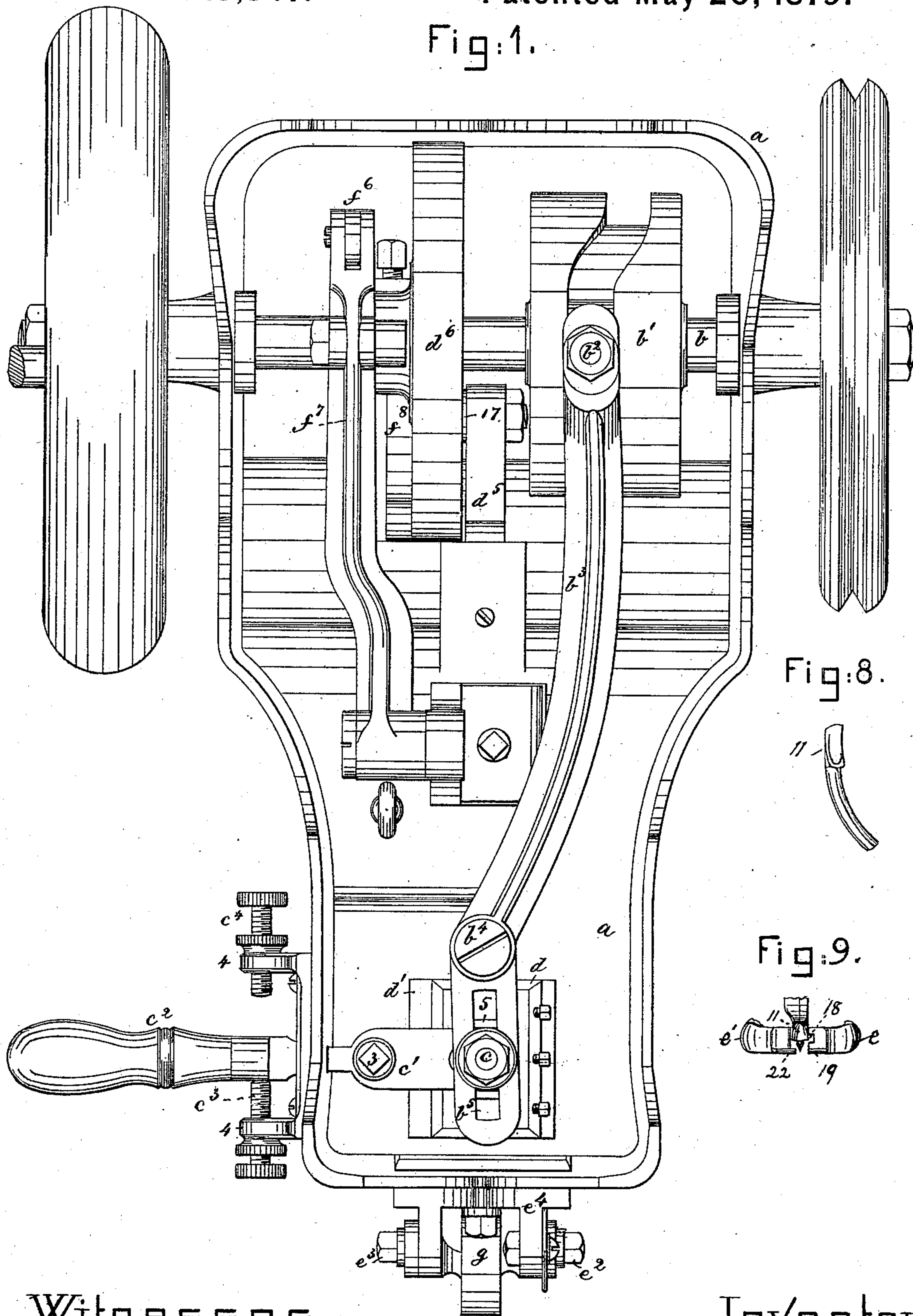


J. S. TURNER.  
Machine for Pricking and Trimming Soles.  
No. 215,547. Patented May 20, 1879.

Fig:1.



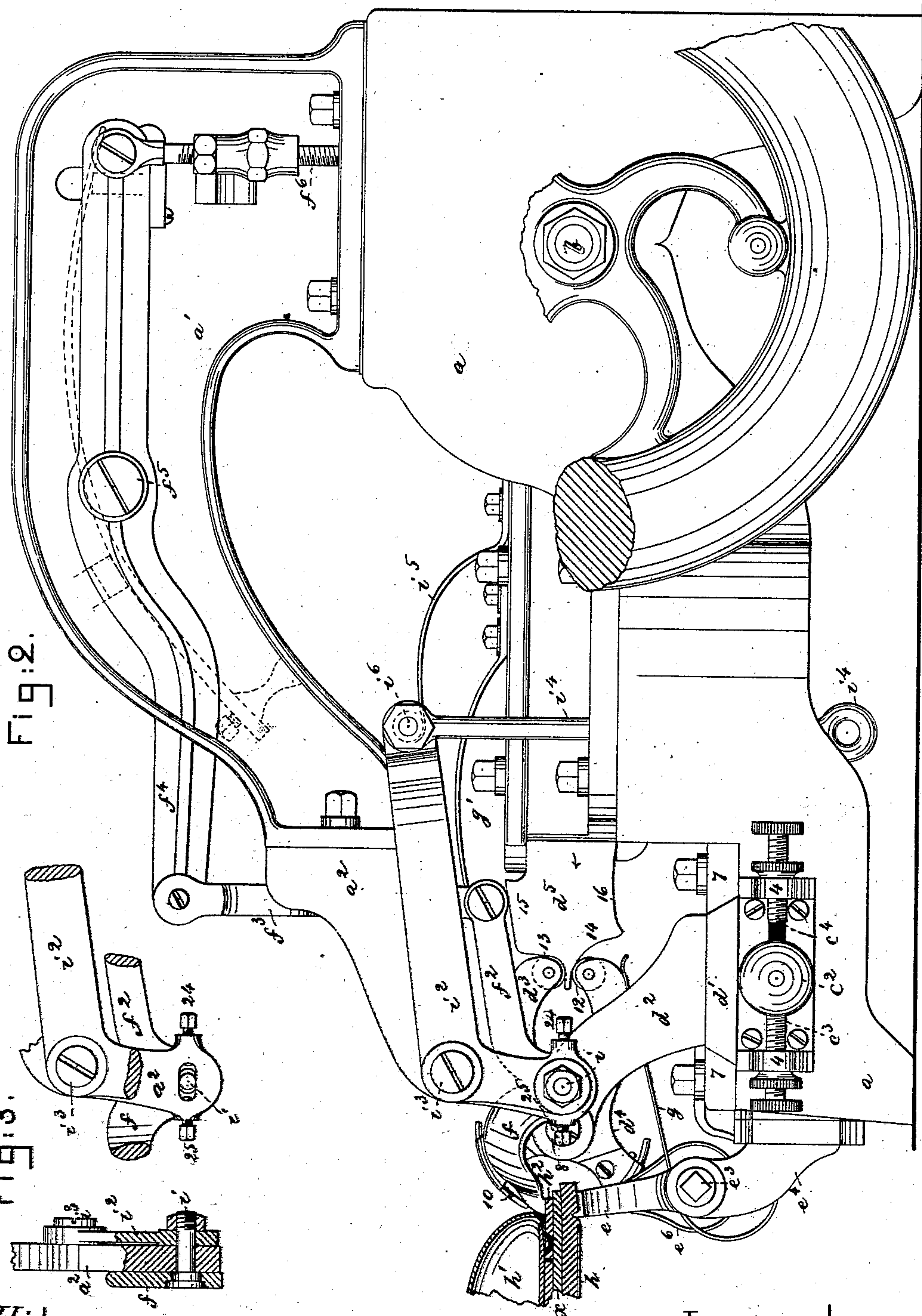
Witnesses,  
L. J. Connor.  
N. E. Whitney.

Inventor.  
Joseph S. Turner.  
by Crosby & Gregory, Attys

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Fig:6.

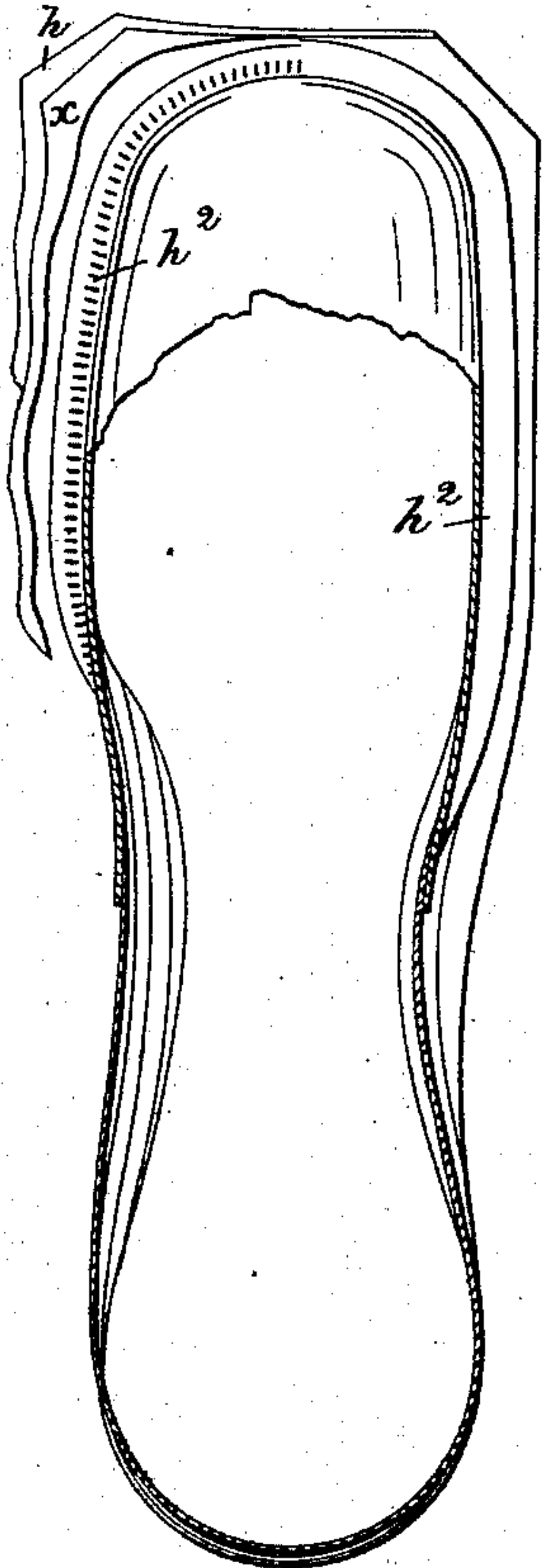


Fig:4.

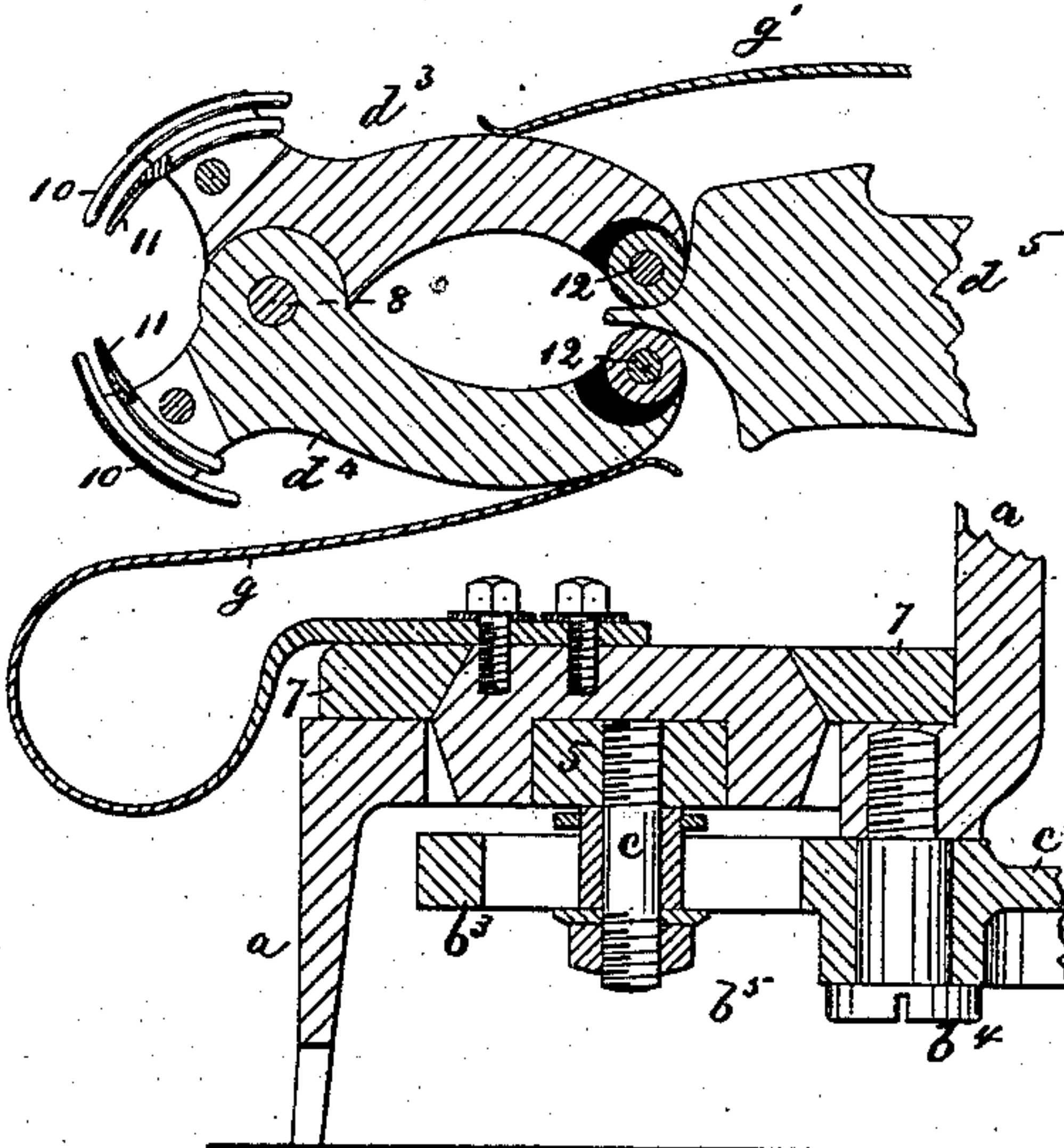


Fig:7.

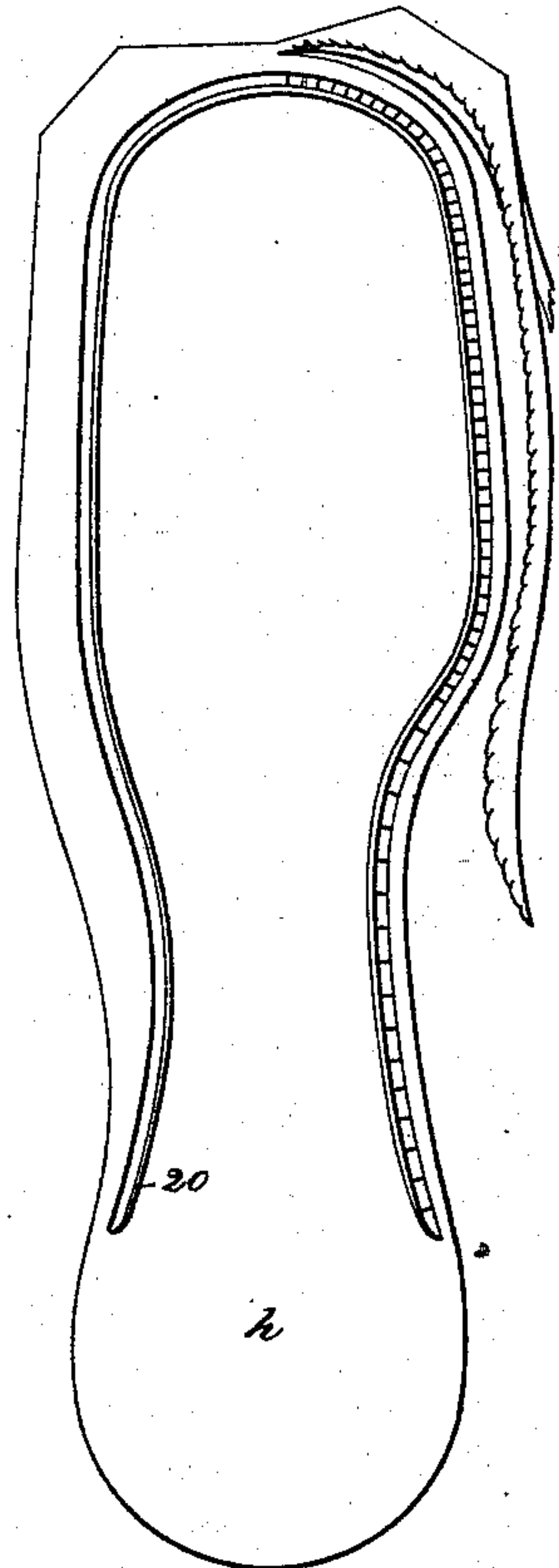
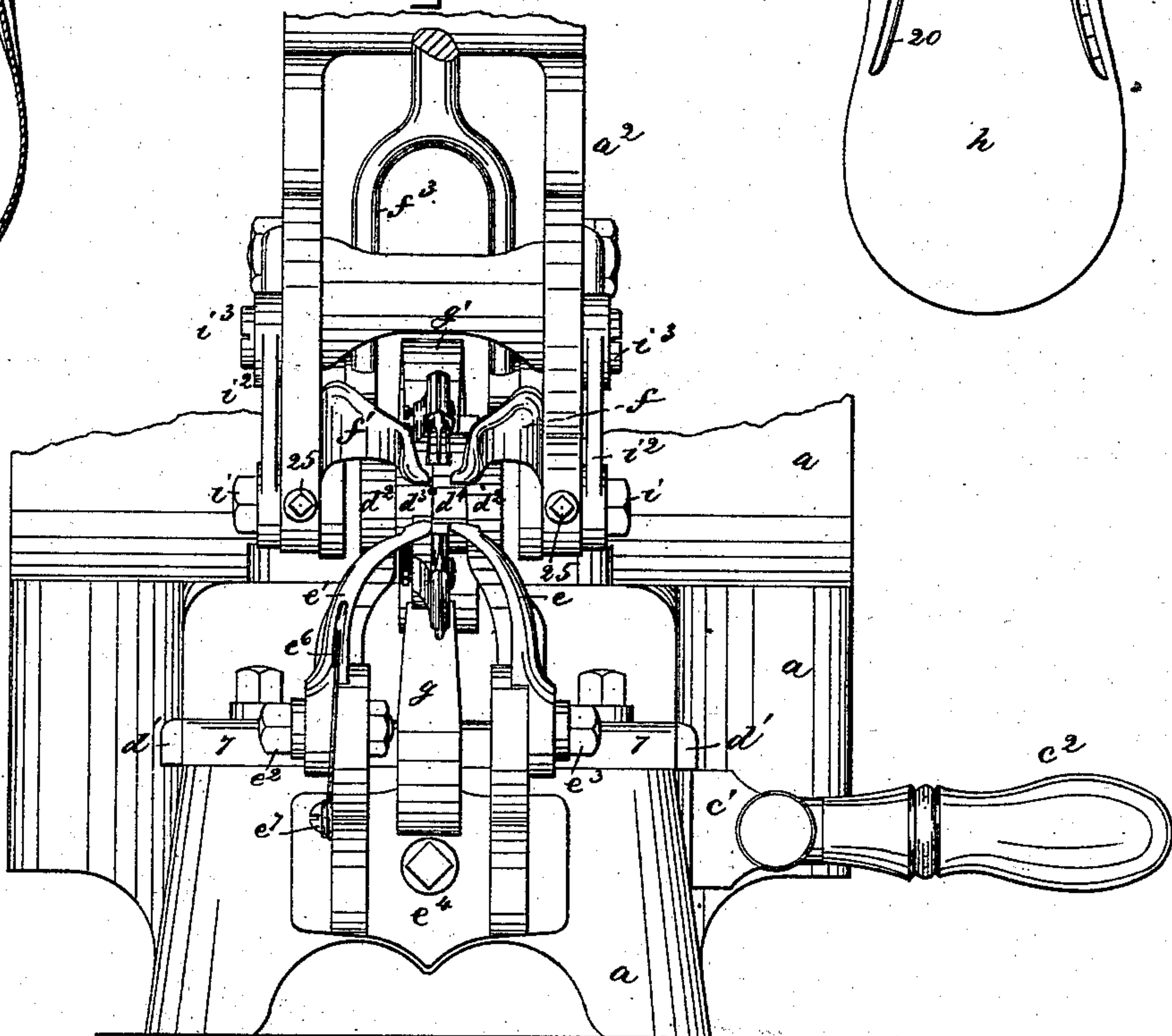


Fig: 5.



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# UNITED STATES PATENT OFFICE.

JOSEPH S. TURNER, OF ROCKLAND, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR PRICKING AND TRIMMING SOLES.

Specification forming part of Letters Patent No. 215,547, dated May 20, 1879; application filed December 2, 1878.

*To all whom it may concern:*

Be it known that I, JOS. S. TURNER, of Rockland, county of Plymouth, State of Massachusetts, have invented an Improvement in Mechanism for Pricking and Trimming Soles, of which the following description, in connection with the accompanying drawings, is a specification.

This invention relates to mechanism for pricking soles preparatory to sewing them by hand, as described in United States Letters Patent No. 191,387, granted to me May 29, 1877, and at the same time the pricking mechanism has, co-operating with it, certain knives or cutters to trim the outer sole and welt at a uniform distance from the edge of the upper or inner sole, the upper, just outside of or next the inner sole, being used as a gaging-surface, or a surface against which bears and moves a gage which regulates the distance from the upper at which the awls and cutters enter the welt and outer sole.

By using the upper as a gaging-surface the sole may be trimmed exactly in accordance with the shape of the upper and last, and by adjusting the gage the sole edge may project for a narrow or broad edge.

In this my improvement, after applying the welt and outer sole to a lasted shoe, the edge of the sole and the superimposed welt, the shoe being held upon a suitable support, are subjected to the action of perforating-awls, which enter the sole and welt from opposite sides and punch holes therein for the reception of the waxed thread. Moving with these awls, and in the arc of a circle coincident with their movement, are cutters which trim the edges of the outer sole, or it and the welt, at a uniform distance from the line of perforations made by the awls. The awls and cutters, while in contact with the material forming the sole, have imparted to them a lateral or feeding movement to move the shoe horizontally. During this operation a channel-gage enters the channel at the wearing-face of the outer sole, or the shoe is guided in the proper path, according to the shape of the last, by a gage which bears against the upper next the welt.

The special features and combinations in which my invention consists are hereinafter

pointed out, and specifically claimed at the end of the specification.

Figure 1 represents an under-side view of a sole pricking and trimming machine constructed in accordance with this invention; Fig. 2, a side elevation thereof, the balance-wheel being broken away and the shoe being in section; Fig. 3, details to be referred to; Fig. 4, a longitudinal section taken through the awls and cutters and their actuating mechanism; Fig. 5, a partial front elevation of Fig. 2, the parts being represented as when grasping a sole, but with the sole omitted. Fig. 6 is a view of a partially punched and trimmed welt and sole, viewed from the welt side, the principal portion of the upper being cut away parallel with the sole. Fig. 7 is a view of the same shoe, taken from the bottom or outer sole. Fig. 8 represents the cutter detached; and Fig. 9, a top view of the rests or feet which support the work.

The frame-work  $a$   $a^1$   $a^2$  may be of any suitable shape to properly sustain the working parts.

The main shaft  $b$ , driven by hand or other power, has upon it a cam-grooved hub,  $b^1$ , which receives a roller or pin,  $b^2$ , at the rear end of a lever,  $b^3$ , having its fulcrum at  $b^4$ , and slotted at its forward end, as at  $b^5$ , to receive a movable stud or pin,  $c$ , extended through a slot, 2, in a feed-regulating lever,  $c^1$ , having a handle,  $c^2$ , pivoted at 3, and controlled as to the extent of its movement by feed-regulating stops  $c^3$   $c^4$ . (Shown as screws held in ears 4, attached to frame  $a$ .)

The upper end of stud  $c$  has a square head, 5, fitted into a grooved portion,  $d$ , at the under side of a carriage,  $d^1$ , fitted between guides 7, and having upon it the ears  $d^2$ , which carry the fulcrum-pin 8, on which turn the two awl-carriers  $d^3$   $d^4$ , provided each with a curved awl, 10, and a chisel or gouge-like cutter, 11. (See enlarged detail, Fig 8.)

The adjacent awls and cutters commence to enter the material at substantially the same time.

By shifting the handle or levers  $c^2$   $c^1$  the pin  $c$  may be moved more or less from the fulcrum  $b^4$  of levers  $b^3$ , and consequently the carriage  $d^1$ , ears  $d^2$ , and awl-carriers may be moved



more or less while the awls and cutters are in the leather, to feed the shoe or boot a greater or less distance, according to the distance desired between the awl-holes. The handle being against one of the stops  $c^3$  will regulate the distance between the awl-holes about the toe and ball of the boot or shoe, and arriving at the shank the handle may be quickly thrown against the other stop,  $c^4$ , thereby lengthening the distance between the awl-holes made through the edge of the shank. The stops being once set for the maximum and minimum distances between the holes, the handle or lever may be quickly changed, and any number of pairs of boots or shoes be made with exactly the same spacing at all parts. By attaching the cutters directly to the awl-carriers they always cut the welt and sole concentric with the holes made by the awls, and a uniform width of leather is maintained outside the awl-holes, which is not the case in regular hand-sewed work, wherein the outer sole is trimmed after sewing.

The awls and cutters being in the sole when the shoe is moved horizontally hold it very securely and makes a feed of great power; but after feeding the shoe the awls and cutters are withdrawn and returned to their starting-point, preparatory to again entering the welt and outer sole, the shoe being then held between the channel feet or rests  $e e^1$  and pressers  $f f^1$ .

The carriers  $d^3 d^4$ , held with the awls most separated by springs  $g g^1$ , are provided with anti-friction rollers 12, which are struck by the carrier-operating cam bar or slide  $d^5$ , provided with actuating-surfaces 13 14 15 16, so shaped, substantially as shown, that as the slide  $d^5$  is moved horizontally forward in the direction of the arrow, Fig. 2, by a groove made in the face of a cam-hub,  $d^6$ , (it receiving a pin or roller, 17, at the rear end of  $d^5$ , see Fig. 1,) the carriers will be turned to project the awls and cutters through the welt and outer sole.

The awls and knives enter the material at the same time, thereby acting simultaneously against the material, and, arriving at or near the center of the material, or so that their points are quite near each other, the awl and cutter of the carrier  $d^4$  are depressed, and the awl and cutter of carrier  $d^3$  follow after them until the last-mentioned cutter passes below the point reached by the cutter of carrier  $d^4$  in its previous upward movement. With the awls and cutters yet in the material the carriers are moved laterally for the desired distance, according to the length of feed-stroke, the rollers then traveling horizontally in contact with the broad end of  $d^5$ ; and at the end of the feeding-stroke the lower and upper cutter both start upward together for a very short distance, (the stock being held by the pressers,) after which the lower awl and cutter are depressed, and the upper awl and cutter are fully elevated and removed from the stock and moved horizontally back to the point from which they started. These movements of the

awls and cutters punch the holes of uniform size, and completely sever the waste material from the sole and welt, and loosen the awls and cutters, so that they may be withdrawn from the stock without sticking; and the cutting faces or edges, coming in contact only with the leather being cut, are not dulled, as though but one cutter were used.

The channel feet or rests  $e e^1$  are adjustably held by bolts  $e^2 e^3$  in a bracket,  $e^4$ , at the front of frame  $a$ .

The foot  $e$  is held tight by the bolt  $e^3$ , and at its upper end has a small flat portion, (see Fig. 9,) provided preferably with a throat, 18, and a ledge, 19, the one to permit the passage of the cutters 11, and the other to enter the channel 20, cut in the outer sole,  $h$ .

The foot  $e^1$  is free to vibrate about its bolt  $e^3$ , but is held in its proper position vertically, or nearly so, by an adjustable U-shaped spring,  $e^6$ , held by a screw or bolt,  $e^7$ , the ends of the said spring pressing against the front and rear faces of the foot portion  $e^1$ . This foot  $e^1$  has at the top a channel-entering projection, 22, and on reaching a curved portion of the channel, as at the toe or shank of a boot or shoe, the foot  $e^1$  is free to turn on its bolt  $e^2$ , and follow the channel as its direction is changed by moving the shoe, the projection 22 remaining in the channel all the time, which would not be the case if the foot  $e^1$  were held rigidly.

The cutters and awls work in an arc of a circle between the feet, and the awls, moved in a path coincident with the ledges 19 22, enter the sole at its lower side, directly at the bottom of the channel.

If desired, the feet  $e e^1$  may serve only as rests, and one of the pressers may be provided with a channel-opener; but in such modification the shoe would be held with the outer sole uppermost, or the reverse of the shoe  $h^1$ . (Shown at Fig. 2.)

The pressers  $f f^1$ , which bear upon the welt  $h^2$ , attached to the upper and inner sole in the usual manner, act also to regulate the distance from the upper at which the awl and cutters penetrate the welt and outer sole; and it may be an intermediate filling-sole,  $x$ , for the said combined pressers and gages are made adjustable toward and from the path in which the awls and cutters reciprocate. These gages  $f f^1$ , having backwardly-extending arms  $f^2$ , connected by a link,  $f^3$ , with a vibrating lever,  $f^4$ , pivoted at  $f^5$ , and connected by an adjustable link,  $f^6$ , with a radius-bar,  $f^7$ , set in motion by a cam,  $f^8$ , so as to automatically raise and lower the pressers to release or grasp the material at the proper times, have their fulcrum-pins  $i$  at the ends of the shorter arms of the gage-shifting levers  $i^2$ , pivoted at  $i^3$  upon the part  $a^2$  of the frame-work, the said levers being connected at their rear ends by a link or rod,  $i^6$ , with any suitable treadle, controlled by the foot or hand of the operator.

A strong spring,  $i^5$ , pressing against the rod  $i^6$ , which joins the two levers  $i^2$  at their rear ends, holds the fulcrum-pins pressed against



the gage-stop 24, and, consequently, the acting faces of the gages are in their backward position, or nearest the path of movement of the awls and cutters.

By depressing the rear end of the gage-shifting levers <sup>i</sup> the fulcrum-pins <sup>i</sup> are, with the gages, moved away from the path of movement of the awls until they are stopped by gage-stops 25.

It is obvious that the gage-stops 24-25 may be adjusted as it may be desired to punch and trim the welt and outer sole at a less or greater distance from the upper, against which the gages bear.

In operation, the shoe is lasted, the welt is attached, and the leather for the outer sole, and also for the inner or filling sole, if used, is applied, after which the outer sole is marked and channeled, preferably by a hand-operated tool, such as described by me in another application for Letters Patent, filed December 7, 1878, the upper on the last near the welt being used as a gaging-surface, to cause the channel to correspond with the contour of the last-bottom, the channel being shown at 20, and placed in the machine. The awls make a series of perforations through the welt and through the outer and inner soles, entering at the base of the channel, (these holes being shown at Figs. 6, 7,) and at the same time the cutters trim the welt and inner and outer soles evenly at a uniform distance from the upper, it being used as a gage, after which the holes punched by the awls are filled in with thread, after the manner of the cordwainer's stitch, as described in my patent of May 29, 1877.

It is obvious, in case the channel-opener was placed upon the gages, that the channel could be used as a gaging-surface from which to trim the welt and sole; but in so doing care would be taken to mark the line for the channel by means of a gage having its marking-point governed by the outline of the upper or last near the inner sole. Such a tool will form the subject-matter of another application for Letters Patent.

The awls and cutters will preferably be made curved, so as better to fit into the shank; but it is obvious that the upper and lower awls might be made to penetrate the welt and outer sole in angular directions with relation to each other, so that lines projected forward in the direction of the movement of said straight awls would cross each other at or near the center of the combined welt and sole, viewed as to thickness only.

Heretofore, in the manufacture of welted work, it has been usual to trim the welt after it is attached to the inner sole and upper of the lasted shoe, and then the outer sole usually shaped by a die, and the inner sole, if one was used, were both trimmed down to meet the welt, and the welt and sole were united by stitches.

In said operation the workman depends upon his eye alone to determine the uniform projection of the welt and outer sole from the

upper, and much time of valuable workmen is lost which, according to this improved plan, is saved.

Simultaneously punching and trimming the welt and outer sole maintains the sole edge in exact uniformity with the line of stitches uniting the welt and outer sole.

In preparing a shoe or boot to be sewed by hand according to this my invention, it will be observed that the edge of the sole is not used as a gaging-surface over and along which the channeling-tool is moved to place the channel at its proper position in the wearing-face of the outer sole, and I am therefore enabled to apply to the lasted shoe, for the purposes of an outer sole, a piece of leather which has not been sole-shaped by means of a die, as heretofore common.

I am aware that in sewing-machines it is common to cut or trim the edges of the material being sewed parallel with the line of stitches; but I am not aware that any sewing-machine containing a cutter has otherwise been adapted to support a lasted shoe and permit the edge of its sole to be trimmed about the ball and into the shank; nor am I aware that any machine for trimming soles or leather has ever been provided with two cutting devices to operate upon the sole from its opposite faces.

I claim—

1. In a machine for perforating a welt and outer sole, two awls adapted to simultaneously penetrate the welt and outer sole, combined with a rest or support for the shoe while being acted upon by the awls.

2. In a machine for perforating a welt and outer sole, two awls adapted to simultaneously enter and pass through the said welt and outer sole, combined with a rest for the shoe and a movable gage to co-operate with the upper or channel to place the series of perforations at the desired distance from the upper, substantially as described.

3. Two awls to perforate the welt and outer sole in opposite directions, as described, combined with a gage adapted to bear upon the upper near the welt, and mechanism to move the said gage toward and from the path of movement of the awls, substantially as described.

4. In a machine for perforating a welt and outer sole, a pivoted gage to bear against the upper near the welt, and stops to determine the movement of the fulcrum-pin of the gage toward or from the path of movement of the awls, substantially as described.

5. In a machine for perforating a welt and outer sole, two awls and a support for the boot or shoe, combined with two independent pressers to bear upon the material at the front and the rear of the awls, and mechanism to raise and lower the pressers, substantially as described.

6. In a machine for perforating a welt and outer sole, two awls to simultaneously enter and penetrate the welt and outer sole, combined with two feet, *e e'*, to support the material, one



of the said feet being adapted to yield and remain in the channel of the outer sole, notwithstanding the curvatures in the channel, substantially as described.

7. In a machine for perforating a welt and outer sole, a pivoted rest or foot,  $e^1$ , provided with a shoe-supporting surface, and a ledge, 19, to enter and open the channel in the outer sole, combined with a spring to maintain the foot in upright position, but yet permit it to yield toward and from the center of oscillation of the awls, substantially as described.

8. In a machine to perforate the welt and outer sole of a shoe, two cutters or blades to enter from opposite sides and trim the outer sole, or outer sole and welt, parallel with the series of perforations made therein, substantially as described.

9. Two curved awls and two curved cutters, having substantially coincident centers of oscillation, combined with a rest or support for the material, substantially as described.

10. The combination, with the mechanism for perforating a welt and outer sole, and mechanism to trim them parallel with the series of perforations, of a channel-guide and support for the boot or shoe and a presser, to operate substantially as described.

11. The combination, with mechanism to perforate a welt and outer sole, of two cutters to enter the sole from opposite sides, and a rest or support for the material, and a gage to bear against the upper near the welt, to regulate the distance from the upper of the perforations made by the awls, substantially as described.

12. In a machine for simultaneously perforating and trimming a welt and outer sole, an awl and cutter having coincident centers of vibration or movement, combined with mechanism to move the awl and cutter-carrier horizontally when the awl and cutter engage the welt and sole to feed the boot or shoe forward, substantially as described.

13. In a machine to perforate a welt and outer sole, two awls and two cutters to enter the welt and outer sole at opposite sides to perforate and trim them, combined with a fixed rest or foot and a movable rest or foot provided with a channel-gage, substantially as described.

14. Two awls to perforate and two cutters to trim a welt and outer sole at the desired distance from the upper, combined with mechanism to operate the awl and cutter-carriers to permit the cutters to almost meet, and subsequently to move one cutter forward while the other is retracted, to cut that portion of

the sole which rests between the cutters when they nearly approach each other, substantially as hereinbefore described.

15. The combination, with a perforating-awl and a laterally or horizontally moving carriage to cause the awl to feed the material, of a handle or lever made movable between adjustable stops adapted to arrest the lever at its two extremes of movement, to produce and insure a certain length of feed about the fore part of the boot or shoe and a longer feed at the shank, substantially as described.

16. A cutting-blade to penetrate the welt or upper side of the sole, combined with a second cutter to cut into and trim the sole from its wearing-face, substantially as described.

17. In a machine to simultaneously prick holes in and trim the edge of a sole or welt on a last, a curved awl and a curved cutter, to enable the sole or welt to be perforated and trimmed at its concaved or shank portion, substantially as described.

18. In a machine to trim soles, a gage to enter the channel in an outer sole, and two cutters to enter the sole from its opposite faces or sides, to operate substantially as described.

19. A cutter to enter and trim a sole, combined with mechanism to move it laterally while in the sole to assist in feeding the shoe after each cutting operation, substantially as described.

20. That improvement in the art or method of making welted boots and shoes which consists in lasting the upper upon the inner sole, attaching a welt to the upper and inner sole, applying a piece of leather for an outer sole to the welt and lasted upper, channeling the outer sole about the toe, ball, and shank of the foot in a line substantially concentric with the outline of the lasted upper near the welt, then punching holes through the welt and outer sole, and simultaneously trimming the welt and the piece of leather for the outer sole at a uniform distance from the upper, giving the said piece of leather the proper shape for the outer sole according to the shape of the last, and then sewing the welt and outer sole together by threads inserted through the said holes, the different steps being in the order and substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH S. TURNER.

Witnesses:

G. W. GREGORY,  
N. E. WHITNEY.