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LEAD BASE ALLOY

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This invention relates to lead base alloys.

High-priced tin alloys are known and used commercially consisting of alloys having the approximate composition of 43% tin, 17% antimony and the balance lead. This alloy has proved satisfactory in use, but because of the high content of tin, it is desirable to replace such tin alloys be lead base alloys having a lower cost.

An important object of the present invention, accordingly, is to provide a low-priced lead base alloy having properties approximating those of the high-priced tin alloy mentioned above.

The invention accordingly comprises the novel products, the specific embodiments of which are described hereinafter by way of example and in accordance with which we now prefer to practice the invention.

We have found in accordance with our invention that an alloy may be prepared by melting lead and antimony in a heated cast iron or steel kettle and then adding to this melt the proper quantity of silver. To this melt is then added a proportion of manganese which results in the production of an alloy having the desired characteristics in accordance with our invention. Unless otherwise indicated quantities employed herein are in parts by weight. In preparing the melt, we take 16.00 to 18.00 parts of antimony and 80.0 to 82.0 parts of lead and melt them down at a temperature of about 500° C. 1.50 to 2.00 parts of silver as shot or crystals are preferably washed into the molten lead-antimony alloy at the temperature mentioned. The alloy is then thoroughly mixed, for example by the use of stirrers or paddles, and to it is added .25 to .50 parts of powdered manganese at approximately the temperature mentioned. The stirring is then continued at such temperature to complete the formation of the desired alloy. Only a small proportion of the manganese appears to remain in the resulting alloy. Apparently a considerable proportion of it is oxidized to manganese oxide. The metals employed and the resulting alloys obtained are tabulated below:

Melt, Per Cent		Resulting Alloy, Per Cent	
Antimony	16.00 to 18.00	Antimony	16.00 to 18.00
Manganese	.25 to .50	Manganese	.01 to less than 0.1
Silver	1.50 to 2.00	Silver	1.50 to 2.00
Lead	80.00 to 82.00	Lead	80.00 to 82.00

A preferred melt and resulting alloy are given in the example below. It is to be understood that the example is to be considered as illustrative

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and that the invention is not to be considered as restricted thereto except as indicated in the appended claims.

Example

About 17 parts by weight of antimony and about 81 parts by weight of lead are melted at a temperature of about 500° C. Then about 1.75 parts of silver as shot silver are washed into this molten alloy. About .25 part of manganese in powdered form is added to the mass at about the temperature mentioned. Stirring is continued for about 30 minutes. The dross is removed and a alloy having approximately the following composition is obtained:

	Per cent
Antimony	about 17.
Silver	do 1.75
Lead	do 81.24
Manganese	do .01

This alloy has a Rockwell Hardness of approximately H–53. It has excellent casting characteristics and also has excellent grinding characteristics. The grinding characteristics mentioned are determined by grinding a casting of an alloy on an emery wheel. In grinding the alloy of the example, it dusts readily and does not clog the emery surface and, accordingly, has the excellent characteristics mentioned. The alloy may be used as a valve seat for large meters and for other purposes where the expensive tin alloy mentioned above has been employed. It has been found by actual wear tests that the alloy is superior as a valve seat material to the commonly used tin alloy mentioned above. This was true whether the valve employed on the seat was made up of Bakelite or from an alloy consisting of 73% tin and 27% antimony, which is the standard valve alloy for the larger gas meters.

The alloys prepared in accordance with our invention within the ranges mentioned above have similar excellent characteristics to the alloy described under the example given.

What we claim is:

1. A lead base alloy consisting of antimony 16.00 to 18.00%, silver 1.50 to 2.00%, an appreciable amount but less than .1% manganese, and lead 80.00 to 82.00%.

2. A lead base alloy consisting of antimony about 17%, silver about 1.75%, manganese about .01%, and lead about 81.24%.

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