Feb. 20, 1923. 1,445,860.

J. S. TUREK.

APPARATUS FOR TREATING METALS.

FILED MAY 13, 1921.

Fig. 1.

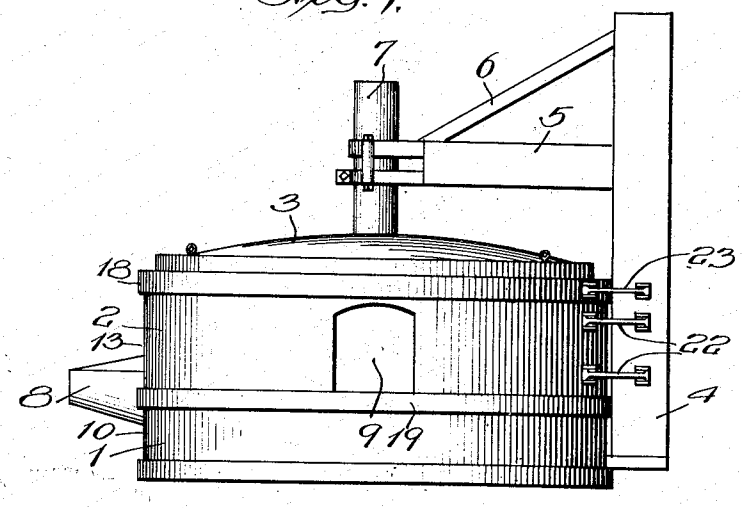


Fig. 2.

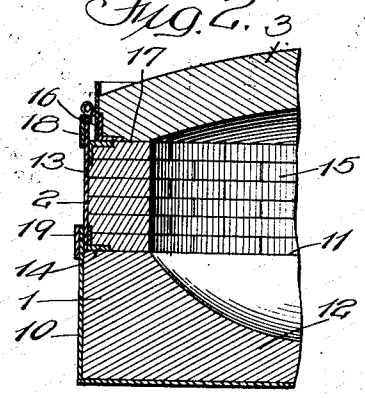


Fig. 3.

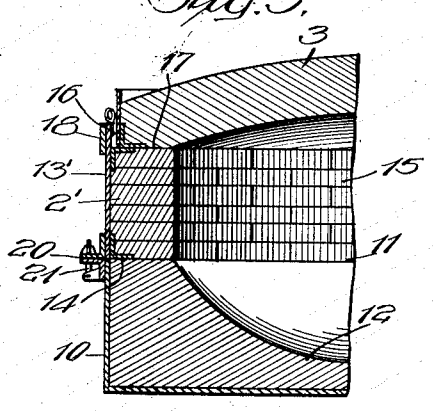
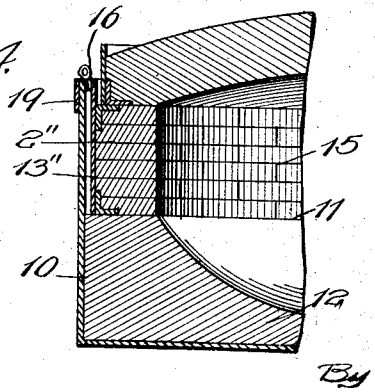


Fig. 4.



Witnesses:
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Patented Feb. 20, 1923. 1,445,860

UNITED STATES PATENT OFFICE.

JOSEPH S. TUREK, OF CICERO, ILLINOIS.

APPARATUS FOR TREATING METALS.

Application filed May 13, 1921. Serial No. 469,210.

To all whom it may concern:

Be it known that I, JOSEPH S. TUREK, a citizen of the United States, residing at Cicero, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in an Apparatus for Treating Metals, of which the following is a description.

My invention relates to improvements in an apparatus for treating metals, and more particularly to an electric furnace of the tilting type, as used for refining, melting or heat-treating metals, said furnace having either an acid, basic, neutral or combination lining and bottom. As ordinarily constructed, the lining of such a furnace is attacked and quickly deteriorated by the intense heat generated therein, and must be periodically replaced or renewed. The greatest amount of deterioration or decay of the lining occurs above the slag line of the furnace, the slag getting on said lining and being extremely destructive thereto, due to the various impurities in the slag. To repair the lining, the entire furnace must be shut down until it is cool enough to work on. It is needless to point out that this shut down is very expensive, due to the time lost and heat units wasted. My invention provides a furnace as above described which is sectional, that is, is composed of a bottom, top and a removable intermediate portion, so that whenever the lining of said intermediate portion need be renewed or replaced, it may be removed from the furnace as an entirety and repaired and replaced, or else an auxiliary replacement part may be substituted therefor. This intermediate portion of the furnace may be replaced with a minimum loss of time and heat units and at a great convenience to the workmen repairing the furnace. Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosure herein given.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like reference characters indicate like or corresponding parts,

Fig. 1 is an elevation of my improved form of furnace;

Fig. 2 is a vertical sectional view of a portion thereof;

Fig. 3 is a sectional view similar to that shown in Fig. 2, illustrating a modification thereof; and

Fig. 4 is a vertical section similar to that shown in Fig. 2, illustrating another modification thereof.

Referring to the drawings, wherein I have shown a preferred form of my invention, 1. 2 and 3 indicate the bottom, intermediate and top portions of a furnace, said furnace being preferably arranged so as to tilt in order to pour, by any preferred tilting means, (said tilting mechanism not shown). At the rear of the furnace and preferably secured to the bottom portion 1 thereof in any suitable manner, is a tower 4, said tower being preferably vertically arranged and having cross-arms 5 and 6 for holding the electrodes 7 at their outer ends.

A pouring spout 8 is usually provided in the furnace through which the metal is poured when the furnace is tilted. Side doors 9 are suitably arranged in the side wall of the furnace for the purpose of inspection or the like. The bottom portion of the furnace comprises an outer shell 10, preferably of metal, and extending to or above the slag line 11 of the furnace. A lining 12 of the desired thickness and of any suitable material is positioned within the bottom shell and extends to subtantially the slag line 11, or where desired.

In the modifications shown, I have indicated the intermediate furnace portion 2, 2′ and 2″ as comprising an outer lining or shell 13, 13′ and 13″, respectively, said shells having angle-irons 14 at the top and bottom portions thereof and extending peripherally thereabout on the interior thereof. A shell lining 15 of any suitable refractory material is held in place between said angle-irons within said intermediate shells, the peripheral wall of said shells being extended as at 16 so as to project beyond the upper wall of the lining and forming a seat for the peripheral edge 17 of the top or roof 3 of the furnace. If desired, a reinforcing band 18 may encircle said intermediate portion at its upper end, and as shown in Figs. 2 and 4, reinforcing bands 19 may be provided at the upper end of the shell 10.

In the form shown in Fig. 3 the meeting edges of the intermediate and bottom shells

are provided with cooperating angle-irons 20, said intermediate portion being removably held in place thereon by pivoted bolts 21.

In the modification shown in Fig. 4, the peripheral wall of the bottom shell 10 is extended so as to entirely enclose the intermediate portion 13''.

In all of said modifications, the lateral movement of the intermediate portion relative to the bottom portion is prevented by locking means, or by a projecting encircling wall. Anchor rods 22 and 23 are preferably provided to secure the intermediate and roof portions of the furnace to the tower so that the furnace may be tilted as a whole or in its entirety without displacing any of the assembled parts. While I have mentioned and shown the juncture of the bottom and intermediate portion or adjacent the slag line, this may be as desired or preferred, for example, it might be below or above this point. Generally it would not be below.

In order to remove the intermediate shell portion, the roof is lifted by suitable means, and then the intermediate shell portion is lifted over the top edge of the bottom portion and out of the way thereof, said lifting being accomplished by any desired or well known means, such as hooks or the like. While I have particularly mentioned the intermediate portion as replaceable, obviously this construction allows for renewal or replacement of the bottom, intermediate or top section at will.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence I do not wish to be understood as limiting myself to the exact form, arrangement, construction and combination of parts herein shown and described, or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:

1. In a furnace of the class described, a roof, a bottom shell portion having a lining therein, and having its peripheral wall extending above said lining, and an intermediate body portion having a lining therein and cooperating with and extending upwardly from said peripheral wall of the bottom portion, said intermediate body portion and its lining being arranged so as to be detachably removed as an entirety off said bottom member.

2. In a furnace of the class described, a top, a bottom having an outer shell and a lining, and an intermediate peripheral wall portion having an outer shell and lining, said intermediate portion and lining being removably held in position as an entirety between said top and bottom, the outer shell of said intermediate portion projecting upwardly beyond its lining so as to form a seat for said top.

3. A furnace of the kind described comprising a top, a bottom and an intermediate portion removably secured therebetween, a support for said furnace, and fastening means for detachably securing said top and intermediate portions to said support.

4. An electric furnace of the kind described comprising a roof, a bottom and an intermediate shell portion therebetween, said intermediate shell portion being removably secured in place, a support for said parts, and anchor means detachably connecting said top and intermediate portions to said support.

In testimony whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

JOSEPH S. TUREK.

Witnesses:
ROY W. HILL,
BERTHA HARTMANN.