Sept. 27, 1927. 1,643,526

F. STOCKINGER

PHOTO ENGRAVING PROCESS

Filed May 18, 1926

Fig. 1.

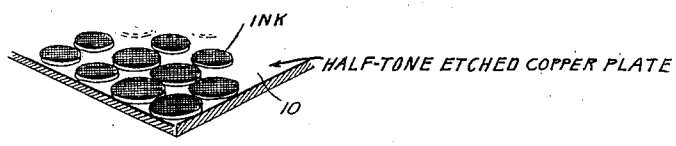


Fig. 2.

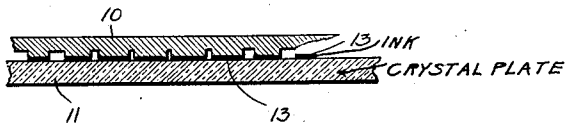


Fig. 3.



Fig. 4.



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UNITED STATES PATENT OFFICE.

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PHOTO-ENGRAVING PROCESS.

Application filed May 18, 1926. Serial No. 109,878.

This invention relates to a process of producing offset printing plates from photoengravers' cuts, and has for its object to provide an improved process in this art, which will give the maximum efficiency, and which will reduce the cost of production to a minimum.

Printing plates used in lithography and offset work and intended for printing in one color or in combinations of colors are produced by a series of steps which are well known and require no discussion here. It is well known to those skilled in the art that present methods are far from perfect, the difficulties being due to methods of proof transference, delicate handling required of the finished plates, and mainly to the short life of such plates in the presses.

Briefly stated, the present invention comprehends a process of producing offset printing plates from photoengravers' cuts which consists in, first rolling off a half tone etched copper plate with ink, then making an impression from the inked plate onto the surface of a sheet of crystal plate glass, the result being a positive impression, which is thereafter reproduced on the sensitive surface of a zinc plate. The zinc plate is developed and deeply etched and finally provided with a deposit of varnish or other similar medium. Further treatment of the plate removes all of the varnish except that deposited on the hollows of the engravings. The plate after being cleaned and polished is run off with ink and an impression made on the blanket of an offset press in the usual manner. The strength and character of the impression on the offset blanket, resulting from the process, make it possible to utilize substantially any grade and surfaced paper upon which impressions may be taken. The life of the offset plate is considerably lengthened because the deeply etched subject in half tone is subjected to practically no wear, while ordinary printing plates, comprising a raised printing surface, become worn in the high lights and as a consequence no impression is made on the offset blanket in the course of a long run.

The object obtained by the present invention has been sought by others, and so far as I am aware the closest approximation to my method is one in which a sheet of celluloid or solidified transparent gelatin is utilized as a reproducing body to produce a printing plate, but the inherent nature of celluloid and the steps necessary to carry out the process in the use of celluloid render the prior art method impractical. One of the essential difficulties with the prior art method is due mainly to the action of certain chemicals on the celluloid, which warps and becomes otherwise distorted under the treatment.

After exhaustive experiments with the object of overcoming the difficulties above pointed out, I concluded that the solution of the problem was to be found in the use of a proper medium to reproduce the half tone copper plate onto the offset zinc plate. Going a step further and taking into account the fact that while the celluloid is transparent, with the use of such proper medium, the celluloid still became distorted under the chemical treatment to which it was subjected, the solution again pointed in the direction of a different material than celluloid. I then discovered that by replacing the celluloid by crystal plate glass and subjecting the same to a new method of operation, the offset plates obtained by the improved process are practically indestructible and as a consequence the impressions made in the high lights of a subject remain constant throughout the life of the plate. The use of the crystal plates also insures perfect register where more than one color is used in the offset work, and because of the weight of the impressions obtained from the plates, each copy of the run of prints, has a depth of color and shade gradation which it is not possible to obtain by any of the processes now used in this art.

The present invention consisting of the novel methods, steps and processes hereinafter described and claimed, will be more easily comprehended if taken in connection with the illustrations in the accompanying drawings, in which, Figure 1 is a fragmentary perspective view of a copper plate having an object etched in relief on its surface, the same having been rolled off with a printing ink as a step in the present process; Figure 2 is a substantially cross sectional view of the inked copper plate superimposed on the surface of a sheet of crystal glass; Figure 3 is a fragmentary perspective view of a zinc negative obtained by exposure of light through the glass reproduction, and Figure 4 is a substantially sectional view through

the final etched zinc negative plate illustrating the deposit of varnish over the bottom walls of the etched dots.

In carrying out my improved process, a half tone copper plate is etched so as to render the subject in relief, the plate being similar to those used ordinarily for typographical printing purposes. The etched copper plate is then thoroughly cleansed and polished and rolled off with a stiff grade of ink. The inked plate is superimposed on a prepared sheet of perfectly flat crystal plate which is arranged on the bed of a press. The plate is pressed against the crystal plate to cause the ink to be transferred to the surface of the crystal.

The crystal plate then virtually becomes a positive of the object. An application of lamp-black to the inked surface and a subsequent application of talcum to remove surplus ink, places the crystal reproducing body in readiness for use. A zinc plate is then prepared and its sensitized surface is placed under the crystal plate. An exposure is then made and the zinc plate developed and etched to a depth of substantially .002 or .003 of an inch. The result of these steps is a plate having a design represented by hollows corresponding to the spaces between the lines of the process screen. The etched surface of the zinc plate is finally given an application of ink shedding varnish and then treated to remove the varnish from the non-design portion. This treatment leaves a film of the varnish in the hollows of the engravings. The plate is then ready for an application of ink, which is confined to the hollows of the engraving, and which may be drawn off from the varnish film and deposited on the offset blanket of a press in the usual manner.

Negatives produced after the manner described above are for all practical purposes perfect reproductions of the original plates, so that a plurality of printing plates produced to reproduce in two or more colors are insured perfect register. The finished negatives having the deeply etched hollows are not destroyed by allowing the ink to become dry on the surface, as is the case with plates having the printing surface in relief, because in the event that dry ink is allowed to adhere to the printing surface all that is necessary to do is to wash and etch the surface again making the plate ready for the press.

In the accompanying drawings, I have illustratively exemplified a simple etched plate, a crystal plate having an impression of the design of the etched plate, and a negative plate. The half tone etched copper plate is 10, the crystal plate 11, and the negative zinc printing plate 12. The inked design on the crystal plate 11 is 13 and the varnish deposit in the hollows of the engraving in the zinc plate 12 is 14.

Having set forth of what my invention consists and the nature in which it is practiced, what I claim and desire by Letters Patent is:—

1. The process of producing offset printing plates from photoengravers' cuts, which consists in making an ink impression of a design onto a rigid transparent plate, thereafter exposing a sensitized surface of a printing plate under said transparent plate, and treating the exposed surface to produce an ink shedding printing surface.

2. The process of producing offset printing plates from photoengravers' cuts, which consists in preparing a plate with the design etched in relief, then rolling off the design with ink, making an impression of said inked design onto a rigid transparent crystal plate, thereafter exposing a sensitized surface of a printing plate under said transparent plate, and finally treating the exposed surface to produce an ink shedding printing surface.

3. The process of producing offset printing plates from photoengravers' cuts, which consists in preparing a plate with the design etched in relief, then rolling off the design with ink, making an impression of said inked design onto the surface of a rigid transparent crystal plate, applying an opaque substance to the ink impression on the transparent plate and then removing the surplus opaque substance from the non-design surface of the transparent plate, preparing a printing plate and exposing the sensitized surface of same under the transparent plate, and thereafter treating the exposed surface to produce an ink shedding printing surface.

4. The process of producing an offset printing plate from photoengravers' cuts which consists in preparing a half tone etched plate having the design in relief, rolling off the design with a stiff ink, preparing a rigid transparent crystal plate, then impressing said inked plate onto the transparent crystal plate to transfer the ink design to the surface of said transparent plate, applying opaque powder to the surface of the transparent plate and removing the surplus from the non-design portions of the surface, preparing an offset printing plate, thereafter exposing the sensitized surface of the offset plate under the transparent plate, and finally treating the exposed surface to produce an ink shedding printing surface.

5. The process of producing offset printing plates from photoengravers' cuts, which consists in printing a design in half tone onto the surfaces of a rigid transparent reproducing body thereafter utilizing said body to produce a printing plate, and finally treating the printing plate to produce an ink shedding film in the hollows of the engraving.

6. The process of producing offset print-

ing plates from photoengravers' cuts, which consists in preparing a half tone plate with the design etched in relief, rolling off the design with ink, impressing the inked plate on the surface of a transparent glass plate, treating the impression to intensify the design, preparing a zinc plate and exposing the sensitized surface thereof under said glass plate, preparing the exposed surface to produce a printing surface having a design etched deeply therein, applying an ink shedding varnish to the etched surface of the printing surface and thereafter treating the varnish to remove all thereof except the portions in the hollows of the etched engraving.

In testimony whereof I affix my signature.

FRANZ STOCKINGER.