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PATENTED MAY 7, 1907.

A. W. McARTHUR & J. M. DARKE.
METAL MOLD FOR CASTING IRON AND STEEL.

APPLICATION FILED DEC. 30, 1902.

Fig. 1.

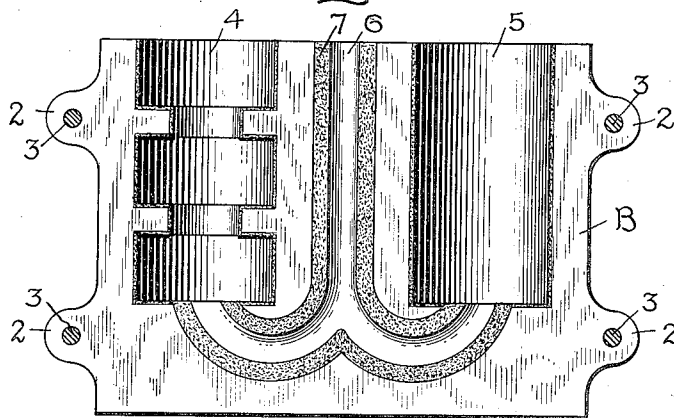
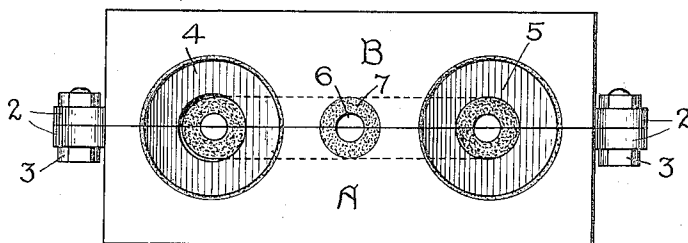


Fig. 2.



Witnesses:

Green Oxford

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att'y.

UNITED STATES PATENT OFFICE.

ALONZO W. McARTHUR, OF SWAMPSCOTT, AND JESSE M. DARKE, OF LYNN,
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METAL MOLD FOR CASTING IRON AND STEEL.

No. 852,671.

Specification of Letters Patent.

Patented May 7, 1907.

Application filed December 30, 1902. Serial No. 137,145.

To all whom it may concern:

Be it known that we, ALONZO W. McARTHUR and JESSE M. DARKE, citizens of the United States, residing, respectively, at Swampscott, county of Essex, State of Massachusetts, and at Lynn, county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Metal Molds for Casting Iron and Steel, of which the following is a specification.

Our invention relates to metal founding, and has for its object to provide a permanent mold for the production of heavy iron and steel castings.

Metal molds have been used heretofore in casting ingots and in casting very small pieces such as light gears, but they have not been adapted for making larger castings on account of the practical difficulty in separating the mold from the casting and the destruction of the mold due to their welding or burning together. In very small molds it has been practicable to apply washes which would in a measure prevent the sticking of the castings thereto, but in the larger ones requiring considerable metal it has been impracticable heretofore to fix a wash in place upon the smooth metallic surfaces of the molds so that it would not be removed by the flowing metal.

Our invention consists in coating the inner surfaces of a metal mold with a substance which will adhere thereto in the presence of molten metal and provide a smooth surface to which a refractory wash will adhere sufficient to withstand the erosive effect of the molten metal.

The invention will be more readily understood by reference to the accompanying drawing forming a part of this specification, in which

Figure 1 is an inner elevation of one side of a mold embodying one form of our invention and with the gate and clamping bolts shown in section, and Fig. 2 is a top plan view of the whole mold.

In the modification of our invention shown in the drawing the mold is of iron, and made in halves A and B with lugs 2—2 projecting

from the opposite ends through which the clamping bolts 3—3 pass, and whereby the halves are held together. The mold has two cavities 4 and 5 and between them a channel 6 which branches at its lower end and connects with the bottoms of both cavities.

In the channel 6 is located a dry sand gate 7, which may be very inexpensively made and readily fitted to the mold. In case the mold is to be used for making steel or low carbon iron castings the dry sand gate may be made of such a mixture as is used in making facing sand for dry molds or dry cores suitable for steel foundry use, and in case the mold is used for making gray iron castings the gate may be made of a mixture of sand and clay suitable to resist the action of fluid cast iron.

The smooth inner or face surfaces of the mold are not adapted to retain in place any of the washes or coatings known at the present time against the action of the flowing metal, and in order to provide a smooth coating therefor, to which such washes or coatings will adhere so as to effectually resist the action of the molten metal, we apply thereto a lining of adhesive material, such as sodium silicate, and dry or fuse it in place by subjecting the mold to high temperatures. We have found that the usual silica washes satisfactorily adhere to a surface thus formed, even when the volume of molten metal is relatively large.

By the use of the dry sand gate a great quantity of molten metal may be poured into a mold without cutting of the channel, and when the metal reaches the main cavities of the mold the erosive action is insufficient to overcome the affinity of the wash for the sodium silicate surfaces.

It is apparent that the adhesive lining above described is adapted for use upon small molds as well as upon the larger, and accordingly may be used to advantage where the sand gate is not required.

Our invention is capable of many changes and modifications without departing from the spirit thereof.

What we claim as new, and desire to se-

cure by Letters Patent of the United States, is,—

1. A metal mold for casting steel provided with a lining consisting of sodium silicate fused in place.
2. A metal mold provided with a permanent adhesive lining of sodium silicate and a wash of a refractory material applied thereto.
3. A metal mold provided with a dry sand

gate and a permanent adhesive lining of sodium silicate fused in place.

In witness whereof I have hereunto set my hand this 27th day of December, 1902.

ALONZO W. McARTHUR.

JESSE M. DARKE.

Witnesses:

DUGALD McK. McKILLOP,

JOHN A. McMANUS.