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PHOTOGRAPH AND METHOD OF MAKING THE SAME

Filed Aug. 27, 1925

Fig. 1.

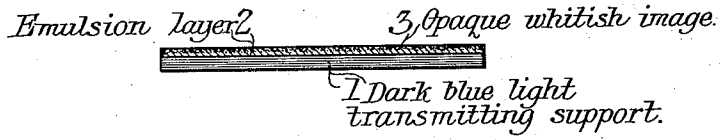
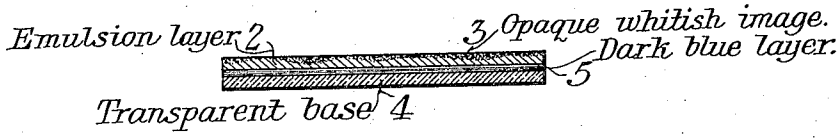


Fig. 2.



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UNITED STATES PATENT OFFICE.

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PHOTOGRAPH AND METHOD OF MAKING THE SAME.

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This invention relates to photography and more particularly to the formation in a single process of a photograph that can be used both as a negative and as a positive. To obtain this result, I use as the support for the photograph a material which visually is very dark and indeed may approach opacity while it is capable of transmitting considerable light of wave lengths to which ordinary photographic emulsions are sensitive. In an emulsion on such a support is formed a photographic image which is preferably whitish by reflected light. While it is of considerable density so that the image is negative by transmitted light, it is positive when viewed by reflected light.

Reference will now be made to the accompanying drawing in which

Fig. 1 is a section on an enlarged scale of one embodiment of my invention and Fig. 2 is a section of a second embodiment.

In the example shown in Figure 1, the base or support 1 is made of a light transmitting material such as glass or celluloid, in which there is incorporated dye or light absorbent material preferably of very dark blue color. When viewed by ordinary light, it appears to be so dark as to be almost or quite opaque. It is, however, capable of transmitting light in the blue and violet region of the spectrum. Upon this support is an emulsion layer 2 which is preferably of the ordinary gelatine bromide type. In the second embodiment of my invention, the base 4 is transparent but has upon one surface a layer 5 which may be of gelatine or other colloid in which is incorporated a dye having the properties mentioned, and upon the support which consists of these two layers there is placed an emulsion layer 2.

This photographic element is exposed in a camera or other photographic apparatus to a light image and is treated in photographic baths so as to transform the affected particles into a permanent image 3, which is preferably of a whitish color and of sufficient opacity to be used as a printing image for the making of photographic copies, and where I use the term "opaque" I mean an opacity of this extent.

This image may be formed in one of several ways. One method is by development in a bath of the type well known in the literature for the making of images by the Ferrotype process. A typical method of procedure is as follows.

The following baths are prepared:

Bath A.

	Parts.
Sodium thiosulfate	4
Water	20

Bath B.

Sodium carbonate	200
Sodium sulphite	100
Hydroquinone	12.5
Potassium bromide	29
Bath (A)	25
Warm water to	1000

In the above formulæ the parts are by weight. Bath B is allowed to stand for two days and the clear solution is poured off for use. The exposed sensitive plate is developed in bath B until the high lights and halftones are well out, and the plate is then rinsed in water and fixed in Bath A. Both the development and fixing take place in a very short time at normal temperatures. The resulting image is whitish in appearance and appears as a positive with a dark ground when viewed as an ordinary photograph. Many modifications of this bath have been described in the literature and may be used in carrying out the process.

A second method is by development in any well known developer such as those of the Pyro or "M. Q." type, no one formula being preferred, followed by the ordinary fixing bath of sodium thiosulfate and by a bleach bath such as the following:

	Parts.
Potassium bromide	23
Mercury bichloride	23
Water to	1000

The resulting image is as before whitish in appearance and of sufficient opacity to constitute a printing negative.

The above process has been found particularly useful for aerial work, particularly where the greatest possible speed is required as for military purposes. The image obtained appears as a positive upon a dark ground and can be viewed at once without the necessity of first making a print. Moreover, the first process described is extremely rapid

in action and can be carried on in the air and the completed photograph, if on film, can be dropped to the earth and viewed within a few minutes after exposure.

It is obvious that numerous modifications and equivalents are possible, and I contemplate these as a part of my invention and included within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A photograph comprising a support that is absorptive of a high percentage of visible light rays but is capable of transmitting photographically actinic light rays, and a layer thereon containing an image that is substantially opaque but is of a light appearance by reflected light, whereby the photograph is capable of use as a photographic printing negative by transmitted light, but the image appears as a positive upon a dark ground when viewed by reflected light.

2. A photograph comprising a support that transmits only photographically actinic light in a limited portion of the spectrum and that appears very dark and a layer upon one surface of the support containing a photographically formed image that is substantially opaque but is of a light appearance by reflected light.

3. The method of forming a direct positive capable of use as a photographic printing negative that comprises the exposure to a light image of a sensitive layer carried on a support that transmits principally photographically actinic light and the transformation of the sensitive portions thus exposed into an image that is substantially opaque to transmitted light but is of a light appearance by reflected light.

4. The method of forming a direct positive capable of use as a photographic printing negative that comprises the exposure to a light image of a layer containing sensitive silver salts carried on a support that transmits only photographically actinic light and the transformation of the exposed silver salts into an image that is of a light appearance by reflected light but substantially opaque to transmitted light.

Signed at Rochester, New York, this 19th day of Aug., 1925.

SAMUEL E. SHEPPARD