UNITED STATES PATENT OFFICE.

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PROCESS OF MAKING ALLOYS.

SPECIFICATION forming part of Letters Patent No. 646,118, dated March 27, 1900.

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To all whom it may concern:

Be it known that we, GUILLIAM H. CLAMER and JOSEPH G. HENDRICKSON, citizens of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have jointly invented a new and useful Process of Making Alloys, of which the following is a specification.

It has been proven by experiment and actual usage that a copper, tin, and lead alloy is the best alloy known for bearing purposes, especially where hard usage and heavy loads are to be carried, such as in the service of railroads. It is also known that such an alloy is useful for articles which are exposed to the action of acid and other chemicals, as alkalies and other destructive elements. It has also been determined that the greater the proportion of lead and the less the proportion of tin in the alloy the better it is suited for these purposes.

The object of our invention is to make an alloy as above described (being an alloy of copper and lead, with or without tin) having the maximum percentage of lead obtainable.

By all known methods heretofore lead could not be alloyed over fifteen or sixteen per cent. at the most without serious segregation and then only by the use of phosphorous or other non-metallic materials, thirteen or fourteen per cent. being about the limit which could be obtained with any certainty. The tin in these alloys could not be reduced below six per cent. By our process we are able to alloy lead with copper in proportions far exceeding sixteen per cent. and are also able to reduce the percentage of tin or even to entirely dispense with it. These results are obtained through the agency of a small percentage of nickel, which when alloyed with copper causes it to set very quickly after pouring, due to the rise in the melting-point of the alloy. By this quick setting the lead, which is only mechanically held when in these excessive proportions, (with or without tin,) is held up and prevented from segregating to the bottom of the casting, as would be the case were the casting to set slowly, as it would without the addition of a small percentage of metal, such as nickel.

To practice our process, the copper and nickel or nickel-containing material are first melted in a receptacle, and when thoroughly molten the lead or lead and tin are then added, thus producing the finished product. As examples, we may mention twenty-two per cent. of lead, three per cent. of tin, if used, one per cent. of nickel, and the balance copper, the alloy to be poured at a heat which would be considered good foundry practice in respect to such materials.

We realize that other materials, such as zinc and antimony or the like, may be added to the mixture; but such addition we regard as not essential and as not involving invention.

Having thus described the nature and objects of our invention, what we claim as new, and desire to secure by Letters Patent, is—

The process of preventing segregation of a lead-copper alloy which consists in adding thereto a relatively-small proportion of nickel, substantially as described.

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Witnesses:
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