

Feb. 9, 1937.

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2,070,547

TILE SUPPORT

Original Filed May 6, 1926

Fig. 1

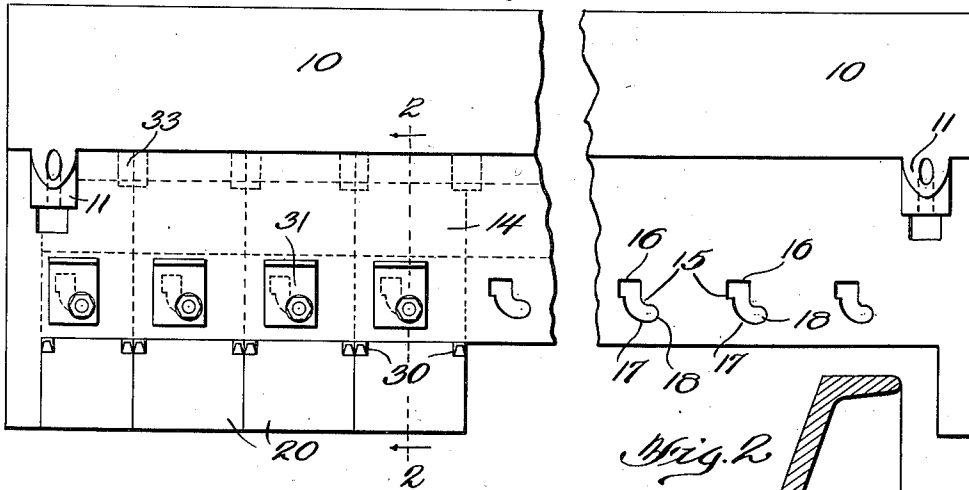


Fig. 2

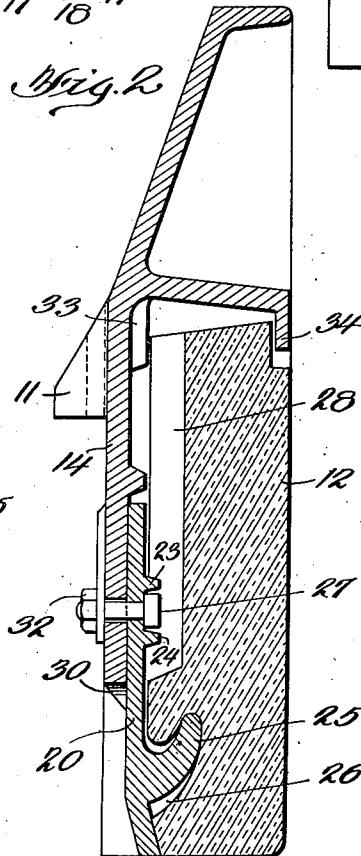


Fig. 3

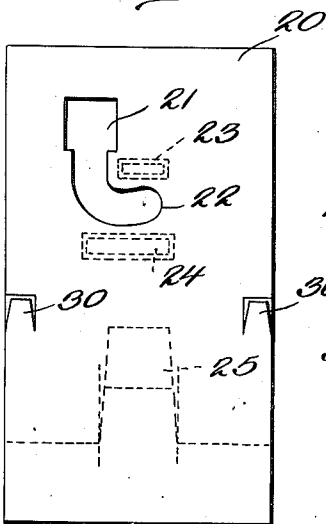
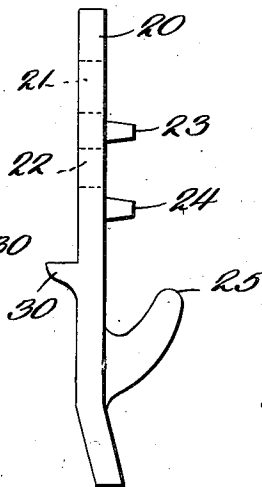


Fig. 4



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UNITED STATES PATENT OFFICE

2,070,547

TILE SUPPORT

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Original application May 6, 1926, Serial No.
107,299. Divided and this application May 28,
1932, Serial No. 614,194

14 Claims. (Cl. 110—173)

This invention relates to furnaces and has for its principal object the provision of means on a furnace door or gate for mounting tile or other refractory material. A specific object is the provision of an improved tile and tile holding construction in the hopper gate.

This is a division of my application Serial No. 107,299 filed May 6, 1926, patented November 8, 1932, No. 1,887,153.

One embodiment of the invention is illustrated by the attached drawing in which

Figure 1 is a front elevation of a hopper gate partly with tiles in assembled position.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a front elevation of a single tile supporting plate.

Figure 4 is a side elevation thereof.

The gate 10 shown in Figures 1 and 2 is adapted to be mounted in a well known manner in a hopper (not shown) so as to be raised or lowered to regulate the rate the fuel is fed to a traveling grate; lugs 11 on each side of the gate are provided to receive the chains or cables by which the raising and lowering are accomplished.

The tiles 12 which protect the metal parts of the hopper gate from the furnace heat are attached to the main frame 14 of the hopper gate as will now be described. The panel of the hopper gate main frame or apron 14 has a plurality of openings 15 therein equal in number with the tiles, each opening having a square bolt head receiving portion 16 leading by smaller curved portions 17 to seats 18. Corresponding to each hole 15 is a tile support or cast iron plate 20 having a square hole 21 leading by a narrower downwardly directed slot to a seat 22. Above and below seats 22 are horizontal ribs 23 and 24 on the rear of the plate 20. Also on the rear of the plate 20 is a tile holding bracket lug or hook 25 engaging in a recess 26 in the tile.

The tile 12 is first engaged on lug or hook 25 and then plate 20 with the tile is slid up behind the main frame or apron 14 of the hopper gate until the square holes 16 and 21 match. Then the square head 27 of a bolt is inserted thru the matched holes and while maintaining the parts in this position the bolt is moved downward and then sideways to the right, the bolt head moving freely in tile slot 28, until the bolt rests in seats 18 and 22 with its square head between the parallel ribs 23 and 24 which latter are to prevent the bolt head from turning. Lugs 30 by engaging the lower edge of main frame 14, position and prevent turning of plate 20. If desired, a cover washer plate 31 may be slipped

on the bolt stem and be held in place by the nut 32. It will be seen that by loosening the nut and moving the bolt to the left and lowering plate 20, the latter with its tile can be removed from its place. A new hopper gate tile can be substituted on its supporting plate and the latter again raised and secured in position. The upper end of each tile 12 engages between pads 33 and the depending edge 34 of the gate. In practice it is found that the entire removal of the supporting plate 20 for the renewal of a tile is unnecessary because by leaving the loosened bolt in place the plate can be suspended thereon in which position it can be tilted forward the necessary amount to permit the tilting and removal of the tile from the lug 25, it being understood that the plate has dropped sufficiently far for the top of the tile to clear the apron or ledge 34.

What I claim is:

1. In combination, a hopper gate having a plurality of holes and a plurality of tile supports each having a hole connecting with a slot, a headed bolt in each hole and extending thru the slot in each tile support, the holes being of such size as to permit passage of the bolt head therethru, and the slots being of such width as to prevent the passage of said bolt head.

2. The combination of claim 1 in which the back of the tile supports have lug means adjacent a portion of the slot in each tile support adapted to prevent rotation of the bolt heads.

3. The combination of claim 1 in which the holes in the hopper gate communicate with slots therein of less width than said holes and the hopper gate and tile supports have abutments adapted to prevent rotation of the tile supports when bolts extend thru the slots in the hopper gate and tile supports.

4. A tile support comprising a substantially flat plate having a stop lug on one side and a tile engaging lug on the other and having a curved slot therein, said slot having a horizontal portion and a vertical portion, the vertical portion being enlarged at the upper end and a pair of horizontal ribs adjacent the horizontal portion spaced apart a distance substantially equal to the diameter of said enlarged portion.

5. The device of claim 4 in which two stop lugs are provided on said one side one adjacent each vertical edge of said tile support and in which the tile engaging lug is between and below the stop lugs and the horizontal portion of the slot is below the vertical portion thereof.

6. In combination, a closure member for a fur-

- nace opening comprising a flange adapted to lie flush against the furnace front adjacent the opening, a panel spaced forwardly of said flange and adapted to extend over the opening, said panel having a plurality of slots therein, a number of tile supporting plates having an equal number of slots, bolts in said slots adapted to secure the plates in place on said panel, tile supporting lugs on said plates, a tile on each plate supported at one end by one of said lugs and held at the other end between said panel and flange and adapted to lie parallel to said flange whereby only the tile is exposed to the high temperature of the furnace fire.
7. The device of claim 6 in which said slots are enlarged at one end to permit the insertion of the heads of the bolts and ribs are provided on the inner side of the plates adjacent the slots for engaging and holding the heads of the bolts to prevent them from turning.
8. The device of claim 6 in which said tiles are grooved on the side engaging the supporting plate whereby the heads of said bolts are spaced from the tile.
9. The device of claim 6 in which the plates have abutments to engage the panels to position the plates with respect to the panel.
10. In combination, a hopper gate member having a plurality of slots therein, a portion of each slot being horizontal, a plurality of tile supporting members, each member having a slot therein, each of said last mentioned slots having a horizontal portion, abutment means on each tile supporting member for engaging said gate member to cause the horizontal slot portion in the supporting member to register with the horizontal portion of a slot in the gate member, one of said registering slots having a vertical portion communicating with the horizontal portion, said vertical portion being positioned to overlie the horizontal portion of the proximate slot during a limited vertical movement of the tile supporting member whereby a securing means may be moved horizontally into or out of said vertical slot portion to permit or prevent vertical movement of the tile supporting member to release or lock the tile.
11. In combination, a hopper gate plate, a plurality of tile supporting plates secured to the hopper gate plate, each supporting plate having a tile supporting means, a plurality of slots in said hopper gate plate, a slot in each of said tile supporting plates, all of said slots having a horizontal portion and some of the slots having a vertical portion, said vertical portions being positioned respectively to register with a portion of the proximate slots during vertical movement of the tile supporting plates, the horizontal portion of the tile supporting plate slots registering with the horizontal portion of the gate plate slots when the tile supporting plates are in normal tile supporting position whereby a bolt in said registered slots may be moved in a horizontal direction into and out of registration with said vertical slot portion thereby locking and unlocking said tile supporting plates against vertical movement with respect to the hopper gate plate.
12. In a hopper gate, a vertical ledge, a vertical apron spaced forwardly of said ledge and in a plane substantially parallel to the plane of the ledge, a plurality of tile supporting plates bolted to said apron, a tile hook intermediate the ends of each plate for supporting a tile, and a tile on each hook extending from the lower edge of the tile plates into the space between said ledge and apron.
13. In combination in a hopper gate of the guillotine type, an apertured upright frame member for extending across a hopper opening, a plurality of apertured upright tile supporting plate members, said plate members adapted when in position to have their apertures in part registration respectively with apertures of the frame member, a single bolt in each pair of partly registered apertures for individually securing the plate members to the frame member, a tile supporting lug on the fire side and above the lower edge of each plate member, and a tile individually supported on each lug, said apertures being in part elongated whereby upon loosening the bolts the plate members may be lowered with respect to the frame member to facilitate removal of the tiles from the supporting lugs.
14. In a hopper gate, a frame having a recess along one side, one wall of said recess being substantially vertical, a substantially vertical apron forming a continuation of the opposite wall of said recess, a plurality of tile supporting plates adjustably secured to said apron, adjustable securing means adapted to loosely engage the apron and plates to permit the plates to be moved toward and away from the recess, an upwardly sloping lug on each plate, and a plurality of tiles each having an upwardly sloping recess in its lower portion loosely receiving one of said lugs, whereby a tile is loosely supported on each lug and adapted to be moved therewith to bring the upper end into said frame recess to lock the tile to the frame.

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