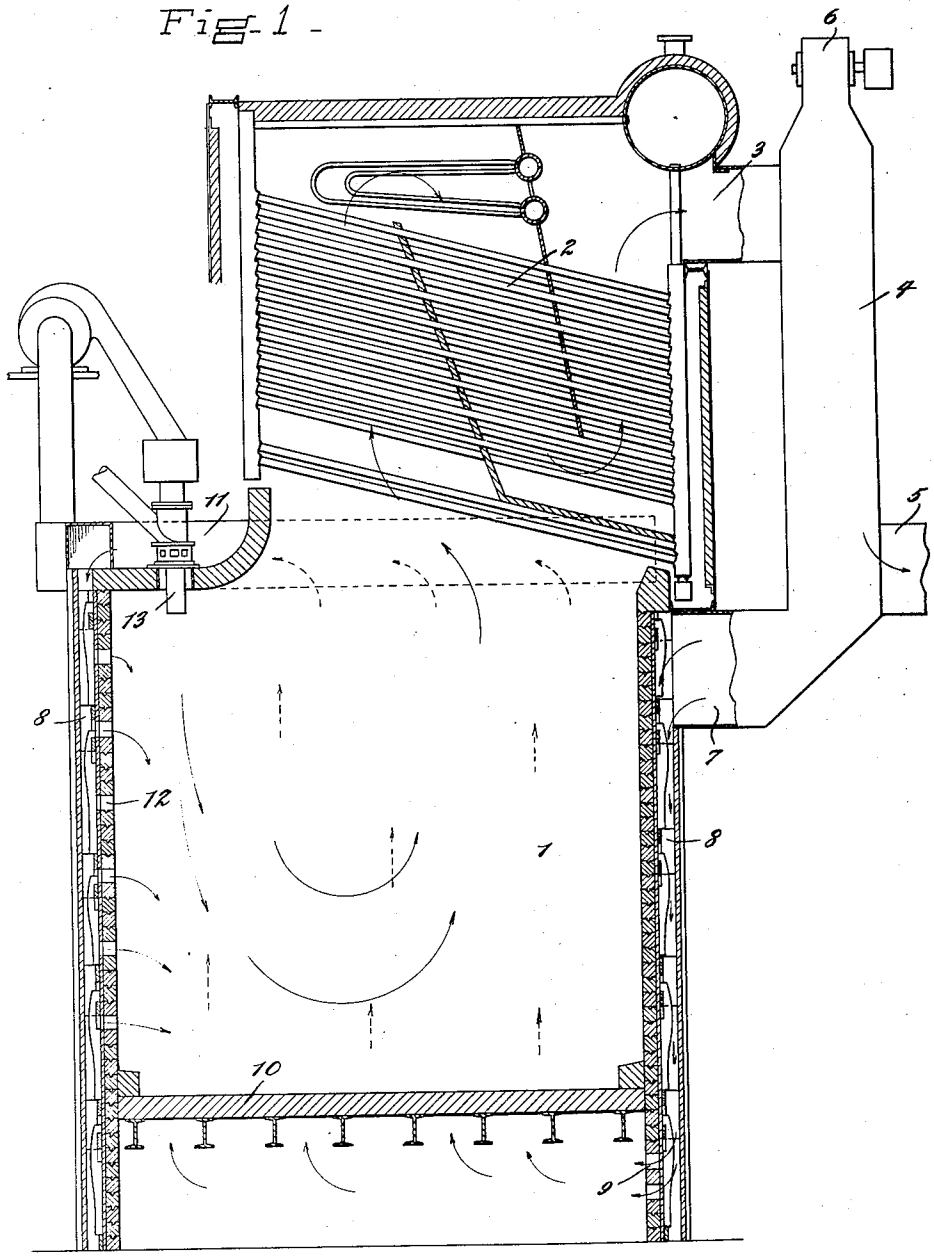
Dec. 8, 1931. D. S. JACOBUS 1,835,873

SECTIONAL FURNACE WALL

Original Filed Jan. 13, 1925 2 Sheets-Sheet 1

Fig. 1.



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Original Filed Jan. 13, 1925 2 Sheets-Sheet 2

Fig. 2.

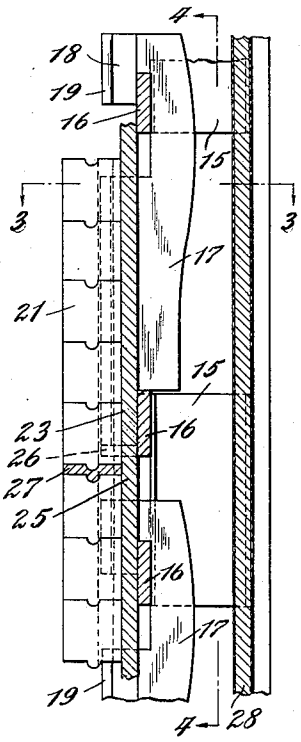


Fig. 4.

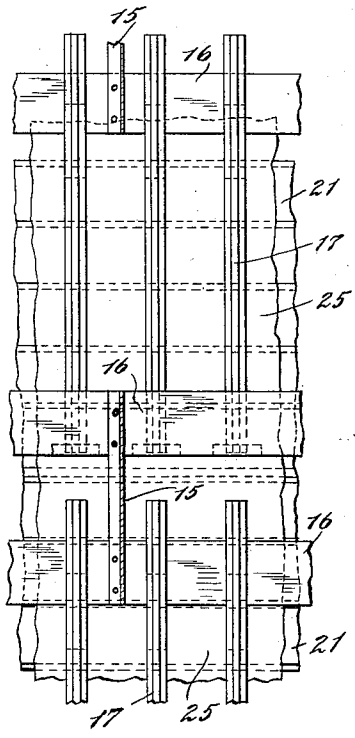


Fig. 5.

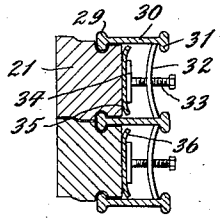


Fig. 6.

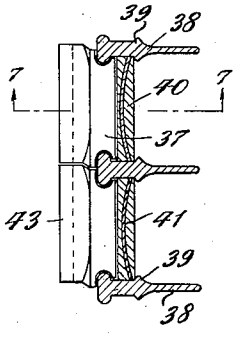


Fig. 3.

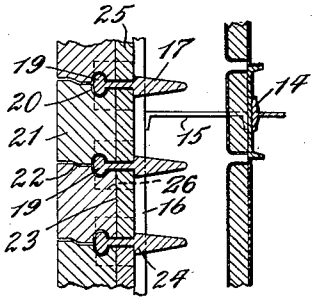


Fig. 7.

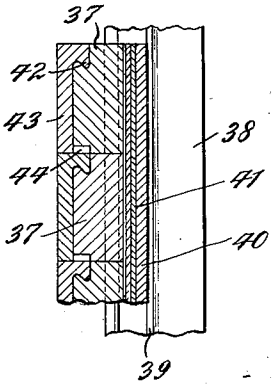
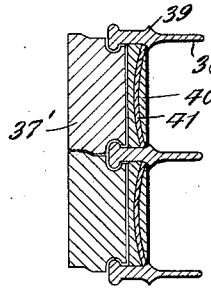


Fig. 8.



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UNITED STATES PATENT OFFICE

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SECTIONAL FURNACE WALL

Original application filed January 13, 1925, Serial No. 2,081. Divided and this application filed December 4, 1928. Serial No. 323,717.

This application is a division of my copending application Serial No. 2,081, filed January 13, 1925. The invention will be best understood from the following description. In the annexed drawings, in which I have shown certain selected embodiments of the invention,

Fig. 1 is a vertical sectional view through a furnace and boiler, the furnace wall being constructed according to one form of the invention.

Fig. 2 is an enlarged sectional view on the same plane as Fig. 1, and showing a fragment of the wall.

Fig. 3 is a section on the line 3—3 of Fig. 2.

Fig. 4 is a section on the line 4—4 of Fig. 2.

Figs. 5, 6 and 8 are views corresponding to Fig. 3, but showing other forms which the invention may take.

Fig. 7 is a section on the line 7—7 of Fig. 6.

I have shown the invention as applied to a furnace having a combustion chamber 1 located beneath a boiler 2 of the horizontal tube construction, the details of which will not be described. A suitable gas outlet 3 is provided for the gases which have passed over the boiler, and the gases pass from this flue through an air heater 4 to the outlet 5. A fan 6 is provided to force air through the heater 4 to an air inlet 7 which connects with ducts 8 formed in the rear furnace wall. The details of these ducts will be more fully described later.

The air from the ducts may be discharged through apertures 9 into the space beneath the floor 10 of the furnace. The air may then rise through ducts in the side walls, which are similar to the ducts 8, into a duct 11 adjacent the top of the furnace, one of these ducts being arranged on each side of the furnace and then the air may be discharged into the ducts 8 in the front wall of the furnace. These ducts may be connected to the combustion chamber by apertures 12 so that the air may enter the chamber from the front wall. If desired, some of the air which has been thus heated may be supplied to the burner 13 which is here shown as a pulverized fuel burner.

Preferably, I construct the walls of the furnace so that they are, in effect, made up of independent sections which sections may be made as small as desired. I also preferably construct these sections so that the parts of any one of them may be taken out and replaced without disturbance of the remainder of the wall, and I also arrange these sections in relation to each other so that relative movement may take place therebetween so as to take up the expansions and contractions to which such a wall is subjected.

I have shown the furnace wall as comprising a plurality of vertically arranged fixed supports 14 which may be in the form of the usual I-beam section. Connected to the supports 14, I have shown short channel sections 15 connected at their inner flanges to horizontally extending bars 16. Supported on each of the bars 16 is a plurality of separate supports 17, each provided at its upper end with a hook 18 adapted to hook over a bar 16. The lower end of each support 17 rests upon the next lower bar 16.

Each support is provided adjacent its inner edge, by which I mean the edge nearest the furnace, with a projection or bulb 19 adapted to be received in recesses 20 in tile 21. In the form shown, these recesses are formed in the adjacent faces of the two tile, as best seen in Fig. 3, and these adjacent faces are provided with offset portions 22 whereby radiant heat from the furnace will not be permitted to strike the supports. Placed rearwardly from the backs 23 of the tile 21, are projections 24 on the supports, and in the form shown in Figs. 2 and 3, I have indicated an insulating material 25 held in place against the backs of the tile by the projections. The lower part of each support has an inwardly projecting portion 26 which is received in a recess of the lowest tile carried by the support, and a suitable expansion joint is formed by introducing a suitable material 27 between this lowest tile and the top tile on the next support below. A suitable casing 28 is supported at a distance from the tile, and supports 17, so as to form space for the circulation of air in the manner described above.

In Fig. 5, I have shown a different form of the invention, and in which the tile 21 are

supported on bulbs 29 of supports 30. In this form, the projections on the supports disposed rearwardly from the wall are in the form of bulbs 31 on the opposite edges of these supports. Between the supports are plates 32 which are preferably sprung into place so as to have their edges contact with the projections or bulbs 31. These plates may conveniently be formed so as to seal the space between the supports 30. Each of the plates 32 has a threaded hole to receive a bolt 33 which is provided at its inner end with a large head 34 bearing against a plate 35 resting against the back of the tile 21. By this arrangement, the plates 35 may be held tightly in position, and consequently the tile may be also held in position. The edges of the plates 35 are turned up, as shown at 36, so that if it is desired, a suitable plastic backing, not shown, may be inserted beneath them.

In Figs. 6 and 7, I have shown the wall as formed of two kinds of tile, the wall tile 37 being carried on the bulbed supports 38 which are provided with projections 39 between which and the backs of the tile the insulating material 40 may be placed. In this form, I have shown the insulating material, which of course is normally a plastic material, as reinforced by means of metallic members 41 of any suitable form. These members may conveniently be arched and sprung into place between the projections 39 on adjacent supports 38. Preferably, each of the tile 37 has recesses 42 in the inner face thereof adapted to receive corresponding projections on facing tile 43. In the form shown, these recesses are in the shape of grooves at the top of the tile and extending horizontally on the wall, and the corresponding projections on the facing tile are in the form of hooks adapted to be received in the grooves. The bottom of each of the tile 37 is provided adjacent its bottom with a recess 44 so that the hook on the facing tile next lower can be raised and removed through the groove in the wall tile.

In Fig. 8, I have shown a form which corresponds in all principal particulars to the form shown in Fig. 6, and to which corresponding numerals have been applied. In this form the facing tile, however, are omitted, the wall tile 37′ being modified accordingly to omit the grooves for the support of the facing tile.

In operation, the air is discharged into the space between the tile, and the casing in the rear thereof, this space being substantially divided into ducts by means of the channels 15 and the supports 17, 30 or 38, as the case may be. The walls of the ducts are of course not continuous, but nevertheless they serve to direct the flow of air and, at the same time, permit relatively free circulation thereof. The course followed by the air has been described above and will not be repeated here.

I claim:—

1. A furnace wall comprising a plurality of fixed vertically disposed supports, horizontal supporting members connected to said fixed supports and spaced apart vertically thereon, a group of tile supports for each horizontal supporting member and spaced apart thereon across the wall, each tile support having a vertically disposed bulbed rib thereon, and tile having recesses to engage said bulbed rib, each tile support having a projection beneath the row of tile connected to said rib to support said row, each tile support having a vertically disposed projection on its outer edge and filling material between each pair of tile supports and held in place by said vertically disposed projections to form with said supports a substantially continuous backing plate for said wall.

2. A furnace wall comprising a plurality of fixed vertically disposed supports, horizontal supporting members connected to said fixed supports and spaced apart vertically thereon, a group of tile supports for each horizontal supporting member and spaced apart thereon across the wall, each tile support having a vertically disposed bulbed rib thereon, tile having recesses to engage said bulbed rib, each tile support having a projection beneath the row of tile connected to said rib to support said row, and closure plates extending between the adjacent tile supports of each group and detachably connected thereto.

3. A furnace wall comprising a plurality of fixed vertically disposed supports, horizontal supporting members connected to said fixed supports and spaced apart vertically thereon, a group of tile supports for each horizontal supporting member and spaced apart thereon across the wall, each tile support having a vertically disposed bulbed rib thereon, tile having recesses to engage said bulbed rib, each tile support having a projection beneath the row of tile connected to said rib to support said row, each tile support having a vertically disposed projection on its outer side, closure plates between each pair of adjacent tile supports with their edges engaging the vertically disposed projections of said pair, and means to press said edges against said projections.

4. A vertically extending furnace wall having metallic tile supports, wall tile supported on and by said supports, and facing tile supported on said wall tile and interlocked therewith.

5. A vertically extending furnace wall having metallic tile supports, wall tile supported on and by said supports, and facing tile supported on said wall tile, each wall tile having a recess in its inner face and each

facing tile having a projection at its top to engage said projection to be supported thereby.

6. A furnace wall comprising a plurality of substantially parallel metallic tile supports, each support having a bulb along one edge thereof, tile having recesses receiving said bulbs, and means disposed between said supports to seal the space therebetween.

7. A furnace wall comprising a plurality of substantially parallel metallic tile supports, each support being placed with one edge towards the furnace, a bulb on said edge, tile having recesses receiving said bulbs, and means disposed between the supports outwardly of the tile to seal the space between the supports.

8. A furnace wall comprising a plurality of substantially parallel metallic tile supports, each support being placed with one edge towards the furnace, a bulb on said edge, tile having recesses receiving said bulbs, means disposed between the supports outwardly of the tile to seal the space between the supports, and projections on said supports holding said sealing means in place.

9. A furnace wall comprising a plurality of substantially parallel metallic tile supports, each support being placed with one edge towards the furnace, a bulb on said edge, tile having recesses receiving said bulbs, projections on the supports disposed outwardly from the back of the tile, and plates having their edges contacting with said projections.

10. A furnace wall comprising a plurality of substantially parallel tile supports, each support being placed with one edge towards the furnace, a bulb on said edge, tile having recesses receiving said bulbs, projections on the supports disposed outwardly from the back of the tile, plates having their edges contacting with said projections, bolts threaded through said plates, and other plates contacting with the backs of the tile and in contact with said bolts.

11. A furnace wall comprising a plurality of substantially parallel metallic tile supports, each support being placed with one edge towards the furnace, a bulb on said edge, tile having recesses receiving said bulbs, projections on the supports disposed outwardly from the back of the tile, and sealing material disposed between said projections and the backs of the tile.

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