Sept. 29, 1931. M. G. DUMAS 1,825,446

HOT TOP FOR INGOT MOLDS

Filed Aug. 23, 1930

Fig. 1.

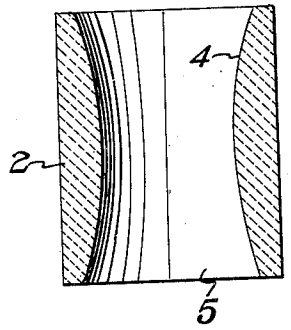


Fig. 2.

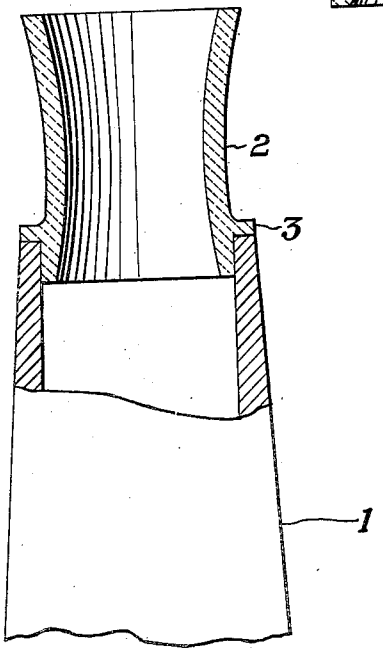
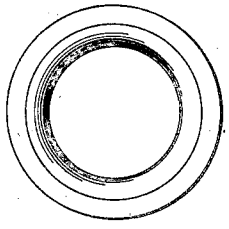


Fig. 3.



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HOT TOP FOR INGOT MOLDS

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This invention relates to hot tops for ingot molds and it is among the objects thereof to provide a form of hot top or feeder which shall be adapted to provide a pressure column of maximum height in a minimum mass of metal to be fed to the ingot.

In the pouring of ingots provision is made to provide an excess mass of molten metal which is fed into the ingot while the metal is setting or cooling to prevent forming of pipe, so-called, and to obtain an ingot of more nearly uniform density throughout.

After the ingot is formed, the excess metal is cropped off or sheared, such sheared off portion being commonly referred to as "croppage" which constitutes the waste metal or scrap which is an expensive item in the manufacture of ingot steel.

It is among the objects of the present invention to produce a miximum head of pressure in the metal to be fed to the ingot and at the same time reduce the croppage to a minimum and to accomplish this object provision is made to prevent freezing to render the full force of the pressure effective to densify the top portion of the ingot metal.

These and other objects will become more apparent from a consideration of the accompanying drawings in which like reference characters designate like parts and in which Fig. 1 is a vertical sectional view of one form of hot top embodying the principles of this invention; Fig. 2 a vertical sectional elevational view illustrating the feeding position of a hot top on an ingot mold; and Fig. 3 a top plan view of the hot top shown in Fig. 2.

With reference to Figs. 1 to 3 inclusive of the drawings, 1 generally designates an ingot mold, 2 a hot top which is provided with offset portions or shoulders 3 in the form of a peripheral flange which engages the top of the mold 1 to rest the hot top thereon. The particular manner of supporting the hot top forms no part of this invention as the hot top may be supported on top of the ingot mold in any convenient and suitable manner.

The hot top 2 is designated to provide a volume of metal of such mass that it will retain its molten condition for a sufficient period to complete the feeding of the metal into the ingot mold, this being the determining factor in hot top designs.

In accordance with the present invention, the hot top 2 is formed of a maximum height and formed to have its inner walls 4 of convex shape as shown in Figs. 1 and 2, thereby producing a maximum height or column which determines the head pressure of the molten metal in the feeder. The minimum diameter of the interior of the hot top should be sufficiently great to prevent freezing of the metal and in any event should not be less than one-half of the diameter of the lower opening 5 of the hot top, this having been determined as a safe proportion on the basis that the greater mass below the minimum cross-sectional area of the hot top retains the heat to the extent that the metal does not freeze very rapidly at its most constricted portion. For the same reason the increasing diameter at the top of the hot top assists in preventing the freezing of the metal at the constricted portion, thus establishing that the convex shape of the inner walls is very effective and consistent with the maintenance of the maximum head pressure for feeding purposes.

The tops of hot tops shown in Fig. 1 is reversible so that either end may be supported on the ingot mold; however, it may be desirous to form supporting shoulders as illustrated in the hot top of Fig. 2.

In Fig. 1, the outer walls of the hot top are straight and the inner walls convex to produce a maximum thickness of wall section at the minimum section of the metal, thus further reducing freezing in the throat portion by reducing heat loss by radiation at this portion.

Although a round shape of hot top is illustrated in Fig. 3 of the drawings, in practice the ingot molds are ordinarily of oblong, rectangular, or fluted shape and the exterior of the hot top is usually shaped to conform to the shape of the mold.

From the foregoing description it will be apparent that a maximum head pressure is obtainable with a minimum mass of metal to be fed by so distorting the mass that it will

produce a maximum height without constricting any portion thereof, to the extent of causing too rapid freezing when the metal is setting.

I claim herein as my invention:

1. A hot top structure for feeding metal to ingots comprising a hollow body having its longitudinal wall section of substantially convexo-concave shape to produce a maximum columnar pressure in a given mass of molten metal.

2. A hot top structure for feeding metal to ingots comprising a hollow body having its longitudinal inner surface of substantially convex shape with its minimum diameter at the mid-portion and gradually increasing in diameter toward the respective ends thereof.

In testimony whereof I have hereunto set my hand.

MAXWELL GERSON DUMAS.