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ANTIPIPING MEANS FOR INGOT MOLDS.

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1,315,944.

Patented Sept. 16, 1919.

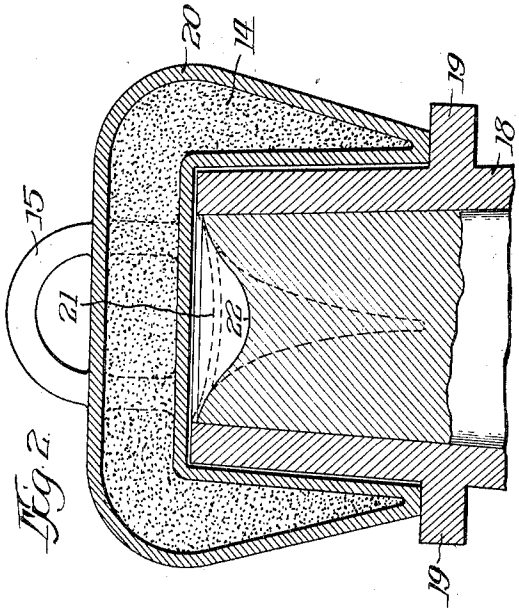


Fig. 2.

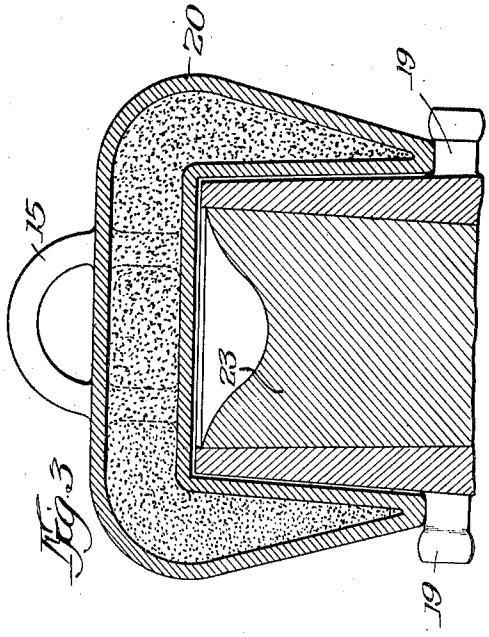


Fig. 3.

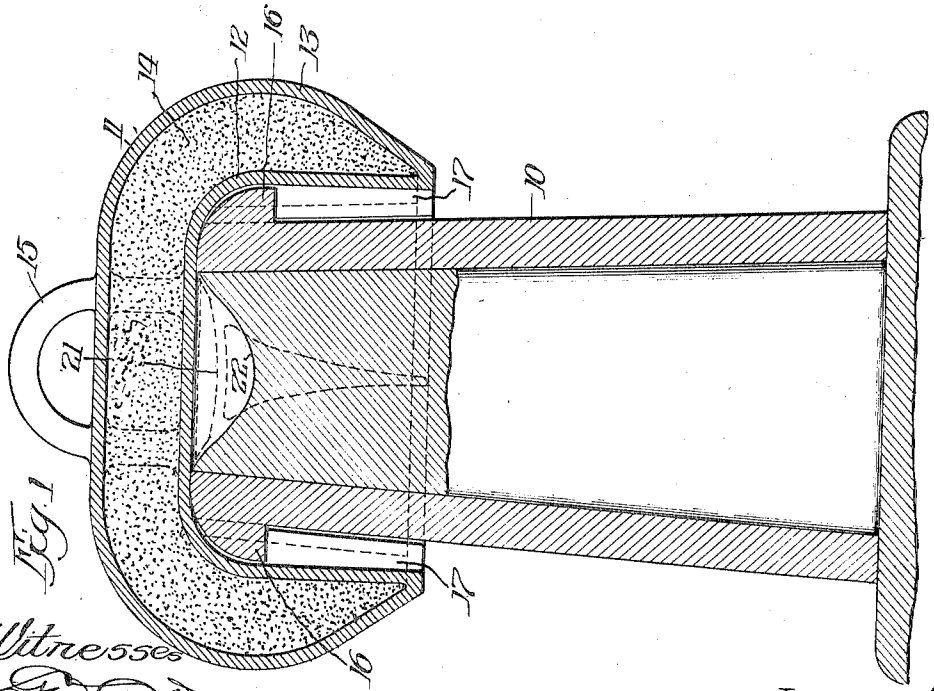


Fig. 1.

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ANTIPIPING MEANS FOR INGOT-MOLDS.

1,315,944. Specification of Letters Patent. Patented Sept. 16, 1919.

Application filed October 11, 1917. Serial No. 195,959.

To all whom it may concern:

Be it known that I, JOHN BRUNNER, a citizen of the United States, and a resident of Evanston, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Antipiping Means for Ingot-Molds, of which the following is a specification.

This invention relates to the ingot-molding art, and more particularly to means for preventing piping.

The main object of the invention is to prevent piping.

Another object is to provide a novel ingot mold equipment for preventing piping.

Generally speaking, these and other objects are accomplished by providing in combination, an ingot mold, and means for covering a portion thereof for preventing piping.

The invention is illustrated on the accompanying sheet of drawings, in which—

Figure 1 is a sectional view of my ingot mold equipment showing the heated cap located in its proper position with respect to the mold;

Fig. 2 is a fragmentary sectional view of a modification of the invention; and

Fig. 3 is a fragmentary sectional view showing another type of mold equipped with my invention.

The various novel features of the invention will be apparent from the following description and drawings, and will be particularly pointed out in the appended claims.

As is well known, piping is caused by the crystallization of particles of steel which form adjacent the mold, thereby causing a shrinking of the metal away from the center, leaving a space which must be filled by molten metal located at a higher point. In view of the fact that the metal at the top of the mold freezes very rapidly, a relatively large opening is left in the central part of the ingot which tapers toward the lower end thereof. It is this opening, or the piping of the ingot, which is detrimental and causes considerable waste.

Piping can be overcome to a very large degree by maintaining the top of the ingot in a molten condition until the bottom of the ingot has crystallized. To accomplish this result I have provided the ingot mold 10 with a covering 11 for the upper part of the mold, which preferably takes the form of a cap which extends down over the ingot and covers the mold to an extent commensurate with the length of the normal amount of piping. In view of the fact that the chief function of the cap 11 is to maintain the top portion of the mold hot, or to maintain the ingot in a molten condition, it is necessary that the cap prevent radiation of the heat. To this end, the cap is preferably provided with inner and outer walls 12 and 13, respectively, between which is located any good insulating medium, such as sand 14. When the cap is used for the first time it is to be heated to a relatively high degree and then placed over the mold after the molten metal is poured into the mold. The cap being heated in the first instance will retain its heat and may for a considerable length of time under continuous operation be used thereafter without further heating. The cap may be provided with any suitable bail 15 by means of which the cap may be readily placed on and removed from the mold 10.

As shown in Fig. 1, the upper part of the mold 10 is provided with outwardly extending portions 16, by means of which the mold may be stripped from the ingot. To accommodate the portions 16, the cap is provided with grooved portions 17.

In Fig. 2 I have shown a different type of mold 18, in which the laterally extending portions 19 are located intermediate the ends of the mold proper, and the cap 20, also slightly modified in shape, fits down over the mold 18 and rests upon the projections 19.

Fig. 3 discloses a similar arrangement in which the laterally extending projections 19 of the mold are rounded.

Referring again to Fig. 1 of the drawings, the piping action which heretofore has taken place is indicated by dotted lines, there being a crust 21 formed over the top of the ingot. The full line 22 indicates the shape which the upper part of the ingot will take when my heat retaining cap is applied to the mold, showing that the piping is eliminated. The same also is shown in Fig. 2. By referring to Fig. 3, the ingot 23 is shown as formed when my improved heat retaining cap is placed over the mold. It will be noted that the top of the ingot is merely sunken in a slight amount, and that the piping as such is eliminated.

It is apparent that there may be various modifications of my invention, and it is my intention to cover all such modifications which do not involve a departure from the spirit and scope of the invention as set forth in the following claims.

I claim:

1. In combination, an ingot mold, a heat retaining covering therefor, including a member having spaced walls, and an insulating medium of porous material within the space intermediate said walls.

2. A heat retaining cap for ingot molds, including spaced walls, and an insulating medium of porous material therebetween.

3. A heat retaining cap for ingot molds, including a member having an opening formed therein for an insulating medium of substantial body.

Signed at Chicago, Illinois, this fifth day of October, A. D., 1917.

JOHN BRUNNER.

Witnesses:
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