UNITED STATES PATENT OFFICE.

WILLIAM MILD, OF HAMILTON, OHIO, ASSIGNOR OF ONE-HALF TO STEPHEN CRANE, OF SAME PLACE.

PROCESS OF AND COMPOUND FOR COATING METALS.

SPECIFICATION forming part of Letters Patent No. 491,220, dated February 7, 1893.

Application filed February 8, 1892. Serial No. 420,768. (No specimens.)

To all whom it may concern:

Be it known that I, WILLIAM MILD, a citizen of the United States, and a resident of Hamilton, in the county of Butler and State of Ohio, have invented a certain new and useful Process of and Compound for Coating Metals, of which the following is a specification.

The object of my invention is a process of and means for coating metals to protect them from oxidation, which coating can be cheaply applied and will not scale or crack by bending the metal which is coated with it.

The invention is especially intended for use upon sheet metal, wire &c, which are now usually coated by what is known as the galvanizing process. This coating will crack and scale off in use, and soon becomes oxidized when exposed to the elements. My invention overcomes these difficulties and can be applied much cheaper.

My metallic bath in which the metal to be coated is dipped, is composed of lead, block tin, bismuth, sodium, and muriate of ammonia, in about the following proportions. For a ton bath, I take thirteen hundred pounds of lead, seven hundred pounds of block tin, one-half pound bismuth, and six ounces of the metal sodium. When these are melted together I stir for twenty minutes and then let it stand for twenty minutes more, after which I skim all the dross from the surface and then add two pounds of muriate of ammonia and the bath is ready for use.

The articles are prepared for coating in the following manner: The articles are first immersed in a warm bath composed of one part of sulphuric acid to twenty parts of water and left in the bath until all scales and impurities are removed, or loosened. The articles are then removed and plunged into clean water to wash off what scales are left adhering. The articles are taken from this bath and dipped in a bath composed of two hundred pounds of muriatic acid two pounds of muriate of ammonia and ten pounds of spelter zinc dissolved together. From this bath they are placed in a drying oven and when dry the articles are lowered into the metallic bath and left there until coated with metal, which will be ordinarily about one minute. When taken out of this bath the articles are shaken to free them of the surplus metal and immediately plunged into a boiling bath composed of two pounds of muriate of ammonia to eighty gallons of water. This removes all dross or impurities adhering to the surface and leaves the finished articles with a clean bright coat of flexible metal.

When the article is a casting or fitting which is greasy I add to the first pickling bath about four pounds of caustic soda to remove the grease.

As a substitute for the sodium used in the metallic bath I can use eighteen pounds of britannia metal, or the proportionate amount of the metals of which it is composed. I prefer to use the sodium as it gives a brighter and smoother coat

I find in use that the metallic bath will deteriorate and I ascertain this fact by the formation of a thick frothy scum upon top. When this occurs I skim off the scum, and add about one pound of muriate of ammonia. It is also a fact to be noticed that the articles will take up more than a proportionate amount of sodium. This fact is indicated by the color of the coated article. So soon as the coating shows a bluish cast when removed from the metallic bath, it indicates to the operator that more sodium should be added. Usually from one-half to one ounce of the metal sodium will correct the bath. This can be readily determined by the operator, as when the bath has the requisite amount of sodium the coated article comes out of the bath with bright white coating.

I have described my process when used with a one ton bath which is about as small as it is economical to use. It is necessary to keep the bath kettle pretty well filled. For this purpose I mold the first bath into ingots, and when the metal is withdrawn from the bath I add the alloy to keep the kettle full. By this means I keep a supply of the metal in stock. I am enabled by having a quantity of the metal prepared to run my process continuously. This is impossible with the ordinary galvanizing or zinc process which forms a heavy sediment that settles in the kettle. From twenty to thirty per cent of the metal

settles and is worthless for coating. I have no difficulty of this kind as all my metal is used the sediment amounts to very little.

I intend to prepare my alloy in ingots for sale to parties who desire to use my coating process on a limited scale. The proportions I have given above for the alloy, and for the baths for preparing the metals to be coated, I have found after experience to be the best, but these proportions may be varied somewhat.

What I claim as new and desire to secure by Letters Patent is:

1. In the process of coating with metal, immersing the metal to be coated in a bath consisting of lead, block tin, bismuth, sodium, and muriate of ammonia in about the following proportions for a one ton bath to wit: lead thirteen hundred pounds block tin seven hundred pounds, bismuth one-half pound, sodium six ounces, and muriate of ammonia two pounds prepared substantially as specified.

2. The process of coating metal with a flexible adherent coating, which consists in preparing the metal to be coated by first immersing the same in a warm bath of diluted sulphuric acid, then rinsing the same in clear water, then dipping the article in a bath of muriatic acid two hundred pounds muriate of ammonia two pounds, spelter zinc ten pounds, and after drying dipping the article in a hot metallic bath of lead, block tin, bismuth, sodium, and muriate of ammonia, in the proportions specified and finally plunging the article in a bath of boiling water and muriate of ammonia in the proportions one pound of muriate of ammonia to forty gallons of water.

WM. MILD.

Witnesses:
F. T. HAMMERLE,
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