

B. Q. BUDDING.
POLISHING MACHINE.

No. 39,546.

Patented Aug. 18, 1863.

Fig. 2.

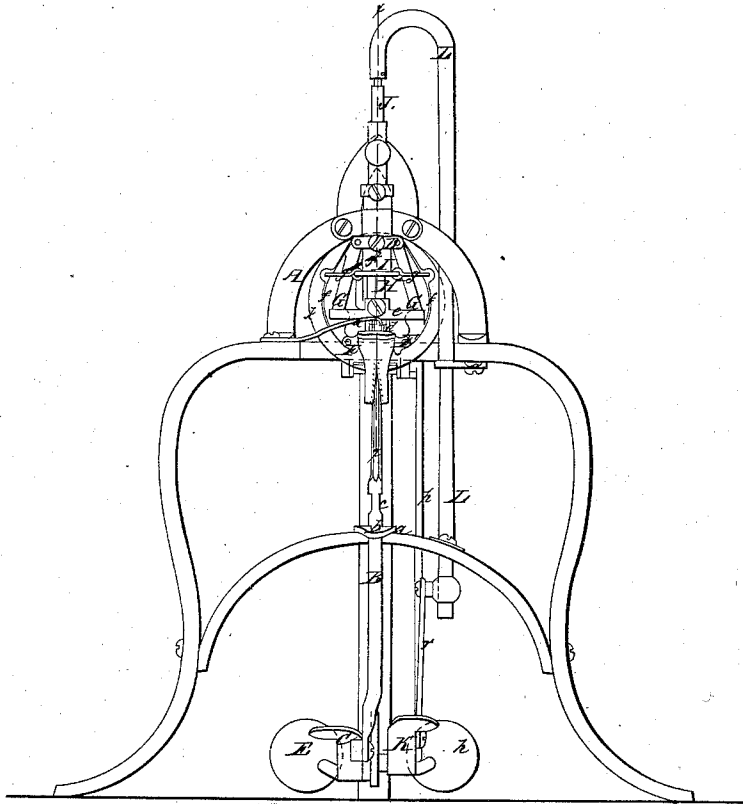
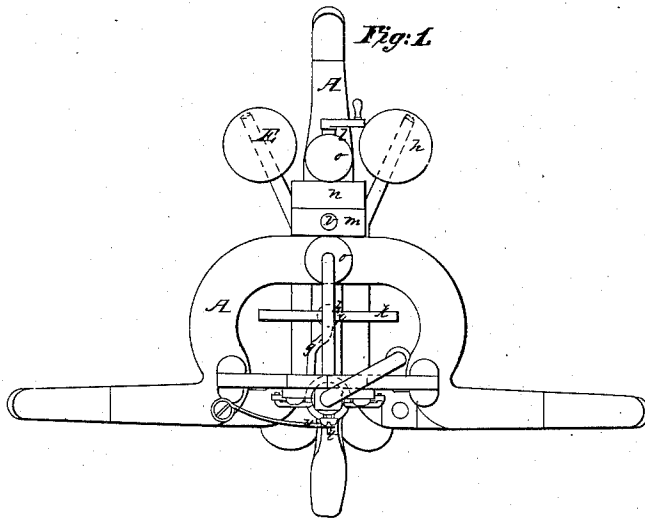


Fig. 1.



Witnesses.

*W. B. Crosby—
Francis Gould*

Inventor.

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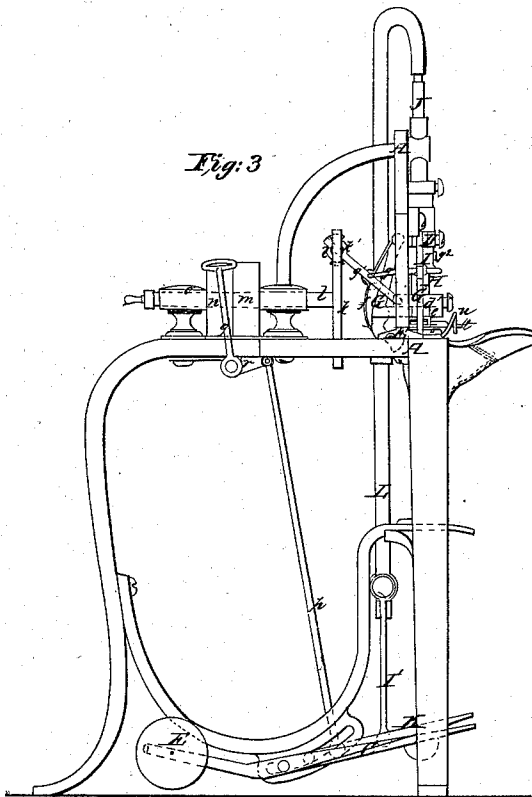


Fig. 4.

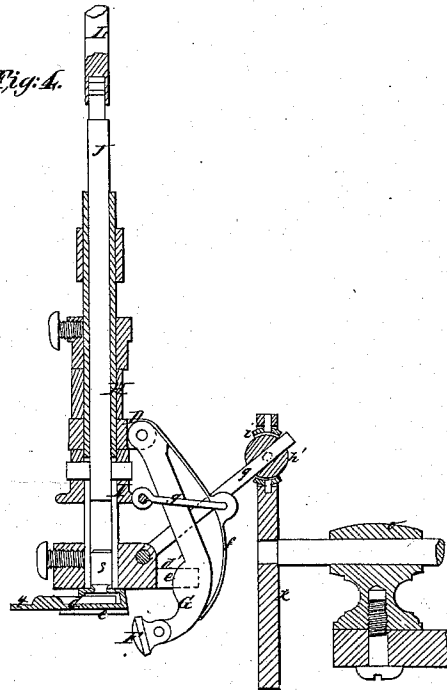


Fig. 7.

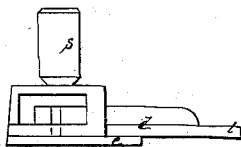


Fig. 5.

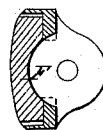


Fig. 8.

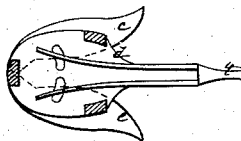
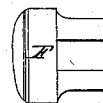


Fig. 6.



Witnesses.

J. B. Crosby,
Francis Gould.

Inventor.

B. Q. Budding

UNITED STATES PATENT OFFICE.

BENJAMIN Q. BUDDING, OF MILFORD, MASSACHUSETTS.

HEEL-POLISHING MACHINE.

Specification forming part of Letters Patent No. 39,516, dated August 18, 1863.

To all whom it may concern :

Be it known that I, BENJ. Q. BUDDING, of Milford, county of Worcester, and State of Massachusetts, have invented a new and Improved Heel - Polishing Machine; and I do hereby declare that the following, taken in connection with the drawings, which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

My invention relates to certain improvements in polishing-machines; and it consists in the construction and operation of mechanism for surfacing or polishing heels of boots and shoes.

My machine is shown in Sheets 1 and 2 of the accompanying drawings. Figure 1 represents a top view; Fig. 2, a front elevation, and Fig. 3, a side elevation of the same. Fig. 4 is a section, taken on the line *xx* of Fig. 2. Figs. 5 and 6 are views of one of the polishing-tools. Figs. 7 and 8 are views of the plate and springs against which the heel is held while being polished.

In the drawings, A denotes the frame-work of the machine; B, a vertical rod joined at its lower end to a treadle or foot-lever, C, and bearing on its upper end a last or shoe-holder, which supports the shoe D, the heel of which is to be polished. The last may be applied to the top of the rod by a universal joint, so that the shoe will be capable of a lateral or rocking motion thereupon. The rod B slides vertically through a plate, *a*, and in such manner that when at its lowest position the rod may be tipped forward, (by means of a slot, *b*, in the plate and corresponding portion *c* of the rod,) for the purpose of fixing the shoe upon the last, or removing it therefrom. The shoe is kept at its highest position, or in place to be operated upon, by a counter-balance weight, E, which being applied to the rear end of the treadle C keeps the opposite end and the rod B elevated while the shoe is brought down from the polishing-tools by applying the foot to the front end of said treadle. When at its highest position, the heel is clamped or borne against the plate *d*, or two springs, *e e*, applied thereto. When so clamped, the heel is presented to the action of a series of polishers or polishing-tools, F' F', arranged and operated as follows: As shown, the polishers are placed one to operate against the back of

the heel, and one on each side thereof, though they may be arranged to operate over more or less of the surface as circumstances may require. Each tool, F, is hinged or jointed to the foot of a vertical arm, G, hung upon a ring, D, fixed upon a tubular shaft, H, and so as to be capable of movement at its lower end through slots *d'* in a plate, *e*, toward and away from the shoe. Each polisher is so hinged to its arm that it can move thereon vertically to bring its surface properly against the sides of different heels, according as said sides or edges may have more or less inclination to the bottom surface of the heel. To each arm G a curved spring, *f*, is applied, said spring being fastened at top to the arm and bearing at bottom against it. A link, *g*, connects each spring to a sliding collar, I, which slides vertically upon the shaft H. When the collar is at its highest position, the links *g* are nearly horizontal, and the polishers are out of contact with the heel, but when the collar is forced down the links will be inclined and the springs *f* and arms G will be drawn in in such a manner as to force the polishers against the heel. By jointing the links to the springs, instead of directly to the arms, I obtain a variable pressure of the polishers against the heels, instead of a positive unyielding pressure, and this enables the polishers to yield to any irregularities of surface in the heel, at whatever pressure the springs may have on the arms. A treadle, K, is connected at its front end by a link or rod, I', to a rod, L, which, extending up over the top of the machine, turns over, and is jointed to a shaft or piston, J, which slides up and down in the shaft H. A bolt, *g*², connects the collar I and shaft or piston J. A weight, *h*, on the rear end of the treadle, serves to keep the piston J and collar I in their normal position and the polishers out of contact with the heel, while pressure of the foot on the front of the lever forces the polishers against the heel. Whenever they are so brought against the heel a reciprocating, rotary, or circular motion is given to them, as follows: The rear of the plate *e*, in which the arms G work, has one end of an inclined crank-pin, *g'*, jointed to it. The other end of the pin extends and slides through a ball, *h'*, of a universal joint, *i*, near the periphery of a crank-wheel, K. Said wheel is fixed on a shaft, *l*, bearing a fast pulley, *m*,

and a loose pulley, *n*, and rotating in bearings *o o*. Rotation of the shaft and crank-wheel imparts a rotary motion to the adjacent end of the crank-rod, while its other end is thereby actuated in such a manner as to impart horizontal and reciprocating motions to the plate *e*, and thereby to the polishers.

To vary the length of throw of the polishers according to the size of the heel, or length of surface to be polished, is done as follows: The fast pulley is fastened to the shaft by a screw, *v*. If we wish to shorten the throw of the polishers we loosen the fast pulley and slide the shaft *l* back. This lessens the inclination of the crank rod with respect to the axial line of the shaft *l*, and, as the inclination of the crank approximates to the line of the shaft, the throw of the polishers will be proportionately lessened. A rod, *p*, extends up from the treadle *K*, and is fastened at the top to a shipping-lever, *q*, turning in bearings *r*. When the polishers are out of contact with the heel, they are kept from horizontal movement by the belt being upon the loose pulley *n*. When the treadle is depressed to force them into contact with the heel, the same movement of the treadle draws down the rod *p* and causes the lever *q* to shift the belt onto the fast pulley *m*, thereby causing simultaneous pressure of the polishers against the surface of the heel, and horizontal movement over the same. Withdrawal of the foot or raising of the treadle releases the polishers from contact with the heel, and at the same time stops their horizontal movement by slipping the belt back onto the loose pulley. The plate *d*, which forms the instrument against which the bottom surface of the heel, (or while being operated upon the top surface thereof,) is applied to the shaft *H* by a shank-pin, *s*, which rotates freely in the shaft, and the plate is kept from rotation, when the machine is in operation, by a pin, *t*, thereon, which extends into a fork or wire, *u*, and is thereby kept from turning. The springs *c*, on the bottom of the plate, are so applied as to adapt the same

to different sizes of heels. The tendency of the polishers, when working against the corners of the heels, is to push up or form a ridge of the leather, and the springs are so applied as to bear down on the flat surface of the heel and form an edge to the same, against which the polishers will work. They are made of such size and so applied that they extend out beyond the edge until the shoe is clamped up to the springs, and, the polishers being forced up against them, they are made to conform to the edge thereof, and will then present a surface to be worked against.

By my machine heels can be much more quickly and finely finished than in the old method, where the polishing tool is rubbed over the surface by hand.

I claim—

1. The polishers *F*, when arranged so as to be capable of simultaneous pressure against and reciprocating rotary movement around the edge or side of the heel, as set forth.

2. The combination of arms *G*, springs *f*, collar *l*, and links *g*, or their equivalents, for producing the motion of the polishers against and away from the heel, as above described.

3. The arrangement of mechanism, consisting of the plate *e*, adjustable crank-pin *g*³, joint *i*, and crank-wheel *k*, or the mechanical equivalent thereof, operating together, substantially as described.

4. Combining a pressure mechanism, as shown by the arm *G*, collar *l*, link *g*, shaft *J*, rods *I* *L*, and treadle *K*, or other suitable mechanism, for producing the pressure of the polishers with a shipping mechanism (consisting of lever *q* and rod *p*, or their equivalent) for their simultaneous operation, substantially as above set forth.

5. In combination with the bearing plate *d* the springs *c c*, operating in manner and for the purpose as described above.

B. Q. BUDDING.

Witnesses:

J. B. CROSBY,
FRANCIS GOULD.