I. BOGER & W. H. KING.

Machine for Grinding, Smoothing, and Polishing Glass.

No. 201,738. Patented March 26, 1878.

Fig. 1.

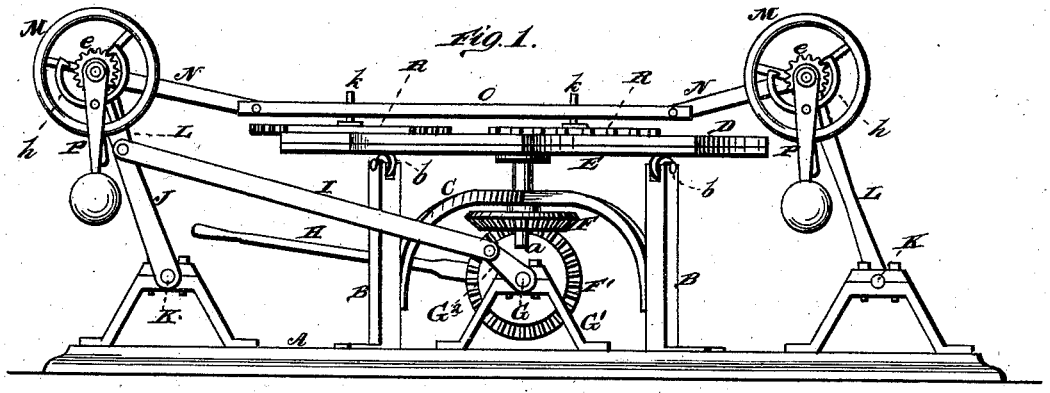


Fig. 2.

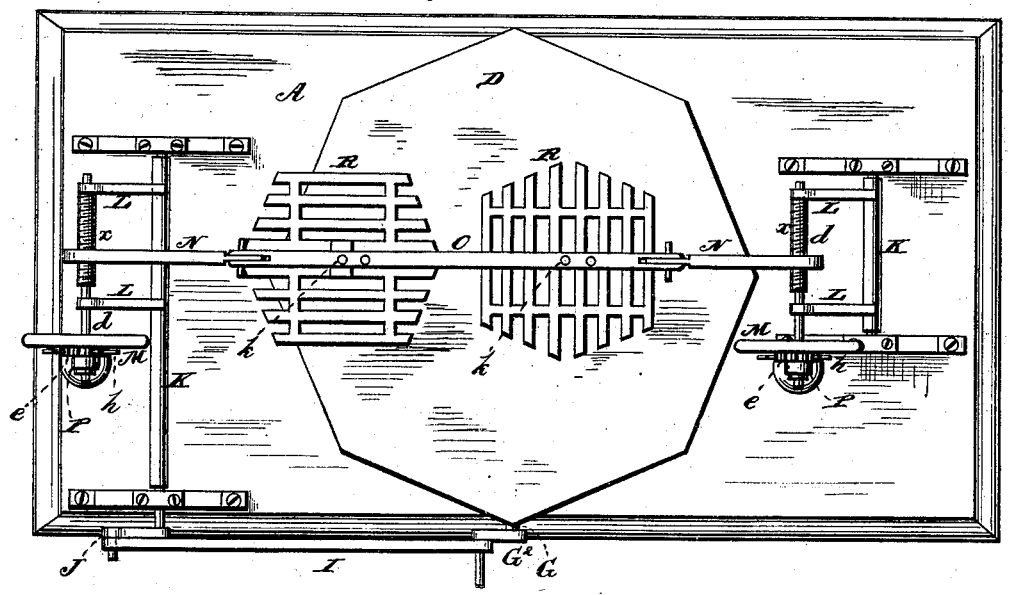


Fig. 3.

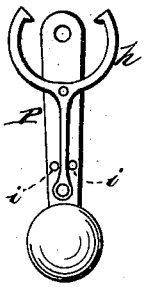


Fig. 4.

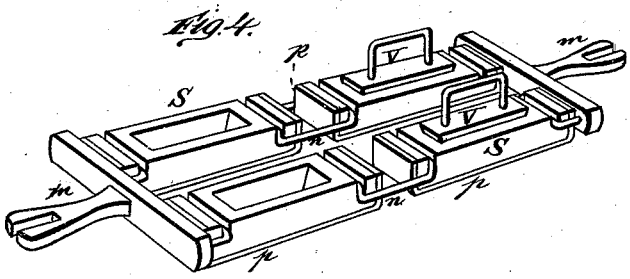
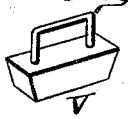


Fig. 5.



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UNITED STATES PATENT OFFICE.

ISHMEL BOGER AND WILLIAM H. KING, OF LOUISVILLE, KY., ASSIGNORS OF ONE-THIRD THEIR RIGHT TO LOUIS KOSIOL, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR GRINDING, SMOOTHING, AND POLISHING GLASS.

Specification forming part of Letters Patent No. **201,738**, dated March 26, 1878; application filed February 2, 1878.

To all whom it may concern:

Be it known that we, ISHMEL BOGER and WM. HENRY KING, of Louisville, in the county of Jefferson and State of Kentucky, have invented a new and valuable Improvement in Machine for Grinding, Smoothing, and Polishing Glass; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a side view of our machine for grinding, smoothing, and polishing glass. Fig. 2 is a plan view. Fig. 3 is a view of the pendulum, and Figs. 4 and 5 are perspective details thereof.

The nature of our invention consists in the construction and arrangement of a machine for grinding, smoothing, and polishing plate-glass, as will be hereinafter more fully set forth.

The annexed drawings, to which reference is made, fully illustrate our invention.

A represents the bed or platform of our machine, upon which are four upright posts, B B, connected by means of an arched frame, C. In the upper end of each post B is mounted a roller, *b*, and upon these rollers rests a frame, E, to which the table D is permanently secured. This table may be of the polygonal form shown, or round, if desired.

From the center of the frame E projects a shaft, *a*, downward through the center of the frame C, and to the lower end of said shaft, within the frame, is secured a bevel-gear wheel, F, which meshes with a similar wheel, F′, feathered on a horizontal shaft, G. This shaft is the driving-shaft, to which the power is applied, and it has its bearings in suitable standards G^1 G^1 on the bed A. By the rotation of the shaft G the table D thus obtains a horizontal rotary motion upon the rollers *b b*.

The gear-wheel F′ is feathered on the shaft G in such a manner that it can be moved to and from the wheel F by means of a lever, H, and thus throw the table in and out of gear, as required, to make the same revolve or allow it to remain stationary.

On one end of the driving-shaft G is a crank, G^2, connected, by a pitman, I, with an arm, J, projecting from a rocking shaft, K, placed in suitable bearings at one end of the bed A. A similar shaft, K, is arranged in bearings at the other end of the bed. Each shaft K is provided with two upwardly-projecting parallel arms, L L, in the upper ends of which is journaled a shaft, *d*, having screw-threads *x* nearly its entire length between said arms. Upon one of the projecting ends of the screw-shaft *d* is secured a hand-wheel, M, by means of which said shaft may be turned by hand in either direction, as required. During the operation of the machine these shafts are rotated, as required, in either direction by the following means: The two shafts *d d* are connected by means of two arms, N N, and a bar, O, the bars N N being placed upon the screws of the shaft, so that by the turning of said shafts said arms will be moved laterally in either direction. The inner or free ends of the arms N N are connected by the bar O, which is pivoted to them, as shown. Hence it follows that as the driving-shaft rotates, and by its crank G^2 and pitman I communicates a rocking motion to one of the shafts K with its arms L L, the other shaft K, with its arms, is rocked simultaneously therewith in the same direction.

Each hand-wheel M is on its outer side provided with a double ratchet or cog wheel, *e*, as shown. On the end of the shaft *d* is hung a pendulum, P, to the side of which is pivoted a double pawl, *h*—that is to say, a pawl having two prongs, one on each side of the ratchet-wheel, and arranged so that either prong can be thrown in gear with said wheel.

The main or center arm of the pawl may be held between two pins, *i i*, on the side of the pendulum, in which case neither prong is in contact with the ratchet-wheel, and according as said arm is thrown either to the right or left of said pins either one or the other of the prongs is thrown in contact with the ratchet. Now, as the arms L swing back and forth, the pendulum P remains hanging vertically, turning upon the shaft *d*, and, therefore, while the arms move in one direction the prong in contact with the ratchet slides over the teeth, and when the arms move in the opposite direction

said prong takes hold of the ratchet, and turns the shaft *d* a certain distance, and the arms N are therefore simultaneously and gradually moved laterally on their respective screw-shafts in either direction desired.

The grinders R R used in our machine consist simply each of a series of metal bars connected by cross-bars, all cast in one piece, or in any other suitable manner. In the center of each grinder is an upwardly-projecting pin, *k*, which is passed upward through one of a series of holes near one end of the bar O.

The plate-glass is laid on the table D, and the grinders R placed on top of the glass, and the machine then started, when the table will revolve, and the grinders be moved back and forth over the glass, which motion also gives a rotary movement to said grinders. At the same time the grinders are, by means of the screw-shafts *d d*, gradually moved from one side to the other and back again by changing the pawls *h h*.

For smoothing and polishing, the grinders and bar O are removed, and the polishing-boxes S S substituted, said boxes being provided with couplings *m m*, to connect with the inner ends of the bars N N, and also connected together by means of links *n n*.

V V represent weights, to be placed in the boxes S to have the proper pressure on the glass. The boxes are lined on the under side with leather or other suitable material *p*, as shown.

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

1. In a machine for grinding, smoothing, and polishing glass, the combination of a rotating table and grinding or polishing devices, having a reciprocating and a lateral motion, substantially as herein set forth.

2. The combination of the posts B with rollers *b* and frame C, the table D, frame E, with shaft *a*, having bevel-gearing F, and the movable gear-wheel F′, feathered on the driving-shaft G, substantially as and for the purposes set forth.

3. The combination, with the table A, of the rocking shafts K K, with arms L L, carrying shafts *d d*, the arms N N on said shafts, and connected together, as described, and the driving-shaft G, with crank G^2, pitman I, and arms J, all substantially as and for the purposes set forth.

4. The combination, with the screw-shaft *d*, of the hand-wheel M, with ratchet-wheel *e*, pendulum P, with pins *i i*, and the double pawl *h*, substantially as and for the purposes set forth.

5. The polishing-boxes S, lined as described, and provided with weights V, the links *n n*, and couplings *m m*, in combination with the arms N N, all substantially as and for the purposes set forth.

In testimony that we claim the above we have hereunto subscribed our names in the presence of two witnesses.

ISHMEL BOGER.
WILLIAM H. KING.

Witnesses:
AARON KOHN,
A. D. BUCHEN.