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A. W. CORNELL

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PHOTOLITHOGRAPHIC PLATE

Original Filed Oct. 8, 1928

Fig. 1.

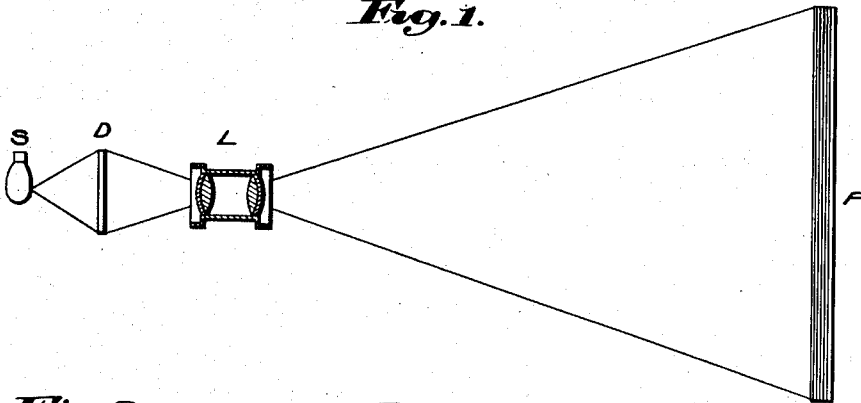


Fig. 2.

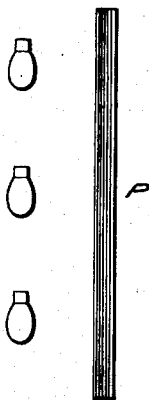


Fig. 3.

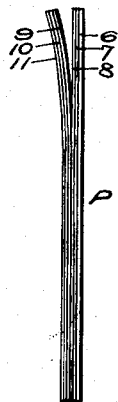
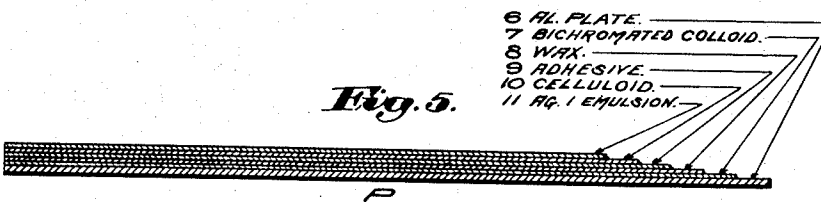


Fig. 4.



Fig. 5.



6 AL. PLATE.
7 BICHROMATED COLLOID.
8 WAX.
9 ADHESIVE.
10 CELLULOSE.
11 FIG. 1 EMULSION.

Inventor:
Arthur W. Cornell.
by Emory, Booth, Jarney & Lane
Attys

UNITED STATES PATENT OFFICE

ARTHUR W. CORNELL, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO FORBES LITHOGRAPH MANUFACTURING COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS

PHOTOLITHOGRAPHIC PLATE

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This invention relates to the production of printing plates, and the purpose is to provide an improved double-coated sensitized plate facilitating the photographic production of press plates for use in printing processes, as, for example, in lithography. While not limited thereto, my invention finds a particular application in the production of press plates of large size. My invention may be understood from the following description of an illustrative embodiment thereof taken in connection with the accompanying drawing, wherein:

Fig. 1 is a diagrammatic view of an arrangement for forming a photographic image on the plate;

Figs. 2 and 3 are diagrammatic views of subsequent steps;

Fig. 4 is a diagrammatic view of a completed press plate; and

Fig. 5 is a section on an enlarged scale through a plate embodying the invention with parts successively broken away.

In all the figures the relative proportion of the parts is unreal and diagrammatic.

In accordance with my invention I provide a novel actinically sensitive plate and to facilitate an understanding of the principles of the invention I will first describe didactically a preferred construction of such plate and thereafter indicate the manner in which it may be used from which it will appear how the specific form illustrates the principles of the invention.

Referring to Fig. 5, the sensitized plate P illustrated comprises the support 6 which preferably takes the form of a metal plate of aluminum or other metal, such as is commonly used in printing presses, on which is applied the layer 7 of bichromated albumen. The layer 7 is provided with a very thin, protective coating 8 of paraffin of uniform thickness. Adhesively secured to the face of the paraffin layer is a pellicle 10 of celluloid (pyroxylin) and on this is secured in the manner customary in the art a light sensitive layer 11 of high actinic sensitivity, conveniently an ordinary wet plate emulsion embodying silver iodide. The pellicle 10 may be secured to the face of the wax layer by the use of a

solution of rosin and turpentine which is applied to the pellicle and allowed to dry until it becomes tacky and the pellicle is then applied over the wax layer and adhesively secured in position.

A plate constructed as described may be used to particular advantage when large images are to be produced, say, for example, plates ten feet square. In Fig. 1 is shown diagrammatically a method and arrangement of parts for producing such a large photographic image. The image to be reproduced on a large scale may be in the form of a photographically produced transparency D, either a negative or a diapositive, illuminated from a source of light S, the image being projected by means of the lens L on the sensitized plate P. If we are to utilize a lens of reasonable size and a light source not so close thereto as to provide excessive heat, the plate P must be a considerable distance away from the lens and the light available is comparatively feeble. It is well known that bichromated colloid is particularly adapted as a sensitive layer for the production of images for use in phototypographical processes because when actinized it may be washed to provide a resist in which the differences of light intensity of the image reproduced are made manifest by differences of level, thus providing a printing surface adaptable for use in various types of press or a means for obtaining in an indirect manner such a surface. Bichromated colloid, however, is relatively slow printing and if it is actinized by such an arrangement as shown in Fig. 1, a long exposure must be given, the resulting image is apt to lack sharpness of definition and difficulties may arise because of mechanical vibration during the long period of exposure. Rapidly acting sensitive media, such as silver salts, might be quickly printed and a transfer made therefrom to a colloid layer. The silver emulsion, however, would have to be supported, as by means of a glass plate. Obviously such a glass plate of the size suggested, say ten by ten feet, would be so heavy as to be unwieldy apart from its fragile character. Other and lighter transparent mountings are unsatisfactory because

of the difficulty in holding them flat and because of shrinkage and other troubles met with in handling.

When the compound plate P shown in Fig. 5 is utilized in the arrangement shown in Fig. 1, assuming that a positive image is to be prepared in the bichromated colloid layer 7 to provide a press plate adapted for direct use on presses of the offset type, the image D may be a photographic diapositive and exposure made for a brief time will actinize the emulsion 11. This may be developed in the ordinary manner with the wax layer 8 protecting the underlying colloid from the developing reagents. The compounds film may then be placed closely adjacent suitable sources of light, as indicated diagrammatically in Fig. 2, and a print made from the negative image in layer 11 through to the colloid layer 7. The negative 11 on its carrier 10 may then be mechanically stripped off, as indicated diagrammatically in Fig. 3, the adhesive rupturing readily for this purpose. Any wax left adhering on the face of the chromate layer may be sponged off with turpentine and the actinized bichromate layer is then developed in the usual manner to form a relief image, as indicated diagrammatically in Fig. 4.

To indicate the advantages in point of time, it may be said that if a direct exposure of bichromated albumen were made in the arrangement of parts shown in Fig. 1, about an hour's exposure might be necessary in a given case. With the compound plate shown an exposure of a minute and a half is sufficient. Development of the silver negative may require about ten minutes and printing, as shown in Fig. 2, about four to seven minutes. The stripping off of the outer layer illustrated in Fig. 3 is almost instantaneous. The great saving of time is obvious and also the quality of the work is better.

In accordance with my invention a plate is provided which is as easily handled as the printing plate itself, and where a press plate is the desired product of the process, this may in itself serve as the support in the production of the image without the necessity of providing any other rigid plate. To permit the double coating idea to be practically utilized, I protect the colloid layer with a coating of some suitable substance which will be inert to the reagents utilized in developing the image in the more sensitive outer layer, and in particular one which is waterproof, one of low cohesiveness and low adhesion, of an amorphous character, and one reasonably translucent in thin layers. As the coating may be conveniently applied by means of a solvent the available solvent should not be such as to harm the sensitized colloid. These characteristics will be found in waxes and I may use the word "wax" to define such a substance, and paraffin is a cheap and convenient

wax to use. The highly sensitive emulsion is preferably arranged so that it may be mechanically stripped off after a print is made from the negative formed thereon, and for this purpose may be mounted on the pellicle of celluloid and this may be adhesively secured to the wax. Ordinary pastes or glues would not adhere to wax. Furthermore, adhesives which would be affected by water would not be adaptable because the pellicle might become separated from the underlying layers during development of the image in the silver emulsion. The use of resin obviates these difficulties and provides a joint which may be ruptured mechanically to permit stripping of the pellicle in the manner illustrated in Figure 3. Experience has shown that separation of the parts apparently takes place substantially at the location of the resin, but it is, of course, immaterial, if at this stage of the process a part of the wax is stripped away with the outer layers. The wax 8 and adhesive 9 form a uniting stratum between the pellicle and the bichromate layer resistant to the strains of handling and to developing treatment but readily rupturable to permit the pellicle to be stripped off.

I am aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and I therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive; reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

I claim

1. In combination, a support, a light sensitive coating thereon of low sensitivity and capable after exposure and development of forming a resist, a protective coating thereover, and a pellicle having thereon a light sensitive coating of high sensitivity adherent thereto by a readily mechanically rupturable joint.

2. The combination of claim 1 wherein said support is a metal plate adapted to serve as a printing plate.

3. In combination with a printing plate having a bichromated colloid coating, a wax covering therefor, and a pellicle having an emulsion coating of relatively high sensitivity secured over said wax covering by a resinous adhesive.

4. In combination with a printing plate having a bichromated colloid coating, a layer of relatively high sensitivity to light overlying the same and secured thereto by an intervening stratum resistant to the action of developing agents for said layer and of low cohesiveness to permit said layer after development to be mechanically stripped therefrom.

5. In combination with a printing plate

having a bichromated colloid coating, a wax covering for said coating, and a light sensitive film of relatively high sensitivity secured over said wax coating.

5 In testimony whereof, I have signed my name to this specification.

ARTHUR W. CORNELL.

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