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BEARING METAL

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This invention relates to a bearing metal of the ternary lead-tin-antimony system containing a high percentage of lead, and is an improvement in or modification of the invention described and claimed in the specification of the U. S. A. Patent No. 1,632,604. In the specification of this prior patent a bearing metal of the aforesaid kind is described, which consists of 65% to 77% lead, 3% to 14% tin, 10% to 27% antimony and 0.7% to 2.5% arsenic. The presence of other metallic additions is excluded by this prescription, as the invention of the Patent No. 1,632,604 was based on the knowledge, that the arsenic added in an amount limited as aforesaid can manifest its full efficiency only on condition that any other metallic addition is excluded. The property of arsenic of ameliorating alloys with a high lead content and a low tin content to such an extent, that they equal bearing metals containing a high percentage of tin, is lost, if the usual additions (for instance copper or nickel) are introduced into the alloy. As is explained in the specification of said patent the cause of such an astonishing pnenomenon is attributable to the fact, that the action of arsenic is due to the abundant formation of a well determined arsenic tin compound, viz the compound As_2Sn_3, so that additions, adapted to form other arsenic compounds and thus to detract the formation of the aforesaid arsenic-tin-compound, are essentially and markedly weakening, that is to say they diminish the favourable action of the added arsenic.

In the further development of said invention I have now found, that in contradistinction to all the other metals there are two metals, the action of which does not diminish the efficiency of the added arsenic, but on the contrary increases same. These two metals are indium and cadmium. According to the present invention therefore alloys composed in accordance with the specification of said patent contain besides the constituents there set forth also indium and/or cadmium. These two metals are in the periodical series of elements closely adjacent to tin, as can be seen from their order number (Cd 48, In 49, Sn 50) as well as from their atomic weights (Cd 112.4, In 114.8, Sn 118.7). It is to be supposed that it is due to the position in said series closely adjacent to that of tin, that the presence of indium or cadmium or both of them does not impede the formation of the hardening As_2Sn_3 crystals. On the contrary these metals will form solid solutions with the said crystals effecting the hardening, whereby these crystals are rendered even more resistant and hard. Consequently the hardness and suitability of the final product is augmented by the said additions.

The addition of cadmium and/or indium must be kept within the limits of 0.5% to 3.5%. Thus for instance very satisfying results have been obtained with an alloy composed as follows:

	Per cent
Sb	25
Sn	5
As	1.2
Cd or In	2
Pb	66.8

What I claim is:

1. Bearing metals consisting of 65–77% lead, 3–14% tin, 10–27% antimony, 0.7–2.5% arsenic and 0.5–3.5% of metals of the class including cadmium and indium.

2. Bearing metals consisting of 65–77% lead, 3–14% tin, 10–27% antimony 0.7–2.5% arsenic and 0.5–3.5% cadmium.

3. Bearing metals consisting of 65–77% lead, 3–14% tin, 10–27% antimony 0.7–2.5% arsenic and 2% cadmium.

4. Bearing metal consisting of 66.8% lead, 5% tin, 25% antimony 1.2% arsenic and 2% cadmium.

5. Bearing metals consisting of 65–77% lead, 3–14% tin, 10–27% antimony 0.7–2.5% arsenic and 0.5–3.5% of a mixture of cadmium and indium.

In testimony whereof I have affixed my signature.

PAUL KEMP.