

U. WEDGE.
FURNACE.

APPLICATION FILED MAY 7, 1909.

939,934.

Patented Nov. 9, 1909.

Fig. 1.

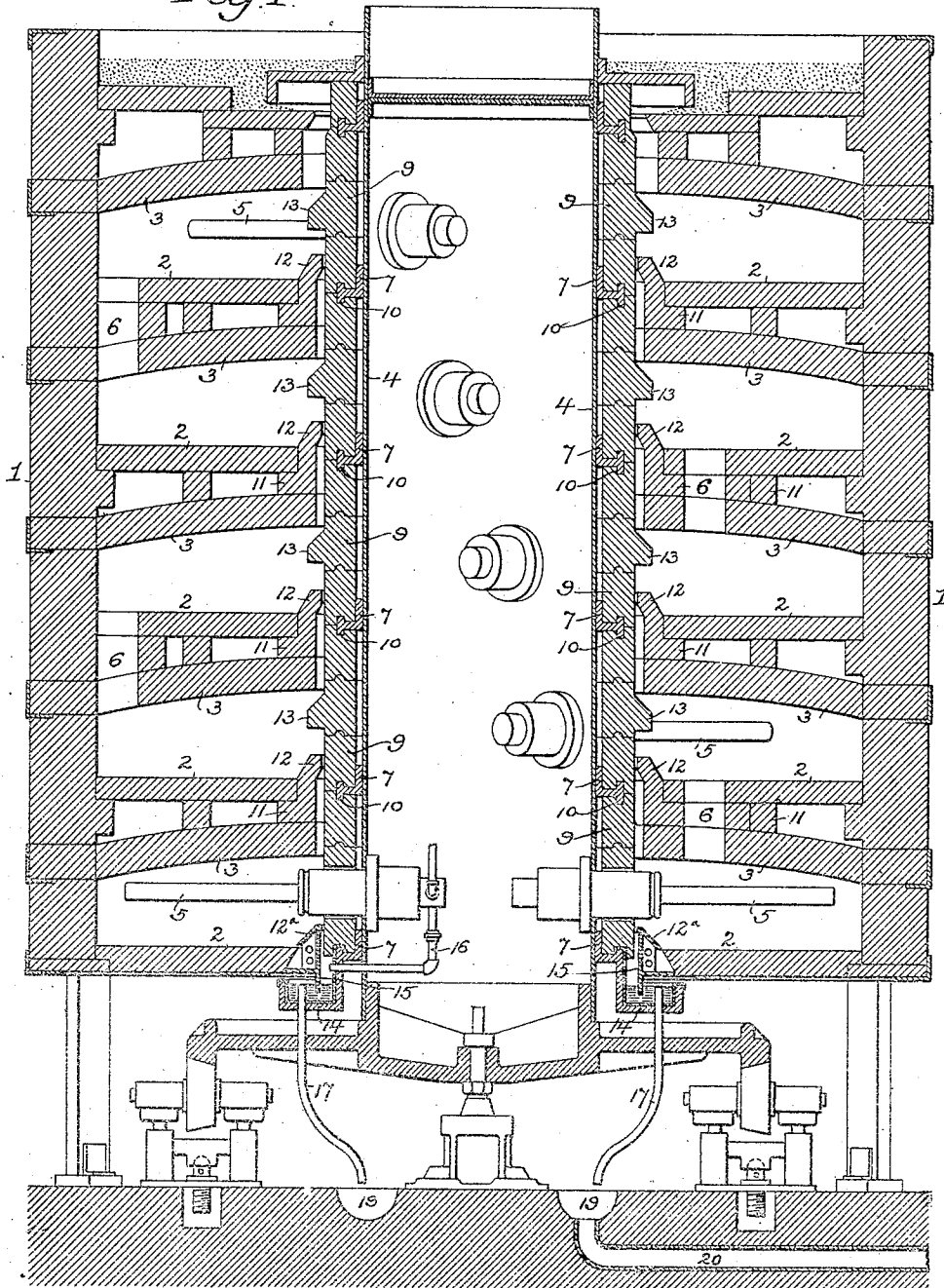
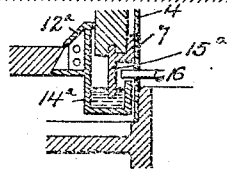


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

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FURNACE.

939,934.

Specification of Letters Patent.

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Original application filed February 24, 1909, Serial No. 479,736. Divided and this application filed May 7, 1909. Serial No. 495,203.

To all whom it may concern:

Be it known that I, UTLEY WEDGE, a citizen of the United States, residing in Ardmore, Pennsylvania, have invented certain improvements in Furnaces, (the same being a division of my application, Serial No. 479,736, filed February 24, 1909,) of which the following is a specification.

My invention relates to that class of roasting or like furnaces which have superposed hearths, and a central shaft provided with arms carrying stirring and feeding blades or rabblies disposed in the different working chambers, the ore or other material to be treated (hereinafter, for convenience referred to as "ore") being fed into the furnace at the top and, after being properly treated in its passage through the furnace, being discharged from the bottom.

The objects of my invention are to provide for the proper support of the refractory protecting blocks on the central shaft of the furnace, to prevent the passage of untreated or only partially treated ore from an upper to a lower working chamber, and to prevent access of air to the furnace around the lower end of the shaft. These objects I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a view, partly in vertical transverse section and partly in elevation, of a furnace constructed in accordance with my invention, and Fig. 2 is a sectional view illustrating a modification of one of the features of the invention.

In the drawings, 1 represents the outer wall of the furnace, 2 the hearths, and 3 the arches of the successive working chambers and 4 the central hollow shaft carrying the radial arms 5 which project into the working chambers and are intended to carry stirring and feeding blades or rabblies, not shown in the drawing, whereby the material delivered into the upper working chamber is caused to travel therefrom through the successive chambers below, the various chambers being in communication with one another through passages 6.

Secured to the outside of the shaft 4 are angular bars 7 upon which are supported the refractory blocks 9 whereby said shaft is protected from the heat of the furnace, the bars 7 having ribs or flanges 10 upon their horizontal members which ribs or flanges are

contained in grooves or recesses in adjoining faces of the blocks 9, as shown in Fig. 1, so that while said blocks are both supported vertically upon and confined radially to the shaft 4, no part of any of the bars 7 is exposed directly to the heat of the furnace, the burning out of said bars being thereby prevented and the necessity for their relatively frequent renewal being overcome.

The tiles 11 which support the inner portions of the hearths 2 of the respective working chambers of the furnace are provided with vertical flanges 12 which project above the level of the hearth and thereby tend to prevent the ore on any hearth of the furnace from gaining access to the annular space between the tiles 11 and the protecting blocks 9 which surround the rotating shaft 4, and certain of the latter blocks have outwardly projecting beveled flanges 13, whereby, if any portion of the ore upon either hearth of the furnace does find its way to the space between the tiles 11 and the protecting blocks 9 it will, after falling through said space, be deflected by the beveled flange 13 into the working chamber below, that from which it has escaped and will therefore be prevented from finding its way into the final or finishing chamber of the furnace, consequently there will be no admixture of raw or partially treated ore with the finished ore in said final chamber.

In order to prevent access of air to the working chambers around the lower end of the central shaft of the furnace said shaft is provided with an annular trough 14 preferably formed in one piece with the lowermost angle bar 7 which supports the refractory casing of the shaft and into this trough dips a depending flange 15 on the metallic deflector 12^a with which the inner portion of the lowermost hearth 2 of the furnace is provided.

The trough 14 is normally filled with water up to a level above the bottom of the flange 15 so as to seal said flange and prevent the flow of air inwardly past the same, water being supplied to the trough in any available way, as, for instance, by the discharge pipe 16 which conveys the cooling water from the stirrer arm 5 in the lowermost chamber of the furnace, the water, when it has reached the proper level in the trough 14, escaping therefrom through one or more overflow pipes 17 through which it

is discharged into an annular gutter 19, communicating with a sewer pipe 20.

As an alternative construction to that just described, a trough 14^a may form part of the deflector 12^a and may receive a flange 15^a on the shaft 4, as shown in Fig. 2.

I claim:

1. The combination of the central, hollow rotating shaft of a furnace, refractory blocks constituting a protecting casing for said shaft, and bars on the shaft for supporting said blocks, the horizontal portions of said bars having edge flanges contained in grooves in the blocks and protected by said blocks from the direct action of the heat.

2. The combination of the rotating shaft of a furnace, the superposed hearths and supporting tiles for the inner portions of said hearths, said tiles having flanges projecting above the level of the hearth.

3. The combination of the fixed structure of a furnace having superposed working chambers, with a central rotating shaft having incasing blocks with beveled flanges for deflecting outwardly any material which may fall from one working chamber to another around the shaft casing.

4. The combination of the fixed structure and the rotating central shaft of a furnace with an annular trough upon the lower portion of one of said members and a flange upon the lower portion of the other mem-

ber, said flange projecting into said trough for sealing purposes, and the member which is carried by the fixed structure having in the lowermost chamber of the furnace a deflecting flange surrounding the shaft.

5. The combination of the rotating shaft of a furnace, refractory blocks constituting a casing for said shaft, and a supporting bar for said blocks having formed integral therewith one of the members of a seal for preventing access of air to the furnace around the lower end of the shaft.

6. The combination of the central rotating shaft of a furnace, having projecting water-cooled stirring arms, a sealing trough at the lower end of the furnace, and a connection between said sealing trough and one of the stirrer arms, whereby the waste water is discharged from the latter into the trough.

7. The combination of the central rotating shaft of a furnace, having a sealing trough at its lower end, an overflow pipe carried by and rotating with said trough, and a gutter into which said pipe discharges.

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

UTLEY WEDGE.

Witnesses:

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