

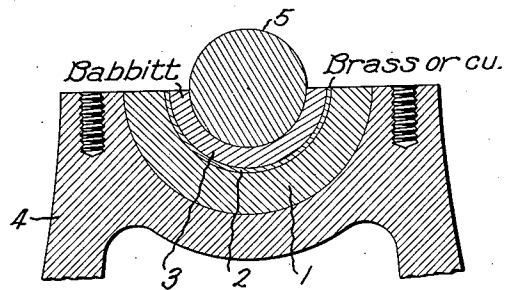
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F. C. KELLEY

METAL COATING

Original Filed May 10, 1920



Inventor:
Floyd C. Kelley,
by *Alexander S. Hunt*
His Attorney.

UNITED STATES PATENT OFFICE.

FLOYD C. KELLEY, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

METAL COATING.

Original application filed May 10, 1920, Serial No. 380,023. Divided and this application filed October 12, 1922. Serial No. 593,958.

To all whom it may concern:

Be it known that I, FLOYD C. KELLEY, a citizen of the United States, residing at Schenectady, in the county of Schenectady, State of New York, have invented certain new and useful Improvements in Metal Coatings (division of my application filed May 10, 1920, Serial No. 380,023), of which the following is a specification.

The present invention relates to the coating of cast iron with other metal and particularly to the production of a composite article of cast iron and a non-ferrous metal.

Great difficulty has been experienced in causing cast iron to unite with a non-ferrous metal, for example, copper, in such a way as to produce a thoroughly adherent coating or union. Heating the metals to be united in hydrogen does not cause the copper to wet the cast iron as is the case when copper in a molten state is brought into contact with steel in the presence of hydrogen. Fluxes likewise fail to produce an adherent coating between cast iron and copper, or the like, when used in the usual way in contact with air.

I have discovered that a homogeneously adherent union between cast iron and a non-ferrous metal of lower melting point, such as copper, silver or brass can be produced by applying the molten non-ferrous metal to the cast iron to be coated in a reducing atmosphere in the presence of a flux, particularly cryolite.

In accordance with my invention, cast iron articles intimately united with brass or other suitable cupreous metal, may be produced. The cupreous metal in turn may be united with a layer of other metal, such as Babbitt metal which otherwise could not be integrally united with cast iron.

The accompanying drawing illustrates in section a bearing made by the practice of a process embodying my invention.

In accordance with one method of producing the article constituting my invention a body of cast iron 1 to be joined to a metal layer 2 of copper, silver or the like is heated in any convenient way, as for example, in an ordinary gas flame, to about 750 to 800° C., whereby the surface of the cast iron is

oxidized. A suitable flux, preferably cryolite, then is distributed uniformly over the heated surface as by applying the cryolite in powdered form upon the oxidized surface of the cast iron. The cryolite is brought to fusion on the heated cast iron, and the iron surface coated with cryolite flux is brought into contact with molten copper, brass or the like in a hydrogen atmosphere. For example, a piece of copper wire may be wrapped about the cast iron and the iron with the copper heated to the melting point of copper in a hydrogen furnace. If the cryolite has been properly distributed before melting the copper, a uniform coating 2, of copper results which when molten "wets" the cast iron in such a way as to resist mechanical separation when solidified. In my opinion the heating of the cast iron to about 750° to 800° C. in an ordinary gas flame oxidizes the carbon out of the surface of the cast iron, and whatever oxide of the iron is formed is subsequently reduced by the hydrogen.

A layer of Babbitt metal 3 may be cast against the layer of copper. Babbitt metal is an alloy consisting of a preponderant amount of tin, a lesser amount of antimony and a small percentage of copper. A bearing thus produced may be supported on a suitable frame 4. Only one-half of the bearing enclosing the shaft 5 has been illustrated.

When cast iron is to be coated with silver, I prefer to employ borax as a flux.

In the appended claims, I have set forth the novel features of my invention with particular reference to copper, but I wish it to be understood that my invention is equally applicable to coating cast iron with other metals, as for example, brass, and I mean by the appended claims to cover an article comprising cast iron united to metals other than copper having similar properties.

What I claim as new and desire to secure by Letters Patent of the United States, is,—

1. An article of manufacture comprising cast iron, a coating of cupreous metal united with the cast iron, the surface of the iron at the junction with said cupreous coating containing less carbon than the main body

of said iron, and a layer of Babbitt metal united with said cupreous metal.

2. An article of manufacture comprising cast iron, a coating of copper directly and integrally united with the surface of the cast iron, and a layer of tin alloy united with said copper coating.

3. An article of manufacture consisting of a base of cast iron, a coating of copper united therewith and a layer of Babbitt metal united with said copper coating. 10

In witness whereof, I have hereunto set my hand this 10th day of October, 1922.

FLOYD C. KELLEY.