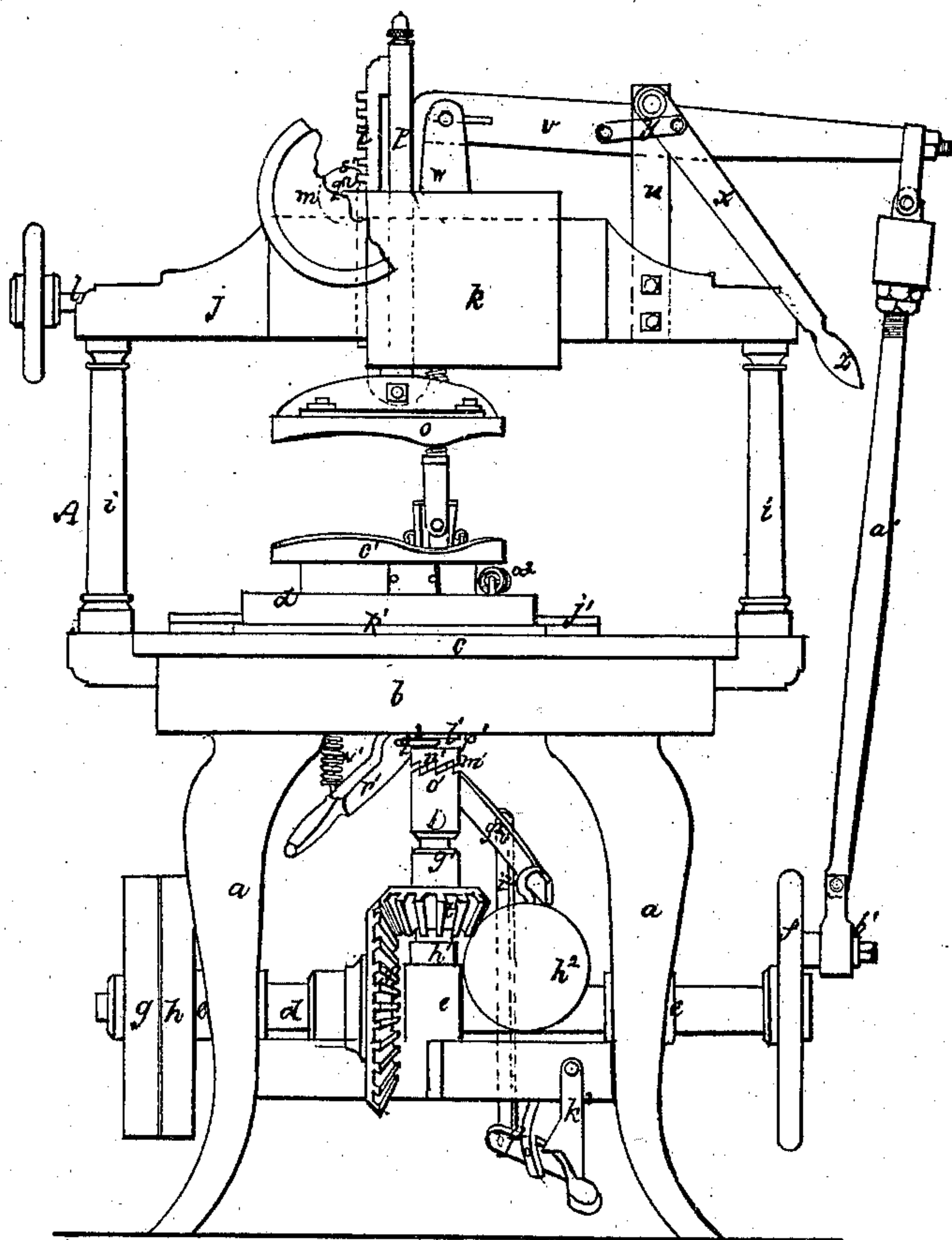


A. JEFFERS.
MACHINE FOR MOLDING, ROUNDING, CHANNELING, AND STAMPING
SOLES OF BOOTS OR SHOES.

No. 99,682.

Patented Feb. 8, 1870.

Fig. 1.



Witnesses.
Edward Griffith.
Edmund H. Hewins.

Albert Jeffers.
by his Attorney.
Frederick Curtis.

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Fig. 5. Patented Feb. 8, 1870.

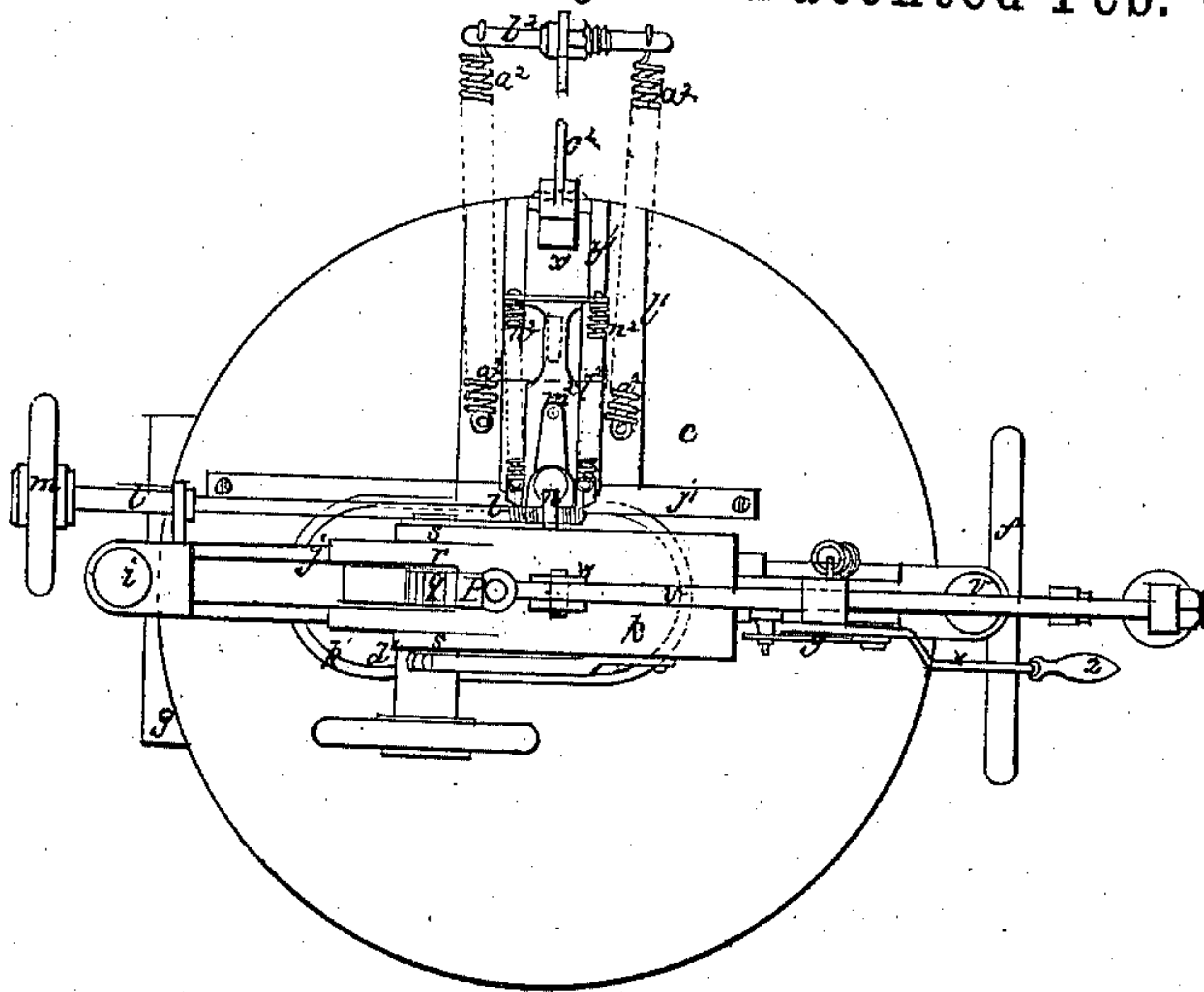
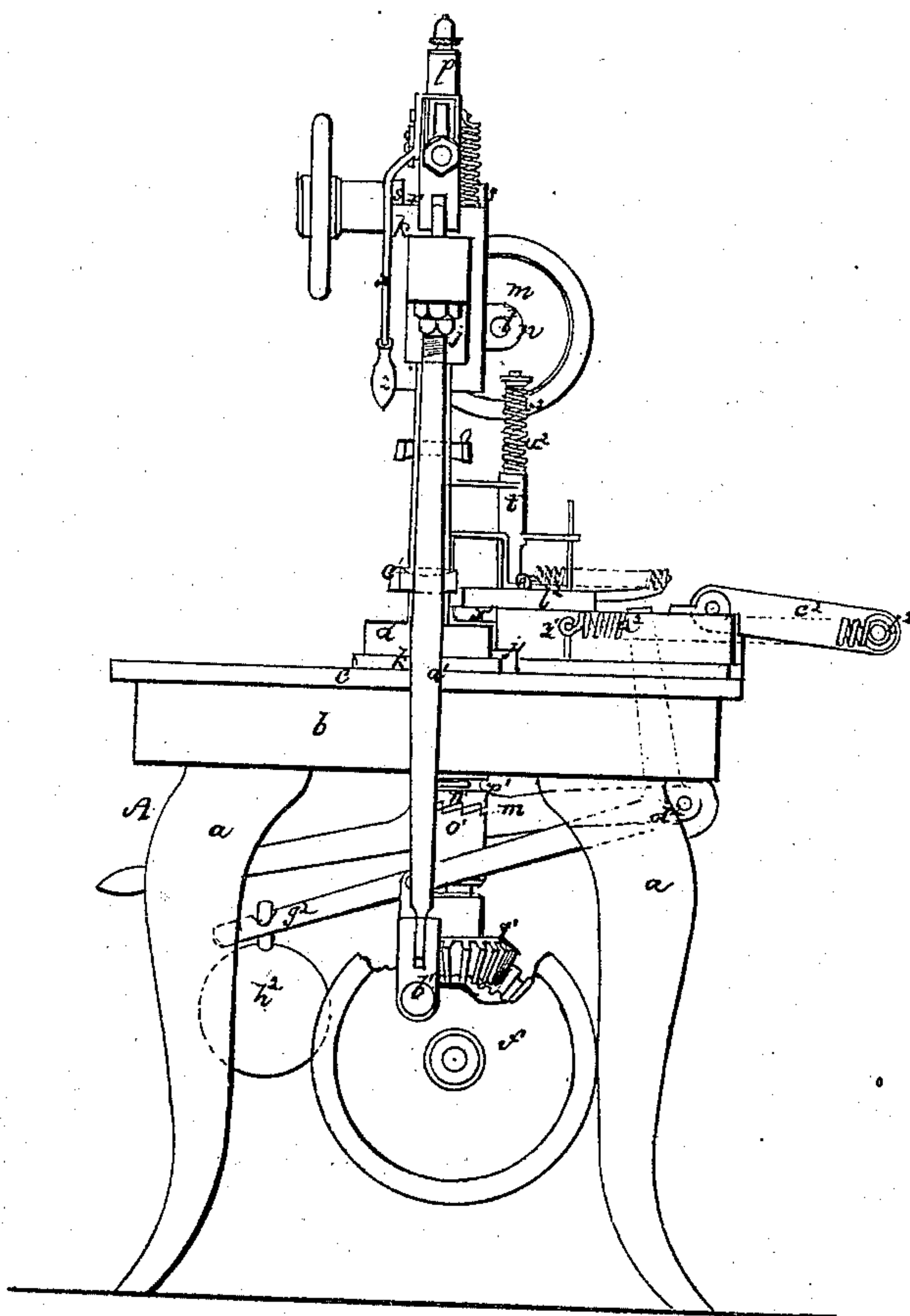


Fig. 2.



Witnesses
Edward Griffith
Edmund H. Henshaw

Albert Jeffers
by his Attorney
Frederick Curtis

A. JEFFERS.

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Fig. 7.

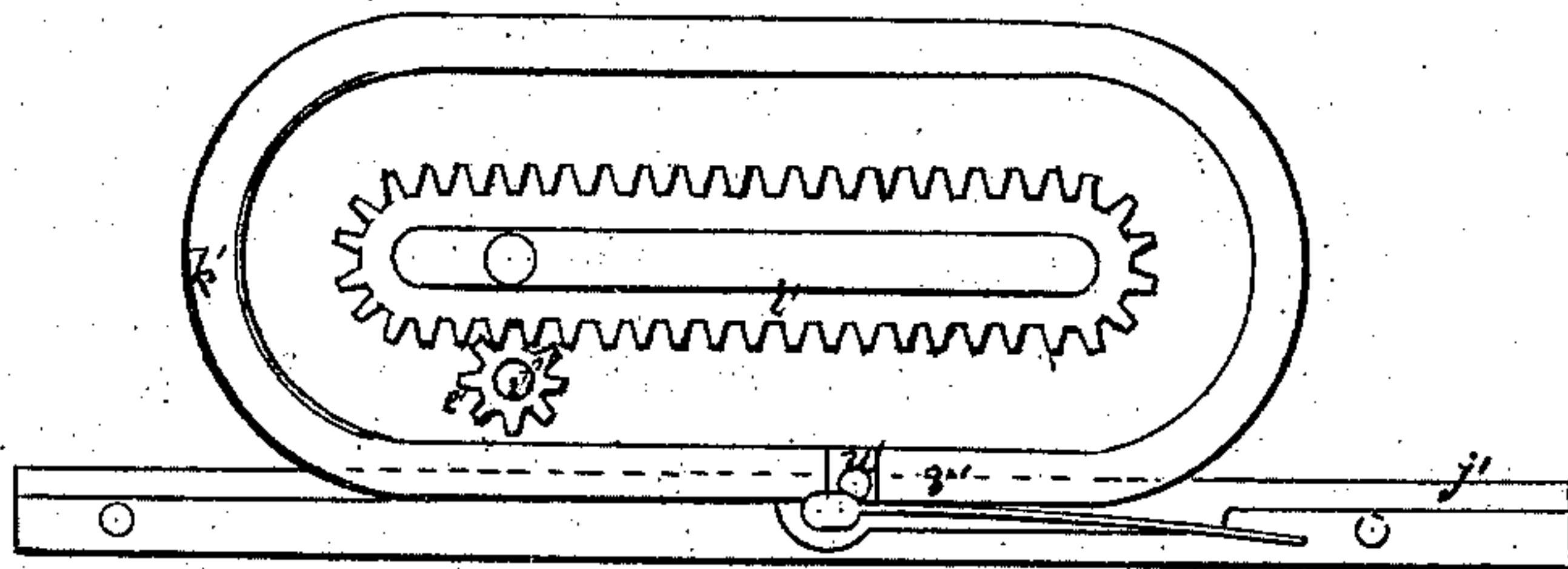
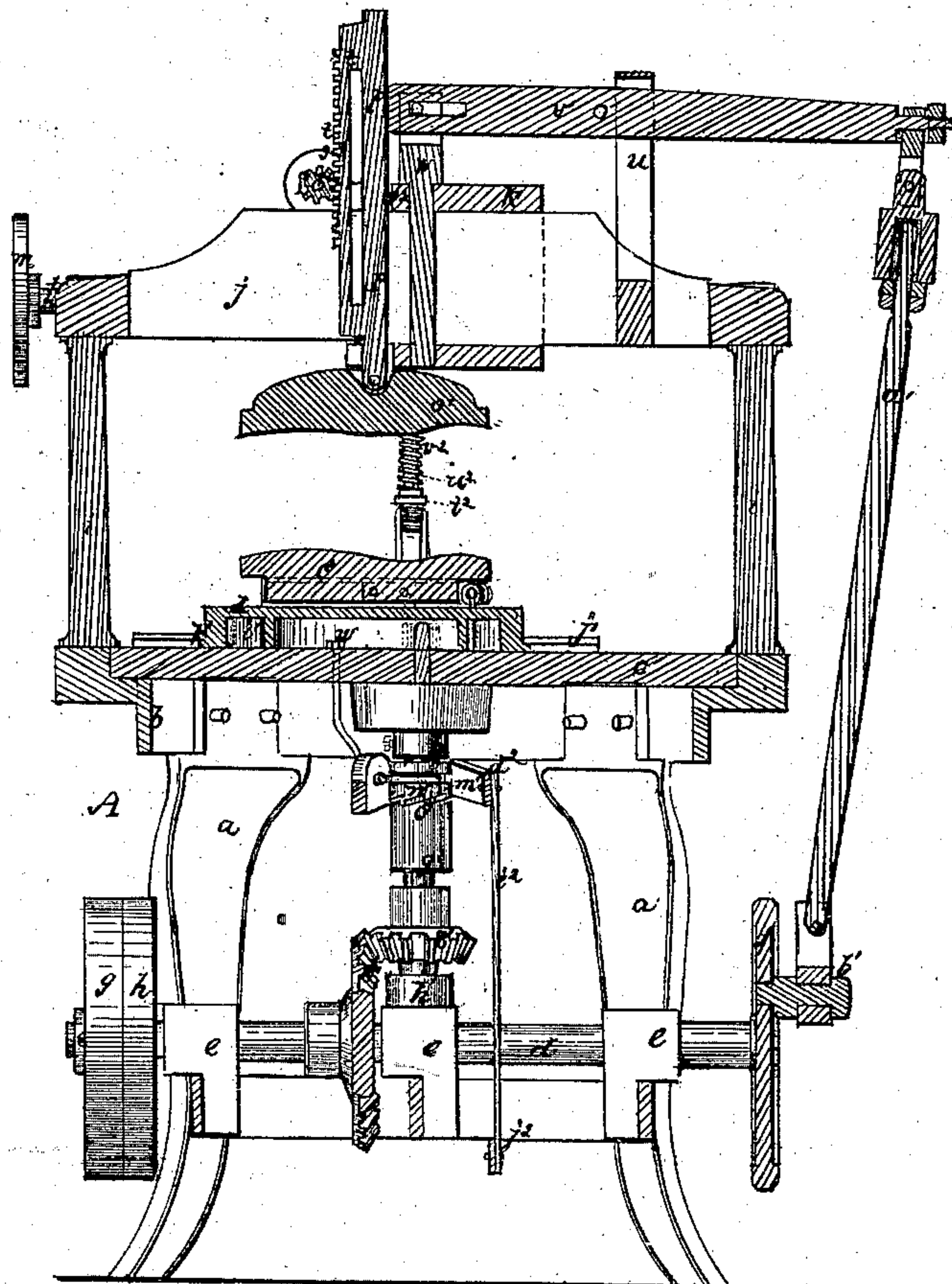


Fig. 3.



Witnesses.

Edward Griffith.
Edmund W. Newins.

Albert Jeffers.

by his Attorney.

Frederick Curtis.

A. JEFFERS.

MACHINE FOR MOLDING, ROUNDING, CHANNELING, AND STAMPING
SOLES OF BOOTS OR SHOES.

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Fig. 6.

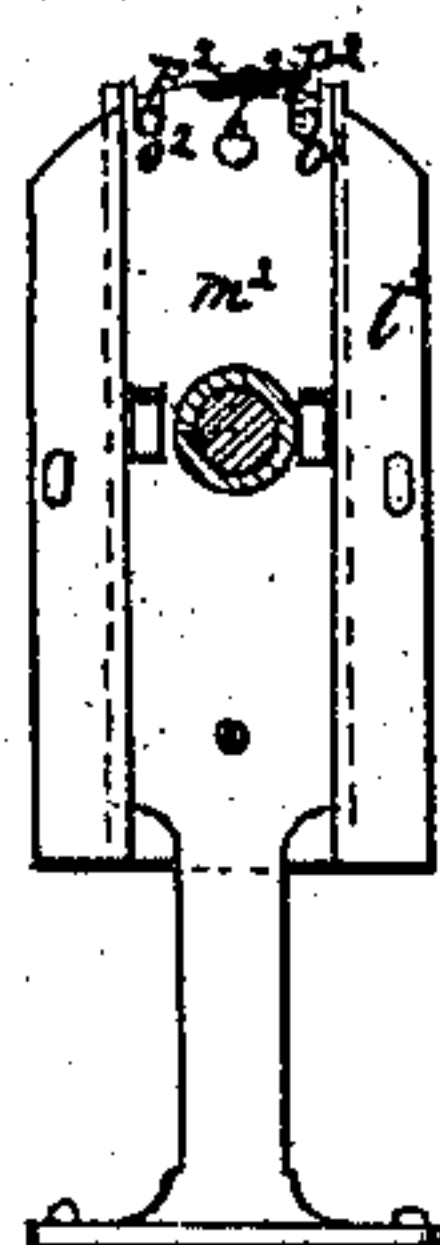
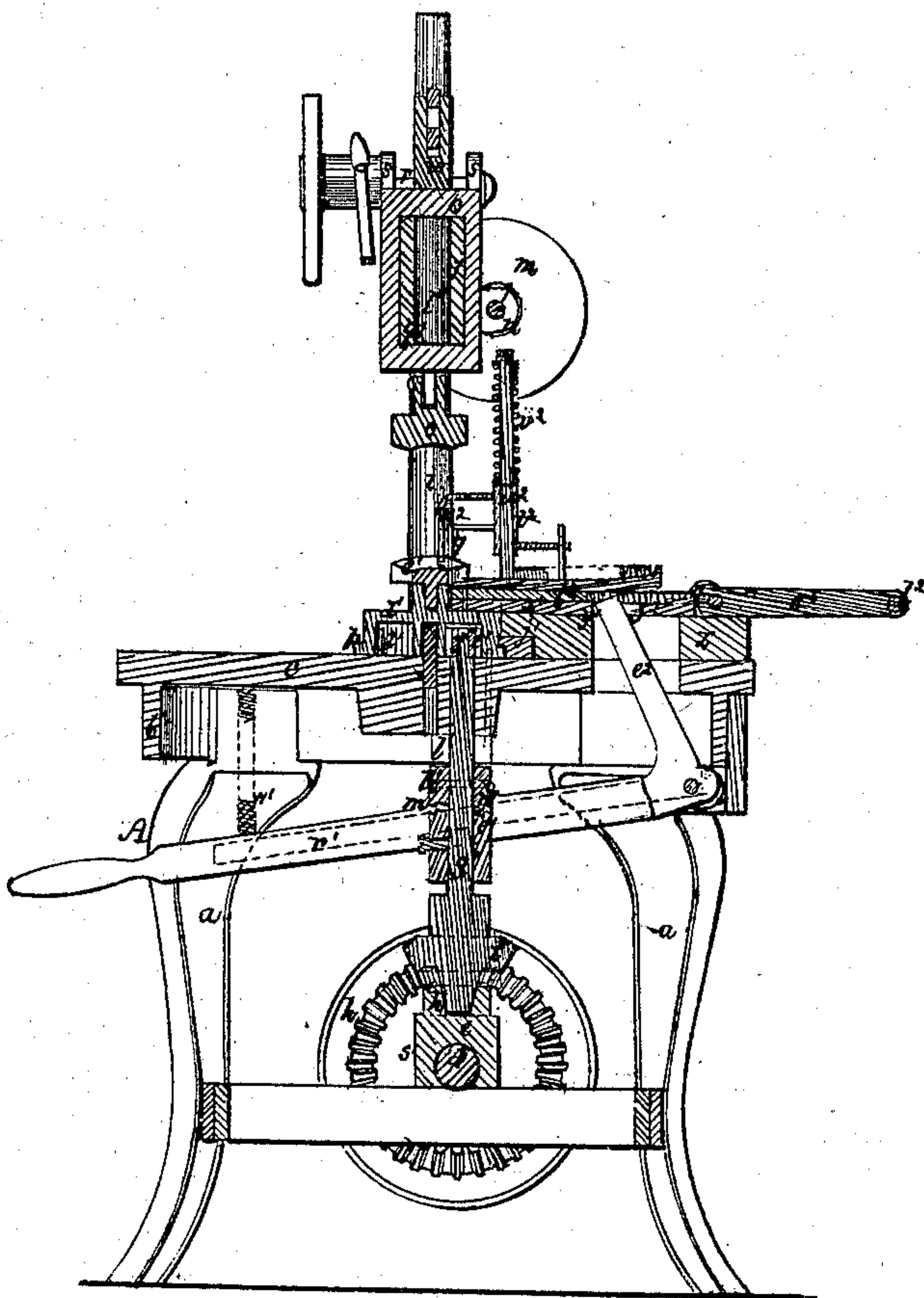


Fig. 4.



Witnesses.

Edward Griffith.
Edmund W. Kearns.

Albert Jeffers.

by his Attorney,
Frederick Curtis.

United States Patent Office.

ALBERT JEFFERS, OF LYNN, MASSACHUSETTS.

Letters Patent No. 99,682, dated February 8, 1870.

IMPROVEMENT IN MACHINE FOR MOULDING, ROUNDING, CHANNELLING, AND STAMPING SOLES OF BOOTS AND SHOES.

The Schedule referred to in these Letters Patent and making part of the same

Be it known that I, ALBERT JEFFERS, of Lynn, in the county of Essex, and Commonwealth of Massachusetts, have made an invention of a new and useful Machine for Performing the Operations of Moulding, Rounding, Channelling, and Stamping the Soles of Boots or Shoes, previous to their application to the uppers thereof; and do hereby declare the following to be a full, clear, and exact description thereof, due reference being had to the accompanying drawings, which make part of this specification, and in which—

Figure 1 is a front elevation;

Figure 2, a side elevation;

Figure 3, a vertical central and longitudinal section;

Figure 4, a vertical and transverse section; and

Figure 5, a plan of a machine, embodying the features of my invention.

Details of this machine, as they may suggest themselves, will be duly referred to.

Previous to entering upon the description herein contained of the nature and purposes of the machine which comprises the subject-matter of these Letters Patent, and consequently of my present invention, I would say that Letters Patent of the United States of America, numbered 83,172, were issued to me on the 20th day of October, 1868, for a machine for moulding, rounding, and channelling soles of boots or shoes.

Although certain defects, which were found to exist in the machine organized as shown in said Letters Patent, naturally suggested to my mind the invention herein described, and although a portion of the effects produced by my present machine are analogous to those effected by the former, yet my last embodiment of devices and details should not be coupled with my patented machine, inasmuch as the two possess very little, if anything, in common.

The object of my present invention, as before prefaced, and as this context will explain, is to organize into a self-contained whole, devices or mechanism for effecting the operations of moulding, rounding, channelling, and stamping, as the operations are technically termed, the soles of boots and shoes; the first mentioned operation consisting in conforming or shaping the general area of the sole to fit the tread of a last; the operation second named, in cutting or plowing a groove or channel for reception of the stitching which secures the sole of a boot to its upper; the third mentioned operation consisting in cutting, with the aid of a travelling knife, the contour of the sole, in order to adapt it to the outline of the last to which it is to be applied; the fourth and last operation consisting in affixing or impressing upon or within the wearing-face of the sole, the number of the shoe which carries it, or any other character, figure, or design

which taste or circumstances may render desirable or necessary.

For the purpose of clear elucidation and explanation of the machine, and to enable persons skilled in the craft to which it appertains to make and use such machine, the following description of its construction and operation may be divided into two parts, the first being that for moulding and stamping the sole, and the second, that of rounding and channelling such sole.

In the various figures of the drawings before mentioned, as accompanying this specification, and illustrating my invention, like figures, wherever they occur, indicate like parts.

Beginning with the moulding-portion of the machine, the reader, by referring to these drawings, will see that the frame of the machine is shown at A as of suitable size and form to receive the operative parts, to be hereinafter described; its general form, in front elevation, being similar to that of the well-known McKey sewing-machine, now in extensive use for sewing together the sole and upper of a boot or shoe, and to which my present invention is a very valuable adjunct.

The frame A, in its general construction, is composed of four legs or standards, *a a a a*, united at top by an annular rail, *b*, upon which is fixed a broad flat table or platform, *c*, either circular or otherwise.

The driving-shaft of the machine is represented at *d* as properly supported and revolving in boxes *e e*, upheld by cross-bars, which bridge the lower portion of the two opposite end standards *a a*, before mentioned, such driving-shaft being disposed parallel to and in longitudinal alignment with the main or primary working-features of the machinery, and provided at one extremity with fast and loose pulleys *g h*, after the manner of many classes of machinery, the former of such pulleys being the driving-pulley of mechanism.

The opposite, (and in the present instance right-handed,) extremity of the driving-shaft *d*, is furnished with a crank or crank-wheel, *f*, for effecting vertical alternations of the mould-block to and fro of the forming-last, as hereinafter explained.

To each side of the outer margin of the platform *c* is affixed an upright post, *i*; while spanning the tops of these posts, and firmly uniting them, is a slotted cross-head or open truss, *j*.

Embracing, and sliding upon this cross-head *j*, which thus performs the office of ways, is a rectangular tubular carriage or head *k*, the relative position of this carriage, with respect to the cross-head, being adjusted by means of a male screw, *l*, which passes through a spur, *m*, fixed upon its rear side, the head or shank of the screw being in turn pivoted in a suitable man-

ner to a second spur, *n*, fixed to the outer end of the cross-head. The purpose of thus applying the tubular carriage *k* adjustably to the cross-head, is to permit of changes of the position of the mould-block which is carried by the carriage, and which will be hereinafter explained, the object in thus varying the position of the mould and stamping-block being to bring it into coincidence with the shaping-last, with which it operates.

The said moulding and stamping-block or press is shown at *o*, in the accompanying drawing, as swivelled to the lower end of an upright rod or spindle, *p*, which is susceptible of vertical reciprocations within a channel or bore, *q*, formed within the sliding-carriage *k* before mentioned, and preferably, in point of construction, at the left of the same. The vertical movements of this rod *p* being effected by means of a pinion, *q*, mounted upon and revolving with a short horizontal shaft, *r*, supported in suitable bearings *s s*, erected upon the upper part of the cross-head *j*, the said pinion *q* meshing into the teeth of a rack, *t*, fixed to or making part of the rod *p*, as exhibited in fig. 3 of the accompanying drawings.

The front extremity of the shaft *r* should be provided with a hand-wheel or other means of rotating it, and it should also be provided with a suitable hold-fast pawl or spring-catch, to maintain it at its highest altitude.

The under, or moulding, and stamping or embossing-surface of the press-block *o* is in general conformation a duplicate of the upper surface of the shaping-last or bed, such two surfaces corresponding in form to the tread of the last upon which the boot using the sole is to be made.

The purpose in view, in swivelling the mould-block to its rod, is to allow of tilting-movements in any direction, in order to insure its perfect adjustment to the upper face of the forming-last.

As hereinbefore premised, the under, or moulding and embossing-surface of the mould-block *o* may be provided with a die, for impressing upon the sole its individual number, or that of the boot or shoe to which it belongs, or character or figures of any nature, may, by like means, be fixed upon the sole, whether the trade-mark or address of a manufacturer, or any ornamental design.

The existence of the central slot or orifice of the cross-head *j* is for the purpose of permitting traversions of the adjustable carriage and its adjuncts thereupon.

Upon the cross-head *j*, and near one end thereof, I erect a furcated post or upright guide, *u*, within which is disposed, loosely, at about its centre, a long, horizontal, oscillating lever or bar, *v*, the forward or inner extremity of such lever being fulcrumed to a standard *w*, erected upon the upper part of the carriage *k*, and near the central part thereof, and in close relationship with the upper end of the rod *p* of the mould-block, the union of the lever and post being a sliding or yielding one, in order to permit of sliding movements of the said lever upon its fulcrum, and over and upon the rod *p*, or from off, and to one side of such rod, for the purpose hereinafter explained.

The traversion or sliding movement of the lever *v* is effected by means of a hanging lever or arm, *x*, which is pivoted to it by means of a pitman or link, *y*, one end of which is swivelled or connected to the lever *v* at about its centre, and the opposite end to the said arm *x*, and near to the upper part of the same, the upper extremity of the arm itself being fulcrumed to the top of the furcated post or guide *u*.

Seizing the handle *Z* of the arm *x* with his right hand, the attendant of the machine may perfectly control the traversions of the lever, so far as forcing it into the path of movement of the rod *p*, or isolating it therefrom, is concerned.

The outer or remote end of the lever *v* is connected, by means of a connecting-rod, *a'*, with the wrist-pin *b'* of the crank or wheel *f*, hereinbefore mentioned, as mounted upon the driving-shaft, this rod *a'* being susceptible of longitudinal expansion or contraction, in order to vary the degrees of pressure exerted by its agency upon the lever *v*, and through the latter the amount of power with which the mould-block is forced upon the sole, since it will be apparent, that as the crank-wheel *f*, by its revolution, effects, through such rod, the depression of the inner end of the lever *v*; any prolongation of the rod produces such rigidity of its accessories as to effect an increase in such pressure.

The expansible nature of the connecting-rod also compensates for any slackness or looseness of joints of the lever and its connections.

The receiving and shaping-last or bed-block of the machine, which has been herein alluded to, is exhibited at *c'*, in the annexed drawings, as being of like size and shape with the mould-block *o*, and mounted upon an oblong and flat travelling tablet or base plate, *d'*, which is supported loosely upon the top of the platform *c* of the machine frame, the said shaping-last having, upon its upper surface, a series of bristling spurs, to securely hold the sole thereto.

Motions of this tablet and its last upon the platform, through an oblong or elliptical path, or conformably to the outline of the shaping-last, are effected by means of a pinion, *e'*, which rises above the surface of the platform, and is fixed to the upper end of a short upright tubular shaft, *f'*, this shaft passing through the said platform, and extending a short distance below it, and encompassing and sliding upon a perpendicular spindle or arbor, *g'*, the lower end of such spindle being stepped in a suitable block or bearing, *h'*, fixed to the machine frame, and above its driving shaft, and centrally of both.

The pinion extends into the body or interior of the tablet *d'*, which is concave or cavernous, and which is formed with an integral endless rack or range *i'* of teeth, which extend about its entire circuit, and parallel, or approximatingly so, to its outer boundary. Revolutions of the pinion, by instrumentalities hereafter stated, produce corresponding ensuing revolutions or journeys of the tablet *d'*, and supporting-last *c'*, the movement thus described being, as before stated, an oblong, endless path.

The tablet *d'* is maintained in place upon the machine-table in part by a rail, *j'*, which is securely bolted to the said tablet, an overhanging lip, reaching inward from the rail, and lapping upon a rib, *k'*, which circumscribes the lower edge of the said tablet, as defined in fig. 5 of the accompanying drawings.

The instrumentalities for effecting revolution of the pinion-shaft *f'*, are organized as follows:

To such shaft, and near its lower part, is affixed a tubular hub, *l'*, upon the lower end of which is produced a series of saw-teeth, *m' m'*, which constitutes a semi-clutch, *n'*, to operate in conjunction with a second and twin-shaped semi-clutch *o'* disposed below it, and mounted upon the shaft or spindle *g'* before mentioned. These clutches are similar in construction and operation to those ordinarily in use, and with which all mechanics are familiar.

An annular groove, *p'*, is cut in the periphery of the hub *l'*, into which the fork *q'* of a compound shipping-lever *r'* extends, the office of the latter-mentioned lever, which is fulcrumed to the under side of the machine-table, being to effect the locking or disengagement of the two semi-clutches.

The spindle *g'* is driven by a bevelled gear, *s'*, fixed to the driving-shaft *d* of the machine, such bevelled gear meshing into a second bevelled gear, *t'*, fixed to the said spindle *g'*, as represented in the drawings.

Revolutions of the driving-shaft effect, by means of the gears *s'* and *t'*, sympathetic revolutions of the spin-

die, and by means of the semi-clutches $n^1 o^1$, corresponding rotations of the tubular shaft f^1 and its pinion, when, by the depression of the shipping-lever r^1 , the two clutches are thrown into engagement.

During the time these clutches are separated, the driving-shaft d and spindle g^1 are revolving without action upon the working-parts of the machine, except to produce titulations of the outer end of the lever r .

u^1 , in the accompanying drawings, represents an upright bolt, the lower end of which is pivoted to the shipping-lever r^1 , and whose upper end extends into a passage or hole made in the machine-table, the disposition of the bolt and hole being such, that the former coincides with the ribs k^1 of the travelling tablet d^1 , under which it lies.

This rib is constructed with an orifice or notch, v^1 , in one side, into which the bolt u^1 enters, when such notch, by the revolution of the tablet, is brought into coincidence with it, which takes place after the completion of one entire revolution or movement of the tablet, being thus estopped from further movement by means of the bolt, until the latter is withdrawn from the notch by the depression of the shipping-lever.

This depression of the shipping-lever effects a twofold purpose, that of engaging the two clutches n^1 and o^1 , and, simultaneous therewith, lowering the bolt u^1 , and, by releasing the hold upon the tablet, allows the latter to be revolved by the revolution of the tubular shaft f^1 , which is effected by the action of the gears s^1 and t^1 .

It will be apparent that the bolt, in turn, performs the double office of, at one time, locking the tablet to the machine-table, while the clutches are out of engagement, and, at another time, maintaining these clutches in contact, and thus preserving in operation the proper instrumentalities for effecting a revolution of such tablet, it being understood, and as will be evident, to the reader hereof, that the depression of the bolt which was effected by means of the shipping-lever, is maintained by its own impact with the bottom of the tablet or its encompassing rib k^1 , until such tablet has completed one entire circuit, which, as before stated, brings its notch into coincidence with the bolt.

The elevation of the bolt into this last-mentioned notch is effected by the contraction of a coiled or other proper spring, w^1 , one end of which is secured to the under side of the machine-table, and the other fixed to an arm, z , pivoted to and disposed alongside of the shipping-lever r^1 .

We have now seen the nature and grouping of agencies for producing the descent and insuring ascent of the mould-block, to and from the shaping-last, as well as the locking and unlocking of such last with respect to the machine-table, and its travelling movement in describing its circuit about and by means of the pinion which drives it.

It now remains for me to describe the construction and mode of operation of the devices which effect the cutting out the sole, and the production of the channel, which is to receive the stitching which secures the sole to the upper.

The combination of devices by whose agency I effect such results, comprises, as a general whole, the portion of the machine which I term the "head block."

This head-block is composed first of a flat rectangular sliding plate, x^1 , dovetailed upon its edges, and sliding within a dovetailed groove, y^1 , formed in the upper part of the box or bed-plate z^1 , erected centrally upon the machine-table, and end on to the travelling-tablet d^1 , and so disposed, with respect to the latter, that the bottom of the said sliding plate x^1 shall be on a level with or slightly above that of the upper surface of the tablet, where it overlaps a short distance, or as shown in fig. 4 of the accompanying drawings, when at its extreme forward position.

The sliding plate or carriage x^1 is forced rearward

and away from the tablet d^1 , by the action of two coiled springs, $a^2 a^2$, disposed upon opposite sides of it, and with their outer extremities fixed to opposite ends of a cross-bar, b^2 , fixed to a rod or pitman, c^2 , which, in its turn, is pivoted to the rear and outer extremity of the said plate x^1 , the opposite ends of said springs being secured to the bed-plate z^1 before mentioned, or to the machine-table, or any fixture thereof.

The rearward movements of the plate x^1 are effected by means of a bell-crank lever, d^2 , fulcrumed at its bend to the underside of the machine-table, or a stud fixed thereat, the fulcrum of said lever being closely contiguous to that of the shipping-lever r^1 , hereinbefore mentioned.

The upper extremity of the outer and vertical arm e^2 of the lever d^2 , passes through an orifice, f^2 , made in the plate x^1 , and at about its centre, the remaining arm g^2 , of the said lever, extending to the front of the machine, and having affixed to its extremity a weight or ball, h^2 , of sufficient gravity to aid considerably the action of the springs $a^2 a^2$ in retracting the plate x^1 , this weight, however, being rather a desirable addition than necessary appendage of the machine.

A connecting-rod or pitman, i^2 , connects the centre of the longer and horizontal arm g^2 of the bell-crank lever d^2 with the inner end of a treadle, j^2 , disposed at the lower part of the machine-frame, and pivoted at about its centre, to a cross-bar, uniting the lower portion of the two front legs of the machine-frame, the pedal of this treadle extending into such a position in advance of the machine, as to enable the attendant of the same to readily place his foot upon it.

By placing the foot upon the treadle and elevating its inner end, and with it the longer arm of the bell-crank lever, the upright arm of the such lever is vibrated upon its fulcrum, its ensuing retraction causing a like retraction of the sliding plate x^1 , and its accessories, for the purpose of removing with it the channelling-tool and knife from contact with the sole upon the shaping-last after the necessary operations upon such sole have been completed.

A stop-pawl, k^2 , is pivoted to the cross-bar last mentioned, and in close proximity to the pedal of the treadle, and is for the purpose of maintaining it in a depressed position, and consequently retain the sliding-plate x^1 and its adjunct in the rearward position when circumstances require, against the power of the springs $a^2 a^2$, and the gravity of the weight h^1 , exerted to force it in a contrary direction.

To the upper and front end of the plate x^1 , a horizontal and second and swinging plate, l^2 , of similar character, but shorter, is pivoted, also at its front end, in such manner that its rear end is free to describe an arc of a circle upon the lower plate.

Within the upper face of the plate l^2 , I dispose a third plate or cutter-head, m^2 , the connection and disposition of these two last-mentioned plates being similar to that of the said plate l^2 , and the lower sliding plate x^1 , they being provided with springs $n^2 n^2$ in like manner as with said lower plates, and for the same purpose. The proper position of the upper plate, which I term the tool-carrier, inasmuch as it carries the rounding-knife and channelling-instrument upon the middle plate, being determined by pins $o^2 o^2$, fixed to the upper surface of the latter, and extending into slots or notches $p^2 p^2$, made in the said upper plate, as represented in Figure 6, of the drawings, which is a plan of the two.

The rounding-tool or knife for cutting or turning the sole close to the edge of the bed c^1 , is shown at q^2 , in the drawings, as mounted in a suitable manner, and in an upright position at the front end of the upper plate or cutter-head m^2 , and so that, when the latter is in its extreme forward position, such knife shall be in close contact with the edge of the forming-last c^1 .

The holder or chuck for supporting the channelling-

tool or plowing-instrument is denoted by the letter r^2 , as pivoted to the lower end of the tool-carrier, which, as represented in the present instance, is a bent or curved bar s^2 , making part of or extending outwardly from a tubular standard, t^2 , which slides upon an upright rod, u^2 , erected upon the cutter-head or plate m^2 .

The said tool-holder is depressed toward the cutter-head or the shaping-last when surmounting it, by a coiled spring, v^2 , which encircles the upper part of the rod u^2 , and rests upon the top of said tool-carrier.

As the construction and operation of the channelling-instrument carried by the clutch p^2 , and which operates upon the upper surface of the sole, which, at the time, is upon the last c^1 , to form the stitch-receiving channel therein, is fully explained in Letters Patent of the United States, issued to William Duchemin and myself, on the 27th day of August, 1867, for an improved mode of channelling soles, a detailed description of such instrument is not considered a necessary or pertinent part of this specification.

I would remark, however, that the channelling-tool is to be applied to the tool-carrier, and in combination with a movable guide, in such manner as to allow of its position with respect to such tool-carrier and guide being varied or changed, in order to regulate the depth of the channel to be cut, as well as for other useful purposes.

Having thus described the mechanical construction of parts which embody a working and self-contained whole or practical machine for carrying out the object of my present invention, I will now describe the operation of such machine.

The normal or starting position of the travelling tablet is that shown in fig. 5 of the accompanying drawings, that is to say, with the toe of its shaping-last c^1 at the right of the operator, and with the "ball" of such last about opposite the headstock, hereinbefore mentioned, the locking-bolt w^1 being, at this time, within the notch v^1 of the tablet, and locking the latter immovably to the table of the machine.

The piece of leather or sole-blank, having been previously moistened by immersion in water, in the customary manner, is to be placed upon the forming-last or bed c^1 , or upon the sharp spurs which crown it, and preferably, pressed somewhat about them.

The operator now seizes hold of the hand-wheel of the pinion-shaft, and, by means of such pinion, produces a descent of the mould-block upon the sole-blank, the upper end of the spindle p of such mould-block, by this act, being brought immediately below the path of forward movement of the lever v .

This having been accomplished, the operator next seizes, within his right hand, the handle of the lever or arm x , and, by depressing it, drives forward the lever v , until its inner end is over, and coincides with the spindle of the mould-block, the hold of the arm being maintained until the proper time comes for its removal, as hereinafter stated, which is effected by a coiled spring applied to the lever v , and the furcated post u , as exhibited in the drawings.

With his hold upon the arm preserved, the attendant now depresses the outer forward end or handle of the shipper r^1 , by this act forcing the two clutches into engagement, and putting the shaft and pinion in revolution, and at the same instant, and by the same act withdrawing the bolt from contact with the tablet, and leaving the latter free to begin its movement consequent upon revolution of the pinion e^1 , the wrist of the crank-wheel f being in the position shown in the drawings, or as in readiness to effect the elevation of the outer, and the ensuing depression of the inner end of the lever v .

A commencement of revolution of the driving-shaft inaugurated by ordinary means first, by means of the aforesaid crank-wheel and lever v , effects a very pow-

erful descent of the mould-block upon the sole-blank, and toward the bed c^1 , thus embracing and compressing between them such blank, by this operation, not only moulding the said blank to the general surface of the last, to which it is subsequently securely confined by its spurs, but also impressing upon or into such sole the figure or characters with which the bottom of the mould is provided.

The moment the wrist of the crank-wheel arrives at its highest point, the pressure of the lever v upon the mould-block of necessity ceases, and the attendant, at this point, releases his hold of the handle or arm x , which permits the spring of the said lever to retract it to its normal position, and out of coincidence with the spindle of the mould-block.

The next act of the attendant is to elevate the mould-block by the same agencies that lowered it, the sole-blank remaining upon the shaping-last, to which it clings with a sufficient tenacity to remain in place thereupon during the manipulations to which it is subjected.

The duty of the attendant is now to remove the stop-pawl or dog from contact with the treadle, and allow the force of the springs a^2 a^2 , and the gravity of the weight h^2 , to advance the head-stock, and force its knife or rounding-tool in close contact with the edge of the shaping-last, care being taken by the attendant that the channelling-tool, carried by the chuck before mentioned, be elevated, and deposited upon the upper surface of the sole-blank.

The continued revolution of the driving-shaft, and, as a consequence, through instrumentalities before mentioned, of the tubular-shaft f^1 and its pinion, effects revolutions or journeys of the tablet d^1 and shaping-last c^1 , about the pinion, and, as before stated, in an oblong path, the yielding connections of the various component parts of the head-block, allowing the cutting and channelling-tools to conform themselves to the curvature of the boundary of said last, and to operate in parallelism therewith.

The tablet and shaping-last continue their journey in unison, until a complete circuit has been made, and the notch r^1 , of the tablet, arrives over the bolt w^1 , when the latter, as well as the shipping-lever r^1 , is elevated, thus, at one movement, locking the bolt into said notch, and disengaging the clutches, the tablet coming to a stop, and being locked immovably in position, thus bringing us to our starting point.

During this circuit of the tablet d^1 , the rounding-tool or knife has cut the sole closely to the edge of the last, while the channelling-tool has, at the same time, cut within or from the face of such blank the continuous or endless channel to receive the stitching.

The operator now places his foot upon the treadle j^2 , and depresses it to such an extent that it is locked in position by its hold-fast pawl, the lowering of the treadle having the effect of retracting the head-block, and its adjuncts, including the rounding and channelling instruments, from proximity to the sole-blank and tablet.

The sole is now forcibly removed from the spurs of the last, when it will be found to have received, not only the impress of such last, and of the character formed upon the lower face of the movable block, but an endless channel, as before stated, and to have been cut to the outline of the last.

The advantages of the machine comprising the subject of my present invention consist, as before prefaced, mainly, in the fact that the four operations are combined in one machine, and the work performed in one complete movement or circuit of working-parts of such machine, the number of machines are reduced to one-third that now required to do the same work, with a consequent diminution of the amount of capital required to conduct the business.

Its use also diminishes to about that extent the size of the room occupied by such machines, with a consequent diminution in the amount expended for rent of such rooms or building; the number of operators being reduced to one-third that heretofore required, making a saving of expense of great magnitude.

The work is also performed by the machine in the most thorough and perfect manner.

Claims.

What I claim to be novel and original with myself, and desire to secure by Letters Patent of the United States, is as follows:

1. As a means of moulding a sole, the combination of the moulding-block *o*, and the shaping-last or bed *c*, when the former is supported by the spindle *p*, and actuated by the rack *t*, pinion *q*, and lever *v*, and the latter is affixed to or makes part of the travelling tablet *d*, the whole being as before explained.
2. In combination with the travelling tablet *d*, the bolt *u*, operating in connection with a notch in the tablet to stop its movement, essentially as explained.
3. In a machine for moulding, rounding, channeling, and stamping soles, the combination of a bolt and a shipping-lever, with the travelling-tablet or last, and the movable semi-clutch, whereby, upon one movement of said shipper, the bolt is withdrawn from connection with the tablet, and the clutch is locked to its fellow clutch, and *vice versa*, such arrangement of parts being productive of results hereinbefore enumerated.
4. Supporting the mould-block, and its suspensory, upon a carriage which is susceptible of lateral adjustment upon the supporting cross-head or superstructure of the machine, the same being for the purpose of securing correctly the relationship or coincidence of the said mould-block and the shaping-last or bed below it, should such adjustment become desirable, the advantages of such an arrangement being hereinbefore alluded to and explained.
5. In combination with the travelling tablet, arranged and driven as explained, the tongued rail, or its equivalent, whereby the correct position of the

tablet upon the machine-table is insured, for the purpose explained.

6. As a means of exerting great pressure upon the mould-block, the employment of the lever *v*, sliding at its forward end on a fulcrum, as explained, and operated in a horizontal plane by the arm *x*, or its equivalent, and in vertical oscillations by the crank-wheel *f*, and rod *a*, or their substitutes, in manner, and operating as set forth.

7. In combination with the lever *v*, and mould-block *o*, and its suspensory, the construction of the connecting-rod *a*, whereby its length may be varied and adjusted for the purpose before alluded to.

8. The combination and arrangement of the mould-block *o*, operated by the rack *t* and pinion *q*, and carried by the tubular carriage *k*, the furcated or slotted cross-head *j*, or its equivalent, and the lever *v*, the latter being mounted, provided, and operating as explained.

9. The combination and arrangement of the bolt *u*, the shipping-lever *r*, with its fork *g*, and the tubular hub or semi-clutch *l*, the latter operating in connection with its fellow-clutch *o*, and the bolt with the notch of the tablet, the whole being combined and operating as herein explained.

10. In combination with the travelling tablet *d* and the bolt *u*, the shipping-lever *r*, for maintaining the depression of the said bolt at such times as the periphery of the tablet recedes therefrom, to prevent premature entrance of such bolt into the path of movement of the tablet.

11. As a means of effecting alternate advances and retreat of the head-block of the machine, and its adjuncts, with respect to the supporting-last thereof, the arrangement of the bell-crank lever *a*, and treadle *j*, united by the pitman *l*, the same operating as explained.

12. The travelling tablet *d*, with its top extended to enclose its operating-rack and pinion, and form the rib *k*, substantially as shown and described.

Witnesses:

ALBERT JEFFERS.

FREDERICK CURTIS,
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