

UNITED STATES PATENT OFFICE.

SELAH HILER, OF HAVERSTRAW, ASSIGNOR TO JOHN M. AND CORNELIUS
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IMPROVEMENT IN COATING METALS.

Specification forming part of Letters Patent No. 21,797, dated October 12, 1858.

To all whom it may concern:

Be it known that I, SELAH HILER, of Haverstraw, in the county of Rockland and State of New York, United States of America, have invented and made a certain new and useful improvement in the method of coating iron and steel with silver, copper, and brass, or any alloy where silver or copper is used; and I do hereby declare the following to be a full, clear, and exact description of said invention.

In the manufacture of stair-rods, buttons, trunk-nails, trunk-bands, mats for photographs, door-mountings, and various other articles, brass or other ornamental metal has generally been used, which of itself is either made sufficiently thick to possess the required strength, or else a thinner sheet of brass is drawn tightly over a mold or form of iron or other cheaper metal. In both the foregoing cases the brass or other ornamental metal is costly if sufficiently thick, or, if attached to an iron form or mold, is apt to become loose, and possesses very little solidity or durability.

The nature of my said invention consists in a new method of coating iron or steel with silver, copper, or brass, or any alloy where silver or copper is used, whereby the two metals become so united that they can be rolled, hammered, drawn, or otherwise worked without causing their separation.

In order to coat iron or steel with silver or copper or their alloys, various methods have heretofore been pursued. The iron has been cleaned and dipped cold, and also when heated, into the melted coating metal; but the coating thus obtained is not sufficiently amalgamated or united with the iron to adhere to the same when rolled, hammered, or otherwise worked. Two plates or bars of metal have been cleaned and brought into contact, and then heated until the coating metal has melted and the two become united. This last operation, however, it is believed has never been successfully practiced, so as to introduce metal thus prepared into public use, probably on account of the air remaining between the surfaces causing oxidation and preventing a perfect union.

I have discovered that the best union of the iron or steel with its coating metal can be made by heating the iron or steel until it is fused,

and bringing it while in that condition in contact with the coating metal, and keeping it so in contact until both metals have become cooled to a proper temperature. I accomplish this by taking a bar of common good wrought-iron and cutting it up into pieces weighing from four to eight pounds, the particular size not being material. I then place these pieces into a suitable crucible, preferring that known kind in the arts as a "black-lead" crucible. I then add with the iron any known flux, generally using borax, in the proportion of about one-quarter of a pound of borax to one hundred pounds of iron; but the particular quantity is not material. I then place the crucible in a furnace such as is generally used in melting steel, and place on a cover of the same material, and then subject the whole to a very high degree of heat for the space of from two to three hours, when the iron will become melted and capable of being poured as a liquid, and by placing the coating metal in a mold having a space left therein to receive the iron or steel in a melted state, the same being poured into the said space in contact with the said coating metal, whereupon the coating metal will be fused by the heat of the metal to be coated, and by allowing them to remain in contact until both have become hard by cooling, it will be found that they have become so firmly united that they may be hammered, rolled, drawn, or otherwise worked without causing their separation. On the melted iron being poured into the mold in contact with the coating metal, the latter becomes fused by the heat of the former; but before it is so fused the iron has parted with so much of its heat as to be sufficiently chilled to prevent the coating metal from mixing with the iron, and also to prevent the said coating metal from sinking down and occupying the bottom of the mold. When steel is to be coated, it may be treated in the same manner in which I treat the wrought-iron, except that it will be found that a less degree of heat will suffice to melt it.

In case I wish to make an iron or steel wire covered with the coating metal, I take a tube composed of the coating metal, place it in a suitable mold, and pour the iron or steel in a melted state into the tube, whereupon the tube of coating metal becomes fused by the

heat of the iron or steel, and, cooling a sufficient time for both to become hard, they are firmly united, and then may be rolled or drawn out into wire perfectly covered with the coating metal and of such size as may be desired.

The manner of constructing molds in which said metal is coated may be varied and adapted to any particular purpose desired. The method also of melting or pouring the iron or steel may be varied to suit the article required to be made.

I do not claim heating the iron or steel to be coated with brass, copper, silver, or other metals or alloys of metals to a white or welding heat, that having been done before; but

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

The coating iron or steel with copper, silver, or brass, or alloys where silver or copper is used, by bringing the iron or steel, while in a melted state, into contact with the coating metal, and allowing them to so remain until the two metals have become hard by cooling, substantially as specified.

S. HILER.

In presence of—

MILES B. ANDREW,
MELVILLE V. BIGGS.