

E. C. WASHBURN.
 RISER LINING FOR MOLDING DEVICES.
 APPLICATION FILED MAR. 15, 1906.

900,970.

Patented Oct. 13, 1908.

Fig. 1.

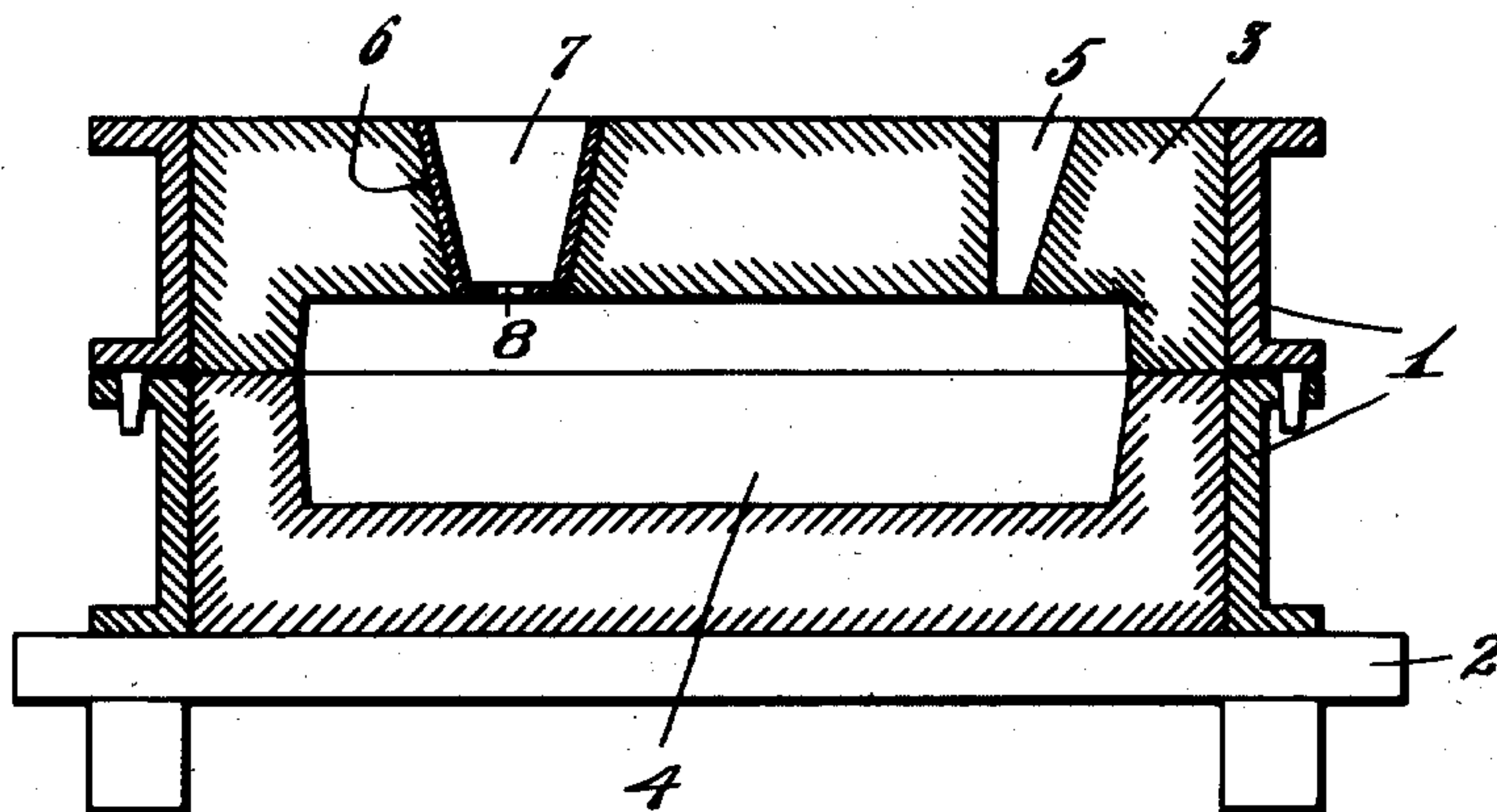


Fig. 2.

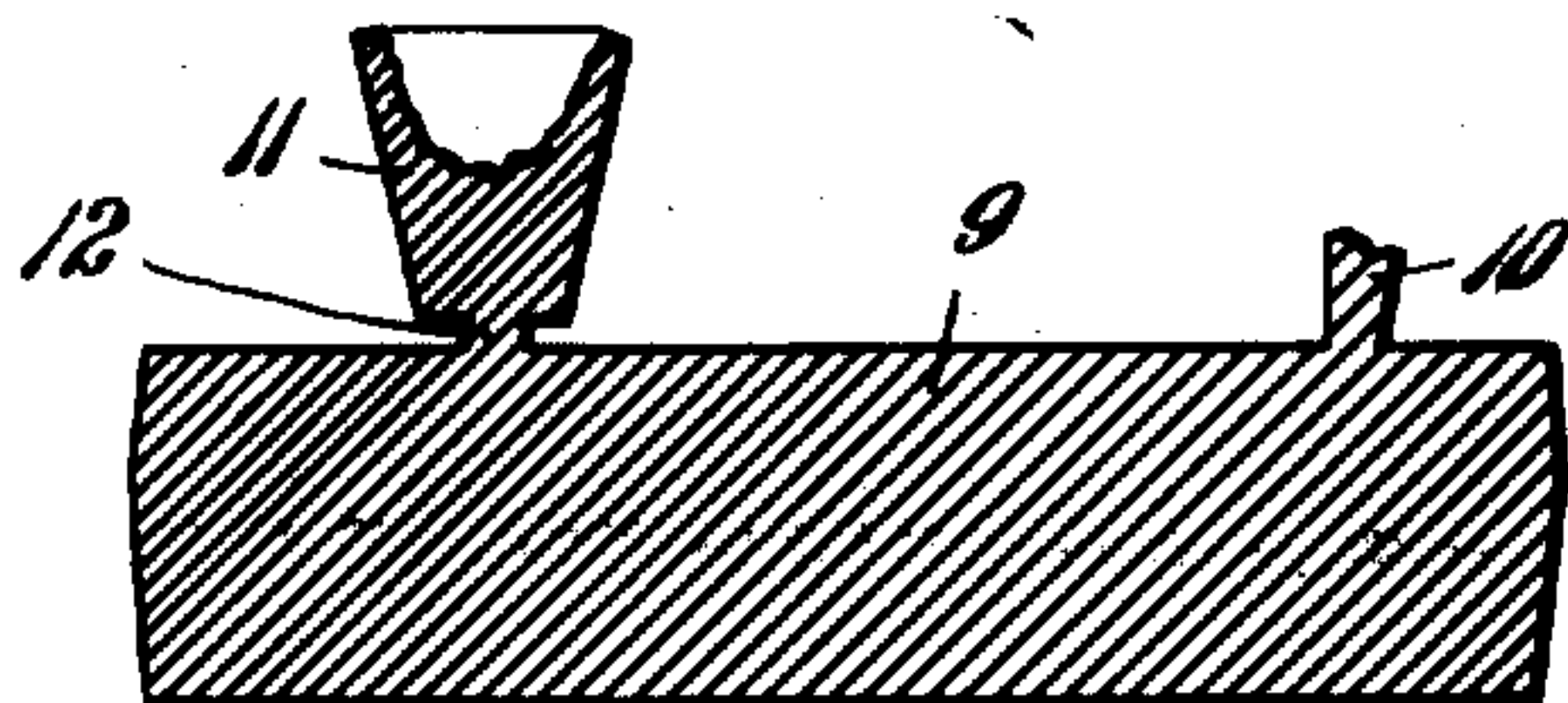
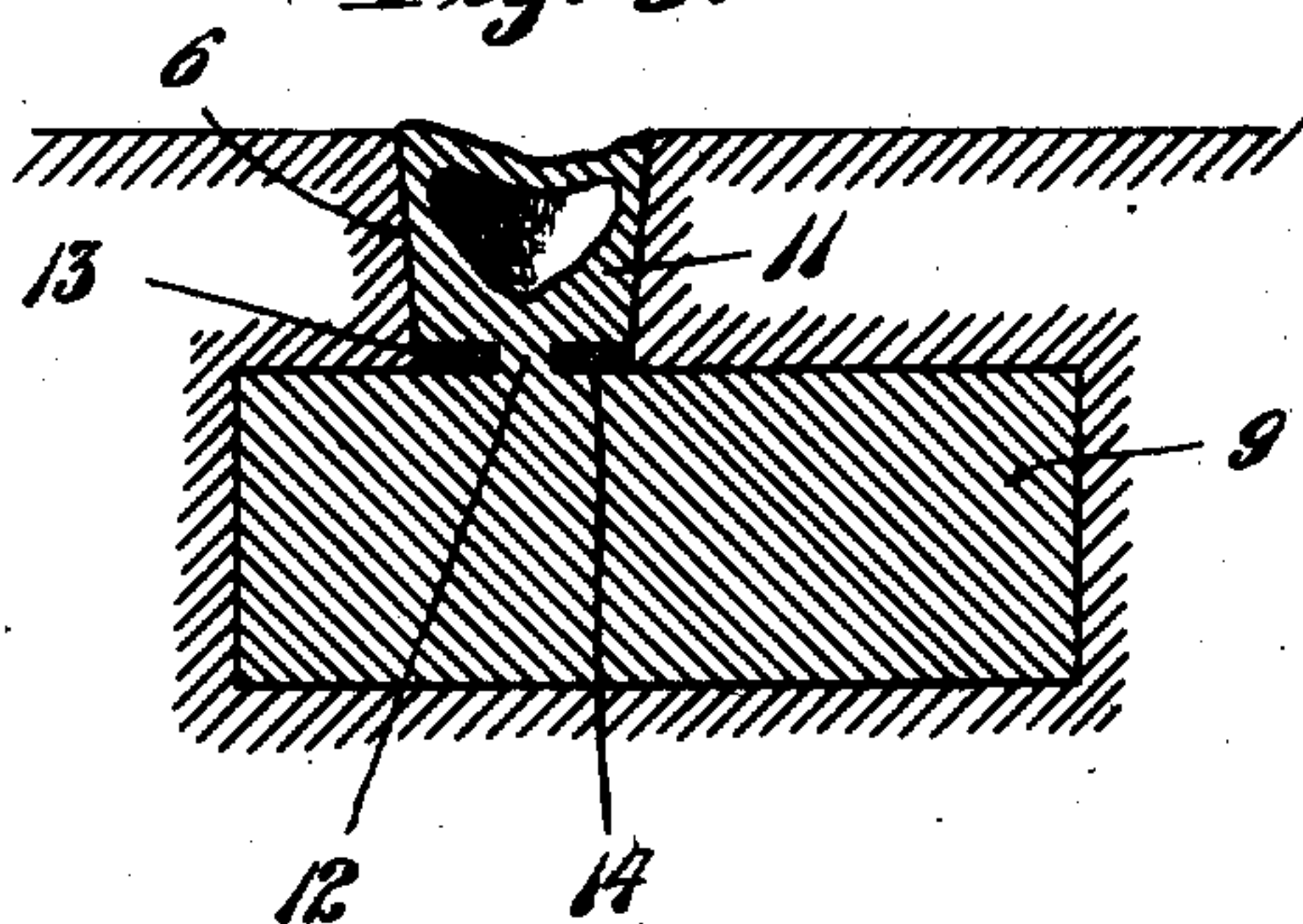


Fig. 3.



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RISER-LINING FOR MOLDING DEVICES.

No. 900,970.

Specification of Letters Patent.

Patented Oct. 13, 1908.

Application filed March 15, 1906. Serial No. 306,117.

To all whom it may concern:

Be it known that I, EDWIN C. WASHBURN, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Riser-Linings for Molding Devices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates particularly to apparatus for molding large and heavy castings, and is directed to the provision of an improved "riser", whereby certain improved results are obtained, all as hereinafter set forth.

As is well known, in making large castings, the metal is usually poured into the mold through a vertical opening called a "gate" and another and larger opening is provided, called a "riser", which permits the molten metal, after the mold is filled, to run into said riser, and to run from said riser into the mold, to compensate for shrinkage, as the metal cools. It is also the custom to pour considerable metal into this riser, to insure ample supply of molten metal to fully compensate for shrinkage of the metal in cooling. This so-called "riser" must be large, when large castings are to be made. Hitherto, this riser has been formed directly in the sand and it has been necessary to form the entire riser with large cross section and so that there has been a large surplus body of metal united to the casting by a neck portion of very large cross section. This surplus body has had to be cut off from the casting, by a saw or other cutting tool, and when the castings have been very large and heavy and consequently hard to handle, considerable time of several men has been required to accomplish this result. Furthermore, the cold and damp sand of the mold rapidly chills the metal in the riser, and often causes the riser, where it joins the casting, to solidify too rapidly and to choke up the riser, with the result that a depression or flaw is produced in the casting.

In accordance with my invention, I provide a heat retaining device which will prevent rapid chilling of the metal in the riser and mold, particularly around the neck of the riser adjacent to the mold, or where the body of the mold left in the riser will join with the body of the casting, thereby per-

mitting the use of a comparatively small passage, adjacent to the body of the mold.

In practice, I have found the best form of this heat retaining device to be a pot-like receptacle constructed of baked clay, and having in its bottom a passage which is of much smaller cross section than the bottom of the pot. This pot, when placed in the riser, should be located with the under surface of its bottom alined with the adjacent surface of the mold or cavity in which the casting is to be formed. An ordinary flower pot having in its bottom a central opening affords an extremely cheap and efficient device for the above purpose. I have also found that by the use of this device it is possible to use a comparatively small hole in the bottom of the pot, so that the comparatively large body of metal contained within the pot will be united to the casting only by a comparatively small neck portion, which neck portion may be broken off by the use of a hammer or sledge. Good results may also be obtained by the use of a plate or disk-like body of baked clay placed in the bottom of the riser, adjacent to the body of the mold.

Baked clay is a material that will not be fused to any considerable extent by molten steel or other metal and, furthermore, is a poor conductor of heat or, otherwise stated, is a good insulator of heat and, hence, will prevent the chilling or rapid cooling of the metal which runs into contact therewith. It is better, however, to provide the riser with a complete lining such as afforded by a pot. Many other materials besides baked clay may, however, be used to form the so-called heat retainer. For instance the heat retainer, so-called, might be made of asbestos and even if constructed of metal or of wood would, to some extent, be efficient for the purposes had in view. The term "riser" is herein used for the sake of convenience, but, of course, it will be understood that the improved device may be applied at any and all places where molten metal is to be run into the mold.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Referring to the drawings, Figure 1 is a view principally in section, taken transversely through a flask and body of sand therein constituting a mold. Fig. 2 is a sectional view of the casting as it would appear

when first removed from the mold; and Fig. 3 is a sectional view illustrating a modified form of the improved "heat retainer".

The numeral 1 indicates a two part flask of the usual or any suitable construction which, as shown, is set up on a mold board 2.

The numeral 3 indicates the molding sand contained within the flask and within which is formed a mold 4 which is to give form to the body to be cast.

The numeral 5 indicates the usual "gate" which opens into the cavity 4; and the numeral 6 indicates a vertical passage which leads into the mold 4, and which corresponds to the usual so-called "riser". In this riser 6 is placed the lining in the form of a clay pot 7 having, in its bottom, an opening 8 of considerably less cross section than the bottom of the pot.

The numeral 9 indicates the body of the casting, the numeral 10 the lug that is cast thereon by the metal left within the gate 5, and the numeral 11 the lug or body of metal cast integrally with the body 9, by the metal left within the pot 7. The lug 11, it will be seen, is connected to the body of the casting by a contracted neck portion 12, so that it may be easily broken off from the casting. The casting shown is in the form of an ingot, but, of course, in practice it may be of any form so far as my invention is concerned.

In Fig. 3, the numeral 13 indicates the disk or plate, preferably of baked clay, having a central passage 14, the said disk or plate being placed at the bottom of the riser 6 with its under surface adjacent to or alined with the upper surface of the casting 9.

My experiments up to date go to show that by the use of the simple device above described, castings may be produced which will not have flaws due to the cause above stated and furthermore, that a very material saving of labor is effected by making it possible to break rather than saw the lug 11 from the body of the casting.

It will be noted that the only difference between the forms of the device shown in Figs. 1 and 3, is that the perforated disk like bottom or body shown in Fig. 1, is provided with a vertical flange, which flange and vertical bottom constitute the pot.

What I claim is:

The combination with a molding apparatus having a riser or gate opening into the mold, of a disk-like body of non-fusible material which is a poor conductor of heat placed at the bottom of said riser or gate adjacent to the mold, with its flat under surface extended along the upper portion of the mold cavity and constituting a considerable portion of the upper wall of the mold, and forming a thin partition between the top of the mold and the bottom of the riser, the said disk-like body having a central perforation through which the molten metal may be poured into the mold, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

EDWIN C. WASHBURN.

Witnesses:

MALIE HOEL,
F. D. MERCHANT.