

# UNITED STATES PATENT OFFICE.

LUCIAN R. NOURSE, OF ELGIN, ILLINOIS.

PROCESS OF COATING CAST-IRON WITH OTHER METALS OR ALLOYS.

SPECIFICATION forming part of Letters Patent No. 516,551, dated March 13, 1894.

Application filed July 12, 1893. Serial No. 480,289. (No specimens.)

*To all whom it may concern:*

Be it known that I, LUCIAN R. NOURSE, a citizen of the United States, residing at South Elgin, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Processes of Coating Cast-Iron with other Metals or Alloys; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to the art of coating or plating metal with other metals or alloys, and has for its primary object to provide a supplemental, integral metallic coating for cast iron surfaces to which other metals will tenaciously adhere; the fusing or melting point of which coating is above that of the metal or alloy with which it is intended to be finally coated. Then after having been dipped in a suitable flux, the supplemental metal coated articles are immersed in the molten metal desired for the final coating.

The primary object and the supplemental coating of the articles is accomplished by electrolysis and the final coating by the ordinary means used by tin-platers and galvanizers.

In order to successfully accomplish the first object of my invention, a large amount of electric current must be used, thereby doing a large amount of coating in a reasonably sized bath, and in a reasonably short time. This has never to my knowledge been done prior to my invention. All the various solutions used being of such a composition that only weak currents of electricity could be utilized, besides causing the deposits to form only upon the more prominent parts of the article to be coated, and upon particularly objectionably formed or shaped articles having depressions and angles in the same without any, or so little of the coating that no melted metal would adhere, causing the whole article or articles to be worthless; and that if a reasonably strong current were used, oxidation of the metal deposited took place, spoiling the work itself and so changing the solution that even with a weak amount it afterward failed to produce the proper effect.

I have found in the practical demonstration of my invention that a current of electricity larger in proportion to the quantity of

ingredients added from time to time can be used by my improved process and solution and thereby overcome all the heretofore objectionable features stated. Furthermore, owing to the porous nature of cast iron a comparatively heavy coating must be deposited to obtain good results, and this can only be obtained by a strong current and a constantly uniform solution. As a perfect product of such articles will only command low prices, (they being in direct competition with malleable and wrought iron, tinned and galvanized articles), all efforts heretofore to produce commercially desirable cast iron coated articles have so far as my knowledge extends failed; whereas the cost of my process is so low that a great demand is being created for the product of the process, thereby adding greatly to the industry of producing cast iron articles with properly coated surfaces.

The invention will be fully disclosed in the following specification and claim.

I first prepare an electroplating bath consisting of a saturated solution of a salt or double salt of iron, sulphate of iron being preferred, and some borate or boric compound, preferably boracic acid and water, then by a suitable heating apparatus, such as steam conducting pipes, the temperature of the bath is raised until the abnormal heat of from 130° to 140° Fahrenheit is reached and constantly maintained while the work is going on; at which temperature the bath will show by a hydrometer a density of 17° to 20° Baumé, sufficient of the sulphate of iron and boracic acid being constantly supplied to the bath to cause the solution to remain saturated with them. For a bath which is maintained at the temperature specified, I use about two and one half pounds of sulphate of iron and about six ounces of boracic acid to each gallon of the solution. The iron articles to be coated being now placed in position and properly connected electrically to a low tension but strong current of electricity, maintained at as constant a supply as it is possible, the articles will be found to receive a white or nearly white coating, the thickness of which depends upon the time they remain in the bath. Very smooth castings requiring less and rough castings more than an average amount of time in the solution to produce an effective coating.

