Aug. 19, 1930. L. M. BEALL 1,773,339

FURNACE WALL

Filed June 4, 1928

Fig. 1.

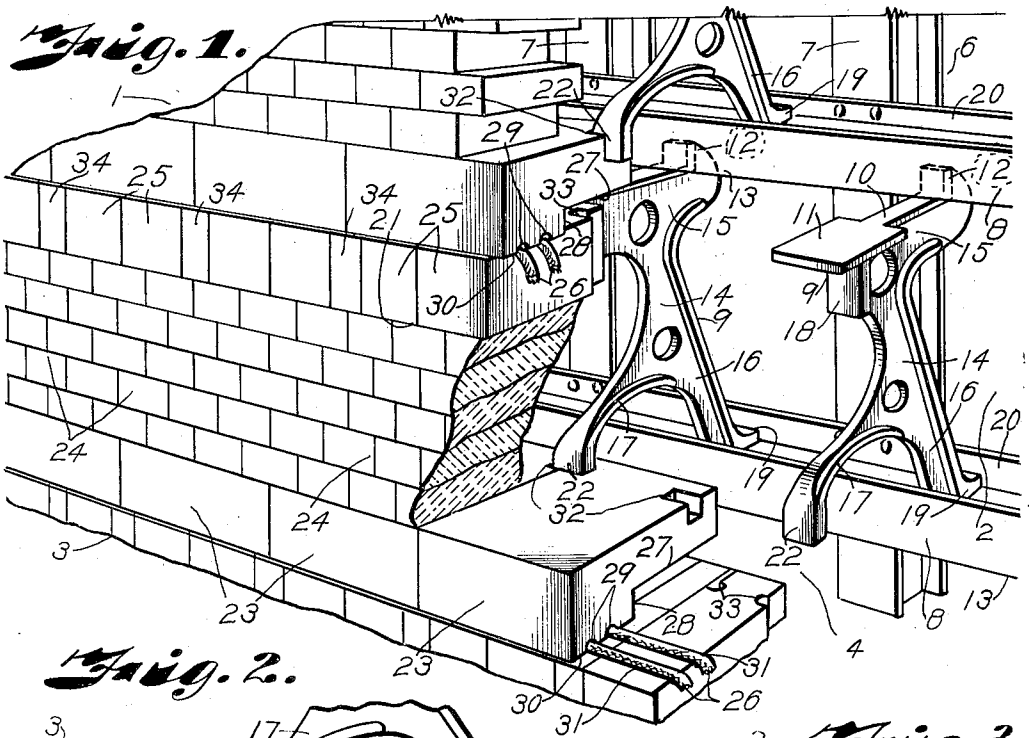


Fig. 2.

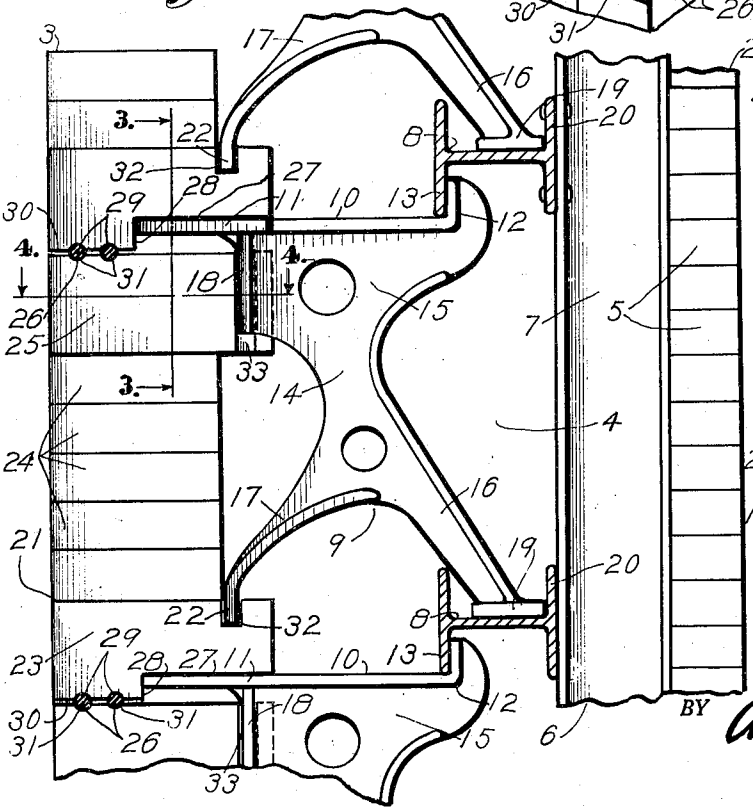


Fig. 3.

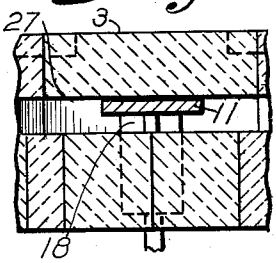
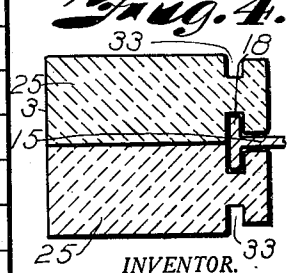


Fig. 4.



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UNITED STATES PATENT OFFICE

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FURNACE WALL

Application filed June 4, 1928. Serial No. 282,536.

My invention relates to furnace wall construction and more particularly to a sectionally constructed furnace wall including supports for spacing and supporting each section individually from an outer wall.

The principal object of the present invention is to permit removal of any one of the inner wall sections so that repairs or replacement of parts in a section may be made without removing adjacent sections of the wall.

A further object of my invention is to provide for cooling the inner furnace wall by the circulation of air through the space between the walls, and for equalizing the temperature of the air passing to a burner by interrupting its flow around the support brackets interposed between the walls.

Another object of the invention is to provide novel means for sealing the joints between upper and lower ends of adjoining wall sections and to permit contraction and expansion of the inner wall.

In accomplishing these and other objects of my invention I have provided improved details of structure, the preferred forms of which are illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a part of a furnace wall from the inside thereof, showing parts broken away for better illustration of the wall supporting means.

Fig. 2 is a side elevation of part of a wall illustrating the method of supporting a wall section in spaced relation with the outer support wall.

Fig. 3 is a section on the line 3—3, Fig. 2, illustrating the assembled relation of the cap blocks and base blocks of adjoining wall sections and the mounting of a base block on its support bracket.

Fig. 4 is a sectional plan view of the cap blocks on the line 4—4, Fig. 2, showing the blocks in locked engagement with the support bracket.

Referring in detail to the drawings:

1 designates a double furnace wall including an outer wall 2 and a spaced inner wall 3, the inner wall forming an enclosure for burners, boilers or the like, the outer wall defining an air space 4 between the walls so that air passing to the burner circulates through the space and tends to cool the inner wall.

The outer wall 2 constructed of ordinary brick 5 is reinforced on its inner side by a steel framework 6 including vertical buck stays 7 equally spaced about the wall, and horizontally disposed H beams 8 secured to the buck stays and vertically spaced thereon for receiving support brackets 9 supporting the inner wall 3 hereafter described.

Each support bracket 9 includes an upper horizontal rail portion 10 having at one end a rectangular-shaped plate 11 horizontally and centrally disposed with relation to the rail, the rail extending rearwardly from the plate and terminating in an upwardly protruding hook 12 engageable with the outer and lower flange 13 of the H beam 8.

Formed at right angles and extending downwardly from the rail portion 10 is a web plate 14 cut away at its sides and bottom end, thus forming a head portion 15 and angularly disposed legs 16 and 17.

The head 15 is provided at its outer end with a plate 18 depending vertically and centrally with relation to the plate 11 from a point adjacent the inner edge of the plate 11 and extending transversely with relation to the web 14.

Provided at the bottom of the leg 16 is a foot portion 19 resting on the web of the beam 8, with the outer edge of the foot engaged with the flange 20 of the beam so that the weight of a wall section 21 resting on the plate 11 causes the foot to fulcrum in the beam and the hook 12 to engage with the flange 13 of the next higher support beam 8.

The leg 17 spaced outwardly from the leg

16 is provided at its lower end with a vertically extending foot portion 22 positioned at a substantially central position below the plate 11 and adapted for engagement with parts of the inner wall 3, presently described.

The wall 3 is composed of a plurality of the sections 21 (Fig. 2), each section being supported by one of the brackets 9 and consisting of a base block 23, standard fire brick 24, cap blocks 25 and a sealing element preferably asbestos rope 26, which is applied between adjoining sections for providing an air-tight and flexible joint, and permitting expansion and contraction of the assembled wall.

The base blocks 23 are provided with an undercut bottom 27 to permit clearance for the support plate 11 with the underlying cap blocks 25 and the shoulder 28 formed by the undercut serves as a stop for engaging with the outer edge of the plate 11 and aligning the blocks in the wall.

Grooves 29 are also provided in the outer bottom portion 30 of the base blocks for alignment with like grooves 31 in the upper surface of the cap blocks so that the asbestos rope 26 may be applied in the grooves for spacing the blocks and serving as resilient sealing means to permit contraction and expansion of the wall between adjoining sections.

Assuming a wall section to be constructed at an intermediate position in the wall as shown in Figs. 1, 2 and 3, a bracket 9 is placed in position on the beams 8 and in proper spaced relation with the bracket of a previously assembled section. A base block 23 is placed on the plate 11 of the bracket 9 and shifted laterally for abutment with the base block of the adjoining section. The notch 32 on the abutting side of the block engages with the foot portion 22 of the next higher bracket, a part of which engages with the notch 32 of the adjoining abutted block.

When the block 23 is in abutment with the adjoining block, its side edges are equally spaced from the side edges of the plate 11 and the shoulder 28 of the block is in abutment with the end edge of said plate, as shown in Fig. 2.

Next in the order of assembly the fire bricks 24 are laid on the base block in alternate form and the cap blocks 25 are placed on the fire bricks for capping the section.

The cap blocks 25 are provided with vertical grooves 33 in their side walls at a point adjacent their inner ends, and in assembly on a section, the blocks are shifted into abutment from opposite sides of the bracket 9 so that the grooves engage over the side edges of the plate 18. A spacer brick 34 is placed between the paired cap blocks of adjoining sections, so that upon removal of the spacer brick, the cap blocks may be shifted laterally from locked engagement with the plate 18, thus permitting dismantling of the section for repair or replacement of its parts.

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

1. In furnace wall construction, an outer wall, an inner wall, horizontal vertically spaced supports on the outer wall, superimposed brackets mounted on lower supports and anchored to upper supports and carrying the inner wall in spaced relation to the outer wall, and means for locking the inner wall to the supports.

2. In a furnace wall construction, an outer wall, a framework re-enforcing the wall, an inner wall comprising superimposed sections, brackets hooked to the framework of the outer wall, seats on the brackets engaging under the wall sections, and a foot on each bracket for engaging the top of the next lower section.

3. In a furnace wall construction, an outer wall, a framework re-enforcing the wall, an inner wall comprising superimposed sections, each section having overhanging ledges provided with sockets spaced from the vertical faces of the sections, brackets mounted on the framework and having seats for engaging under the ledges, and feet for engaging in the sockets.

4. In a furnace wall construction, an outer wall, a framework re-enforcing the wall, an inner wall comprising superimposed sections, each section having overhanging ledges provided with sockets on their upper faces and recesses on their under faces, and brackets mounted on the framework having seats for engaging in said recesses and feet for engaging in said sockets to support and space the inner wall from the outer wall.

5. In a furnace wall construction, an outer wall, a framework re-enforcing the wall, vertically spaced horizontal supports secured to said framework, and having depending flanges at their outer edges, an inner wall including superimposed sections, and means for supporting the sections including a bracket mounted on one of said supports and having a hook engageable with the flange of a vertically adjacent support.

6. In a furnace wall construction including an outer wall and supports fixed to the outer wall including a pair of vertically spaced horizontal beams, an inner wall section including a base block having an undercut bottom and a notch in its upper surface, and a cap block having a vertical groove in one side, a bracket anchored to said beams and including a rail adapted to receive the undercut bottom of the base block and a foot engageable in said notch to support and retain the section in spaced relation with the outer wall, and a plate engageable in said cap block groove.

7. In a furnace wall construction including an outer wall and vertically arranged

brackets supported by the outer wall, superimposed inner wall sections including a base block having an inner undercut bottom portion mounted on one of said brackets and a projecting outer portion provided with a groove, and a cap block adapted to engage a vertically adjacent bracket and having a groove adapted for alignment with the groove of the base block of a superimposed section.

In testimony whereof I affix my signature.

LEE M. BEALL.