UNITED STATES PATENT OFFICE.

ALBERT W. MORRIS, OF SPRINGFIELD, MASSACHUSETTS.

ALUMINUM ALLOY AND IN ARTICLES MADE THEREFROM.

1,227,174. Specification of Letters Patent. Patented May 22, 1917.

No Drawing. Application filed November 26, 1915. Serial No. 63,475.

To all whom it may concern:

Be it known that I, ALBERT W. MORRIS, a citizen of the United States, residing in Springfield, Massachusetts, have invented certain Improvements in Aluminum Alloys and in Articles Made Therefrom, of which the following is a specification.

My invention relates to an aluminum alloy and to castings or forgings made therefrom, the object of my invention being to provide an alloy which will permit of the full chilling effect of the mold or die, will reduce the shrinkage of the castings or forgings, overcome the danger of cracking of the same, and increase their density, tensile strength and elongation properties as compared with those produced from the alluminum alloys at present in use.

This object I attain by adding iron to the alloy as hereinafter set forth. The alloy may consist of aluminum and iron alone, or it may contain other metals such as zinc, copper, nickel, cadmium, magnesium, manganese, or one or more of these metals, besides the aluminum and iron.

It is generally believed by those experienced in the art of casting or forging articles of aluminum alloy that the presence of iron is detrimental and tends to make the castings or forgings brittle, particularly when hot, but I have discovered that the presence of certain percentages of properly alloyed iron materially improves such castings or forgings in the respects noted in the first paragraph hereof.

Where the alloy contains also another metal or other metals, the percentage of aluminum should not be less than 70% of the whole, and the percentage of iron should not be less than 1% or more than 6%. Care should be taken to keep the silicon content as low as possible.

A casting or forging made from my improved alloy may be permitted to remain in contact with the mold or dies until it receives the full chilling effect of the same without risk of causing it to crack, and I further find that the presence of iron reduces the shrinkage of the casting or forging, while at the same time it increases its density, imparts to it a much higher tensile strength than usual, and permits of greater elongation.

The iron may be introduced in the form of ferro-aluminum, ferro-zinc, ferro-copper, or the like, or may be introduced in a metallic state in the form of chips, filings, etc., or it may be derived from the furnace, pot, or crucible in which the aluminum is melted or in which it is retained in the molten state before being cast or forged.

Although in my claim I have referred to my invention as an aluminum alloy it must be understood that this term is intended to cover as well castings, forgings or other articles made from such alloy.

My invention is of especial importance in the manufacture of fuses and detonators for explosive shells, as the density of the alloy is such as to prevent leakage, through it, of gases which would cause premature explosion of the shell.

I claim:

An alloy containing aluminum, iron, and one or more other hardening metals, such as nickel, the proportion of aluminum being not less than 70% and the proportion of iron from 1% to 6% of the whole.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ALBERT W. MORRIS.

Witnesses:
L. J. HARLEY, Jr.,
E. M. HOLLISTER.