

H. J. LOHMANN.
METALLIC COATING FOR METALLIC ARTICLES.
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1,052,156.

Patented Feb. 4, 1913.

Fig. 1.

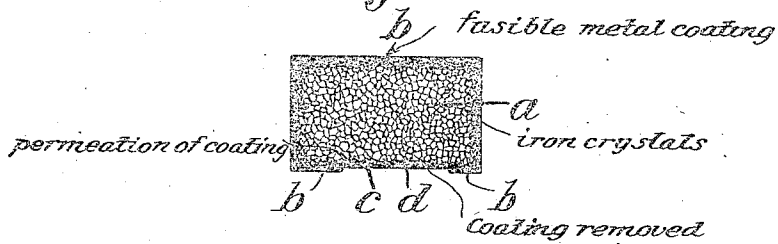
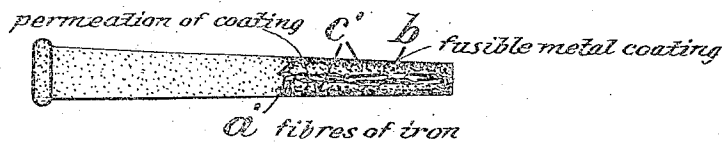


Fig. 2.



Witnesses:

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Inventor

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UNITED STATES PATENT OFFICE.

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METALLIC COATING FOR METALLIC ARTICLES.

1,052,156.

Specification of Letters Patent.

Patented Feb. 4, 1913.

Application filed February 20, 1912. Serial No. 378,371.

To all whom it may concern:

Be it known that I, HERMAN J. LOHMANN, a citizen of the United States, residing at 90 Monticello avenue, Jersey City, county of Hudson, and State of New Jersey, have invented certain new and useful Improvements in Metallic Coating for Metallic Articles, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The present invention relates to a means for preventing the corrosion of metallic articles, especially those made of iron or steel, and such means consists of a lead coating permeating the substance of the article to a measurable depth and having a strong chemical union therewith, so as to prevent the penetration of the atmosphere and the resultant oxidation of the article.

The most common means used for protecting iron and steel articles is the process of so-called "galvanizing" with zinc; but the susceptibility of zinc to corrosion by atmospheric influences, and especially by sulfurous or sulfuric acid fumes and vapors, and by sea-air or sea-water, is well known. Zinc is also a brittle metal, which possesses only a surface adhesion with the article, and sheet-metal coated with it cannot therefore be worked into forms where the metal is abruptly bent, without cracking the coating and exposing the sheet to oxidation.

The present invention substitutes a coating of lead alone or with a slight admixture of tin, for the zinc coating heretofore used.

It is well known that lead presents a great resistance to sulfurous and other corrosive fumes, and that it is entirely flexible, so that sheet-metal articles coated therewith may be bent without cracking the coating; but lead alone has not usually been substituted for zinc as a coating, because it has no affinity for iron and the means employed for attaching the zinc coating will not attach the lead coating satisfactorily.

I have discovered that the process for coating iron or steel articles patented to me on April 25, 1911, in Patent No. 990,443, can be used to coat articles of iron or steel with a plain lead coating, which forms a chemical union with the surface of the article and penetrates the same so as to protect it, even if the surface coating be re-

moved by wear or abrasion. This discovery is of great value, because lead is materially cheaper than zinc, and articles can therefore be coated with it at less cost, and possess a resistance to corrosion which is many times greater than that afforded by zinc.

Where a bright appearance is desired in the article, I mix one per cent. of tin with the lead, such addition also causing the lead to flow more freely when applied to the metallic articles and giving the coating a little brighter color, while it remains substantially a lead-coating.

The article claimed herein is readily distinguished from any plates heretofore coated with lead, by the penetration of the coating into the substance of the article and its chemical union therewith. It is also distinguished from any lead-coated or zinc-coated article heretofore produced, by the absence of any line of demarcation between the coating and the article when a section of the article is etched and examined by a microscope. Such penetration of the coating into the substance of the metallic article is illustrated graphically in the annexed drawing, in which—

Figure 1 is a section considerably magnified of a rectangular piece of cast iron with the coating applied upon its four sides, except where it has been removed from the surface of the iron upon a portion of its under side. Fig. 2 shows a wrought nail considerably enlarged with the end portion in section.

In Fig. 1, *a* shows the substance of the rectangular casting, *b* shows the coating thereon, *c* the portion of the coating which penetrates the superficial crystals of the casting, which penetration is graphically shown by stippling upon such crystals. *d* designates the surface of the casting where a portion of the coating has been removed upon the under side; the stippling adjacent to such surface showing the penetration which protects the surface of the casting where the coating is removed.

In Fig. 2, a nail of swede iron is shown, the letter *a'* designates the fibrous body of the nail, the letter *b* the fusible metal coating, and the letter *c* the permeating portion of the coating which extends into and between the fibers.

In applying the coating to the article, the

lead alone, or admixed with one per cent. of tin is melted to form a molten bath, and the article dipped therein after suitable preparation to cause a penetration of the melted metal into the substance of the article and a chemical union therewith.

At the present time, I use the process described in the said Patent No. 990,443, for amalgamating the surface of the article in a peculiar manner before dipping it into the bath of the molten metal; but my claim herein is not to the method of coating, but to the article having the characteristics claimed, however they may be obtained. These characteristics give the lead-coated metallic article an extraordinary resistance to corrosive agents, so that articles with such a coating are able to resist sea-water, the corrosive atmosphere in mines and acid factories, chimney stacks, and other situations where ordinary galvanized articles are soon corroded.

The present invention is a specific form of that claimed in my application No. 585,952 filed October 8, 1910 for patent on permeating protective for iron and steel articles, in which claim is made broadly to an article of iron or steel having a coating of any metal of the lead group (lead, zinc or tin) covering its surface and penetrating the substance of the article to a material and measurable depth and forming a chemical union

therewith, and my present application is therefore limited to the specific form of the invention described and claimed herein.

Having thus set forth the nature of my invention what is claimed herein is:

1. A metallic article having a coating chiefly of lead disposed upon the surface and penetrating into the substance of the article to a material and measurable depth and forming a chemical union therewith, such permeating portion of the lead operating to protect the article from corrosion independently of the surface-coating.

2. An article of iron or steel having a coating chiefly of lead disposed upon the surface, the lead having about one per cent. of tin mingled therewith, and the coating having a penetration into the exposed pores of the article to a material and measurable depth and forming a chemical union with the exposed surfaces, such permeating portion of the coating-metal operating to protect the article from corrosion independently of the surface-coating.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HERMAN J. LOHMANN.

Witnesses:

JOHN G. BELDEN,
THOMAS S. CRANE.