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M. S. PAPAZIAN
METHOD OF RECESSING THE SINK
HEAD OF INGOTS AND THE LIKE
Original Filed May 21, 1943

2,485,065

FIG. 1.

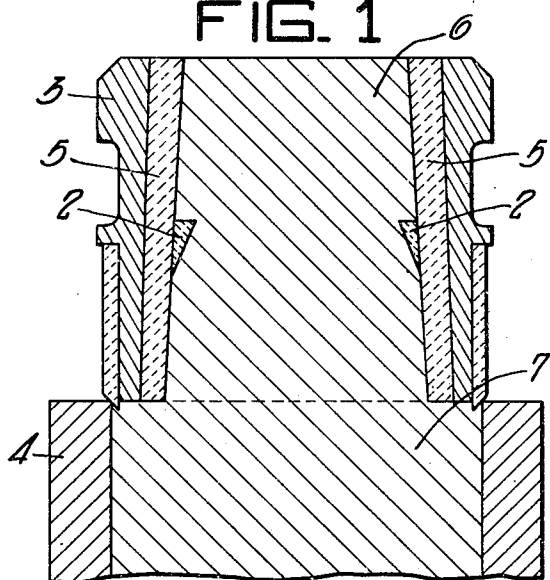


FIG. 2.

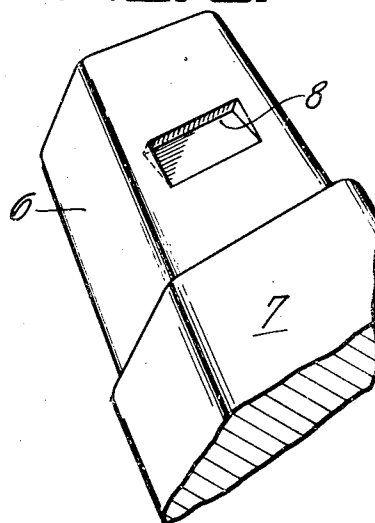


FIG. 3.

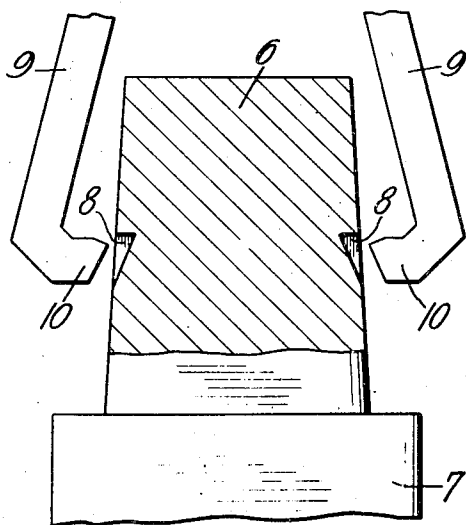


FIG. 5.

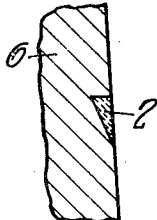


FIG. 4.

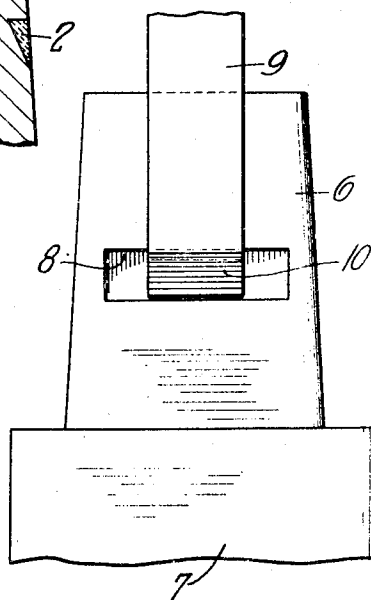
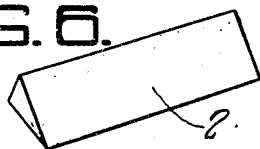


FIG. 6.



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METHOD OF RECESSING THE SINKHEAD
OF INGOTS AND THE LIKE

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Continuation of application Serial No. 487,930,
May 21, 1943. This application November 27,
1946, Serial No. 712,615

5 Claims. (Cl. 22—190)

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This invention relates to ingots and the like and, particularly, to an improved method of recessing the opposed side walls thereof for receiving the jaws or tongs of a crane or other lifting mechanism.

In the manufacture of ingots in the steel industry, it is customary in the forming of big end up molds to provide a hot top for a purpose well known to those skilled in the art. After the mold has been poured and the mold has cooled, the hot top is removed and the mold is stripped from the ingot, usually by means of an overhead stripping crane which carries downwardly extending jaws or tongs for engaging opposed side walls of the ingot in a well known manner.

Generally, there is arranged on the lower ends of the jaws or tongs of the stripper crane, extremely sharp points or bits which bite into the side walls of the ingot for firmly gripping the same while the crane lifts the ingot from the molds. These sharp points of the gripping jaws tend to gouge into the side walls of the ingot, and, oftentimes, light seams or other defects result in the slab or bloom formed therefrom which, of course, is objectionable. Also oftentimes the points or bits of the gripping jaws or tongs would not properly bite into the ingot so that the same was not securely and firmly gripped by the tongs thereby creating a safety hazard to the workmen in the vicinity of the stripping or lifting operations. According to the present invention, the opposed side walls of the hot top of the ingot are recessed for receiving the gripping jaws of the tongs of the stripping or other lifting mechanism thereby eliminating the above mentioned disadvantages.

Accordingly, it is the general object of the present invention to provide an improved method of casting ingots and the like whereby the opposed side walls of the hot top of the ingot are recessed for receiving the jaws or tongs of the stripping or lifting mechanism.

It is another object of this invention to recess the opposed side walls of the hot top of ingots and the like for receiving the jaws or tongs of the stripping mechanism so as to aid materially the stripping and handling of the ingots, and to provide a more efficient and effective means of gripping the same, and at the same time, to provide a much safer means of handling the ingots than by the present practice.

Various other objects and advantages of this invention will be more apparent in the course of the following specification and will be particularly pointed out in the appended claims.

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In the accompanying drawings there is shown, for the purpose of illustration, an embodiment which my invention may assume in practice.

In these drawings:

5 Figure 1 is a vertical section through the top of an ingot mold and the hot top thereof showing my invention incorporated therewith;

10 Figure 2 is a perspective view of the top of an ingot and the hot top thereof showing the side wall recessed in accordance with the teachings of the present invention;

15 Figure 3 is a top side view of an ingot partly in section showing the opposed side walls thereof recessed for receiving the jaws or tongs of a crane;

20 Figure 4 is a side view of Figure 3;

25 Figure 5 is a vertical section through one side of the top of an ingot showing the core positioned therein after the casting of the ingot; and

30 Figure 6 is a perspective view of the core of my invention for recessing the opposed side walls of an ingot.

Referring more particularly to the drawings, the improved means for recessing the opposed side walls of an ingot or the like consists preferably, of an elongated wedge-shaped core-like member 2 which is adapted to be cast in the metal of the ingot during the casting thereof. The elongated core-like members 2, as shown in Figure 6 of the drawings, are made of a refractory material and, preferably, are formed or cut from a 2½" x 4½" x 9", standard firebrick. The hot top 3 of the ingot mold is usually lined with a refractory material or firebrick as at 5, and the core-like members 2 are preferably cemented to the inner opposed side walls thereof, preferably by means of suitable cement. Each of the core-like members 2 is arranged substantially horizontal and centrally of the side walls with the thickest part thereof being uppermost, and it is preferable that these core members be positioned on the side walls of the hot top at a point approximately 12" from the top of the hot top so that they will not be displaced from the side walls during the pouring of the molten metal into the ingot mold, as shown in Figure 1 of the drawings.

As the molten metal is poured or cast into the mold and the hot top, it will be seen that the molten metal will flow around each of the core-like members 2 as the metal approaches a level near the top of the hot top and they are embedded in the hot top of the ingot after the pouring operation. After the molten metal has been poured into the metal and the hot top to the desired level, which of course, will be above the core-like members 2, and after the metal has

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solidified therein, the hot top 3 is removed from the top of the mold 4 and from around the ingot hot top 6 of the ingot 7. As the hot top is removed from the mold and the top of the ingot, it will be seen that the core-like members 2 are severed or disconnected from their positions on the inner side walls of the hot top and are left embedded in the hot top of the ingot with one arranged in either side thereof, as shown in Figure 5 of the drawings.

After the hot top has been removed from the mold, each of the core-like members 2 is removed from or broken out of its embedded position in the side wall of the ingot hot top, preferably, by means of chipping the same with a chisel or similar tool. It will be seen that after each of the core-like members 2 is removed from the hot top of the ingot that there is arranged in the opposed side walls thereof, a pair of diametrically opposed elongated recesses or notches 8, so as to provide a shoulder as shown in Figure 2 of the drawings, with which the jaws of the stripping mechanism are adapted to cooperate to lift the ingot. It is preferable that the core-like members 2 be of such length so as to provide a recess in the sides of the mold having a width substantially greater than the width of the gripping ends of the pair of jaws or tongs 9, as shown in Figure 4 of the drawings, so as to provide sufficient clearance to either side of the jaws and so as to permit the entry of same into the recesses with a minimum amount of maneuvering. It will be seen that the opposed jaws 10 of the tongs 9 are then positioned in the opposed recesses 8 against the shoulders therein, in the ingot hot top and that the ingot is moved upwardly and the mold is stripped therefrom, by the stripping or other lifting mechanism (not shown).

As a result of my invention, it will be seen that there is provided recesses in the hot top of the ingot for conveniently and safely handling the same. Also, it will be seen that these recesses are arranged in the hot top of the ingot, which is usually scrapped, thereby eliminating the danger of any surface defects or seams resulting in the surfaces of the slab or bloom into which the ingot is later rolled. In other words, the gouging of the side walls of the ingot by sharp points or bits of the tongs is eliminated, and all the gripping action is confined to the hot top of the ingot due to the recesses formed in the opposed walls thereof, in accordance with the teachings of the present invention.

While I have shown and described one specific embodiment of my invention, it will be understood that this embodiment is merely for the purpose of illustration and description and that various other forms may be devised within the scope of my invention, as defined in the appended claims.

This application is a continuation of my previous application, Serial No. 487,930, filed May 21, 1943, now abandoned.

I claim:

1. In the casting of ingots and the like, the method, which includes the steps of cementing a fired refractory core-like member on each of at least two opposed inner side walls of the hot top of the ingot mold, pouring the molten metal in the mold and hot top to a level so that the metal is disposed around the core-like members and extends a substantial height above them, allowing the metal to cool and solidify, severing the core-like members from the hot top whereby they remain embedded in the ingot, and removing the hot top from the mold.

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2. In the casting of ingots and the like, the method which includes the steps of cementing an elongated fired refractory wedge-shaped core-like member on each of at least two opposed inner side walls of the hot top of the ingot mold so that the core-like member is disposed substantially horizontal with the thickest portion of each of the wedge-shaped core-like members being uppermost, the composition of the core-like members being such as substantially to retain their integrity when submerged in the molten ingot metal, pouring the molten metal in the mold and hot top to a level so that the metal is disposed around the core-like members and extends a substantial height above them, allowing the metal to cool and solidify, severing the core-like members from the hot top whereby they remain embedded in the ingot, and removing the hot top from the mold.

3. In the casting of ingots and the like, the method which includes the steps of cementing a fired refractory core-like member on each of at least two opposed inner side walls of the hot top of the ingot mold, pouring the molten metal in the mold and hot top to a level so that the metal is disposed around the core-like members and extends a substantial height above them, allowing the metal to cool and solidify, severing the core-like members from the hot top whereby they remain embedded in the ingot, removing the hot top from the mold, and finally removing the core-like members from the ingot so as to provide a recess in each of the side walls of at least two opposed sides of the hot top of the ingot for receiving the jaws of a crane or other lifting mechanism.

4. In the casting of ingots and the like, the method which includes the steps of cementing an elongated fired refractory core-like member on each of at least two opposed inner side walls of the hot top of the mold, said core-like members being of such composition as substantially to retain their integrity when submerged in the molten metal of which the ingot is to be made, pouring the molten metal in the mold and hot top to a level so that the metal is disposed around the core-like members and extends a substantial height above them, allowing the metal to cool and solidify, severing the core-like members from the hot top whereby they remain embedded in the ingot, removing the hot top from the mold, and finally removing the core-like members from the ingot so as to provide a recess in each of the side walls of at least two opposed sides of the hot top of the ingot for receiving the jaws of a crane or other lifting mechanism.

5. In the casting of ingots and the like, the method which includes the steps of cementing an elongated fired refractory wedge-shaped core-like member on each of at least two opposed inner side walls of the hot top of the ingot mold so that the core-like member is disposed substantially horizontal with the thickest portion of each of the wedge-shaped core-like members being uppermost, the composition of the core-like members being such as substantially to retain their integrity when submerged in the molten ingot metal, pouring the molten metal in the mold and hot top to a level so that the metal is disposed around the core-like members and extends a substantial height above them, allowing the metal to cool and solidify, severing the core-like members from the hot top whereby they remain embedded in the ingot, removing the hot top from the mold, and finally removing the core-like members from the ingot so as to provide a recess in each of the

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side walls of at least two opposed sides of the hot top of the ingot for receiving the jaws of a crane or other lifting mechanism.

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