Patented Feb. 5, 1935 1,990,070

UNITED STATES PATENT OFFICE

1,990,070

BIMETALLIC ARTICLE

Herbert W. Graham and Samuel L. Case, Pittsburgh, Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

No Drawing. Application March 16, 1933, Serial No. 661,090

2 Claims. (Cl. 91—70.2)

This invention relates to bimetallic articles and particularly to a bimetallic body having a coating of lead.

It is common practice to apply a protective coating of lead to steel, the coated material being known as "terne plate". However, the lead does not adhere directly to steel and it has heretofore been necessary to first apply tin or some other metal which will adhere to the steel and to which the lead will in turn adhere. The intermediate tin coating serves primarily to insure adherence of the lead and would be eliminated if it were possible to coat the steel directly, as it is an added expense. We have found that the intermediate coating can be eliminated and the lead made to adhere directly to the ferrous base by the addition of sodium to the lead. Preferably around 4½ to 5 percent of sodium will be used, but it may vary from 3 to 7 percent. The minimum quantity of sodium is dependent to some extent upon the cleanness of the steel. An imperfectly clean steel will take a satisfactory coating if 4½ percent sodium is present in the alloy. If the steel is more thoroughly cleaned, the percentage of sodium may be somewhat lower.

Care should be used in maintaining the bath at proper temperature. Our experiments show that the range in which the alloy will adhere to the base is relatively small and that the temperature should be between 720 and 820° F. The wire, strip or other product being coated is preferably immersed in the bath and then wiped off. The resulting coating is smooth, clean and uniform. Wires to which it has been applied have been severely twisted but there is no evidence of brittleness or separation of the coating.

The lead coat applied according to our invention is continuous in character and is ideal for protective purposes. The lead sodium alloy "wets" the steel and adheres smoothly and uniformly over the surface. The invention may be applied to articles of various shape or form and either by continuous operation or by individual treatment. It is useful not only for protecting the base metal from the elements, but also for other purposes as, for example, it affords a lubricating sheath which permits of drawing or rolling the steel while cold without substantially increasing its hardness.

We have described a present preferred embodiment of our invention. It will be understood, however, that this is by way of illustration only and that it may be otherwise embodied or practiced within the scope of the following claims.

We claim:

1. In the method of coating a ferrous base with lead-sodium alloy, the steps consisting in forming a molten bath consisting of lead having from 3% to 7% of sodium incorporated therein, and applying the molten lead-sodium alloy to the base while maintaining the bath at a temperature of 720 to 820° F.

2. As a new manufacture, a body consisting of a steel base having a coating in direct engagement therewith, the coating being a binary alloy of lead and sodium, the sodium being present in the alloy in the amount of 3 to 7%, said coating resulting from treatment of the base with molten alloy between 720° F. and 820° F.

HERBERT W. GRAHAM.
SAMUEL L. CASE.