A. C. MURRAY.

PROCESS FOR PRODUCING HALF TONE ENGRAVINGS.

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Fig. 1.

Fig. 2.

Fig. 3.

Witnesses.

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PROCESS FOR PRODUCING HALF-TONE ENGRAVINGS.


To all whom it may concern:

Be it known that I, ARTHUR C. MURRAY, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Processes for Producing Half-Tone Engravings, of which the following is a specification.

This invention relates to a process for producing half-tone engravings and has for its objects the bringing out of a more perfect definition of tone by using a paraffin or similar wax in place of a staging ink, which is now in common use, and to greatly decrease the cost of producing high grade half-tone engravings, and also obtaining more accurate and uniform results than have heretofore been possible.

In order to obtain a clearly defined picture with a satisfactory tone range, it is necessary to make successive etchings of different portions of the plate and to depend more or less upon skilled hand work. To properly understand my invention and its objects, the present general method of producing half-tone engravings will be briefly described.

The ordinary practice of the art is to first produce a half-tone negative of the picture or object to be reproduced, and from this half-tone negative a positive is produced upon a metal plate by any of the well known processes, and the picture being in the form of raised spots. To make this negative, the picture or object is photographed upon a sensitized plate, there being a screen interposed between the lens of the camera and the plate. In making this negative there is produced upon it opaque and transparent spots all over the same, and these spots vary relatively to each other in size according to the tone depths of the different portions of the picture or object to be reproduced in half-tone. It is also necessary to make the area of the transparent spots in the negative, larger than if a positive to be printed from it were to have the original tone range, and so a greater depth of tone is introduced.

The reason for introducing this greater depth of tone is that if only the required tone is given, the dark spots on the high lights of the picture will be so small that in etching the plate, the side walls of these spots will be entirely eaten away before a suitable depth for printing can be obtained.

After the positive plate has been obtained and a suitable acid resist formed on those portions of the plate which are not to be etched, the plate is given an etching for a certain length of time. This etching is what is known as a flat etching, and brings the darkest portions of the picture to the proper tone, while the lighter portions of the picture are still of too deep a tone.

The plate is then put into the hands of a "stager" who paints up all the dark portions of the illustration or picture on the plate, leaving open the high lights for further etching which increases the contrast in the resultant impression from the plate, as the more etching which a plate has, the lighter it becomes. Unless the half-tones or shading is protected by a suitable acid resist, the plate becomes flat, losing the contrast between the high light and shading. This staging is done by hand with the use of a brush and a flowing solution of printing ink, lithographic ink or other preparation which forms an acid resist. This is an operation that often requires from thirty minutes to two hours, depending upon the size and intricacy of the plate and the quality of the work desired.

The plate is now etched again and where more contrast between the shadows and high lights is desired, a third or fourth etching is made upon the plate. For the third etching, the deep shadows and darker half-tones are staged or protected by painting and so on for each successive etching until the high lights are sufficiently etched.

In my process the plate is prepared for the successive etching operations after the first etch in a manner to obtain better results in a shorter time and without the skill necessary in the ordinary practice just described.

For illustration, the drawing accompanying this specification has Figure 1 to show a plan view of an enlarged etched half-tone plate, which has been completed etched in two operations. Fig. 2 is a cross section of plate on line A—A of Fig. 1 after the first etch. Fig. 3 is a cross section of plate on line A—A after the second etch.

In Fig. 1, the deep shadows are shown at the left and having a large connected black surface with small white spots representing depressions. These white spots or depressions over distance 4, gradually increase in size toward the right until they become connected and form grooves, over
distance 6, which increase in size to the extreme right and so form the high lights, while at the same time the connected black surface 8 at the left has been broken up. 5 into disconnected dots 8 which become smaller toward the right as the grooves become larger. The distance represented by 1 might be called deep shadow, 2 middle tone and 3 a high light.

In Fig. 2, the wax 9 is shown held in the depressions 7 representing the deep shadows and middle tones over the distance 4 and wiped out clean in the high lights or open spaces between the dots 8 over the distance 5.

After the second etch as shown in Fig. 3, the depressions 7 over the distance 4 are the same size as in Fig. 2, as they were protected by the wax 9 and the disconnected dots 8 in Fig. 2 are etched fine to 8 as in Figs. 1 and 3.

My process consists of first making a negative and a positive and completing the first etch in the usual manner, then heating the plate and rubbing over it a block of paraffin wax, or similar preparation. The heat of the plate melts the wax, completely covering the plate with a wax film and filling up all of the etched portions. Then before the wax has had time to cool, the plate is rubbed over with a cloth and diagonally through the grooves 7 so the wax is removed from the more open spaces, or high lights, and leaves the wax in the dark portions of the plate. In this way all the portions of the plate to be given a second etch are cleaned while the portions which are sufficiently etched are protected. The plate is now cooled with water and the second etch proceeded with, which consists of laying the plate on a flat surface and scrubbing in the etching fluid with a bristle brush.

When necessary further successive etches can be made in like manner.

By my method, a more gradual change in tone value is given the plate by cleaning or wiping out the wax where a gradual or slower etch is desired between the dark shadows and the high lights. The wax is cleanly wiped out in the larger part of the grooves, or high lights, while still hot, and in the middle tones, having smaller spaces, a slight coating of wax remains. Then during the second etch, the brush gradually cleans out the thinly coated portions or middle tones and they receive a proportionally less etch.

Having thus described my process, what I claim is:

1. The improved process of making half-tone engravings, such process consisting in making a plate from a negative and giving it the first etch in the usual manner, then heating the plate and rubbing over it a block of paraffin wax, completely covering the plate and filling up all of the etched portions, then, while still hot, cleanly wiping out the wax from all the portions of said plate which are to be etched and lastly etching said plate in the usual manner.

2. In the art of producing half-tone plates, treating a plate to obtain a half-tone surface, applying to such surface a coating of paraffin or similar wax while in a heated condition, wiping such surface while still heated and removing the wax from the portion of said surface to be further etched, cooling said plate and etching the plate while thus prepared.

3. A method of producing half-tone plates, which consists in preparing a flat etched plate, heating the plate and applying a coating of paraffin or similar wax to fill up the etched surfaces, cleaning out the wax from the high lights and thinning out the wax from the middle tones while the plate is still heated, cooling said plate and applying an etching fluid in such a manner as to give a full etch to the high lights and to gradually clean out the wax in said middle tones and thereby give said middle tones a graduated etch according to their tone values.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

ARTHUR C. MURRAY.

Witnesses:

ANDREW T. BEASLEY,
LUCIAN C. JACKSON,