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ELECTRIC-ARC FURNACE EQUIPPED WITH PUDDLING COIL

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FIG. 1

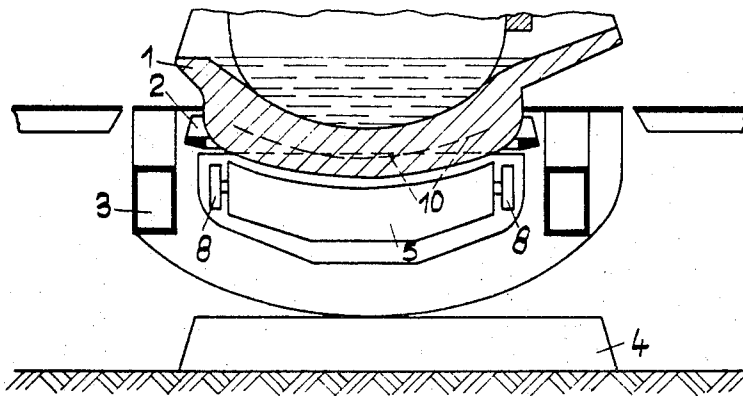
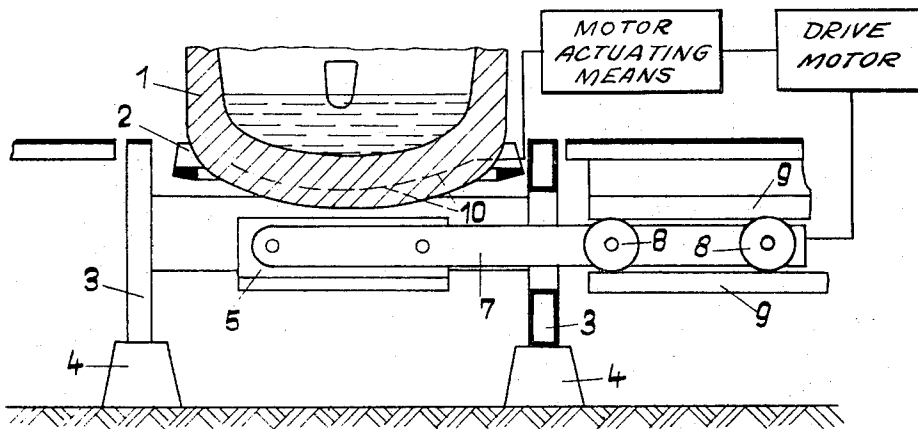


FIG. 2



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## ELECTRIC-ARC FURNACE EQUIPPED WITH PUDDLING COIL

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3 Claims. (Cl. 13—10)

### ABSTRACT OF THE DISCLOSURE

An electric arc furnace comprising a furnace vessel and puddling coil operatively disposed below the furnace vessel. Means are provided for removing the puddling coil from under the furnace vessel and are arranged away from the underneath of the furnace vessel and include rails extending away therefrom and running gear means movable on the rails and operatively connected to the puddling coil for moving the latter away from underneath the furnace vessel and a drive motor means responsive to an impending breakthrough in the furnace vessel for actuating the running gear means, removing the puddling coil from the danger zone.

The present invention relates to an electric-arc furnace equipped with a puddling coil.

In order to agitate the melt in an electric-arc furnace and to attain thereby improved metallurgical results, such as shorter charging periods and other advantages, inductive stirring devices, so-called puddling coils are used, which are arranged directly below the bottom of the furnace vessel. These coils are attached directly to the vessel in nonrotatable furnace vessels, while the coils are built into the tipping bridge structure in rotatable furnace vessels. In the case of a furnace breakthrough which, as practical experiences have demonstrated, can never be excluded with safety, the puddling coil disposed underneath the furnace bottom suffers, and is even destroyed by the liquid metal under unfavorable circumstances.

It is one object of the present invention to provide an electric-arc furnace which eliminates the danger of damaging the coil, in case of a breakthrough, completely or at least to a substantial degree.

It is another object of the present invention to provide an electric-arc furnace, wherein the puddling coil is designed to be movable, for example, rollable or tiltable, such that it can be rapidly removed from the space underneath the hearth, if necessary.

With this and other objects in view which will become apparent in the following detailed description, the present invention will be clearly understood in connection with the accompanying drawing, in which

FIGURE 1 is a vertical section of an electric-arc furnace with a puddling coil, taken in the direction of tipping; and

FIG. 2 is a similar section of the furnace shown in FIG. 1 taken in a direction perpendicular to the tipping direction.

Referring now to the drawing, a furnace vessel 1 rests with a rotating ring 2 and with rotating rolls (not shown) on a tipping bridge 3 which, in turn, is supported on a

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rolling track 4. A puddling coil 5 is connected with a running gear 8 by means of beams 7, the running gear 8 being rollable between and along rails 9.

The running gear 8 together with the puddling coil 5 is rolled away, in case of an impending furnace breakthrough, by means of a conventional driving device (not shown), crosswise of the tipping direction, and the puddling coil 5 is removed from the immediate furnace range. So as to insure the timely removal of the puddling coil 5, temperature sensing elements 10, such as thermo-elements, are built in. Upon reaching a predetermined critical temperature at a spot of the furnace bottom, the temperature sensing elements can automatically initiate the removal of the puddling coil 5 from the space under the hearth.

The present invention is advantageously applicable to electric-arc melting furnace having a furnace vessel which is capable of tipping, and/or rotating, and/or rolling, wherein the devices required for tipping and/or rotating, and/or rolling are disposed above the level of the liquid content in the furnace vessel.

Such furnaces can be designed such that the furnace vessel is provided on its outer periphery, above the liquid content of the furnace vessel, with a rotating ring which is mounted on supporting rollers, which are suspended from a supporting ring equipped with tipping pivots. The supporting rollers can be arranged on levers, which are swingably secured to the supporting ring, so as to allow the furnace vessel to be lowered and to be exchanged.

While I have disclosed one embodiment of the present invention with certain useful variants thereof, it is to be understood that this embodiment is given by example only and not in a limiting sense, the scope of the present invention being determined by the objects and the claims.

I claim:

1. An electric-arc furnace, comprising:

a furnace vessel defining a space therebelow,  
a puddling coil disposed below said furnace vessel,  
means for operatively connecting said puddling coil to said furnace vessel,  
means for removing said puddling coil from said space underneath said furnace vessel,  
said means disposed away from said space beneath, said furnace vessel and comprising:

rails extending away from said furnace vessel,  
running gear means movable on said rails and operatively connected to said puddling coil for moving the latter jointly with said running gear means when said running gear means is moved, and

drive motor means for moving said running gear means on said rails in a direction away from from said furnace vessel and adapted to be actuated during an impending breakthrough in the furnace vessel.

2. An electric-arc furnace, comprising:

a furnace vessel defining a space therebelow,  
a puddling coil disposed below said furnace vessel,  
means for operatively connecting said puddling coil to said furnace vessel,  
carriage means for removing said puddling coil from said space underneath said furnace vessel,  
temperature sensing means mounted in the bottom of

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said furnace vessel for sensing the temperature in said bottom of said furnace vessel, and means operatively connected to said sensing means for actuating said drive motor means in response to a predetermined temperature of said sensing means, thereby causing an automatic removal of said puddling coil away from said space underneath said furnace vessel.

3. An electric-arc furnace, comprising:  
 a furnace vessel defining a space therebelow,  
 a puddling coil disposed below said furnace vessel,  
 means for operatively connecting said puddling coil to said furnace vessel,  
 carriage means for removing said puddling coil from said space underneath said furnace vessel,

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means for performing at least one of tipping, rotating, and displacing movements of said furnace vessel, and said last-named means being disposed above the level of the liquid content in said furnace vessel.

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