

UNITED STATES PATENT OFFICE.

PHILIP BARNARD, OF CHICAGO, ILLINOIS.

PROCESS OF ENGRAVING.

SPECIFICATION forming part of Letters Patent No. 302,226, dated July 22, 1884.

Application filed July 30, 1883. (Specimens.)

To all whom it may concern:

Be it known that I, PHILIP BARNARD, a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in the Art of Engraving; and I do hereby declare the following to be a full, clear, and exact description of said improvements, sufficient to enable others skilled in the art to make and use the same.

In lieu of the ordinary box-wood or like block of the wood engraved, the object of my invention is to provide a block formed from friable material, and having a thin surface-coating, in color sharply contrasting with that of the body of the friable block directly beneath.

A further object of the invention is to vary, at pleasure, the color either of the surface-coating, or of the block beneath, or of both, as may be required, so that said coating and block shall always faithfully represent to the eye the same contrasting colors which are to prevail, respectively, in the ink and in the paper or other material of final impression. The block, being friable, admits of the use of a needle-like stylus, which, in the hand of the artist, may be employed in the dual capacity of depicting the sketch and simultaneously therewith of engraving the same upon and within the body of the block. Without materially lessening the freedom of movement which the artist enjoys in the use of his pencil, the nature of the block permits him to employ his skill, instead of that of the engraver, in cutting the sketch. Rapidity, ease, and beauty of execution, the development of the finer and more graceful effects, are therefore made to rest directly with the artist himself, who, with readily-acquired skill in the use of the light stylus, is wholly released from dependence upon the laborious, uncertain, difficult, cramped, and more or less unfaithful methods of the wood-engraver for the reproduction of his designs. The contrast in color between the surface-coating and the body of the friable block directly beneath enables the artist to measure with exactness the force and strength of each stroke of his graver, for, as the slightest scratch is sufficient to remove the surface-coating and to develop the sharply-contrasting shade, he can always accurately judge of the effects which he is producing, however

fine and indistinct these ordinarily might appear. Again, by reason of the fidelity with which the color of the ink and of the surface of final impression are reproduced in the coating and in the friable block beneath, the eye is powerfully aided, and the artist has constantly before him, at every stage in the progress of his work, the exact appearance in shade or contrast which the design in all its details will present after it is imprinted. This exceedingly important quality of my invention avoids the necessity of making trial-impressions and of retouching the block or of commencing the work anew, which in ordinary engraving is a frequent experience, in that the contrasts while the block is being cut are different and usually directly opposed to those which are prevalent in the final imprint, and thus tend constantly to greatly deceive and mislead the operator. By the present improvement nothing is left to his imagination, the final shades or tones of color exactly as they will appear being presented to the eye at all times in the corresponding colors of the surface-coating and the body of the block. In this respect the invention markedly distinguishes itself from ordinary wood-engraving, which is incapable of any such exactitude in contrasts, and is without adaptability therein to the various colors which may be adopted for printing-ink and printed surfaces.

Having thus defined the general nature and scope of the invention, I shall proceed to describe the practice of the same, and thereafter to specifically claim what is believed to be new and original in said improvements.

In preparing the blocks, a suitable quantity of plaster-of-paris is mixed with water to a creamy consistency and the mass then molded in forms of desired size and thickness, the latter being usually $\frac{1}{8}$ of an inch, or about the height of ordinary printing-type. After the molded blocks have become perfectly dry, one face thereof, either by dipping or painting, is covered with a thin film of gelatine in water or other like size, which will fill the pores of the molded blocks without being of any appreciable thickness to impede the action of the engraving-tool. When this film has become dry, an outer or surface coating, usually of india-ink, is applied, and is allowed to become thoroughly dry. The coating is ordinarily per-

feetly black and of no material thickness, the gelatine or like size preventing it from striking through into the body of the block, so that it dries entirely upon the surface and creates a sharp contrast with the block beneath. With a pointed or needle-like instrument the artist may scratch upon this prepared surface, the friable nature of the plaster-of-paris allowing him to do this with great facility and freedom of movement, so that working almost as with a pencil he is enabled to depict the sketch to the minutest details and to perform the engraving in very act of making the sketch. It is noteworthy, moreover, that the lines and dot, being scratched through and into the body of the block beneath, show white against the black or untouched portions of the surface-coating, so that the progress and character of the work are apparent at sight. The finest effects and nicest variations in light and shade are readily depicted in the friable material, which is yet sufficiently tenacious to give sharp and well-defined lines where the needle or stylus has traversed. The sketch and engraving being thus finished by one and the same operation, the block is left in condition to immediately take therefrom the usual wax or like impression, as when proceeding with wood-cuts in preparation of electro or stereo types suitable for printing.

Thus far detailed the process is that which should be followed when the cuts are to be printed in black ink on white paper; but the nature of the materials is such that when it is desired to print on tinted paper, or with colored inks, or both, then, by incorporating suitable pigments with the plaster in process of molding, the block can be made the color of the particular tint of the paper chosen to receive the final imprint, and in like manner the surface-coating can be laid in color like unto that of the printing-ink to be ultimately employed, it being merely necessary to use suitable pigment incorporated with or in lieu of the india-ink in laying the surface-coat, so as to produce the same color as the ink of final impression. By this means the artist has always before him an exact reproduction of the tints and contrasts which are to prevail in the finished print, so that the need of taking proof-copies and thereafter retouching the wood-cut, to soften or develop shades, are no longer requisite. This method in large measure gives prominence to the skill, facility, and grace of the artist in sketching, relieving entirely from any dependence upon the wood-cutter, enabling him after a little practice to employ the slight stylus or needle-like graver with as much freedom as the pencil. It is particularly advantageous for doing quick work, since it requires no more time to complete the design than is usually consumed in making the preliminary sketch under the old method of wood-cutting. The exceeding cheapness of the materials over other processes is also to be noted. The size of the blocks may be much increased over the usual dimensions, the ease

with which the scratching is done and its resemblance to sketching permitting the use of blocks in the manner of card-board sheets. Other materials than plaster-of-paris, of like friable nature—such as chalk or other equivalent material—may be employed for engraving blocks without departing from the spirit of the invention, and a variety of tools other than the simple stylus may be used in delineation.

Heretofore it has been proposed to build upon a wooden block or backing several successive layers of whiting and size indurated with oil, the last layers of which material have been coated with india-ink, and the whole, when finished, being to a depth of about one-eighth of an inch, and presenting much the same appearance as the so-called "silicated" tablets. This block was designed to be engraved upon with a pointed needle, and thereafter to be used directly in the press for striking off prints or impressions; but said block is of a horny consistency, and differs essentially in hardness from the block devised by me, which cannot withstand the severe usage of the press, besides which, being much more friable, the latter is penetrated and cut with a facility and freedom that the old form of block mentioned cannot approach. Moreover, the surface of this older block is not made absolutely black, but of much lighter shade, sufficient, at least, to display the marks of the lithographic pencil used in making the preliminary sketch, an expedient which with my invention is wholly unnecessary. Not only this, but the coloring-matter being applied in succession to several of the last layers of the mixture, there is a regular gradation in shade from the surface downward, and not a sharp abrupt contrast between the surface-coating and the body of the block directly beneath, as in my invention. By reason of this gradation the finer and more delicate work of the graver is but indistinctly shown, so that the artist is misled and errors are of frequent occurrence. Again, the presence of the oil discolors the mixture, so that at best these body-layers never show absolutely white—an effect which is not only possible but usual and entirely desirable for most of the engraver's work, since it is printed on white paper. No attempt whatever is made to reproduce in surface-coating, and in the body of the block, the colors of the ink and of the paper of final impression, which, as already set out, is a highly valuable feature of my invention, while the ink of the older form, being applied at the tops of the layers, often shows in bands or lines with but imperfect blending, so that the engraver is subjected to exceeding annoyance and confusion. I disclaim, therefore, this prior type of engraver's block as wholly distinct from my improvements, and as defective in particulars stated.

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

1. An engraver's block consisting of plaster-of-paris or like friable material capable of

being scratched by a sharp stylus, and having a thin surface pigment-coating in sharp and striking contrast to the color of the friable surface beneath it, substantially as described.

5 2. An engraver's block consisting of plaster-of-paris or like friable material capable of being scratched by a sharp stylus, the body of said block being colored in correspondence to the color or tint of the material upon which
10 the final imprint is made, while the sketch-surface has a pigment-coating in color corresponding to that of the ink with which the imprint is made, and in sharp and striking contrast to the color of the surface of the friable
15 block, substantially as described.

3. An engraver's block consisting of plaster-of-paris or like friable material capable of being scratched by a sharp stylus, having a colored surface-coating and a lower coating of
20 gelatine film or the like to arrest penetration of the coating into the body of the block, substantially as described.

4. The method of forming a block for engravers' use, which consists in casting a block
25 of plaster-of-paris or like friable material with a thin surface-coating, through which a stylus may scratch in sharp and striking contrast to the color of the surface of the friable block, substantially as described.

30 5. That improvement in the art of engraving which consists in scratching the sketch directly upon and into a block of plaster-of-paris or like friable material having a thin pigment surface or ground in color sharply contrasting
35 therewith, through which a stylus may scratch, and then stereotyping or electrotyping said finished block by taking a wax cast, as usual, to produce a printing-block, substantially as described.

40 6. In the process of engraving, the method of preparing an original, which consists in coating a block of plaster-of-paris or like friable material with a thin pigment-surface in colors sharply contrasting therewith, and
45 scratching the sketch directly upon and through said pigment-coating, substantially as described.

7. That improvement in the art of engraving which consists in preparing a block of

plaster-of-paris or like friable material, coloring the body of said block in tint corresponding to that of the material to receive the final impression, and thinly surface-coating said block in tint corresponding to that of the ink
50 used in final printing, and sharply contrasting with the surface of the friable block, then scratching the sketch directly upon and through said coating, taking a wax impression of the finished sketch, and finally electrotyping
55 or stereotyping to obtain a printing-block, substantially as described.

8. That improvement in the art of engraving which consists in preparing a block of plaster-of-paris or like friable material, thinly
60 surface-coating said block in tint corresponding to that of the ink used in final printing, and sharply contrasting with the surface beneath it, then scratching the sketch directly upon and through said coating, taking a wax impression of the finished sketch, and finally
70 electrotyping or stereotyping to obtain a printing-plate, substantially as described.

9. That improvement in the art of engraving which consists in preparing a block of plaster-of-paris or like friable material, coloring
75 the body of said block in tint corresponding to that of the material to receive the final impression, surface-coating said block in suitable pigment sharply contrasting therewith, then scratching the sketch directly upon and through said coating, taking a wax impression of the finished sketch, and finally electrotyping
80 or stereotyping to obtain a printing-plate, substantially as described.

10. That improvement in the art of engraving which consists in scratching the sketch directly upon and into a block of plaster-of-paris or like friable material having a thin pigment surface or ground of sharply-contrast-
85 ing color, through which a stylus may scratch, and then stereotyping or electrotyping from said finished block, substantially as described.

PHILIP BARNARD.

Witnesses:

PHILIP G. WEINRICH,
JAS. S. MURPHY.