UNITED STATES PATENT OFFICE.

JOSEPH M. THOMAS, OF AUBURN, NEW YORK, ASSIGNOR TO BYRON C. SMITH, OF SAME PLACE.

COMPOSITION FOR BRASS ELECTROPLATING.

SPECIFICATION forming part of Letters Patent No. 273,324, dated March 6, 1883.

Application filed May 11, 1882. (No specimens.)

To all whom it may concern:

Be it known that I, JOSEPH M. THOMAS, a citizen of the United States, residing at Auburn, in the county of Cayuga and State of New York, have invented a new and useful composition of matter to be used as a solution in the process of electroplating the surfaces of iron or other metals with a uniform and durable deposit of brass, and enabling the same to hold its color and withstand oxidation, of which the following is a specification.

Heretofore many obstacles have been encountered in brass electroplating, the chief of which and the most difficult to overcome has been to get a solution that would, by passing a current through it, deposit brass of a deep yellow color in a few minutes of time, and one which would produce a deposit that would effectually prevent the iron or steel upon which the deposit was laid from oxidizing or rusting. The solutions now in general use will not deposit upon steel, malleable, cast, or wrought iron in the same uniform manner; neither will they serve for tin, lead, bismuth, type or britannia metal. The solution as given in my formula hereinafter, and in the proportions named, entirely overcomes these obstacles, and with a strong smooth electric current, and a temperature of 165° Fahrenheit, will deposit upon any of the metals above mentioned a uniform and durable shell of brass in eight minutes' time, of about the thickness of ordinary writing paper, and of a deep yellow color. A deposit of brass thus made with my solution will withstand the vapors of concentrated nitric and sulphuric acids when exposed thereto much better than solid brass itself. It will, besides, receive a fine polish equal to that of solid brass, and withstand oxidation. The solution, too, is not only the cheapest but the most rapid and reliable for the same thickness of electro-deposited shell, and without change of anodes (small or large surface) will serve equally well for the many different metals. It is not necessary to make the solution denser or weaker for the different metals, the same proportions, ingredients, and anodes answering equally well, and securing at a temperature of 165° Fahrenheit, with a strong smooth current of electricity, a regular and effective non-oxidizing deposit or shell of brass.

My composition of matter consists of the following ingredients, combined in the proportions and under the conditions hereinafter stated, to wit: eight ounces (liquid measure) aqua-ammoniæ of 26° Baumé strength; eighteen ounces (avoirdupois weight) cyanide of patassium, generally known as the "commercial cyanide;" one ounce (avoirdupois weight) crystallized acetate of copper; two ounces (avoirdupois weight) crystallized acetate of zinc; one-fourth ounce (liquid measure) diluted or commercial hydrocyanic acid; one gallon of rain or distilled water, (liquid measure.)

In compounding the above mixture I first dissolve the acetate of copper in the aqua-ammoniæ. The water is then raised to a temperature of 165° Fahrenheit, and the cyanide of potassium dissolved therein. I now add the acetate of zinc, stirring until all is dissolved, and then put in the acetate of copper and ammonia mixture; lastly, I add the hydrocyanic acid. The above solution, thus prepared, is now used as a bath in the ordinary way and in connection with either copper and zinc or brass anodes of large area. The color of the brass deposit is determined by the strength and uniformity of the current of electricity passed through the solution, and to secure the most favorable result should be of uniform strength and smoothness.

I am aware that various compositions are patented and in use for brass-plating; but I am not aware that all of the ingredients of my composition, in the proportions stated, have been used together.

What I claim, and desire to secure by Letters Patent of the United States, is—

The herein-described composition of matter to be used in electro-metallurgy for depositing a coating or shell of brass on iron and other metals, consisting of aqua-ammoniæ, cyanide of potassium, acetate of copper, acetate of zinc, hydrocyanic acid, and rain or distilled water, in the proportions and for the purpose herein specified.

In testimony whereof I have hereunto set my hand this 9th day of May, A. D. 1882.

JOS. M. THOMAS.

Witnesses:

JOHN L. HUNTER,

FRANK R. RATHBUN.