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BEARING

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The invention relates to bearings and has as objects the provision of a bearing that shall be compacted during manufacture to a condition to bear the greatest stress of its intended service without deformation, and with reduced tendency to wear: the provision of a bearing accurate to the desired size; the provision of a forged bearing with a surface free from the oxides which result from the heating to which bearing metal has heretofore been subjected to make it possible to forge it; the provision of a bearing of self lubricating metal leaving a surface with an excess of the lubricating element; the provision of a bearing having a large percentage of surface contact.

The material from which it is preferred to make bearings is that described in an application for patent filed by Albert H. Ackerman, on November 11th, 1922, Serial No. 600,408 comprising an alloy of copper and lead without the presence of any substantial quantity of other substances. It is intended by the word "alloy" to indicate such a union of the metals involved that the resulting substance may be repeatedly melted and solidified without segregation of the united metals and providing a material having physical characteristics differing from either of the combined metals. For instance the alloy of the copending application above referred to has a melting point of substantially 1700° F. as compared with the 1950° F. of copper and 589° F. of lead. This alloy shows under the miscroscope a reticulation of copper having the minute pockets filled with lead, substantially no other materials being present.

The material referred to may be melted and recast repeatedly without segregation of its constituent metals, and bearings have heretofore been made therefrom by melting the pig metal, casting the bearing in a mold of the desired form and finally machining the casting to the exact dimensions required.

I have discovered that metal of this general nature may be made to flow under pressure, at atmospheric temperature, so as to completely fill a die shaped accurately to the form and dimensions desired in the finished bearing. To produce the bearing provided by the invention a die is provided such that the material treated will be enclosed on all sides when being pressed and pressure is applied to the material through the agency of a plunger which completely closes the plunger opening of the die. The amount of the forming pressure is made greater than the greatest pressure which the bearing is to be called upon to support in the service expected.

The structure of the metal above referred to, is shown by the miscroscope to be that of a sponge or reticulated mass of copper saturated with lead. When metal of the nature referred to is used and the pressure is applied in the formation of the bearing, the lead will flow more readily than the copper and the finished bearing will therefore, present a surface largely of a thin film of lead.

The minute projections which are present upon all machined or cast surfaces are flattened by the pressure of the die surface which is highly polished during manufacture, and as a result the bearing provided by the invention will present a much larger percentage of surface contact than bearing of the prior art.

The pressure has the result of compacting the material of the bearing so that it will not be deformed by the working blows upon the shaft or other borne member during service.

The process provided by the invention makes possible the production of finished bearings in larger quantities in a given time than by a casting and machining process.

The process is applicable to a variety of bearing metals of the nature referred to. Reference to this particular substance is not intended as being a limitation.

I claim as my invention:

A bearing comprising an integral body of a matrix of copper having lead embedded therein, and a thin, smooth wear resisting inner surface of lead, said body compacted in a cold state under a pressure in excess of the expected pressure of service, said inner surface of lead integral with said embedded lead produced and polished by said pressure.

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