

UNITED STATES PATENT OFFICE.

JOSIAH H. LEGGE, OF PITTSBURG, ASSIGNOR OF ONE-FOURTH TO A. A. McCARTY, OF ALLEGHENY, PENNSYLVANIA.

COMPOUND FOR COATING METAL.

SPECIFICATION forming part of Letters Patent No. 295,256, dated March 18, 1884.

Application filed October 22, 1883. (No specimens.)

To all whom it may concern:

Be it known that I, JOSIAH H. LEGGE, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Compounds for Coating Metals; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to alloys for coating metal sheets, wire, or other articles, its object being to form a composition by which these articles can be coated without pickling, as has heretofore always been considered necessary in coating with tin, zinc, and like metals. It consists, essentially, in a compound formed of lead, zinc, tin, and borax or baborate of soda, the compound being formed by melting the several metals together and then thoroughly intermingling the borax therewith, the several metals being held together by the borax, and the compound, while heated, being spread, rubbed, or pressed into the article to be coated, and forming a fine surface thereon, which efficiently protects the iron from oxidation and resists any ordinary friction or wear on its surface.

My improved compound is preferably formed of the following proportions: Lead, fifty parts; zinc, fifty parts; tin, twelve and one-half parts, and borax, one part. The proportions may, however, be varied without departing from my invention, the lead and zinc being employed in any proportions to each other of from twenty to eighty parts, and the tin being employed in any proportion from five to twenty-five parts to the one hundred parts of lead and zinc combined, while the borax may be employed in any proportion from one-half part to five parts to the one hundred parts of lead and zinc combined. In forming my improved composition, I first melt the zinc in a suitable crucible, furnace, or pot, and then drop in the tin, preferably in a divided state, and allow it to melt. The lead is then introduced, and when properly melted the proportion of borax is gradually stirred in with the metal, and the coating compound is then ready for use. The different metals employed may be melted separately, if desired, and afterward mixed in the melting furnace or pot.

The borax or baborate of soda acts to hold the metals together, and also causes them to unite with the sheet or other article to be coated without its being pickled, as hereinafter described. The compound thus formed is in a mushy or viscid condition when melted, and the articles to be coated can be easily pressed into it. When cold, it breaks up into small lumps or granular form.

Before applying my improved coating composition to the surfaces of the sheet, wire, or other article to be coated, the article is first passed between metal brushes to brush or break off all the loose scale or oxide adhering to the article; or this loose scale or oxide is removed by other suitable mechanical means. Where the article is of irregular form, it can be brushed by means of metal brushes or scraped to break off this scale or oxide. The coating compound can be applied in different ways. The manner preferred by me in coating sheets and wire is to pass it down into the material and through suitable rolls within the material or at its surface, which will press or rub the coating compound into the surface of the metal. These rolls may be formed of metal, asbestos, or any other suitable material. Instead of the rolls, a series of brushes may be employed, by which the compound will be spread and rubbed on the sheet or other article. The article can also be first dipped into the melted compound and afterward the compound adhering to it be rubbed into its surface by suitable brushes, scrapers, or other tools. The heated compound can also be spread upon the surface of the article and rubbed on in any suitable manner, in this last case it not being necessary to dip the article in the compound.

This coating compound enters into the metal to be coated, and apparently absorbs any oxide or scale left on the surface of the article, forming a smooth and fine finish on its surface. On account of the lead and tin in the compound it efficiently protects the articles from oxidizing or rusting, while the zinc increases the hardness of the metal surface formed on the sheet or other article, so that the articles coated with this compound will stand exposure without rusting, and, where a

large proportion of zinc is employed, any ordinary frictional wear.

As all the materials employed in the compound are cheap, it is evident that the coating compound can be made at a very little expense. As it does not require the pickling of the sheet or article in acid before it is coated, I am enabled to preserve the surface-finish of any wrought metal coated, and to preserve the strength of the article, which is often impaired by the acid employed in scaling the article. I also prevent any liability of oxidation or rusting under the coating of the article, as often happens with galvanized or tinned sheets or articles where the acid has not been properly removed from the sheet before coating.

I am aware that fluxes of borax have been employed on the surface of melted coating metals to prevent oxidation, or as one of the ingredients in vitreous compounds to dissolve the oxide from the surface of sheet metal; but these uses differ from my invention, as the borax did not enter in any manner into the coating formed.

I am also aware that a pulverulent compound formed of lead, borax, flake-white, zinc, brass, copper, manganese, tin, antimony, and lime, and containing about twenty per cent. of borax, as described in Letters Patent granted

to E. Wood, March 17, 1874, has been employed, being spread on metal articles while at a red heat, and fused by the heat of the article, forming a coating thereon, and the borax simply acting to assist in the fusion of the metals in the pulverulent compound. This, however, differs from my improved compound, as it is not composed of the same ingredients, is not compounded in the same manner or for the same purpose as my compound, and the borax does not act to hold the several metals together, and does not enter into the body of the coating compound or form part of the coating or covering of the articles treated, as is the case in my improved compound.

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

The herein-described compound for coating metals, composed of lead, zinc, tin, and borax, the borax being in the proportion of one-half of one per cent. to five per cent. of the lead and zinc employed, substantially as and for the purposes set forth.

In testimony whereof I, the said JOSIAH H. LEGGE, have hereunto set my hand.

JOSIAH H. LEGGE.

Witnesses:

JAMES I. KAY,
J. N. COOKE.