B. J. DOWNS.

Alloy for Journal-Bearings.

No. 221,400. Patented Nov. 11, 1879.

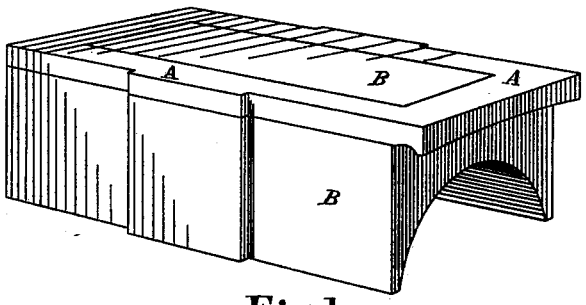

Fig:1.

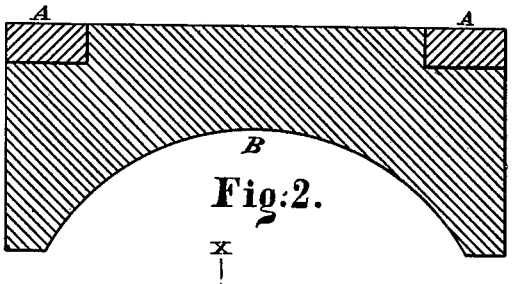

Fig:2.

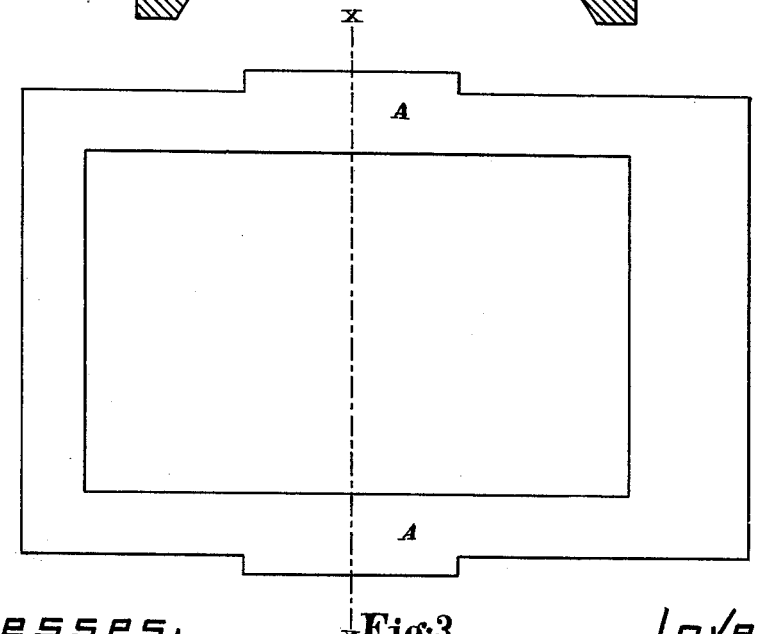

Fig:3.

Witnesses.
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UNITED STATES PATENT OFFICE.

BENJAMIN J. DOWNS, OF EAST BOSTON, MASSACHUSETTS.

IMPROVEMENT IN ALLOYS FOR JOURNAL-BEARINGS.

Specification forming part of Letters Patent No. **221,400**, dated November 11, 1879; application filed July 10, 1879.

To all whom it may concern:

Be it known that I, BENJAMIN J. DOWNS, of East Boston, Massachusetts, have invented an Improved Anti-Friction Metallic Compound for Journal-Bearings, &c., and that the same is fully described in the following specification, and a form thereof is illustrated in the accompanying drawings.

The object of my invention is to reduce to a minimum the friction between journals and their bearings, in order to avoid heating the former under any rate of speed or with any length of continuous rotation.

My invention consists in a metallic alloy, in which tin largely predominates, comprising about four-fifths of the compound, while about one-eighth is copper and one-twentieth antimony, and in a journal-bearing composed of such material.

The drawings represent, in Figure 1, a complete bearing-block, adapted for use with a car-axle; and in Fig. 2 is shown a skeleton base for supporting the same.

I am aware that various metallic compounds have been used heretofore for the purpose of reducing friction between moving metal bodies, and accomplishing that object with more or less of success. I have experimented largely in this direction, and practically tested various alloys to determine the most suitable metals and the proportions in which they should be used, in order to secure the best results at the least cost, and at the same time obtain a compound that could be remelted and repeatedly used.

My improved anti-friction compound is composed of thirty-two and one-half parts tin, five parts copper, and two parts antimony, by weight, melted together and thoroughly commingled. The product of this union is a silver-gray compound, showing on fracture a coarse granular appearance, but on turning or filing presenting a remarkably smooth surface, with a somewhat greasy feel, like soapstone. A surface like this is admirably adapted for bearings subjected to long-continued and heavy wear, since it requires little or no lubrication, and will not heat the axles or become heated by them, under ordinary circumstances.

Compared with the well-known "Babbitt metal," my compound is of lighter color, coarser grain, (on fracture,) finer and smoother surface when finished, and more silky feel. The proportions in which I have combined the constituent elements are those shown by experience to be best adapted to the accomplishment of the end in view, and cannot be varied from, beyond a small percentage of either ingredient, without loss of efficiency in the product.

To strengthen and support this material in suitably-shaped blocks for bearings, I provide a base or skeleton frame, A, formed of some cheaper and more tenacious metal or metals, and of such shape as is desired, preferably conforming in outline with the bearing-block. This base I coat with tin on the side which is to be next the alloy, place it in the mold, and cast upon it the body or bearing B, which readily and permanently unites with the tinned frame, making of them one solid block of the desired form, which may be milled in the usual manner, for securing conformity of surface to that of the journal, or may be used in the shape in which it leaves the metal mold.

I claim as of my invention—

The improved anti-friction metal herein described, composed of about thirty-two and one-half parts tin, five parts copper, and two parts antimony, substantially as set forth.

BENJAMIN J. DOWNS.

Witnesses:
A. E. MOWRY,
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