UNITED STATES PATENT OFFICE.

WILLIAM A. McADAMS, OF BAY SHORE, NEW YORK.

MEANS FOR CASTING ALUMINIUM ALLOYS.

No. 859,888. Specification of Letters Patent. Patented July 9, 1907.

Original application filed June 29, 1906, Serial No. 324,059. Divided and this application filed December 27, 1906. Serial No. 349,599.

To all whom it may concern:

Be it known that I, WILLIAM A. 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 Means for Casting Aluminium Alloys, of which the following is a specification.

My invention relates to means for 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.

This application is a division of my pending application Serial No. 324,059 filed June 29, 1906.

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 molds for removing the heat at the proper rate from the molten metal, said molds being made up of finely granulated material and capable of being handled in substantially the same manner as sand molds.

My invention consists broadly in forming a mold of finely granulated material in which the heat of the molten mass in the mold may be utilized to set up around the molten mass a solid body of good heat-conducting material for rapidly removing the heat from the metal.

My invention more specifically consists in a mold formed of finely subdivided carborundum mixed with sugar and either with or without the introduction of clay and finely subdivided carbon, the whole worked into a plastic condition by the introduction of a liquid, water for example, whereby the heat of the molten metal will, promptly upon the pouring of the metal, form a solid body around the casting, the said solid body having a thickness proportionate to the thickness of the casting and forming an excellent heat-conductor for rapidly removing the heat from the cast metal.

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 form a mold capable of removing 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. A mold for casting consisting of a plastic mixture comprising a finely subdivided good heat-conducting material, a carbonizable binder and a liquid.

2. A mold for casting consisting of a plastic mixture comprising finely subdivided carborundum and sugar.

3. A mold for casting consisting of a plastic mixture comprising finely subdivided carborundum, sugar and clay.

4. A mold for casting consisting of a plastic mixture comprising finely subdivided carborundum, sugar, clay and finely subdivided carbon.

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

WILLIAM A. McADAMS.

Witnesses:
C. S. SUNDGREN,
FREDK. HAYNES.