E. LEITNER.

PROCESS OF MAKING PRINTING PLATES.

APPLICATION FILED FEB. 10, 1914.

1,329,088.

Patented Jan. 27, 1920.

Fig. 1.

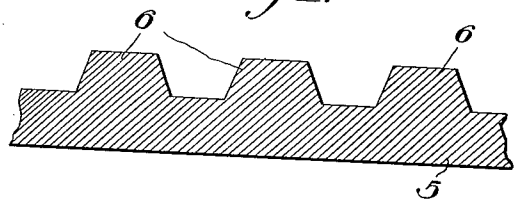


Fig. 2.

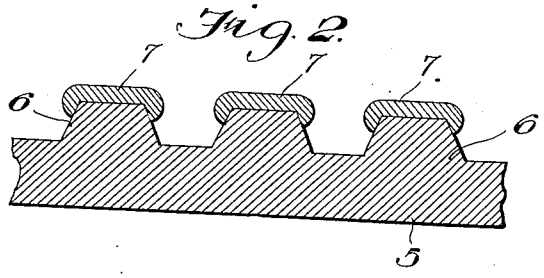
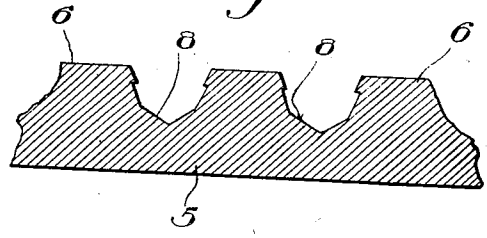


Fig. 3.



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EMIL LEITNER, OF HOBOKEN, NEW JERSEY, ASSIGNOR TO POWERS PHOTO ENGRAVING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

PROCESS OF MAKING PRINTING-PLATES.

1,329,088. Specification of Letters Patent. **Patented Jan. 27, 1920.**

Application filed February 10, 1914. Serial No. 817,914.

To all whom it may concern:

Be it known that I, EMIL LEITNER, a subject of the Emperor of Germany, having declared my intention of becoming a citizen of the United States, residing at Hoboken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Processes of Making Printing-Plates, of which the following is a specification.

The invention relates to photo-mechanical printing plates and processes of producing the same, and more especially to processes for producing by chemical and mechanical means a deep etched plate.

Objects of the invention are to provide photo-mechanically a printing plate which is deep etched without sacrificing or weakening the half-tone dots therein, and without marring the gradation of color tones therein; to produce entirely by mechanical means a plate in which the top or upper portions of the half-tone dots or like figures are preserved intact as to area, while securing a deep etch or depression of the surrounding portions of the plate. These and other objects of the invention will be set forth hereinafter in part, and in part will be obvious.

The invention consists in the novel steps, processes, combinations and improvements herein indicated and described.

The accompanying drawings represent diagrammatically and on a highly magnified scale certain steps in the process. Figure 1 represents the plate after the first etch; Fig. 2 represents the plate with the protective covering 1 applied to the faces and sides of the screen figure preparatory to the deep etch; and Fig. 3 represents the plate after the deep etch.

In carrying out my process, the preliminary steps in making a half-tone plate may be performed in the usual manner. An original may be placed before the camera, and a negative made therefrom with the interposition of the half-tone screen producing the usual stippled or half-tone negative.

A copper plate, or other like plate, is sensitized in a suitable manner, as by having applied to its surface a solution of albumin mixed with a light sensitive agent, such as ammonium bichromate. This solution is spread in a uniform layer over the surface of the plate and dried as a coating thereon in a suitable manner as by whirling the plate over a heater.

The sensitized surface of the plate is then exposed to light action beneath the half-tone negative, and is afterward developed in water. After drying the developed plate, in case of the "enameled top" plate, it is then heated and the enamel "burnt in." The plate is then given its first etch in the usual manner, preferably with ferric chlorid solution.

After the plate has been so developed and etched, its surface is broken up into a great number of dots or like screen figures, by the action of the half-tone screen in a well-known manner. I apply an acid resistant material to the tops or faces of the dots or screen figures, and also to the upper part of the sides thereof. For this purpose, I roll up the plate with a mixture of printers' ink with tar oil, using preferably a jobbing ink, such for example as Helmuth's job black Z. W. grinding, using or mixing the ink and oil in substantially the proportions of one part of the oil to from three to four parts of the ink. After the ink and oil have been thoroughly and uniformly mixed together, I roll up the plate therewith. In rolling up the plate I use a roller made of the ordinary inking roller composition mounted in bearings to turn easily instead of the ordinary hard leather covered rolling up roller. By the use of the resilient composition roller the individual dots depress its surface and the ink is thus carried down the sides of the dots. The rolling is continued until the ink not only covers the top or surface of the dots, or like half-tone figures, but goes down the sides thereof to a distance substantially half-way of the depth of the depressions as left by the first etch.

After the ink has been so put on, I apply to the plate, the acid resistant material, using preferably asphaltum powder, which powder is applied uniformly over the plate. The loose powder is removed from the uninked portions of the plate, in a suitable manner as by gentle brushing with a soft brush or with a powder puff.

The asphaltum powder remaining adherent upon the inked portions of the plate is heated or burned so as to melt the powder and cause it to run together to form a proper acid resistant coating over the ink. The burning or melting of the powder is

regulated so as to avoid melting the ink and thereby causing it to run down farther along the sides of the half-tone dots or figures.

The plate so protected by its acid resistant coating, I etch with a deep etch, such as iron perchlorid, and by reason of both the top and the upper portion of the sides of the half-tone dots or like figures being protected by the resist, the deep etching acts only in the depressions between said dots or like screen figures, without affecting the top and upper portion of the sides thereof, that is without decreasing the size of the printing surface or area of the dots or like screen figures and thus without impairing or varying the relative tones of the plate. This gives an excellent printing plate adapted for use with many different kinds of printing papers, printing more easily, requiring very little make-ready or other preliminary preparations, and making an exceedingly useful and excellent printing plate under widely varying conditions of use.

In the drawings 5 designates the body of a plate and 6 the dots thereon, 7 the protecting covering of ink applied as described after the first etch which extends over the top of each dot and approximately half way down the sides thereof. 8 indicates the part cut away by the second etch effected while the top and sides of the dots are protected.

It will be understood that variations from the herein described steps may be made, within the scope of the accompanying claims, without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim as my invention and desire to secure by Letters Patent is:—

1. The process of deep etching a plate having a half tone design etched thereon in which the dots of the design have the tone values of the original, which process consists in applying a protecting covering to both the top and the upper portions only of the sides of the dots formed by the first etch, and deep etching the low unprotected places between the dots, whereby the relative tone values of all parts of the plate are maintained by the prevention of the diminution in size of the dots during the deep etching.

2. The process of deep etching a plate having a half tone design etched thereon in which the dots of the design have the tone values of the original, which process consists in applying a covering consisting of a mixture of printers' ink and tar oil to both the top and the upper portions only of the sides of the dots formed by the first etch, dusting the plate with acid resist powder, and deep-etching the low unprotected places between the dots, whereby the relative tone values of all parts of the plate are maintained by the prevention of the diminution in size of the dots during the deep etching.

3. The process of deep etching a plate having a half tone design etched thereon in which the dots of the design have the tone values of the original, which process consists in applying a covering consisting of a mixture of printers' ink and tar oil to both the top and the upper portions only of the sides of the dots formed by the first etch, dusting the plate with asphaltum, heating the plate and deep-etching the low unprotected places between the dots, whereby the relative tone values of all parts of the plate are maintained by the prevention of the diminution in size of the dots during the deep etching.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

EMIL LEITNER.

Witnesses:
JOHN D. MORGAN,
JOHN W. SNYDER.