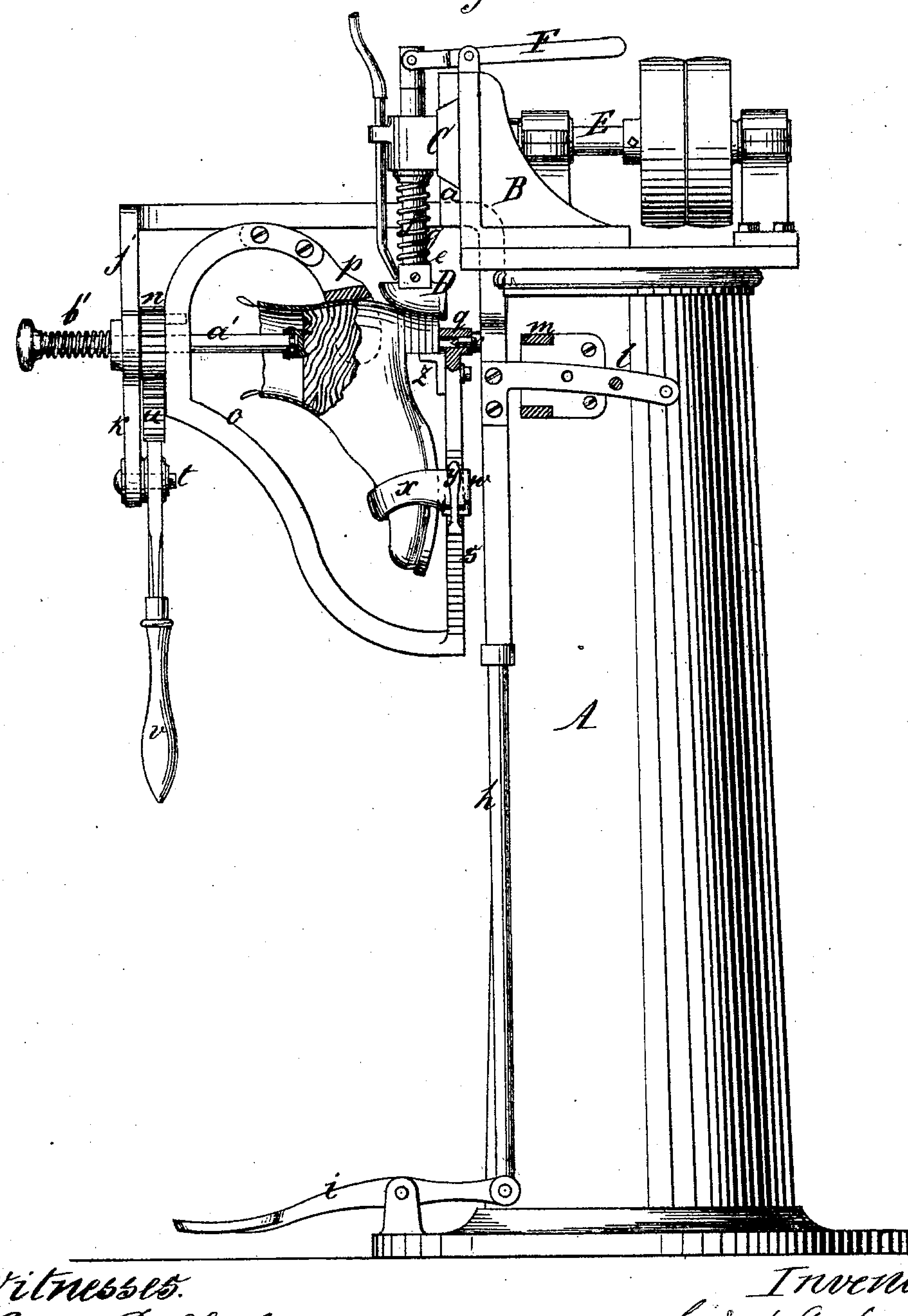
4 Sheets--Sheet 1.

L. GRAF.

Machines for Polishing the Heels and Soles of Boots and Shoes.

No. 147,125. Patented Feb. 3, 1874.

Fig. 1.



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AM. PHOTO-LITHOGRAPHIC Co. N.Y. (OSBORNE'S PROCESS)

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Fig. 2.

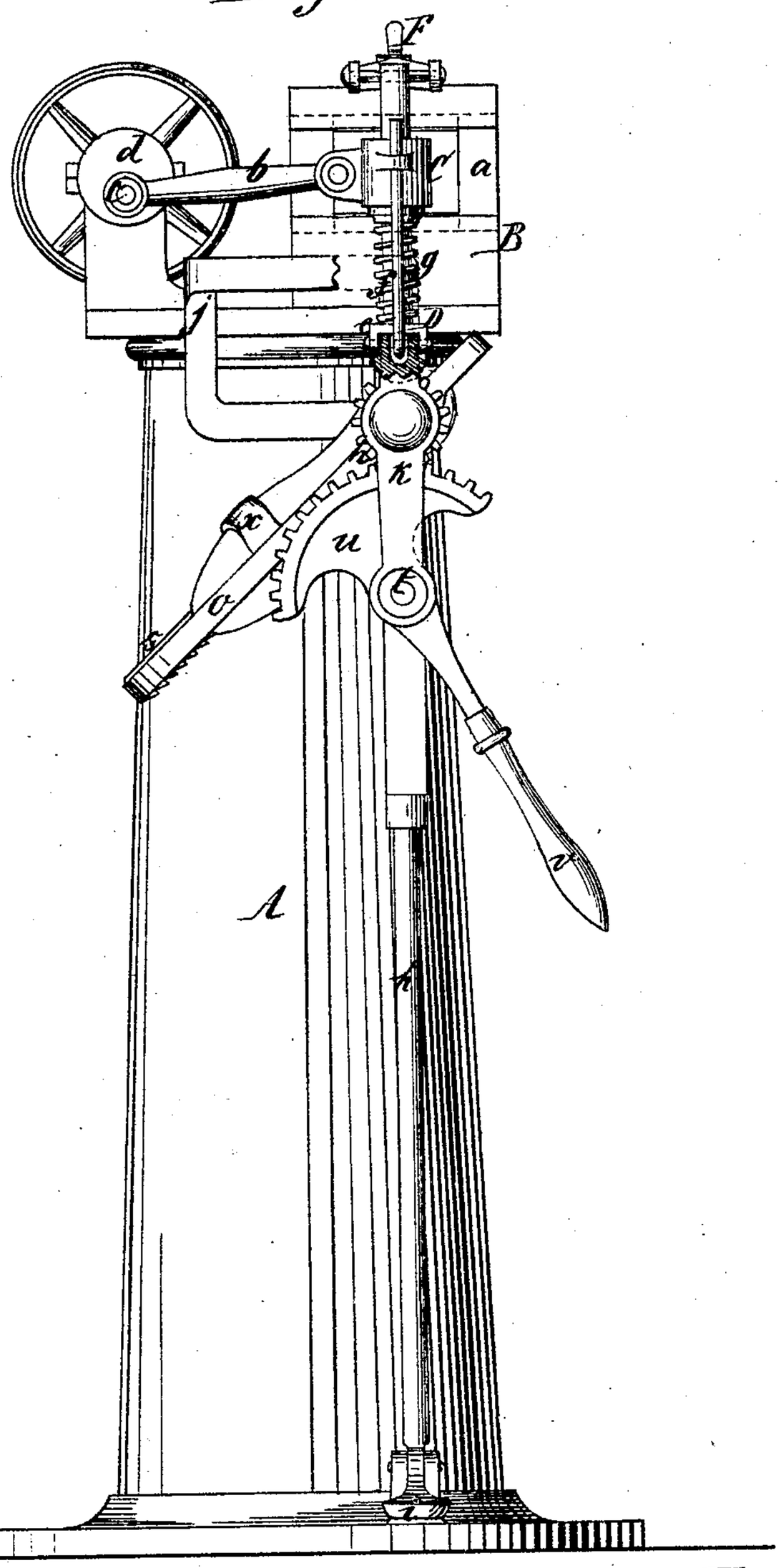

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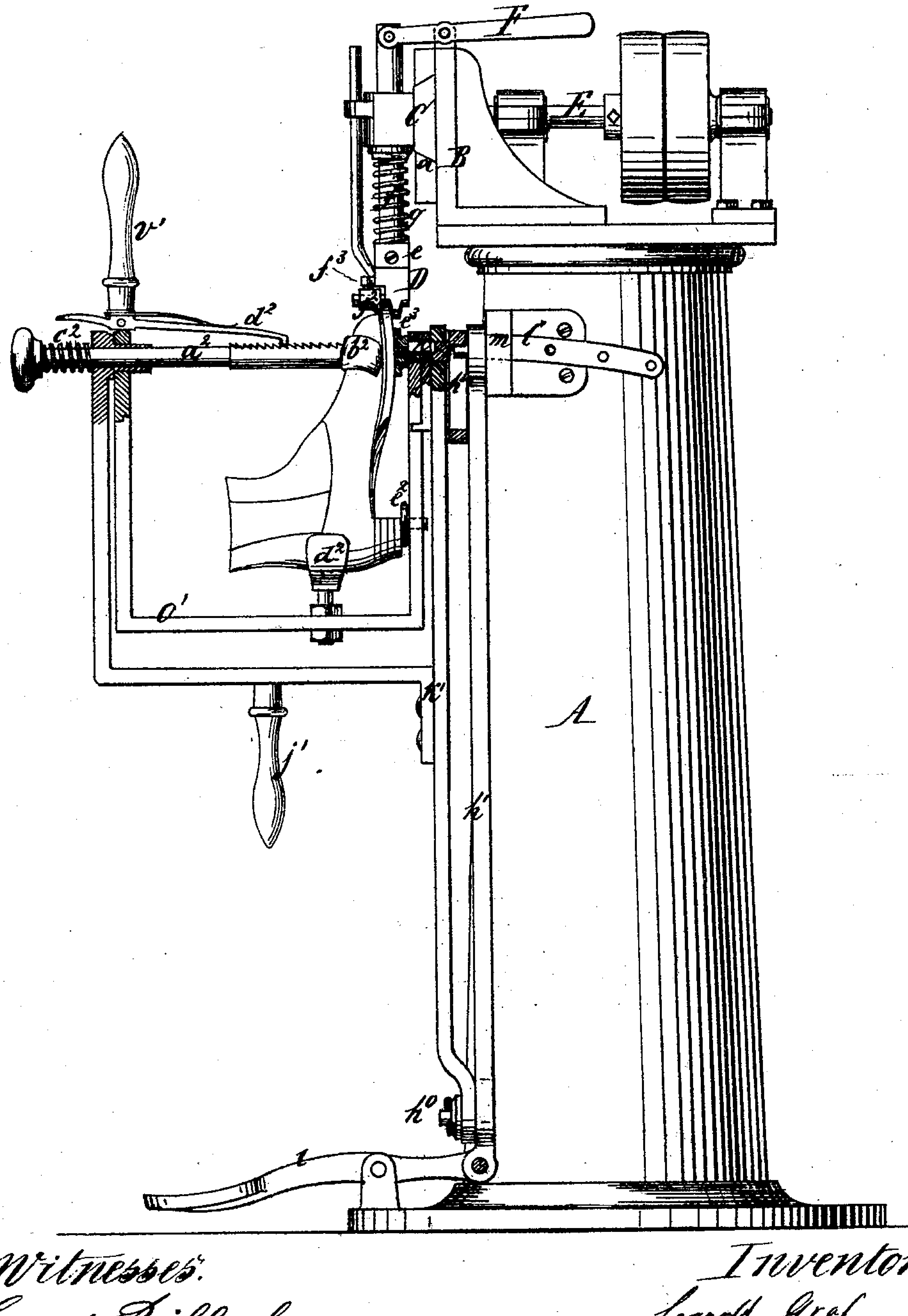
Fig. 3.



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Machines for Polishing the Heels and Soles of Boots and Shoes.

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Fig: 4.

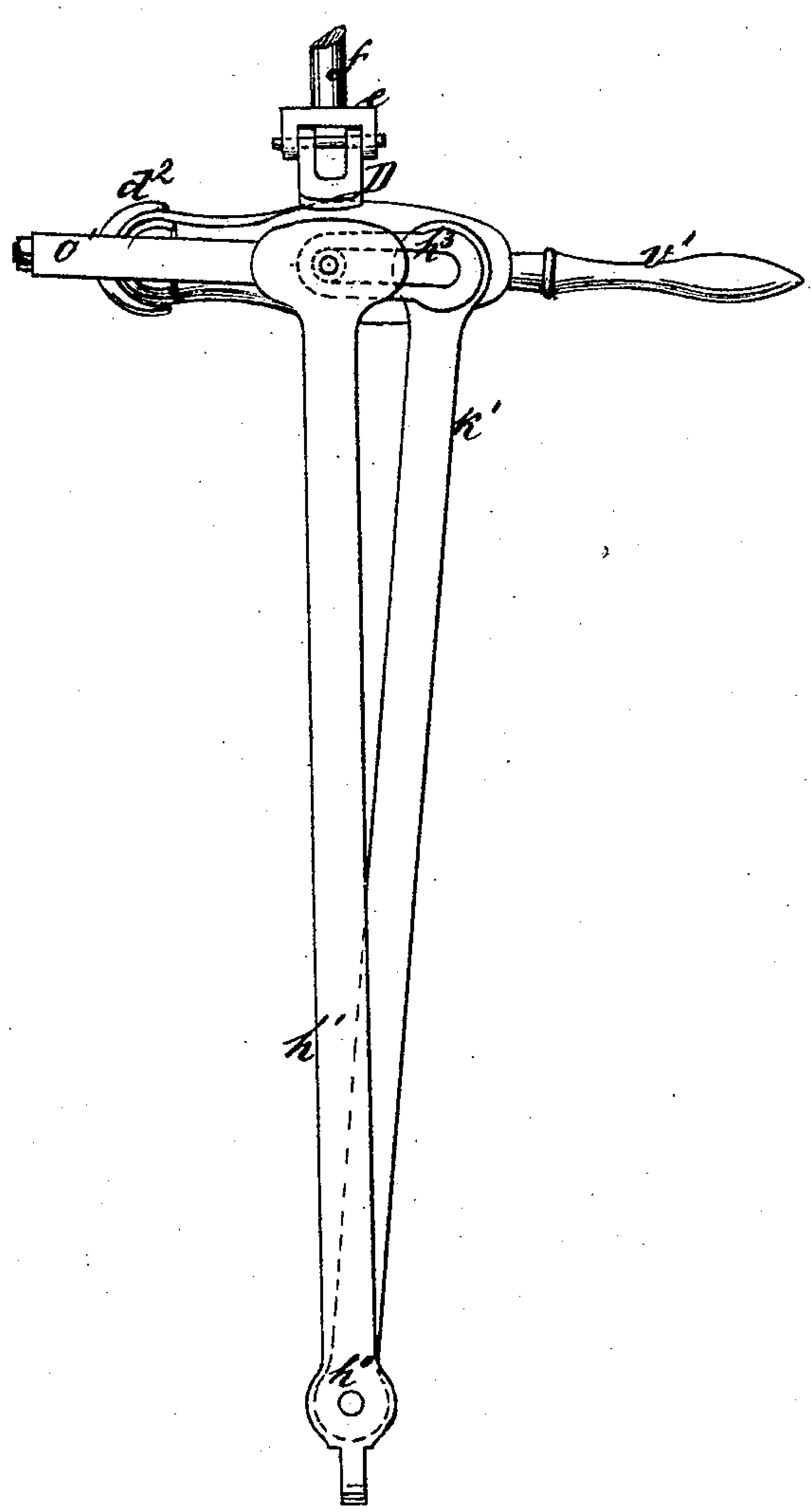
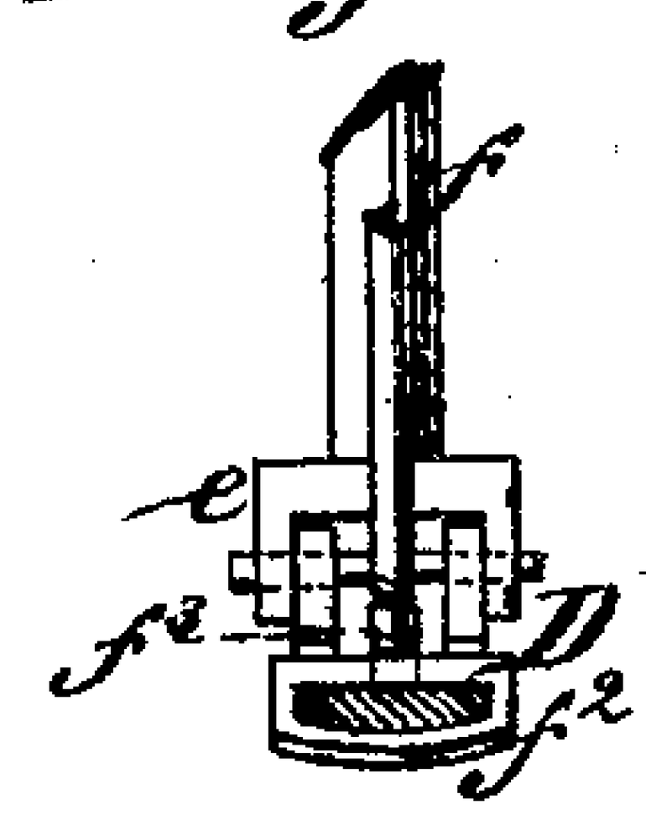


Fig: 5.



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UNITED STATES PATENT OFFICE.

LEOPOLD GRAF, OF NEWARK, NEW JERSEY.

IMPROVEMENT IN MACHINES FOR POLISHING THE HEELS AND SOLES OF BOOTS AND SHOES.

Specification forming part of Letters Patent No. **147,125**, dated February 3, 1874; application filed December 22, 1873.

To all whom it may concern:

Be it known that I, LEOPOLD GRAF, of Newark, in the county of Essex and State of New Jersey, have invented a new and Improved Machine for Polishing the Heels and Soles of Boots and Shoes; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which drawing—

Figure 1 represents a sectional side view of this invention when used for polishing heels. Fig. 2 is a sectional front view of the same. Fig. 3 is a sectional side view of the same when used for polishing the edges of soles. Fig. 4 is a partial front view of the same. Fig. 5 is a transverse section of the burnisher detached.

Similar letters indicate corresponding parts.

This invention relates to certain improvements in machines for burnishing the heels and soles of boots and shoes; and consists in a novel manner of raising and lowering a boot or shoe clamp, and limiting its inward and outward movement with respect to a burnishing-tool mounted upon a carriage, to which is imparted a rectilinear reciprocating motion, said burnishing-tool in its movement being free to rise and fall and act upon the surface to be polished in the same manner in which a burnisher acts which is operated by hand. The invention further consists in a certain combination or union of devices for clamping a boot or shoe, and for presenting its heel or sole to the action of a burnisher; and, further, in a combination of parts too fully hereinafter described to require a further preliminary explanation.

In the drawing, the letter A designates a column which supports a standard, B, provided with a dovetailed groove, *a*, in which is fitted a carriage, C, that carries the burnisher D. The carriage C connects, by a rod, *b*, Fig. 2, with a wrist-pin, *c*, that is secured eccentrically in a disk, *d*, mounted on the end of a shaft, E, Figs. 1 and 3, to which a revolving motion is imparted by a belt or any other suitable means. The burnisher D is secured in a fork, *e*, that is firmly attached to a rod, *f*, which extends through the carriage C, and is depressed by a spring, *g*, so that the burnisher can readily accommodate itself to the surface to be polished. A lever, F, serves to raise the burnisher against the action of the spring *g*. When the shaft E is rotated a rapid rectilinear reciprocating motion is imparted to the carriage C, and the burnisher, being free to rise and fall, acts on the surface to be polished in the same manner in which a burnisher acts which is operated by hand. The burnisher is heated by a gas-pipe in the usual manner. During the time the heel is to be polished, the boot or shoe is secured in a clamp, such as shown in Figs. 1 and 2. This clamp consists chiefly of a rod, *h*, the lower end of which is pivoted to a treadle, *i*, while its upper end is bent to form a handle, *j*, and also a hanger, *k*. From the rod *h* extends a flat curved arm, *l*, Fig. 1, through a loop, *m*, which is secured to the column A, and serves to confine the motion of the clamp within certain limits. The hanger *k* forms the bearing for the hub of a pinion, *n*, to which is firmly secured the curved retaining-bar *o*. One end of this retaining-bar carries a fork, *p*, which is made to fit the heel part of the boot or shoe, while the opposite end *s* of said retaining-bar is made flat, and provided with a socket, *q*, to catch over a pin, *r*, which projects from the rod *h* in line with the bearing for the hub of the pinion *n*, so that the retaining-bar can oscillate round said pin and the hub of the pinion. In the lower end of the hanger *k* is secured a pin, *t*, which forms the bearing for a toothed segment, *u*, that gears in the pinion *n*, and is provided with a handle, *v*, so that by imparting to this handle an oscillating motion the retaining-bar *o* is caused to oscillate in its bearings. On the flat end *s* of the retaining-bar is fitted a slide, *w*, which carries the toe-clamp *x*, and which is retained by a spring-pawl, *y*, that engages with ratchet-teeth cut in the edge of the flat end *s*. By pushing the toe-clamp up toward the heel-fork *p*, the boot or shoe placed between those two parts can be readily fastened in the retaining-bar *o*. On this retaining-bar is also secured a bracket, *z*, which is brought to bear against the flat side of the heel, and serves to steady the same against the thrust of the burnishing-tool. Through the center of the pinion *n* extends a rod, a^1,

which is forced outward by the action of a spring, b^1. By pressing this rod inward, the position of the boot or shoe in the clamp is rendered secure. After the boot or shoe has been fastened in the jaws of the retaining-bar *o*, the shaft E is caused to revolve, and then the workman grasps with one hand the handle *j*, and with the same hand he forces in the rod a^1. With the other hand he grasps the handle *v* of the toothed segment *u*, and one foot he places on the treadle *i*. By means of the treadle the heel can be pressed up against the burnisher, while the handle *j* serves to bring the heel in the desired position under the burnisher, and, by the handle *v*, the heel is gradually turned around so that its entire surface is successively exposed to the action of the burnisher.

When my machine is to be used for burnishing the edges of the soles of boots and shoes, the clamp employed for retaining the boot or shoe is constructed as shown in Figs. 3 and 4, while the motion of the burnisher remains the same. The clamp used in this case consists, chiefly, of a rod, h^1, which extends up from the treadle *i*, and is held in position by the curved arm l'. To the outside of the rod h^1 is pivoted a bracket, k', to which is secured a handle, j', for controlling the position of the clamp. This bracket swings on the pivot h^0, and through its upper end extends a shaft, h^2, to one end of which is secured a slotted arm, h^3, Figs. 3 and 4, so that, when said slotted arm is brought in the position shown in Fig. 4, the bracket can be turned on its pivot h^0 as far as the length of the slot in the arm h^3 will allow. During this motion the slotted arm is guided by a pin projecting from the upper end of the rod h^1. The object of this motion will be presently explained. In the bracket k' is suspended a U-shaped bar, o', which is supported at its inner end by the shaft h^2, which is firmly fastened therein, so that it is compelled to turn with it. The outer end of said U-shaped bar has its bearing on a rod, a^2, which carries on its inner end the toe-clamp b^2, and which is subjected to the action of a coiled spring, c^2, that has a tendency to force it outward. When pushed in, it is retained by a spring-pawl, d^2, which is fastened under a handle, v', that extends from the outer shank of the U-shaped bar o', said pawl being made to engage with ratchet-teeth cut into the rod a^2. The handle v' serves to turn the U-shaped bar in its bearings, provided the slotted arm h^3 is in its central position, as shown in Fig. 3. On the central shank of the U-shaped bar is secured the heel-support d^2, and in the inner shank of said bar is fastened a screw, e^2, which bears against the under surface of the heel and serves to adjust the boot or shoe in the required position in relation to the burnisher.

The heel of the boot or shoe is placed into the heel-support d^2, and its toe part is secured between the toe-clamp b^2 and a plate, c^3, that is secured to the shaft h^2, and in this position the front edge of the sole is exposed to the action of the burnisher, the entire clamp being pressed up by the action of the foot on the treadle, while, by turning the U-shaped bar gradually round, the entire front edge of the sole can be successively exposed to the action of the burnisher.

In burnishing the side edges of the sole, the slotted arm h^3 comes into play, since it becomes necessary, during this operation, to move the sole in a straight line, or nearly so, under the burnisher without turning it round. On the outer end of the burnisher is secured a gage, f^2, which is held in position by a set-screw, f^3, and which serves to confine the sole in the required position in relation to the burnisher, and also to give the proper finish to the sole. By means of the set-screw this burnisher-gage can be adjusted for soles of different thickness.

By this arrangement the motion imparted to the burnisher is made to resemble that which the same receives when operated by hand, and the heels and the soles of the boots or shoes can be polished with great rapidity.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for burnishing the heels and soles of boots and shoes, the treadle mechanism, substantially as described, having an adjusting-bar for raising and lowering the boot or shoe clamp, provided with a curved arm for regulating the extent of its inward and outward motion, as shown and described.

2. The treadle mechanism, having an adjusting-bar for raising and lowering the boot or shoe clamp, provided with a curved arm for regulating the extent of its inward and outward motion, in combination with a carriage supporting a burnishing-tool and mechanism for imparting a rectilinear reciprocating motion to the same, substantially as described and for the purpose specified.

3. The curved retaining-bar O carrying the fixed heel-support *p* and the adjustable toe-clamp *x*, said retaining-bar being hung in a swinging bar, *h*, so that it can be moved, substantially in the manner shown and described.

4. The combination of the treadle, the curved bar, and a jack for presenting the heel or sole edge to the action of the burnishing mechanism, substantially as described, for the purpose specified.

5. In combination with the U-shaped bar O′, hung in a bracket, k', the heel-adjusting screw e^2, substantially as shown and described.

This specification signed by me this 10th day of December, 1873.

LEOPOLD GRAF.

Witnesses:
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E. F. KASTENHUBER.