No. 798,037. PATENTED AUG. 22, 1905.

F. A. HERMANN.

DECORATION OF METAL SURFACES.

APPLICATION FILED APR. 3, 1905.

Fig. 1.

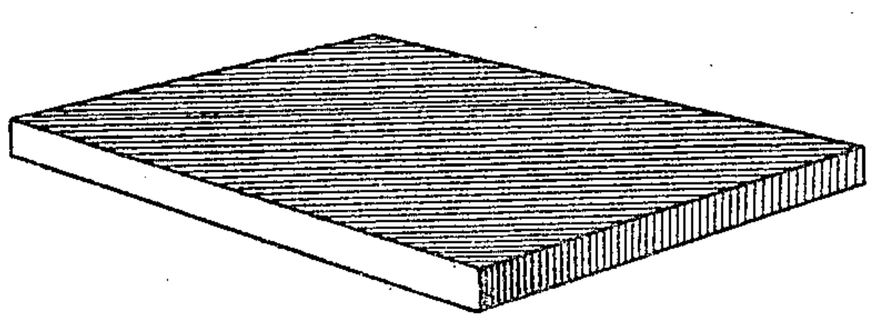


Fig. 2.

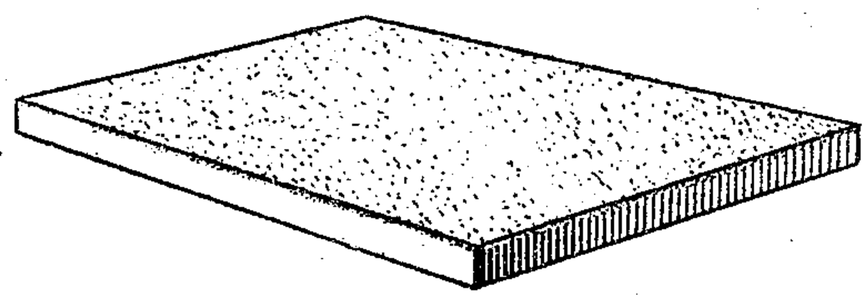


Fig. 3.

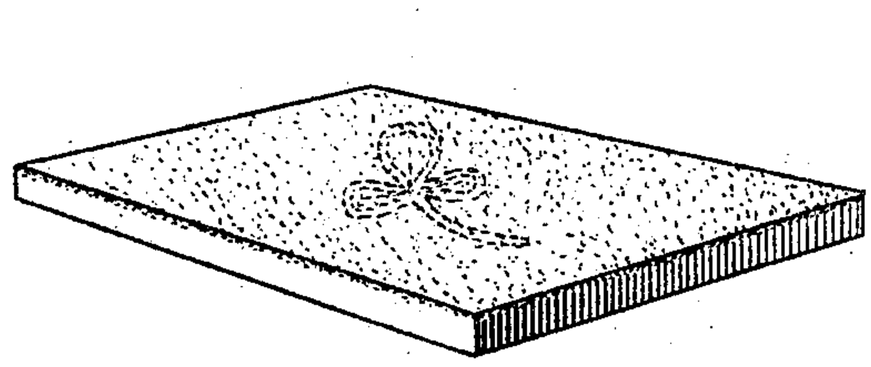
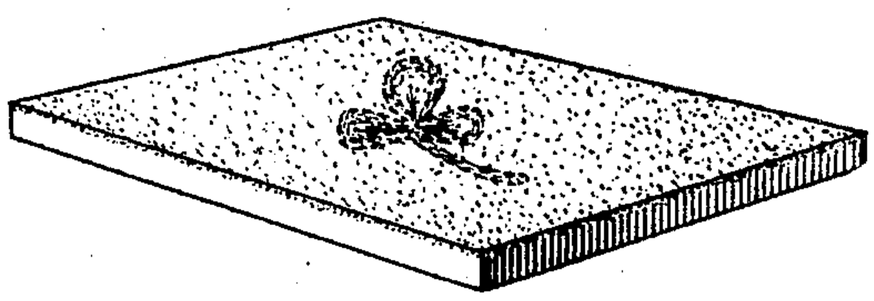


Fig. 4



WITNESSES:

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DECORATION OF METAL SURFACES.

No. 798,037. Specification of Letters Patent. Patented Aug. 22, 1905.

Application filed April 3, 1905. Serial No. 253,528.

To all whom it may concern:

Be it known that I, FREDERICK A. HERMANN, of Melrose, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Decoration of Metal Surfaces, of which the following is a specification.

This invention has reference to processes of ornamenting precious metals in color, and has for its object to provide a successful method of producing such ornamentation directly upon the metal without the use of enamel or other intervening substance.

The invention consists in the improvements hereinafter described and claimed.

In the accompanying drawings, Figures 1 to 4 are perspective views representing a plain block or slab of metal, illustrating the different steps of the process as hereinafter described. The said figures are drawn to conventionally illustrate the invention. It will be readily understood that the process hereinafter described and claimed may be carried out in connection with the metal in any desired form, whether a block or slab, a spoon, knife, cup, or other article.

In carrying out my invention I first take the article to be ornamented, which may be, for instance, a spoon or other article of silverware, and first heat the same or the portion thereof which is to be ornamented to bring to the surface of the article a portion of the alloy contained in the silver, the alloy forming a surface film or coating of oxid on the article. It is a well-known fact that "sterling" silver, or silver in the ordinary commercial condition, is about nine hundred and twenty-five thousandths pure, or, in other words, one thousand parts of silver will consist of nine hundred and twenty-five parts of pure silver and seventy-five parts of copper. After this I place the article or the portion which is to receive the ornamentation in a bath of sulfuric acid.

The article will remain in the bath a sufficient length of time for the acid to act upon and remove from the surface of the silver the oxid of copper or other alloy brought to the surface by the preliminary heating. The bath of sulfuric acid will leave the surface of the silver in a clean unpolished state and of a grayish-white color. I next take suitable colors for my purpose. These are preferably selected from the mineral paints commonly used in decorating china and porcelain and are adapted to be fired or baked to produce the desired result as to color and permanency. To these colors I add a quantity—say about one-third or one-half—of flux, which may be borax or any substance found to be suitable for the purpose, and mix the whole in the usual way with a suitable oil or oils. In some cases, however, the flux will not be required. I then proceed to decorate the article in any preferred manner, either by hand-painting or by a printing or a transferring process. The article is now ready for firing. This may be accomplished in any well-known or desirable way, either by inserting the article in a firing kiln or oven or into a blue gas-flame, the intensity of the heat being so regulated as to bring out the proper degree of brilliancy of the colors and to cause the surface metal of the article under the treatment to fuse and combine with the coloring material, but not to heat the entire article to a melting-point or cause it to lose its original form. Care must be taken to subject the surface of the article very briefly to the heating medium, so that only a film of its surface is fused, leaving its body portion rigid, the article being then removed from the heating medium, so that there is no change of form, such as would result from a more protracted subjection of the article to the heating medium.

Fig. 1 represents an article of sterling silverware after it has been heated to bring to the surface a portion of the alloy in the form of a coating of oxid and before its treatment in the bath of sulfuric acid to remove said coating from its surface.

Fig. 2 is designed to represent the appearance of the article after its surface has been treated with sulfuric acid, the alloy coating having been removed during this step.

Fig. 3 represents the article after an ornamental design has been applied to the surface by means of mineral paint, such as hereinbefore described.

Fig. 4 represents the article after it has been fired to render the design or ornamentation permanent.

In case it is desired to finish the unornamented parts of the article by gilding or plating with gold or other metal the ornamented parts may be protected by a coating of rubber paint or otherwise and the plating process be effected in the ordinary manner, the coating being afterward removed, all in accordance with a common practice.

The colored ornamentation resulting from my process has a beautiful glossy effect and

once completed remains permanent, resisting the wear of ordinary use and cleaning operations.

My invention affords a substantial advantage over all former processes of which I am aware. The usual way of ornamenting precious metals in color has been to first cover the surface to be decorated with an enamel coating. It has been found that the enamel is subject to cracking, which injures the appearance of the finished work, and, moreover, small bits of the enamel are liable to be chipped off at any and all times during the life of the article. It will be seen that by my invention as the color is combined directly with the metal itself and sinks into the same rather than being accumulated upon the outside the work is entirely free from the likelihood of such accidents. There is also a considerable saving in expense in my process over those which have heretofore been common.

My invention will be utilized in various ways, and the process may be applied to small articles, as jewelry, to spoons and other tableware, to cups or vases, or silverware in general. The decoration may take the form of portraits, figures, flowers, natural scenes, &c., at the pleasure of the designer.

It is obvious that any other suitable means may be employed to remove the alloy from the surface.

I claim—

1. That improvement in the art of decorating articles of precious metal containing an alloy, which consists in first removing the alloy from the surface of the metal article, then applying fusible coloring-matter to said surface, and finally heating the article to fuse the coloring-matter.

2. That improvement in the art of decorating articles of precious metal containing an alloy, which consists in first removing the alloy from the surface of the metal article by means of a suitable acid, then applying fusible coloring-matter and a flux to the said surface, and finally heating the article to fuse the coloring-matter.

3. That improvement in the art of decorating portions of articles of precious metal containing an alloy, which consists in first removing the alloy from the surface of the metal article by means of a suitable acid, then applying fusible mineral paint and a flux to a portion of said surfaces, then heating the whole to fuse the paint, and finally finishing the unpainted surfaces of the article.

In testimony whereof I have affixed my signature in presence of two witnesses.

FREDERICK A. HERMANN.

Witnesses:

C. F. BROWN,

E. BATCHELDER.