UNITED STATES PATENT OFFICE.

CHARLES B. MILLER, OF NEW YORK, N. Y.

ANTI-FRICTION ALLOY.

SPECIFICATION forming part of Letters Patent No. 456,898, dated July 28, 1891.

Application filed June 12, 1890. Serial No. 355,220. (Specimens.)

To all whom it may concern:

Be it known that I, CHARLES B. MILLER, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Anti-Friction Alloys; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to a certain new and improved anti-friction alloy to be used in the manufacture of bearings, steps, &c., the object of the invention being to produce an anti-friction alloy which will withstand the strain to which it would necessarily be subjected when used as a bearing or step.

My composition is made by the use of the following substances, in proportions between the following limits, substantially as stated, viz: lead, two hundred to four hundred parts; antimony, forty to eighty parts; tin, fifteen to thirty parts; aluminum, one to five parts. These proportions will vary between the limits stated, depending upon the quality of the lead. Hard lead will require less of the other ingredients than will soft lead. Ordinarily the proportions about midway between the extremes mentioned will be found most satisfactory. These proportions, expressed in the nearest whole numbers, are, about, lead, three hundred and twenty parts; antimony, sixty-four parts; tin, twenty-four parts; aluminum, two parts. In preparing and cleaning the lead I prefer to use sal-ammoniac, employing from five-eighths to one and one-fourth part, by weight, as compared with the lead, the sal-ammoniac being added to the lead when molten, mass stirred, and the scum and dross removed from time to time. I also prefer to use from seven and one-half to fifteen parts, by weight, of graphite in a powdered condition, and I have found such use of sal-ammoniac and graphite of great benefit in improving and affecting the quality of the resultant composition. The metallic ingredients are melted and added one by one, as named, care being taken to avoid overheating or excessive oxidation. The aluminum is alloyed by uniting it with any of the other metals, then adding to the mass; or it may be introduced by putting it under (with tongs) the molten mass of the other metals.

This alloy, containing the proportion of aluminum, is hard and particularly adapted for use with journals carrying great weight and revolving at a comparatively low speed. The present alloy is superior for this purpose over the softer alloy containing bismuth, covered by Letters Patent No. 429,158, granted to S. Singley June 3, 1890.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The composition of matter for anti-friction purposes, consisting of lead, from two hundred to four hundred parts; antimony, forty to eighty parts; tin, fifteen to thirty parts, and aluminum, one to five parts, substantially as described.

2. The composition of matter for anti-friction purposes, consisting of lead, three hundred and twenty parts; antimony, sixty-four parts; tin, twenty-four parts, and aluminum, two parts, substantially as described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

CHAS. B. MILLER.

Witnesses:

JOSEPH LIGHTOWLE,

C. E. THORNALL.