

UNITED STATES PATENT OFFICE.

MILTON H. CAMPBELL, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO
NORVIN GREEN, OF SAME PLACE.

ELECTROPLATING WITH PLATINUM AND SILVER.

SPECIFICATION forming part of Letters Patent No. 253,159, dated January 31, 1882.

Application filed October 20, 1881. (No specimens.)

To all whom it may concern:

Be it known that I, MILTON H. CAMPBELL, of New York, N. Y., have invented a new and useful Improvement in the Protection of Silver, Silver-Plated, or other Metallic Surfaces from Corrosion or Tarnishing, of which the following is a specification.

My invention has for its principal object the protection of silver or other goods whose surfaces are liable to become tarnished or corroded in transportation and while in stock; and to this end I prefer to subject the goods which are to be protected to the action of an electroplating-bath having an anode of platinum and silver in the form of a perfectly homogeneous alloy of said metals, and an electrolyte having in its solution platinum and silver, as is more fully hereinafter set forth. I find it preferable for this purpose to compound about thirty-six parts of platinum with sixty-four parts of silver in the production of the platinum-silver alloy, though these proportions may be greatly varied. Seventy-five parts of platinum may be alloyed with twenty-five parts of silver, and these proportions will unite to form a homogeneous combination of the two metals. However, if the proportion of platinum be diminished to ten per cent. the alloy will be incapable of resisting the action of the stronger corrosive agents—such as nitric acid and the sulphides.

The physical properties of the platinum-silver alloy are in general a mean between those of the platinum and silver individually. Its specific gravity and density are a mean between the two metals. In respect to color it is silver-white; also, the alloy is less soluble in nitric acid than silver, but more so than platinum. In fact nitric acid will not attack platinum alone, though when homogeneously alloyed with silver and the silver is in excess both metals will be dissolved by the nitric acid. If, however, platinum is in excess, aqua-regia should be employed to effect a solution of the alloy.

In preparing my solution for the electroplating-bath I dissolve the homogeneous platinum-silver alloy in nitric or nitro-muriatic acid. To effect the solution about two ounces of nitro-muriatic acid, or a greater quantity of nitric

acid, if employed instead, must be used to one ounce of the alloy, to which should be added a volume of water about four times that of the acid and alloy. To this latter solution is added a saturated solution of chloride of ammonia, whereby a precipitate is directly obtained, which is a compound of chloride of platinum and silver, and which, when removed from the solution and dried, is in the form of a gray-white powder. However, the compound chloride need not be dried if it is to be used at once. The compound chloride thus obtained, preparatory to its use in the electroplating-bath, is washed and dissolved in a solution of cyanide of potash. About one ounce of the compound chloride is dissolved in one gallon of water (more or less) containing a sufficient quantity of cyanide of potassium to afford a clear solution.

The method which I prefer in treating the compound chloride of platinum and silver is analogous to that ordinarily employed in dissolving chloride of silver in a solution for electro-silvering. The bath, when depleted, may be re-enforced by the addition of the compound chloride, also adding cyanide of potassium, if necessary, instead of employing an anode.

To adequately protect the goods from corrosion and tarnishing while they are in wholesale stock, in the course of shipment, and on the retailer's hands, about six grains of the alloy should be employed to plate one square foot of surface. Such a coating is not calculated to undergo wear, though if desired it may be much heavier, to afford a permanent as well as temporary protection.

As in the well-known method of electro-depositing brass, considerable care should be exercised in regulating the strength of electrical current employed. If the current be strong, silver will be deposited almost to the exclusion of platinum. I find a current of sufficient strength to deposit in five minutes six grains of the alloy per square foot of the surface of the goods capable of effecting an approximately homogeneous deposit, though a still feebler current is preferable.

In my Patent No. 248,554, of October 18, 1881, I have described and claimed means for obtaining a compound chloride of platinum

and silver. This feature I therefore desire to disclaim from this case. Nor do I desire to claim in this application an alloy of platinum and silver or a protecting coating of platinum and silver for metallic surfaces.

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

1. In an electroplating-bath, an electrolyte containing a dissolved double salt of platinum and silver, in combination with an anode of the homogeneous alloy of platinum and silver.

2. In an electroplating-bath, an electrolyte containing a dissolved double salt of platinum and silver, in combination with means, as speci-

fied, for repleting the solution with the double salt.

3. In an electroplating-bath, the combination of an anode of a homogeneous alloy of platinum and silver, and a liquid for said bath having in solution a compound chloride of platinum and silver.

Executed by me this 14th day of October, 1881.

MILTON H. CAMPBELL.

Witnesses:

W. B. VANSIZE,
WM. ARNOUX.