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COATED MOLD AND METHOD OF COATING
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corporation of New JerseyNo Drawing. Application August 3, 1940,
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This invention relates generally to the art of casting metals. It relates more particularly to metal molds whose interior surfaces have carbohydrate coatings and to a method of coating such molds with such material.

It is well known that when high melting point metals, particularly steels, are cast in metal molds the surfaces of the castings are rough and irregular and that considerable expense is involved in conditioning or cleaning the surfaces of blooms or billets rolled therefrom. These surface imperfections may be traceable to metal which has splashed up from the metal and solidified on the mold walls. Many efforts have been made to avoid these disadvantages by providing a coating on the inner surfaces of such metal molds, and many different substances have been proposed for use in making such coatings. So far as I know, none of these proposed materials has been entirely satisfactory. Some of them tended to repel the splashes of metal but caused blow holes in the surfaces of the ingot.

The present invention results in the production of improved ingot surfaces particularly on both fine grained and coarse grained killed steels and avoids or minimizes the amount of conditioning or cleaning which has been required heretofore.

According to the present invention, the inner surfaces of metal molds are coated with a suitable carbohydrate. Such a carbohydrate, in finely divided solid form, is brought into contact with the inner surfaces of a mold to be coated while those surfaces are at temperatures above the melting point of the carbohydrate being used and below a temperature at which excessive charring of the coating takes place. Conveniently this fine material may be blown against the mold walls progressively from one end of the mold to the other end. Any simple apparatus may be used for this purpose, for example, a tube which has outlets thru which the solid material may be directed against the mold walls and which can be moved within the mold cavity.

A number of different carbohydrates are suitable for this purpose, including such substances as corn sugar, cane sugar, beet sugar, dextrose, maltose and dextrin. These carbohydrates melt at relative low temperatures and some melt at such temperatures that they may be applied to molds whose temperatures are well below 300° F. In general, any carbohydrate is suitable which has a melting point such that part of it, at least, will melt when applied to the mold and

which does not contain sufficient water to interfere with the formation of a smooth adherent coating on the mold walls.

Many other fusible carbohydrates having the foregoing properties may be used.

When a suitable carbohydrate coating material is brought into contact with the heated walls of the metal mold, it melts wholly or partly, and adheres to those walls, forming a coating thereon which is a substantially continuous layer and has a rather bright and smooth surface if it has not been charred. A small amount of charring or coking is not objectionable. When metal is cast in a mold so coated the surface of the metal is such that less conditioning is required on blooms or billets rolled therefrom than is the case when other mold coatings are used. I believe that the present coating repels splashes of metal and prevents them from adhering to the mold and that this action is due to sudden heating of the coating with resultant evolution of gas which however does not cause blowholes in the metal.

While the amount of carbohydrate material used may vary within wide limits, I have found that from about one-half pound to about two pounds of powdered cane sugar is sufficient to coat satisfactorily the inner surfaces of an ingot mold for a 7000 pound ingot.

Having thus described the present invention so that others skilled in the art may be able to understand and practice the same, I state that what I desire to secure by Letters Patent is defined in what is claimed.

What is claimed is:

1. The method of coating a metal mold, in which a high melting point metal is to be cast, which includes the step of bringing into contact with inner surfaces of the heated mold a finely divided, solid carbohydrate having a melting point lower than the temperature of the mold walls and thereby forming an adherent coating on the inner surfaces of the mold walls consisting of a carbohydrate.

2. The method of coating a metal mold, in which high melting point metal is to be cast, which includes the step of blowing against inner surfaces of the metal mold a small amount of a finely divided, solid carbohydrate having a melting point enough lower than the temperature of the mold walls so that part, at least, is melted on said surfaces with the resultant formation of a coating on said surfaces consisting of a carbohydrate.

3. A metal mold for use in casting high melt-

ing point metals having a coating consisting of a carbohydrate adhering to inner surfaces thereof.

5 4. A metal mold for use in casting high melting point metals having a substantially continuous coating consisting of a substantially uncharred carbohydrate coating adhering to the inner surfaces thereof.

10 5. The method of coating a metal mold in which a steel ingot is to be cast, which includes

the step of bringing into contact with the inner surfaces of the warm mold a finely divided solid sugar such as cane sugar, beet sugar or corn sugar having a melting point slightly lower than the temperature of the mold walls and thereby 6 causing the sugar to partially or entirely melt so that it adheres to the inner surfaces of the mold and forms a coating thereon consisting of a carbohydrate.

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