M. D & L. W. Whipple,

Engraving Machine,

No. 11,189. Patented June 27, 1854.

Fig. 2.

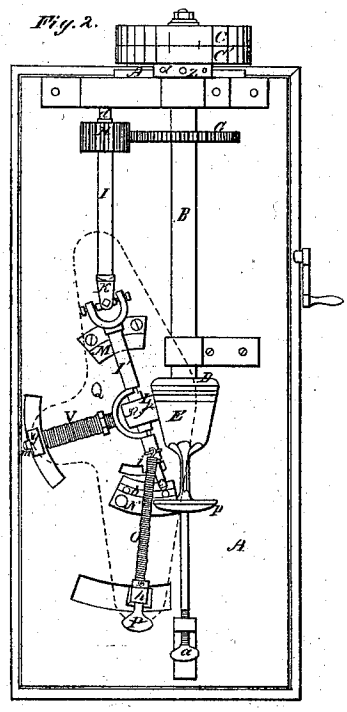


Fig. 3

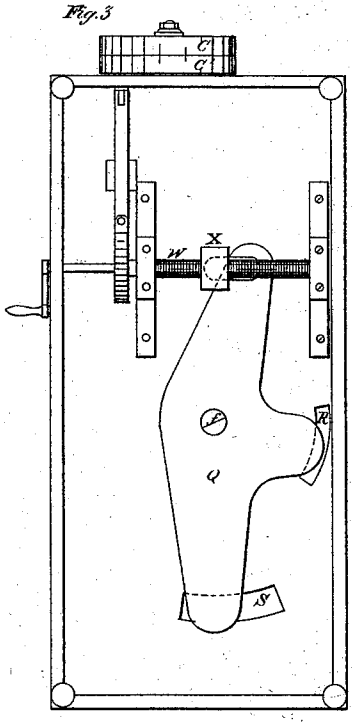


Fig. 4.

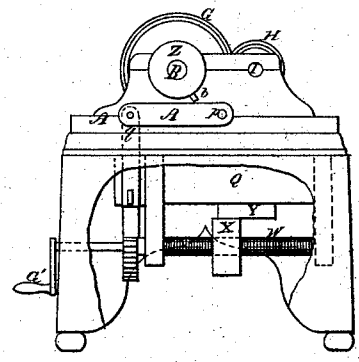


Fig. 5

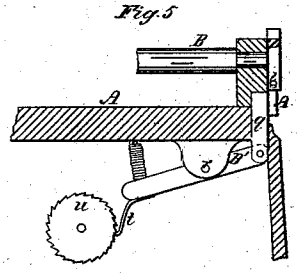
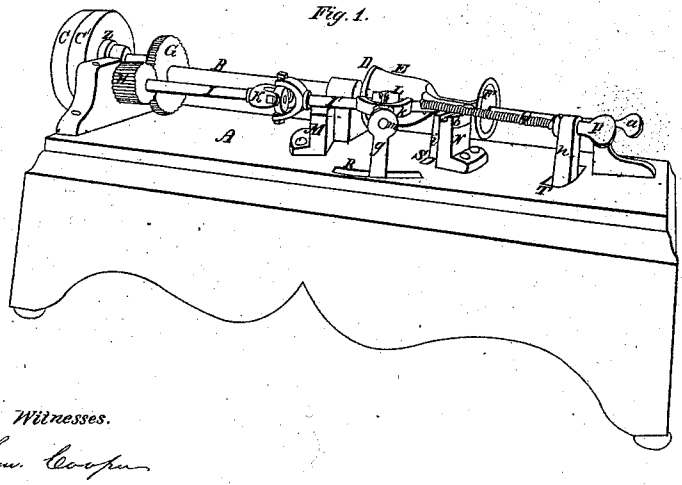


Fig. 1.



Witnesses.

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AM. PHOTO-LITHO. CO. N.Y. (OSBORNE'S PROCESS)

UNITED STATES PATENT OFFICE.

M. D. WHIPPLE AND L. W. WHIPPLE, OF SOMERVILLE, MASSACHUSETTS, ASSIGNORS TO LYMAN W. WHIPPLE AND ROBT. B. FITTS.

PROCESS OF ENGRAVING OR PRINTING UPON GLASS.

Specification of Letters Patent No. 11,189, dated June 27, 1854.

To all whom it may concern:

Be it known that we, MILTON D. WHIPPLE and LYMAN W. WHIPPLE, both of Somerville, in the county of Middlesex and State of Massachusetts, have invented a new and useful process of engraving and printing upon glass and of figuring and ornamenting the same, and also a new machine for the purpose of performing the same, the whole being fully and clearly described in the following specification, reference being had to the annexed drawings, in which—

Figure 1 is a perspective view of our machine; Fig. 2, a plan; Fig. 3, a view of the same from beneath; Fig. 4, an end view with a portion of the framing removed to show the parts beneath and Fig. 5 a detached view of the feeding apparatus.

The first part of our invention consists in causing a metallic cylinder having the desired figures or letters engraved thereon to roll in contact with the surface of glass to be engraved, emery, either dry or mixed with water, being kept constantly at the point of contact between the two.

To enable others skilled in the art to which this most nearly pertains to make use of our invention we will proceed to describe the manner in which we have carried it out.

A is the bed or table upon which the operative parts of the machine are placed.

B is the driving shaft through which the other moving parts of the machine are actuated, by power communicated to the pulleys C, C′. The shaft B carries a chuck D, upon which the article to be engraved is centered. In Figs. 1 and 2 the wineglass E is forced upon the chuck, with which it is caused to revolve, by the center F, which is tightened by the screw *a*.

G is a cog-wheel upon the shaft B, which engages with the gear H upon the shaft I. The number of the teeth should be the same upon these two cog wheels or they should be so proportioned that the one shall be a multiple of the other, that is to say, that one shall revolve once while the other is making 1, 2, 3, 4 or any other given number of revolutions. The shaft I is divided into two portions which are united by the universal joint at K. To the portion I′ is attached the embossing or lettering cylinder L, upon which the pattern to be engaged upon the glass is etched or otherwise countersunk. This cylinder is kept in contact with the article to be engraved in a manner which will be hereafter explained.

The cylinder shaft I′ rests upon and is supported by two uprights M, N, which rise from the bed of the machine. Upon the top of the upright N is a curved guide *b*, against which the end *c* of the shaft I′ is made to press by the spring O, the strength of which is adjusted by the screw P. The center of the curved guide piece *b* is about in the point of contact of the engraving cylinder L and the article to be engraved. The end *d* of the shaft I is allowed a slight longitudinal motion in its bearing for a purpose which will be explained hereafter.

Q is a lever beneath the bed of the machine, which is pivoted at *f*, immediately beneath the point of contact between the engraving cylinder and the article to be engraved.

R, S, and T are mortises through the bed of the machine, up through which project the standards *g*, *h*, and *i* which rise from the lever Q beneath the table. It is evident that as this lever is vibrated upon its center the standards *g*, *h*, and *i*, and the parts connected therewith will vibrate around a common center.

k is a fork attached to the rod *m* which passes through the standard *g*. This fork grasps the shaft I′ upon each side of the engraving cylinder and forces the latter, by means of its spring V, against the article to be engraved. As the lever Q is caused to vibrate upon its center a rocking motion is communicated to the cylinder L, by which means every portion of the cylinder is successively brought in contact with the article to be engraved. The lever Q with its standards *g*, *h* and *i*, is thus made to guide and control all the motions of the engraving cylinder, the shaft I′ being kept pressed up against the standard *i* by the spring O, one end of which is attached to the standard *h*.

The lever Q is slowly revolved upon its center for the purpose of giving the required rocking motion to the engraving cylinder in the following manner: W is a screw which runs transversely beneath the bed of the machine and carries the nut X, which is connected with the lever Q by the link Y. Z is a hub upon the shaft B, which carries one or more studs *l*, which strike against the lever A′ and depress it as the shaft B revolves. This lever is pivoted at *p*, and is connected by the link *q*, to the pawl

lever B′, which is pivoted at *r*, and carries a hook pawl *t*. This pawl is made to engage with the teeth of a ratchet wheel *u* upon the shaft of the screw W, by means of which connections as the shaft B revolves the screw W is caused to turn slowly and thus the lever Q and the parts which support and guide the engraving cylinder L are caused to revolve. The crank G′ upon the shaft of the screw is for the purpose of adjusting the position of the parts previous to the commencement of the operation.

Operation: The parts being adjusted in the positions seen in Figs. 1 and 2 and the article to be engraved being secured upon the chuck on the end of the shaft B as before explained, the machine is set in motion and emery and water are caused to drop upon the point of contact between the engraved cylinder and the glass. Those portions of the cylinder which are engraved or countersunk below the surface produce no effect, but that portion of the cylinder which is unengraved presses or grinds the emery upon the glass, by which the latter is cut or ground, the surface thus produced being more or less rough according to the fineness of the emery or other cutting material employed. It is evident that if the figure be sunk beneath the surface of the engraving cylinder it will appear upon the glass uncut while the ground will be roughened, but if the figure be raised above the surface of the engraving cylinder then it will be cut below the surface of the glass and the ground will be left plain. The engraving cylinder is caused to rock in contact with the article to be cut that every portion of the figure may be brought in contact with the corresponding portion of the glass article to be engraved, the shaft I sliding longitudinally in its bearings *d* to accommodate it to this motion.

It is evident that the diameter of the engraving cylinder should bear about the same relation to the diameter of the article to be engraved that the diameter of the gear H does to that of the wheel G. It is by no means necessary however that this correspondence should be exact, for although any variation therefrom will produce a drag between the surfaces of the engraving cylinder and the glass, yet this drag being equally distributed over the whole surface of the latter is very slight at any one point and can produce no other effect than to widen or narrow the lines of the figures upon the glass to a degree which is not easily discoverable and is not injurious to the beauty or symmetry of the figure.

Where the article to be lettered or engraved is flat instead of being cylindrical or cone shaped, the engraved cylinder may be caused to roll horizontally over its surface by a sliding rack bar and cog wheel, in a manner which need not be further explained, or when globular, cylindrical or conical articles are to be cut the engraving may be made upon a flat strip of metal, which is caused to vibrate back and forth in contact with the glass as the latter rotates, the surface motion of the two being equal. These however are but equivalent methods of carrying out our invention, which consists in transferring the figure from a surface of metal to one of glass in the manner set forth.

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

1. The within described method of engraving or lettering upon glass, an engraved metallic surface being caused to revolve or vibrate in contact with the surface of the glass, emery or other suitable cutting material being interposed between the bearing surfaces of the two.

2. We claim the method substantially as herein described of causing the engraving cylinder to roll in contact with the surface of the article to be engraved, the parts which carry and give motion to the cylinder being connected with the vibrating lever Q operating in the manner substantially as set forth.

MILTON D. WHIPPLE.
LYMAN W. WHIPPLE.

Witnesses:
SAM COOPER,
JOHN S. CLOW.