Aug. 2, 1938. C. R. FON DERSMITH ET AL 2,125,496

INGOT MOLD STOOL

Filed April 29, 1937

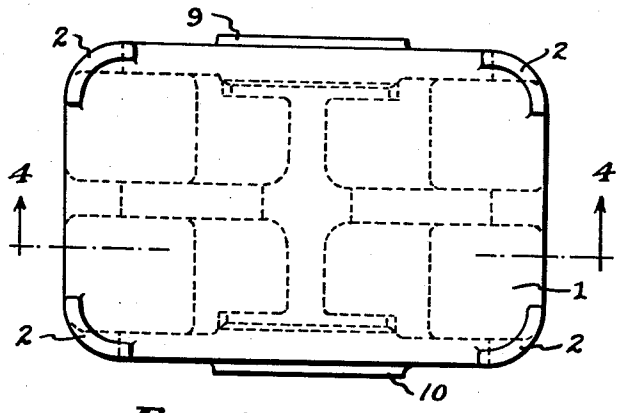

FIG. 1.

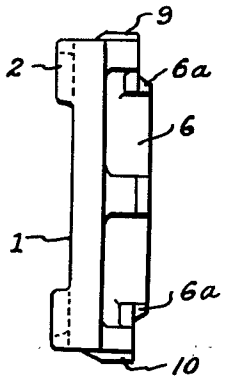

FIG. 2.

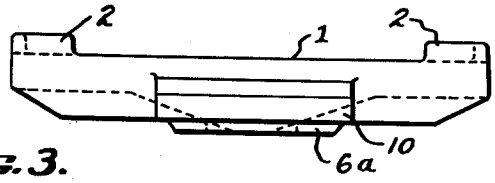

FIG. 3.

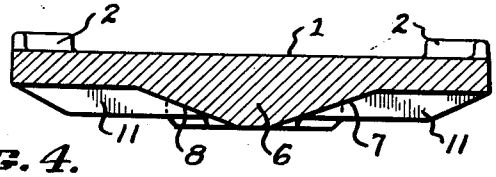

FIG. 4.

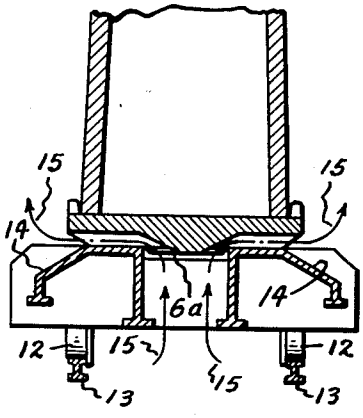

FIG. 5.

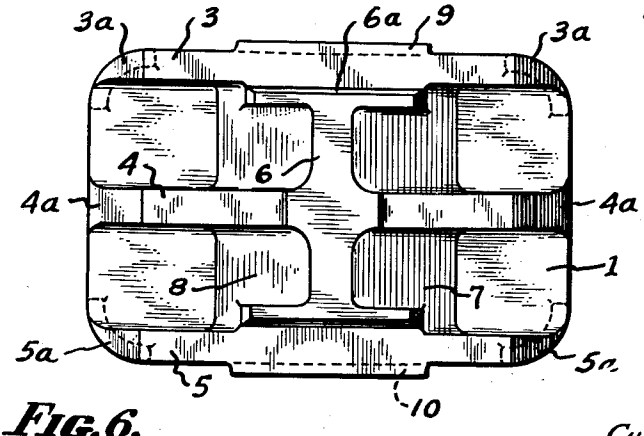

FIG. 6.

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Patented Aug. 2, 1938

2,125,496

UNITED STATES PATENT OFFICE

2,125,496

INGOT MOLD STOOL

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Application April 29, 1937, Serial No. 139,670

5 Claims. (Cl. 22—139)

This invention relates to ingot mold stools. In rolling mill practice, hot steel from the ladle is poured into molds to form ingots suitable for placing in the soaking pits and subsequent rolling on a blooming mill. The mold into which the steel is poured is referred to as an ingot mold and must be so designed that the chilled steel may be extracted from the mold. Usually this is done by making the mold in two pieces. The four sides of the mold form one piece which is usually tapered to facilitate removal of the chilled ingot and a mold stool usually forms the bottom of the mold. In practice the member composing the four sides is placed upon the mold stool and the metal is poured into the mold. Subsequently the ingot is rammed out through the larger end of the mold.

Mold stools for the purpose above described are not new, but they have always been open to several objections. It is difficult to make the mold stool of a material which will stand up under the impact due to the stream of metal impinging on the bottom during pouring of the ingot, and then stand up under the subsequent heating due to contact with the molten steel. Furthermore, the sticking of the ingot to the stool has been a troublesome element which has impeded the removal of the ingot from the mold.

In view of the above mentioned factors, it is an object of our invention to provide a mold stool which will be of adequate strength to support a steel ingot and which will stand up under the rapid heating up on account of the contact with molten metal. Further objects of our invention include the provision of a mold stool which will be light in weight and which will have an air-cooled bottom, whereby sticking of the ingot to the stool is practically eliminated, whereby the life of the stool is greatly increased, and whereby the cost of the stool for metal and freight will be materially reduced.

These and other objects of our invention which will be pointed hereinafter, or which will be apparent to one skilled in the art upon reading these specifications, we accomplish by that certain construction and arrangement of parts of which we shall now describe an exemplary embodiment. Reference is now made to the drawing which forms a part hereof and in which:

Figure 1 is a top plan view of a mold stool according to our invention.

Fig. 2 is an end elevation of the same.

Fig. 3 is a side elevation of the same.

Fig. 4 is a cross sectional view of the same taken on the line 4—4 of Fig. 1.

Fig. 5 is a cross sectional view showing how the mold stool according to our invention rests on the car and showing the air currents which are set up for cooling the mold stool bottom.

Fig. 6 is a bottom plan view of the mold stool.

Briefly in the practice of our invention, we provide a mold stool comprising a flat surface which is adapted to form the bottom of the ingot mold. We form the bottom of the stool in such a manner that an adequate supporting surface is provided and at the same time, ventilating passages are provided so that when the mold stool, with the mold and ingot upon it, is resting on the mold car, convection air currents will be set up to cool the bottom of the mold, whereby its life is increased and sticking is reduced.

The mold stool comprises a single piece of metal having a flat surface 1, which forms the bottom of the mold. The stool is preferably rounded at the corners and is provided with the curved ridges 2 to insure proper seating of the mold upon the stool. The stool is further provided on its under side with the longitudinal ribs 3, 4 and 5, which form supporting surfaces for the stool and serve to strengthen it. We have also provided a transverse rib 6 which has a like function. The rib 6, as may be seen in cross section in Fig. 4, is shaped like an inverted truncated isosceles triangle having the sloping sides 7 and 8 which merge into the bottom of the surface 1. The longitudinal ribs 3, 4 and 5 are beveled as indicated at 3a, 4a and 5a respectively, in order to eliminate mass. This beveling, of course, does not reduce the strength of the stool, but merely reduces the weight of the stool. Along its longitudinal edges the stool is provided with the buttress members 9 and 10 which serve as spacers when a number of such mold stools are placed side by side on a mold car. It will be noted that the rib 6 projects downwardly below the lower edges of the longitudinal ribs 3, 4 and 5. At each end of the rib 6 we have provided the elements 6a which extend to the same depth as the bottom of the rib 6 and which extend longitudinally a substantial distance. These members serve to locate the mold stools on the mold car, as will be described hereinafter. As will be noted from Fig. 6 the various planes and angles are nicely rounded where they meet other planes and angles so as to present a smooth and finished appearance. By reference to Fig. 4 it will be noted that passages 11 are thus provided between the longitudinal ribs 3 and 4 and between the longitudinal ribs 4 and 5 toward each side of the central transverse rib 6.

In use the mold stool is placed upon a mold car as shown in Fig. 5. The car is provided with wheels 12 riding on tracks 13 and is provided with the longitudinal structural members 14. The members 14 are spaced so that their inner vertical portions will receive the downwardly projecting longitudinal elements 6a between them. In this way the mold stools will rest upon the mold car without danger of slipping off the car toward one side or the other. The arrows 15 in Fig. 5 indicate the course of air currents from the floor of the mill up through the mold car and out on each side under the mold stool. Because of the extreme heat around the outside of the ingot molds, these up currents of air are produced in a manner analogous to the stack effect caused by the different densities of the air in the immediate vicinity of the mold as compared to the air further away. Thus an easy passage has been provided for the convection currents described, by the continuous air currents passing up through the car and around the bottom of the mold stool as indicated at 15. The stool is continuously cooled, whereby its life is greatly increased and we have found that sticking of the ingot to the mold stool is practically eliminated.

It is to be understood, of course, that modifications may be made without departing from the spirit of our invention and that we do not intend to limit ourselves other than as pointed out in the claims which follow. Having now fully described our invention, what we claim as new and desire to secure by Letters Patent is:

1. An ingot mold stool for use with open-end ingot molds, said stool comprising a unitary casting having a relatively thin portion forming the bottom of the mold, and strengthening ribs integral therewith on the underside along two opposed edges and centrally thereof, whereby the under surface of said stool is accessible to cooling currents of air when said stool and mold are standing on an ingot mold car.

2. An ingot mold stool for use with open-end molds, said stool comprising a unitary casting having a relatively thin portion forming the bottom of the mold, a plurality of longitudinal strengthening ribs integral therewith on the underside, and a central transverse strengthening rib integral therewith, whereby two sets of cooling channels are provided on the underside of said stool, extending outwardly from the center.

3. In combination, an ingot mold stool and a car, said car having spaced supporting surfaces for said stool, said stool having supporting elements adapted to seat on said supporting surfaces, and ventilating channels formed on the underside thereof, whereby air currents may pass from the floor up through the car and out through said channels and means to prevent said stool from sliding off said car.

4. In combination, an ingot mold stool and a car, said car having spaced supporting surfaces for said stool, said stool having supporting elements adapted to seat on said supporting surfaces, and ventilating channels formed on the underside thereof, whereby air currents may pass from the floor up through the car and out through said channels and means on the sides of said stool to provide for the spacing of other stools resting on said car.

5. In combination, a car having a pair of spaced supporting surfaces, and a plurality of mold stools thereon, said mold stools having supporting elements on their undersides adapted to seat on said supporting surfaces, means cooperating with said spaced supporting surfaces to prevent said stools from sliding off said car, means on the sides of said stools to space them apart, and ventilating channels formed on the undersides thereof, whereby air currents may pass from the floor up through the car and out through said channels.

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