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LEAD ALLOY AND PROCESS FOR MAKING SAME.

No Drawing. Application filed October 21, 1922. Serial No. 596,144.

To all whom it may concern:

Be it known that we, WALTHER MATHESIUS, professor and engineer, and HANS MATHESIUS, engineer, citizens of Germany, residing at Charlottenburg, near Berlin, Germany, 172, Berliner Strasse, have invented certain new and useful Improvements in Lead Alloys and Processes of Making Same, for which we have filed applications for patent in the following countries—viz: Germany, Aug. 24, 1921; Great Britain, Aug. 24, 1922; Belgium, August 24, 1922; Switzerland, August 23, 1922; France, September 27, 1922, and Norway, September 20, 1922, and of which the following is a specification.

Our invention relates to improvements in lead alloys and the process of making the same, and more particularly in lead alloys containing an alkaline earth metal and suitable for use as a bearing metal, the alkaline earth metal having the function of hardening the alloy. In the manufacture of alloys of this kind, metallic calcium and barium are caused to combine with lead, by covering a bath of molten lead with a layer of the molten chlorides of the said metals, and introducing metallic sodium into the bath of lead.

According to the ratio of the said salts contained in the layer of chlorids different amounts of calcium and barium are reduced and passed into the lead bath.

However, this process can not be used for reducing chlorid of strontium by sodium and thus passing metallic strontium into the bath of lead.

Experiments have shown that a lead alloy containing calcium, barium, and strontium at approximately any desired ratio can be made, if at first a salt layer of chlorid of calcium is put on the lead bath and the chlorid is reduced by the addition of sodium so as to produce a lead alloy which mainly contains calcium as a hardening agent and a residue of sodium.

If now the first layer of chlorid is removed and in lieu thereof a layer of chlorid of strontium and chlorid of barium is applied to the bath, the metals are exchanged in a degree corresponding to the ratio of the chlorids contained in the layer, the sodium being almost entirely separated from the alloy, and also a part of the calcium being replaced by metallic strontium and barium. Thereby an alloy is obtained which contains all of the three alkaline earth metals, the amount of the individual metals depending on the amount of the chlorids and sodium applied to the bath. For example, by the said process alloys can be made which contain 2 per cent of calcium, 1 per cent of strontium, and 1 per cent of barium. Such alloys are particularly suitable for use as lead bearing metals, because, by the combined action of the said alkaline earth metals, the lower melting point of the alloy is substantially the same and at about 290° centigrade, even if the ratio of the said metals is different, and because, when moderately heated above the said temperature, the alloy gives a very fluent molten solution.

We claim—

1. The herein described process, which consists in applying a fused material containing chlorid of strontium to a bath of a molten lead alloy containing calcium and an alkali metal.

2. The herein described process, which consists in applying chlorid of strontium and chlorid of barium to a bath of a molten lead alloy containing calcium and an alkali metal.

3. The herein described process, which consists in applying chlorid of strontium to a bath of a molten lead alloy containing calcium and sodium.

4. The herein described process, which consists in first applying a surface layer of a molten salt containing chlorid of calcium to a bath of molten lead, adding metallic sodium to the bath, permitting reaction until the bath contains calcium and sodium, removing the surface layer, and applying to the bath a surface layer containing chlorid of strontium.

5. The herein described process, which consists in first applying a surface layer of a molten salt containing chlorid of calcium to a bath of molten lead, adding an alkali metal to the bath, permitting reaction until

the bath contains calcium and alkali metal, removing the surface layer, and applying to the bath a surface layer containing chlorid of strontium and chlorid of barium.

6. A shaft bearing formed of the herein described alloy consisting essentially of lead with about 2% of calcium, and about 2% of other alkaline earth metal.

In testimony whereof we affix our signatures in presence of two witnesses.

WALTHER MATHESIUS.
HANS MATHESIUS.

Witnesses:
ARTHUR SHROEDER,
ROGER T. ANSPECH.