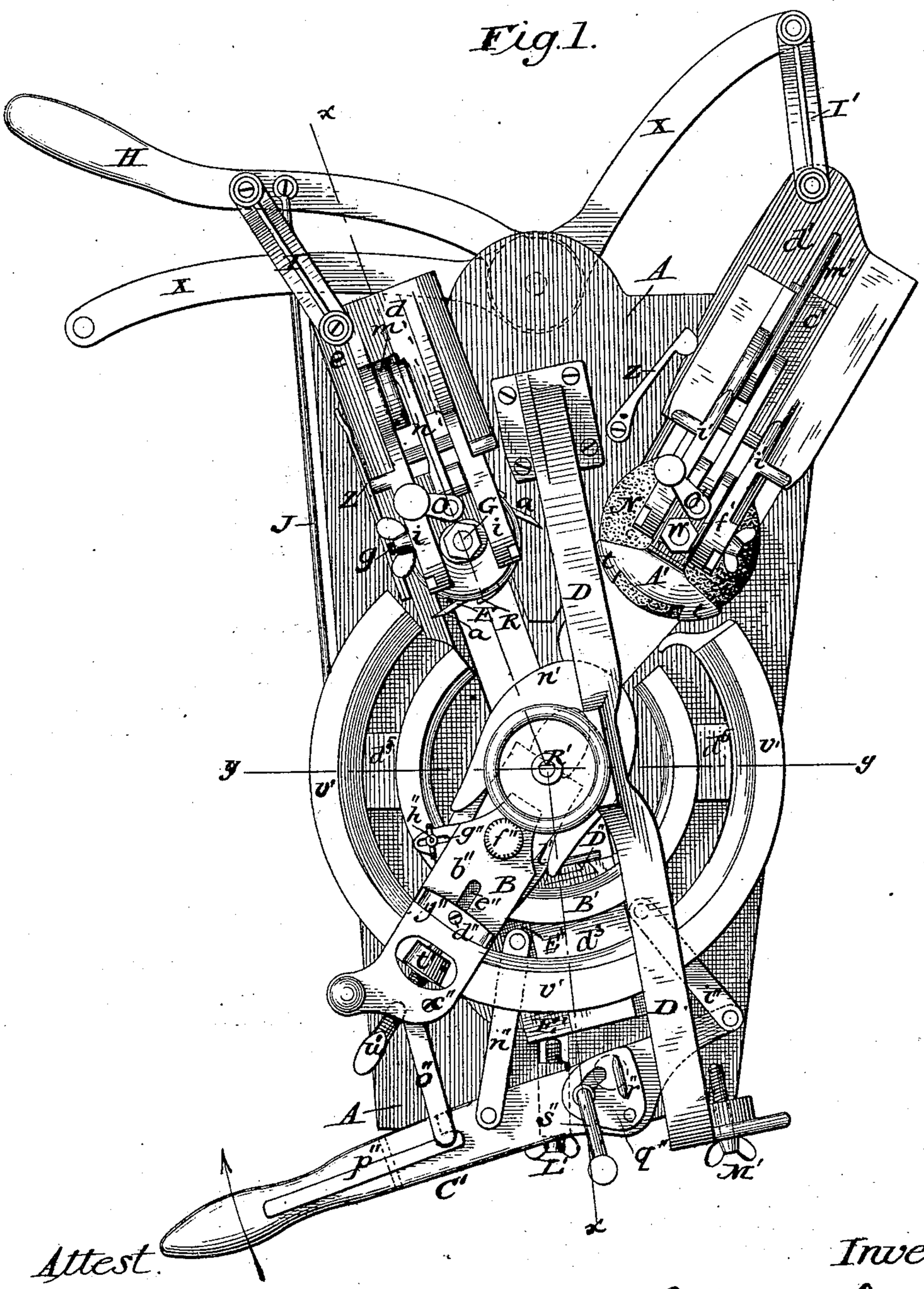
(No Model.) 6 Sheets—Sheet 1.

W. MANLEY.

MACHINE FOR FINISHING BOOT AND SHOE HEELS.

No. 284,566. Patented Sept. 4, 1883.

Fig. 1.



Attest.

Sidney P. Hollingsworth

Newton Wyckoff.

Inventor.

William Manley.

By his atty.

Philip T. Dodge

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W. MANLEY.

MACHINE FOR FINISHING BOOT AND SHOE HEELS.

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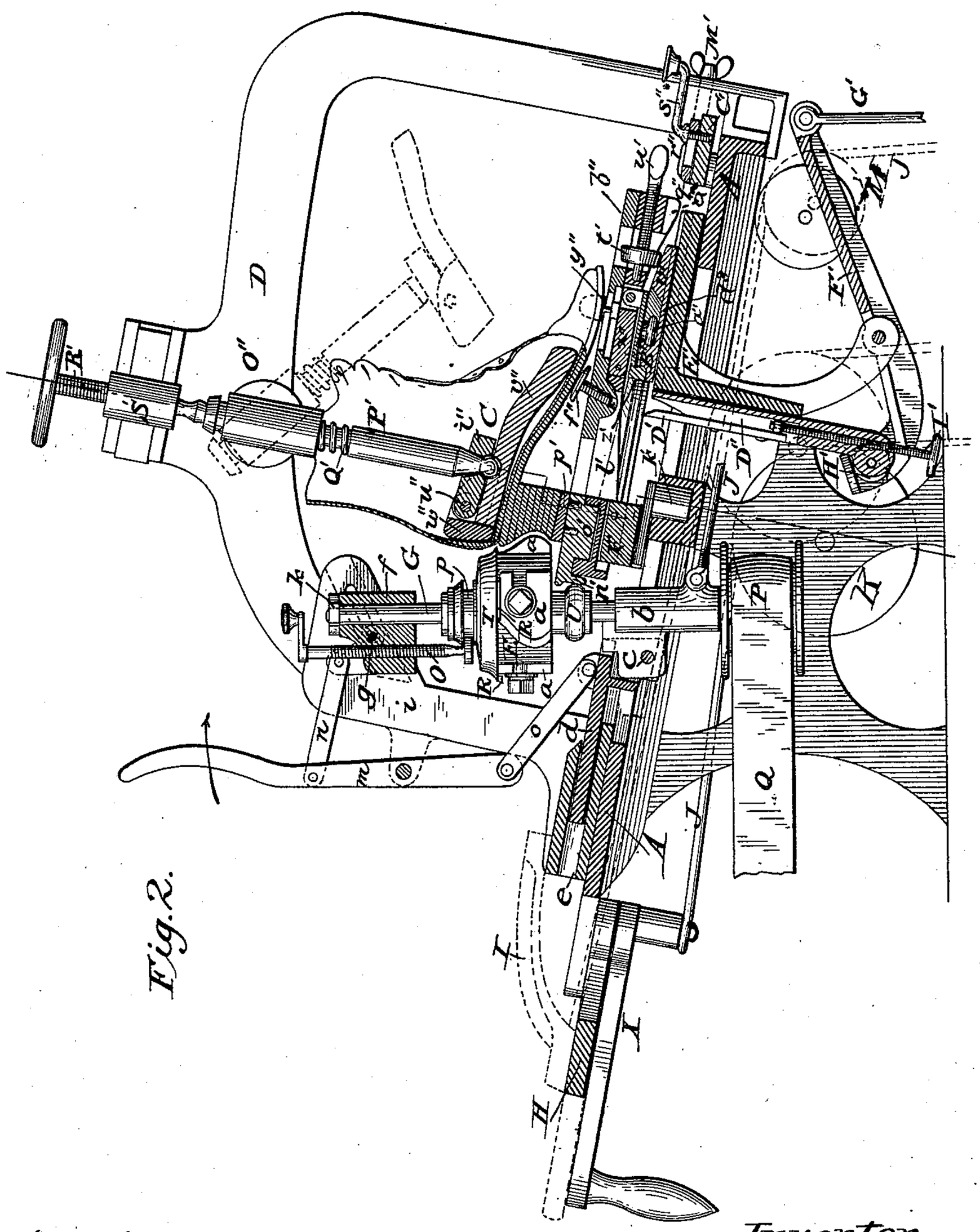

Fig. 2.

Attest.

Sidney P. Hollingsworth

Newton Wyckoff.

Inventor.

William Manley.

By his Atty.

Philip T. Dodge.

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No. 284,566. Patented Sept. 4, 1883.

Fig. 3.

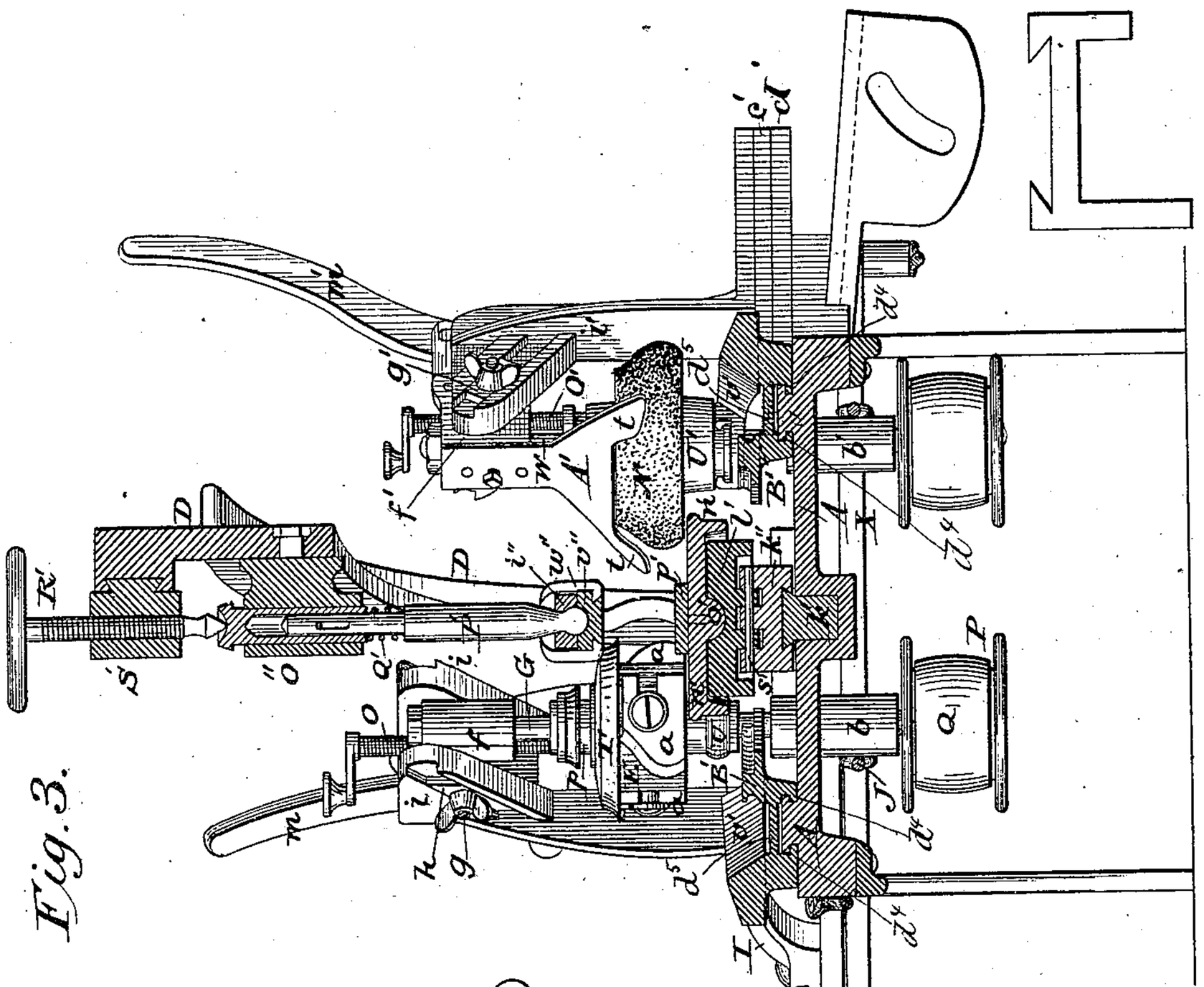


Fig. 4.

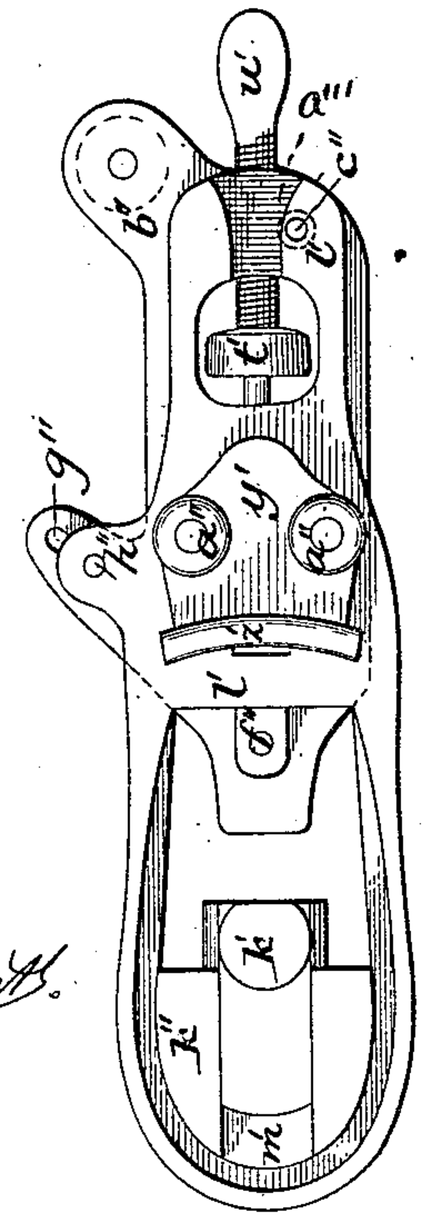
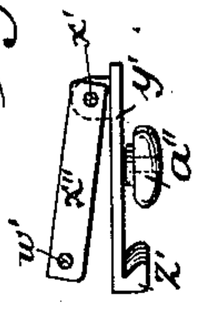


Fig. 5.



Attest.

Sidney P. Hollingsworth.

Newton Wyckoff.

Inventor.

William Manley.

By his Atty.

Philip T. Dodge.

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W. MANLEY.

MACHINE FOR FINISHING BOOT AND SHOE HEELS.

No. 284,566. Patented Sept. 4, 1883.

Fig. 6

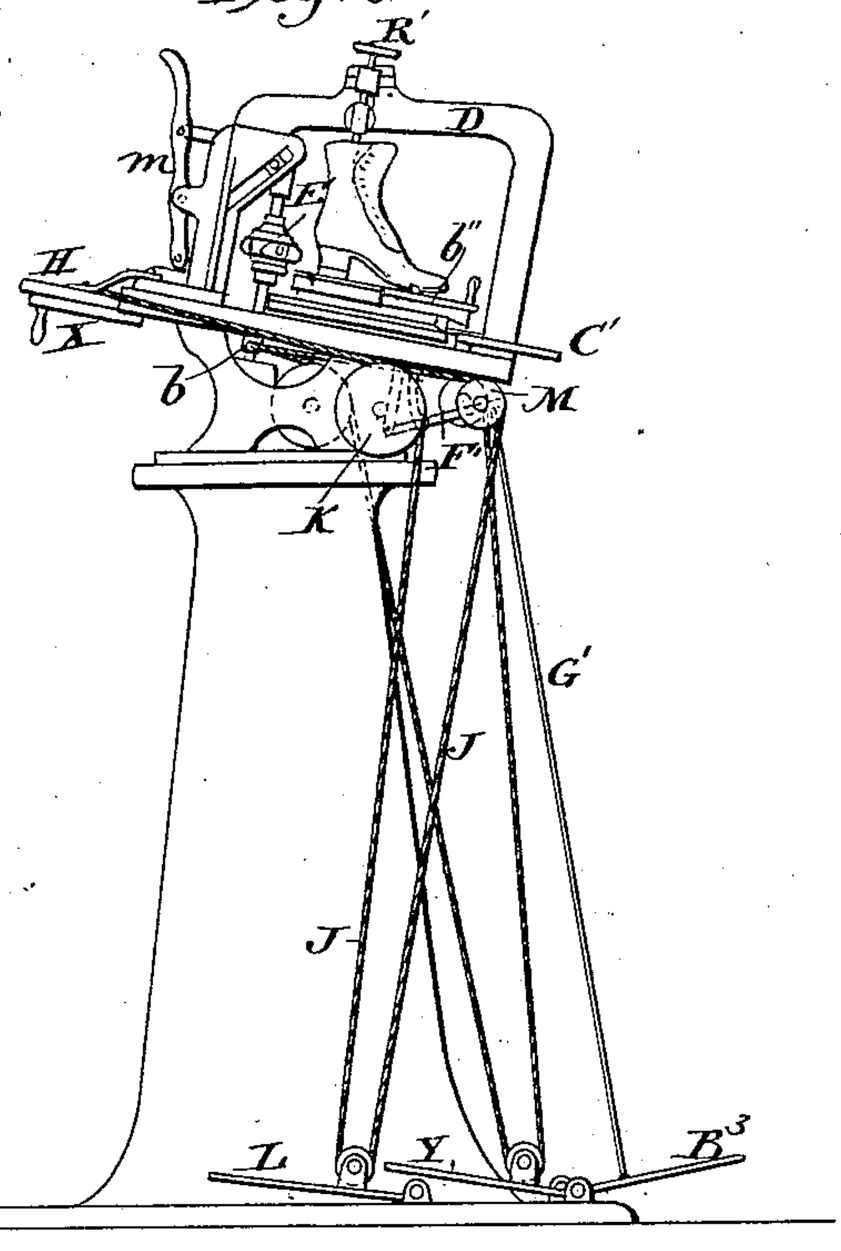


Fig. 13

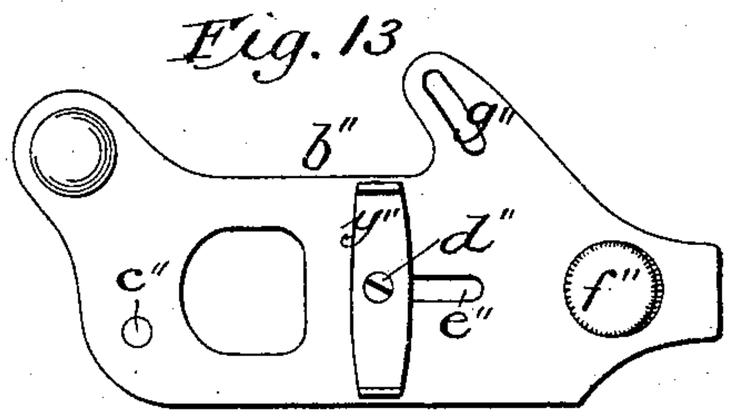


Fig. 14.

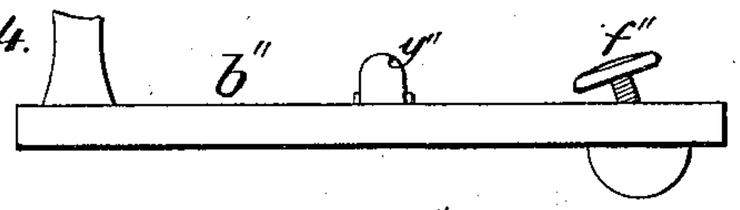
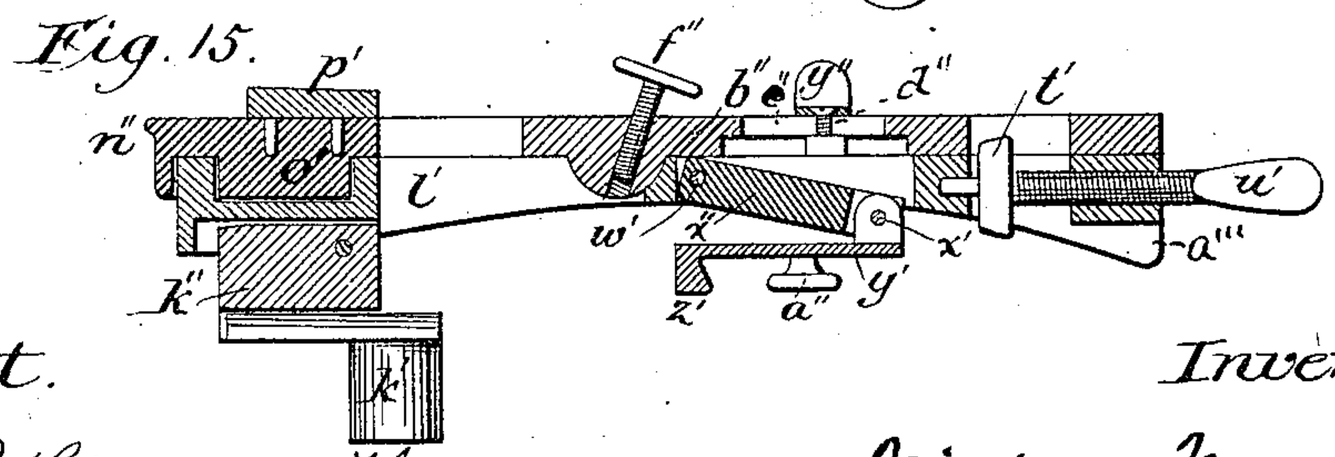


Fig. 15.



Attest.

Sidney P. Hollingsworth

Harry Stripley

Inventor.

William Manley.

By his attorney.

P. T. Dodge.

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W. MANLEY.

MACHINE FOR FINISHING BOOT AND SHOE HEELS.

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Fig. 8.

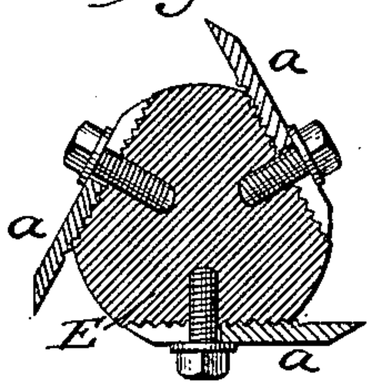


Fig. 7.

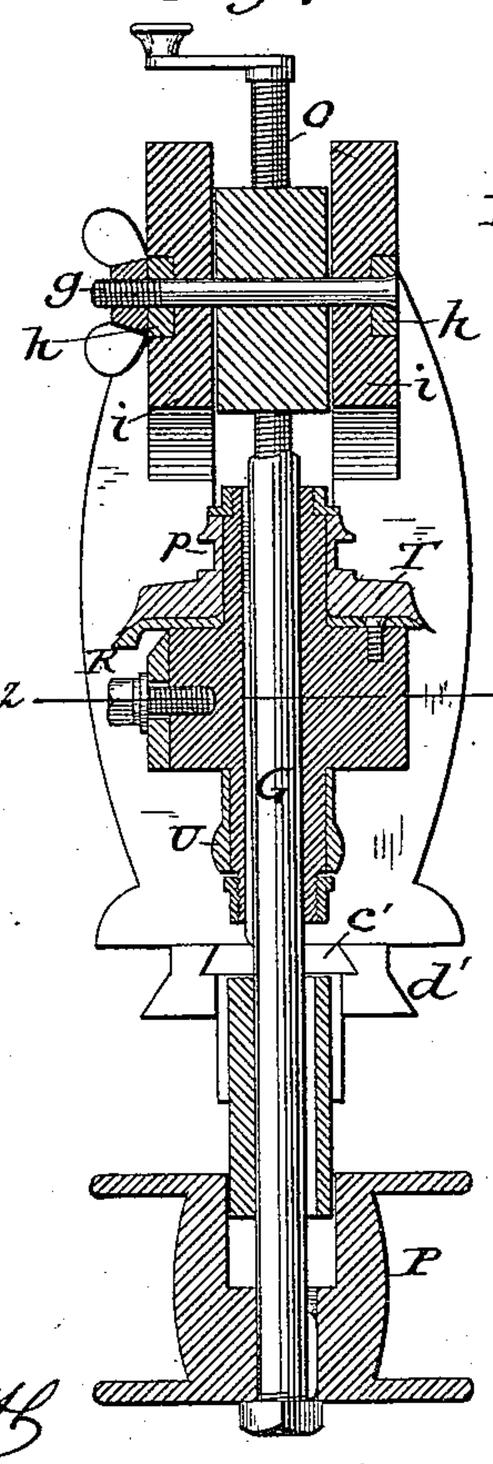


Fig. 9.

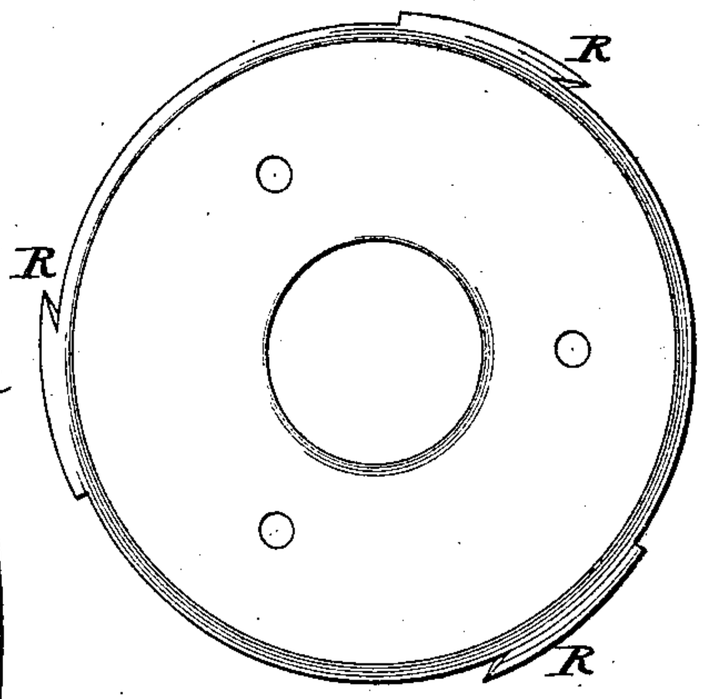
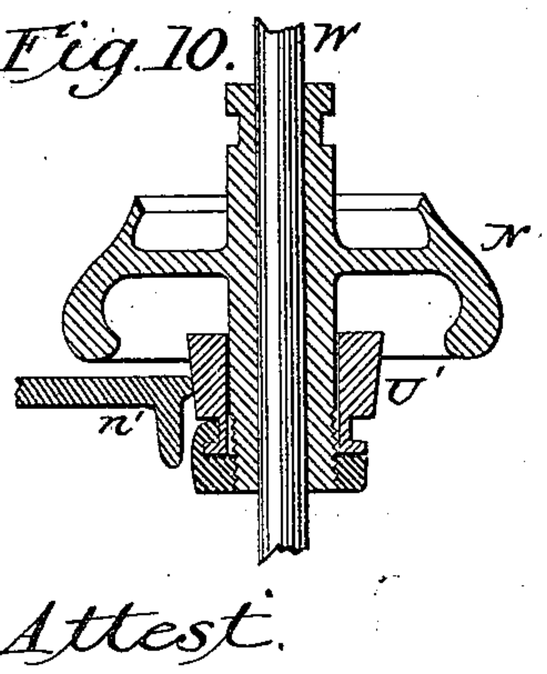


Fig. 10.



Attest.

Sidney P. Hollingsworth

Newton Wyckoff

Inventor.

William Manley.

By his atty.

Philip T. Dodge.

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MACHINE FOR FINISHING BOOT AND SHOE HEELS.

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Fig. 11

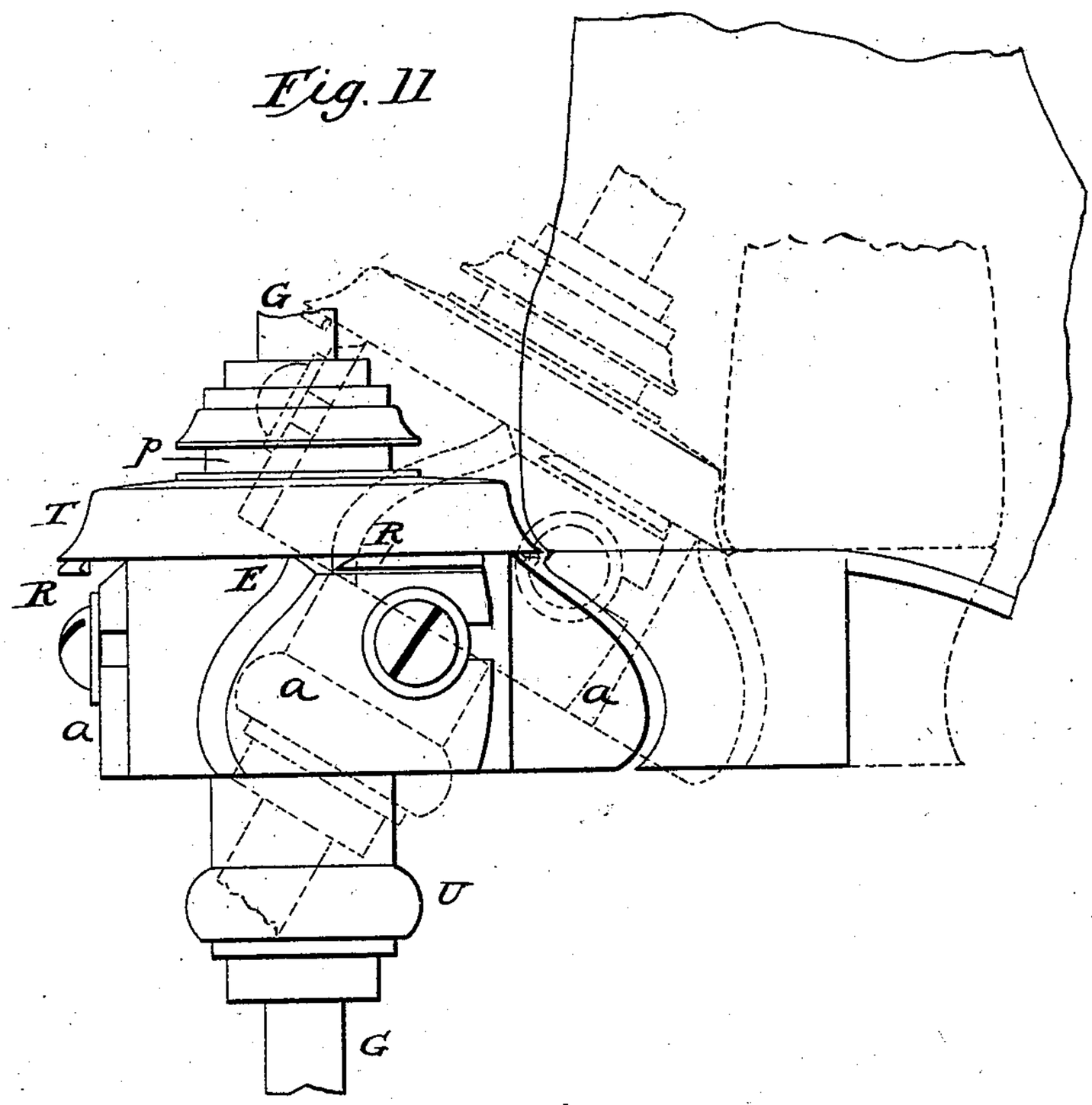
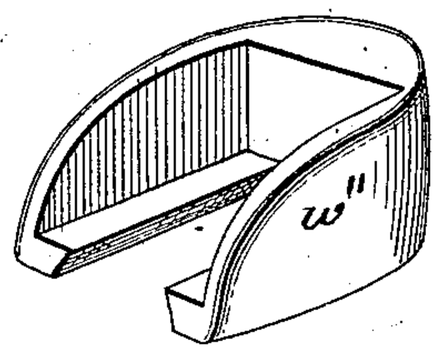


Fig. 12.



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Sidney P. Hollingsworth

Newton Wyckoff.

Inventor.

William Manley

By his Atty

Philip T. Dodge.

UNITED STATES PATENT OFFICE.

WILLIAM MANLEY, OF ROCHESTER, NEW YORK.

MACHINE FOR FINISHING BOOT AND SHOE HEELS.

SPECIFICATION forming part of Letters Patent No. 284,566, dated September 4, 1883.

Application filed May 15, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM MANLEY, of Rochester, in the county of Monroe and State of New York, have invented certain Improvements in Heel-Finishing Machines, of which the following is a specification.

The object of this invention is to provide a machine wherein a heel may be trimmed, finished, and breasted complete, ready for inking, without being released or removed between the different operations.

The leading features of my machine are, first, the construction and organization whereby the three operations of trimming the heel, buffing or scouring it, and breasting the same are successively performed without rejacking the boot or shoe or readjusting any parts, except to slide the jack on which the boot or shoe is mounted from one position to another, after trimming and scouring, before breasting; second, the peculiar construction and organization of the slides which bear, respectively, the trimming cutter-head and the scouring-head; third, the peculiar construction and organization for bringing the boot or shoe into position for breasting the heel and for operating the breasting-knife. Some special features of construction additional to the above will be described and claimed.

Referring to the accompanying drawings, Figure 1 represents a top plan view of my machine. Fig. 2 is a vertical section of the same, on the line *x x*, through the jack and the rotary trimming-head. Fig. 3 is a vertical cross-section on the line *y y*. Fig. 4 is a bottom plan view of the jack; Fig. 5, a side view of the pivoted tongue by which the toe end of the jack is connected to its circular guiding-rail and allowed a vertical adjustment. Fig. 6 is a side elevation of the machine on a reduced scale, showing the inclination of the bed-plate and the connection of the treadles by which the rotary heads are controlled. Fig. 7 is a vertical central section of the rotary trimming or cutting head. Fig. 8 is a horizontal section of the same on the line *z z*. Fig. 9 is a plan view of the guard and cutters forming parts of the main cutter-head, by which the heel-seat or feather-edge of the rand is trimmed. Fig. 10 is a vertical central section through the finishing-wheel and its guide or pattern plate. Fig. 11 is an elevation of the cutter, illustrating the movement of the rotary trimming-head, whereby it is adapted to follow the changing form of the heel-surface. Fig. 12 is a perspective view of the detachable heel-filling piece used upon the last or presser-plate; Figs. 13 to 15, views of details hereinafter explained.

In proceeding to construct my machine I first mount upon any suitable standard or support a bed-plate, A, designed to sustain the principal working parts of the machine. Instead of arranging the bed-plate in a horizontal position, as in most other machines, I place it with a downward inclination toward one side, as plainly shown in Figs. 2 and 6, this inclination serving the double purpose of affording a better view of the parts when in action and of securing the automatic discharge of the chips and shavings from the bed, whereby the machine is kept clean and the obstruction of the moving parts prevented.

On the bed-plate I mount a horizontally-revolving jack, B, which will be hereinafter described in detail, for the purpose of sustaining the shoe and presenting its heel to the devices which are to operate thereon.

For the purpose of holding the shoe down in place on the jack, I provide the clamp or pressure-last C, hereinafter described in detail, and sustain the same on the arched frame D, extending above and secured rigidly to the bed-plate, as shown.

For the purpose of trimming or cutting the edge of the heel, I employ a rotary cutter, E, carried by an upright spindle or shaft, G, located above the bed-plate, near the heel of the jack, so that by a slight movement the cutter may be brought against the heel of the shoe. The cutter-head is provided with the series of cutter-blades or knives *a*, the ends of which correspond in form with the vertical contour of the heel at its rear. Inasmuch as the vertical outline of the heel varies in passing from the rear end around to the side faces, and inasmuch as the inclination of the heel-seat or rand varies in heels of different heights, it is necessary that the cutter-head and its spindle shall be capable of rocking or tipping in a vertical plane, so that the blades may be adjusted to follow the heel. I therefore mount the upper and lower ends of the spindle in

movable bearings connected with means whereby they may be instantly adjusted while the machine is in action. This is most clearly shown in Fig. 2. The lower end of the spindle G is passed loosely through a bearing-collar, *b*, which is connected by a horizontal pivot, *c*, to one end of a slide, *d*, which is seated in a second slide, *e*, mounted on the bed-plate. The upper end of the spindle G is mounted in a block, *f*, which is supported by a horizontal pivot, *g*, which has its ends sustained in sliding plates *h*, seated in inclined dovetail grooves in the upper ends of two standards, *i*, which are formed rigidly upon the before-mentioned sliding plate *e*. The upper end of the spindle G is provided with a head or collar, *k*, or equivalent device, to sustain its weight, and prevent it from dropping endwise through the upper box. It will be perceived that the bearings for both ends of the spindle are arranged so that they may be moved forward and backward by moving the slide *e*, which will move the cutter bodily forward or backward without changing the inclination of the spindle. It will also be seen that by means of the slide *d* and the sliding bearing *f* the upper and lower ends of the spindle may be moved forward and backward independently in such manner as to vary the inclination of the spindle. For the purpose of effecting this adjustment of the spindle, I pivot to one of the standards *i* a hand-lever, *m*, connected by a link, *n*, to the upper bearing, *f*, and connected at its lower end by a link, *o*, to the lower slide, *d*. Upon moving the upper end of the lever forward, as indicated by the arrow in Fig. 2, it is caused to draw the plate *d* and the lower bearing of the spindle backward, and at the same time to force the upper bearing forward and upward in the inclined slots, the effect being not only to turn the spindle forward from an inclined to an upright position, but also to elevate the spindle and cutter-head to a limited extent. In other words, the movement of the lever may be said to impart a vertical rocking or rolling motion to the cutter-head and its spindle, whereby the edges of the cutter-blades may be caused to follow the bearing-surface of the heel. This adjustment of the cutter-head is clearly represented in Fig. 11, wherein the cutter-head and its action upon the rear end of the heel are represented in full lines, while the shape of the heel and the position of the cutter-head when acting upon its side are represented in dotted lines. It will be seen that both the upper and lower bearings of the spindle are sustained indirectly from the main slide *e*, and that, therefore, the forward and backward motion of said slide serves to carry the cutter to and from the heel of the shoe without regard to and without interfering with the rocking or tipping motion of the spindle, the two adjustments being independent of each other.

For the purpose of moving the slide *e* forward and backward, I pivot to the rear end of the bed-plate a horizontal hand-lever, H, and connect the same by means of a link, I, to the rear end of the slide, as shown in the several figures. Inasmuch as the attendant will have occasion to employ his hands most of the time for other purposes, I provide a foot-connection for moving the slide forward and maintaining the proper pressure of the cutter-head against the heel. This connection is shown in the drawings in Figs. 1, 2, and 6, and consists of a cord, J, attached at one end of the lever H, and extended thence downward over a stationary guide-pulley, K, beneath the pulley, attached to a treadle, L, and thence upward over a second guide-pulley, M, to the lower bearing of the spindle. The depression of the treadle causes the cord to urge the bearing *b* forward, and also to urge forward the lever H, and thereby the main slide *e*, which, through its intermediate connections, will cause a forward pressure to be applied to the upper as well as to the lower bearing of the spindle. The use of the pulley upon the treadle L permits the strain to be equalized upon both ends of the belt, and also admits of the belt shifting or moving endwise to accommodate itself to the changing positions of the spindle and slide *e*.

In the use of the machine it becomes necessary to raise and lower the cutter-head upon its spindle G. It is therefore mounted loosely thereon and connected by a spline or feather, by which the two are caused to rotate together. A circumferentially-grooved collar, *p*, is formed upon the upper end of the cutter-head, and arranged to engage with a head or enlargement on the lower end of a screw, O, seated in the upper bearing of the spindle, as plainly represented in Fig. 2. The screw O is provided on its upper end with a hand-crank or its equivalent, whereby it may be readily turned, and when turned its lower end will serve to raise or lower the cutter-head upon the spindle. In this way the cutter-head may be adjusted while the machine is in motion and without interfering with its movement, and fixed at any required height. The rotary motion is communicated to the spindle and cutter-head by means of a pulley, P, secured upon the lower end of the spindle, and provided with a driving-belt, Q, extending to any suitable motor. The knives or blades *a* of the cutter-head are provided in their rear ends with open slots, through which fastening-bolts are passed to secure them to the head. These open-ended slots admit of the knives being secured and released by a slight turn of the fastening-bolt without the necessity of removing the same. In order to hold the knives firmly in position and facilitate their adjustment, they are provided on their rear surfaces with transverse teeth or serrations, which engage with corresponding serrations on the surface of the cutter-head, as plainly represented in Figs. 2 and 8. These serrations also serve to prevent the knives from working out of adjustment,

and to prevent them from being thrown from the head in the event of their accidentally becoming loosened. The knives or cutters have their outer ends preferably made in such shape as to conform to the rear end of the heel, as represented in Fig. 2; but they may be modified in form as circumstances may require.

For the purpose of trimming the rand or edge of the heel-seat—sometimes denominated the "feather-edge"—I provide the cutter-head with thin horizontal cutting-blades R, the edges of which are located between the main knives and extended downward below the upper edges of the latter, as shown in Figs. 2, 7, and 9. It will be perceived that under this arrangement the main knives cut upward, while the trimming-knives cut downward, past a given line. In other words, the upper and lower knives overlap each other in their cutting action, so that jointly they serve to give a clean, finished cut to the edge of the heel-seat. The upper blades—which are commonly denominated the "trimming-cutters"—are preferably formed upon the edge of a thin steel disk, as shown in Figs. 7 and 9; but they may be made in separate pieces and otherwise attached, if desired.

For the purpose of preventing the trimming-cutters R from acting upon and injuring the upper of the shoe, I mount upon the cutter-head, immediately above said blades, a circular guard, T. This guard is in the form of a disk having its lower side fitted down closely above the cutters R and made concave to conform to the outer curvature of the upper. This form of the guard admits of the cutters R working in closely between the upper and the heel, so as to completely finish the heel-seat without injury or danger to the upper.

For the purpose of guiding or controlling the cutter in its action upon the heel, so as to determine the form of the latter, I provide the cutter-head, at the under side, with a hub or roller, U, having a rounded outer edge, and provide the jack, around its heel, with a pattern-plate, n', against which the roller travels as the jack is turned. The pattern-plate and roller co-operate with each other, and serve, as in other machines, to regulate the advance and retreat of the cutter—or, in other words, its movement to and from the heel of the shoe. The construction of the pattern-plate and the manner of its adjustment to the jack will be hereinafter described in detail.

The foregoing devices constitute the complete apparatus for cutting or trimming the heel.

Passing next to the means employed for scouring or buffing the heel subsequent to the action of the cutter-head, they will be found to consist of an upright rotary spindle, W, provided with a wheel or disk of any suitable construction, this second spindle, W, being adjustably supported and driven in precisely the same manner as the spindle G, which carries the cutter-head, the two spindles and the devices for sustaining and operating them being, in other words, duplicates of each other.

Referring to Figs. 1 and 3, W represents the spindle of the buffing or finishing wheel, located upon the bed-plate and adjacent to the jack. The spindle is sustained at its lower end in the bearing b', pivoted to the slide c', which is in turn mounted upon the slide d'. The upper end of the spindle is mounted in the bearing f', sustained by a transverse pivot, or by lateral journals in slides g', working in inclined grooves in the upright standard i', which are formed rigidly upon the base-slide d'. The arrangement of parts is, as before stated, a duplicate of that employed in connection with the cutting-head. The upper bearings of the spindle W are connected by links with a hand-lever, m', by which the spindle and its wheel may be rocked and adjusted in the same manner as the cutter-spindle.

For the purpose of moving the buffing-wheel and its attendant parts forward and backward, their supporting-slide d' is connected by a link, I', to a hand-lever, X, which is pivoted to the bed-plate and extended forward in position to be readily grasped by the operator.

For the purpose of urging the buffing-head forward by the foot, a cord is connected at one end to the lever X and at the other end to the lower bearing of the spindle W, and passed downward over guide-pulleys and beneath the pulley to a second foot-lever, Y, as shown in Fig. 6. The action of this lever and its attendant parts upon the buffing-head is the same as that of the previously-described cord J upon the spindle of the cutter-head. By means, therefore, of the second treadle, Y, which will urge the buffing-wheel forward, and of the hand-lever m', by which the buffing-wheel and its spindle may be tipped or rocked at will while being urged against the heel, the buffing-wheel is caused to conform in position, movement, and action to the surface of the heel in such manner as to finish the same uniformly throughout its entire surface.

In order to hold the slides by which the spindles are carried backward, so as to prevent the heads from sliding accidentally forward, the bed-plate of the machine is provided, as shown, with spring catches or detents Z, which are fastened at one end to the bed-plate, while their opposite ends are arranged to engage in inclined notches in the slides d and d', respectively, as plainly shown in Fig. 1.

In order to prevent the scouring-wheel N from encountering and injuring the upper of the shoe, I attach to the upper bearing of its shaft or spindle the stationary guard or fender A'. (Plainly represented in Figs. 1 and 3.) This fender has a curved upper surface, lying above the edge of the buffing-wheel in such manner as to ride against and protect the seat of the upper, and also has at each side a depending horn or arm, t, which serves to force back the upper at the shank, the better to pro-

tect the upper from the action of the wheel. This guard is preferably made of elastic material, so that it may yield to a limited extent as the buffing-wheel is forced against the heel. The vertical adjustment of the buffing-wheel upon its shaft is secured by means of a vertical adjusting-screw, O′, engaging with a grooved collar or hub on the wheel in the same manner as the adjusting-screw of the cutter-head. The advance of the buffing-wheel inward against the heel of the shoe and its action in following the surface of the same are controlled by providing it, on the under side, with a hub or pulley, U′, arranged to travel against the edge of the pattern-plate upon the jack, as hereinafter more fully explained.

The above parts constitute the entire buffing mechanism.

Passing next to the construction of the jack by which the shoe is sustained, reference is made particularly to Figs. 1, 2, 3, 4, and 5. The jack consists of the following principal members: a journal or fulcrum, a body-plate which has both a pivotal and a horizontal sliding motion upon said journal, a pattern-plate detachably seated upon said body-plate, a heel-supporting plate detachably mounted upon the pattern-plate, and a laterally-adjustable plate mounted on the forward portion of the base-frame to sustain the sole of the shoe against lateral motion.

Referring to Figs. 3 and 4, k' represents a journal seated vertically in a hole in the bed-plate, and provided at its upper end with a horizontal slide or plate of dovetail form. Upon the upper dovetailed end of the journal k' there is mounted a block, k'', which is free to rotate with the journal, and also free to slide horizontally thereon. l' represents the main frame or plate of the jack, having its rear end connected by a horizontal pivot, s', to the upper side of the sliding and rotating block k''. This compound support for the rear end of the jack-body admits of the body being swung horizontally around the journal-block k' as a center, and also of its being moved endwise horizontally by the sliding motion of the block k'' upon the journal, and also of the toe of the jack-body being raised and lowered upon the pivot s' as a center. Upon the rear end of the swinging base-plate l', I mount a pattern-plate, n', having a suitably-curved outer edge, to co-operate with the rolls upon the rotary heads, thereby determining the form which the heel of the shoe shall receive. The pattern-plate is connected firmly to the base-plate by means of a longitudinal rib, o', formed on its under side, and seated in a corresponding groove in the top of the swinging base-plate, as plainly represented in Fig. 3, this connection causing the pattern-plate to turn with the base-plate. Upon the pattern-plate I connect, by interlocking lugs or otherwise, a small plate, p', to receive and support the heel of the shoe. This plate, which will be of a form and size corresponding to that of the heel, will be made of greater or less height, as circumstances may require, and may be given such inclination from front to rear as the form of the heel may demand. The upper surface of this plate is provided with sand, emery, or other coarse or abrasive material, secured thereto, for the purpose of engaging firmly with the heel of the shoe and securing the same against lateral movement.

In order to present shoes having heels of different heights properly for the action of the rotary heads, it is necessary to provide means for raising and lowering the toe of the jack. The forward end of the body-plate is provided with an elongated opening containing a roller, t', carried by a journal on one end of a thumb-screw, u', which is mounted horizontally in the toe of the jack, as shown in Figs. 2 and 4. The roller t' travels upon and is sustained by a circular track, v', mounted, as hereinafter described, upon the bed-plate of the machine. This track, it will be observed, has a downward inclination in cross-section from its inner to its outer edge, so that by turning the screw u' the roller t' may be adjusted to travel upon a higher or a lower portion of the track, and thus caused to carry the toe of the jack at any required height. By thus adjusting the pitch or inclination of the jack it is adapted to present the heel-seat in the same plane with the trimming-blades R, whether the heel be a high or a low one. The machine is thus adapted for trimming perfectly and accurately the seats of shoes having heels of various heights.

Inasmuch as the body-plate of the jack is capable of sliding endwise in relation to its journal, as before mentioned, it is necessary to provide means for preventing this end motion at improper times. I therefore mount upon the bed-plate, in the manner hereinafter described, a circular guiding-rail, B′, clearly shown in Figs. 1, 2, and 3. I connect this rail with the jack by means of a sliding link-connection such as shown in Figs. 2, 4, and 5, adapted to permit the jack to sweep around over the rail, and also of its being raised and lowered at the toe. This connection consists, as plainly represented in Figs. 2 and 5, of a longitudinal tongue, x'', having one end united to the jack by a horizontal pivot, w', and the opposite end connected by a horizontal pivot, x', to a plate, y'. The plate y' rests on top of the circular rail B′, but is provided with a lip, z', engaging over and under one edge of said rail, and also with a roller, a'', which engages under the opposite edge of said rail. The lip z' and roller a'' serve to hold the plate down firmly upon the circular rail, while permitting it to slide freely endwise thereof. The link x'' serves as a connection between the sliding plate and the body of the jack, which is thus held by the rail from sliding endwise. The object of using the pivoted link x'' between the sliding plate and the jack is to permit the vertical adjustment of the jack, as before described.

For the purpose of supporting the sole of the shoe, I mount upon the body-frame l' of the jack a horizontal swinging plate, b'', pivoted to the jack at c'', as shown in Figs. 1 and 13. The object of permitting this plate to swing laterally is to adapt the jack for presenting right or left hand or straight shoes in proper position to the heel-trimming devices. Upon this laterally-swinging plate b'', I mount a clasp to engage with the opposite sides of the sole. This clasp consists, as shown in Fig. 1, of a plate, y'', having upturned ends, and secured at its center by a bolt or screw, d'', passing through a longitudinal slot, e'', in the plate. The slot and screw admit of the clamp being moved forward and backward, and also of its being turned horizontally, so as to adapt its ends to engage firmly with soles of different widths.

For the purpose of supporting the sole of the shoe, I provide the laterally-moving plate with a vertical screw, f'', the upper end of which is provided with an enlarged head, as shown in Figs. 1 and 2. The edges of the head are serrated or milled, in order to admit of its being quickly adjusted vertically, as the character of the shoe may require.

For the purpose of securing the plate b'' after being adjusted laterally I provide it in one edge with a horizontal slot, g'', through which I pass a thumb-screw, h'', into the main plate. By tightening this screw the plate b'' may be secured to the right or left or in its central position, as demanded.

As before stated, the circular rail B', through its intermediate connections, prevents the jack from shifting endwise. As, however, it is necessary that the jack shall be moved endwise preparatory to the breasting operation, I connect the two circular rails B' and v' to the bed-plate by means of sliding connections, so that when necessary they may both be moved forward upon the bed-plate, together with the jack, the journal or fulcrum of the jack remaining, however, in position. When the rails are moved forward with the jack, the latter moves upon them in the same manner as when they are in their normal position. The two circular rails or tracks v' and B' are connected and sustained by the slide d^3, (shown in Figs. 1 and 2,) which bears in a groove in the bed-plate. They are also sustained at the sides by engagement with guides d^4 on the bed-plate, as plainly represented in Fig. 3. For the purpose of effecting the sliding motion of the two circular rails B' and v', I attach to the lower end of the bed-plate a horizontal hand-lever, C', and connect the same at one end by a link, i'', to the slide by which the rails are supported. In consequence of this connection the movement of the lever C' causes both rails and the body of the jack to be moved forward and backward upon the bed of the machine.

The breasting of the heel is performed by an upright sliding blade, D', as shown in Fig. 2, this knife being mounted in a plate, D'', sliding in vertical guides or ways, which depend from a horizontal plate, E', mounted in guides upon the bed-plate below the circular tracks and the jack. The guides which sustain the knife-carrying plate are also adapted to sustain the pivot of the lever F', one end of which is connected with a pitman, G', which will be extended downward to a suitably-arranged treadle or equivalent operating device, as shown in the drawings at Fig. 6, while its opposite end is adapted to engage with rollers H', attached to the lower end of the knife-supporting plate. When the outer end of the lever is depressed by the action of the treadle B^3, as shown in Fig. 6, its inner end will force the knife upward to act upon the heel, the jack being provided, as shown in Figs. 2 and 4, with an opening, through which the knife may pass to the heel, this construction permitting the heel to be breasted while clamped upon the jack, without the necessity of removing or adjusting it for the action of the rotary heads. This construction, by which it is only necessary to jack the shoe once for the two operations of trimming and-breasting, is an important feature of my invention, inasmuch as considerable time and labor are saved thereby. The knife D' is united to its carrying-plate D'' by a dovetail groove or equivalent connection, permitting the knife to slide vertically, and the two parts are connected by a vertical hand-screw, I', by which the knife may be raised and lowered in relation to the plate. The end of the plate, encountering the sole of the shoe as it rises, serves as a stop to limit the cut of the knife, and by means of the screw the knife may be adjusted in such relation as to cut to the exact depth required without danger of cutting so deep as to injure the shoe. The details of construction as regards the lever F' and its connection with the knife are of secondary importance, and may be modified as desired. When the jack is in position to present the shoe to the rotary trimming and buffing heads before described, the heel stands out of line with the breasting-knife. In order to bring the heel directly above the knife preparatory to the breasting operation, I slide the jack and its adjuncts forward in the manner before described, without rejacking the shoe or changing its position upon the jack, and also slide the plate E', in which the breasting-knife is sustained, backward. This movement of the knife backward at the same time that the heel is brought forward enables me to bring the heel and knife in line more easily and quickly than by moving either the jack or the knife the entire distance. The forward movement of the jack and the backward movement of the knift-support simultaneously are secured by means of the before-mentioned lever C', pivoted to the bed-plate A of the machine. One end of this lever is connected by the link i'' to the plate d^3, which connects the jack-supporting rails B' and v', the link acting to move the plate d^3, and thereby to shift the two rails

and the jack sustained upon them forward or backward. The lever is also connected on the opposite side of its pivot by a link, n'', with the plate E′, which sustains the knife, as clearly represented in Fig. 1, so that the movement of the lever causes said link n'' to move the knife-support E′ forward or backward. Owing to the fact that the links n'' and i'' are upon opposite sides of the pivot of the lever, as explained, the movement of the levers causes the jack-supporting rails and jack to be drawn forward while the knife-support E′ is being moved backward, and vice versa. On moving the hand-lever in the direction indicated by the arrow in Fig. 1 the jack is moved forward and the breasting-knife moved backward until the latter is brought directly beneath the heel, whereupon it is operated through the foot-lever, as before described. A reverse movement of the hand-lever C′ causes the knife to be drawn forward and the jack moved backward in position to present the heel of the shoe to the rotary heads.

In order to lock the lever C′ in position so as to keep the jack and breasting-knife from moving accidentally, I mount upon the bed-plate a spring-catch, o'', which engages on the under side with the lever C′ when the latter is thrown to the right. To release this catch, I mount in the hand-lever C′ a small thumb-lever, p'', so that when the forward end is depressed its rear end will raise the catch o'' out of engagement with the lever, leaving the latter free to move. The distance which the lever C moves determines the distance to which the breasting-knife is carried beneath the heel, and consequently the thickness of the cut or shaving taken from the breast of the heel by the knife, and also determines the distance to which the jack is carried backward toward the rotary cutter-heads.

In order that the backward movement of the jack and the thickness of the shaving taken from the breast of the heel may be regulated as desired, I provide two stops, L′ and M′, as clearly shown in Fig. 1, to limit the motion of the lever C′. These stops consist, in the present instance, of thumb-screws. The screw L′ is mounted on the plate to encounter the rear end of the knife-supporting slide E′, thereby limiting the backward movement of said plate, and through the intermediate connections limiting the backward sliding movement of the jack. The second screw, M′, is also mounted upon the bed-plate or frame and encounters the rear end of the lever C′, thereby limiting the movement of the lever, and through the intermediate parts determining the distance to which the breasting-knife shall be carried beneath the heel.

While it is preferred to use the adjustable stop-screws, it is manifest that stops of any other suitable construction and arrangement may be used, provided only that they limit the sliding motion of the jack and the breasting-knife.

During the operation of the breasting-knife it is necessary that the jack shall be held rigidly against its swinging or rotating motion. For this purpose I mount upon the hand-lever C′ a pivoted stop-plate, q'', having in its upper surface a stud, r'', to enter a notch, a''', in the end of the jack. As the lever is moved forward to bring the jack in position for the operation of the breasting-knife the stud r'' is carried automatically into the end of the jack, and as the motion of the lever is reversed to carry the jack backward the stud r'' is automatically withdrawn, and the jack thereby released. The stop-plate q'', upon which the locking-stud is carried, is pivoted upon the arm C′ and slotted to receive a fastening-screw, s'', as shown in Fig. 1. This construction admits of the locking-stud being moved to the right or left, in order to secure the jack in the different positions required for breasting the heels of right, left, and straight shoes.

In order to retain the shoe properly in position upon the jack during the operation of the trimming, buffing, and breasting mechanisms, it is necessary to provide a properly-sustained last to fill the heel of the shoe and force the same downward upon the jack. This device is clearly represented in Figs. 2 and 3. A hub or plate, O″, is united by a horizontal pivot to the arched frame directly above the jack. Through the plate O″, I pass the upper end of a vertical stem or spindle, P′, this spindle being arranged to rotate freely and to slide to a limited extent through the plate O″. Collars or shoulders formed upon the spindle P′ prevent its escape from the supporting-plate, and a spiral spring, Q′, applied around the spindle, below the plate, tends to urge the spindle downward.

Owing to the fact that the spindle-supporting plate O″ is sustained by a horizontal pivot, it will swing or turn freely in such manner as to admit of the spindle being swung outward at the lower end, to one side, as indicated by dotted lines in Fig. 2, in order to permit the ready application and removal of the shoe.

The lower end of the spindle P′ is formed with a reduced neck, terminating in a spherical head. Around the neck, above the spherical head, I mount a plate, i'', and to the rear end of this plate I connect by a horizontal pivot, u'', a small last or pressure-plate, v'', the latter made of such length as to extend from the heel of the shoe forward to the ball of the sole. It is important that the plate v'' shall be made of the length stated, in order to relieve the shoe from the downward pressure on the shank, which would tend to destroy its form. To the rear end of the last or pressure-plate v'', I apply a detachable cap or sleeve, w'', Fig. 12, designed to fill and expand the shoe at the heel. This sleeve fits over the last from the rear end, and has its sides adapted to engage in dovetailed grooves in the last, as clearly shown in Figs. 2 and 3, whereby it is retained in position thereon. Being thus attached, the cap may be readily removed and replaced by

others of different size, conforming to the shoes upon which the machine operates. The connection of the last with the pressure-spindle P′ in the manner described admits of the last being turned freely in a horizontal direction, while its attachment, by means of the hinged connections *u″*, admits of the last tipping in relation to the spindle and adjusting itself to shoes having heels of different heights. This hinged connection is advantageous in that when the spindle is thrown to one side the last will swing downward therefrom, as shown in dotted lines in Fig. 2, and permit the more ready removal and application of the shoes, and also in that it permits the last and spindle to accommodate themselves to the varying position of the shoe as the jack slides forward and backward.

For the purpose of applying the required pressure to the spindle and last, I make use of an upright screw, R′, as shown in Figs. 2 and 3, mounted in a plate, S′, and arranged to slide laterally in guides upon the arched frame. The lower end of the screw is arranged to enter a cavity in the upper end of the spindle and force the same downward. The sliding motion of the screw-supporting plate admits of the screw moving laterally and continuing its action upon the upper end of the spindle as the latter is vibrated by the sliding motion of the jack. When the shoe is to be released, the screw R′ is turned upward, thereby removing the pressure from the spindle, which may then be moved to one side with the last, as before described.

Having thus described my invention, what I claim is—

1. In a heel-finishing machine, the trimming-head mounted on a slide having a movement toward and from the heel, the said slide mounted in another slide having a movement toward and from the heel, in combination with a hand-lever and intermediate connecting mechanism arranged to move the head-spindle bearings simultaneously in opposite directions.

2. The sliding plate *e*, carrying the spindle G, in combination with the handle-lever H, cord J, and treadle L.

3. The combination of the standards *i i*, having forwardly-inclined slots or grooves therein, bearing-block *f* on a horizontal pivot, *g*, mounted in the said inclined slots or grooves, spindle G, bearing the rotary cutter-head E, and adjusting-screw O in the said bearing-block.

4. The combination of the standards *i i*, having forwardly-inclined slots or grooves therein, bearing-block *f* on a horizontal pivot, *g*, mounted in the said inclined slots or grooves, spindle G, carrying the cutter-head E, adjusting-screw O, gage-roller U, pattern-plate *n′* on the jack, and lower bearing, *b*, carried by the slide *d*.

5. The combination of the spindle G, having simultaneous vertical and lateral adjustments, and the cutter-head E, adjustable up and down upon the said spindle.

6. The combination of the slide *e*, carrying the standards *i i*, in which is mounted the upper bearing of the cutter-spindle G, and the slide *d*, mounted on the slide *e* and carrying the lower bearing of the said spindle.

7. A machine for finishing boot and shoe heels, provided with a rotary boot or shoe carrying jack, B, a tilting trimming-head, E, mounted on a slide, *e*, adapted to give it a movement toward and from the jack, and a tilting scouring-head, N, mounted in a slide, *d′*, adapted to give it a movement toward and from the jack.

8. A machine for finishing boot and shoe heels, provided with a rotary boot or shoe carrying jack, B, a trimming-head, E, mounted on a slide, *e*, adapted to give it a movement toward and from the jack, a scouring-head, N, mounted on a slide, *d′*, adapted to give it a movement toward and from the jack, and a breasting-knife, D′, mounted on a slide, D^2, adapted to give it an up-and-down movement through the jack.

9. A trimming-head, E, mounted on a spindle, G, adapted to have its two ends adjusted simultaneously in opposite directions, in combination with means, substantially as described, for effecting the said adjustments.

10. A scouring-wheel, N, mounted on a spindle, W, adapted to have its two ends adjusted simultaneously in opposite directions, in combination with means, substantially as described, for effecting the said adjustments.

11. The combination of the rotary buffing-wheel and the non-rotating shield, constructed substantially as described, and provided with ears or horns at the corners.

12. The combination of a rotary and horizontally movable jack, B, a vertically and horizontally movable breasting-knife, D′, and means, substantially as set forth, for giving the jack and breasting-knife simultaneous movements in opposite directions, substantially as and for the purpose herein specified.

WILLIAM MANLEY.

Witnesses:
W. CLARENCE DUVALL,
PHILIP T. DODGE.