

No. 648,206.

Patented Apr. 24, 1900.

G. R. HILDYARD.
PROCESS OF PRODUCING PRINTING PLATES.

(Application filed Mar. 17, 1899.)

(No Model.)

Fig. 1.

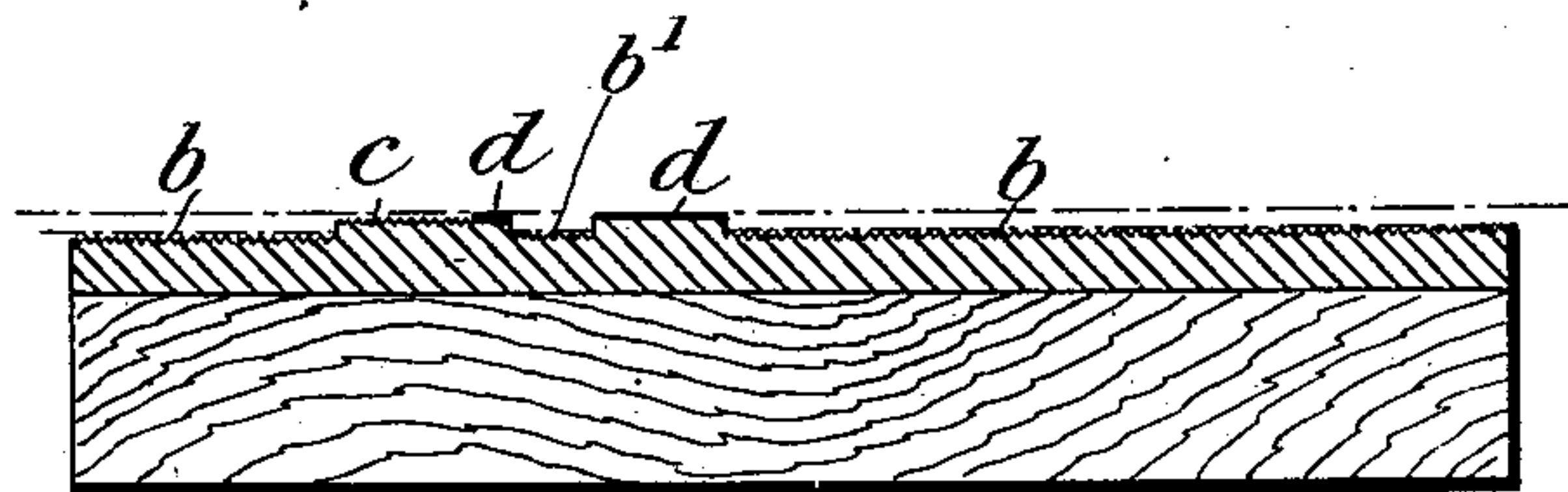
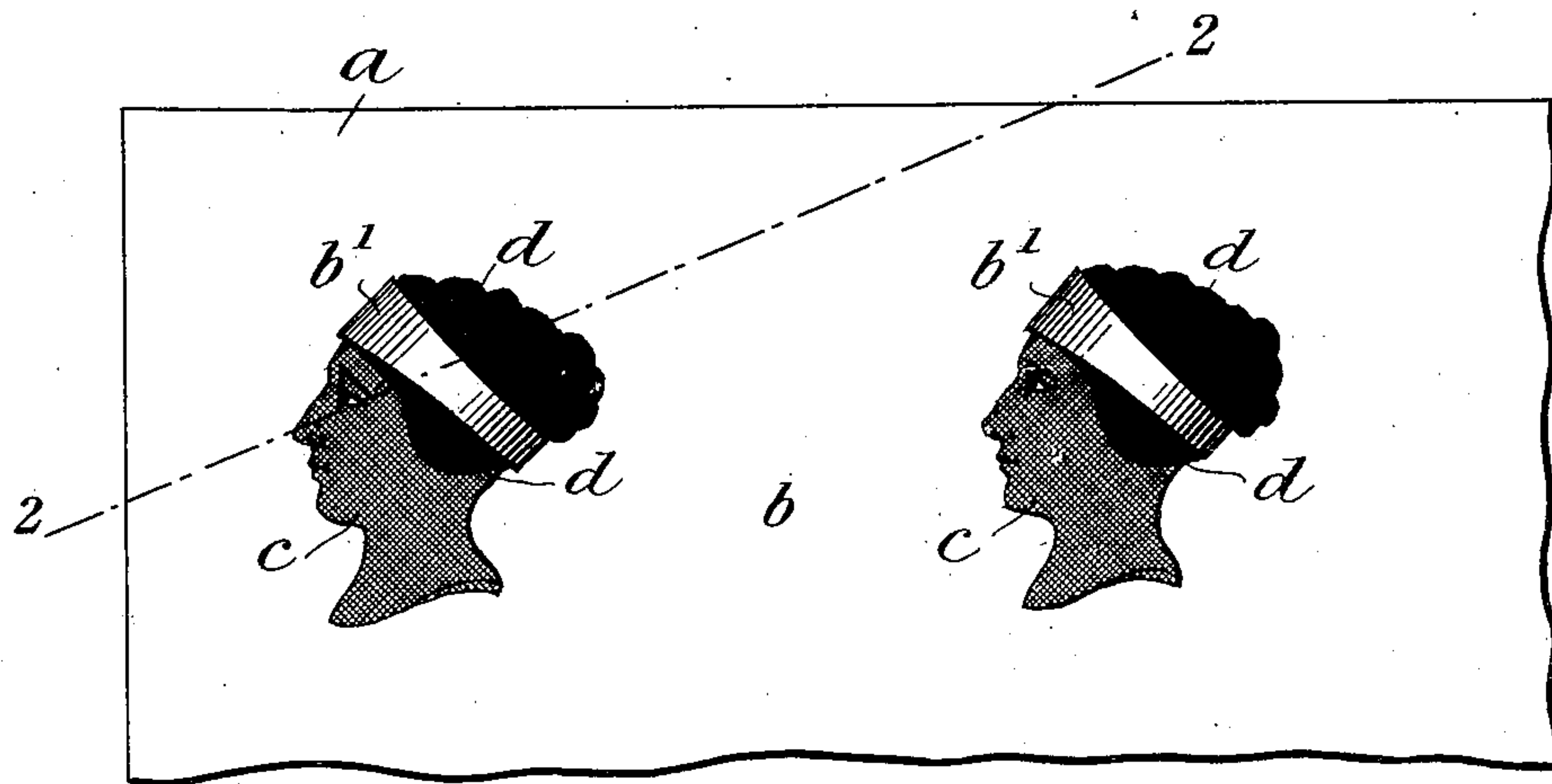


Fig. 2.

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GEORGE R. HILDYARD, OF LONDON, ENGLAND.

PROCESS OF PRODUCING PRINTING-PLATES.

SPECIFICATION forming part of Letters Patent No. 648,206, dated April 24, 1900.

Application filed March 17, 1899. Serial No. 709,521. (No specimens.)

To all whom it may concern:

Be it known that I, GEORGE RICHARD HILDYARD, of London, England, have invented certain new and useful Improvements in the Manufacture of Plates for Printing, of which the following is a specification.

My invention has reference to the manufacture of zinc or other plates for printing by the relief-plate or type-printing process, and more particularly for fine or color printing. In ordinary lithographic printing the water employed tends to stretch the paper and the acid and gum used tend to "rot" the work, while the closest work "bungs up," because it is all on the same level. If, on the other hand, typographic machines are employed for fine or color printing, the work which ought to leave off the softest has the hardest and sharpest edge and it is practically impossible to get the soft drawing of the lithographic draftsman properly reproduced, while for the "whites" that are to appear in the picture or between picture and picture, if such whites exceed about an inch in diameter it is necessary to entirely gouge out or "rout" out the corresponding parts of the plate, leaving apertures or openings therein, so that it is not practicable to have a series of designs at, say, a few inches apart on the same zinc plate, which is of the ordinary thickness.

The object of my invention is to avoid the above drawbacks while preserving the good points of both the lithographic and typographic methods of printing.

According to my invention I alter the structure of the parts of the surface of the plate between the different designs of a series, and also of any parts that correspond with whites in the designs in such a peculiar manner that what I may term a uniform "rottenness," or, in other words, what appears to be an extremely fine-grain with needle-point-like tops, is produced of such peculiar nature that these parts although accepting a small quantity of ink from the inking-rollers when manipulated in the ordinary manner, as in typographic printing, will not transfer such ink to the paper while printing.

In the accompanying drawings, Figure 1 is a face view of part of a zinc plate made according to my invention, and Fig. 2 is a section on the line 2 2 of Fig. 1.

The vertical dimensions are exaggerated in Fig. 2 for the sake of clearness.

a is the zinc plate, bearing a number of pictures spaced widely apart.

b indicates the large whites or open spaces between the pictures, and *b'* indicates the large whites between the raised lines, dots, and solid surfaces of the picture.

c indicates the raised half-tone surfaces, and *d* indicates the raised solid surfaces, of the pictures.

In carrying out my invention I produce the above-described alteration of the surface by the following novel method: Having transferred to or drawn upon the zinc plate by any usual process the design or designs to be reproduced in the required positions, as shown, for example, in Fig. 1, and having placed the work under acid-resist, I bite out the plate to a depth of little over one millimeter. The effect of this initial etching is to make the peculiar surface obtained by this invention about one millimeter lower down than the printing-surface of the plate in order to prevent the cylinder pressing on and injuring the needle-like tops of the plate. I then proceed as follows: I take a suitable tacky substance—such, for example, as a lithographic varnish—with which should preferably be mixed sufficient bronze blue or Chinese blue to tint it, and generally a little oil to thin it. I then distribute the tacky substance very evenly upon the whole of the zinc plate, including the design portions, in as thin a coating as possible. This is effected preferably by rolling in the manner usually adopted in applying ink to a flat surface for hand-press printing. I find it desirable to have in stock several solutions of the tacky substance of different consistencies, the variation being obtained by the use of more or less oil, turpentine, paraffin, methylated spirit, or the like, and I use whichever solution is best adapted for the purpose, according to the state of moisture and temperature of the surrounding atmosphere. A damp atmosphere makes a thick solution and a warm atmosphere a thinner solution desirable. It is best to make a preliminary test by means of a small piece of zinc.

The tacky substance used in this process may be composed as follows: lithographic varnish, five hundred parts; Chinese blue, one to

five parts, and oil, from one part to ten parts, according to the dryness of the weather. The lithographic varnish is that usually met with in commerce.

5 I next submit the plate, before the coating of the tacky substance has become dry, to the action of a biting or etching solution, preferably composed of commercial nitric acid and water in the proportion of about two to four
10 fluid ounces of acid to eighty fluid ounces of water. This solution can be applied to the plate in various ways—as, for example, by pouring it onto and then off the plate, or by dipping the plate in a non-rocking bath of
15 the solution and then after removing the plate rinsing it with cold water. Any residue of varnish should be sponged off. It is best to submit the plate to several of these acid treatments successively, (three by prefer-
20 ence,) and to increase the strength of the solution every time. For instance, for the three successive treatments I should employ solutions containing, respectively, two, three, and four fluid ounces of acid to eighty fluid ounces
25 of water.

The functions of the various ingredients are as follows: The oil is to thin the varnish when too thick. The thickening depends to some extent on the temperature and moisture
30 of the atmosphere. The lithographic varnish is to partially protect the plate from the nitric acid, which, nevertheless, eats through the varnish and attacks the plate in the places where it eats through. Although to the eye
35 the surface of the plate appears level, yet under the microscope the needle-points can be distinctly seen like cones. When Chinese blue is added, it is found that the action of the nitric acid on the varnish is quickened.

40 The tacky substance acts as a partial resist to the nitric acid. Immediately the acid is applied it eats through in places, causing the graining or rottenness, which is the object of my invention.

45 The initial biting out to the extent of one millimeter has no effect in producing the grain or rottenness; but I find that it is desirable to do this, as I thereby obtain a better plate.

50 The action of the acid when applied, as described, to a zinc plate which has a thin coating of a tacky substance, such as that described, is to alter the nature of the surface *b* of the plate *a* between the different designs

and of any parts *b'* that correspond with whites in the designs and to thereby produce a uniform rottenness or very fine grain of peculiar nature, as hereinbefore explained. The peculiar nature of the surface of the plate as thus produced is such that when the plate is
60 used to print from in the typographic way these parts do not transfer any ink to the paper or material printed upon, and no water is necessary in order to obtain this effect.

The portions of the plate which constitute the design or work are not attacked by the acid, because they have previously been placed under acid-resist, as has been already hereinbefore stated.

What I claim, and desire to secure by Letters Patent, is—

1. In the manufacture of plates for printing, the mode or process hereinbefore described of treating the plates after the design or designs to be reproduced have been transferred to or drawn thereon in the required
75 positions, and the work has been placed under acid-resist, which mode or process consists in altering the nature or structure of the parts of the surface of the plate between the designs thereon and also of any parts that correspond with whites in the designs into an extremely-fine grain with needle-point-like tops
80 as hereinbefore described whereby the said parts will not in the printing process transfer any ink to the paper or other material brought in contact therewith, no water being necessary to produce this effect.

2. In the manufacture of plates for printing, the mode or process hereinbefore described of treating the plates after the design or designs to be reproduced have been transferred to or drawn thereon in the required positions and the work has been placed under
90 acid-resist, which mode or process consists in first biting out the plate to a slight depth, then applying thereon a thin coating of a tacky substance such as a lithographic varnish and in then submitting the plate to the action of a biting or etching solution, substantially as and for the purpose set forth.
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In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

GEORGE R. HILDYARD.

Witnesses:

JOHN C. MEWBURN,
ROBERT M. SPEARPOINT.