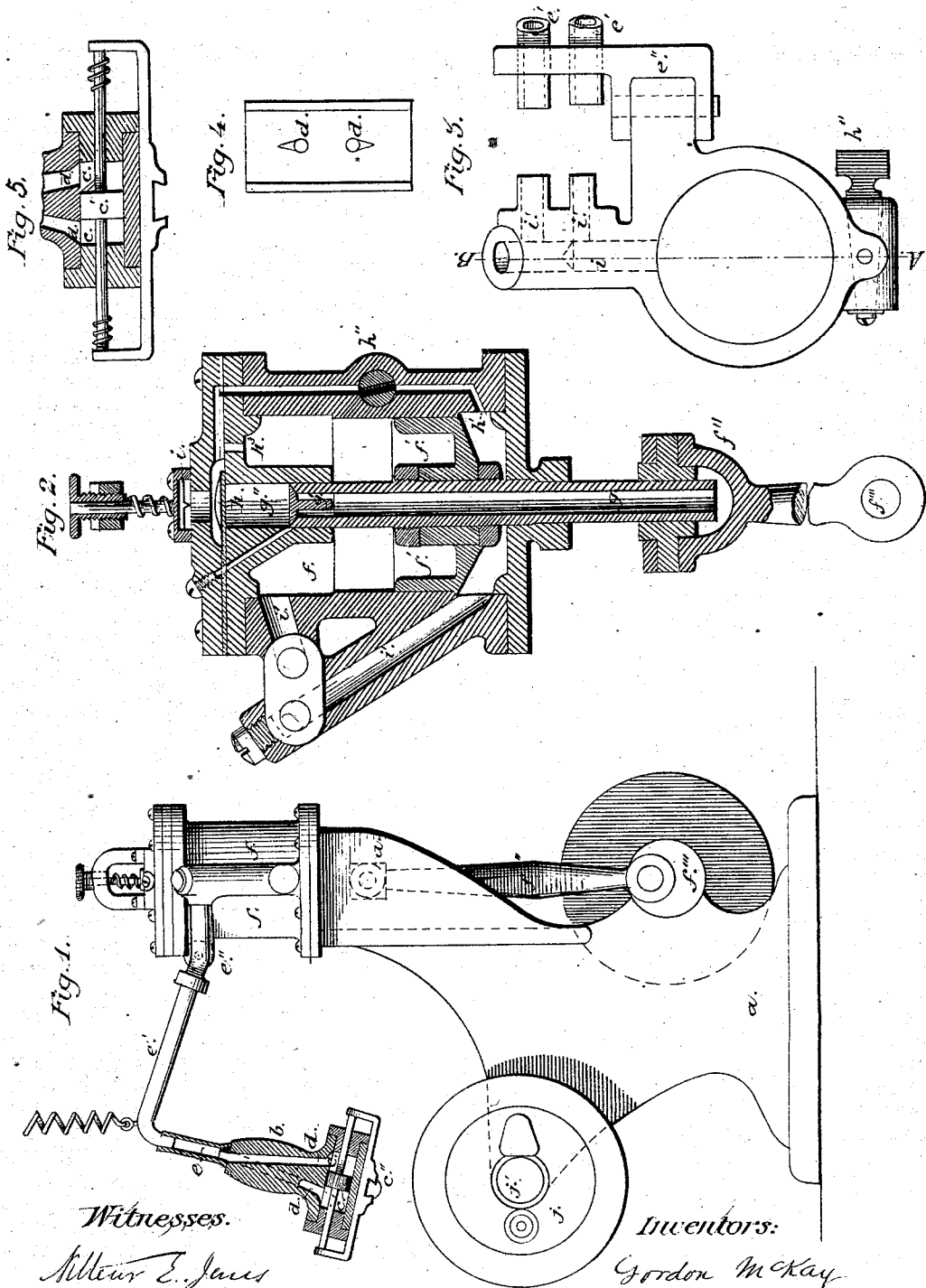


G. McKAY & H. P. FAIRFIELD.

Machine for Burnishing Boots and Shoes.

No. 159,339.

Patented Feb. 2, 1875.



Witnesses:
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UNITED STATES PATENT OFFICE.

GORDON McKAY, OF CAMBRIDGE, AND HADLEY P. FAIRFIELD, OF BOSTON,
MASSACHUSETTS; SAID FAIRFIELD ASSIGNOR TO SAID McKAY.

IMPROVEMENT IN MACHINES FOR BURNISHING BOOTS AND SHOES.

Specification forming part of Letters Patent No. **159,339**, dated February 2, 1875; application filed
December 22, 1874.

To all whom it may concern:

Be it known that we, GORDON McKAY, of Cambridge, Middlesex county, and HADLEY P. FAIRFIELD, of Boston, Suffolk county, all in the State of Massachusetts, have invented certain Improvements in Burnishing-Machines; and we do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of our invention sufficient to enable those skilled in the art to practice it.

Our invention relates to a machine for burnishing, and is especially adapted to burnishing the edges of soles or heels of shoes, and generally that kind of burnishing which can be better done by moving the burnisher over the surface to be burnished; and for this purpose we have made a burnisher which is attached to the end of a handle, and made to reciprocate more or less rapidly at the will of the operator; and for burnishing soles of shoes we apply heat from a jet of gas. The machine consists of a frame supporting the mechanism for actuating the burnisher and the jack on which the shoe to be burnished is placed. At the lower part of the frame there is a crank-shaft driven by a belt or other suitable means. The crank gives motion to a piston working in an air-cylinder. From each end of this cylinder there are air-passages, which, by means of flexible pipes, convey the air alternately compressed and expanded to the ends of a smaller similar cylinder and piston placed in the lower end of the handle of the burnisher, thereby giving corresponding reciprocations to the burnisher. In order that the motions of the burnisher-piston may be more nearly coincident with those of the motor-piston, and be in a great measure free from the sudden or jerking motion which the compressibility of the air would give unless in some way counteracted, and which would make the instrument nearly useless for burnishing, we supply in the cylinders and pipes air of several atmospheres' tension or compressed air at all times on each side of each piston, thus, so to speak, stiffening the columns of air which are between the driving-piston and that in the burnisher—that is, if

the machine were to be operated under one atmosphere's pressure, and the resistance of the burnisher required the force of one atmosphere to move it, the space between the actuating piston and the burnisher-piston must be reduced one-half before the burnisher would move at all; but, if the same machine were operated with a pressure of seven atmospheres, the burnisher would move when the actuating piston had passed over one-seventh of that space. To prevent concussions at the ends of the strokes of the burnisher-piston we have made the apertures by which the air enters and leaves the burnisher-cylinder triangular in shape, having one of the angles toward the ends of the cylinder, and the piston, as it approaches the end of its stroke, partially closes this aperture, thus compressing the air and forming a cushion to overcome this blow. At the same time the aperture is not entirely closed, but left sufficiently open to admit air to make the return stroke. To compensate for leakage we construct the actuating cylinder with an air-pump, which forces a certain amount of air at each alternate stroke into a reservoir, from which the quantity necessary to keep up the required pressure passes through passages to each end of the actuating cylinder, and the surplus escapes at the escape-valve. The distribution of the supply of air between the two ends of the actuating cylinder is regulated by a stop-cock. The air-cushion may be supplemented or entirely replaced by the introduction of coiled-wire springs between the ends of the burnisher-cylinder and the arms of the burnisher-slide that the piston-rod acts upon; and when so used we make the piston-rod somewhat longer, as seen in Fig. 5.

Having thus described the nature and general operation of our machine, we will proceed to describe the drawings.

Figure 1 is a side elevation of the machine, showing the burnisher-cylinder and handle in section. Fig. 2 is a section of the actuating cylinder on the line A B, Fig. 3. Fig. 3 is a top view of the actuating cylinder with the upper cover removed. Fig. 4 is a section of the burnisher-cylinder at right angles to that seen in Fig. 1. Fig. 5 is a longitudinal sec-

tion of the burnisher-cylinder, showing the coiled springs applied upon the piston-rod between the ends of the cylinder and the arms of the burnisher-slide.

Similar letters and figures denote the same parts.

a a is the frame of the machine. *b* is the burnisher-handle; *c*, the burnisher-cylinder; *c'*, the burnisher-piston, carrying, by means of its projecting piston-rod, the burnisher *c''*, which slides in dovetailed ways on the outside bottom of the cylinder. *d d* are the ports, triangular in shape, for the passage of the air to and from the actuating cylinder. *e* are the flexible pipes, of which there are two, one communicating with each end of the actuating cylinder. *e'* are two bent pipes of metal, hinged on the hinge *e''*, which may have a suitable supporting-spring or counterpoise to sustain the weight of the burnisher. This hinge and bent pipe arrangement is to permit the burnisher to be moved nearer to or farther from the center of the jack when burnishing the heels or toes and shank of the shoe. The form of the ports in the burnisher-cylinder is seen in front view in Fig. 4. *f f* is the actuating cylinder; *f' f'*, its piston; *f''*, the connecting-rod giving motion to the piston from the crank *f'''* through the hollow piston-rod *g*, in the upper end of which is the air-pump valve *g'*, working in the air-pump cylinder *g''*. Directly above the valve *g'* is the valve *h* opening into the reservoir and communicating with the lower end of the actuating cylinder by the passage *h'* and the adjusting-cock *h''*, and with the upper end of the actuating-cylinder by the passage *h³*. *i* is the escape-valve, with its spring and adjusting-screw. *i' i'* are the passages communicating with the metal hinged pipes *e' e'* by flexible pipes, which are removed in Fig. 3. *j* is the shoe-support or jack, which

turns on its center *j'* and has the well-known toe-support and pin-gripe for fastening the shoe and last to the jack.

We claim—

1. The combination of the air-pumping mechanism, consisting of the cylinder *g''* and its plunger *g*, and the valves *g'* and *h* or their equivalents, with the actuating cylinder *f* and its piston *f'*, or their equivalents.

2. The combination of the air-pump with the air-passages *h³* and *h'*, and the adjusting-cock *h''* and valve *i*, or their equivalents, acting substantially in the manner described, to create and maintain within the cylinders and passages of the machine a pressure greater than the ordinary atmospheric pressure, as and for the purposes described.

3. The combination of the actuating cylinder, the burnishing-cylinder, and the jack.

4. The triangular-shaped air-apertures *d d*, in combination with the piston *c'*, when so constructed and operating as to cushion the piston without entirely closing the apertures.

5. The combination of the burnishing-cylinder, the flexible pipes, and the spring or counterpoise for supporting the burnishing-cylinder.

6. In a machine in which an actuating piston gives motion to another piston, substantially in the manner described, the combination, with such pistons, of columns of compressed air concurrently employed on both sides thereof, as and for the purposes set forth.

7. The combination of the springs on the burnisher piston-rod with the piston *c'*, and the actuating cylinder.

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Witnesses:

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