C. W. HAWTHORNE.

INGOT SKID FOR INGOT HEATING FURNACES.

APPLICATION FILED JUNE 19, 1919.

1,361,254. **Patented Dec. 7, 1920.**

Fig. 1.

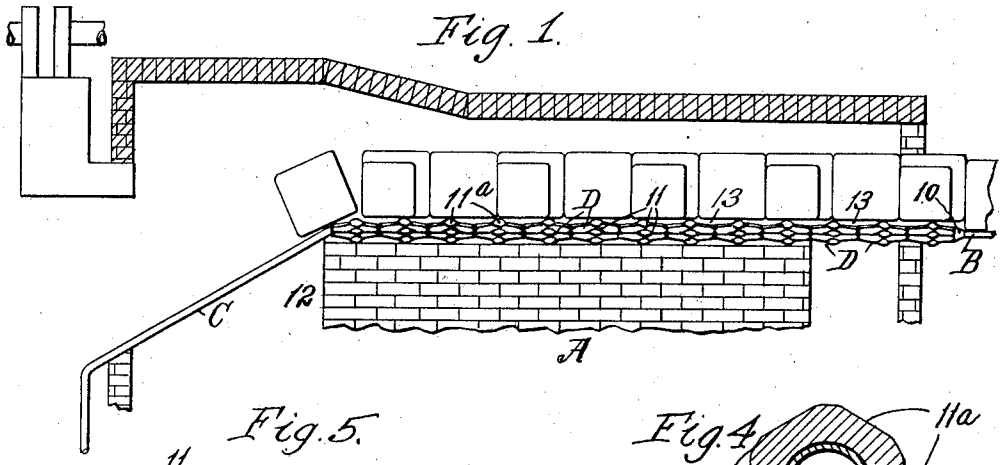


Fig. 5.

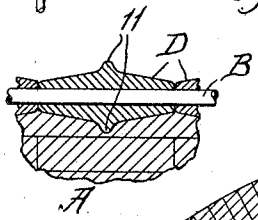


Fig. 4

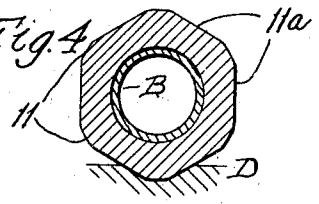


Fig. 2.

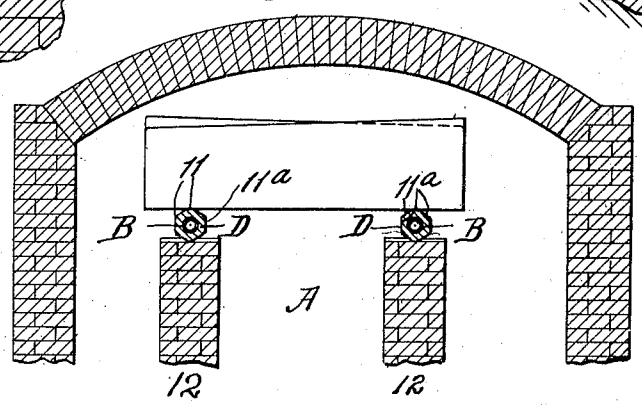
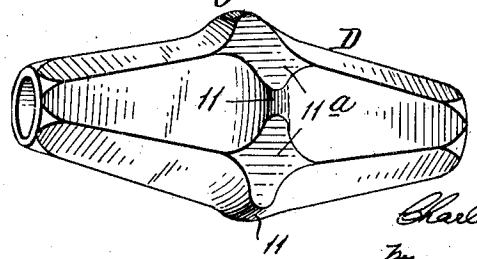


Fig. 3.



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UNITED STATES PATENT OFFICE.

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INGOT-SKID FOR INGOT-HEATING FURNACES.

1,361,254. Specification of Letters Patent. Patented Dec. 7, 1920.

Application filed June 19, 1919. Serial No. 305,281.

To all whom it may concern:

Be it known that I, CHARLES W. HAWTHORNE, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Ingot-Skids for Ingot-Heating Furnaces, of which the following is a specification.

This invention relates to improvements in ingot skids or supports for ingot-heating furnaces.

In heating steel ingots preparatory to rolling them into bars or other shapes, the ingots are heated in a heating furnace, the ingots resting on horizontal skid rails, pipes or supports which extend through the furnace and on which the ingots slide as they are shoved through the furnace a step at a time as each new ingot is introduced. These skids or supports are water-cooled to protect them from injury from the heat of the furnace, and on account of their lower temperature, they chill the ingots in spots in the vicinity of the points of contact of the ingots with the skids or pipes. These cool spots seriously interfere with the proper rolling of the ingots, since different portions of the ingots are of different temperature and the article rolled from the ingots will not be of uniform character throughout.

The primary object of this invention is to product an ingot support or skid for ingot heating furnaces which will practically prevent such cool or unheated spots in the ingots.

Other objects of the invention are to provide ingot supporting members or sleeves which can be readily applied to the water-cooled skid pipes of the furnaces and will provide spaced, restricted supporting points or portions for the ingots which will permit of access of the heating flame to practically all portions of the ingots; also to form the ingot supporting sleeves or members so that each one has a plurality of restricted supporting points for the ingot and is adapted to be turned to different positions on the skid pipes for presenting new supporting portions for the ingots; and also to improve the construction of the ingot skids or supports of ingot heating furnaces in the other respects hereinafter described and set forth in the claims.

In the accompanying drawings:

Figure 1 is a fragmentary longitudinal section of an ingot heating furnace provided with ingot skids or supports embodying the invention.

Fig. 2 is a transverse section thereof.

Fig. 3 is a perspective view of one of the skid sleeves or members.

Fig. 4 is a cross-section of one of the sleeves or members.

Fig. 5 is a fragmentary longitudinal section of the skid.

A represents the furnace which may be of the usual or any suitable construction, and B represents two parallel spaced skid pipes which extend through the furnace from front to rear thereof and are provided with the usual downwardly inclined rear portions C on which the ingots are adapted to slide out of the furnace. These pipes, as usual, are connected with suitable means so that water is caused to flow through the pipes to protect them from burning or injury by the heat of the furnace.

The ingot skids or supports are preferably constructed as follows:

On each of the skid pipes B is threaded or arranged a series of hollow ingot supporting members or sleeves D which preferably are arranged in contact, end to end, and extend throughout the horizontal portion of the skid from end to end of the heating portion of the furnace. As shown, the sleeves or members D are retained in place on the skid pipe between the front end of the inclined rear portion of the pipe and a collar or stop 10 of any suitable sort on the pipe at the front end of the series or sleeves or members. Preferably, each of the supporting sleeves or members tapers or decreases in diameter from its middle portion to its opposite ends and is of polygonal external shape in cross-section and provided at its large middle portion with a circumferential series of supporting faces or portions 11 of relatively small area. When the supporting sleeves or members are threaded on the skid pipes B they rest at their lower sides upon the walls or supports 12 for the skid pipes, and the restricted supporting portions 11 form a series of spaced, restricted, raised supports or projections on which the ingots are

adapted to rest and slide as they are shoved through the furnace. The restricted supporting portions of each sleeve or member are disposed at intervals around the sleeve or member and separated by intervening flat or depressed parts 11ª and the tapering ends of the sleeves form depressions between the supporting portions of adjacent sleeves D on each skid pipe, so that when the ingots rest on the restricted supports, spaces 13 for the passage of flame or heat are left beneath the ingots between the supporting portions 11 of adjacent sleeves and around each supporting portion on each sleeve. The flame or heat therefore has ready access to the under surfaces of the ingots all around each of the supporting portions or faces 11. The flame, therefore, has direct contact with the ingots except at the very small portions thereof immediately in contact with the restricted supports and the ingots can be heated so nearly uniformly throughout as to practically eliminate the cool spots caused by the greater contact of the ingots with the skid pipes or supports heretofore used.

The supporting sleeves or members D are preferably made of such length that the distance from center to center of the supporting portions 11 of adjacent sleeves is less than or differs from the distance from center to center of adjacent ingots. By this arrangement each time the ingots are advanced a step in the furnace by the introduction of a new ingot, new portions of the ingots will rest on the restricted supporting portions of the sleeves, and in this way a portion of an ingot which is in contact with the restricted supports in one portion of the furnace will be out of contact with such supports and accessible to the flame heat in other portions of the furnace, thus, resulting in a more complete and uniform heating of the ingots throughout.

The restricted supports 11 of the sleeves or members D wear down more or less in use by contact with the ingots sliding over the same, and if the supports become thus worn down to an objectionable degree the supporting sleeves or members can be readily turned a part revolution on the skid pipe to present a new set of supporting faces or portions uppermost for the ingots to rest upon. Since each of the supporting sleeves or members has several of the restricted supporting portions extending around its circumference, the sleeve or member can be turned to as many different positions as it has supporting faces or portions and therefore the supporting sleeves or members are adapted for use for a long period of time before they have to be renewed. Since the sleeves are of polygonal shape they have flat faces lowermost to rest on in each of their different positions, and by providing the wall 12 with seat blocks or bricks conforming to the undersides of the sleeves D, as shown in Fig. 5, the wall is not apt to be split or broken by the pressure of the sleeves due to the weight of the ingots.

I claim as my invention:

1. An ingot skid for ingot-heating furnaces comprising an elongated support extending lengthwise in the furnace and along which the ingots slide through the furnace lengthwise of the support, said skid having a series of alternate restricted raised portions and depressed portions, said depressed portions being of a length less than the width of the ingot and forming spaces beneath ingots resting on said raised portions.

2. An ingot skid for ingot-heating furnaces comprising an elongated support extending lengthwise in the furnace and along which the ingots slide through the furnace lengthwise of the support, said skid having a series of alternate restricted raised portions and depressed portions, said raised portions being spaced apart a distance different from and not greater than the distance between centers of adjacent ingots, and said depressed portions forming spaces beneath ingots resting on said raised portions.

3. An ingot skid for ingot-heating furnaces comprising an elongated support extending lengthwise in the furnace and along which the ingots slide through the furnace lengthwise of the support, said skid having on each of a plurality of sides thereof alternate restricted raised portions and depressed portions, said depressed portions being of a length less than the width of the ingot and forming spaces beneath ingots resting on said raised portions, and said skid being rotatable to place different sides thereof uppermost.

4. An ingot skid for ingot heating furnaces comprising a series of separate members arranged end to end and forming an elongated support along which the ingots slide, said members having portions of different diameters forming alternate raised and depressed portions on the skid.

5. An ingot skid or support for ingot-heating furnaces, comprising a pipe, and supporting sleeves surrounding said pipe and forming a series of alternate raised and depressed portions, said depressed portions forming spaces beneath ingots resting on said raised portions.

6. An ingot skid or support for ingot-heating furnaces, comprising a pipe, and supporting sleeves arranged end to end on said pipe, said sleeves having portions of different diameter forming a series of alternate raised and depressed portions, said depressed portions forming spaces beneath ingots resting on said raised portions.

7. An ingot skid or support for ingot-heating furnaces, comprising a pipe, and

supporting sleeves surrounding said pipe, said sleeves being of polygonal cross-section and having portions of different diameters forming a series of alternate raised and depressed portions, said depressed portions forming spaces beneath ingots resting on said raised portions.

8. An ingot skid or support for ingot-heating furnaces, comprising a pipe, and supporting sleeves surrounding said pipe, said sleeves being of polygonal cross-section and having portions of different diameters forming a series of alternate raised and depressed portions, said depressed portions forming spaces beneath ingots resting on said raised portions, and said sleeves being rotatable on said pipe to place different sides of the sleeves uppermost.

9. An ingot skid or support for ingot-heating furnaces, comprising a pipe, and supporting sleeves arranged end to end on said pipe, each of said sleeves being of largest diameter at its middle portion and tapering from said middle portion toward its opposite ends.

Witness my hand this 12th day of June, 1919.

CHARLES W. HAWTHORNE.

Witnesses:
WILLIAM D. STOWE,
BERTHA KERR.