

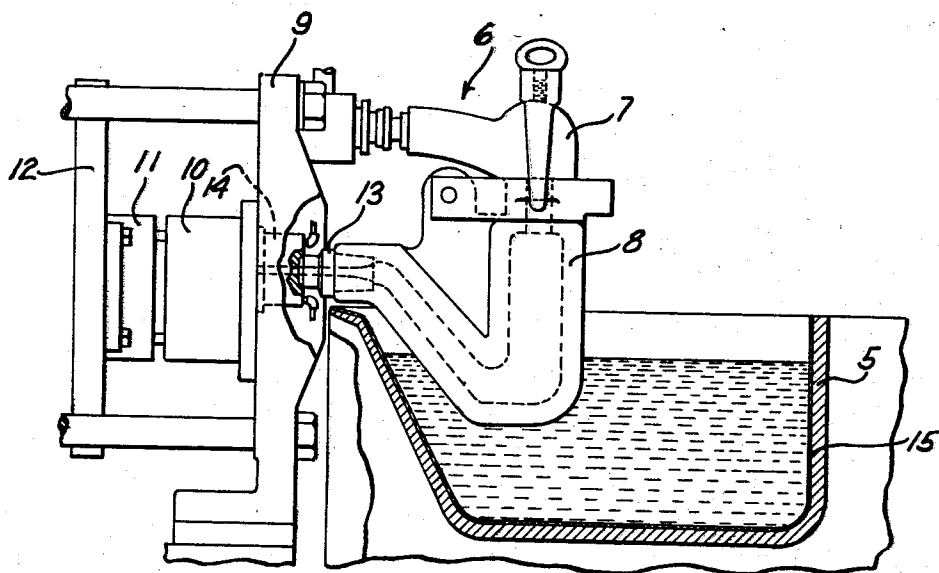
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APPARATUS PROVIDED WITH A PROTECTIVE COATING FOR HANDLING MOLTEN METAL

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APPARATUS PROVIDED WITH A PROTECTIVE COATING FOR HANDLING MOLTEN METAL

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2 Claims. (Cl. 22—69)

This invention relates to a method of protecting surfaces from molten metal, and apparatus provided with a protective coating for handling molten metal.

5 In die casting operations when alloys of aluminum or zinc are used as the casting metals, it has been the practice in some instances to make the die casting apparatus of iron, and since it is well known that alloys of aluminum and zinc 10 attack and dissolve the ferrous metal parts of the casting or molding equipment, it is desirable to provide means whereby the casting apparatus may be protected against this corrosive action of the molten metal, and to prevent the casting 15 alloy from being contaminated by the dissolved portions of the ferrous metal apparatus.

Objects of the present invention are to provide a method of protecting surfaces which come in contact with molten metal and to provide an 20 apparatus for handling molten metal in which destruction of the apparatus by the molten metal and resulting contamination of the molten metal will be reduced to a minimum.

In accordance with this object, one embodiment of the invention contemplates the provision of a method of protecting surfaces which are subject to attack by the corrosive molten metals by applying to the surfaces a black cast iron enamel, having a maturing temperature of approximately 25 the melting point of the molten metals. In pursuing this method, the parts of an apparatus for handling molten metal are coated upon the surfaces thereof which come in contact with the molten metal with black cast iron enamel.

35 A clearer understanding of the invention will be had from the following description taken in connection with the accompanying drawing, wherein a single figure illustrates the invention as applied to the container in which metal is melted for 40 supplying a casting apparatus with molten casting alloy.

Referring now to the drawing wherein reference numerals are used to designate the various parts, there is disclosed the charging end of the die casting apparatus in connection with which the black enamel coating is to be used. The reference numeral 5 designates the pot in which a casting alloy such as an aluminum alloy is melted for supplying the apparatus. A charging gun or 50 gooseneck designated generally by the numeral 6, comprising a cover 7, which is clamped onto a lower molten metal containing portion 8, is pivotally supported by any suitable actuating mechanism (not shown) for swinging the gooseneck 55 down into the melting pot to receive a charge of

molten metal and then up into engagement with a stationary die plate 9. A stationary die 10 secured to the die plate 9 is engaged by a movable die 11 which is mounted on a reciprocating plate 12 actuated by suitable control apparatus (not shown). A nozzle 13 is secured to the discharging end of the gooseneck for conveying the molten metal therefrom through a watercooled bushing 14 into the dies 10 and 11.

The pot 5 in which the casting alloys are melted is usually constructed of cast iron because cast iron has substantially better resistance characteristics than most other metals, and this invention contemplates a method of protecting the cast iron pot 5 from the corrosive action of the molten alloy. Preferably the pot 5 is coated on its inner surface as designated by the numeral 15, with a coating of black cast iron enamel containing boro silicate of soda, potash and lime and which might contain magnesium, lead and barium. This is the usual type of cast iron enamel, and also contains manganese dioxide and chromium trioxide as coloring matter and preferably contains as a coloring agent and as an adhesive a small amount of cobalt. It is preferable that the enamel does not contain iron in any form which might be dissolved by the action of the molten casting alloys. This, as pointed out hereinbefore, is the usual type of cast iron enamel, and has a maturing temperature of approximately 1300° F.

In the preferred embodiment of the method, the interior of the pot 5 is sprayed or washed with this enamel composition and then heated to a temperature of 1300° F. and held at that temperature for a length of time dependent upon the size and thickness of the pot to properly mature the enamel lining on the pot.

It is to be noted at this time that the maturing temperature of the vitreous enamel is 1300° F. and the temperature at which the casting alloy is maintained in a molten state, is approximately 1280° to 1320° F. Apparently this results in the enamel being maintained in a plastic state during a melt of alloys; however, it has been noted that although a thin coating of aluminum alloy adheres to the pot after the pot has been cooled and drained, that nevertheless there is always a coating of vitreous enamel interposed between the aluminum alloy and the iron pot, so that although the enamel becomes plastic, it does not dissolve in the casting alloy and always protects the surface of the pot.

Although the invention has been specifically disclosed in connection with a method of protecting parts of a die casting apparatus, it will be

understood that it is equally applicable to other apparatus wherever it is desired to protect a ferrous metal element from attack by molten metals or alloys or to protect any surface from the action of molten metal and it will be understood that the invention is not limited to the specific apparatus disclosed, but is limited only by the scope of the appended claims:

What is claimed is:

- 10 1. A ferrous metal member designed to contact with molten aluminum alloy, having the sur-

face thereof which comes in contact with the molten alloy coated with a vitreous enamel which becomes plastic at the temperature at which the alloy is maintained in a molten state.

2. A ferrous metal member having a surface designed to contact with molten casting alloys, said surface being provided with a coating of black cast iron enamel including boro silicate of soda, potash, lime, manganese dioxide, chromium trioxide, and cobalt.

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