

United States Patent Office.

BENJAMIN BAUGH, OF CHADWICK, NEAR BRONSGROVE, ENGLAND.

Letters Patent No. 98,336, dated December 28, 1869.

IMPROVEMENT IN ENAMELLING IRON AND STEEL.

The Schedule referred to in these Letters Patent and making part of the same.

I, BENJAMIN BAUGH, of Chadwick, near Bronsgrove, in the county of Worcester, England, have invented a new and improved Method of Enamelling the Surfaces of Cast or Wrought-Iron, or Steel, to produce letters, devices, or ornamentation thereon, of which the following is a full and exact description.

In the processes heretofore employed for this purpose, the ordinary method consists in, first, covering the surface of the metal plate with a coat of enamel, which is fused thereon, and subsequently applying, by means of a stencil-plate, adhesive size or mucilage to those parts which are to receive another color, the enamel being then dusted upon those portions in the form of powder, which adheres to the size, and is subsequently fused thereon.

Serious disadvantages belong to this method; among them that the edges or boundaries of the figures are left rough and irregular; that fine lines cannot be produced, and that the powder has to be applied of such thickness, in order to obscure the color beneath it, as to produce an elevated and uneven surface, which is incompatible with a delicate design.

Beside these objections, the stencils employed have to be formed of heavy metal, as they must be of greater thickness than the depth of the powder when applied, to prevent portions being lifted off in their removal, which makes them expensive, and, in consequence of such thickness, they are adapted to use only upon plane surfaces.

It is the object of my invention to obviate these defects; and

It consists, first, in an improved method of applying the enamel ground, to produce a delicate or complicated design in such a manner as to preserve a clear and distinct outline, and produce fine lines and delicate tracery, all with easy and rapidity of execution; and secondly, in the method of producing a design in several colors, by a transfer of the same, at one operation, all as hereinafter set forth.

In carrying my invention into practice, I proceed as follows:

I first lay upon the surface of the plate of the metal to be enamelled a uniform ground, of any color required to produce the intended design, as, for instance, a name-plate, or tablet, with the ground white and the inscription in blue. The white ground, having been fused on in the melting-furnace and allowed to cool, there is then applied with a brush evenly over the whole surface a coating of blue enamel, the materials of which are finely levigated and mixed with gum-arabic and water, or other mucilage, to form a paste of slightly adherent properties.

When dry, a stencil of the inscription, or of each letter separately, is laid on, and the enamel paste is removed from the parts which are unprotected by the

stencil, by the application of a stiff brush, leaving the ground clean, except the letters.

The plate is then again subjected to heat, whereby the paste, which is fusible at lower temperature than the ground previously laid, becomes permanently fixed upon it.

By this process, the letters are left with their boundaries or outlines sharp and well defined, instead of rough and irregular, as by the old process. The mechanical removal, by means of a brush, enables very delicate lines to be formed through the paste, to expose the enamel ground, and admits of the use of ornaments having sharp angles and minute points and details to be distinctly and perfectly rendered, which is impossible by any other known method, and this adapts it to be used for any arabesque or mosaic pattern, however complicated it may be in design.

It is obvious that the ground may be dark, and of any color, as well as of the kind described, and the subsequent coat of a lighter color; as, for instance, the ground may be of blue, and the inscription white, and a succession of colors may be given, to produce a variously-colored design, by the same method.

It is also obvious that the inscription or design may be cut out in the stencil, and the ground thereby exposed be removed by the brush, instead of the surrounding parts, with a like effect, it being left to the choice of the designer whether this process be followed, or that previously described.

I employ stencils formed of very thin sheet-metal, (or even of paper, where they require to be used but a few times,) which, by their flexibility, lie more closely in contact with the surface, and leave the lines and margins of the figures more perfect, while they conform to convex and irregular surfaces, whereas, by the process heretofore employed, very thick plates have been necessary, which are adapted to use upon plane surfaces only, and are produced only at great expense.

I combine with the method described, the use of artistic graphic representations, such as views, portraits, or groups, thereby producing metal tablets decorated in enamel, in a manner adapted to architectural purposes, as the finishing of interiors, panels for cabinet-work, &c. Such designs are produced upon stone in the usual lithographic manner, and printed in successive impressions upon paper prepared for transferring, by having its surface coated with gum-arabic, or other substance that is soluble in water, mineral colors and fluxes being used, which are adapted to fuse under heat, and combine to form the picture in enamel, of appropriate colors.

The enamel ground having been fused on, as previously described, for stencilling, it is covered with copal or other suitable varnish, and the face of the prepared picture is laid upon it and pressed, to insure

adhesion of all parts, when the paper is removed by wetting, as is ordinarily done in transferring prints. The plate is then subjected to heat until the colors of the picture are fused, and become incorporated with the previously-enamelled surface.

By this simple method, I produce elaborate pictorial and ornamental designs, as well as inscriptions in enamel, upon metal tablets, being enabled, by the substitution of printing and transferring for the labor of painting directly upon the surface enamelled, to produce them in a very rapid manner, and at much less cost than has been heretofore done.

I claim, as my invention—

1. The method of producing ornamental designs and inscriptions in enamel upon metal tablets, by the use of stencils, substantially as set forth.

2. The method of producing pictorial designs of several colors in enamel upon metal plates, by the use of separate printings of the several colors upon suitably-prepared paper, and the transfer of the same to the surface to be enamelled, and fusing thereon, substantially as set forth.

3. As a new article of manufacture, enamelled metallic tablets, formed of designs produced in part by stencilling, and in part by printing and transferring, substantially as set forth.

In witness whereof, I have hereunto signed my name, in the presence of two subscribing witnesses.

BENJAMIN BAUGH.

Witnesses:

KATE N. JONES,
J FRASER.