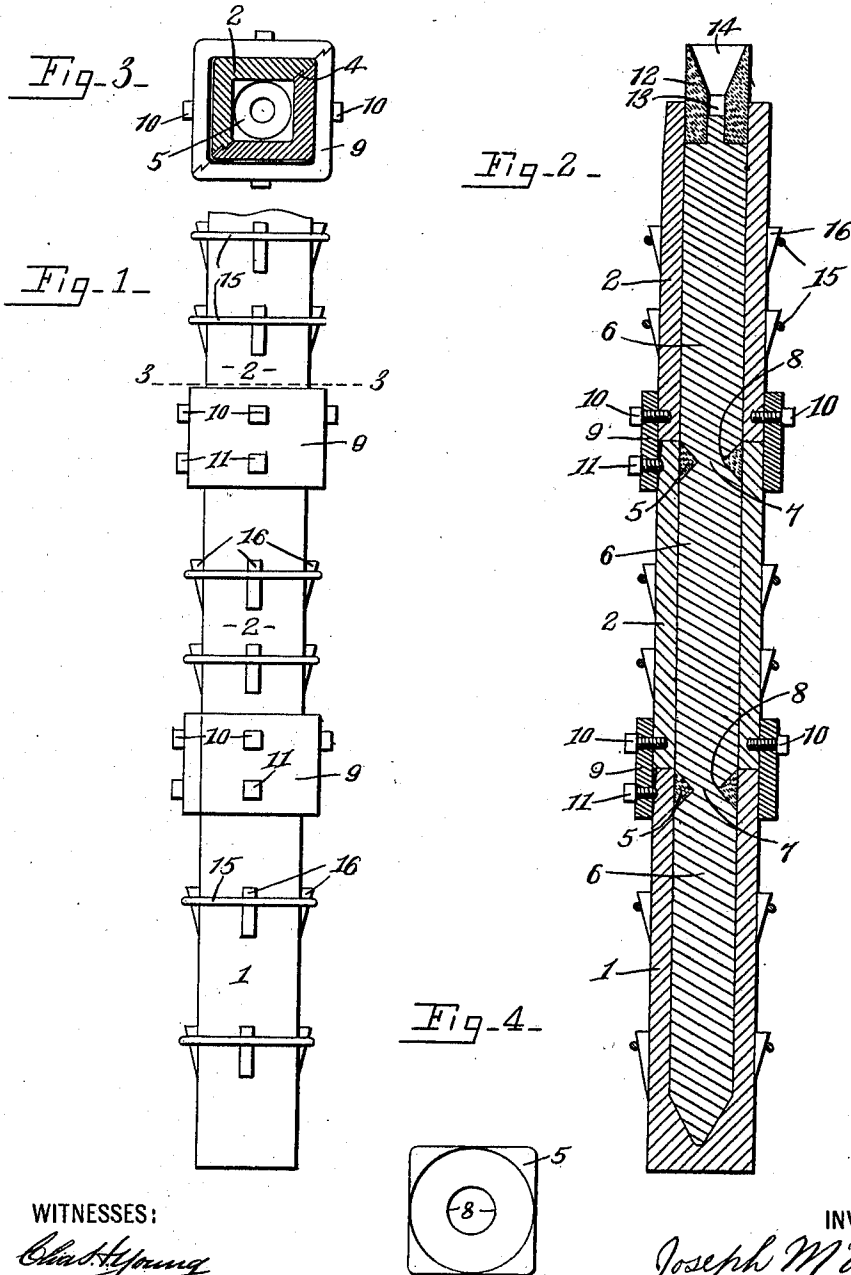


J. M. WARD.
MOLD FOR FORMING CAST STEEL INGOTS.
APPLICATION FILED JULY 2, 1909.

993,004.

Patented May 23, 1911.



WITNESSES:

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JOSEPH M. WARD, OF SOLVAY, NEW YORK.

MOLD FOR FORMING CAST STEEL INGOTS.

993,004.

Specification of Letters Patent.

Patented May 23, 1911.

Application filed July 2, 1909. Serial No. 505,546.

To all whom it may concern:

Be it known that I, JOSEPH M. WARD, of the village of Solvay, in the county of Onondaga and State of New York, have invented a certain new and useful Mold for Forming Cast Steel Ingots, of which the following is a specification.

My invention has for its objects the production of means for casting steel ingots, as hereinafter set forth and claimed, by which no hollows or "pipes" are formed in the ends of the ingots.

In describing this invention reference is had to the accompanying drawing in which like characters designate corresponding parts in all the views.

Figure 1 is an elevation of one form of this means for casting ingots, the crown piece being removed. Fig. 2 is a vertical sectional view of said casting means and ingots therein. Fig. 3 is a sectional view on line "3-3" Fig. 1. Fig. 4 is a plan of one of the internal collars of said casting means.

This means for casting steel ingots comprises, a mold section and an internal member or collar slidable in the end thereof in order to rest upon the surface of the molten metal in the mold so that the metal adheres to the collar while cooling, as well as to the sides of the mold and the formation of pipes is avoided. Usually the mold comprises sections adapted to be successively placed one upon the other in communication with each other and filled, each mold section having an internal collar associated therewith, and slidable therein in order to rest upon the surface of the molten metal in such section, such collar restricting the width of the passage so that the ingots formed in adjoining mold sections are connected by necks which can be easily broken.

1 is the bottom mold section closed at its lower end, and 2 are additional mold sections, shown as arranged in their positions occupied after they have been filled. Each mold section, as here shown, is square in cross-section and is separable into two lengthwise parts or subsections, at 4, along a diagonal plane extending lengthwise thereof, in order to permit the removal of the ingot. Each of the additional mold sections 2 is open from end to end, and each mold section including the bottom section, is provided with an internal collar 5 at one end which lessens or restricts the width of the

mold passage so that an ingot 6 is formed in each section and the ingots in adjoining sections are connected by necks 7 which can be easily broken when the mold is removed. As seen in Fig. 4, the opening of each collar is preferably circular and the upper and lower surfaces of the collar meet in a sharp edge 8 around the circular opening so that the neck of the ingot formed by the collar can be easily broken. The collars 5 are preferably formed of relatively fragile material, as fire clay, so that they will not materially interfere with the breaking of the necks 7, and each collar is usually heated and placed in position after the mold section in which it belongs has been filled. The placing of a collar in the end of each mold section and the successive filling of the mold sections arranged end to end in communication with each other, prevent the formation of hollows or "pipes" in the ingots so that the ingots are uniform throughout. It is obvious that the collars may be dispensed with and the ingots separated from each other in some other manner.

The contiguous mold sections are joined together by collars 9 encircling the abutting ends thereof, each collar 9 being fixed to one of the two sections it connects, and projecting beyond the end thereof to form a bell which receives the end of the contiguous section. Each collar 9 is secured to one section in any suitable manner, as by bolts 10, and may be tightened upon the other section by suitable means as a set screw 11.

Preferably, my mold is provided with a crown piece 12 of earthen ware or firebrick, which facilitates the pouring of the metal into the top section and also prevents the formation of a pipe or hollow in the top section, since the metal is poured until the passage 13 of the crown piece is partly full. Said passage 13 is of less diameter than the opening of the collars 5 and widens outwardly, at 14, at its upper end, forming a funnel.

The subsections of the mold sections are held from transverse separation by any desirable means here shown as bands 15 encircling the mold sections, these bands being tightened upon the sections by wedges 16. After the ingots have cooled, the wedges 16 and bands 15 are removed permitting the mold sections to be separated longitudinally whereupon the ingots may be readily broken apart.

What I claim is:—

1. A mold for casting steel ingots having an internal member associated therewith and slidable therein in position to rest upon the surface of the molten metal in the mold, substantially as and for the purpose described. 5
2. A mold for casting steel ingots having an internal collar associated therewith and slidable therein in position to rest upon the surface of the molten metal in the mold, substantially as and for the purpose specified. 10
3. A mold for casting steel ingots comprising sections adapted to be successively placed one upon the other in communication with each other and filled, each mold section having an internal collar associated therewith and slidable therein in order to rest upon the surface of the molten metal in said section, the collar restricting the width of the passage thereof so that an ingot is formed in each mold section and is connected by a neck to the ingot in the adjoining mold section, substantially as and for the purpose specified. 15
4. A mold for casting steel ingots comprising sections adapted to be successively placed one upon the other in communication with each other and filled, each mold section having an internal collar associated therewith, and slidable therein in order to rest upon the surface of the molten metal in such section, the collar restricting the width of the passage thereof so that an ingot is formed in each mold section and is connected by a neck to the ingot in the adjoining mold section, and the collar having its lower face converging upwardly toward its upper face, substantially as and for the purpose described. 25
5. A mold for casting steel ingots comprising sections adapted to be successively placed one upon the other in communication with each other and filled, each mold section having an internal collar associated therewith, and slidable therein in order to rest upon the surface of the molten metal, the collar restricting the width of the passage thereof so that an ingot is formed in each mold section and is connected by a neck to the ingot in the adjoining mold section, and the collar having its upper and lower faces converging toward the central opening of the collar and meeting forming an edge, substantially as and for the purpose specified. 30
6. A mold for casting steel ingots comprising sections adapted to be successively placed one upon the other in communication with each other and filled, each mold section having an internal collar associated therewith, and slidable therein in order to rest upon the surface of the molten metal in said section, the collar restricting the width of the passage thereof so that an ingot is formed in each mold section and is connected by a neck to the ingot in the adjoining mold section, and the collar being formed of fragile material, substantially as and for the purpose set forth. 35
7. A mold for casting steel ingots comprising sections adapted to be successively placed one upon the other in communication with each other and filled, each mold section having an internal collar associated therewith, and slidable therein in order to rest upon the surface of the molten metal in said section, the collar restricting the width of the passage thereof so that an ingot is formed in each mold section and is connected by a neck to the ingot in the adjoining mold section, and the collar being formed of fire-clay, substantially as and for the purpose described. 40
8. A mold for casting steel ingots comprising a collar slidable in the upper end of the mold in position to rest upon the surface of the molten material in such mold, the collar having a central passage and a funnel-shaped mouth communicating with the passage, substantially as and for the purpose specified. 45
9. A mold for casting steel ingots comprising sections adapted to be successively placed one upon the other in communication with each other and filled, the bottom section being closed at its lower end, and detachable means arranged in each section and adapted to be inserted in the end of each section abutting against the next section, for restricting the width of the passage of the mold section so that each section forms an ingot connected by a neck to the ingot in the next section, substantially as and for the purpose described. 50
10. A mold for casting steel ingots comprising sections adapted to be successively placed one upon the other in communication with each other and filled, the bottom section having its lower end closed, and collars adapted to be inserted in the upper ends of the sections, the collars restricting the width of the passage of the mold so that each section forms an ingot connected by a neck to the ingot in the next section, substantially as and for the purpose set forth. 55
11. A mold for casting steel ingots comprising sections arranged one above the other in communication with each other, each section being separable into lengthwise subsections, and each section being formed with a bell at one end for receiving the abutting end of the next section, substantially as and for the purpose specified. 60
12. A mold for casting steel ingots comprising sections arranged one above the other in communication with each other, each section being separable into two lengthwise subsections, and collars encircling the abutting ends of the sections, substantially as and for the purpose described. 65
13. A mold for casting steel ingots com-

prising sections arranged one above the
other in communication with each other,
each section being separable in lengthwise
subsections, and collars encircling the abut-
5 ting ends of the sections, each collar being
fixed to one sections and projecting beyond
the end thereof forming a bell for receiving
the end of the next section, substantially as
and for the purpose set forth.

In testimony whereof, I have hereunto 10
signed my name in the presence of two at-
testing witnesses, at Syracuse, in the county
of Onondaga, in the State of New York, this
25th day of May, 1909.

JOSEPH M. WARD.

Witnesses:

H. D. GOODELL, Jr.,

S. DAVIS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
