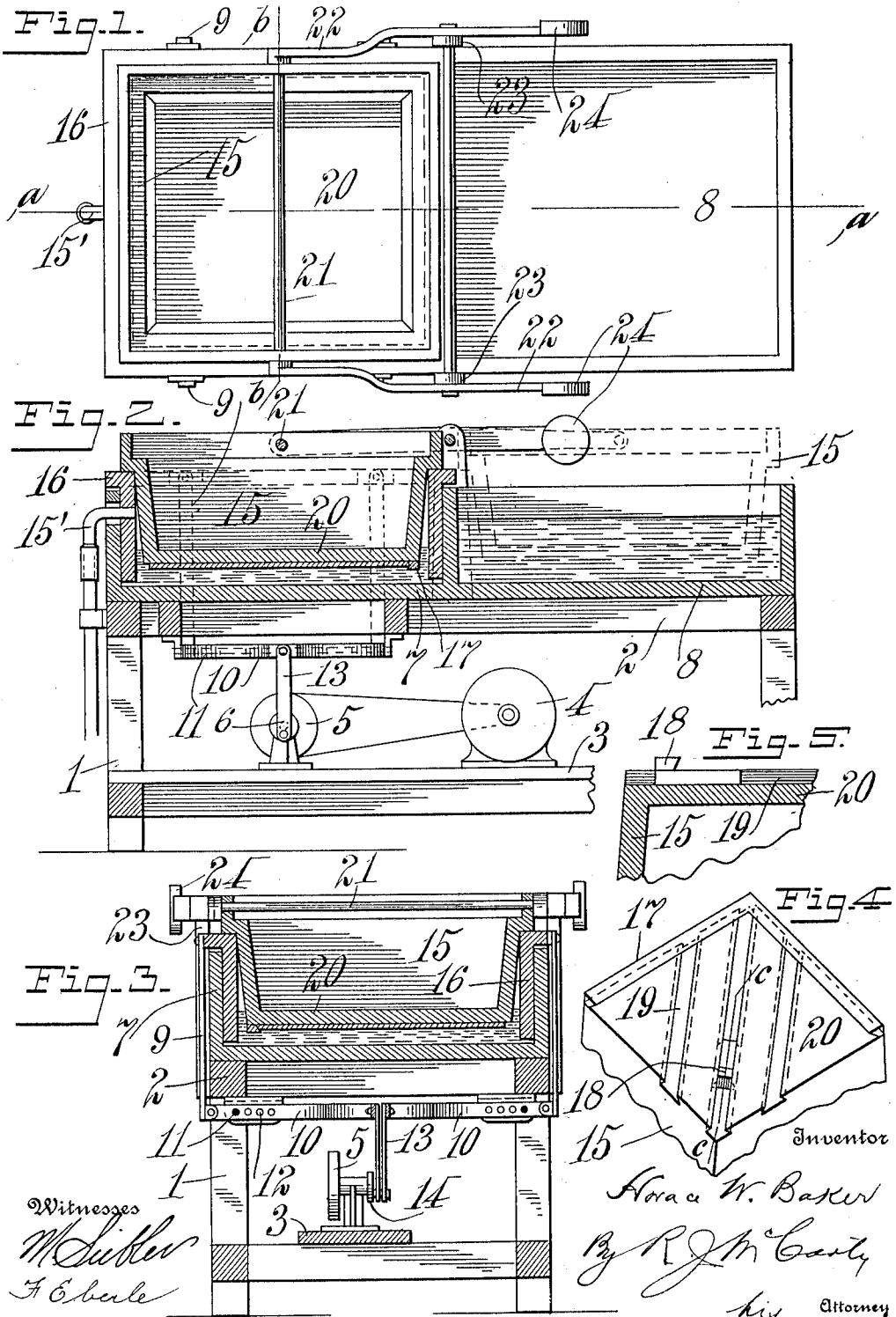


H. W. BAKER.
MACHINE FOR ETCHING PLATES.
APPLICATION FILED OCT. 18, 1911.

1,039,242.

Patented Sept. 24, 1912.



UNITED STATES PATENT OFFICE.

HORACE W. BAKER, OF DAYTON, OHIO.

MACHINE FOR ETCHING PLATES.

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Specification of Letters Patent.

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Application filed October 18, 1911. Serial No. 655,360.

To all whom it may concern:

Be it known that I, HORACE W. BAKER, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Machines for Etching Plates; and I do 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 appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to improvements in etching machines.

The object of the invention is to provide means whereby the plate to be etched is reciprocated in the body of solution at right angles to the face of the plate, thus preventing to a great extent, the acid eating under the lines which form the image or design on the plate.

Another object of the invention is to provide a machine which effects a great saving of time in etching to the requisite depth. And a still further object is to provide a machine in which the plate may be turned with the face of the etching up, either over the acid tank or wash tank.

Preceding a description of the invention reference is made to the accompanying drawings of which—

Figure 1 is a top plan view of the machine. Fig. 2 is a vertical longitudinal sectional elevation of the same on the line *a—*a** of Fig. 1. Fig. 3 is a cross-section of the same on the line *b—*b** of Fig. 1. Fig. 4 is a detail perspective view of the plate support, and Fig. 5 is a sectional view of the same through one corner, on the line *c—*c** of Fig. 4.

In the description and drawings, similar reference characters indicate corresponding parts.

The stationary frame-work of the machine consists of suitable standards 1 joined by cross pieces 2, and a base 3 for supporting the power generator 4, transmission pulley 5 and shaft 6. The top of the frame-work supports tanks 7 and 8, the former of which contains the etching solution or acid bath for the plates, either metal or glass plates, and the latter of which contains the washing liquid, for example, water. With-

in the acid tank 7 is arranged a vertically reciprocating frame 16 which is caused to vibrate or reciprocate in the etching solution or acid by the following means. Pivoted to the opposite upper sides of said frame are depending arms 9—9 the lower ends of which are pivoted each to a lever 10—10. These levers are fulcrumed beneath the bed of the frame-work by means of pivot pins 11. A series of openings 12 are provided near the outer ends of said levers in order that the leverage may be adjusted or changed by removing the fulcrum pins and inserting them in other openings. The inner ends of said levers are suitably connected each to a pitman 13 which are connected with a crank 14 on the shaft 6 driven from the motor 4.

The fumes from the acid tank may be carried off in any suitable way. In the drawings I have shown a pipe 15' which penetrates a side of the reciprocating frame 16. A plate carrier 15 is supported within and on the reciprocating frame 16 and as a consequence vibrates therewith under the influence of the motor. The lower edge of said plate carrier 15 is constructed with a flange 17 on two sides which receive two edges of the plate to be etched. Coöperating with these clamping flanges 17 is a sliding clamp 18 which is adapted to move in any of the dove tail slots 19 in the lower side of the bottom 20 of the plate carrier 15. The said clamp 19 is shaped to hook over the adjacent edge of the plate and to hold it in position in the clamping flanges 17. The said plate carrier 15 is connected by a rod 21 to two side levers 22—22 which are fulcrumed on supports 23—23 and have on their free ends, weights 24—24. It will be seen that the rod 21 forms a central hinge upon which the plate support is suspended and swings. The rod 21 permits the carrier to be reversed with the plate uppermost thereby allowing the plate to be inspected and the carrier to form a cover for the acid bath 7. By this arrangement the carrier and plate therewith may be elevated and swung over the water tank 8 and lowered therein where it may be washed of the etching solution and the carrier reversed and said plate removed therefrom for inspection or further treatment. The plate to be etched is reciprocated in the body of solution broad side. As a consequence the etching is uniform and of the required depth in a comparatively short time. In the drawings, I have

shown the plate holder 15 constructed to hold the plate with the face down. During the vertical reciprocation of the said plate it is forced through the solution by a movement of the plate at right angles to the body of the solution. This action is such as to avoid the acid getting in under the "resist" lines which form the image or design on the plate. The same action may take place by supporting the plate with the edges standing vertically and imparting a horizontal reciprocatory movement thereto. In this manner of vibrating the plate the movement thereof would also be at right angles to the surface of the body of solution. The mode of operation, therefore, consists in submerging a plate, previously prepared for etching, in a body of etching solution and in imparting to said plate while so in the body of solution, a series of vibrations varying in speed according to the work. The manipulation of the plate from one tank to the other enables the work of etching to be done more expeditiously and with greater safety to the work as well as the operator.

Having described my invention, I claim:

1. In a machine of the type specified, the combination with a tank for containing an

etching solution, of a reciprocating frame received by said tank, means for reciprocating said frame, a plate holder received by said reciprocating frame and adapted to be reciprocated thereby, and arms pivotally attached to said plate holder and adapted to act as guides for said plate holder when the same is elevated to inspect the plate.

2. In a machine of the type specified, the combination with an etching tank and an adjacent washing tank, of a reciprocating frame received by said etching tank, means for reciprocating said frame, a plate holder received by said reciprocating frame and adapted to be reciprocated thereby, and arms pivotally attached to said plate holder and adapted to act as guides for said plate holder when said plate holder is transferred from one tank to the other, said pivotal arms being also adapted to permit the plate holder to be reversed to permit inspection of the plate.

In testimony whereof I affix my signature, in presence of two witnesses.

HORACE W. BAKER.

Witnesses:

R. J. McCARTY,
MATTHEW SEIBLER.