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2,190,392

INGOT CAP

Filed June 16, 1938

FIG. 1.

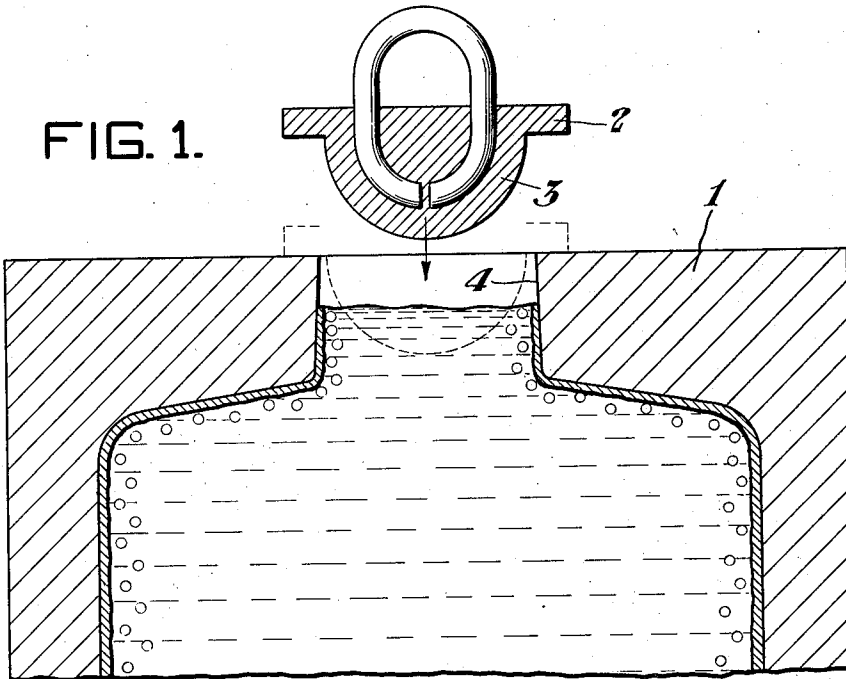
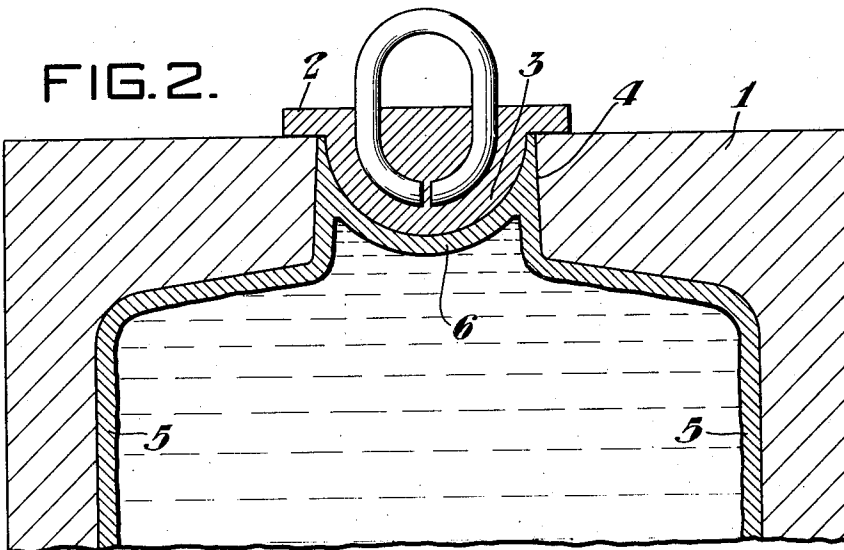


FIG. 2.



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UNITED STATES PATENT OFFICE

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INGOT CAP

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Application June 16, 1938, Serial No. 214,098

1 Claim. (Cl. 22—139)

This invention relates to ingot caps such as are used to close the tops of ingot molds into which oxidized molten steel has been cast, whereby to freeze a crust on the top of the ingot steel and prevent further gas evolution or rimming. One of the objects is to provide a cap that will afford substantial safety against break-outs.

Accompanying drawing illustrates a cap embodying the principles of the invention, Figure 1 showing the cap ready to be placed over the neck-opening of a bottle-neck mold, and Figure 2 showing the cap in place and the ingot steel capped by a frozen crust.

More specifically, this drawing shows a bottle-neck mold 1 into which oxidized steel has been cast, the cap 2 for capping this steel having a hemispherical metal contacting bottom 3 of at least slightly less diameter than the neck-opening 4 of the mold 1.

The second figure shows the cap in use, the ingot metal being now enclosed by a crust 5 constituting the rim usually associated with the initial freezing of oxidized rimming steel, the top of the ingot being sealed by a crust 6 forming a continuation of the rim.

Due to the cap being of slightly less diameter than the neck-opening of the mold, and due to the fact that, as illustrated by the first figure, the steel was cast to a level well up into this neck, the sealing crust 6 encircles the almost perpendicular sides of the hemispherical bottom of the cap and firmly grips the same, due to thermal constriction. This mechanically holds the cap in place and is a substantial aid in the prevention of breakouts, since the cap is held in place so as to support the crust 6. Furthermore, this sealing crust is hemispherical in form due to the fact that it is frozen to form by the hemispherical bottom of the cap. Therefore, as the gas pressure builds up in the steel in the mold, it is resisted by a hemisphere of solidified metal which, due to its form, is structurally strong, so that there is little tendency of this crust 6 to rupture.

A cap combining the features of this invention is particularly adapted for use in connection with the method disclosed by a co-pending application entitled "Method of producing capped steel", bearing Serial No. 214,099 and filed June 16, 1938. Briefly, this method consists in capping steel of the gas-evolving or normally-rimming type as soon as possible after casting of the steel into an ingot mold, the degree of oxidation of the steel being controlled so that the steel neither rises nor falls appreciably in the mold prior to capping. Since the steel does not rise in the mold, it is necessary to provide a cap which can dip into and displace the molten ingot metal, and this the cap here disclosed is obviously capable of doing. Furthermore, this method results in high internal gas pressures which might tend to produce breakouts if prior art caps having flat bottoms were used; and here again a cap embodying the principles of the present invention is particularly applicable in that it is best able to meet the situation.

I claim:

Steel ingot casting equipment comprising an ingot mold having a round opening in its top and an ingot cap for capping steel cast in said mold and exposed by said opening, said cap having a portion for engaging the top of said mold to restrict the entrance of said cap through said opening and having a downward hemispherical steel contacting bottom extending down through said opening when said portion engages said top, said bottom being of such diameter as compared to the diameter of said round opening as to leave an annular space between the side of said bottom and the inside edge of said round opening into which the steel may be displaced by said bottom dipping into the steel when it is cast into said mold, adjacent portions of said bottom and said inside edge of said opening approaching parallelism.

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