

UNITED STATES PATENT OFFICE

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ALLOYS

No Drawing.

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This invention relates to alloys comprising beryllium and aluminum which are characterized by lightness. One of the primary objects of the invention is to improve the properties of the beryllium-aluminum alloys by adding other alloying elements which improve strength, workability, resistance to corrosion, and other properties, as will further appear.

I employ manganese and molybdenum as additional alloying elements, and in the preferred practice of my invention I proceed as follows:

I first prepare a stock alloy, preferably high in beryllium. This stock alloy is comprised of beryllium aluminum and molybdenum. I melt the beryllium and aluminum, employing a suitable flux, with which I include calcium molybdate. Molybdenum is reduced and enters the alloy.

On preparation of the stock alloy the flux is cleaned off and then a cleansing alloy is added, which comprises aluminum, magnesium and manganese. Most of the magnesium burns out. The proportions preferably employed are such as to produce an alloy comprised of approximately 70% beryllium, .6% manganese, .6% molybdenum and the balance has roughly 28% aluminum.

As compared with a 70-30 beryllium aluminum alloy, the foregoing alloy is more workable, flows better, makes a better casting, has increased strength, and also bendability and is resistant to corrosion.

In sheet form, say from fifteen to twenty thousandths thick, this alloy has a strength of about one hundred to one hundred and ten thousand pounds per square inch, depending upon the amount of cold work given. The manganese and molybdenum harden the aluminum eutectic. The alloy has a relatively low coefficient of friction and is, therefore, useful as cast for piston rings, pistons and the like. It is further useful in pistons because it has a relatively slight tendency to grow.

In castings, the alloy has a tensile strength of about thirty thousand to forty thousand pounds per square inch.

If increased springability is desired about

two per cent. of iron is added and the aluminum content correspondingly reduced.

In sheet form the alloy is particularly useful for aeroplane wings and similar parts where a combination of great lightness, strength and bendability are desired. The alloy is much lighter and stronger than duralumin and is much more resistant to corrosion.

I claim:

1. An alloy comprising beryllium, aluminum, manganese and molybdenum, approximately in the following proportions, Be 70%, Mn .6%, Mo .6%, and Al the remainder.

2. An alloy for machine parts, sheets and the like, wherein lightness combined with strength is desired, said alloy including approximately 70% beryllium and approximately 28.8% aluminum, and said alloy further including approximately .6% of manganese.

In testimony whereof I have hereunto signed my name.

JOSEPH KENT SMITH.