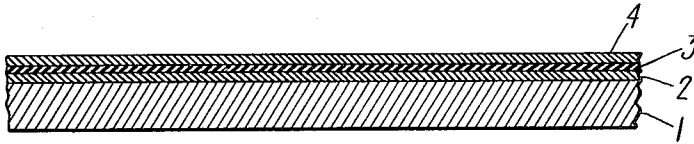


C. P. BROWNING.
PHOTO ENGRAVING.
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Patented Nov. 19, 1918.



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PHOTO-ENGRAVING.

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To all whom it may concern:

Be it known that I, CLARENCE P. BROWNING, a citizen of the United States, residing in New York city, borough of Brooklyn, 5 county of Kings, State of New York, have invented certain new and useful Improvements in Photo-Engraving, of which the following is a specification.

My invention relates to photo-engraving 10 and has particular reference to certain processes and instrumentalities by which the present methods of procedure may be shortened by the elimination of certain steps which, so far as I am aware, have hitherto 15 been regarded as essential. As is well known, it has been the practice in making either a half-tone or a line cut plate first to make a negative, then to strip this from its glass backing, reversing it and applying it 20 to another glass plate, then to make a contact print of this reversed negative upon a metal plate of zinc or copper sensitized with a bichromate solution. Thereafter the bichromate coating is developed, and after 25 other well-known steps have been taken to protect the plate, the latter is etched with any suitable acid. I have discovered that it is unnecessary to use two coated plates, first, the plate with the rapid silver emulsion, and, 30 second, the zinc plate coated with ammonium bichromate or other slow light-sensitive substance and the usual coating of gelatin, albumen or the like. I combine in a single structure the two sensitized coatings, 35 superimposing them upon the metallic plate and separating them by a suitable substance. I am thus enabled to eliminate entirely the step of stripping and reversing the negative.

The accompanying drawing, which forms 40 a part of this specification, is a diagrammatic, sectional view of an embodiment of my invention, in which the numeral 1 designates a metallic plate of zinc or copper, carrying a coating 2 of ammonium bichromate 45 or other comparatively sluggish light sensitive substance. Over this bichromate coating is placed a coating 3 of a transparent, waterproof substance, such as may be obtained by flowing a rubber solution over the 50 bichromate. A final coating 4 of silver emulsion or any suitable substance which is extremely active photographically is then placed over the coating 3. In practising my invention, I therefore preferably use a support 55 consisting of the metallic plate (which is eventually to furnish a half-tone or line

cut, as the case may be) carrying the bichromate coating with which it is supplied, in the ordinary processes of photo-engraving, and spaced from the bichromate coating by 60 the rubber or other suitable transparent substance, is the extremely rapid silver emulsion. There is thus provided upon the single support, namely, the metallic plate, the two photographic coatings which are to be 65 used in the manner to be described below in completing the process of photo-engraving, and these are spaced by a transparent, waterproof coating.

For the purpose of simplicity the use of 70 such a plate will be described in connection with the making of a line cut, but it will be obvious how such a plate can be used in a similar way in engraving a half-tone.

The plate provided with the three coat- 75 ings is placed in a plate holder, this, of course, being done in a dark room, because of the extreme sensitivity of the silver emulsion to light. The plate is then exposed in a camera in the usual way for the making 80 of a negative, and after it has been exposed for the proper period it is removed in the plate holder to the dark room and there subjected to development in the customary fashion. Any suitable developer which is 85 adapted to be used with the particular emulsion with which the plate is coated may be utilized.

After development is completed a suitable intensifying solution, such as copper sul- 90 fate, followed by the usual silver solution may be flowed over the plate, as is customary in the making of a half-tone negative, or a mercuric chlorid solution followed by a solution of potassium sulfid, as is customary 95 in the making of a line negative. These steps result in producing an intensified negative upon the plate without in any way appreciably affecting the bichromate coating which is beneath such negative. The coat- 100 ing of rubber solution which separates the two light-sensitive coatings prevents any liquid from reaching the bichromate during the processes of development and intensification of the silver emulsion, and the short ex- 105 posure which is sufficient to expose the silver emulsion fully has no appreciable effect upon the bichromate. The result is a fully exposed developed and intensified negative superimposed upon a light-sensitive bichro- 110 mate coating and separated from it by a layer of transparent waterproof substance.

When the process has reached this stage the plate may safely be removed from the dark room and a proper exposure is then given it in order to make a print from the negative upon the bichromate coating which is beneath it. Since the rubber coating between the negative and the bichromate is transparent, the rubber in no way impedes this step in the process.

10 After the bichromate has been exposed to strong light for a sufficient period, the silver negative film may be removed from the plate by washing it in any suitable solution, such as ether or alcohol. The next step is 15 to strip off the rubber coating by dissolving it in some suitable solvent, such as benzin or kerosene. These steps may preferably be combined by immersing the plate at once in benzin or kerosene, thereby dissolving off 20 the rubber which takes with it the silver negative. This leaves the metallic plate with a single coating of adequately exposed bichromate ready for development and for the remaining steps in the photo-engraving 25 process, which, briefly, may be rolling in photo-engraving ink, developing in water, or if enamel, developed by a strong force of water under a tap, powdering in dragon's blood and etching in acid. These steps are 30 all well known and need not be described in detail.

As has already been stated, such added steps as are necessary to adapt the process to half-tone photo-engraving will be obvious 35 to those skilled in the art, and therefore will not be set forth at large.

I realize that my invention is susceptible

of wide adaptation and use, and I do not desire to be limited to the precise details of operation, nor to the particular substances set forth in the foregoing description.

Having thus described my invention, I claim:—

1. The process of making a photo-engraving upon a metallic plate provided with a 45 light sensitive coating of low sensitiveness, a superimposed transparent protecting coating, and a third superimposed light sensitive coating of relatively high sensitiveness, which process consists in exposing the plate 50 to light for sufficient time to affect the coating of high sensitiveness but not the coating of low sensitiveness, developing the image in the coating of high sensitiveness while the protecting coating protects the coating of 55 low sensitiveness from action of the developer, printing through the negative thus formed a positive image upon the coating of low sensitiveness, removing the negative and protecting coating, developing the positive 60 image in the coating of the low sensitiveness to form a resist and then etching the metal plate.

2. A photographic plate comprising an etchable metallic plate having thereon a 65 light sensitive coating of relatively low sensitiveness and capable, after exposure and developing, of forming a resist, a second coating comprising a transparent water-proof substance, superimposed thereon, and 70 a third coating of relatively high sensitiveness superimposed on said second coating.

CLARENCE P. BROWNING.