

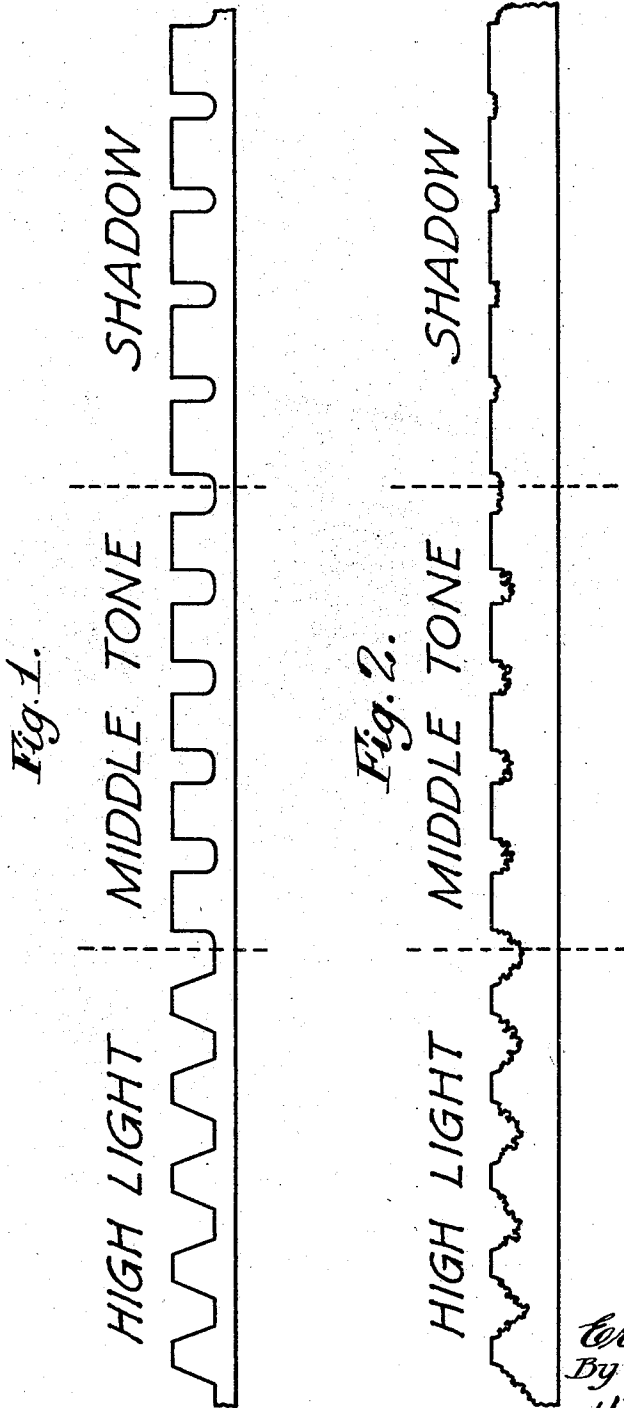
March 3, 1936.

E. SCHERER

2,032,771

METHOD OF MAKING HALF TONE PLATES

Filed Dec. 12, 1934



Inventor
Ernest Scherer
By his Attorneys
Williamson & Williamson

UNITED STATES PATENT OFFICE

2,032,771

METHOD OF MAKING HALFTONE PLATES

Ernest Scherer, Minneapolis, Minn.

Application December 12, 1934, Serial No. 757,130

3 Claims. (Cl. 41—43)

This invention relates to photo-engraving and more particularly to improvements in the making of half-tone plates.

Heretofore in the etching of metal half-tone plates, the so-called "dragon blood powder" process has been extensively utilized by newspapers, engravers and the like. The time required for etching has been considerable and the several applications of the powder and the brushing of the same seriously menaces the health of the engravers. Furthermore, with the powder method and other etching methods heretofore practiced it has not been possible to obtain sufficient depth in the middle tone and shadow portions of the plates or clear cut and regularly cut high light portions.

It is an object of my invention to provide a simple and improved method for making half-tone plates which may be easily and economically carried out; which will reduce the time required to make successful metal plates and the like to approximately one-third ($\frac{1}{3}$) of the time now consumed in the powder method, and which will produce nearly perfect high light, middle tone and shadow portions on the plate.

It is a further object to provide a materially improved half-tone plate wherein the etching is substantially perfect, clear cut and regularly formed and which will not adhere to the mats and which will produce accurate impressions and have substantially longer life than plates produced by methods extensively utilized at this time.

A more specific object is the provision of a "cold top" half-tone etching method wherein a film of acid resisting ink is uniformly rolled upon the plate once or oftener during the "bites" or etching steps and is caused because of the manner in which applied and the manner in which the plate is treated to flow uniformly about the shoulders of the high lights, middle tones and shadows of the plate, producing clear, cut, pyramidal cups and assuring the depth to the middle tone and shadow portions of the plate.

These and other objects and advantages of the invention will be more fully set forth in the following description made in connection with the accompanying drawing, in which like reference characters refer to similar parts throughout the several views, and wherein:—

Fig. 1 is a cross section on a greatly magnified scale of a portion of a half-tone plate produced with my improved method, and

Fig. 2 is a similar enlarged cross section of a

half-tone plate produced by the well known "dragon blood" powder method.

With my method the sensitized metal plate usually constructed of zinc is printed or prepared from the negative in the usual manner. This plate is then treated with acid for a very short period, preferably not over a minute and I prefer to carry out this step in the conventional etching machine with the plate disposed horizontally and face downward. This gives sufficient depth around the dots or printing elements to enable the second step of my method to be successfully carried out. The plate is then washed with water to remove the acid therefrom. After the brief etching step or "first bite", the plate is disposed horizontally face up on a suitable support and I roll upon the face of this plate a very thin film of acid resisting ink. The ink is preferably applied by a large roller of greater length than the width of the plate and the ink may be supplied to the roller by a suitable pad or the like. It is essential that the acid-resisting ink utilized have adequate viscosity when heated for uniformly flowing about the shoulders of the impression portions and it is also essential that the ink dry or harden rapidly when the plate is cooled. While several different compositions have been used by me successfully and my method is in no sense limited to the use of the preparation here disclosed, I have found the following mixture satisfactory for the purposes intended.

One and one-half ($1\frac{1}{2}$) pounds of Litho black is first mixed with three-fourths ($\frac{3}{4}$) ounces of wool fat, this mixture constituting one part of the preparation. The second part is made up of one-half ($\frac{1}{2}$) ounce of beeswax and one (1) ounce of castor oil, thoroughly mixed together. Then the two parts, independently prepared, are thoroughly mixed together and heated until the consistency of cream is obtained. Thereafter a teaspoonful of pulverized asphaltum is added to the mixture and thoroughly mixed therewith.

Immediately after the first rolling, the plate is heated for a few seconds to melt and thin the ink and the plate is preferably disposed in horizontal position while being heated. Uniform heating of the plate is desired in order that uniform thinning and melting of the ink be assured and for accomplishing this uniform application of heat to all parts of the plate through the medium of a metal slab or top is desirable. The small period of time for heating is controlled in such manner that the ink will have time to uniformly flow over the shoulders of the impression por-

tions but will not reach or cover the bottoms of the depressions of the plate. After the requisite heating the plate is very quickly chilled by application in horizontal position to a cold pad or other chilling medium which causes the ink to very quickly harden with the shoulders of the impression portions nicely covered and the bottoms of the depressions uncovered. The plate is then returned to the etching machine, disposed horizontally and face downward and treated with the acid for a period of from one (1) to three (3) minutes. In some instances the plate need only be rolled with ink once and in other instances it is desirable to roll twice or even three times. The application of ink is repeated if this is desirable in the manner previously described, care being taken to first wash off the acid and the plate is again placed in the etching machine as before described for the requisite amount of time to etch to the depth required and to form the pyramidal cups. The length of time and number of etching operations and rolling is determined to a good extent by the amount of openness in the high light negative.

With my method the size of the dots and the depth of the depressions may be accurately controlled by examining the plate from time to time with a glass and continuing the etching as desired. It is impossible with the powder method or other methods known by me to control the depth of the cups and reduction of the dots.

After the desired reduction and depths are obtained, a "snap bite" is usually given the plate, usually not over twenty-five (25) to thirty (30) seconds application of the etching machine. This straightens up the side walls forming the high lights.

The plate is then washed with benzol to completely remove the ink and is then ready for use.

With my improved method as described the acid resistant is very perfectly and uniformly applied to the portions of the plate desired. The uniform flow of the ink, after application to the high points or face of the plate, protects the shoulders of the dots, prevents under-cutting in the subsequent acid treating steps and still leaves the bottoms of the cups or depressions uncovered. The cups formed in the high light portions of the plate are of symmetrical, pyramidal form defined by smooth surfaces and lines. The depressions in the middle tone and shadow portions of the plate are deep and smoothly and regularly formed, as illustrated in the drawing, Fig. 1.

An inspection of Fig. 2 shows the defects and irregularities in plates produced by the well-known "dragon blood" powder process. The brushing of the powder in different directions upon the plate is not uniform and fills up the recesses so that it is impossible to obtain deep cups in the middle tone or shadow portions. The surfaces formed by the etching, because of the irregularities in the powder and the lack of uniform distribution are rough and adhere to mats formed from such plates. Fig. 2 clearly illustrates the average zinc plate which is formed by the powder method.

With my improved plate, substantially perfect mats may be produced and the mats spring free of the plates and bear sharp impressions. Through my method very excellent middle tones and shadows can be produced in the subsequent printing and the size of the dots and the depth and size of the depressions may be controlled according to the wishes of the engraver.

As a result of exhaustive tests I have ascertained that substantially perfect half-tone plates may be completely etched, ready for printing or for making mats in approximately one-third the time required with the old "dragon blood" powder method.

What is claimed is:—

1. The method of etching a metal half-tone plate which consists in first subjecting a plate which has been printed from a negative to a very short preliminary acid treatment for the purpose of slightly depressing the portions surrounding the impression portions, then uniformly applying by roller action a thin film of acid-resisting fluid, heating the plate disposed face up in horizontal position for a very short interval to melt and thin the fluid and to permit the fluid to flow uniformly over the shoulders of the impression portions, then quickly chilling the plate to harden the fluid before it can flow over the bottom portions of the depressions and then subjecting the plate to a longer treatment of acid for the purpose of producing the desired printing depth.

2. The method of etching a metal half-tone plate which consists in first subjecting a plate which has been printed from a negative to a very short preliminary acid treatment for the purpose of slightly depressing the portions surrounding the impression portions, then uniformly applying, by roller action, a thin film of acid-resisting fluid to the treated plate, thinning the film of acid-resisting fluid with the plate disposed face up in horizontal position and then quickly hardening the fluid before it can flow over the bottom portions of the depressions and then subjecting the plate to a longer treatment of acid for the purpose of producing the desired printing depth.

3. The method of etching a metal half-tone plate which consists in first subjecting a plate which has been printed from a negative to a very short preliminary acid treatment for the purpose of slightly depressing the portions surrounding the impression portions, then uniformly applying a thin film of acid-resisting fluid to the impression portions of the treated plate, heating the plate disposed face up in horizontal position for a short interval to melt and thin the fluid and to permit the fluid to flow uniformly over the shoulders of the impression portions, then causing the fluid to harden before it can flow over the bottom portions of the impression and then subjecting the plate to a longer treatment of acid for the purpose of producing the desired printing depth.

ERNEST SCHERER.