Dec. 21, 1943. G. P. REINTJES 2,337,208

SECTIONAL FURNACE WALL AND TUBE PACKING

Original Filed April 22, 1940 3 Sheets-Sheet 1

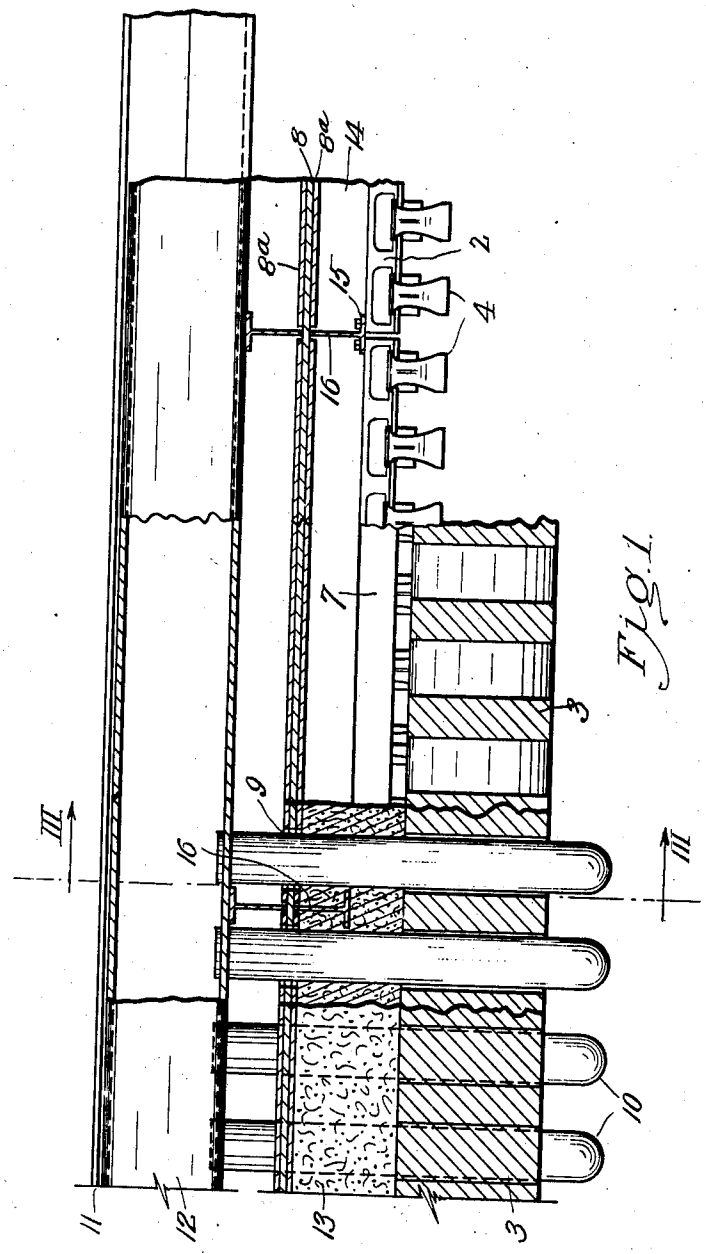


FIG. 1.

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Original Filed April 22, 1940 3 Sheets-Sheet 2

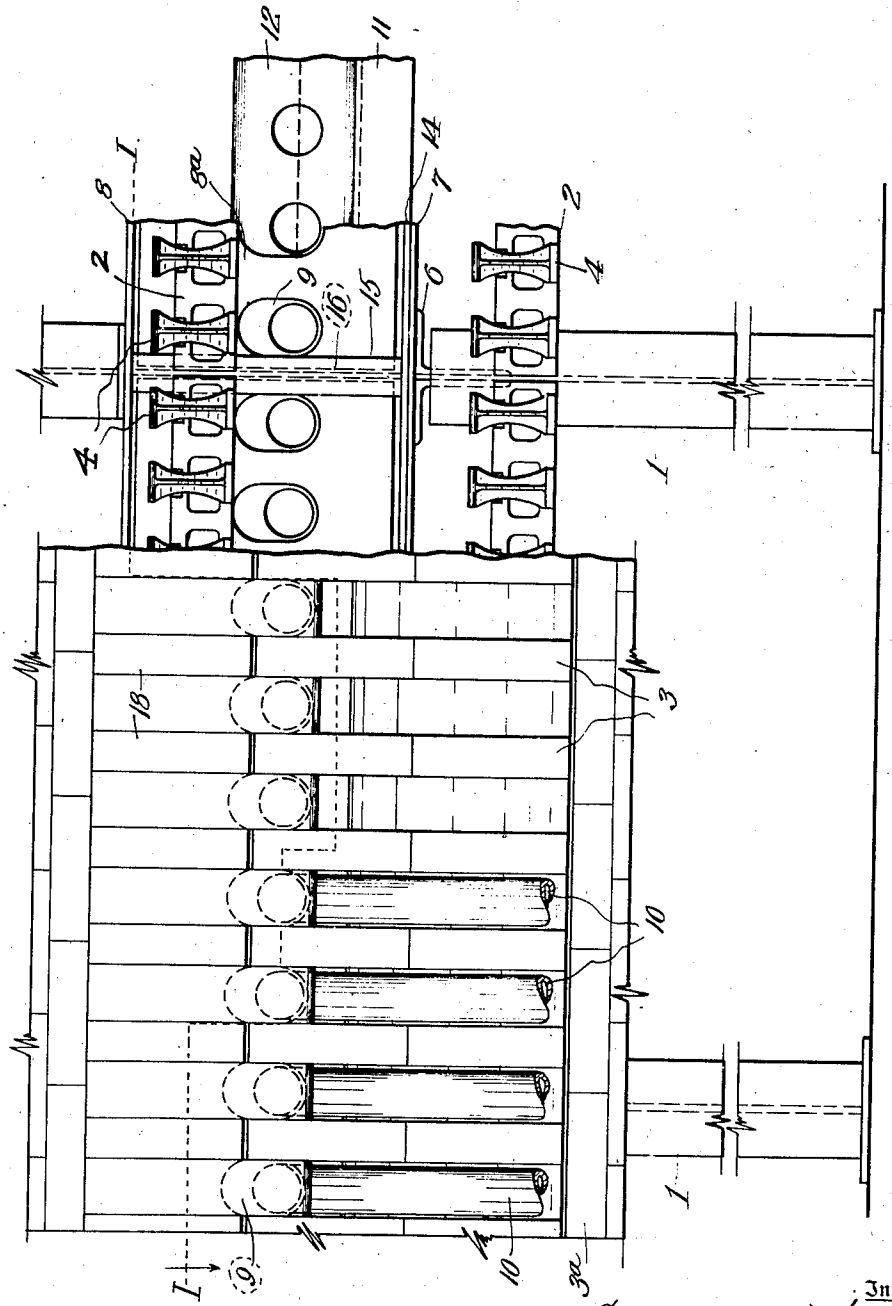


FIG. 2.

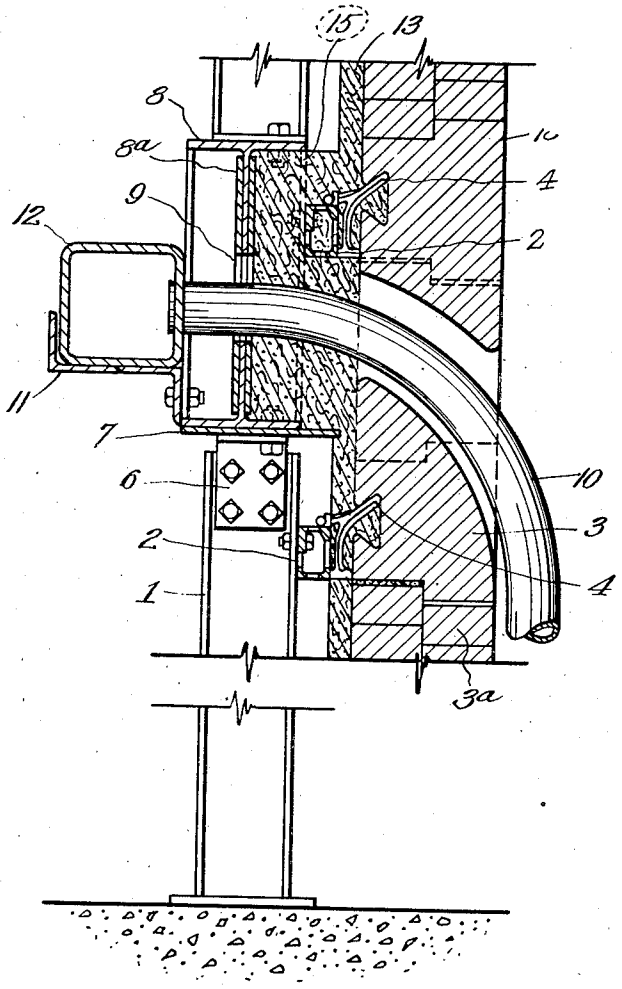
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Fig. 3.



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SECTIONAL FURNACE WALL AND TUBE PACKING

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Substituted for abandoned application Serial No. 330,948, April 22, 1940. This application November 16, 1942, Serial No. 465,769

10 Claims. (Cl. 122—6)

This application is a substitute for my abandoned application for Sectional furnace wall and tube packing, filed April 22, 1940, Serial No. 330,948. This invention relates to furnace walls and more particularly to that section or portion of such wall through which the tubes of a water wall extend. This horizontal belt or section has heretofore usually involved a heavy, bulky construction, difficult and expensive to place and maintain. My prime object, therefore, is to provide a furnace wall construction which produces a stronger, simpler, more easily maintained, less expensive and more efficient wall of the character mentioned.

With the general objects named in view and others as will hereinafter appear, the invention consists in certain novel and useful features of construction and organization of parts as hereinafter described and claimed; and in order that it may be fully understood, reference is to be had to the accompanying drawings, in which:

Figure 1 is a horizontal section through a furnace wall section embodying the invention, said section being taken on the line I—I of Figure 2.

Figure 2 is an elevational view of the inner face of the furnace wall as well as indicating fragmental vertical sections corresponding to the showing of Figure 1.

Figure 3 is a vertical transverse section taken through the wall on the line III—III of Figure 1.

In the said drawings, where like reference characters identify corresponding parts in all of the figures, the type of furnace illustrated, by way of example, is of the metallic sectionally supported wall type, in which 1 are a series of horizontally spaced vertical columns, and attached in vertically spaced relation to the inner faces of the columns, are longitudinally extending rows of supports 2 for tile or refractory, which may support rows of tile 3, or may support brackets 4, which, in turn, support the tile 3 as shown. Each horizontal belt or section of the furnace wall is completed by utilizing the tile 3 as supports for ordinary brick 3a.

At any suitable point intermediate the height of the columns 1, depending upon the type of boiler, the columns may carry right-angle flanges 6 which may support shelf plates 7 inserted below a horizontal I-beam 8 located in a vertical plane outside the plane of the fire face of the wall. The vertical web of said beam may be reinforced by plates 8a welded to its opposite sides, the parts being formed with a plurality of spaced openings or perforations 9 of such size as to receive the water tubes 10 of a water wall construction of any type. Where the water tubes must be free for vertical expansion, the openings 9 are vertically elongated as shown, and the tubes when cold, are installed at the proper end of the openings or slots 9 to allow movement upon expansion. In one type of boiler construction, the horizontal beam 8 may carry a bracket 11 in which a header 12 receiving the ends of the tubes 10, is mounted, for vertical movement on expansion of its tubes. After installation of the tubes the wall section may be completed in any suitable manner as by filling in the fire side with plastics, a sectionally supported belt of tile, an independently supported wall, or otherwise.

However, the preferred construction of this belt of the wall is, as follows: In order to provide a shelf or support for compressible packing 13 around the tubes 10, the beam 8 has a lower flange 14 which constitutes a shelf or support for packing 13 around the tubes, and to further strengthen the beam, particularly if its constitutes a part of the lateral support of the furnace framework and carries the load of the upper part thereof, said beam is preferably provided with a series of spaced T-shaped vertically extending reinforce members, the heads 15 of the T-members being spaced from and parallel to the beam web, providing pockets or spaces between which a portion of the packing is stuffed and thereby more effectually holding the packing from moving laterally away from the beam. The stems 16 of the said T's, being welded to the beam web, by preference, form a series of sections or compartments and thus sectionalize the packing so that local loosening will not be readily propagated longitudinally of the beam. If the construction is to be completed by a suspended wall section or belt, the T-heads 15 carry a horizontal tile support 2 on which suitable tile 18 may be suspended, or said supports may carry separate tile hangers 4, to which the tile 18 may be removably secured, as shown.

From the above description and drawings it will be apparent that while I have described and illustrated a construction embodying the features of advantage set forth as desirable, it is to be understood that I reserve the right to all changes within the spirit of the invention and without the ambit of the prior art.

I claim:

1. In a sectionally supported furnace wall construction, a perforated horizontal beam paralleling and outside the vertical plane of the combustion side of said wall, a tile-support projecting from the furnace side of the beam, water tubes

extending into the furnace through the perforations in the beam, tile carried by said tile-support and providing openings accommodating the water tubes, and packing inserted between said tile and beam.

2. In a sectionally supported furnace wall construction, a horizontal beam paralleling and outside the plane of the combustion side of said wall and having a perforated vertical web and top and bottom horizontal flanges, a tile-support projecting from the furnace side of said beam, water tubes extending through the perforations in the beam, tile carried by the tile-support and providing openings accommodating said water tubes, and packing inserted between said tile and beam.

3. In a sectionally supported furnace wall construction, a horizontal beam paralleling and outside the plane of the combustion side of said wall and having a perforated vertical web and top and bottom horizontal flanges, a T-shaped reinforcing member extending vertically from flange to flange of said beam, the stem of said member being at right angles to the web and its cross-head paralleling the web, a horizontal tile-support carried by said reinforcing member, water tubes extending through the perforations in the web of the beam, and tile carried by the tile-support and providing openings accommodating said water tubes.

4. In a sectionally supported furnace wall construction, a perforated horizontal beam paralleling and outside the vertical plane of the combustion side of said wall and having a horizontal flange at its lower edge projecting toward the furnace, a tile-support carried by the beam and spaced above said flange, water tubes extending into the furnace through the perforations in the beam, tile carried by said tile-support and providing openings accommodating the water tubes, and packing around the tubes between the tile and beam and supported by said beam flange.

5. In a sectionally supported furnace wall construction, a horizontal beam paralleling and outside the vertical plane of the combustion side of said wall and having a perforated vertical web and top and bottom parallel flanges projecting toward the furnace, a reinforcing member paralleling the web and connecting the edges of the top and bottom flanges to form a pocket between the proximate faces of the member and web, water tubes extending into the furnace through the perforations in the beam, and packing around the tubes between the proximate faces of the member and web and supported by the bottom flange of the beam.

6. In a sectionally supported furnace wall construction, a horizontal beam paralleling and outside the vertical plane of the combustion side of said wall and having a perforated vertical web and top and bottom parallel flanges projecting toward the furnace, a reinforcing member paralleling the web and connecting the edges of the top and bottom flanges to form a pocket between the proximate faces of the member and web, water tubes extending into the furnace through the perforations in the beam, a tile-support carried by said reinforcing member, tile carried by the tile-support and providing openings accommodating the water tubes, and packing around the tubes between the proximate faces of the member and web and supported by the bottom beam flange.

7. In a sectionally supported furnace wall construction, a horizontal beam paralleling and outside the plane of the combustion side of the wall and having a perforated vertical web and top and bottom horizontal flanges, a series of horizontally spaced vertically extending reinforcing members secured at their ends to the top and bottom flanges to provide a series of independent packing sections at right angles to the web of the beam, water tubes extending through the perforations in the beam, and packing supported by the bottom flange and filling the sections between adjacent reinforcing members.

8. In a sectionally supported furnace wall construction, a horizontal beam paralleling and outside the plane of the combustion side of the wall and having a perforated vertical web and top and bottom horizontal flanges, a series of horizontally spaced vertically extending reinforcing members secured at their ends to the top and bottom flanges to provide a series of independent packing sections at right angles to the web of the beam, a tile-support projecting from said reinforcing members, water tubes extending through the perforations in the beam, tile carried by the tile-support and providing openings accommodating said water tubes, and packing supported by the bottom beam flange and filling the sections between adjacent reinforcing members.

9. In a sectionally supported furnace wall construction, a horizontal beam paralleling and outside the plane of the combustion side of said wall and having a perforated vertical web and top and bottom horizontal flanges, a series of horizontally spaced vertically extending T-shaped reinforcing members having their stems at right angles to the web and their cross heads parallel thereto and extending from beam flange to beam flange to provide a series of sectionalized packing receiving pockets, water tubes extending through the perforations in the beam, and packing enclosed in the pockets between the reinforcing members and supported by the lower flange of said beam.

10. In a sectionally supported furnace wall construction, a horizontal beam paralleling and outside the plane of the combustion side of said wall and having a perforated vertical web and top and bottom horizontal flanges, a series of horizontally spaced vertically extending T-shaped reinforcing members having their stems at right angles to the web and their cross heads parallel thereto and extending from beam flange to beam flange to provide a series of sectionalized packing receiving spaces, a tile-support projecting from the reinforcing members inwardly toward the furnace, water tubes extending through the perforations in the beam, tile carried by said tile-support, and packing enclosed in the spaces between the reinforcing members and supported by the lower flange of said beam.

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