

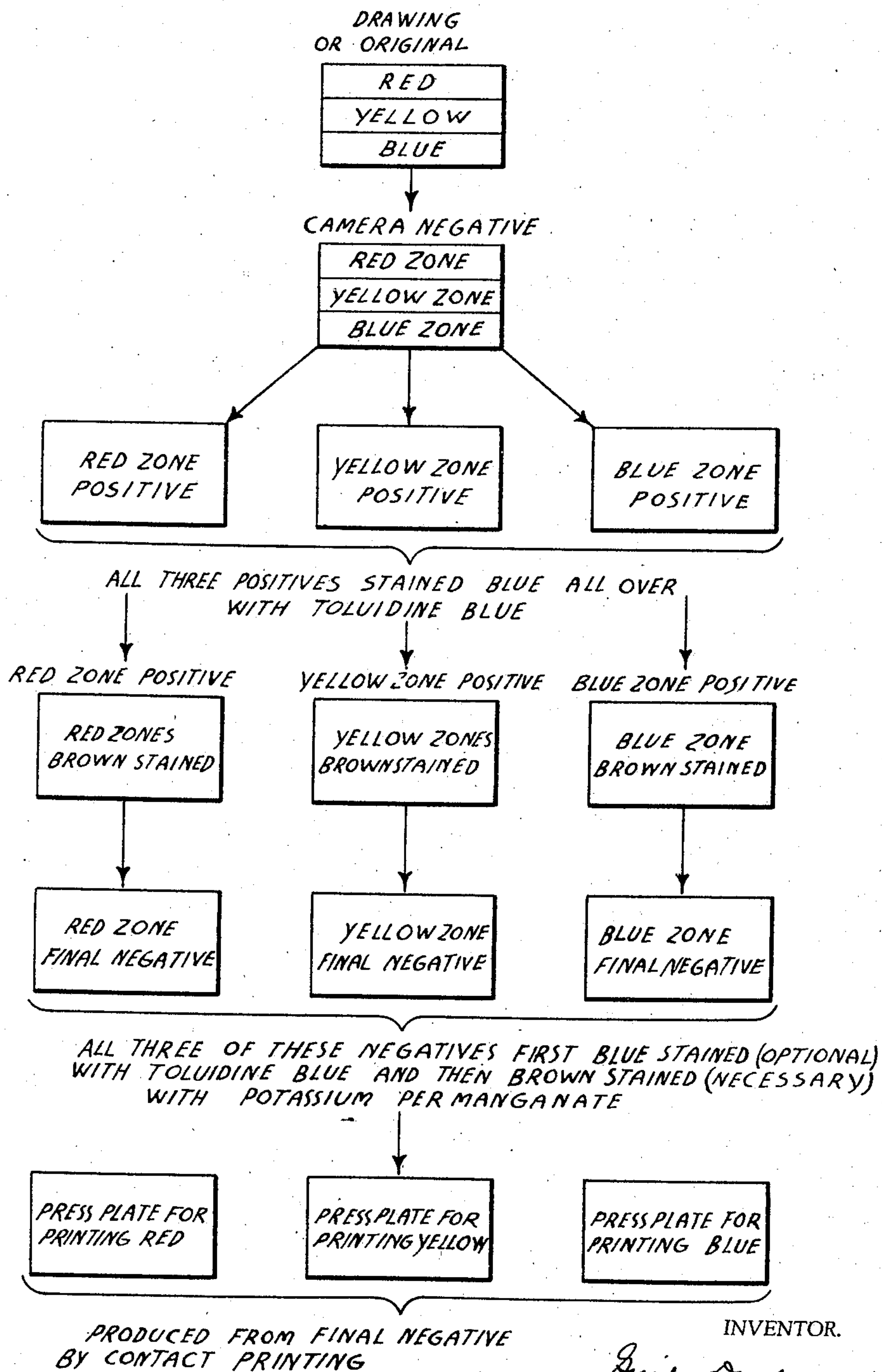
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G. DAUB

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PROCESS OF PRODUCING PRESS PLATES

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PROCESS OF PRODUCING PRESS PLATES

Guido Daub, Milwaukee, Wis., assignor to The
Gugler Lithographic Company, Milwaukee,
Wis., a corporation of Wisconsin

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8 Claims. (Cl. 95—5.1)

This invention relates to the production of the final negatives utilized for making the printing of press plates used for multi-colored print.

In multi-color printing, as, for example, printing labels having a number of colors, for instance, three, three distinct press plates are employed, that is, one press plate for each color. If, for example, the label has yellow portions, red portions and blue portions, there will be one press plate for the yellow portion, one for the red and one for the blue. Of course, in the resulting label the several colored portions which are separately printed are accurately registered and have the appearance of having been produced by a single printing operation.

One of the principal objects of the present invention is to facilitate the production of the final negatives used for making the printing or press plates and to insure accurate color registration in the final production.

It is to be understood that the positives and negatives referred to in this description and used in this process consist of a sheet or plate of glass having a sensitized coating applied to one surface thereof. The sensitized coating is constituted of colloid, such as albumen or the like, containing a bichromate such as bichromate of ammonia. As is well known, when portions of such a sensitized coating are exposed to light, such portions will be hardened whereas portions not exposed to light will remain in their original soft or soluble condition and can be removed in a developing or washing process.

The drawing accompanying this application diagrammatically indicates the steps of the process for carrying out the present invention.

As indicated in the drawing, in carrying out the process of the present invention, an original, which may be a sketch or drawing made by an artist, is first photographed and, of course, an ordinary camera negative is produced. The ordinary camera negative so produced may be one made upon a silver halide gelatin emulsion and consisting of a metallic silver image imbedded in gelatin, albumen, or some other carrier.

From this camera negative as many positives are made as there are colors involved in the final production. In the example indicated in the drawing, three colors are involved, that is, red, yellow and blue, and therefore three positives are produced from the camera negative, the positives being identified on the drawing as "red zone positive", "yellow zone positive" and "blue zone positive".

These positives are produced by conventional

and well known contact printing operations on a support of transparent material, such as a sheet of glass, which support carries a coating of a bichromate sensitized material.

As a result of the exposure involved in the contact printing, each positive consists of a support bare in the unexposed areas and covered with transparent hardened albumen in the exposed areas. The bichromate type of emulsion does not, however, change color or relative opacity to a marked degree upon exposure.

At this point the first novel feature is introduced into the process and that is the staining of the positives or the albumen images thereon blue by immersing each of the three positives in a dye-stuff known commercially as toluidine blue. Blue staining in this manner renders the images of each of the positives readily discernible and thus prepares the positives for the subsequent operations or steps.

After the three positives are stained blue they are separately touched up by an operator with a solution of potassium permanganate.

A suitable potassium permanganate solution may be made by dissolving 3.25 grams of potassium permanganate in 100 cubic centimeters of water.

The red zone positive has the red zone or zones thereof stained brown and this is accomplished by the operator painting such red zone or zones by means of a brush or otherwise with the solution of potassium permanganate. The yellow zone or zones of the yellow zone positive and the blue zone or zones of the blue zone positive are stained brown in a similar manner.

The brown stain reacts with the hardened portions of the coating making up the image of the zone to which it is applied in such manner as to cause such hardened coating to be so modified or conditioned as to be capable of intercepting the light waves that are active in producing changes in sensitized coatings. The brown stain will not adhere to and does not discolor any of the clear glass areas of the positives. However, the brown stain zones have been so modified that they are now capable of printing, the requisite contrast for printing being provided by the brown staining.

From these positives, negatives are produced by conventional contact printing operation. Thus, as indicated in the drawing, a red zone final negative is printed from the brown stained red zone positive, the yellow zone final negative from the similarly conditioned yellow zone posi-

tive and a blue zone final negative from the blue zone positive.

In the instance of either one of these positives, only the brown stain zones or portions thereof will be effective to print on the portions of the final negatives which underlie them. The remainder of each positive, that is, the portions outside of the brown stain zones will not have sufficient contrast to print on the negative and all of the negative underlying such remainder will be exposed to light and have its coating covered with transparent hardened albumen after exposure. That portion of the negative which underlies the brown stained zones of the positive will have portions exposed to light and hardened, and other portions unexposed to light and consequently bare or clear when the negative is developed.

It is true that the portions of the image reproduced or printed on the negatives are not as yet readily discernible or printable, since this type of emulsion, as previously pointed out, does not change color or relative opacity to a marked degree upon exposure. If it is desirable to make such portions of the image discernible, this may be done by staining a negative with toluidine blue. In order to make such portions printable, they must be brown stained, that is, the negative must be immersed in a solution of potassium permanganate.

The negatives produced in this manner are used in producing the press or printing plates employed for printing the several colored portions of the image. These so-called press or printing plates usually comprise a metal plate such as a zinc plate having a bichromated albumen coating which is hardened under the influence of light striking against the same after passing through a negative so that the light-struck portions are ink receptive while the non-light-struck portions are water receptive and ink repellent.

To produce the press plates or printing plates from the final negatives, the negatives are placed in contact with the sensitized coating surfaces of the zinc plates in the so-called directoplate printing machine and after exposure and subsequent treatment the images of the color zones of each negative are transferred to the printing or press plates to make certain areas thereof ink receptive and others ink repellent, as previously pointed out.

In general, it will be seen that the invention proposes to utilize the properties of that type of sensitized element wherein the support is a sheet of transparent material and wherein color or relative opacity of the sensitized emulsion is not changed to a marked degree upon exposure, all for the purpose of facilitating the production of press plates or final negatives for making such plates for multi-colored printing. The invention utilizes these properties of such a sensitized element first by rendering the image thereof after exposure and development discernible though not printable. This makes practical the selection of certain zones or portions of the image for printing. The conversion of the selected portions or zones from a non-printable to a printable condition is effected by brown staining. Such is believed to represent the broader aspects of the invention, although in the process specifically described, the intermediate sensitized elements (the positives and final negatives referred to in the foregoing detailed description) are, in each instance, made up of a transparent support coated with albumen sensitized with bi-

chromate. The printing or press plates also preferably have coatings of bichromated albumen but the plate or support of such is zinc or the like rather than a transparent substance such as glass. Similarly, in the process specifically described, the reagents for blue staining and brown staining are preferably, respectively toluidine blue and a solution of potassium permanganate. Other substances, however having equivalent properties and capable of functioning in substantially the same manner to produce the same results are contemplated by the present invention. As to the ordinary camera negative referred to in the foregoing specification, it is now apparent that all it need be is a reproduction of the original of such character as to be capable of printing to produce positives of the type having a transparent support coated with a bichromated albumen or the like.

With this process it is easy to utilize the conventional registry marks or crosses from the camera negative onto the positive and final negative to the press plates thereby insuring accurate registration in the final printing operation.

The process described in detail has been selected for the purpose of illustration and example and is subject to a number of variations as will be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the subjoined claims.

The invention claimed is:

1. The hereindescribed process of producing final negatives for use in making multi-colored printing plates comprising making on transparent material having a coating of sensitized bichromate emulsion as many positives as there are colors to be reproduced, staining each of said positives to render the images thereof discernible while maintaining them non-printable, dark staining selected color zones on the several positives to render the images of the selected color zones of each positive printable, printing similar negatives from said positives and then similarly dark staining said negatives.

2. The hereindescribed process of producing final negatives for use in making multi-colored printing plates comprising making on transparent material having a coating of sensitized bichromate emulsion as many positives as there are colors to be reproduced, blue staining each of said positives with toluidine blue to render the images thereof discernible while maintaining them non-printable, brown staining with potassium permanganate selected color zones on the several positives to render the images of the selected zones only of each positive printable, printing similar negatives from said positives and then similarly brown staining said negatives.

3. The hereindescribed process of making printing plates which consists in photographing an original to produce a negative, printing on transparent material having a coating of sensitized bichromate albumen emulsion, as many positives from said negative as there are colors to be reproduced, staining all of the positives to render the images thereof discernible while maintaining the same non-printable, dark staining a color zone on each of said positives to render said color zone printable, printing a negative on transparent material having a coating of sensitized bichromated albumen emulsion, from each positive, whereby on each of said last-named negatives the color zones only of the respective positives are printed and the remaining portions

of said last-named negatives are covered entirely with transparent, hardened albumen, staining all of the transparent, hardened albumen of said negatives and then making a printing plate from each of said negatives.

4. The hereindescribed process of making printing plates which consists in photographing an original to produce an ordinary camera negative, contact printing, on transparent material having a coating of sensitized bichromated albumen emulsion, as many positives from said camera negative as there are colors to be reproduced, blue staining with toluidine blue all of the positives to render the images thereof discernible while maintaining the same non-printable, brown staining with a solution of potassium permanganate a selected color zone on each of said positives to render said selected color zones printable, contact printing a negative, on transparent material having a coating of sensitized bichromated albumen emulsion, from each positive whereby on each of said last-named negatives the color zones only of the respective positions are printed and the remaining portions of said last-named negatives are covered with transparent, hardened albumen, brown staining all of the transparent, hardened albumen of said last-named negatives with a solution of potassium permanganate and making a printing plate on a metal sheet having a coating of bichromated albumen from each of said negatives and by contact printing whereby the portions of the printing plates corresponding to the brown stained, hardened albumen of the negatives will be rendered ink repellent and water receptive and all other portions of said printing plates ink receptive.

5. In the art of color printing, steps incident to the production of printing plates which consist in staining an image, produced in the sensitized coating of a sheet of transparent material of the type wherein color or relative opacity is not changed to a marked degree upon exposure, for the purpose of rendering the image clearly discernible while preserving the same non-

printable and then dark staining a color zone of said image to render said zone only thereof printable.

6. In the art of color printing, the steps incident to the production of printing plates which consist in blue staining an image, produced in the sensitized coating of a sheet of transparent material of the type wherein color or relative opacity is not changed to a marked degree upon exposure, for the purpose of rendering the image discernible while preserving the same non-printable and then brown staining the color zone of said image to render the hardened portions of the coating of said zone only substantially non-actinic whereby said zone only may be printed.

7. The hereindescribed process for producing printing plates for multi-colored printing which consists in making photographic positives having on a sheet of transparent material a sensitized coating of the type wherein color or relative opacity is not changed to a marked degree upon exposure and equal in number to the number of colors employed, blue staining all of the positives to render the images thereof discernible while maintaining them non-printable, and dark staining on each positive portions corresponding to each color zone, one color zone being dark stained on one positive and other color zones being dark stained on other positives whereby to render a color zone on each positive printable while leaving the remainder of each positive non-printable and thereafter printing from the positives to produce the printing plates.

8. The hereindescribed process for making final negatives suitable for use in the production of printing plates, which process consists in preparing a positive on a transparent support carrying a coating sensitized with bichromate, staining said positive to render the image thereof discernible while maintaining it non-printable, dark staining a selected portion of said positive to render such selected portion printable, producing a similar negative from said positive and dark staining said negative.

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