3 Sheets—Sheet 1.

J. STEVER.
Burnishing-Machine.

No. 199,592. Patented Jan. 22, 1878.

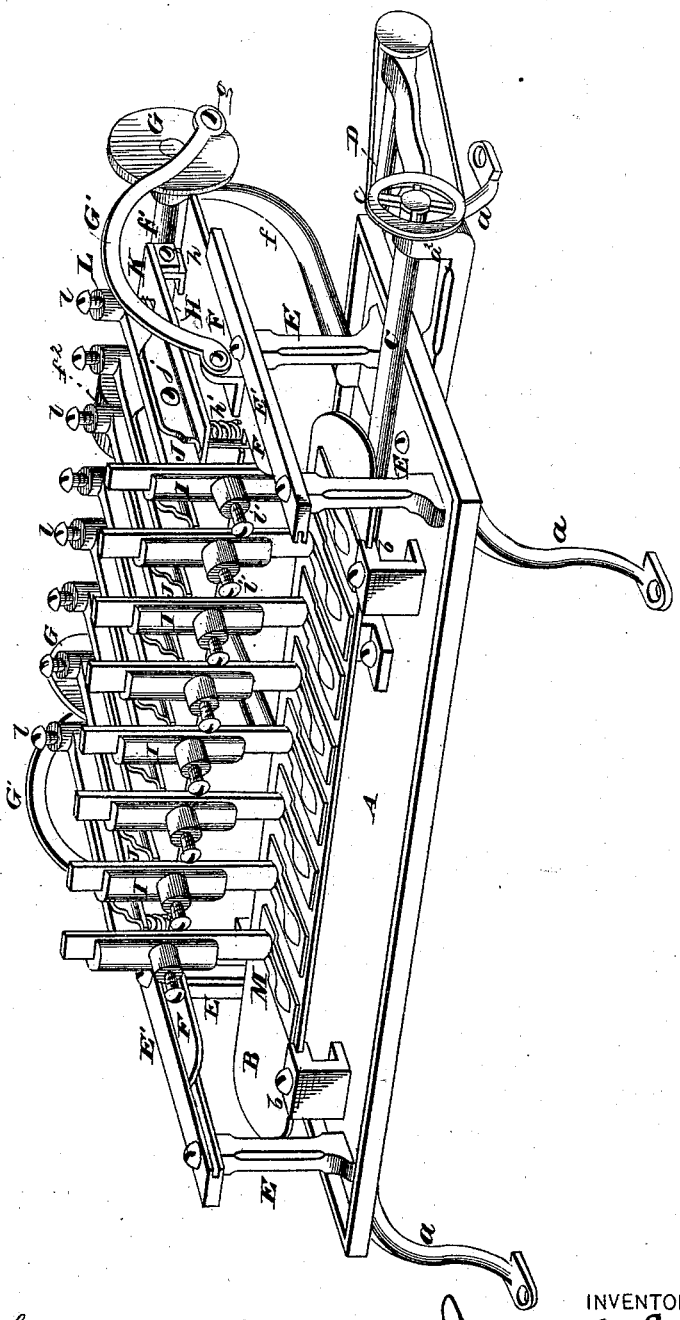

Fig. 1.

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Fig. 2.

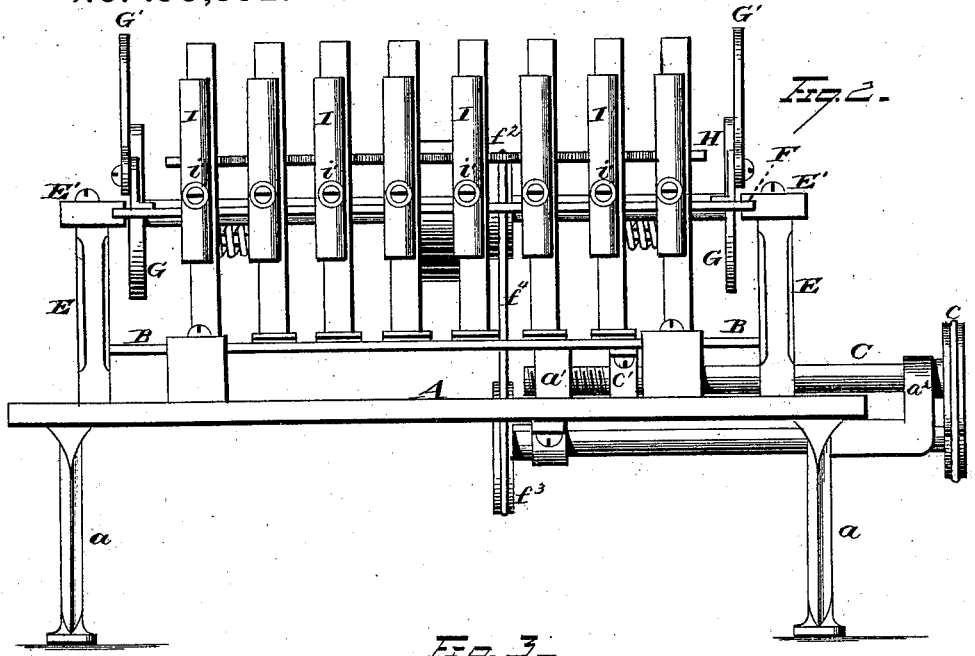
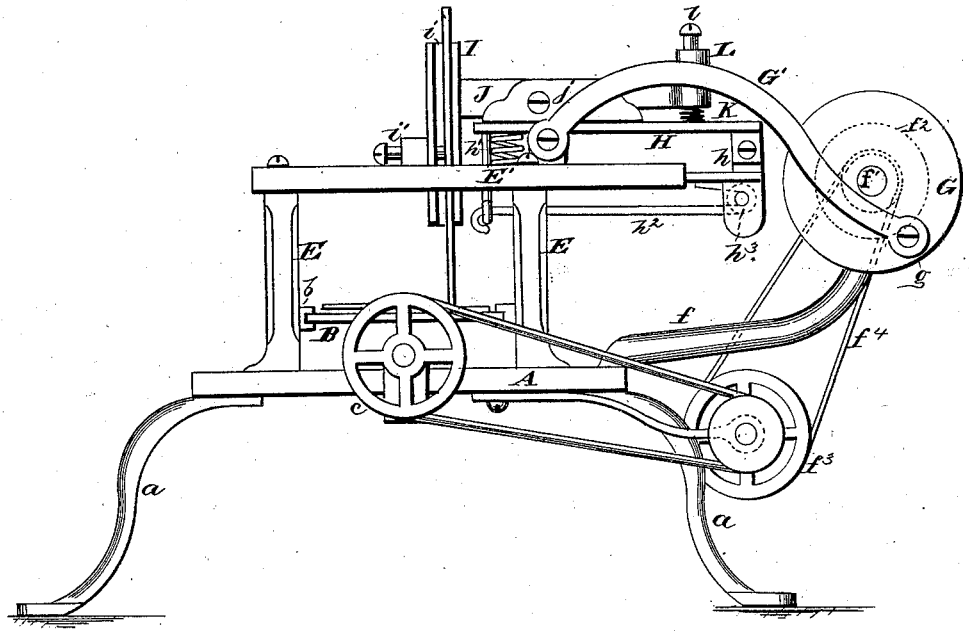


Fig. 3.



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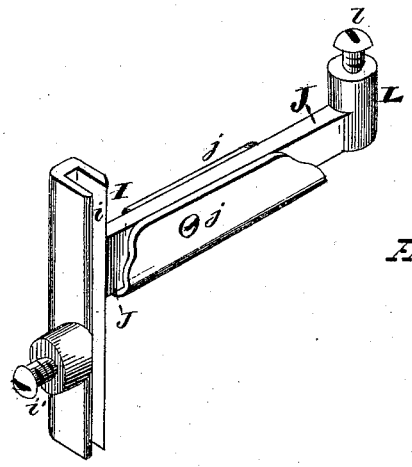
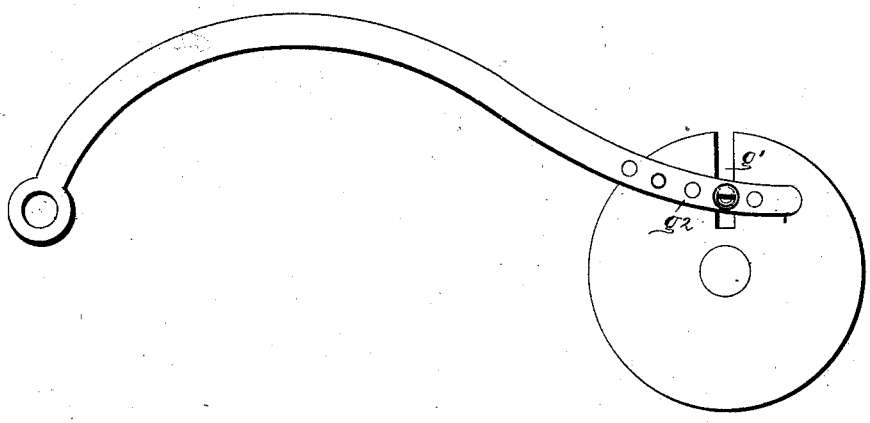


Fig. 4.

Fig. 5.



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UNITED STATES PATENT OFFICE.

JEREMIAH STEVER, OF BIRMINGHAM, CONNECTICUT, ASSIGNOR OF ONE-HALF HIS RIGHT TO D. S. BRINSMADE, OF SAME PLACE.

IMPROVEMENT IN BURNISHING-MACHINES.

Specification forming part of Letters Patent No. **199,592**, dated January 22, 1878; application filed December 8, 1877.

To all whom it may concern:

Be it known that I, JEREMIAH STEVER, of Birmingham, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Burnishing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in burnishing-machines.

The object of this invention is to provide a burnishing-machine of such a construction that a number of articles may be burnished on a single machine at the same time, and the work accomplished in an accurate and ready manner; and to that end my invention consists of, first, in a burnishing-machine, a movable plate or table adapted to have any desired patterns secured thereto, in combination with a yielding follower, and a series of burnishing-tools, said follower and burnishers being secured to a superposed plate adapted and arranged to have a movement at right angles to the pattern-plate, whereby all of said burnishers are required to partake of the movement of the yielding follower, which latter rests upon and is moved over the pattern, and thus allow of the burnishing of a number of articles simultaneously on a single machine.

My invention further consists in the combination, with a horizontally-reciprocating plate having one or more patterns secured thereto, of a transversely-reciprocating plate having a yielding plate hinged or pivoted thereto, said yielding plate furnished with one or more yielding followers, and a series of burnishers attached to yielding stocks or holders, whereby the weight of the burnishers is upheld by the springs, and consequent wear saved the follower and patterns.

My invention further consists in the several details of construction and combinations of parts, as will more fully appear from the following description and claims.

In the accompanying drawings, Figure 1 is a view, in perspective, of my improved burnishing-machine. Fig. 2 is a front elevation, and Fig. 3 an end view, of the same. Fig. 4 is a detached view of one of the burnisher-holders, and Fig. 5 is a modification.

A represents the bed-plate of the machine, the same being supported by the legs *a*, which latter may be rigidly secured to the floor or bench. B is a plate adapted to have a free horizontal movement in the guideways *b*, the latter being secured to the bed-plate A.

A reciprocating movement is imparted to plate B as follows: To the bed-plate A are attached the bearings a^1 a^2, within which rest the ends of the screw-threaded shaft C, the outer end of which carries a band-wheel, *c*. To the under side of the plate B is secured a nut, *c'*, which is screw-threaded to receive the threads of the shaft C.

By turning the shaft C in one direction the plate B is moved in one direction, and by reversing the revolution of said shaft the plate is moved in the opposite direction. This movement may be imparted in an automatic manner, if desired, by attaching suitable clutches, pulleys, and belt-shifters to the driving-shaft D; or fast and loose pulleys may be secured to said shaft, and the movement of the plate controlled by an ordinary belt-shipper arranged to be controlled by the workman.

To the opposite ends of bed-plate A are secured the standards E, which serve to support the transverse guideways E'. Within grooves *e*, formed in the inner edges of guideways E', are placed the ends of a transversely-reciprocating plate, F.

Plate F is moved as follows: Two or more arms, *f*, are secured at their lower ends to the rear side of bed-plate A, while their upper ends are furnished with bearings for the counter-shaft f^1. The latter is revolved by means of a pulley, f^2, which is secured thereto, and connected to a driving-pulley, f^3, on the driving-shaft D by means of a belt, f^4. To the ends of the counter-shaft f^1 are secured the wheels or disks G. Connecting-rods G' are pivoted at their forward ends to the plate F, while their rear ends are pivoted to wrist-pins *g*, attached to the outer faces of disks or wheels G. When the counter-shaft f^1 is revolved, a reciprocating move-

ment is imparted to plate F by means of the connecting-rods G′.

In order to accommodate the movement of the plate F to different articles required to be burnished the parts may be constructed in the manner illustrated in Fig. 5, wherein the disks are provided with a series of holes, or a slot, g^1, arranged at different distances from the center of the disks toward their peripheries.

The connecting-rods are also constructed with a series of holes, g^2. Now, if it is desired to burnish but a small surface of an article, the plate carrying the burnishers is moved in such position that the followers will rest upon the central portion of the patterns. The ends of the connecting-rods are then secured to the wrist-pins, which latter are attached to the disks at a sufficient distance from their centers to insure the desired stroke of the plate, so that every portion of the article required to be burnished shall be traversed by the burnishers.

H is a yielding plate or burnisher-carrier. It is hinged or pivoted at its rear side to the plate F at h, and is upheld from the plate F by means of spiral, volute, or other springs, h^1, which are placed between said plates at their forward edges. The power exerted by the springs h^1 in forcing the plate H away from the plate F is counteracted by the springs h^2, which latter are coiled about short shafts h^3, attached to the under side of plate F. The forward ends of springs h^2 are attached to the front edge of the yielding plate H. This arrangement of parts operates to impart an upward and downward yielding pressure to the plate H, for a purpose hereinafter set forth. I represents burnisher-holders, and the same are formed with open side grooves i, for the reception of the burnishers, which latter are removably secured by set-screws i'. Burnisher-holders I are provided with arms J, located at right angles to the stocks. Arms J are each pivoted between two plates, j, secured to the upper surface of the yielding plate H. A downward yielding pressure is imparted to the burnishers and followers by means of the springs K, which are placed within sockets L, secured to the arms J.

The tension of the springs K may be regulated by means of the adjusting-screws l, inserted in the upper ends of sockets L.

The operation of my improved burnishing-machine is as follows: Any desired patterns, M, (the counterpart of the articles to be burnished,) are secured to the table B at either end thereof, and the followers are then adjusted in such position that they will press upon said patterns. The articles to be burnished are then secured in any desired manner to the plate B, each of said articles being located immediately beneath and in line with one of the burnishers. Motion is then imparted to the driving-shaft, which, in turn, imparts a reciprocating movement to the plate H, through the medium of the connecting-rods. The burnishers are thus reciprocated the entire length of the articles being operated upon, and the articles are moved at right angles to the movement of the burnishers by means of the screw-shaft, which actuates the plate to which the articles are secured. The pressure of the followers upon the patterns is regulated, independently of the combined weight of the burnishers, by means of the springs, which serve to support the yielding plate to which the followers and burnishers are secured. This arrangement of parts admits of any desired pressure of the followers upon their respective patterns. The pressure of the burnishers may be readily regulated by adjusting the screws, which serve to vary the tension of the springs, located in the several sockets attached to the burnisher-arms. As the plate to which the articles are attached has a movement at a right angle to the movement of the burnishers, and as the latter are reciprocated the entire length of the articles operated upon, it follows that every portion of the surface of the said articles is subjected to the action of the burnishers.

The particular shape or size of the article to be operated upon is immaterial as regards the operation of the machine. In every case the followers travel over the entire surface of the patterns, and transmit most accurately and perfectly the contour of said patterns to the burnishers, so that the latter will exert a predetermined pressure on the surface of the articles irrespective of their shape and size.

It is obvious that many advantages will follow the use of a machine embodying my invention, as a number of articles may be burnished simultaneously on a single machine, and each article is subjected to the same pressure and action of the burnishers, thus insuring a uniformity of finished work not possible to be obtained by the ordinary method of hand-burnishing.

It is evident that many slight changes may be made in the details of construction and arrangement of parts without departing from the spirit of my invention, and hence I do not limit myself to the exact construction shown and described; but

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

1. The combination, with a movable plate adapted to have one or more patterns and a number of articles to be burnished secured thereto, of a superposed movable plate provided with one or more followers and a number of burnishers, substantially as set forth.

2. The combination, with a movable plate or table adapted to have one or more patterns and one or more articles to be burnished secured thereto, of a superposed yielding plate provided with one or more followers and one or more burnishers, said yielding plate arranged and adapted to be moved transversely to the movement of the pattern-plate, substantially as set forth.

3. The combination, with a reciprocating

plate and a plate hinged thereto, said plates being connected to each other in a yielding manner, of one or more followers and one or more burnishers, substantially as set forth.

4. The combination, with a reciprocating plate and a yielding plate hinged thereto, of one or more followers and a series of burnishers, said followers and burnishers being removably secured to independent and yielding holders, substantially as set forth.

5. The combination, with the yielding plate, of a series of burnisher-holders, the same provided with sockets and springs, adapted to have their tension adjusted by screws attached to said sockets, substantially as set forth.

6. The combination, with a series of burnishers and one or more followers, said burnishers and followers attached to a yielding plate, of a pattern-plate provided with a screw-threaded nut and a screw-threaded shaft, adapted to engage in said nut and impart a reciprocating movement to said plate, substantially as set forth.

7. The combination, with the longitudinally-reciprocating pattern-plate B, the transversely-reciprocating plate F, and hinged plate H, of the springs h h^1 and the series of burnishers, substantially as set forth.

8. The burnisher-holders J, constructed with an open groove, i, at one end, and provided with a socket, L, at the opposite end, substantially as set forth.

9. The combination, with the yielding plate H, of one or more burnisher-holders, pivoted to said plate, and springs K, located in sockets L, formed on one end of said holders, substantially as set forth.

10. The combination, with the plate F and hinged plate H, the latter provided with one or more followers and a series of burnishers, of the shaft f^1, disks or wheels G, and connecting-rods G′, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 30th day of November, 1877.

JEREMIAH STEVER.

Witnesses:
S. M. GARDNER,
WM. SIDNEY DOWNS.