

## [54] CONTAINER WITH SLIDING SHUTTER FOR A LIQUID MELT

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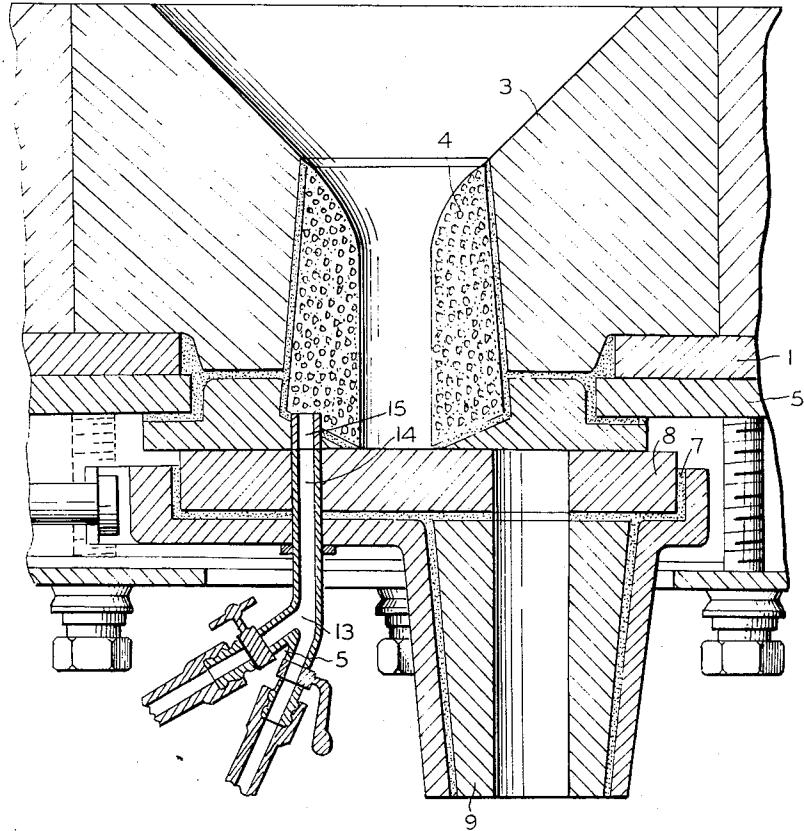
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## [57] ABSTRACT

A container with a sliding shutter for a liquid melt having an orifice plate of refractory material with a flow passage fixed on the bottom of the container. A slideable valve plate has a flow passage opposite the orifice plate. A gas permeable body through which gas can be fed to the melt cooperates with the flow passage of the orifice plate. A plurality of gas conduits are connected with the gas permeable body for feeding selectively various gases to the melt. The conduits are provided with a three-way valve.

7 Claims, 3 Drawing Figures



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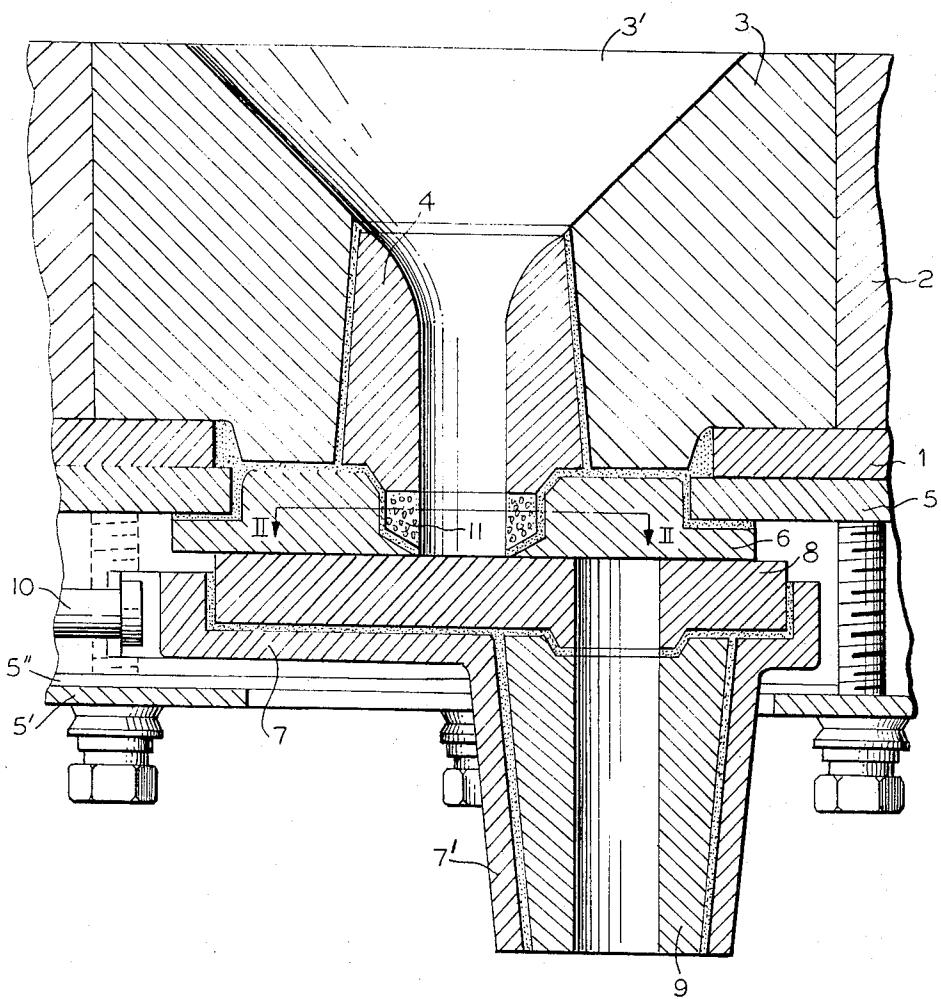


FIG. 1

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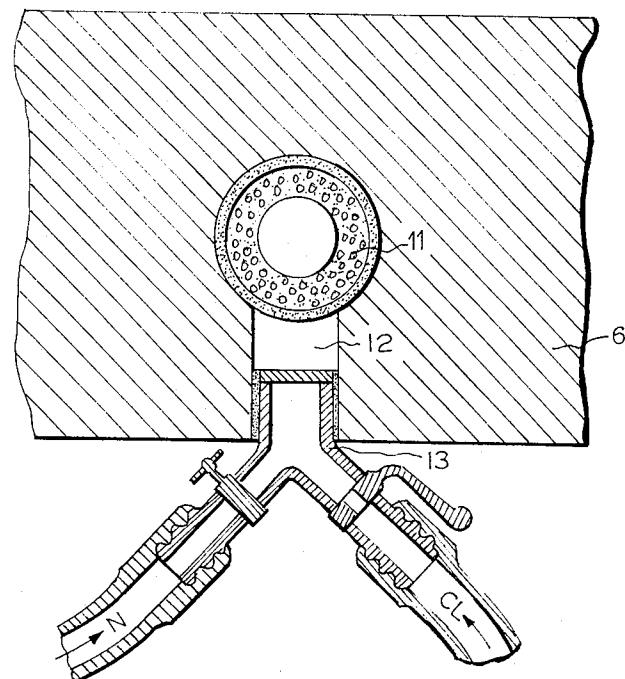


FIG. 2

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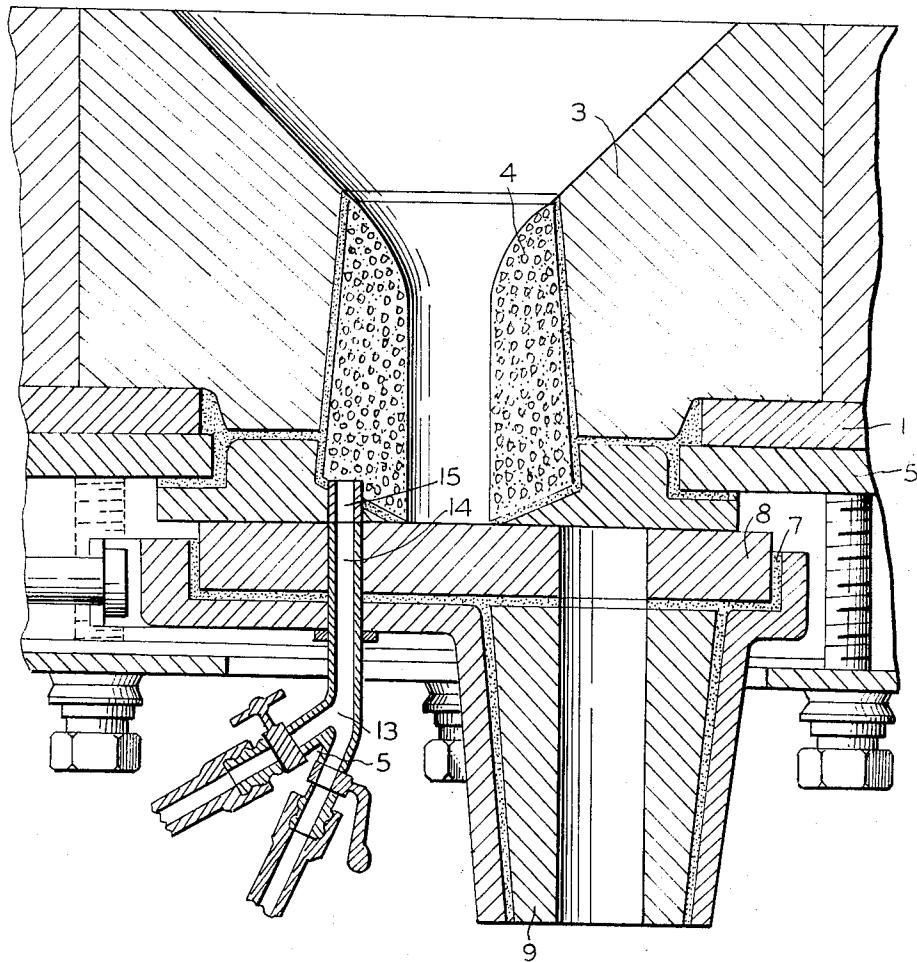


FIG. 3

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**CONTAINER WITH SLIDING SHUTTER FOR A LIQUID MELT**

The invention refers to a container with a sliding shutter for a liquid melt comprising an orifice plate with a flow passage firmly set on the bottom of the container, opposite to it a slidable valve plate with a flow passage, and a refractory body permeable to gas through which an inert gas can be fed to the melt set in the flow passage of the orifice plate.

In this kind of container the object of feeding gas to the melt in the area of the flow passage of the orifice plate is to prevent the metal from hardening due to cooling and thus occluding the flow passage. Furthermore this measure helps to homogenize all of the remaining melt in the container.

There are also other reasons for feeding gas to a melt, particularly reaction gases. For instance with aluminum melts, chlorine is introduced in order to free the melt of undesired metalloids, particularly sodium. The reaction gases were in the past blown into the melt from above through graphite pipes.

An object of the present invention is to provide a more effective way of degassing the melt, without having to use graphite pipes which are highly exposed to wear and tear.

A further object is to provide a container, which has a gas permeable body on the outlet thereof, with a valve connection, for instance a three-way valve, to a gas feed pipe which is connected with the gas permeable body for introducing selectively various gases. In this manner reaction gases can be fed through the gas permeable body into the melt.

A still further object is to make it possible to use only one means for cleaning, homogenizing, degassing and securing an undisturbed drain of the molten metal. The gassing of the melt from below permits a high gas utilization and the utilization of a gas permeable body, such as a gas sink, which produces small gas bubbles and allows an intensive action of the gas upon the melt.

With the above and other objects in view which will become apparent from the detailed description below, some preferred embodiments of the invention are shown in the drawings, in which:

FIG. 1 is a vertical section through a sliding shutter set on the bottom of a pouring ladle, whereby a gas sink is inserted into its orifice plate.

FIG. 2 is a cross section along section line II-II in FIG. 1,

FIG. 3 is a vertical section through a modification of the invention.

The drawing of the lower part of a pouring ladle with a sliding shutter in FIG. 1 a pouring ladle having a metal casing 1, an internal refractory lining 2, a refractory block 3 with an inlet hole 3' and a refractory pouring insert 4 embedded within the hole by refractory mortar. The casing plate 5 of the sliding shutter which is screwed tight onto the casing 1, consists of a fixed orifice plate 6 and a sliding part set across said orifice plate in guideways 5'' whereby a cast iron lid 5' is screwed onto the housing plate 5. The sliding part is composed of a cast iron supporting body 7 with a nozzle 7', a valve plate 8 positioned therein, and an outflow jacket 9. The displacement between a closed position, whereby the sliding plate 8 seals a central flow passage of orifice plate 6, and an open position whereby the flow passages in the orifice plate 6 and the

valve plate 8 align, is achieved by means of a hydraulic drive 10.

In order to avoid the "freezing" of the melt over the valve plate 8 when it is in a closed position and so as to make it possible at the same time to feed a finely dispersed reaction gas, for instance chlorine, into the melt, according to the device of FIG. 1 a porous, gas permeable gas sink 11, such as a ring-shaped insert, is set into the orifice plate 6. Sink 11, as shown in FIG. 2, is connected with a gas feeding conduit 12 through orifice plate 6. Through this conduit 12 and the gas link 11, different gases may be fed into the melt according to need, through a three-way valve 13. An inert gas can be fed, for instance nitrogen or argon, and a reaction gas, for example chlorine.

The modification according to FIG. 3 is different from FIGS. 1 and 2, in that the pouring insert 4 forms the gas sink. The gas is fed in this case through conduits 14 and 15 through the valve plate 8 and the orifice plate 6.

As a deviation of the shown applications the expert may use many different forms of construction for the gas permeable body as well as many different ways for connecting gas conduits with the latter. Since the function remains always the same, the invention covers also these various modifications.

I claim:

1. A container for a liquid melt and having a sliding shutter for the discharge of said liquid melt, said container comprising:

a refractory block having an inlet hole;  
an orifice plate of refractory material fixed to the bottom of said refractory block, said orifice plate having an orifice therein in communication with said inlet hole;

a slidable valve plate sealingly and slidably positioned against said orifice plate, said valve plate having a flow passage therethrough;  
a porous gas permeable refractory body positioned in said orifice of said orifice plate;  
a conduit extending through said orifice plate to said gas permeable body; and

a plurality of conduit means communicating with said conduit and including means to allow the selective communication of a plurality of different gases to said conduit and thus to said gas permeable body.

2. A container as claimed in claim 1, wherein said gas permeable body comprises a ring-shaped insert positioned within said orifice, said insert having a flow passage therethrough.

3. A container as claimed in claim 2, wherein said conduit extends radially through said orifice plate.

4. A container as claimed in claim 1, wherein said gas permeable body comprises a pouring insert positioned in said inlet hole of said refractory block, said insert further extending into said orifice in said orifice plate, said insert having a flow passage therethrough.

5. A container as claimed in claim 4, wherein said conduit extends substantially vertically through said orifice plate to said insert.

6. A container as claimed in claim 1, wherein said plurality of conduit means comprises at least one conduit connected to a supply of inert gas and at least one conduit connected to a supply of reaction gas.

7. A container as claimed in claim 6, wherein said means to allow selective communication comprises a three-way valve connected to said conduit and to said conduits connected to said supplies of inert gas and reaction gas.

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