

UNITED STATES PATENT OFFICE.

WILLIAM H. KELLY, OF LOS ANGELES, CALIFORNIA.

PROCESS OF MAKING BEARING METALS.

1,234,547.

Specification of Letters Patent.

Patented July 24, 1917.

No Drawing.

Application filed December 26, 1914. Serial No. 879,212.

To all whom it may concern:

Be it known that I, WILLIAM H. KELLY, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles, State of California, have invented a new and useful Improvement in Processes of Making Bearing Metals, of which the following is a specification.

My invention has for its object the production of a bearing metal suitable for all surfaces subject to friction, which has great heat conducting qualities.

It is well known that both copper and lead possess heat conducting qualities to the degree of carrying off heat occasioned by friction to prevent the binding of frictional parts. It is also well known that neither one of these metals are suitable for bearing purposes alone. It is also a well known and undisputed fact that these two metals are not capable of forming a perfect mechanical mixture under their common commercial conditions.

It is also well known that the great difference in the specific gravity of these two metals allows the lead to settle to the bottom of the copper when the two metals are melted and cast together, leaving a greater amount of the copper at the top. This results in producing an imperfect material which is valueless as a bearing metal.

My invention overcomes all of the difficulties before mentioned and enables me to produce a perfect mixture of copper and lead suitable for bearing purposes.

In carrying out my invention I first take common commercial pig or scrap metallic lead and melt the same in a suitable crucible or melting pot. When the metallic lead is reduced to a molten condition I introduce a mixture of oxygen and hydrogen into the molten mass and submit it to its action for a period of time ranging from thirty to forty-five seconds.

The purified or treated lead may then be run into bars or pigs for future use or may be mixed at once while melted with copper of suitable purity to make the mixture of required proportions.

To the metallic lead which has been subjected to the action of oxygen and hydrogen as above stated I add the required amount of commercially pure metallic copper. The

two metals may be melted together or may be combined after each has been melted separately. In either event the combined metals should be heated to a temperature of over 2000 degrees F. before the composition is poured into the molds.

By commercially pure copper I desire to be understood as meaning copper of ninety-eight to ninety-nine per cent. purity which is commonly produced by electrolytic precipitation.

The mixture when made in the manner stated is homogeneous throughout and the two metals do not separate in the molds. I have observed that it is not necessary to stir or agitate the molten metals to effect a distribution of the lead throughout the copper.

I have found that a desirable metal for universal bearing purposes is made of sixty per cent. of copper and forty per cent. of lead, but these proportions may be varied as occasion may require.

The metal mixture resulting from the carrying out of the steps above set forth is both tough and hard enough to meet all ordinary requirements imposed upon bearing surfaces and absorbs all heat generated through frictional contact and transmits it to the metal supports for the bearings, thereby keeping the parts cool and preventing binding thereof.

The oxygen and hydrogen is preferably introduced into the bottom of the molten lead in a crucible and liberated therein in such a manner as to permit the same to permeate throughout the lead mass. This may be accomplished through the use of a refractory nozzle of sufficient length.

What I claim is:

The process of producing a bearing metal of lead and copper which consists in first purifying metallic lead by subjecting the same while in a molten condition to the action of oxygen and hydrogen and then mixing such treated lead with commercially pure metallic copper.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 18th day of December, 1914.

WILLIAM H. KELLY.

In presence of—

F. M. TOWNSEND,
FRED A. MANSFIELD.