

UNITED STATES PATENT OFFICE.

JOHN B. JONES, OF BROOKLYN, ASSIGNOR OF ONE-HALF HIS RIGHT TO
HENRY W. SHEPARD, OF SAME PLACE, AND ROBERT SEAMAN, OF NEW
YORK, N. Y.

COATING IRON WITH ZINC AND ALLOYS OF ZINC.

SPECIFICATION forming part of Letters Patent No. 234,481, dated November 16, 1880.

Application filed April 3, 1880. (Specimens.)

To all whom it may concern:

Be it known that I, JOHN B. JONES, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Coating Iron with Zinc and Alloys of Zinc, for the purpose of resisting oxidation and preventing waste of metal; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to an improved step in the process of coating metals; and the invention consists in subjecting the metal, after it comes from the usual acid-bath, to a neutralizing-bath composed of the chlorides of organic or metallic bases positive to iron, and the oxide or unpurified surface dross of the metal or alloy intended to be used as the metal or coating bath, for the purpose of decomposing the injurious ferric salts in the iron articles to be coated.

The sheets of iron or other articles to be coated are first cleansed of the scale and dirt in the ordinary bath of dilute acid, and are then washed in clear water and inspected as in the common process of galvanizing. The sheets thus washed are then put into a bath of water containing about one or two per cent. of any soluble metallic or organic chloride whose bases are positive to iron, such as methylamine or ethylamine chlorides, ammonium, or zinc chloride.

Into, say, about one hundred gallons of this solution I stir about four or five pounds of the oxide or unpurified surface dross of the metal or alloy intended to be used as the metal bath. The addition of this oxide furnishes an element contained in that portion of zinc of which it is composed which materially assists in decomposing the ferric salts in the iron, forming a positive element to the negative ferric salts, as there always remains a sufficient quantity of free acid in the pores of the iron to excite action, although it may have been washed in water.

In use the temperature most suitable is about 120° Fahrenheit. The sheets of iron, when taken from the clear-water bath, are put into this bath, remaining for a short time—say ten or fifteen minutes—or until the next lot of

sheets or articles from the water bath are ready. The action of this neutralizing bath or solution of chlorides and metallic oxides is to decompose the ferric salts and neutralize any free acid contained in the pores of the iron after leaving the first bath of sulphuric or muriatic acid. The ferric salts are infusible at the temperature of the metal bath, and unless they are decomposed or removed they will remain in the iron and cause rust or otherwise injure it by its subsequent decomposition after the metal coating has been applied.

As the sheets come from the neutralizing bath they are immersed, without drying, in the usual manner into a metal bath composing the alloy, to obtain the desired coating.

The alloy which I prefer to use in coating metals, after they have been subjected to the action of the processes hereinbefore described, is an alloy composed of nickel, lead, tin, and zinc, applied as a metal bath, and compounded substantially as described in an application for Letters Patent filed by me on the 17th day of August, A. D. 1880; but I may use as an alloy the ordinary bath of melted zinc.

In some cases I may employ another bath, which I term a "flux-bath," for the purpose of removing any oxidation or preventing its formation as the sheets or articles are passed into the alloy or metal bath. This flux-bath should be composed of about equal volumes of water and chlorides of zinc, or any other chlorides of the organic or metallic bases whose salts are fusible at the temperature of the metal bath. When this flux-bath is employed the sheets undried are taken from the neutralizing-bath and at once put into the flux bath, and are thence taken and immersed undried in the metal bath.

Instead of this flux-bath I may use a bath composed in the proportions of one gallon of water, two pounds of chloride of ammonium, (sal-ammonia,) and one gallon of dissolved chloride of zinc. If this last bath be used its surface should be covered to a depth of two or three inches with naphthaline-oil or any other substance capable of combining with chlorine in a heated condition; but the use of either of these baths is optional, and it is not

necessary to employ either of them except in rare cases where the neutralizing bath fails to thoroughly decompose and remove the ferric salts.

5 My improved process of preparing the iron sheets or other articles to be coated is a valuable improvement, whether the metal bath is composed of zinc only or of zinc, tin, lead, and nickel combined, or tin only, or iron coating of
10 any kind. It thoroughly decomposes the injurious ferric salts from the fibers of the iron, thereby removing an injurious and destructive element to the durability of the iron through deliquescence and exposure to moist atmos-
15 phere. Besides this, the combined action of the acid and the neutralizing-baths so thoroughly cleans the iron and frees it from infusible ferric salts and iron oxides as to insure a perfect chemical union between the iron and

the coating metal without the use of the ordi- 20 nary drying-chamber and free muriatic acid.

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

The improvement in the process of coating metals, which consists in subjecting the metal, 25 after it comes from the usual acid-bath, to a neutralizing-bath composed of the chlorides of organic or metallic bases positive to iron and the oxide or unpurified surface dross of the metal or alloy intended to be used as the metal 30 or coating bath, as described, for the purpose of decomposing the injurious ferric salts in the metal to be coated, substantially as specified.

JOHN B. JONES.

Witnesses:

ERNEST C. WEBB,
JOHN B. BAKER.