UNITED STATES PATENT OFFICE.

EVERETT D. HOLLEY, OF FORESTVILLE, AND CHARLES L. ROOT, OF BRISTOL, CONNECTICUT, ASSIGNORS TO BRISTOL BRASS COMPANY, OF BRISTOL, CONNECTICUT, A CORPORATION OF CONNECTICUT.

PROCESS OF UNITING METALS.

No. 906,627. Specification of Letters Patent. Patented Dec. 15, 1908.

Application filed February 29, 1908. Serial No. 418,447.

To all whom it may concern:

Be it known that we, EVERETT D. HOLLEY and CHARLES L. ROOT, citizens of the United States, residing at Forestville, Connecticut, and Bristol, Connecticut, respectively, have invented certain new and useful Improvements in Processes of Uniting Metals, of which the following is a specification.

This invention relates to the art of homogeneously uniting two bodies of metals the chemical properties of which may be such as to prevent the formation of an alloy, and it has for its object a simple and efficient process for accomplishing the desired result.

More particularly, the process forming the subject matter of the present invention, pertains to the close and full unification of two different metals which cannot be affiliated with each other except under their melting temperatures, as for instance, iron and copper, although they may be soldered at their points of contact. In some instances it may be required to have both metal-surfaces intimately contacting throughout, and in such cases the application of heat forms an important factor; and on the other hand may be a very decided detriment on account of a natural shrinkage during the cooling period. For instance, let it be supposed that a certain quantity of copper shall be cast onto an iron plate; experience has fully demonstrated that the copper will shrink away from the cast iron and therefore be loose therefrom, so that a cast iron mold will be well adapted for producing copper castings on account of the non-adherence between the two metals. Now in order to produce not only a thorough adherence between these two metals, but, as a matter of fact, to establish a practically homogeneous union between them, we introduce a medium the nature of which is such as to adhere closely to one metal and at the same time is adapted to form an alloy with the other, while again it fuses at a temperature which is less than that required to melt the other two metals above referred to. In connection with iron and copper, this medium consists of zinc which may readily be applied in molten condition to the iron, and in a manner similar to the ordinary galvanizing process. After the iron surface has thus been galvanized and cooled, the iron is then placed into a mold to receive the copper which is poured in molten condition on the zinc-coated surface, this action resulting in fusing the zinc, the melting point of which is about 680 degrees F.; while the melting temperature of copper is approximately 2000 degrees F. Now, inasmuch as the melting temperature of cast iron is about 2192 degrees F., it follows that the iron texture will not be disturbed, and it has also been demonstrated that the fusion of the copper and zinc will result in an alloy-like union, so that the copper will in this manner be closely and thoroughly combined with the iron on such portions of the iron surface which had previously been coated with zinc.

It is of course evident that wrought iron or steel may be substituted for the cast iron, without in any way changing the result.

We claim:—

1. The process of homogeneously uniting the adjacent surfaces of a pair of chemically different primary metals, which consists in coating one of said surfaces with an adherent metallic medium fusible at a lower temperature than the primary metal bodies and constituting an alloy element for the other metal, and then bringing said primary metals into contact with each other, one of said metals being in molten condition, and then allowing the said metals to cool naturally.

2. The process of homogeneously uniting bodies of iron and copper, which consists in applying a coat of melted zinc to the surface of the iron, and then pouring the copper in melted condition unto the zinc coated-surface of the iron and allowing it to cool naturally.

EVERETT D. HOLLEY.
CHAS. L. ROOT.

Witnesses:
W. H. GRAHAM,
J. R. SMITH.