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PRODUCTION OF SHOW CARDS, ADVERTISEMENTS, SIGNS, DECORATIONS, OR THE LIKE BY STENCILING.

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To all whom it may concern:

Be it known that HERBERT HAMILTON SCOTT and GEORGE McINTOSH SCOTT, subjects of the King of Great Britain, residing at 45 Kingsway, London, W. C. 2, England, have invented certain new and useful Improvements Relating to the Production of Show Cards, Advertisements, Signs, Decorations, or the like by Stenciling, of which the following is a specification.

This invention relates to the production of showcards, advertisements, signs, decorations or other decorative metal articles by stenciling, the chief object being to enable vitreous enamel metal signs and the like to be manufactured commercially in large numbers in a rapid, inexpensive and simple manner.

Hitherto the commercial production of vitreous enamel metal signs, particularly signs with complicated or multi-colored designs or lettering thereon, has been limited owing to the many operations and great labour and expense involved in the method of production hitherto employed. The drawbacks and limitations to printing methods with the aid of a litho-stone or zinc plate, the aerographing method, and the "brushing out" method are well known in the trade.

According to the present invention vitreous enamel metal signs or other decorative articles are produced by preparing a vitreous enameling composition or paint of suitable consistency and drying characteristics, applying the composition to the vitreous enamel surface to be decorated by means of a screen or stencil of silk or other meshed material having permeable and impermeable portions, and finally heating the article so treated to a temperature sufficient to cause fusion of the vitreous composition. In the preparation of the paint or composition finely ground quartz-like enamel or "enamel frit" is used as the body or base which is coloured as required by means of the powdered enameling oxides of commerce and worked up to a suitable consistency to pass through the meshes of the stencil employed.

The fineness of the powdered materials should be as great as is necessary to enable the composition to pass through the meshes of the stencil and the materials should therefore be capable in their dry unmixed state of passing through a screen of slightly finer mesh. We have found that a fineness of powder corresponding to two hundred meshes to the square inch gives satisfactory results. The stencil used with such powder would have about 130 to 140 meshes to the square inch, but the fineness of powder used depends to some extent on the amount of detail to be shown on the metal sign.

In working up the powdered quartz-like enamel or "enamel frit" and oxide mixture into a suitable pasty mass a liquid must be used that will not permit of too rapid drying and yet can eventually be dried completely without causing the surface to be spoilt by bubbles or otherwise when the article is subjected to the "enamel fusing" temperature. Liquid of an oily character should be used. For example we have found that a mixture composed of one part by volume of turpentine, 1 part by volume of beeswax, and 8 parts by volume of paraffin oil gives excellent results. This oily mixture is taken and mixed with approximate three times its weight of the quartz-like enamel or "enamel frit" and oxide mixture and the whole is ground in a mill after which a small proportion of a varnish such as litho-varnish amounting for example to one to two per cent of the aforesaid oily mixture is well mixed in. The proportion of the coloured oxide to quartz-like enamel or frit depends on the quality and nature of the oxide and generally speaking varies from 4 to 20 per cent. The pasty composition is effectively and simply applied by pressing it through the meshes of the stencil by means of a squeegee. After stenciling the vitreous enamel metal sheets as above described we heat them sufficiently to dry out the oily medium and then heat them in a muffle furnace or otherwise to a temperature sufficiently high to cause fusion of the vitreous enamel background with the vitreous composition applied through the stencil, for example from say about 600° to 1000° C. depending upon

the nature of the composition. We thereby obtain real vitreous enamel sheet metal advertising signs or the like.

In carrying out our process particular attention is directed to the cooperative effect between the vitreous paste and the permeable mesh portion of the stencil. In being pressed through the mesh, the vitreous paste is divided up into numerous small particles and so deposited on the enamel base. Upon firing, all the ingredients of the paste except the vitreous portion, are readily driven off before the temperature has risen to that of the fusion point of the vitreous matter. As a result, the vitreous particles of the paste are fused into a continuous, smooth layer on the enamel base, and are not subjected to the action of volatile matter being driven off. Were the paste to be put on through a cut stencil having ties and without any mesh, it could not be evenly applied, and furthermore, upon firing, the volatile matters in the paste could not be so readily driven off since the paste would not be in a finely divided state due to passage through stencil meshes. As a result the finished product would be rough and uneven, due both to the imperfect application, and to the driving off of volatile substances during the fusion of the vitreous material.

By passing the vitreous paste through a mesh stencil, the mesh of the stencil so modifies the condition of the paste as deposited on the base that the stenciled plate can be fired to produce a smooth, even, and highly glazed product.

In producing many designs, a cut stencil having ties cannot be employed, but it is necessary to use a mesh stencil. With a mesh stencil, however, dry vitreous material cannot be dusted through the mesh. We have provided a volatilizable, pasty medium for the particles of vitreous material and thus made possible the use of a mesh stencil with a vitreous enamel. Further, the action of the mesh of the stencil, on the vitreous paste, results in depositing the paste on the base in a condition such that firing of the product will drive off the medium portion of the paste and leave only the vitreous particles when the fusing temperature has been reached. Thus the medium portion of the paste permits use of a mesh stencil for vitreous enamel work, and the action of the mesh on the paste, permits firing of the product so that very satisfactory results are attained.

The manufacture of vitreous enamel signs consisting of metal plates having a vitreous enamel surface and the lettering or designs impressed thereon by means of vitreous enamel compositions and fused into the enameled surface in accordance with the present invention constitutes an important development in the art and enables vitreous enamel metal signs and the like whether simple or intricate to be manufactured rapidly and relatively cheaply in large numbers. One distinct advantage is in the case of multi-coloured designs, because each colour can be applied and quickly dried ready for the application of the next colour, the actual fusing of the colours if they do not overlap being carried out in a single final fusing operation. Moreover the stencils last a considerable time before becoming defective through wear and no technical skill or special plant such as is required for lithograph work is necessary in using the stencils.

Vitreous enamel metal signs and the like manufactured in accordance with our invention are as durable as ordinary enamel ware and will withstand rough usage and weather changes for a great length of time without deterioration.

What we claim is:—

1. A method of producing vitreous enamel metal signs and other decorative articles, comprising, applying a vitreous enamel composition through a mesh and onto a vitreous enamel surface, and heating the product to an enamel fusing temperature.

2. A method of producing vitreous enamel metal signs and other decorative articles, comprising, placing a stencil composed of meshed material having permeable and impermeable portions corresponding to the letters or design to be produced, upon a vitreous enamel surface, applying a vitreous enamel composition to the vitreous enamel surface through the permeable portions of the stencil, then removing the stencil, and finally heating the product to an enamel fusing temperature.

3. A method of producing vitreous enamel metal signs and other decorative articles, comprising, placing a stencil composed of meshed material having permeable and impermeable portions corresponding to the letters or design to be produced, upon a vitreous enamel surface, pressing a finely ground vitreous enamel paste through the permeable portions of the stencil, then removing the stencil, and finally heating the product to an enamel fusing temperature.

4. A method of producing vitreous enamel metal signs and other decorative articles, comprising, placing a stencil composed of meshed material having permeable and impermeable portions corresponding to the letters or design to be produced, upon a vitreous enamel surface, applying to the enamel surface a finely ground quartz-like enamel composition through the permeable portions of the stencil, then removing the stencil and finally heating the product to an enamel fusing temperature.

5. A method of producing multi-coloured

vitreous enamel metal signs and other decorative articles, comprising, placing in succession, a set of stencils composed of meshed material having permeable and impermeable portions corresponding to the letters or designs to be produced in the respective colors, upon a vitreous enamel surface, applying respectively colored vitreous enamel compositions to the vitreous enamel surface through the permeable portions of the respective stencils, removing each stencil and firing the vitreous portion of the applied composition before placing a succeeding stencil in position.

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