Patented Feb. 1, 1938 2,107,223

UNITED STATES PATENT OFFICE

2,107,223

BEARING METAL ALLOY

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No Drawing. Application October 24, 1936, Serial No. 107,368

3 Claims. (Cl. 75—166)

The present invention relates to a bearing metal alloy and has more particular reference to that type of alloy commonly known as a lead base babbitt. The general object and nature of the invention is to improve the physical and structural properties of such a lead base babbitt by the addition of a metallic element, namely, tellurium, thereto. The addition of such element results in a new alloy having improved bearing metal properties of greater resistance to wear, greater resistance to fatigue, and greater compressive strength, while at the same time possessing finer, more uniform and evenly distributed microstructural characteristics.

The new alloy embodying the principle of my invention is particularly suitable as a bearing metal for use in the bearings and journals of cam shafts, connecting rods, and crank shafts in internal combustion engines.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The following description sets forth in detail one approved combination of ingredients embodying my invention, such disclosed means constituting, however, but one of various forms in which the principle of the invention may be used.

The present application is a continuation in part of the copending application of myself and John V. O. Palm, Serial No. 64,916, filed Feb. 20, 1936 for "Bearing alloy" wherein there is disclosed and claimed a new bearing metal alloy of improved properties and characteristics and involving the addition of tellurium to a tin base babbitt. The present application constitutes an improvement and continued development of the invention embodied in the last identified application and specifically involves the addition of tellurium as the improving element to a lead base babbitt.

Lead base babbitts as now commonly and commercially used in the art consist of one to twenty percent antimony, one to twenty percent tin, and the balance lead. The upper limit of the tin content may in some cases range as high as forty percent. Copper is frequently added to these lead base babbitts as a hardening agent, and the amount of copper which is added lies in the range of .01% to 3.0%. Arsenic is sometimes present in maximum amounts of .20%, probably as an impurity. Such lead base babbitts have heretofore been used as bearing metals in installations where the bearing pressures and bearing temperatures are relatively low. But under more severe operating conditions, namely, under higher bearing pressures and temperatures, and increased speed, such lead base babbitts are subject to failure.

I have found that the properties and characteristics of lead base babbitts, and their resistance to more severe operating conditions as a bearing metal, can be substantially improved by the addition of small amounts of tellurium. The addition of tellurium in the amount of .01 to 5% to lead base babbitts results in a material increase in the resistance to fatigue, compressive strength and a greater uniformity and finer grain structure of the bearing metal. Such tellurium addition particularly substantially inhibits the formation of a dendritic microstructure in a lead base babbitt as cast. Furthermore the antimony crystals interspersed through the matrix are finer and more evenly distributed.

By way of specific example, and in illustration of new bearing metal alloys having the above improved properties and characteristics, the following percentages of constituents are indicated:

Lead	Antimony	Tin	Copper	Tellurium
Percent	*Percent*	*Percent*	*Percent*	*Percent*
Max. 86	9¼–10¾	4½–5½	Max. .5	.05–.09
76	14–16	9¼–10¾	.5	.05–.09
82	12½	5	0	.05–.09

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the materials employed, provided the ingredients stated by any of the following claims or the equivalent of such stated ingredients be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. A bearing metal alloy consisting of from 1 to 20% antimony, 1 to 20% tin, .01 to 3% copper, .01 to 5% tellurium, and the balance lead.

2. A bearing metal alloy consisting of from 9¼ to 10¾% antimony, 4½ to 5½% tin, copper in the amount of .01 to .5%, from .05 to .09% of tellurium, and lead in the amount of 83 to 86%.

3. A bearing metal alloy consisting of 14 to 16% antimony, 9¼ to 10¾% tin, .5% of copper, .05 to .09% tellurium, and the balance lead.

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