U. WEDGE.

RABBLE ARM FOR ROASTING FURNACES.

APPLICATION FILED MAR. 8, 1910.

1,068,955.

Patented July 29, 1913.

2 SHEETS—SHEET 1.

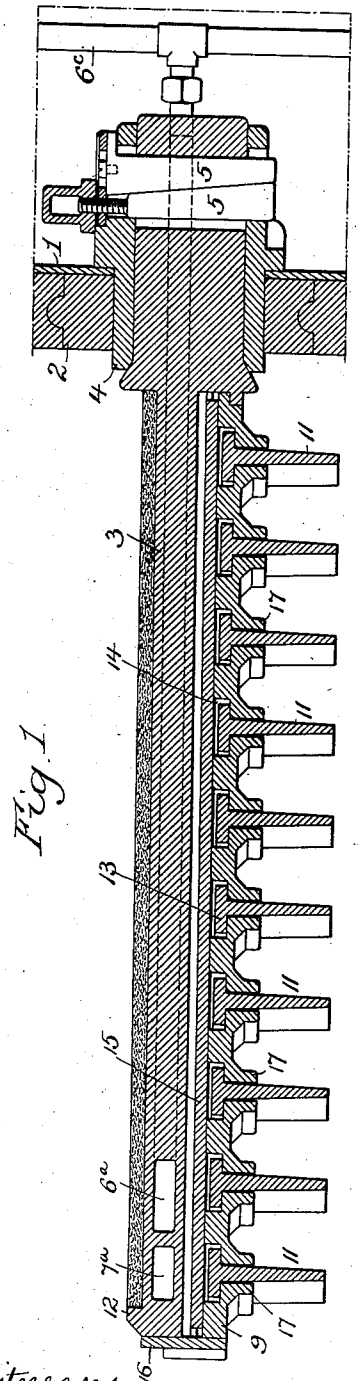


Fig. 1.

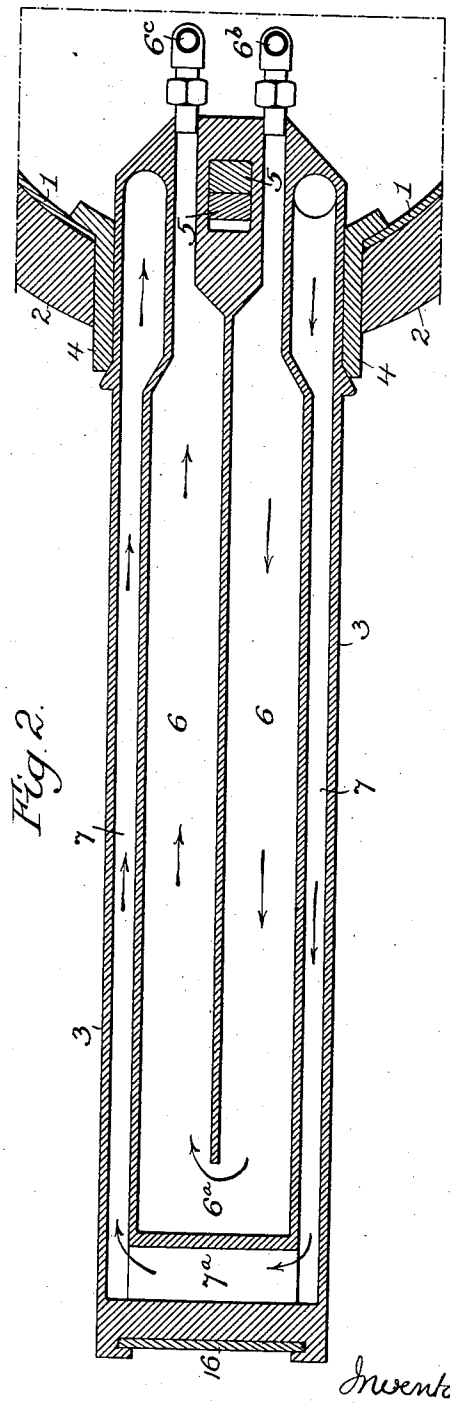


Fig. 2.

Witnesses
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2 SHEETS—SHEET 2.

Fig. 3.

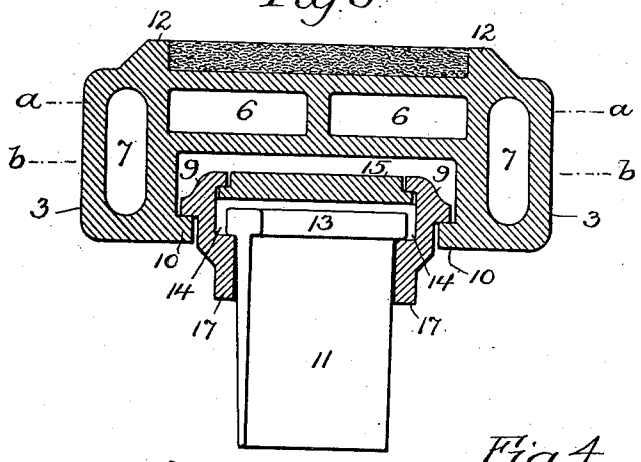
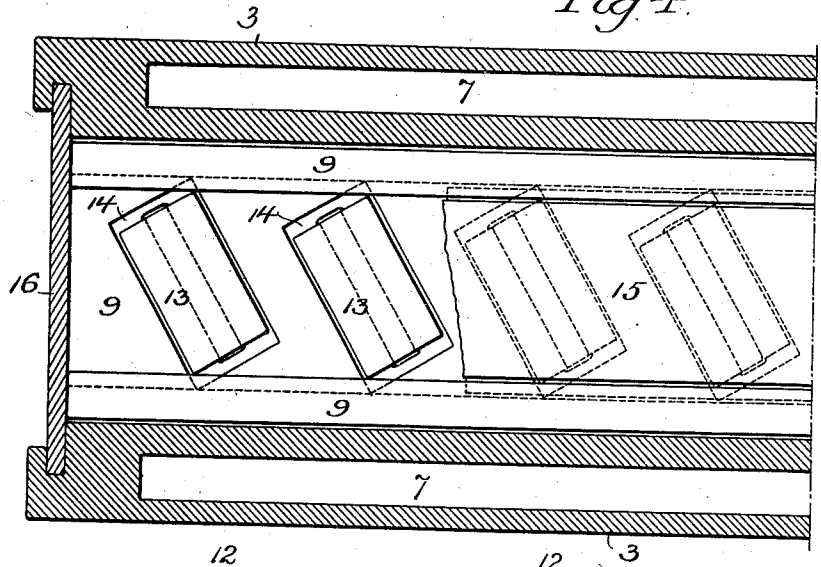


Fig. 4.



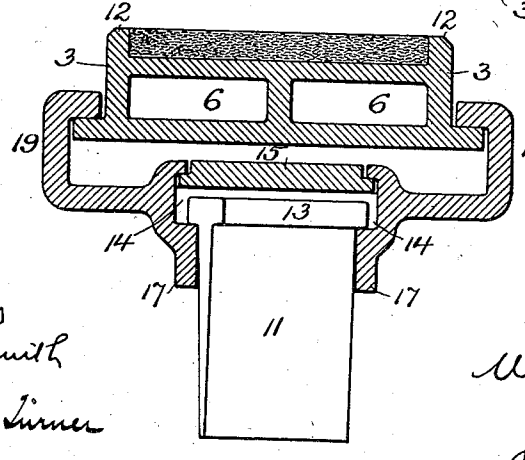


Fig. 5.

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UNITED STATES PATENT OFFICE.

UTLEY WEDGE, OF ARDMORE, PENNSYLVANIA, ASSIGNOR TO THE FURNACE PATENT COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

RABBLE-ARM FOR ROASTING-FURNACES.

1,068,955. Specification of Letters Patent. Patented July 29, 1913.

Application filed March 8, 1910. Serial No. 548,024.

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 Rabble-Arms for Roasting-Furnaces, of which the following is a specification.

The objects of my invention are to so mount the rabble blades upon the rabble-carrying arm of a roasting or like furnace as to permit of the ready removal or replacing of any one of said rabble blades; to protect the rabble mounts from the excessive heat of the furnace; to effect the cooling of the rabble arm without abstracting an undue amount of heat from the furnace; to prevent condensation of the furnace gases by contact with the cooled surfaces of the rabble arm or rabble mounts, and to permit the rabble blades to rise as a unit when they meet with any obstructions which they cannot displace. These objects I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal section of part of the rotating shaft of a furnace and one of its rabble arms constructed in accordance with my invention; Fig. 2 is a horizontal section on the line *a—a*, Fig. 3, of the inner and outer portions of the rabble arm; Fig. 3 is an enlarged transverse section of the rabble arm; Fig. 4 is a horizontal section of the outer portion of the rabble arm on the line *b—b*, Fig. 3, with part of one of the members cut away to show the parts beneath, and Fig. 5 is a transverse section illustrating a modification of my invention.

In Fig. 1 of the drawing, 1 represents part of the central rotating hollow shaft of the furnace having the usual refractory casing 2, and 3 represents one of the rabble arms which is seated against a hub 4 carried by the shaft and is held in contact with said seat by means of an adjusting device, whereby longitudinal movement can be imparted to the arm, said adjusting device consisting, in the present instance, of a pair of gibs or keys 5, adapted to slots in the hub and arm, as shown in Fig. 1. The upper portion of the arm has water channels 6 connected at their outer ends by a cross channel 6^a, as shown in Fig. 2, and communicating, respectively, at their inner ends, with a water supply pipe 6^b and a water discharge pipe 6^c, whereby, when these connections are established, a circulation of water, in the direction of the arrows, Fig. 2, can be maintained through said passages 6 and 6^a so as to cool the upper portion of the arm. In the front and rear portions of the arm are formed air passages 7, connected, at their outer ends, by a transverse passage 7^a, and intended to communicate, respectively, at their inner ends, with air supply and discharge pipes (not shown) whereby, when these connections are established, circulation of air, in the direction of the arrows, Fig. 2, can be maintained through the passages 7 and 7^a.

The rabble arm 3 is recessed on its under side for the reception of a rabble-carrying bar 9 which rests upon inwardly projecting flanges 10 at the front and rear of the recess, this rabble-carrying bar being removable longitudinally from the end of the rabble arm and being provided with independently movable blades or rabbles 11, whereby, if any of the rabbles is defective, the rabble-carrying bar can be withdrawn from the rabble arm through a suitable opening in the side wall of the furnace, and replaced by a bar carrying perfect rabbles, access to the interior of the working chamber of the furnace for the purpose of replacing rabbles being thereby rendered unnecessary, an important feature in the operation of furnaces in which very high temperatures are maintained. As the withdrawal and replacing of a rabble-carrying bar can be effected very quickly, there is but little exposure of the workmen, even on the outside of the furnace, to the heat emanating from the opening in the side wall of the furnace, through which the bar is removed and inserted.

By the provision of the water circulating chamber 6, that portion of the rabble arm above the rabble-carrying bar is maintained at such a low temperature as to properly protect said bar from the heat of the furnace, while the larger air circulating passages at the front and rear of the rabble arm protect the edges of said bar without reducing the temperature of the front and rear portions of the rabble arm to such a degree as to unduly abstract heat from the working chamber of the furnace. In order to prevent such undue abstraction of heat by the water cooled upper portion of the bar, I prefer to provide the top of the latter with flanges 12,

forming, on top of the bar, a chamber for the reception of dust, sand, fire-clay, or other suitable material which will serve, in a measure, as a non-conductor of heat and will prevent the access of the hot gases of the furnace to the cooled top of the arm upon which they might otherwise be condensed and, in some cases, form an acid deposit which would injure the metal of which the arm is composed.

Each of the rabbles 11 has, at the top, a head 13 adapted to a pocket 14 in the top of the bar 9, these pockets being normally closed at the top by a longitudinal plate 15, sliding in guides on the bar 9 and withdrawn from the outer end of the bar when it is desired to gain access to the rabble heads. Each of the rabbles projects through a slot in the bottom of its respective pocket 14 and is supported by the bearing of its head 13 on the bottom of the pocket.

Between the top of the bar 9 and the top of the recess in the underside of the rabble arm for the reception of said arm is a space into which the bar can rise when its rabbles, or any of them, meet with an obstruction which they cannot remove, the bar dropping to its proper position again as soon as the obstruction has been passed, and in order to prevent access of the furnace gases to this space, I close the outer end of the recess in the bar, by means of a plate 16, as contact of the gases in said space with the cooled upper portion of the rabble arm might cause condensation of the same, or cause corrosive action on the rabble arm.

The rabble-carrying bar and rabble heads are maintained in a relatively cool condition by reason of the circulation of air and water through the rabble arm and in order to protect the upper portions of the rabbles as much as possible from the effect of the heat of the furnace, the bar 9 has depending wings 17, embracing the upper portions of the rabbles for this purpose.

While I prefer to adapt the rabble-carrying bar to an internal recess in the rabble arm, said bar can, if desired, be mounted upon external flanges on the arm, as shown, for instance, at 19 in Fig. 5, the cooling of the arm by the water passages 6, even in this case, serving to protect the rabble-carrying bar and rabbles, in considerable measure, from the heat of the furnace, while, at the same time, the advantages arising from the facility of application and removal of the rabble-carrying bar and its rabbles is preserved, as in the case of the preferred construction.

I claim:

1. A rabble arm having in the under side of the same a recess closed at the sides and open at the bottom, and a rabble-carrying bar contained in said recess and having rabbles which extend downwardly through the opening in the bottom of the same.

2. A rabble arm having in the under side of the same a recess closed at the sides and open at the bottom and having cooling passages above and at the sides of said recess, and a rabble-carrying bar contained in said recess and having rabbles which project downwardly through the opening in the bottom of the same.

3. A rabble arm having a rabble-carrying bar thereon with open-bottomed pockets therein, a series of rabbles having heads contained in said pockets, the rabbles projecting downwardly through the openings of the pockets, and a movable plate for confining the heads of the rabbles in said pockets.

4. A rabble arm having a recess therein, and a rabble-carrying bar vertically movable in said recess.

5. A rabble arm having a recess therein, a rabble-carrying bar vertically movable in said recess, rabbles independently mounted upon and independently removable from said bar, and means for locking them to the bar when in use.

6. The combination of a removable rabble-carrying bar with a rabble arm having a recess therein which provides a space above the bar, and means for closing the outer end of said space.

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

UTLEY WEDGE.

Witnesses:

KATE A. BEADLE,

HAMILTON D. TURNER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."