4 Sheets—Sheet 1.

H. A. HENDERSON.

Heel Trimming and Polishing Machine.

No. 236,494. Patented Jan. 11, 1881.

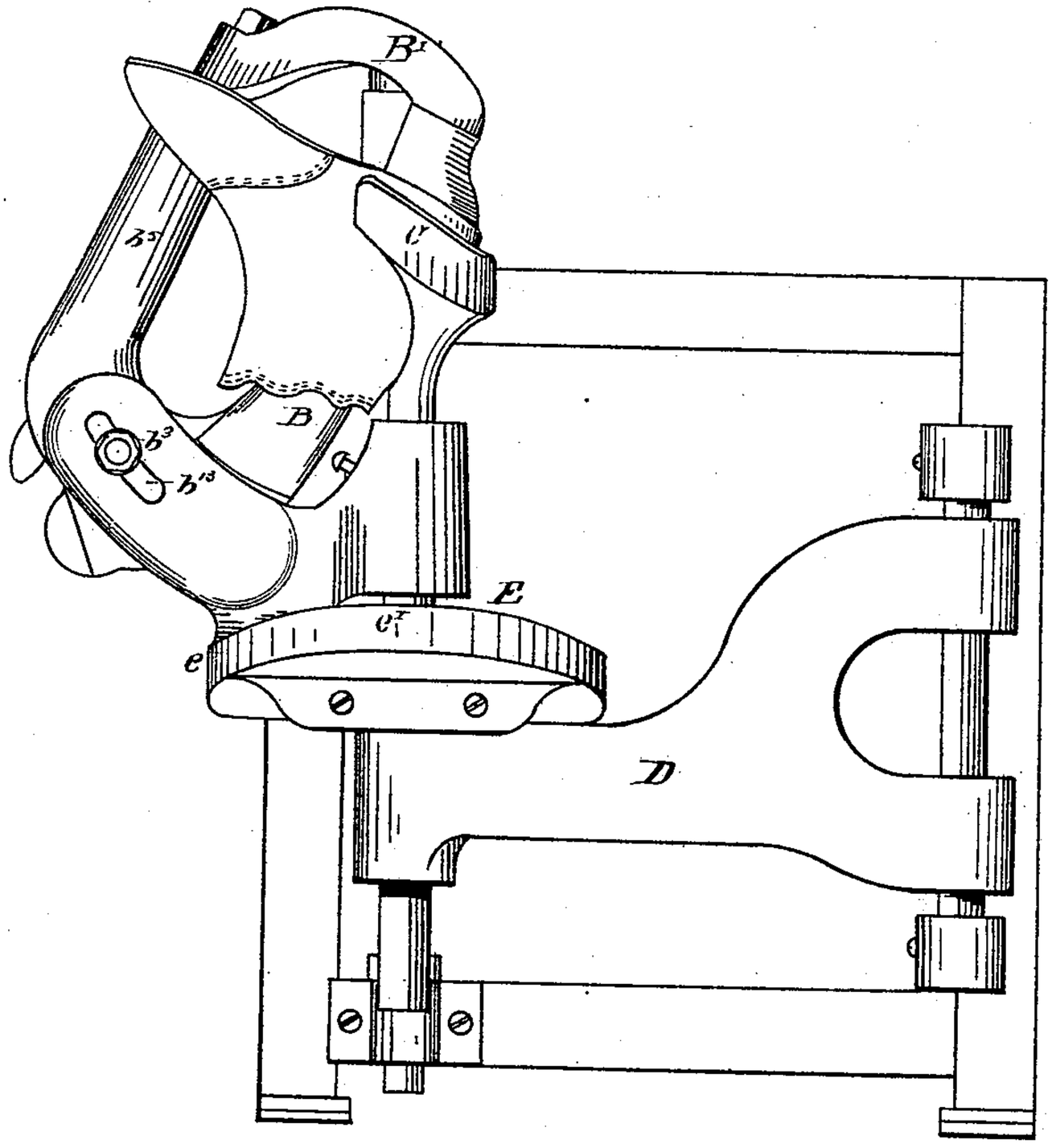

Fig. 1.

WITNESSES

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Clarke & Raymond.

4 Sheets—Sheet 2.

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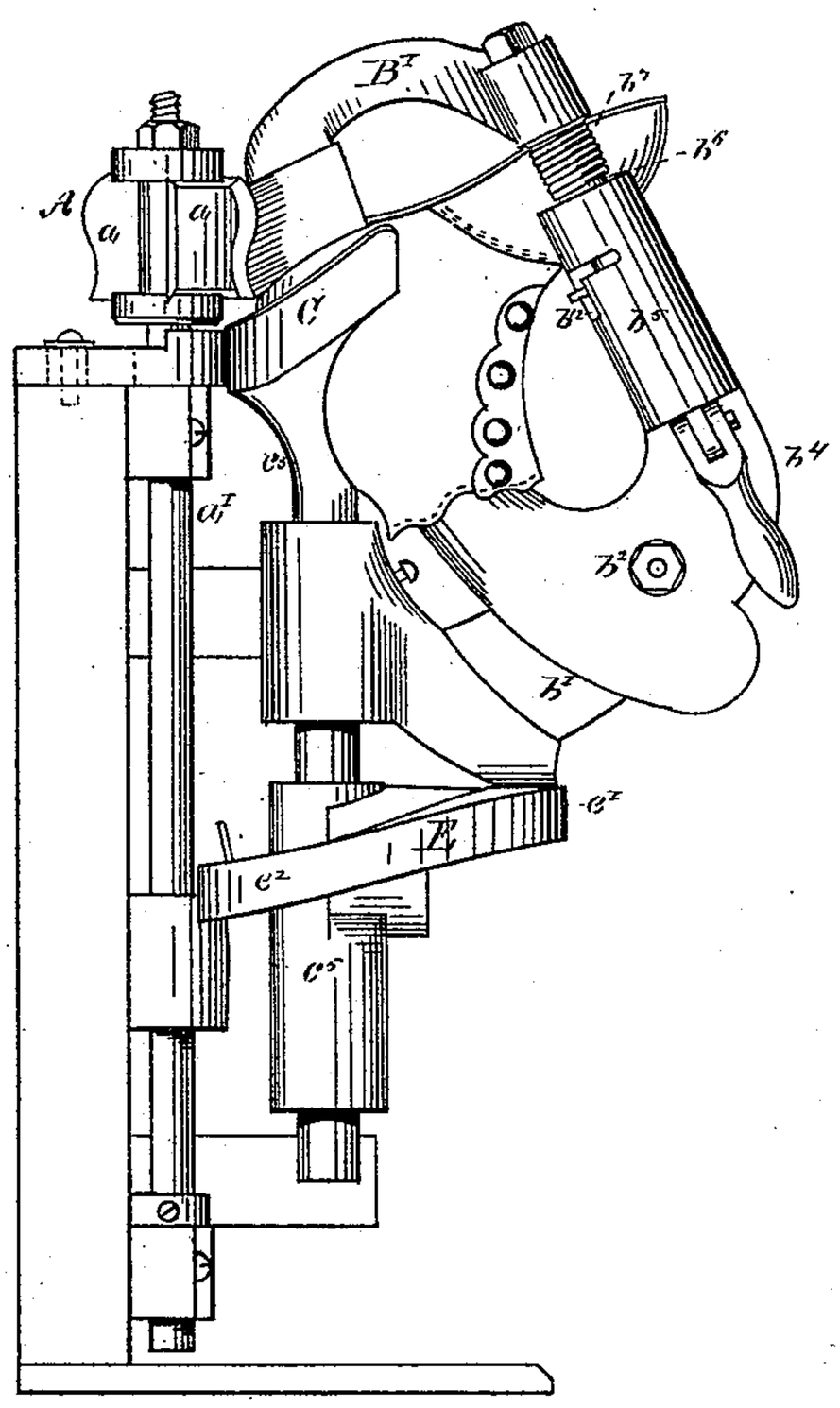

Fig. 2.

WITNESSES

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4 Sheets—Sheet 3.

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Heel Trimming and Polishing Machine.

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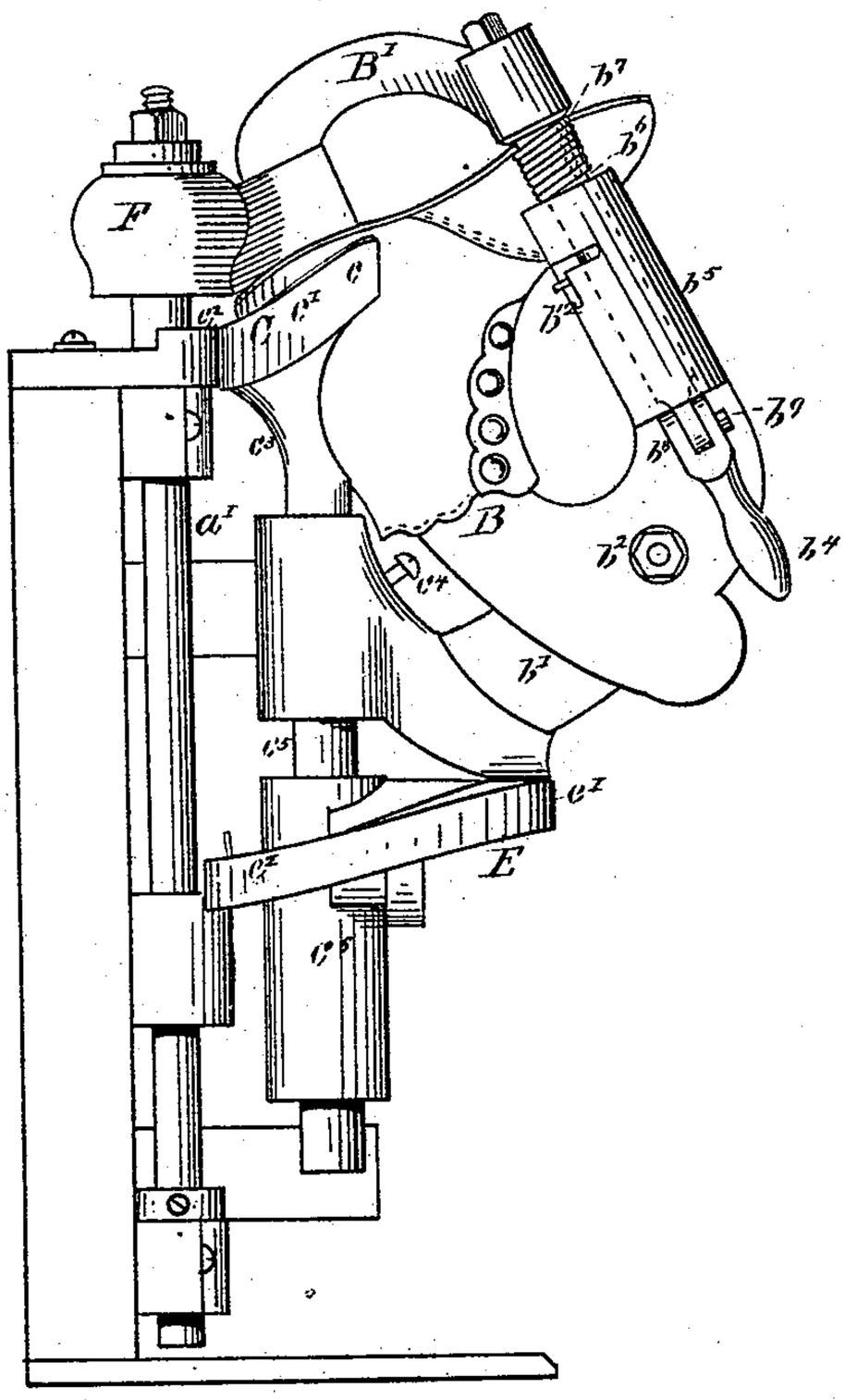

Fig. 3.

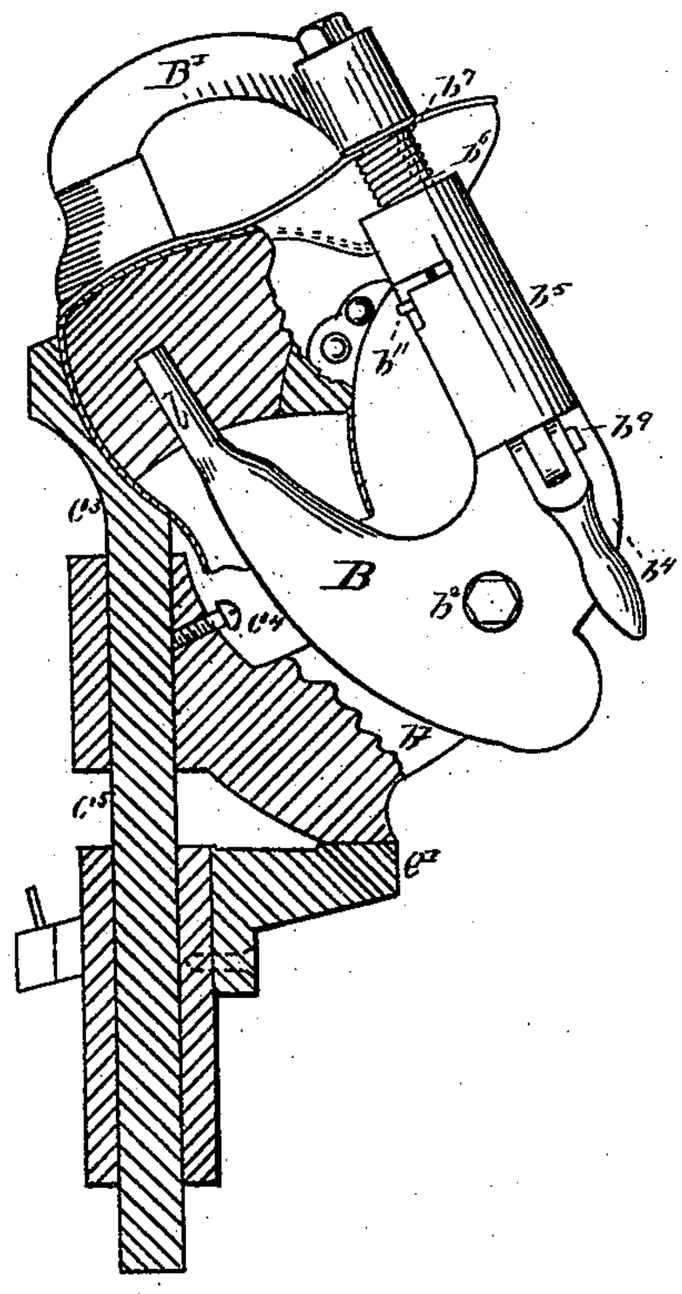

Fig. 4.

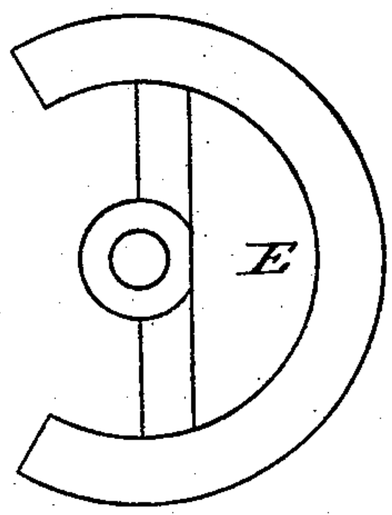

Fig 5.

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4 Sheets—Sheet 4.

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Heel Trimming and Polishing Machine.

No. 236,494. **Patented Jan. 11, 1881.**

Fig. 6.

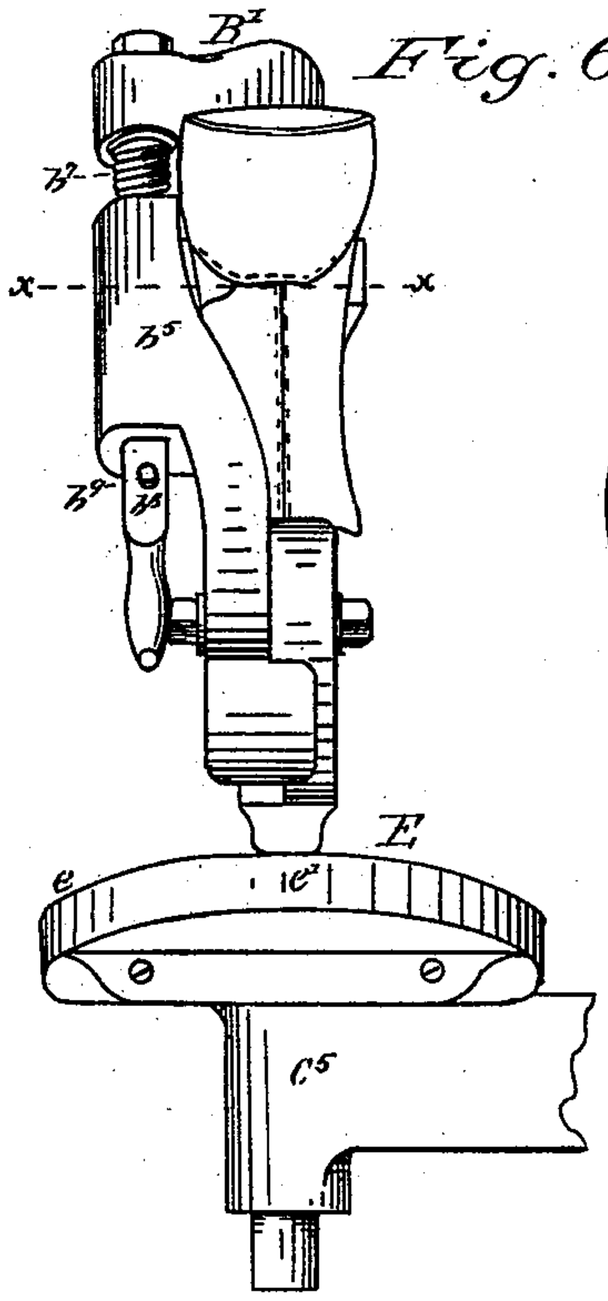


Fig. 7.

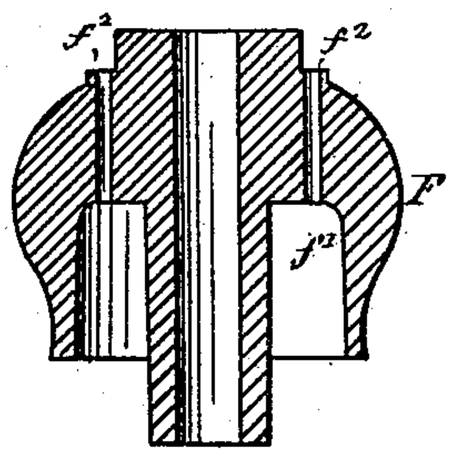


Fig. 8.

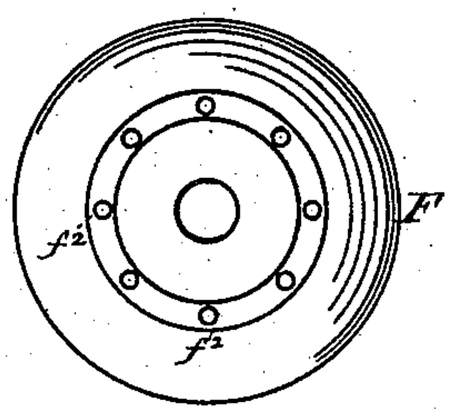


Fig. 10.

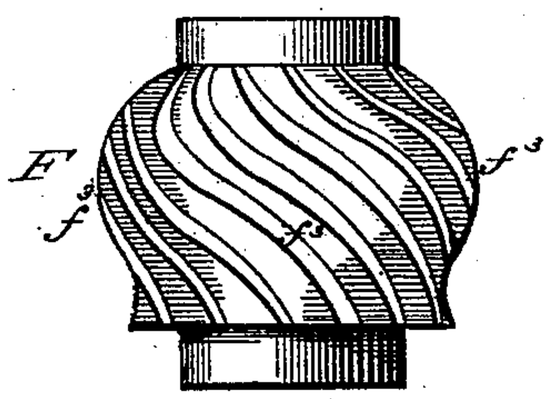


Fig. 12.

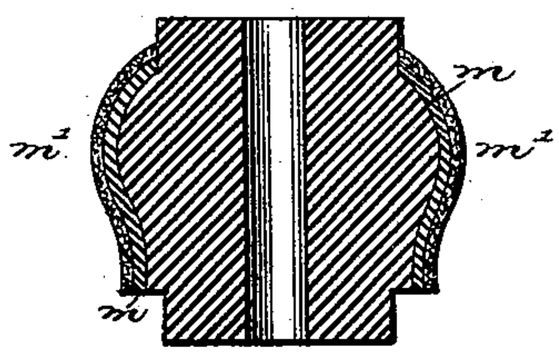


Fig. 11.

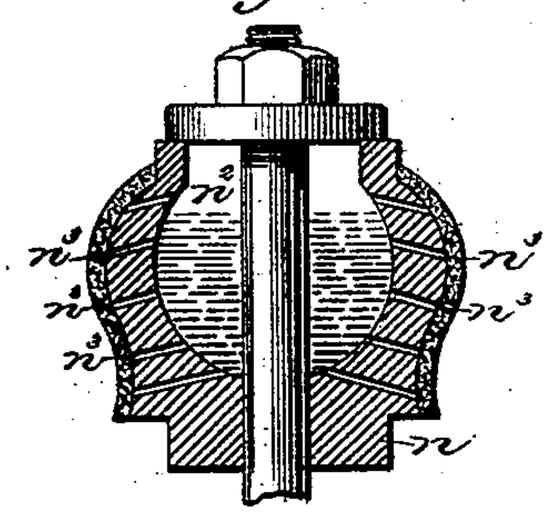
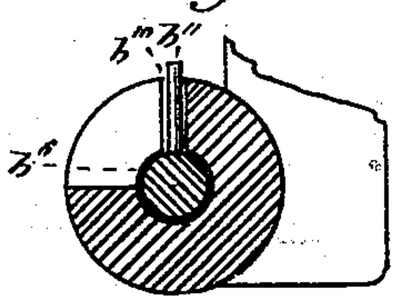


Fig. 9.



WITNESSES.

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INVENTOR.

Henry A. Henderson

by his Attys

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UNITED STATES PATENT OFFICE.

HENRY A. HENDERSON, OF LYNN, ASSIGNOR TO F. F. RAYMOND, 2D, TRUSTEE, OF NEWTON, MASSACHUSETTS.

HEEL TRIMMING AND POLISHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 236,494, dated January 11, 1881.

Application filed December 8, 1879.

To all whom it may concern:

Be it known that I, HENRY A. HENDERSON, of Lynn, in the county of Essex and Commonwealth of Massachusetts, have invented an Improvement in Heel Trimming and Polishing Machines, of which the following is a specification.

This invention has for its object the following-described improvement in heel trimming and polishing machines.

Reference is made to the accompanying drawings, forming a part of this specification, in explaining the nature of my invention, in which—

Figure 1 is a front elevation, showing particularly the jack for supporting and presenting the boot or shoe heel to the trimming, scouring, and polishing tool. Fig. 2 is an end elevation representing the trimming-tool and the jack or heel holding and presenting mechanism. Fig. 3 is an end elevation representing a burnishing-tool in connection with the means for presenting the heel thereto. Fig. 4 is a sectional view of the holding mechanism. Fig. 5 is a plan of the pattern or cam for directing the vertical movement of the holding mechanism in relation to the trimming, scouring, or finishing tool. Fig. 6 is a front elevation of the holding mechanism and the cam. Fig. 7 is a vertical section of the burnishing-tool. Fig. 8 is a plan thereof. Fig. 9 is a cross-section on the line *x x* of Fig. 6. Fig. 10 is an elevation of a burnishing-tool. Fig. 11 is a cross-section of a blacking-tool, and Fig. 12 is a cross-section of a scouring-tool.

This invention is an improvement upon the device shown and described in Patent No. 220,920, granted Hollis C. Paine and myself October 28, 1879. The machine described in said patent embraces two revolving cutter-heads, heel holding and presenting mechanism adapted to be partially revolved, a crane for transferring said heel-holding mechanism from one cutter-head to the other, and guides or tracks for providing the heel-holding mechanism with vertical and tilting movements in relation to each cutter-head.

In this invention the tracks are dispensed with, and in lieu thereof a pattern or cam supported upon the end of the crane is employed. As this invention is organized for trimming and finishing the heel after it has been fastened to the soles of the boot or shoe, it is necessary that the holding and presenting mechanism should be somewhat different from that described in the Letters Patent.

A represents the position occupied by the cutter-head or finishing-tool, and a' is a shaft adapted to support either of said tools, and to be revolved in any desirable manner.

The mechanism or jack for supporting and presenting the heel to the trimming or finishing tool consists in the arm B, (the upper surface of which forms the support for the heel end of the shoe,) which is fastened to the bracket b' by means of the bolt b^2 and nut b^3. The arm B is further provided with the projection b^4, which bears or supports a sleeve, b^5, in which the rod b^6 has a vertical movement against the stress of the spring b^7 by means of the cam-lever b^8, which is pivoted at b^9 to the projection b^4. Attached to the upper end of the rod b^6 is the curved arm or jaw B′, between the under face of which and the upper face of the support B the heel is clamped, the under face of the jaw resting upon the upper surface of the inverted heel, as shown in Fig. 1. It will therefore be observed that the jaw is provided with a vertical movement in relation to the support B or the heel by means of the cam-lever b^8 and the rod b^6, and that the spring b^7 serves to automatically lift the jaw from the heel as the cam-lever is moved upwardly. The jaw is provided also with a lateral movement in relation to the heel or support B, the extent of which is regulated by the slot b^{10} in the sleeve b^5 and the pin b^{11} projecting outwardly from the rod b^6 into the slot. A vertical slot, b^{12}, in the sleeve allows the rod b^6 to be moved vertically, and also acts, in connection with the pin b^{10}, as a guide in directing the vertical movement of the jaw in relation to the heel or support B. The spring b^7 is of sufficient strength to lift the jaw enough to bring the pin in line with the slot b^{10}.

In addition to the clamping mechanism described, I employ as a portion of the heel holding and presenting mechanism the combined holder and pattern C, which is preferably made of steel, so curved as to embrace the heel portion

of the upper or the "counter," as it is called, and whose ends *c* preferably are made so elastic as to embrace several sizes of boots or shoes without change. Its outer surface, *c'*, acts as a pattern or guide in connection with the stationary pattern c^2 below the trimmer, scouring-tool, or burnisher. The holder or guide C is supported upon the end of the rod c^3, which passes into or through the bracket *b'*, and to which it is secured by the locking-screw c^4. In case the rod c^3 passes through the bracket it is made to serve as a pivot, c^5, in connection with the socket c^6 upon the end of the crane D.

It will be observed that the heel-holding device consists in the support B, the jaw B', and the holder C.

It is necessary to vary the inclination of the heel in relation to the trimming or finishing tool, and for this reason I provide the support B with an adjustment upon the arc of a circle of which the extreme upper edge of the back of the heel is the center upon the bracket *b'*, and this is obtained by means of the slot b^{13} and bolt b^2, nut b^3, or other suitable locking device.

The heel-holding mechanism is provided with a vertical movement in relation to the cutter-head or burnisher by means of the cam or pattern E, which is supported upon the crane D, the portion *e* of the bracket *b'* bearing upon the pattern. The extent of this vertical movement, of course, may be varied from time to time by removing the pattern E and by substituting another having greater or less inclination from its highest point *e'* to each end e^2, or in any other desirable way, and the pattern may be fastened to the crane in any desirable manner.

It will be observed that this machine differs in operation from that described in the patent referred to, in the fact that the entire heel can be trimmed by one cutter-head, and that two movements are given the heel simultaneously in relation to the trimming or finishing tool—namely, a revolving movement sufficient to bring the entire edge of the heel from shank to shank in contact with the trimming or finishing tool, and a vertical movement, the vertical movement being upward until the center of the heel at the back is reached, when it is reversed, without, however, reversing the rotatory movement.

When it is desirable to adapt the machine for trimming the edge of the heel the cutter-head A' is employed. For polishing the cutter-head is removed and the burnishing-tool F is substituted. The burnishing-tool in edge conformation should be similar to the edge conformation of the knives of the cutter-head, which preferably should have an ogee curve. Its surface may be continuous, as shown in Fig. 3, or it may be provided with corrugations or recesses f^3 extending vertically or diagonally downward, as shown in Fig. 10. The burnisher should be heated, and for this purpose I have provided it with the chamber *f'* and with the passages f^2, extending upwardly therefrom. A gas-jet is arranged to burn within the chamber, and by the centrifugal force of the revolving burnisher a draft is occasioned, which draws the heat through the passages f^2, thoroughly heats the tool, and maintains the combustion. Of course the tool may be heated by steam, hot air, water, or in any other desirable manner. The movements of the heel holding and presenting mechanism, and consequently of the heel, in relation to the burnishing-tool are identical with those above described—that is, the heel has an upward vertical followed by a downward vertical movement simultaneously with a rotatory movement, bringing all portions of the edge of the heel in contact with the burnishing-tool. A half-revolution is sufficient for this purpose.

In lieu of the supporting-surface *b* upon the support B, a spindle may be employed, in which case the last can be used in connection with the support B, and I deem this to be the most desirable construction, as the last forms a solid and continuous support for the sole and upper and tends to maintain the shape of the upper, while by the use of a support which coincides in extent only to the base of the heel the upper is liable to get twisted or otherwise drawn out of shape.

For the purpose of sandpapering or scouring the heel-edge, I may use a tool which shall have a surface in edge conformation substantially identical with that given the knives of the cutter and the burnishing-tool, in connection with the means herein described for holding and presenting the heel thereto. This tool may be of steel or other metal having a roughened or file-cut working-surface; or it may be of wood or other suitable material of suitable shape, covered with sand-paper or other smoothing or scouring material. Both the burnishing and the scouring tool may have a slight yielding movement given their working-surface by interposing any suitable elastic or yielding material between the outer surface and the bearing, and in the scouring-tool illustrated in Fig. 12 is represented a layer of cloth or rubber, *m*, interposed between the sand-paper or scouring-surface *m'* and the supporting-block m^2.

In Fig. 11 is shown an automatic device for applying the dressing or blacking to the heel-edge preparatory to burnishing, consisting in the blacking-roll *n*, which may be of metal or wood or other suitable material, either plain or covered with an absorptive coating, *n'*. The blacking-roll may have any suitable edge conformation, and it may be provided with the reservoir n^2 for the blacking or dressing, and with the feeding-channels n^3 for the escape of the dressing to the edge of the roll. In lieu of this method of feeding the dressing to the roll, a stationary or revolving feeding device may be arranged to contact with the edge of the roll, and the blacking or dressing

may be contained in the interior of the feeding device, and by any suitable means allowed to escape, in limited quantities, to the edge, from which it is wiped or removed by the blacking-roll. The blacking-roll is used in the same connection with the heel holding and presenting mechanism as that already described in relation to the trimming and finishing tools.

Of course the edge conformation of the various tools may be changed or modified to adapt them to the vertical conformation it is desired that the finished heel shall have.

In case two shafts are used the scouring or blacking tool may be substituted for either the cutter-head or burnisher, or for both, without changing the spirit of my invention.

It will be observed that the tools employed are substantially of two characters—namely, the shaping devices, which comprise the cutter-head and scouring-roll, and the finishing contrivances, which embrace the blacking or coloring and the polishing wheels.

It will be noticed that the heel is presented to the shaping and finishing tools in an inclined position, the back being lower than the face; also, that this method of holding the heel during its presentation to the operating-tool is an important feature in connection with the other elements described of this invention, as the axis of revolution of an inclined heel is from a point near the face at the top to a point near the back at the seat, and this relation of the heel to the operating-tool enables the change in conformation of the edge of the heel at the forward part to that of the back of the heel to be readily obtained, and to be easily varied by changing the vertical movement of the heel in relation to the cutter and its degree of inclination.

It will be noticed that the jaw B′ is curved in plan, so as to bring its outer or pivoted end to one side of a jacked shoe, substantially as shown in Fig. 1, and that this construction gives the jacking mechanism a more compact and lighter structure than if the jaws were on a line with a median line of the shoe and were pivoted beyond the toe. It also enables the shoe to be quickly jacked.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a heel trimming and polishing machine, the heel holding and presenting mechanism described, consisting of the heel-support B, the vertically-movable jaw B′, and the curved heel-holder C, all arranged in relation to each other to operate substantially as described.

2. In a heel trimming and polishing machine, the combination of a shaft adapted to receive and revolve a shaping or finishing tool with the heel holding and presenting mechanism, consisting of the heel-support B, the jaw B′, and the pattern and holder C, arranged to operate as described, and having an oscillating movement in relation to the shaft, and also a vertical movement, substantially as and for the purposes described.

3. The combination of the swinging arm or crane D, supporting the pattern or cam E, said pattern or cam with the heel holding and presenting mechanism described, whereby said mechanism is provided with a vertical movement in relation to the heel trimming or finishing tool, and said heel trimming or finishing tool, all substantially as and for the purposes set forth.

4. The combination of the swinging arm or crane B, the pattern E, supported by the swinging arm, the heel holding and presenting mechanism described, having oscillating and vertical movements upon the end of said swinging arm or crane, and the heel trimming or finishing tool, all substantially as set forth.

5. In a jack for holding a boot or shoe during the heel shaping or finishing operation, the combination of the support B, the jaw B′, provided with lateral and vertical movements in relation to the support B, and arranged to bear upon the top of the inverted heel and clamp it firmly upon the support B, the rod b^6, sleeve b^5, and handle b^8, adapted to move the jaw vertically and then to lock it, substantially as and for the purposes described.

6. In a jack for holding a boot or shoe during the heel shaping or finishing operation, the combination of a jaw, B′, adapted to bear upon the upper portion of the inverted heel and to clamp it to a suitable support, and to be then fastened with the rod b^6 and spring b^7, whereby the said jaw is provided with an automatic upward movement in relation to said support when released, and is held in that position by the spring, all substantially as and for the purposes set forth.

7. In a device for holding a boot or shoe during the heel shaping or finishing operation, the combination of the support B, the jaw B′, the rod b^6, the spring b^7, the cam-lever b^8, and the sleeve b^5, all combined to operate substantially as described.

8. The combination, with the jaw B′ and means for depressing the same, of the guide-pin b^{11} and slot b^{12}, substantially as and for the purposes described.

9. The combination of the jaw B′, provided with a vertical movement in relation to the support B, and with a lateral movement, with the rod b^6, guide-pin b^{11}, slot b^{10} in the sleeve b^5, and the handle b^8, all substantially as and for the purposes set forth.

10. In a jack for holding a boot or shoe during the heel shaping or finishing operation, the combination of the holder C with a heel-support, B, and jaw B′, adapted to be rocked or swung to and from said holder, substantially as and for the purposes described.

11. The combination of the holder C, the bracket or support b', and the set-screw c^4, whereby the holder is provided with vertical adjustment in relation to the support B, substantially as set forth.

12. The combination of the bracket b', which supports the heel-clamping jaw B′, and support B with the vertically-adjustable holder

C, all arranged to operate substantially as described.

13. The combination, in an organized heel trimming and polishing machine, of a rotating shaft, a', adapted to carry the shaping or finishing tool, the said tool, a swinging arm or crane, D, adapted to swing to and from the rotating shaft at the will of the operator, provided at its end with a socket, c^6, for receiving a pin attached to the jack, and the cam E, for controlling the vertical movements of the jack, the jack having a pin, c^3, entering the socket c^6 in the swinging arm or crane, and adapted to be rotated thereon upon an axis substantially parallel to the axis of the shaft, and the gages or guards c' and c^2, to control the horizontal relations of the work and tool, all substantially as described.

HENRY A. HENDERSON.

Witnesses:

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F. F. MCCLINTOCK.