UNITED STATES PATENT OFFICE.

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.

1,154,643. Specification of Letters Patent. Patented Sept. 28, 1915.

No Drawing. Application filed January 26, 1914. Serial No. 814,534.

To all whom it may concern:

Be it known that I. EMIL LEITNER, 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 the art of making half tone printing plates, and in certain of its aspects it is especially applicable to the making of half tone copper printing plates.

Objects of the invention are to provide for artistic effects, and especially artistic effects attainable only with the use of the brush, in the introduction of high lights or "whites" in the half tone plate; to provide for rapid and inexpensive means for producing such artistic effects to produce such and similar effects without the use of engraving or routing tools or machines; to produce such and similar effects in combined half tone and line plates.

Other objects of invention will in part appear hereinafter, and in part will be obvious herefrom to those skilled in the art; said objects being attained in the manner or by the steps set forth in the appended claims.

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

In many classes of illustration work, it is exceedingly desirable to get pure whites or high lights, which are not attainable by the half tone process alone. It has been customary in the art to use engraving tools, routing tools, and similar instruments to cut away or engrave parts of a half tone surface. Such tool work requires men of special skill, and much time is consumed in thus working over the half tone plate to secure effects of the character described. This consumes a great deal of the time, making the process exceedingly lengthy, and the time involved, the skilled operatives required, and the other attendant causes very greatly increase the expense of producing such a printing plate.

In addition to the foregoing, it is impossible by the use of tools to produce the most artistic and desirable effects. The best effects are those produced by the use of the brush, or rather where the effect obtained resembles brush work to a degree which it is impossible to attain with either hand tools or machines. By my present process, I am able to fully realize these desirable effects, and at the same time to produce these effects in the plate with great rapidity and to do so by the use of the brush in connection with etching the surfaces, and to do so further by photo-mechanical means entirely in conjunction with such use of the brush.

The half tone plates may be produced in substantially the usual manner, namely, by the making of the half tone negative from an original copy of suitable character. The printing plate of metal, and preferably of copper is then prepared to receive in a suitable manner a light sensitive solution. The sensitizing of the plate is preferably effected in accordance with what is known as the enamel face or enamel top method, which gives a crisper and sharper plate.

The sensitizing solution is preferably French glue mixed with albumin and ammonium bichromate, dissolved in water. This solution is usually flowed over the surface of the plate and spread in a uniform layer by centrifugal action by whirling the plate, and subjecting it to heat to dry the solution in a coating or layer upon the surface of the plate. The sensitized plate is subjected to the action of light through the half tone negative and the surface is then developed in water in substantially the usual manner.

I am able to produce the desired effects either before or after the plate it etched. I preferably do so before the etching of the plate, as thereby the rolling up or protecting with a suitable resist of the other portions of the plate is more easily effected or accomplished.

A suitable aqueously soluble medium applicable with the brush is provided or such a medium soluble in a solvent which will not attack or dissolve the resist which is placed over the remainder of the plate. I also provide preferably, such a medium which is likewise pigmentous thereby to guide the eye in applying the medium to get the desired effects and gradations in the various parts of the plate. As such a medium, by way of example, I employ gamboge dissolved in water to a proper consistency to be applied by the brush. I apply the gamboge solution in the desired manner, and at the desired places in the printing plate, gradating same in a way which is only possible

by the use of the brush. The gamboge solution is permitted to dry upon the surface of the plate. The plate is then rolled up in any suitable ink, such as an etching ink, over its entire surface, and this layer serves as a resist on the surface of the plate. The plate is then dampened, or immersed in water, and where the layer of ink rests upon the gamboge it is removed by reason of the dissolution of the gamboge therebeneath. Where the ink is directly adherent upon the surface of the plate it is, of course, not affected by the water. The surface of the plate is completely protected by the ink coating or layer over all parts of the design except where the gamboge solution was applied, but where the gamboge solution was applied the surface of the plate is exposed. The plate is now subjected to a deep etch, which cuts away the surface of the plate as exposed and in the required or desired degree of gradation. The surface of the plate is then cleansed from the ink in any suitable manner, as by the application of turpentine or other suitable solvent, and by any other steps necessary or desirable to further cleanse the surface. The plate is then etched in the usual or other suitable manner to produce in the plate the half tone design, which in the case of a copper plate is usually done by an iron perchlorid solution.

The etching to produce the clear whites may occur subsequent to the half tone etching of the plate if desired, but it preferably is done first, as the application of the ink or other resist is more easily effected before the etching than afterward. Where the clear whites are put in after the etching, the ink or other resist must be rubbed down between the dots or screen figures so as to protect the low parts of the plate.

It will be understood that by the use of the foregoing process the combined half tone and line plate may be produced from a combined or assembled original, by painting in the parts of the line drawing, or those parts where a line effect is desired with the gamboge and thus eliminating from those parts the half tone dots or screen figures.

If will be understood from the foregoing that a process has been provided which realizes the advantages and objects of invention stated together with other objects and advantages, and that the delicate and artistic effects of brush work are realized by purely mechanical means, and at a small fraction of the expenditure of time and money required by hand or other tool work, while effecting results that are entirely unattainable thereby.

The invention, it will be understood, is not limited to the precise steps or materials described but variations may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention.

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

1. The process of making a printing plate which comprises sensitizing the surface of the plate, exposing said surface to light action through a negative, developing said surface after it is exposed, applying to parts of said surface by means of a brush a medium soluble in a given solvent, applying to said developed surface an acid resist insoluble in said solvent, applying said solvent to dissolve said soluble medium and to remove said resist where it overlies said medium to expose the surface of the plate, deep etching said exposed portions of the plate, and further preparing said plate for printing.

2. The process of producing a printing plate which comprises sensitizing the surface of the plate, exposing said surface to light action through a negative, developing said surface after it is exposed, applying to parts of said surface by means of a brush a pigmentous medium soluble in a given solvent, applying to said developed surface an acid resist insoluble in said solvent, applying said solvent to dissolve said soluble medium and to remove said resist where it overlies said soluble medium to expose the surface of the plate, deep etching said exposed portions of the plate, and further preparing said plate for printing.

3. The process of making a printing plate which comprises sensitizing the surface of the plate, exposing said surface to light action through a negative, developing said surface after it is exposed, applying to parts of said surface by means of a brush a medium soluble in water, applying to said surface an acid resist, applying water to said surface to dissolve said medium and to remove said resist where it overlies said medium to expose the surface of the plate, deep etching said exposed portions of the plate, and further preparing said plate for printing.

4. The process of making a printing plate which comprises sensitizing the surface of the plate, exposing said surface to light action through a negative, developing said surface after it is exposed, applying to parts of said surface by means of a brush a pigmentous medium soluble in water, applying to said surface an acid resist, applying water to said surface to dissolve said medium and to remove said resist where it overlies said medium to expose the surface of the plate, deep etching said exposed portions of the plate, and further preparing said plate for printing.

5. The process of making a printing plate which comprises sensitizing the surface of the plate, exposing said surface to light action through a half tone negative, developing said surface after it is exposed, applying

to parts of said surface by means of a brush a medium soluble in a given solvent, applying to said developed surface an acid resist insoluble in said solvent, applying said solvent to dissolve said soluble medium and to remove said resist where it overlies said medium to expose the surface of the plate, deep etching said exposed portions of the plate, and applying a half tone etch to the surface of said plate.

6. The process of making a printing plate which comprises sensitizing the surface of the plate, exposing said surface to light action through a half tone negative, developing said surface after it is exposed, applying to parts of said surface by means of a brush a medium soluble in water, applying to said surface an acid resist, applying water to said surface to dissolve said medium and to remove said resist where it overlies said medium to expose the surface of the plate, deep etching said exposed portions of the plate, and applying a half tone etch to the surface of said plate.

7. The process of making a printing plate which comprises sensitizing the surface of the plate, exposing said surface to light action through a negative, developing said surface after it is exposed, applying to parts of said surface by a medium soluble in a given solvent, applying to said developed surface an acid resist soluble in said solvent, applying said solvent to dissolve said soluble medium and to remove said resist where it overlies said medium to expose the surface of the plate, deep etching said exposed portions of the plate, and further preparing said plate for printing.

8. The process of making a printing plate which comprises sensitizing the surface of the plate, exposing said surface to light action through a negative, developing said surface after it is exposed, applying to parts of said surface a medium soluble in water, applying to said surface an acid resist, applying water to said surface to dissolve said medium and to remove said resist where it overlies said medium to expose the surface of the plate, deep etching said exposed portions of the plate, and further preparing said plate for printing.

9. The process of making a printing plate which comprises sensitizing the surface of the plate, exposing said surface to light action through a half tone negative, developing said surface after it is exposed, applying to parts of said surface a medium soluble in water, applying to said surface an acid resist, applying water to said surface to dissolve said medium and to remove said resist where it overlies said medium to expose the surface of the plate, deep etching said exposed portions of the plate, and applying a half tone etch to the surface of said plate.

10. The process of producing a printing plate which comprises sensitizing the surface of the plate, exposing said sensitized surface to the action of light through a design impressing instrumentality, developing said exposed surface, applying manually to portions of said surface after development a soluble layer, applying to said surface a layer of acid resistant material, dissolving said soluble layer and thus removing the overlying part of said acid resistant material, deep etching the portions of the plate surface so exposed, and preparing the surface of said plate for printing.

11. The process of producing a printing plate which comprises sensitizing the surface of the plate, exposing said sensitized surface to the action of light through a design impression instrumentality, developing said exposed surface, applying manually to portions of said surface after development a soluble pigmentous layer, applying to said surface a layer of acid resistant material, dissolving said soluble layer and thus removing therewith the overlying part of said acid resistant material, deep etching the portions of the plate so exposed, removing the acid resistant material, and preparing the surface of said plate for printing.

12. The process of making a half tone copper plate which comprises sensitizing the surface of the plate, exposing said surface to light action through a half tone negative, developing said exposed surface, applying to parts of said surface by means of a brush, a pigmentous aqueously soluble medium, applying to said developed surface of the plate an acid resistant insoluble in water, applying water to the surface of the plate to remove said aqueously soluble medium and the portion of the resist overlying the same, deep etching the parts of the plate thus exposed, and removing the resist and applying a half tone etch to the surface of the plate.

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

EMIL LEITNER.

Witnesses:
JOHN D. MORGAN,
AUGUSTIN J. POWERS.