Jan. 11, 1949. E. A. GRAHAM 2,459,025

MOLD

Filed June 3, 1944

FIG. 1.

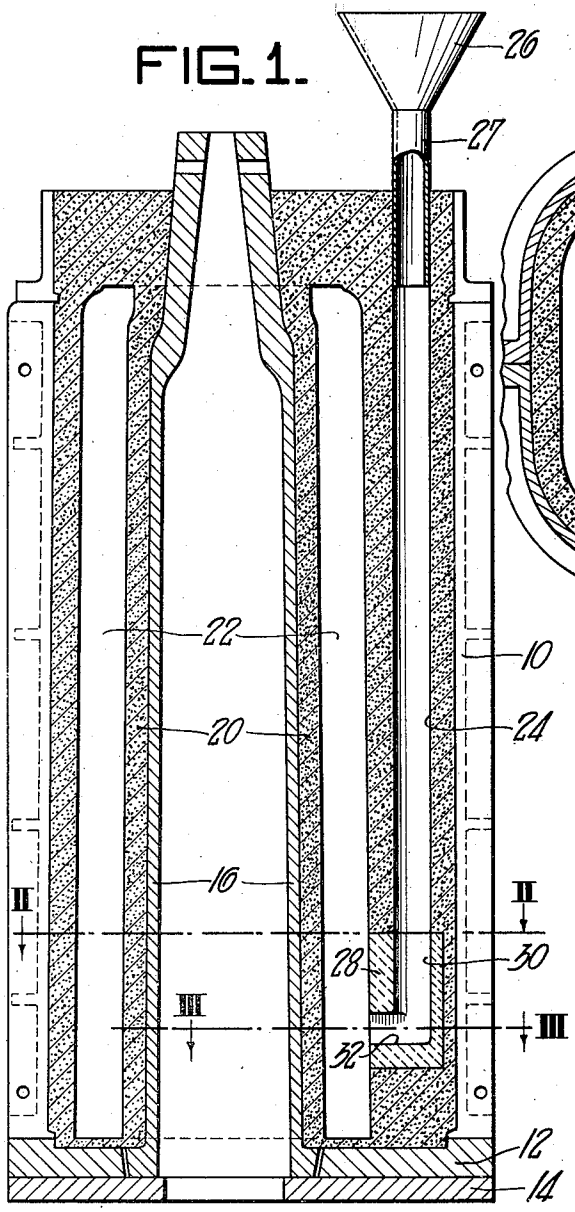


FIG. 2.

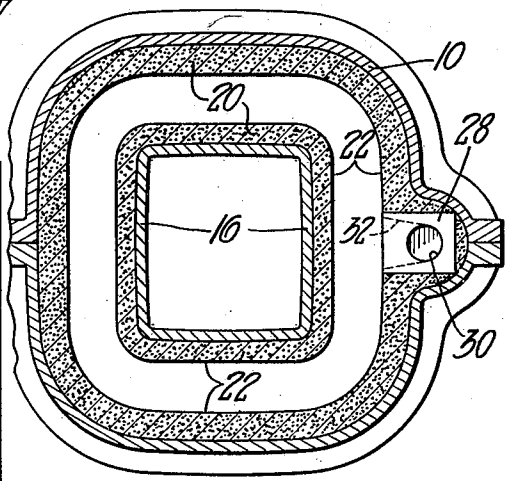


FIG. 3.

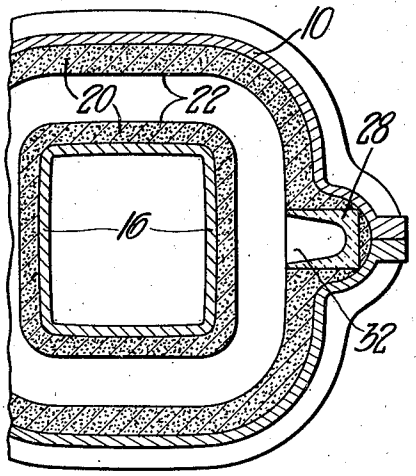
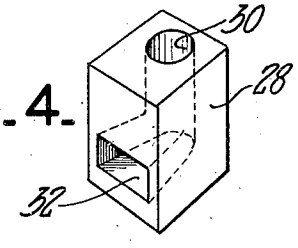


FIG. 4.



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MOLD

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2 Claims. (Cl. 22—134)

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The present invention relates generally to molds, and more particularly to an improvement involving the incorporation of a unitary brick of refractory material having an upright passageway communicating with the sprue of the mold and a laterally-extending gate passageway opening into the mold cavity. While not limited thereto, this invention is peculiarly well suited for incorporation in molds used in the casting of ingot molds.

For a complete understanding of the invention, reference should be made to the following detailed disclosure, the accompanying drawings, and the appended claims.

In the drawings:

Figure 1 is a vertical longitudinal section through a mold embodying the present invention.

Figure 2 is a horizontal section on line II—II of Figure 1.

Figure 3 is a similar section on line III—III of Figure 1.

Figure 4 is a perspective view of the refractory brick adapted to be incorporated in the mold at the lower end of the sprue thereof.

Referring in detail to the drawings, reference numeral **10** represents a conventional form of flask; **12** and **14** represent stool plates adapted to support the flask and the mold; and **16** represents a conventional type of core barrel carrying a body of molding sand **20** constituting the inner core of the mold. The body of molding sand **20** is supported by the flask, and is provided with a mold cavity **22** of a size and shape to suit the design of casting desired. The particular mold illustrated is designed for producing ingot molds, although it is to be understood that the present invention is applicable to molds generally.

Formed in the sand mold body **20** is an upright sprue **24** which is adapted to receive the molten metal to be cast into the mold cavity **22**. As illustrated in the drawings, a funnel-like member **26** having a nozzle **27** adapted to be inserted in the upper end of the sprue, is used, into which the metal to be cast is teemed.

Heretofore it has been the general practice to form a sprue and for the operator to enter the mold and cut away or remove part of the molding sand so as to provide a gate to permit the flow of the molten metal into the mold cavity. This prior practice has the disadvantage that as the metal is teemed into the sprue it exerts an erosive and abrading action at the lower end thereof. This cuts away the gate and results in the formation of a large gob of metal on the mold, and when the casting is removed from the flask the

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excess waste material on the mold face requires considerable chipping in order to remove it. To overcome this disadvantage inherent in prior conventional practice, I insert a unitary refractory brick **28** having an upright passageway **30** communicating with the sprue and having a laterally-extending gate portion **32** at right angles thereto, this gate portion having a flat bottom from end to end and flaring in width from the width of the substantially circular passageway **30** to a greater width, as indicated in Figures 3 and 4, at the point where the gate opens into the mold cavity **22**.

The advantage of this improved gate construction is such that the metal area attached to the casting produced in the mold at the gate will be neatly cast to the shape shown in Figure 4, and the excess metal and waste pieces can be readily broken away so that very little if any chipping will be required on the finished casting. The contour of the gate is preferably oblong, as shown, to permit an easy breakage of the waste from the mold.

The disclosed invention employs the hydrokinetic theory of the hydrocone by which I mean that the velocity pressure of the falling metal down the vertical sprue is converted to static pressure at the point where the vertical stream strikes the flat horizontal surface at the gate **32** prior to entering the mold and thus reducing to a minimum the wash or erosion of the interior face of the mold in the region where the gate **32** intersects the mold cavity.

Having thus described the invention, what I desire to obtain by Letters Patent is set forth in the following claims.

I claim:

1. A mold of the character described comprising a body of sand having an upright mold cavity of great height therein to suit the size, shape and design of the casting desired, an upright sprue of great height in the mold body adapted to receive the molten metal to be cast, a brick of refractory material embedded in the sand body of the mold and having an upright passageway communicating with the lower extremity of the sprue and a laterally extending gate passageway opening into the mold cavity, the bottom surface of said gate passageway being a flat substantially horizontal plane from end to end.

2. A mold of the character described comprising a body of sand having an upright mold cavity therein, a substantially vertical sprue in the mold body adapted to receive the molten metal to be

cast, a unitary insert of refractory brick embedded in the sand body of the mold at the lower end of the sprue and having a substantially horizontal gate passageway opening into the mold cavity, the gate passageway gradually increasing in width horizontally from a minimum at the region of said sprue to a maximum at the plane of intersection of the gate with the mold cavity, said gate passageway being substantially horizontal and having a flat bottom from end to end.

EDWIN A. GRAHAM.

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