

No. 764,082.

PATENTED JULY 5, 1904.

W. G. THORPE.
METHOD OF ETCHING PRINTING PLATES.

APPLICATION FILED MAR. 8, 1904.

NO MODEL.

Fig. 1

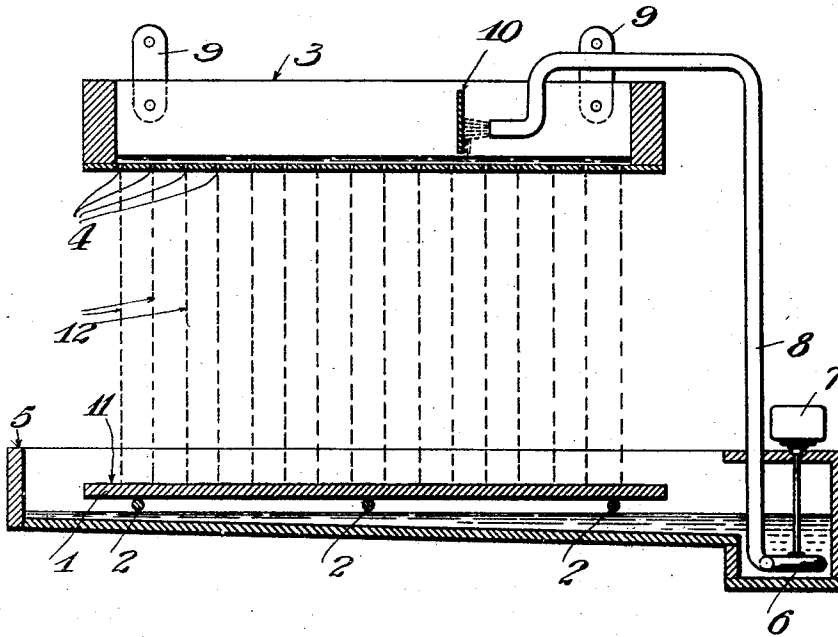
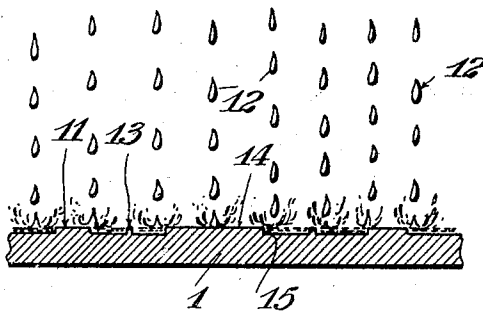


Fig. 2



Witnesses

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WILLARD G. THORPE, OF LOS ANGELES, CALIFORNIA.

METHOD OF ETCHING PRINTING-PLATES.

SPECIFICATION forming part of Letters Patent No. 764,082, dated July 5, 1904.

Application filed March 8, 1904. Serial No. 197,067. (No model.)

To all whom it may concern:

Be it known that I, WILLARD G. THORPE, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Method of Etching Printing-Plates, of which the following is a specification.

The primary object of my invention is to etch zinc or other metal plates expeditiously and in such manner as to produce the maximum sharpness and clearness of the design.

Another object of my invention is to subject the plate to the scouring or cleaning action of an etching agent directed perpendicularly thereto, so as to continually remove deposits therefrom and maintain the etching action, giving superior sharpness and clearness of design without the use of an air-blast.

A further object of the invention is to subject the plate to such action while it is placed face uppermost, so as to allow inspection of the progress of the work without having to overturn the plate.

In etching zinc plates the corrosion by the etching fluid forms a deposit or scale on the exposed parts of the plate, and this deposit interferes with the further action of the etching agent. It is usual to remove this deposit from time to time by the use of a brush, so as to enable the etching process to proceed. This brushing action is injurious to the design formed on the plate, as it tends to scratch the lines and wear away the finer details and the edges of "resist" parts of the design.

My invention provides for continual removal of the deposit by the mechanical action of the etching agent itself. I am aware that it has been proposed to effect this result by the action of an atomized spray directed against the plate from below, the plate being placed with the design downward.

According to my method the plate is placed substantially horizontal, design-face uppermost, and the etching fluid is allowed to fall onto said face by the action of gravity. I prefer to apply the fluid in the form of a "rain"—that is, a multiplicity of falling drops of sufficient size to fall freely with little retardation by the resistance of the air—in distinction to an atomized spray which requires

a current or blast of air to direct it against the plate.

In the accompanying drawings, Figure 1 represents diagrammatically an apparatus suitable for carrying out my invention. Fig. 2 is an enlarged vertical section of a part of the plate, showing the action of the fluid in striking same.

It will be understood that the invention may be carried out by means of various forms of apparatus. For example, it may be carried out by means of the apparatus disclosed and claimed in my Patent No. 740,204, granted to me September 29, 1903, for etching-machines.

Referring to the drawings, 1 designates the plate to be etched, 2 a suitable support therefor, 3 a tank, reservoir, or distributor located above the support 2 and provided with openings 4, adapted to allow the fluid from the reservoir to pass downward in drops or rain onto the plate below. A tank or reservoir 5 is arranged below and around the support 2 to receive the fluid flowing from the surface of the plate. Means are provided for returning the fluid from tank 5 to distributor 3, such means consisting, for example, of a pump 6, driven by a motor 7 and communicating with the reservoir 5 and with a pipe 8, leading to the distributor 3.

It being desirable to impart to the fluid a limited amount of horizontal movement to insure its even distribution on the surface of the plate, the tank 3 is supported by swinging supports 9, so as to be horizontally movable. This movement may be imparted by any suitable means—for example, by hand; but a convenient means is that shown, consisting of a dasher 10 on the distributor in the path of the discharge from pipe 8, so as to be jarred by the impact of the fluid. In carrying out the process in this apparatus the plate 1, which has been suitably prepared with portions of its face 11 covered by a resist corresponding to the design, is placed with the face 11 uppermost on the support 2, and the motor 7 being set in operation the etching fluid is pumped up from tank 5 into tank or distributor 3, whence it issues in the form of drops or rain, (indicated at 12,) falling in approxi-

5 mately vertical paths on the design-surface. The horizontal jarring of the distributor causes the drops to more readily leave the distributor and also insures that the drops from the
 10 respective holes will not always fall at the same places, but will be evenly distributed over the surface of the plate. This movement, however, is not sufficient to interfere with the substantially perpendicular impact of the
 15 drops on the design-surface. The mechanical action of the fluid on the plate is illustrated in Fig. 2, the drops striking the plate with such force and velocity that the deposits formed by the etching action on all parts of
 20 the plate not covered by the design are broken up and dislodged or forcibly detached from the plate by the impact of the fluid, and the splashing and scouring action due to the rebound of the fluid completes the separation
 25 of the deposit and allows the same to be washed away by the fluid. The effect of such perpendicular impact differs from that of the usual rocking horizontal movement of the etching fluid in the following respects: It
 30 exerts a more powerful scouring action due to the forcible impact of the drops on the surface. It attacks all parts of the exposed surface of the design equally, whereas the horizontal movement produces less effect where
 35 the exposed parts are of small extent or already etched below the general surface, the relief of the surrounding parts protecting such depressed parts from the wash of the fluid. There is less danger of overetching of small
 40 details or lines, as the perpendicularly-moving fluid does not tend to wash away the edges of the resist or to undermine the same as does a horizontal wash. There is less danger of underetching of large masses or design portions, as the fluid cuts clean and sharp at the
 45 edge of the resist, whereas with a horizontal movement the parts immediately adjacent a heavy resist are protected more or less from the cutting action of the fluid.

45 Fig. 2 illustrates the above-described action,

13 indicating a small resist portion whose edges are susceptible to injury or wear by the wash of the fluid, and 14 indicating a large resist portion, which protects the adjacent portions 15 of the plate from the wash of the fluid.

What I claim is—

1. The method of etching a plate on a face of which a design has been formed by a resist, which consists in subjecting the plate with the design-face uppermost, to the action of etching fluid falling upon the design-face with sufficient velocity to dislodge and remove the deposits thereon.

2. The method of etching a plate having a design formed on a face thereof by a resist which consists in subjecting the plate, with the design-face uppermost, to the action of a rain of etching fluid, falling perpendicularly against the design-surface with sufficient velocity to dislodge and remove deposits thereon.

3. The method of etching a plate having a design formed on a face thereof, which consists in placing the plate with the design-face uppermost and allowing the etching fluid to fall perpendicularly upon the design-face by distributed series of drops with sufficient velocity to dislodge and remove deposits thereon, and changing the horizontal position of such series of drops.

4. The method of removing the deposit from a plate having a resist over a portion thereof, in the process of etching, which consists in allowing the etching fluid to fall against the surface of said plate with sufficient violence to dislodge said deposit.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, at Los Angeles, in the county of Los Angeles and State of California, this 2d day of March, 1904.

WILLARD G. THORPE.

In presence of—

JULIA TOWNSEND,

ARTHUR P. KNIGHT.