

UNITED STATES PATENT OFFICE.

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METHOD OF CASTING ALUMINIUM ALLOYS.

No. 859,612.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM ALBERT McADAMS, a citizen of the United States, and a resident of Bay Shore, in the county of Suffolk and State of New York, have invented a new and useful Method of Casting Aluminium Alloys, of which the following is a specification.

My invention relates to the method of casting aluminium alloy, for example an alloy composed of aluminium, zinc and copper, in which the aluminium predominates, the object being to maintain the strength of the casting and at the same time employ molds made of finely granulated material commonly spoken of as sand molds. It has been found that a high degree of tensile and compression strength in castings of this alloy is obtained in great part by rapidly removing the heat from the molten metal after it is poured and to insure this removal of the heat, metal molds have been used with walls having a predetermined thickness with respect to the casting to remove the heat at the proper rapid rate. These metal molds are expensive to make and materially add to the expense of the castings and my present invention is directed to the method of removing the heat at the proper rate from the molten metal and at the same time using molds made up of finely granulated material handled in substantially the same manner as sand molds.

To this end my method consists broadly in utilizing the heat of the molten mass of the casting while held in form by a mold formed of finely granulated material, to set up around the casting a solid body of good heat-conducting material for rapidly removing the heat from the casting.

In practice I take finely subdivided carborundum and crystallized sugar, also finely subdivided, in the proportion of about ten pounds of carborundum to twelve ounces of sugar and thoroughly mix them together, spraying with water sufficient to reduce the mass to a plastic state of sufficient stiffness to retain its position when pressed into form around the pattern of the article to be cast. On pouring the molten metal into this mold, the sugar will cement the carborundum into a solid body and the carborundum thus cemented into a solid body will rapidly remove the heat from the molten metal which is to form the casting. It is found furthermore that the thickness of the solid body

formed about the casting will bear the proper relation to the thickness of the casting throughout its several parts so that the heat will be removed at the proper rate from the thicker as well as the thinner parts of the casting.

While the mixture above referred to will serve to remove the heat from the casting at the proper rate, I prefer to introduce into the mixture a certain percentage of yellow clay in a finely subdivided state, for example, about ten ounces of the clay to ten pounds of the carborundum and twelve ounces of sugar. This clay prevents the sugar and carborundum from clogging the sieve and gives molding qualities to the mixture.

In the event the aluminium alloy should be of such a nature as to generate more or less gas, it would be desirable to introduce a percentage of finely subdivided carbon in an amount depending upon the amount of escaping gases to be taken care of, for instance, twenty ounces of carbon to ten pounds of carborundum, twelve ounces of sugar and ten ounces of clay.

When the casting has been completed and removed from the mold, the solid body formed around the casting may be ground or otherwise mashed into a finely subdivided state and again used by the introduction of a small percentage of sugar.

What I claim is:—

1. In the art of casting, forming a mold of plastic material capable of being converted by heat into a solid mass of good heat conducting properties, casting the molten metal therein and utilizing the heat of the molten metal cast therein to convert the said plastic mold into a solid body of good heat conducting properties immediately around the cast metal for absorbing the heat from the said cast metal.

2. In the art of casting, forming a mold of plastic material capable of being converted by heat into a solid mass of good heat conducting properties, casting the molten metal in said mold and utilizing the heat of the molten metal to convert the plastic mold into a solid good heat conducting body immediately surrounding the metal and varying in thickness as the different parts of the casting to be formed vary in thickness and mass.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this 28th day of June, 1906.

WILLIAM ALBERT McADAMS.

Witnesses:

FRED HAYNES,
HENRY THOMAS