

UNITED STATES PATENT OFFICE.

LUDWIG MACH, OF JENA, GERMANY.

ALLOY OF ALUMINIUM AND MAGNESIUM.

SPECIFICATION forming part of Letters Patent No. 646,442, dated April 3, 1900.

Application filed July 12, 1899. Serial No. 723,560. (No specimens.)

To all whom it may concern:

Be it known that I, LUDWIG MACH, a subject of the Emperor of Austria-Hungary, residing at Jena, Empire of Germany, have invented a new and useful Alloy of Aluminium, of which the following is a specification.

This invention relates to an improved alloy of aluminium, magnesium, and antimony.

It has been found that a pure alloy of one hundred parts of aluminium and two to thirty-five parts of magnesium on being brought to a dark heat is thin fluid. When cast in this condition, the castings obtained are perfect as regards density, the molds and even air-passages not exceeding 0.5 millimeters in width being entirely filled by the metal, so that on the whole the behavior of the alloy is the same as that of pure aluminium. However, if a piece of antimony be added to the red-hot alloy of aluminium and magnesium this alloy will become semifluid around the antimony added. The thickening effect will pervade the whole of the metallic mass until it assumes the consistency of a paste throughout, so that the stirring-rod stands upright in it. The fire should then be intensified, and not until a white heat is attained will the thick mass become fluid again, the antimony being fully dissolved. This alloy may be used for castings in a red-hot condition. The castings obtained as regards their mechanical properties are nearly equivalent to castings of pure aluminium and magnesium alloys and are remarkable for their imporosity, whereas castings of alloys of aluminium and magnesium without an addition of antimony are liable to be somewhat deficient in density. Antimony (melting-point 430° centigrade) therefore supplies a means for raising the point of fusion of aluminium and magnesium alloys without disadvantageously affecting their valuable mechanical properties. The specific gravity, as must be admitted, somewhat increases.

If small quantities of antimony are added to pure aluminium, the fracture of this alloy becomes gray and similar to cast-iron and the melting-point may be raised somewhat by substantial additions—say about twenty-five parts of antimony for one hundred parts of aluminium, as has been ascertained by tests, but not in anything like the degree in which this can be done in the case of an alloy of aluminium and magnesium by considerably-smaller additions of that metal—viz., from ten to fifteen parts to one hundred parts of aluminium mixed with, say, twenty-five parts of antimony become fluid when brought to a red heat, while an aluminium and magnesium alloy containing one hundred parts of aluminium and twenty parts of magnesium mixed with from ten to fifteen parts of antimony does not liquefy until heated to a very light red heat. Thus the behavior of the alloy of aluminium and magnesium toward antimony is different from that of pure aluminium.

According to the special purposes for which the alloy is intended to be used I may vary the quantities of its components. I prefer to use alloys of one hundred parts of aluminium, two to thirty parts of magnesium, and 0.5 to forty parts of antimony.

Having now described my invention, what I claim as new, and desire to protect by Letters Patent, is—

An aluminium-magnesium alloy having one hundred parts of aluminium, to two to thirty parts of magnesium and 0.5 to forty parts of antimony, substantially as described.

Signed this 21st day of June, 1899, at Berlin, Germany.

LUDWIG MACH.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.