

UNITED STATES PATENT OFFICE.

EDWARD D. GLEASON, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO
PLASTIC METAL COMPANY, INC., OF BROOKLYN, NEW YORK, A CORPORATION OF
NEW YORK.

LEAD-COPPER ALLOY.

1,066,403.

Specification of Letters Patent.

Patented July 1, 1913.

No Drawing.

Application filed October 2, 1912. Serial No. 723,579.

To all whom it may concern:

Be it known that I, EDWARD D. GLEASON, of Brooklyn, in the county of Kings, city and State of New York, have invented a certain new and useful Improvement in Lead-Copper Alloys, whereof the following is a specification.

My invention relates to plastic alloys including lead and copper, and lead, copper and tin, which may be advantageously used in the manufacture of bearings for shafts, etc.

It is an object of my invention to provide such alloys free from "lead sweats" and segregation, which are defects usually found in such alloys due to lack of affinity of the lead for the copper or copper and tin, and the high specific gravity and low melting point of lead, for, at best, such alloys are but mechanical mixtures wherein copper is held in a finely divided state in a matrix of lead.

Another object of my invention is to provide such alloys including a given percentage of copper but of different degrees of hardness.

The effect of my improvement is to provide an alloy which is homogeneous in that the copper therein is comminuted to the greatest possible extent and equally distributed throughout the mass of the alloy.

In practising my invention, I incorporate boron in copper, as graphite exists in cast iron; such a boron copper product and a method of producing it being the subject matter of another application Serial 731,863 filed November 16, 1912, for Letters Patent of the United States. Such boron copper is harder than ordinary copper and by its employment in varying percentages I am able to make copper-lead alloys which are alike in total percentage of copper but different in degrees of hardness. For instance, an alloy in accordance with my invention may contain 50 parts lead and 50 parts of boron copper and would be much harder and more brittle than another alloy, in accordance with my invention, containing 50 parts lead and 50 parts of copper if the

latter is an aggregate of ordinary copper and boron copper. In any case I prefer to proceed by first melting the copper, with suitable appliances, and adding the lead thereto when the copper is in the fluid state, and, then stirring or otherwise agitating the mixture before pouring it into ingot molds. For instance, I take 50 parts of boron copper, melt it and add thereto 50 parts of lead. The alloy thus produced may be called No. 1. In making another alloy I take 50 parts of ordinary commercial copper; melt it, add 50 parts of lead and then add 100 parts of "No. 1." This may be called No. 2 product and is less hard than "No. 1." In making another alloy I melt 50 parts of commercial copper and 50 parts lead as in the above procedure and add thereto 100 parts of "No. 2," this product being, of course, less hard than the two previous examples. All of these products are free from lead sweats or segregation and have an unctuous anti-frictional texture and a surface resembling planished copper; properties which are advantageous in bearings, piston rings, gaskets and steam packing.

In making alloys of copper, lead and tin; the tin will segregate if not in the proper proportion for the copper and lead. For instance, if copper 67 parts, lead 24 parts and tin 9 parts are mixed in accordance with ordinary foundry practice, the lead will sweat out and form in little pools and the tin will segregate and stratify. On the contrary, by the employment of boron copper as above contemplated such alloys of copper, lead and tin may be made entirely homogeneous and of any desired degree of hardness. For instance an alloy, in accordance with my invention containing 80 parts lead, 19 $\frac{1}{2}$ parts boron copper and $\frac{1}{2}$ part antimony, will fuse in an ordinary iron hand ladle at about 900 degrees F. but is tough, hard, and equal to a so called "Babbitt metal." This alloy is well adapted for the manufacture of die castings, viz., castings made under pressure.

I do not desire to limit myself to the

precise methods of procedure or proportions
herein set forth as it is obvious that various
modifications may be made therein without
departing from my invention as defined in
5 the appended claim.

I claim:—

An alloy containing lead, copper and
boron.

In testimony whereof, I have hereunto
signed my name at Philadelphia, Pennsyl- 10
vania, this thirtieth day of September, 1912.

EDWARD D. GLEASON.

Witnesses:

GERTRUDE N. R. MATTSON,
ANNA ISRAELVITZ.