7, 1887. Serial No. 257,231. (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
5 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 the invention
10 consists of a series of pairs of jaws or clamps arranged substantially in a horizontal plane or in a plane corresponding to or substantially to the longitudinal contour of the bottom of the boot or shoe last, in combination
15 with means for operation on said jaws to close said jaws upon and firmly grasp and hold between them one side of the upper of a boot or shoe suitably held therefor at desired points at or about or along the edge and then move
20 them all together or at the same time, or substantially at the same time, to firmly pull and stretch the side of the upper up and over the edge and partly across the outer surface of the inner sole on the last, the series of jaws
25 being arranged to move and pull in such directions that each pair of jaws will move and pull in a direction at right angles, or substantially at right angles, to that part of the edge of the inner sole over which and where
30 it grasps and pulls upon the upper for the upper to then be secured to the inner sole, substantially as described, or in any suitable manner, all substantially as hereinafter fully described.

35 The invention also consists of a series of pairs of jaws or clamps arranged substantially in the same horizontal plane or in a plane or line corresponding to or substantially to the longitudinal contour of the bottom of a
40 boot or shoe last and constructed and arranged to grasp and hold between them one side of the upper of a boot or shoe at desired points at or about or along the edge, connected and attached to and carried by guiding bars or
45 rods that are arranged to move and are guided in diverging lines backward from the last, said guiding bars or rods being connected to an operating rock-shaft or other suitable means for operation thereof, so that each pair
50 of jaws will pull upon the side of the upper of the boot or shoe in a line corresponding to

its line of direction in which its respective guiding-bar is arranged to move or travel, all substantially as hereinafter fully described.

The invention also consists of a series of
55 pairs of jaws or clamps arranged substantially in the same horizontal plane, or in a plane corresponding to or substantially to the longitudinal contour of the bottom of a boot or shoe last, and constructed and arranged to
60 grasp and hold between them one side of the upper of a boot or shoe at desired points at or about or along the edge; one portion of said series of jaws which grasp and hold the upper at or about the shank portion being con-
65 nected and attached to and carried by guiding bars or rods that are arranged to move and are guided in diverging lines backward from the last, and the other portion of said jaws which grasp and hold the upper at or
70 about the heel and ball portions being connected and attached to and carried by guiding bars or rods that are arranged to move and are guided in lines the reverse of or crossing the guiding bars or rods of the near-
75 est jaws thereto, and preferably arranged to move in slightly converging lines, and all connected to an operating rock-shaft or other suitable means for operation thereof, so that each pair of jaws will pull upon the side of
80 the upper of the boot or shoe in a line corresponding to the line of direction in which its respective guiding-bar is arranged to move or travel, all substantially as hereinafter fully
85 described.

The invention also consists of a series of
90 pairs of jaws or clamps arranged substantially in the same horizontal plane, or in a plane corresponding to or substantially to the longitudinal contour of the bottom of the boot or shoe last, said jaws being operated by
95 suitable mechanism to grasp and hold between them one side of the upper of a boot or shoe at desired points at or about or along the edge, and to then swing downward and
100 backward at their pivotal connection, and to then pull and stretch the upper over the edge of the inner sole in a direction on the same plane, or substantially on the same plane, of the bottom surface of the inner sole, all sub-

The invention also consists of a pair of jaws

pivoted to a bar or rod adapted to move back and forth in suitable guideways, its upper jaw engaging with a pivoted lever or arm suitably connected to an operating rock-shaft or other suitable means, by which said upper jaw is caused to close upon its lower jaw and grasp what is placed between the two jaws, and by the continued operation of the operating mechanism move said jaws back, all substantially as hereinafter fully described.

The invention also consists of certain other construction and arrangement of parts for the proper operation of the machine, all substantially as hereinafter fully described.

In the accompanying sheets of drawings is illustrated a machine for lasting boots or shoes in accordance with this invention, Figure 1 representing such machine in side view, Fig. 2 in plan view, and Fig. 3 in vertical longitudinal section, line 3 3, Fig. 2; Figs. 4 and 5, detail side views; Figs. 6 and 7, detail side views and longitudinal vertical sections; Fig. 8, a horizontal cross-section on line 8 8, Fig. 3. Fig. 9 represents several views in detail, to be hereinafter referred to.

In the drawings, A represents a bed-frame, which is substantially of a rectangular box shape, and having secured to and a short distance above its upper edges, B, by upright bolts C, a horizontal rectangular frame, D, corresponding to the sides and ends of the bed-frame and having a middle cross-bar, E. This bed or box frame A rests on and is firmly connected to the top of a hollow standard, F, by screw-bolts *a*, the upper part only being shown in the drawings, which standard supports all the parts of the machine, and is suitably constructed to stand or rest on the floor.

G G represent separate pairs of jaws or clamps, there being eight pairs in all shown in the present machine, each pair of jaws being secured by a pivot, *b*, between two arms, *d*, and at the front end of a separate bar or holder, H. Each of these bars H supports and carries a pair of jaws, and serves also as means for giving the proper direction of the movement and pull of its respective pair of jaws upon the upper in the operation of the machine. They are square in cross-section at their front portions and are disposed between the upper frame, D, and the bed-frame A, and at their rear ends, which are round in cross-section, four of them, 1, 2, 3, and 4, are between a middle longitudinal bar, J, and upper edge of the back portion, K, of the bed-frame A, and the other four guide-bars, 5, 6, 7, and 8, being above or over the first four guide-bars, are between said middle bar, J, and the upper frame, D, and all being arranged to move longitudinally back and forth, and in such movements each bar is guided laterally at its front end by vertical round rods L, one each side, arranged to turn vertically by its journal ends *e* in bearings in the front portions, M N, respectively, of the frames A and D.

The rear and round end, *f*, of each of the

lower four guide-bars, 1, 2, 3, and 4, is disposed in a correspondingly-shaped socket, *g*, in a separate block, P, arranged to swivel vertically on horizontal pivots *h*, turning in bearings in another block, Q, adapted to swivel horizontally on vertical pivots *m*, turning in bearings in the longitudinal bar J and the upper edge of the back portion, K, of the bed-frame A, and the rear ends of each of the upper four guide-bars, 5, 6, 7, and 8, are disposed in similar swiveling blocks, having like letters, pivoted between the longitudinal bar J and the back portion of the upper frame, D, these pivoted blocks P Q making substantially a universal swiveling-joint connection with their supports, by which free movement longitudinally backward and forward of the back end of each guide-bar H and laterally in all directions is secured.

The four guide-bars 1, 2, 3, and 4, extend backward in diverging lines on substantially the same horizontal plane, and the other four guide-bars 5, 6, 7, and 8, two at each end being in substantially a horizontal plane above and over the first four guide-bars, extend backward in slightly-converging lines and in directions laterally (more or less) the reverse of the first four, all as shown more particularly in plan view in Fig. 2. Each pair of jaws is attached to the front end of its respective guide-bar H, and the guide-bars are all arranged in such manner that all the jaws when in their normal positions will be substantially in a horizontal plane, or a plane corresponding to or substantially to the longitudinal contour of the bottom of the boot or shoe last at the front of the machine.

Each upper jaw, S, is pivoted by its pivot *b* to its guide-bar H by a vertical tongue, *n*, at its back, which is disposed in a groove in the arm *t* of the lower jaw, T, on which pivot *b* the upper jaw can move or swing vertically to and from the lower jaw and both jaws as one on their guide-bar H.

Pivoted at *u*, between the two upper arms, *t*, of the lower jaw, T, in the groove *r*, is an arm or lever, U, which extends upward and somewhat forward in the form shown in the drawings, and is secured at its upper end by a pivot, *v*, to one end of a pitman-rod, V, extending back therefrom above the frame D and secured by a pivot, *w*, to and between two arms, *x*, of a sleeve, W, adapted to swivel around on the upper end of an upwardly-projecting lever or arm, Y, having a handle, *y*, and screwing by its end *z* into a rim or flange, *a'*, of a horizontal rock-shaft, A', adapted to turn in bearings of uprights B', extending back from and forming part of the bed-frame A.

The lower end of each arm or lever U, pivoted to the arms of the lower jaw, T, has a segment, *b'*, of a gear which engages with another segment, *d'*, of a gear on the tongue *n* of the upper jaw, S, so that as the arm or lever U is swung backward or forward on its pivot *u* it will, through the segmental gears

$b' d'$, cause the upper jaw, S, to swing on its pivot and respectively move to or from its lower jaw, T, to open or close the two jaws.

The rock-shaft carries a pulley, C', at its central portion, in the groove e' of which is arranged a chain, D', its two ends extending down therefrom and connected by one end to a spiral spring, E', secured to the standard below (but not shown) in any suitable manner, and by its other end to the upper end of a rod, F', which at its other end is suitably connected to a treadle pivoted in any suitable manner to the bottom of the standard, but not shown in the drawings, so that if the treadle is pressed down it will, through the chain-connection with the pulley, turn the rock-shaft in the direction of the arrow, Figs. 1, 3, and 6, and, allowing the treadle to raise the spring E', will act upon the rock-shaft to return it to its original and normal position. To insure positive movement of the shaft by the chain, it is secured to the pulley by a cross-pin, f' . (Shown in Figs. 6 and 7.)

Each of the guide-bars H bears and rests by a vertical screw, G', having a head, w' , for operation thereof, screwing through it when they are in their normal positions, (shown in Figs. 1 and 3,) upon a transverse horizontal bar, H', arranged within the bed-frame A, which transverse bar rests by its under inclined surfaces, g' , upon inclined upper surfaces or rib edges, h' , of the bed-frame. Turning the screws G' in or out raises or lowers the bars and regulates their height above the transverse bar H', and correspondingly the height of the jaws G and their relative positions horizontally, as desired. Along the front edge of this transverse bar H', on its upper side, are a series of ribs or shoulders, m' , one in front of each guide-bar-regulating screw G', and against which its respective screw is arranged to abut or bear in the operation of the machine, as will be hereinafter described.

The transverse bar H' is arranged to freely move backward and forward on its inclined bearings within the bed-frame, and for such movements it is connected by an arm, n' , secured to it at its middle portion by a bolt, r' , and by a pivot, t' , to and between the ends of two pitman-rods, J', their other ends being connected to the pulley C', one each side, by a screw-bolt, u' , which extends through the pulley and through slots v' in each pitman-rod, the location of the bolt u' on the pulley being preferably above the shaft A' when in its normal position. The slots v' allow the pulley to turn a short distance before the bolt r' will act upon the pitman-rods J' to move the transverse bar H' backward, and the location of the bolt u' on the pulley in reference to its rotation in the last portion or about the last half of the movement of the pulley is such that it will not move or act upon the bar, as the bolt will then only move substantially in a vertical line, moving comparatively little horizontally. Turning the rock-shaft in the

direction of the arrow, Figs. 1, 3, and 6, each lever or arm Y is swung over or backward, pulling by its pitman-rod V upon the arm U, pivoted to the lower jaw, and through its segmental-gear connection closes the upper jaw, S, upon its lower jaw, T, and when so closed the pitman-rods J' of the transverse bar H', as the pulley continues to turn, will pull the same back and down its incline bearings, and through its shoulders m' , abutting against the guide-bar screws G', will pull back and lower the guide-bars H, by which the pivoted connection b of each jaw will move back and down substantially in the arc of a circle of which the front end of each jaw is the center, and which, practically, does not move backward or downward until the jaws are in substantially a horizontal position, as shown in Fig. 4, when the arm of the lower jaw T of each pair of jaws will abut against a shoulder, x' , on its guide-bar, preventing any further swing or movement of the jaws on its guide-bar, when the levers Y will then act upon and pull the several guide-bars H back, carrying with them their respective pairs of jaws.

The upwardly-extended arm y' of each upper jaw, S, has an elongated opening, a^2 , extending through it sidewise, its upper and lower walls or ends, $b^2 d^2$, having sockets c^2 , through which projects and is adapted to move up and down or backward and forward therein a rod or pin, K', having a head, f^2 , its lower end being tapering, which rod has a radially-projecting pin, g^2 , secured to it between the two ends to abut against the upper end, b^2 , to prevent any further upward movement of the rod than desired. A spiral spring, L', encircles the rod and bears against the pin g^2 and the lower end, d^2 , of the arm, which acts to keep the rod in its highest position unless otherwise acted upon.

Each rod K' is located above and perpendicular to an opening, h^2 , through its upper jaw, which opening h^2 is over an open slot, m^2 , in the lower jaw. Each pair of jaws is secured to the front end of a block, M', which has a round tenon, n^2 , adapted to fit within a central longitudinal socket, r^2 , in the end of the main portion of the bar, by which connection each pair of jaws can be moved in or out and be turned around vertically for the adjustment of its position relative to the longitudinal contour line of the bottom of the last placed in position for lasting the upper and the projecting distance of each pair of jaws from the frame-work, according to the size or width and the convexity and concavity of the edge of the inner sole, and it is provided with a set-screw, s^2 , to secure it from movement or accidental escapement from the bar.

N' is the jack for holding the last for the boot to be lasted, and it has a spindle, t^2 , extending downward, arranged to turn in bearings in two arms, u^2 , of a holder, P', pivoted at v^2 to the end of a flat bar, Q', which projects horizontally through and is adapted to

move backward and forward in a vertical slot, w^2 , in the standard running by its upper and lower edges, which are suitably shouldered longitudinally therefor, as at x^2 , upon friction-
 5 rollers R' , turning upon journals y^2 on the standard, by which connections the jack can be swung up to and away from the machine by its pivot v^2 and moved backward and forward by sliding the bar Q' in its slot
 10 w^2 and rotated horizontally on its spindle t^2 . On the lower end of the spindle is a gear-wheel, S' , and T' is a double swinging pawl pivoted to the standard to engage therewith when desired to hold the jack from turning
 15 on its spindle.

U' is a plate set up edgewise and centrally pivoted on the end of a bar, a^3 , which bar is adapted to slide forward and backward in a horizontal groove, b^3 , in the bed-frame A , and
 20 is arranged to be secured therein by a set-screw, d^3 , screwing up through the bed-frame. The plate U' also has on its back side two screws, V' , projecting backward therefrom, one near each end, by which the angle of the
 25 plate when it is placed back against the front of the bed-frame can be arranged as desired, and when so adjusted the set-screw d^3 is screwed in to hold the plate in its fixed position.

The series of pairs of jaws and their respective connecting guide-bars and other parts in their construction and operation are alike. The description and illustration of one
 30 answers for each of the others, and in Figs. 4, 5, 6, and 7 is illustrated one pair of jaws and its connecting parts for operation thereof in side elevation and partial section, the series of movements that each pair of jaws performs, and its operation on the upper of the boot or
 35 shoe in lasting the same from its normal position ready to receive the upper to its position when the upper is drawn over the edge of the inner sole or lasted ready to be secured by a tack, &c., to the inner sole, as will
 40 now be seen. In these views the last D^2 , upper E^2 , and inner sole, F^2 , are shown in detail in dotted lines.

The operation of the machine is substantially as follows: With the machine in the position shown in Figs. 1, 2, 3, and 4, the last,
 50 having the inner sole and upper placed upon it and drawn over the toe and heel in the usual manner, is placed upon the jack, the toe, for instance, at the right, the jack being
 55 moved forward for the purpose by sliding it on its rollers R' . It is then moved back and swung upon its pivot v^2 until the upper of the boot at the side of the last abuts against the plate U' , which has been properly adjusted
 60 for the size of the boot and which places the inside of the side of the boot-upper at or about its edge farther from the machine against the inner or operating faces, f^3 , of the several lower jaws to guide-bars 1, 2, 3,
 65 4, 6, 7, and 8, and between them and under their respective upper jaws, as shown in Fig. 4, holding the boot thus placed firmly against

the plate U' , press down the treadle, which will turn the pulley and its shaft, carrying with it the levers or arms $Y Y$, which, through
 70 their respective connecting-rods V to the arms or levers U of the several jaws G , will cause the upper jaws, S , by their gear-connection therewith, assisted by gravitation, to swing on their pivots or fall down to and close upon
 75 the lower jaws, as shown in Fig. 5, grasping between the two jaws of each pair of jaws the edge of the upper placed between them, as shown. When so closed, the pulley C' will have turned sufficiently for its pin or bolt u'
 80 to abut against the outer ends, m^3 , of the slots v' in the pitman-rods J' , and in its continued rotation will, by the pitman-rods J' , pull upon and move said transverse bar back and down its inclined bearing-surfaces h' , and, by its
 85 several ribs or shoulders m' abutting and striking against their respective screw-pins G' of the several jaw-guiding bars H , the guiding-bars will move backward and downward from the movement of the transverse
 90 bar down its inclined bearing-surfaces, so that the lower jaws will then rest upon the inner sole of the boot being lasted, as shown in Fig. 6. The movement thus far, however, does not
 95 pull the jaws backward, but merely changes the plane of their pivotal connection with the bars in relation to the plane of their front ends from its elevated or angular position
 100 (shown in Fig. 5) into substantially a horizontal one, as shown in Fig. 6, or, in other words, so that the line of grip of the jaws and their pivotal connections with their jaw-guiding
 105 bars will be in the line of the direction horizontally in which the jaw-guiding bars are to be pulled, or substantially in the same horizontal line, and at such time the transverse bar will
 110 have practically ceased movement, so that its ribs or shoulders m' will have no effect upon the guide-bars, even if they should bear upon them, and the arm or lever U of each pair of
 115 jaws will have reached and abutted against its respective shoulder x' on its jaw-guiding bar H , as shown in Fig. 6, so that in the continued movement of the shaft and pulley the jaw-guiding bars will then all be pulled and
 120 moved back, carrying the jaws back with them, and in such movements 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,
 125 as shown in Fig. 7, when the upper is tacked to the inner sole by inserting in each opening h^2 in each upper jaw a tack, point downward, and striking each rod K' upon its head, which
 130 by its lower end will drive the tack through the upper and into the inner sole and fasten and secure the upper to the inner sole, thus lasting one side of the boot or shoe. When the upper is secured by the tacks, the treadle is allowed to rise, which allows the spring E' to turn the shaft and pulley in the reverse direction, returning all the parts back into

their normal positions, (shown in Figs. 1, 2, 3, and 4,) and then the jack is swung and moved forward and turned round in order to last the other side of the boot, which is accomplished in a similar manner to the first side of the boot except that the jaws to the jaw-guiding bar 5 are used in lieu of the jaws to the jaw-guiding bar 8 used before, and when lasted the jack is swung and moved forward and the lasted boot removed from the jack, and the last with another boot placed thereon to be lasted, as before, and so on. When the guide-bars have moved back, the lower jaw, T, abuts by its shoulder g^3 against the under shoulder, h^3 , of its respective bar H, by which, through the last part of the backward movement of its lever or arm U, the upper jaw, S, is swung up into its open position ready for the reception of the upper of the boot, as described.

On the round portion f of some of the jaw-guiding bars H is a spiral spring, n^3 , abutting by one end against the block P, its tension serving to help return the bar to its normal position after the operation of the machine. The middle bars, however, do not need the springs in practical operation. The transverse bar H' also has a spiral spring, W', secured by one end to it and by its other end to the bed-frame, which returns the bar to and helps to keep it in its normal position. The pull of each pair of jaws upon the upper is arranged to be in a line at right angles, or substantially at right angles, to the edge of the inner sole over which the upper is being drawn and stretched, substantially as is shown in Fig. 2, where an inner sole is shown in dotted lines, showing its position on the last for operation thereon, and at the same time by the divergence of the four guiding-bars 1 2 3 4, as shown, which are more particularly for action on the upper at or about the shank of the boot, as their respective jaws move backward in stretching the upper, they also move laterally and from each other, so that the upper when being stretched over the inner sole is not only pulled directly over such edge at right angles, or substantially at right angles, thereto, but is also stretched more or less laterally along such edge, so that when finally secured to the inner sole over the last the upper will fit more snugly to the last, much better than by hand-lasting, and will be smoother and have a much better general appearance after the last is removed from the boot.

The guide-bars 7 8 at the right extend back in directions more or less the reverse of the two guide-bars 3 4 nearest to them, and are also slightly converging, as the jaws to these guide-bars 7 8 are to pull the upper over the edge of the inner sole at the heel when one side of the boot is lasted (see Fig. 2) and at the ball when the opposite side of the boot is lasted, where the direction of the line of such edges is more or less convex, requiring such change of direction of pull upon such jaws to

preserve the right-angular line of pull desired at such portion of the boot, the shank, being concave, requiring the diverging directions of pull, substantially as described. The same is the case with the jaws 5 6, which, in relation to the jaws 1 2, the jaws 5 6 working the reverse of the jaws 7 8, and generally in practical operation all the jaws except the two outer ones, 5 8, working on both sides of the upper, these outer ones alternately operating on the ball of the boot. In using this machine, although there are eight pairs of jaws and their respective guiding-bars shown, only seven are used at a time, the four middle ones at all times, the two 7 8 at the right and the one 6 at the left when the boot is lasted with the toe of the boot at the right, and the two 5 6 at the left and the one 7 at the right when the toe of the boot is at the left. After the boot is lasted in this machine the remaining portion of the toe and heel can be properly lasted in any suitable manner or in any suitable machine, as desired, or can be lasted at the toe and heel before being operated upon by this machine.

Although eight pairs of jaws and their guiding-bars are described and shown, a larger number might be used if desirous of bringing the jaws closer together laterally and to more effectually stretch as much of one side of the upper over the last as can be done in such a machine, in order to last as little as possible of the heel and toe separately.

In Fig. 9 is represented in several detail views the upper jaw, S, and its upward-extended arm y' as provided with means for the better applying or feeding the tacks used in securing the upper to the inner sole, and in such figure view R represents said jaw and additional parts in front view ready to receive a tack; R^2 , front view with the hammer-pin K' as moved down and driving a tack; R^3 , a side view of view R; R^4 , a vertical section on line 5 5, view R; R^5 , a vertical section on line 6 6, view R^3 , but with the movable parts in the position shown in view R^2 . R^6 and R^7 show in vertical section two of the parts in different positions and as respectively shown in R and R^2 , these two views being enlarged. In these views w^3 are two blocks pivoted at v^3 to the front of the arm y' of the jaw above its upper surface, and so they can rest thereon when in their normal positions, as shown in views R, R^3 , and R^4 , and in such position close together. Each block has a vertical tapering groove, a^3 , in its contiguous side or end and opposite to each other to form when placed in their normal positions (shown in views R, R^3 , R^4 , and R^6), a conical socket or opening, f^4 , as shown more particularly at R^6 , which is adapted to receive and hold the tack ready to be driven into the upper and inner sole.

On the front side of the arm y' and above the blocks w^3 is a tube, B^2 , slightly inclined forward, as shown, and having an upwardly-flaring opening, b^4 , and its lower end, e^3 , ar-

ranged to be just over or above the upper end of the conical socket f^4 , formed by the two blocks.

The operation is as follows: The tack is placed in the upper end of the tube B^2 , which passes down through the tube into the conical socket, and, with the upper between the two jaws, S T , it rests by its point upon the upper. Striking the pin K' drives the tack through the upper into the inner sole, and as the lower end of the hammer-pin passes down through the conical socket the blocks w^3 swing upon their pivots, as shown in R^5 and R^7 , to allow its free passage through the socket f^4 , and when the hammer-pin returns to its upper and normal position by its spring L' the blocks by their gravity return to their normal positions ready to receive another tack. The lower end of the tube B^2 is cut away sufficiently to not interfere with the pin K' in its movements. Such a construction and arrangement of parts enables the tacks to be quickly placed in position when lasting the boot for securing the upper to the inner sole.

The conducting-tube B^2 can be dispensed with, if desired, and the tack inserted directly in the conical socket; but it is preferable to use the tube.

The blocks w^3 can have springs combined therewith to return them to their normal positions, in lieu of depending on their gravity; also they can be dispensed with and the tube B^2 used alone; but it is preferable to use both.

It is preferable to make the groove a^3 in each block tapering, as described and shown, as the tack being tapering is the better disposed therein, although the grooves can be straight, if desired.

The open slot m^2 in the lower jaw allows the tack after being driven into its place to pass out therefrom, so that the boot can be removed from the jaws.

The guide-bars H can be arranged to bear directly upon the transverse bar, having a suitable shoulder or projection to abut against the rib or shoulder on the transverse bar, dispensing with the screws G' ; but it is preferable to use the screws or equivalent device, because the height of the bar can be regulated and adjusted. They can be of any suitable construction and can each be in one piece, and can be arranged to move and be guided in their necessary directions of movement in any suitable manner, although, as shown and described, they are very satisfactory and practical in construction and operation. The vertical turning pins or rolls L serve to reduce friction on the sides of the guiding-bars as they move forward and backward. The front end or block of each guide-bar directly holding its pair of jaws is varied in shape to bring the jaws into the required vertical position at the front of the machine for their proper reception and work upon the upper. The working-face of each jaw S is serrated, as shown, to more firmly hold the upper between

it and the lower jaw. The pitman-rods V are made in two pieces, t^3 and u^3 , and are connected together by a right and left screw-threaded sleeve or nut, A^2 , by the turning of which in the proper direction the rod V can be lengthened or shortened, as desired. The screw-threaded nut A^2 has a set-nut, J^2 , screwing onto the part t^2 of the rod V ; also each lever or arm Y has a set-nut, H^2 , and each height-regulating screw G' a set-nut, K^2 , by which each of the said screws is secured from accidental movement after adjustment.

The feeding device for the tacks can be used for other purposes than in connection with a lasting-machine or the two jaws, as described and shown, as they can be used on any suitable support when it is desired to hold or feed and drive tacks, &c.

The length of pull by each pair of jaws upon the upper can be regulated in several ways. For instance, and preferably, by screwing in or out the lever or arm Y of the rock-shaft, so that the distance the pivot-connection w of the pitman-rod V is more or less from the center of rotation of the shaft and thus makes the levers or arms Y pull upon the jaws more or less accordingly. The pitman-rods V can also be lengthened or shortened by turning the right and left screw-threaded sleeve A^2 in the one direction or the other.

The various parts of the machine are preferably made of any suitable metal and constructed in any suitable manner.

Any suitable jack can be used in lieu of the one shown, which forms no part of the present invention.

Having thus described my invention, what I claim is—

1. In a lasting-machine, the combination, with a series of pairs of pivoted jaws arranged diagonally upon a suitable frame or support, all on one side and adapted to pull in diverging lines, of means, substantially as described, to close said jaws and grasp and hold one side of the upper of a boot or shoe at or about its edge at or substantially at one and the same time, so that each pair of jaws will pull upon said upper and stretch the same over the inner sole in a direction at right angles, or substantially at right angles, to the edge of the inner sole, where each pair of jaws grasps and holds the upper.

2. In a lasting-machine, the combination, with a series of pairs of pivoted jaws suitably attached and connected to bars or rods arranged diagonally in grooves or guideways upon a suitable frame or support, all on one side and adapted to pull in diverging lines, of means, substantially as described, connected to and arranged to pull said bars or rods in such diverging lines, for the purpose specified.

3. In a lasting-machine, the combination, with a series of pairs of pivoted jaws suitably attached and connected to bars or rods arranged diagonally upon a suitable frame or support in grooves or guideways and adapted

to pull in diverging lines, and another series of pivoted jaws suitably attached and connected to bars or rods arranged diagonally on said frame or support in grooves or guide-ways and to pull in diverging lines opposite to or crossing more or less the diagonal and diverging lines of the first series of jaw-guiding bars or rods, of means, substantially as described, connected to and arranged to pull said guide bars or rods in such diverging lines, for the purpose specified.

4. In a lasting-machine, the combination, with a series of bars or rods arranged to move backward and forward in suitable guideways and each carrying two jaws, of a transverse bar, H' , provided with ribs or shoulders m' and arranged to move backward and forward on inclined guideways h' , and on which transverse bar rest and bear the guide-bars H , each provided with a shoulder to abut against its respective rib or shoulder m' on the transverse bar, substantially as and for the purpose specified.

5. In a lasting-machine, the combination, with a series of bars or rods arranged to move backward and forward in suitable guideways and each carrying two jaws, of a transverse bar, H' , provided with ribs or shoulders m' and arranged to move backward and forward on inclined guideways h' , and on which transverse bar rest and bear the guide bars or rods, &c., by a regulating-screw, G' , for each screw to abut against its respective rib or shoulder m' on the transverse bar, substantially as and for the purpose specified.

6. In a lasting-machine, the combination, with a series of bars or rods, H , arranged to move backward and forward in suitable guideways and each carrying two jaws, of a transverse bar, H' , provided with ribs or shoulders m' and arranged to move backward and forward on inclined guideways h' , and on which transverse bar rest and bear the guide bars or rods H , arranged to engage with or abut against their respective ribs or shoulders m' on the transverse bar, and all connected to a rock-shaft or other suitable means for operation thereof, for the purpose specified.

7. In a lasting-machine, the combination, with a series of bars or rods, H , arranged to move backward and forward in suitable guideways and each carrying two jaws, of a transverse bar, H' , provided with ribs or shoulders m' and arranged to move backward and forward on inclined guideways h' , and on which transverse bar rest and bear the guide bars or rods H by regulating screws G' in position for such screws to engage with or abut against their respective ribs or shoulders m' on the transverse bar, and all connected to a rock-shaft or other suitable means for operation thereof, for the purpose specified.

8. In a lasting-machine, the combination, with a series of bars or rods, H , arranged to move backward and forward in suitable guideways and each carrying two jaws, of a trans-

verse bar, H' , provided with ribs or shoulders m' and arranged to move backward and forward on inclined guideways g' , and on which transverse bar rest and bear the guide-bars H , and arranged to engage with or abut against their respective ribs or shoulders m' on the transverse bar, said transverse bar being connected by pitman-rods J' to a rock-shaft, A' , by a slot-bearing, v' , and pin w' , and said guiding-bars to said rock-shaft by pitman-rods to levers or arms V , adjustably secured to said rock-shaft, all for operation substantially as and for the purpose specified.

9. In a lasting-machine, the combination, with a series of bars or rods, H , arranged to move backward and forward in suitable guideways and each carrying two jaws, of a transverse bar, H' , provided with ribs or shoulders m' and arranged to move back and forward on inclined guideways g' , and on which transverse bar rest and bear the guide-bars H by regulating screw G' in position for such screw to abut against their respective ribs or shoulders m' on the transverse bar, said transverse bar being connected by pitman-rods J' to a rock-shaft, A' , by a slot-bearing, v' , and pin w' , and said guiding-bars to said rock-shaft by pitman-rods to levers or arms V , adjustably secured to said rock-shaft, all for operation substantially as and for the purpose specified.

10. In a lasting-machine, a bar or rod, H , arranged to move back and forth in suitable guideways made in two parts, connected together by an adjustable connection, one of said parts carrying two jaws pivoted thereto, for the purpose specified.

11. In a lasting-machine, a bar or rod, H , arranged to move backward and forward in suitable guideways made in two parts, one part provided with a tenon, n^2 , adapted to fit within a socket, r^2 , in the other part and secured thereto by a set-screw, s^2 , and carrying two jaws pivoted thereto, for the purpose specified.

12. In a lasting-machine, the combination, with a bar or rod, H , carrying two jaws pivoted thereto adapted to move backward and forward in a guideway provided at the front with friction-rolls and at the rear by a universal swiveling connection with the support, for the purpose specified,

13. In a lasting-machine, the combination, with two jaws pivoted to a bar or rod, H , arranged to move backward and forward in suitable guideways and provided with shoulders x' and h^3 , of a lever pivoted to one of said jaws, having a shoulder, g^3 , on its under side and arranged to engage with the other of said jaws and connected to means for operation thereof, for the purpose specified.

14. In a lasting-machine, the combination, with two jaws pivoted together for operation, substantially as described, and provided with openings, of a spring rod or driver, K' , adapted to slide up and down in suitable

guideways on one of said jaws, for the purpose specified.

15. In a lasting-machine, the combination, with two jaws pivoted together, provided
5 with openings for operation, substantially as described, the upper one having pivoted thereto blocks w^3 , and each provided with a tapering groove, a^3 , on its contiguous side or end, of a spring rod or driver, K' , adapted to

slide up and down in suitable guideways on 10 said 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,

PERCY BRYANT.