

United States Patent Office.

JOHN DANIEL GRÜNEBERG, OF CAMDEN, NEW JERSEY.

Letters Patent No. 102,254, dated April 26, 1870.

IMPROVEMENT IN COATING METALS.

The Schedule referred to in these Letters Patent and making part of the same

Be it known that I, JOHN DANIEL GRÜNEBERG, of the city and county of Camden and State of New Jersey, have invented a new and useful Improvement in Articles of Plated and Coated Metal; and I do hereby declare the following to be a clear and exact description of the nature thereof, sufficient to enable others skilled in the art to which my invention appertains to fully understand and use the same.

I desire to draw attention to an improvement on my patent No. 75,898, granted January 11, 1868. By that process zinc (spelter) or zinc alloy, or other hard metals, are coated by tin or an alloy. The disadvantages arising out of the manufacture thereof, which I have learned by my experience, are the following:

First. When zinc or zinc-alloy is plated or coated with tin, it easily corrodes, and even the slightest touch of perspired hands will produce marks which are very difficult to remove.

Second. Water-tanks lined with the above-named metal will not stand lime-water. It corrodes, and holes appear all over the surface in a very short time.

Third. The aforesaid metal, on account of the tin-plating, is a great deal too expensive to compete with other roofing metal.

Fourth. The waste or cuttings, which are unavoidable in the manufacture of the metal, cannot be used to advantage when melted again with the tin coating, (I am aware that the tin coating could be separated from the zinc before melting, but it would be too expensive,) for then it becomes a zinc-alloy, which is hard and brittle and hardly fit to be used for roofing.

My new invention and improvement is intended to remedy all the above and foregoing imperfections and difficulties, and is done in the following manner, viz:

I cast in a mold a block, or I take a sheet of zinc or zinc-alloy, or other hard metal, and heat it, but not too hot, roll it out to the proper size or thickness, say from one-quarter to one inch in thickness, or according to the size of the sheets wanted. I then cast a block or sheet of lead or lead-alloy, and reduce it by passing it through a pair of highly-polished iron rollers, to the thickness of one-quarter of an inch, more or less, in size, than the aforesaid zinc or zinc-alloy, and then spread it upon a clean smooth table, and lay the prepared block or sheet of zinc or zinc-alloy upon the strip of lead or lead-alloy, and then lap it over and rub it down smoothly. I then take this prepared block or sheet of zinc or zinc-alloy, and pass it through highly-polished rollers with heavy pressure. The friction thereof will heat the metals in passing through the rolls, and cause them to unite firmly with a uniform surface, so as to produce a superior and much cheaper article of metal, and which will not crack or corrode like zinc plated with tin, and is highly adapt-

able for roofing and many other purposes, except for linings of drink water-tanks.

I now will explain my other process, that is, of using the waste or cuttings of the zinc or zinc-alloy to great advantage, without again plating it, which always produces great heat, and frequently spoils the sheets of metal before they can be finished.

I take the waste or cuttings of the zinc or zinc-alloy, and melt it carefully, not too hot nor under the proper melting point, and cast a block or sheet of the requisite size, and then roll it out between a pair of rollers, while at the temperature of from 212° to 318° Fahrenheit, to suitable sheets. Great care must be taken when it is rolled that the zinc or zinc-alloy does not exceed the above temperature, as the metal when too hot will crack, and, even at the degree of 424° Fahrenheit, can be powdered. I then trim and cut such sheets to the desired size for roofing, tub, and tank linings and other purposes. (The object of cutting or trimming the sheets before coating is mainly to keep the waste metal as pure and soft as possible, and without coating or plating it the second time, which would produce another alloy still harder than the first.) They then ought to be properly examined, and grease or any other dirt should be carefully removed, which can be done by washing the same in a weak solution of sulphuric acid and water, say one ounce sulphuric acid to four gallons of water. After this it must be well rinsed with clean water. It is then ready to undergo the following process of coating, viz: with copper, brass, tin, or lead, by dipping in a bath.

Copper Solution.

I dissolve sulphate of copper in water, and add as much cyanide of potassium as will make it clear, and then add about one-fifth to one-tenth aqua ammonia, and finally mix as much water as will reduce it to 8° Baumé.

Brass Solution.

I dissolve equal parts of sulphate of copper and sulphate of zinc in water; and add as much cyanide of potassium as will make it clear, and then add about one-fifth to one-tenth aqua ammonia, and finally mix as much water as will reduce it to 8° Baumé.

Tin Solution.

Three pounds phosphate of soda, one pound muriate of tin; also one and a half pound muriate of tin, which is well dried, and melted by warm temperature in water, sufficiently diluted with water, so as not to discolor the metal.

Lead Solution.

I take litharge and boil it in lye till it is dissolved,

when it must be diluted with water to the degree of 1.33 specific gravity. A coating of lead by this solution on my waste metal can be applied by the galvanic process only.

My dipping process is as follows: The bath-tank must be sufficiently large and the solution sufficient in quantity to receive and cover the aforesaid sheets of prepared waste metal. They then are placed in an upright position, and care should be taken that they do not touch. By this mode both sides are coated, (it can also be coated on one side only, by merely allowing the solution to touch the side you desire to coat,) and after a short time there will be a uniform coating on the same. Also, a coating of any thickness can be applied to the aforesaid waste metal by using the galvanic process in connection with the above and foregoing solutions.

The uses to which my invention can be applied are

numerous; generally speaking, to all purposes requiring stiff metal, especially for roofing, which will neither corrode, crack, nor be affected by heat or cold, being, likewise, a safeguard against fire, and is, therefore, superior to the purest tin, being much cheaper, which is of great importance and advantage to the public, and, therefore, I consider it a great improvement on all former inventions of similar nature.

Having thus described my invention,

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

The mode of coating or plating metals substantially described within.

Signed March 30, 1870.

JOHN D. GRÜNEBERG.

Witnesses:

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