

No. 882,443.

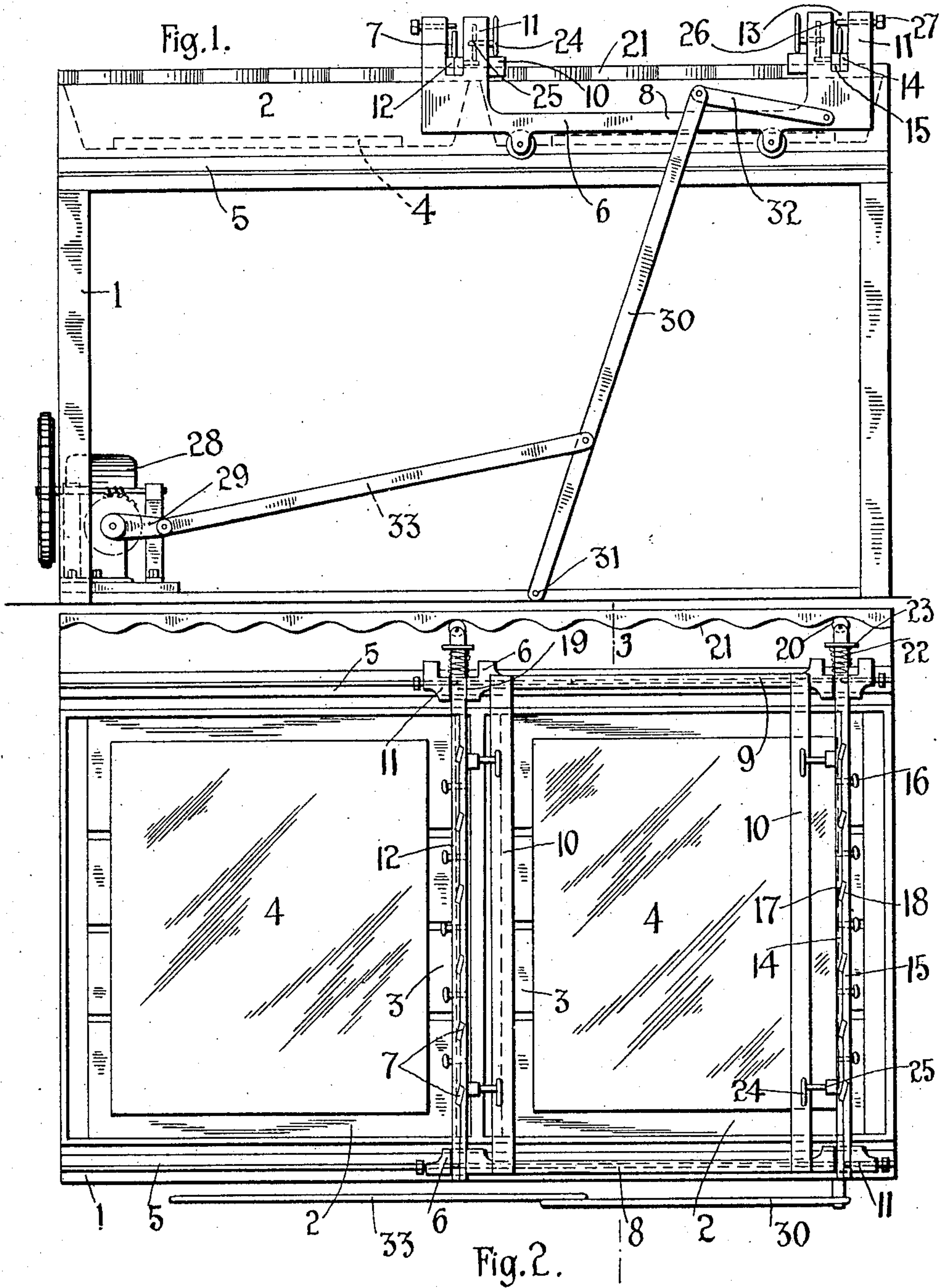
PATENTED MAR. 17, 1908.

J. N. AXT.

APPARATUS FOR ETCHING PLATES.

APPLICATION FILED JAN. 18, 1908.

2 SHEETS—SHEET 1.



WITNESSES
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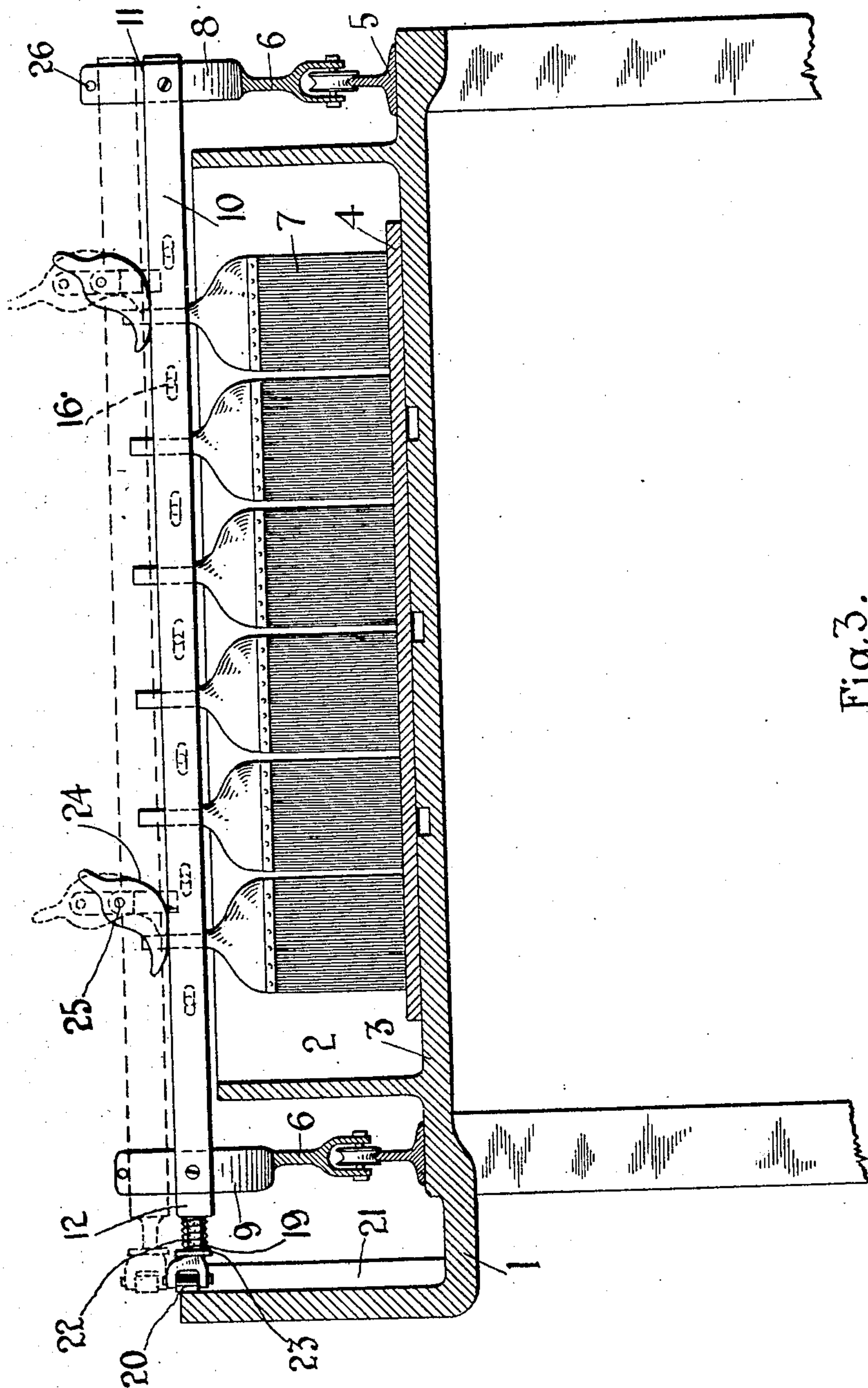


Fig. 3.

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR ETCHING PLATES.

No. 882,443.

Specification of Letters Patent.

Patented March 17, 1908.

Application filed January 18, 1908. Serial No. 411,493.

To all whom it may concern:

Be it known that I, JACOB N. AXT, a citizen of the United States, and a resident of the city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Apparatus for Etching Plates, of which the following is a specification.

The present invention relates to an apparatus for etching the surfaces of plates, which are prepared by producing thereon a design or designs and the parts of the plate which are not covered by the design are subjected to an etch. In other classes of the work the design may be drawn through a ground, after which the plate is etched to produce in the plates the design.

Heretofore etched plates have been produced by immersing the properly prepared plates in an acid bath, and reciprocating brushes upon the face of the same so as to remove the oxid as it forms on the plate, keeping thereby the acid always in touch with clean surfaces of the plate. The brushes have been applied by the attendant by hand or have been mechanically moved over the surfaces of the plate. In the mechanical device, employed for operating the brush, the movement of the brush is, as mentioned hereinbefore, reciprocatory. It is obvious that this reciprocatory movement of the brush is objectionable, in that the brush does not touch all parts of the design with the same degree of pressure, and particularly does not touch sides or shoulders of the design, which are parallel to the line of travel of the brushes, with the same pressure as similar parts of the design which are located at right angles to the direction of movement of the brush.

It is now the object of the present invention to provide an apparatus for etching plates, which moves the brushes in such a way that all parts of the design are operated upon with the same degree of pressure. For this purpose the brushes of the apparatus are moved in the plane of the surface of the plates with a wavy or sinuous motion, whereby all the surfaces of the design are touched with the same degree of pressure.

The invention is illustrated in the accompanying drawings, in which

Figure 1 illustrates a front elevation of the apparatus, Fig. 2 a top view of the same, and

Fig. 3 an enlarged vertical cross section of the device on line 3—3 of Fig. 2.

The frame of the apparatus is shown at 1, supporting a plurality of troughs 2, 2, preferably made of wood and formed with a grooved bottom 3, on which rests the plate 4 to be etched. Upon the frame of the apparatus are arranged horizontal guide rails 5, 5, one on each side of the frame, on which a carriage 6, supporting the brushes 7, travels.

The carriage 6 is made up of two sections 8 and 9, connected by cross bars 10, 10. On the sections 8 and 9 of the carriage are arranged bearings 11, 11 for the brush holders 12, 12. The bearings 11 project over the upper edges of the troughs and are provided with slots 13, 13 into which the brush holders are placed.

The brush holders 12 comprise two sections 14 and 15, held together by thumb-screws 16. The sections 14 and 15 are provided with registering notches 17 and 18, respectively, providing thereby openings into which the handles of the brushes may be placed and securely held when the screws 16 are tightened. It is obvious that by this means the brushes may be adjusted relative to the face of the plate, by loosening the screw 16 and moving the brushes up or down, as required, whereafter the screws are tightened and the brushes held in the desired position. This adjustment may be necessary for two reasons, that is to vary the pressure of the brushes upon the plate, or to compensate for their wear. It will be noticed that the openings, formed by the notches 17 and 18, are arranged under an angle to the axis of the brush holders 12, whereby these brushes will sweep a larger surface in their sinuous movement.

Upon one section of the brush holders 12 is mounted an arm 19, projecting over the troughs and carrying a roller 20, which bears against a sinuous track 21, mounted upon the frame of the apparatus and arranged parallel to the troughs of the same. In order to keep the rollers in operative engagement with the track 21, springs 22 are provided on the arms 19, which bear against the washers 23, placed on the arm 19, and against the section 9 of the carriage 6. The brush holders 12 carry eccentrics 24, pivoted at 25, and normally resting against the connecting rods 10. By means of these eccentrics the brush holders and the brushes, secured there-

to, may be lifted so that the brushes are out of operative position with the plate to be etched. The sinuous track 21 extends only to the plane of the brush holders in their lower position, and it is obvious that when the brush holders and the brushes are raised, the rollers 20 are brought out of operative position with the sinuous track. The uppermost position of the brush-holders is determined by stops 26, arranged on the bearings 11. These stops comprise screws 27, projecting through holes of the bearings into the slots 13 of the same.

The carriage 6 is alternated by any suitable source of power. In the present case an electric motor 28 is located beneath the troughs of the apparatus. This electric motor rotates by suitable intermediary means a crank 29. The connection between this crank and the carriage 6 is made by a plurality of connecting rods and levers. For instance an oscillating lever 30 is fulcrumed at 31 upon the frame of the apparatus; the free end of this lever is engaged by a connecting rod 32, making a connection between this lever and the carriage 6. The lever 30 is oscillated by means of a connecting rod 33, one end of which is pivotally connected to the crank 29, while the other end is connected in the same way to the lever 30.

The operation of the device is as follows: The plates, to be etched, being properly prepared, are placed in the troughs with their surfaces to be etched upward. Sufficient diluted etching acid is supplied to the troughs so as to cover the plate to a desired depth. The brushes are then brought in proper position to the plates, so that the same touch the faces of the plate. The motor is then started, whereby the carriage 6 is alternated. The rollers 20 of the brush holders bear against the sinuous track and will impart to the brush holders and the brushes, carried thereby, a wavy or sinuous motion, brushing off the oxid from the plate as quickly as it forms on the same and touching all parts of the design with precisely the same pressure, whereby the acid is in contact always with evenly clean surfaces.

It is obvious that other means may be employed to produce a wavy motion of the brushes without departing from the spirit and scope of the present invention.

What I claim is:

1. In an etching machine, the combination with a frame, of a plurality of troughs for the acid supported thereby, guide-rails on said frame, a carriage adapted to alternate thereon, brushes supported by said carriage and adapted to extend into said troughs, means for alternating said carriage, and means for imparting a wavy motion to said brushes.

2. In an etching machine, the combination with a frame, of a plurality of troughs

for the acid supported thereby, guide-rails on said frame, a carriage adapted to alternate on the same, vertically adjustable brushes supported by said carriage and adapted to extend into said troughs, means for alternating said carriage, and means for imparting a wavy motion to said brushes.

3. In an etching machine, the combination with a frame, of a plurality of troughs for the acid supported thereby, guide-rails on said frame, a carriage adapted to alternate on the same, vertically and independently adjustable brushes supported by said carriage and extending into said troughs, means for alternating said carriage, and means for imparting a wavy motion to said brushes.

4. In an etching machine, the combination with a frame, of a plurality of troughs for the acid supported thereby, guide-rails on said frame, a carriage adapted to alternate thereon, brush-holders slidably mounted upon said carriage, brushes supported by said brush-holders and extending into said troughs, means for alternating said carriage, and means for reciprocating said brush-holders on said carriage at right angles to the direction of travel of the same.

5. In an etching machine, the combination with a frame, of a plurality of troughs for the acid supported thereby, guide-rails on said frame, a carriage adapted to alternate on the same, brush-holders slidably mounted upon said carriage, vertically adjustable brushes supported by said brush-holders and extending into said troughs, means for alternating said carriage, and means for reciprocating said brush-holders on said carriage at right angles to the direction of travel of the same.

6. In an etching machine, the combination with a frame, of a plurality of troughs for the acid supported thereby, guide-rails on said frame, a carriage adapted to alternate on the same, brush-holders slidably mounted upon said carriage, vertically and independently adjustable brushes supported by said brush-holders and extending into said troughs, means for alternating said carriage, and means for reciprocating said brush-holders on said carriage at right angles to the direction of travel of the same.

7. In an etching machine, the combination with a frame, of a plurality of troughs for the acid supported thereby, guide-rails on said frame, a carriage adapted to alternate on the same, brush-holders slidably mounted on said frame, brushes carried thereby, a sinuous track mounted upon the frame, means operatively connecting said brush-holders with said sinuous track, and means for alternating said carriage.

8. In an etching machine, the combination with a frame, of a plurality of troughs for the acid supported thereby, guide-rails on

said frame, a carriage adapted to alternate on the same, brush-holders slidably mounted on said frame, vertically adjustable brushes carried thereby, a sinuous track mounted upon the frame, means operatively connecting said brush-holders with said sinuous track, and means for alternating said carriage.

9. In an etching machine, the combination with a frame, of a plurality of troughs for the acid supported thereby, guide-rails on said frame, a carriage adapted to alternate on the same, brush-holders slidably mounted on said frame, vertically and independently adjustable brushes carried thereby, a sinuous track mounted upon the frame, means operatively connecting said brush-holders with said sinuous track, and means for alternating said carriage.

10. In an etching machine, the combination with a frame, of a plurality of troughs for the acid supported thereby, guide-rails on said frame, a carriage adapted to alternate on the same, brush-holders slidably mounted on said frame, a sinuous track mounted upon the frame, means operatively connecting said brush-holders with said sinuous track, means for alternating said carriage, and an eccentric mounted upon said brush-holders, whereby the same may be raised relative to said troughs.

Signed at New York, in the county of New York, and State of New York this 31st day of December, A. D. 1907.

JACOB N. AXT.

Witnesses:

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S. BIRNBAUM.