

G. R. CORNWALL.
PRINTING PLATE.

APPLICATION FILED MAR. 20, 1905. RENEWED DEC. 31, 1912.

1,069,856.

Patented Aug. 12, 1913.

Fig. 1.

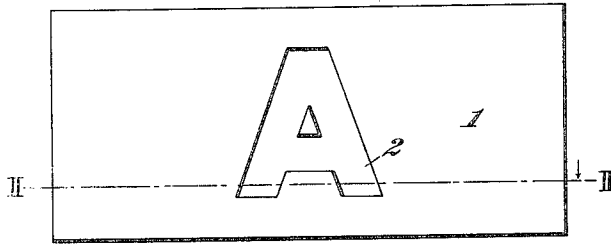


Fig. 2.

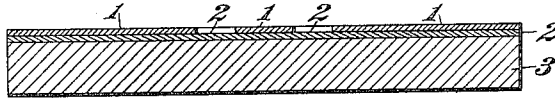


Fig. 3.

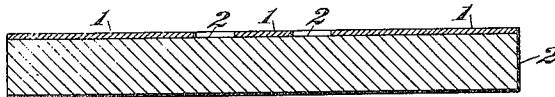
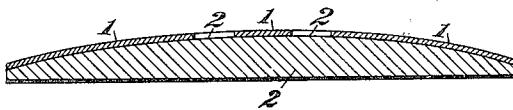


Fig. 4.



Witnesses:

Auguste L. Saltzman.
Frank E. Driscoll.

Inventor,

George R. Cornwall
By
John D. Morgan
Attorney.

UNITED STATES PATENT OFFICE.

GEORGE R. CORNWALL, OF RYE, NEW YORK, ASSIGNOR TO AMERICAN PLANOGRAPH COMPANY, A CORPORATION OF WEST VIRGINIA.

PRINTING-PLATE.

1,069,856.

Specification of Letters Patent.

Patented Aug. 12, 1913.

Application filed March 20, 1905, Serial No. 251,097. Renewed December 31, 1912. Serial No. 739,564.

To all whom it may concern:

Be it known that I, GEORGE R. CORNWALL, a citizen of the United States, residing at Rye, in the county of Westchester and State of New York, have invented new and useful Improvements in Printing-Plates, of which the following is a specification.

The invention relates to printing plates.

An object of the invention is to produce a printing plate which shall be exceedingly durable both as against wear and against injury; which is capable of yielding work of a high quality and at very great speed; which is easily and inexpensively made; and from which the design, while having the qualities above pointed out, may be readily removed when so desired and another design readily substituted therefor and having the same general properties. These and other objects will more fully appear from the following description.

The invention consists in the novel steps, articles, parts, improvements and combinations herein shown and described.

The accompanying drawings, referred to herein and forming a part hereof, illustrate in part a printing plate which is one embodiment of the invention, the same serving in connection with the description herein to explain the principles of the invention. It will be understood that the drawings are diagrammatic in character and do not necessarily actually represent a printing plate nor the relative proportions of the parts thereof, this form of illustration being best suited to elucidate an invention of this character.

Of the drawings: Figure 1 shows a plate carrying a design; Fig. 2 is a section on the line II—II of Fig. 1; Fig. 3 is a similar section showing a modified structure of the plate; and Fig. 4 is a section showing a form of plate particularly adapted for use with a rotary form member.

In the illustration of a printing plate embodying a form of the invention, 1 represents the non-printing portion of the surface of such a plate, said portion being of a planographic character, *i. e.* being adapted to reject ink either from the nature of the surface or from its adaptability to hold an ink-rejecting substance. The design portion of the surface of the plate is represented by the reference numeral 2 and is of a material adapted to take ink readily or to hold an

ink-taking substance. The general disposition of the elements or portions constituting the surface is in layers, as is diagrammatically shown in Figs. 2, 3 and 4. In Fig. 2 the design-bearing element is shown as a layer or film carried by a base 3 and the other element of the surface is shown as a layer or film superposed upon the layer or film 2. In Fig. 3 the layer 2 serves also as the body of the plate. It will be understood that these films or layers may be exceedingly thin, as the plate will be thoroughly efficient wherever there is sufficient film or layer of the metal or other material so that there are no breaks or discontinuances therein at any point on the surface which should be covered by said metal in order to produce the desired printing effect.

Various materials may be used for constructing the plate but certain metals lend themselves peculiarly to the various functions of planographic printing. Among such metals zinc or aluminum constitute desirable elements for the ink-rejecting layer or film while copper, iron and steel constitute desirable elements for the ink-taking elements. It is not essential that the two elements of the surface be different materials, as the same material may be used for both, when it is adapted to assume the properties, under proper treatment, for constituting the ink-taking and ink-rejecting elements of the surface.

In the form shown in Fig. 2 the layer or film may be an electro-deposition of copper upon a bed or plate 3, which may be of iron or steel, or other suitable material, while the topmost layer may be of zinc or aluminum. In Fig. 3 the metal which is to constitute the design is represented as also constituting the body of the plate and it may be of iron or steel, or other suitable metal, and carrying the layer 1 thereon. In Fig. 4 is shown a section of a plate which is of a form adaptable for use with a rotary form member.

The layer 2 may be deposited by dipping the body 3 in molten metal, or it may be deposited electrolytically, or otherwise. The said surface 2 may further be prepared as to its physical state or condition so as to fit it to the highest degree to perform its functions as the design-carrying elements of the planographic printing surface, and the layer or film 1 at the proper time may, if desired,

also receive a coating or layer of ink-rejecting material. The design may be placed upon the film or layer 2 in a proper medium which may be especially adapted with reference to the manner in which the layer or film 1 is to be superposed upon the layer or film 2. This may also be done by dipping or it may be done electrolytically. Where the said layer or film 1 is to be deposited electrolytically, a proper resist is placed on that part of the surface corresponding to the design, so that while the remainder of the surface of the film or layer 2 will receive a deposition of the metal 1 the design will be free therefrom. After the film or layer 1 has been deposited the material of the design which was placed upon the film or layer 2 may be removed, and the plate will then consist of the layer 1 adapted for the ink-rejecting surface of the planographic plate while the design will be defined in the inferior film or layer of metal 2.

The part 2 of the printing surface may be carried as a film or layer upon a supporting body or it may be a part of the supporting body itself, the only requisite being that it shall be of a material capable of taking ink or color readily or of being so treated as to be made to take ink or color readily. In Fig. 2 the said part 2 is shown as a film or layer upon a supporting body while in Figs. 3 and 4 the said part 2 of the printing surface is shown as being a part of the supporting body.

A plate embodying the features of this invention may also be produced by taking a base or support which shall constitute the layer or part 2 or upon which the layer or part 2 may be deposited. The layer or part 1 may then be deposited upon the base or support, or layer 2, and this may be done by dipping the said base or support in molten metal, or by electro-deposition, or otherwise. The surface of the plate in all portions excepting the design may be then covered with a resistant material in any suitable or convenient manner. An etching or other reducing agent may then be applied to the surface for the purpose of etching or cutting away the exposed portions of the metal. A reducing agent which possesses great activity with respect to the layer or part 1 may be used and which, at the same time, is comparatively inert with respect to the layer or part 2. By using such an agent it is practicable to entirely etch or cut away the portions of the layer or part 1 which are not protected by the design and, at the same time, to leave the layer or part 2 unattacked.

In Fig. 4 of the drawings is illustrated a form of plate which is of great practical utility. The plate is made in the form of a segment of the cylinder and is adapted to form a removable portion of the surface of the form cylinder of a rotary press. A ma-

terial well adapted for such a cylinder is iron or steel on account of comparatively low cost, its strong ink-taking properties, as well as for other reasons. Such a plate may be dipped in a metal adapted to constitute the ink-rejecting portion of the planographic printing plate, such as zinc, while said metal is in the molten state. The design may be then brought down to the surface or part 2 by any suitable means, and it may be bitten out by a suitable reducing agent as hereinabove described.

When it is desired to use the plate for another design, the film or layer 1 may be removed by using a proper reducing agent having greater affinity for the constituent metal of said layer or film 1 than for the constituent metal of the layer or film 2, and in a similar manner the film 2 may also be removed if so desired. In certain forms of the invention the removal of the film or layer 1 obliterates the design entirely and leaves the plate in condition to receive a new design.

From the foregoing it will be seen that a planographic printing plate has been provided having its surface in layers; that the layers may be of metal; that the design is carried by an inferior layer; that the design is carried in a durable material and not in a soft and perishable medium. The design being carried in an inferior layer of material also protects it from injury and also from the effects of attrition during the printing operation as well as from the action of the cleaning solutions that may be used on the plate. While such a plate has excellent printing qualities and is of a most durable character, yet by reason of its structure in thin films or layers it is manufactured at small cost and the design is easily removable and replaceable by another design. In use with a rotary press the segmental form possesses many advantages such as the elimination of buckling, deformation, etc., common to flexible sheets or plates.

The invention, in its broader aspects, is not limited to the particular embodiment shown, nor to any particular embodiment, nor to the particular materials shown nor to any particular materials, as changes may be made without departing from the main principles of the invention and without sacrificing its chief advantages.

What I do claim as my invention, and desire to secure by Letters Patent, is:

1. A planographic printing plate consisting of an iron plate, or layer, carrying upon its surface a layer of zinc or aluminum so disposed as to leave the surface of such iron plate, or layer, exposed to form the design.

2. A planographic printing plate consisting of an iron plate, or layer, carrying on its surface a layer of aluminum or zinc, said

layer of aluminum or zinc being so disposed that the iron plate, or layer, forms the ink-taking portion of the printing surface.

5 3. A planographic printing plate having a layer, or element, of iron, and in the form of a segment of a cylinder, and having a coating or layer of zinc, or aluminum, said layers together constituting a planographic printing surface.

10 4. The process of producing a planographic printing plate which comprises placing upon a design-constituting surface a layer of ink-rejecting material and then removing portions of said layer in the form of
15 the desired design so as to leave the design-constituting element exposed in said portions, said two elements thus forming the surface of the printing plate.

20 5. The process of producing a planographic printing plate which comprises covering a suitable base with a layer of design-constituting material, then covering said layer with a layer of ink-rejecting material, then removing said ink-rejecting ma-

terial from the design-constituting layer in 25 the shape or form of the design, the remaining portion of the ink-rejecting layer and the exposed portion of the design-constituting layer then constituting the printing surface. 30

6. The process of producing a planographic printing plate which comprises depositing upon a design-constituting surface a layer of ink-rejecting material, protecting said layer of ink-rejecting material 35 in the non-design parts and then removing said layer in the design parts, the exposed portion of the design-constituting surface and the unremoved portions of the ink-rejecting layer then constituting the printing 40 surface.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE R. CORNWALL.

Witnesses:

WINTHROP POND,
JOHN D. MORGAN.