

UNITED STATES PATENT OFFICE

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TURNING FURNACE FOR METALLURGICAL PURPOSES

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2 Claims. (Cl. 263—32)

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The present invention relates to metallurgical furnaces and more particularly to turning furnaces which rotate about a horizontal axis and which are provided with a plurality of furnace chambers. The molten charge passes in a reciprocating manner from one furnace chamber to another for the purpose of thoroughly mixing the molten charge.

An object of the invention is to provide a furnace of this character with at least two adjacent steps over which the molten metal may flow from one furnace chamber to another with a turbulent action produced by flowing over these steps, the steps being formed by spaced vertical central interior end wall surfaces of the furnace chambers or hearths, together with a lateral surface of each chamber which extends beyond its own central end wall surface to the end wall surface of the adjacent chamber.

A further object of the invention is to provide a turning furnace of this type comprising a pair of horizontally elongated furnace chambers with parallel longitudinal axes disposed for rotation about a common horizontal axis passing through the interiors of both chambers so that the turning axis passes through the outer end walls of the furnace, but not through the central end wall surfaces.

Other and further objects will become apparent upon reading the following specification together with the accompanying drawing forming a part hereof.

Referring to the drawing:

Fig. 1 is a diagrammatic representation of an embodiment of the invention, viewed in longitudinal sectional elevation.

Fig. 2 is a longitudinal sectional view in elevation of an embodiment of the invention, taken along the line 2—2 of Figure 3.

Fig. 3 is a transverse sectional view in elevation, taken along the line 3—3 of Figure 2.

Referring to Figure 1, a furnace is diagrammatically represented which comprises a pair of horizontally elongated furnace chambers 1 and 2. Steps are provided which have corners 4. The longitudinal axis 13 of chamber 1 is parallel to the longitudinal axis 14 of chamber 2 and these parallel axes 13 and 14 are diametrically disposed on opposite sides of a common horizontal turning axis 12 which passes through the interiors of the chambers 1 and 2. The longitudinal axes 13 and 14 are spaced at equal distances from the common turning axis 12.

Referring to Figures 2 and 3, the furnace is mounted for rotation about the common axis 12,

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being supported by two longitudinally spaced circumferential ring members 8 which rest upon rollers 9. One or more of the rollers 9 may be driven in any desired manner, as by a motor (not shown) to provide for continuous rotation of the furnace. The two furnace chambers 1 and 2 of circular cross-sectional configuration are shown supported by spokes 15 which extend inwardly from the ring members 8. The circular chambers 1 and 2 are each provided with a lining 3 of suitable refractory material.

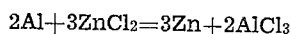
The outer end wall 16 of chamber 1 is provided with an aperture 17 concentric with the common rotational axis 12 and a burner 10 is disposed adjacent to the aperture 17 for heating the furnace. The outer end wall 18 of chamber 2 is similarly apertured at 11, providing a vent for waste gases and an opening for charging the furnace and for removing unmelted materials therefrom.

The chambers 1 and 2 are provided with central interior wall surfaces 19 and 20 which lie in spaced parallel planes 21 and 22 respectively, perpendicular to the common turning axis 12 and located in proximity to the middle thereof.

The chamber 1 is provided with a lateral wall surface 23 which extends beyond its own interior end wall surface 19 to the interior wall surface 20 of the other chamber 2 where it forms a step having a corner 4. Chamber 2 is similarly provided with a lateral wall surface 24 which extends beyond its own interior end wall surface 20 to the interior end wall surface 19 of the other chamber 1 where it forms another step having a corner 4'.

In operation, the furnace is charged with material to be melted and is continuously rotated, being fired by the burner 10. The molten metal flows alternately over the corner 4 and the corner 4', thus passing from chamber 1 into chamber 2 and from chamber 2 back into chamber 1, respectively. In so flowing a waterfall effect is produced which causes turbulence and a thorough mixing of the molten metal.

The furnace is shown in the drawing as being charged with molten salt 6 floating on top of molten metal 5 for carrying out a refining process such as that for the removal of aluminum from a zinc alloy by means of zinc chloride according to the equation



In this process it is necessary to mix the molten metal and salt together very intimately. The turbulence produced by the waterfall action of the step corners 4 and 4' greatly enhances the

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mixing action as the molten charge flows back and forth between the furnace chambers 1 and 2.

Having thus described a specific embodiment of my invention for purposes of illustration, what I desire to secure by Letters Patent is the invention as defined in the appended claims.

I claim:

1. A turning furnace of the class described, comprising: a pair of horizontally elongated furnace chambers having substantially parallel longitudinal axes, said chambers being disposed for rotation about a common generally horizontal axis passing through the interiors of both of said chambers, said parallel axes being diametrically disposed on opposite sides of said common axis and spaced at substantially equal distances therefrom, said chambers having central interior end wall surfaces lying in spaced parallel planes substantially perpendicular to said common axis and in proximity to the middle thereof, each chamber having a lateral surface extending beyond its own central end wall surface to the end wall surface of the other chamber.

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2. A turning furnace according to claim 1 in which each of said chambers is of circular cross-sectional configuration.

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