Nov. 26, 1929. G. P. JACKSON 1.736,882

FURNACE WALL CONSTRUCTION

Filed Oct. 2, 1925

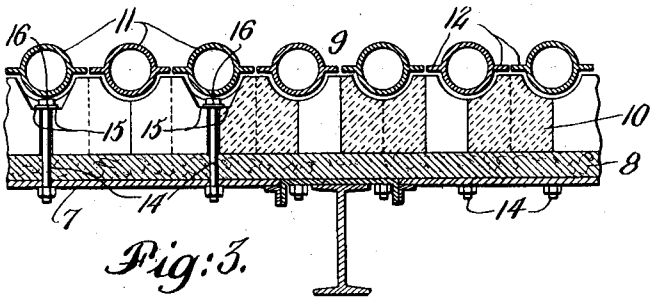

Fig: 3.

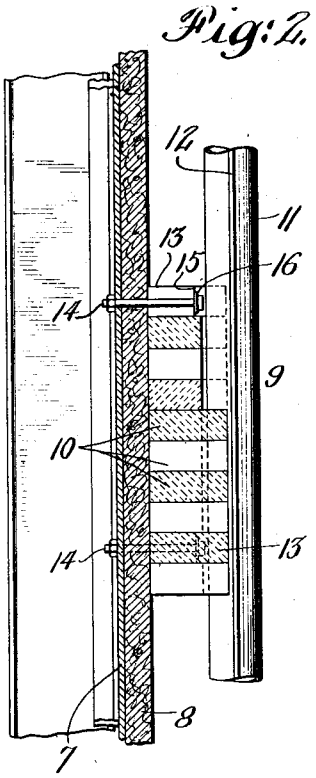

Fig: 2.

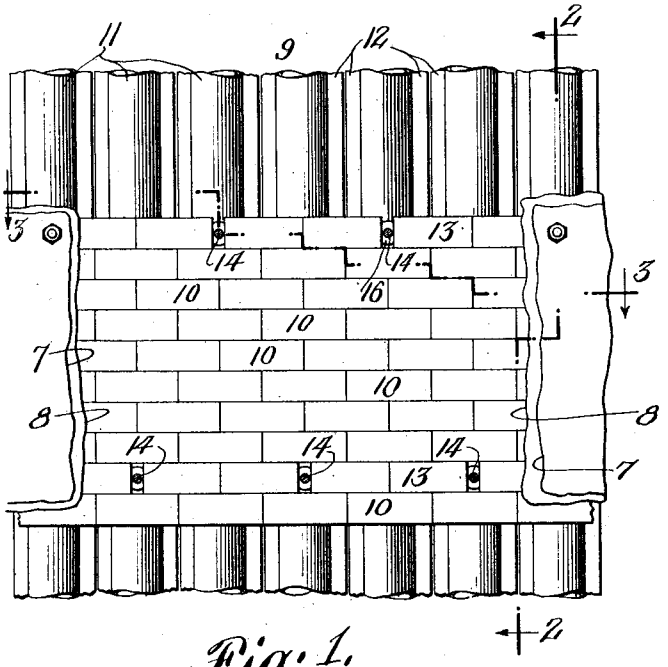

Fig: 1.

Inventor
George P. Jackson
By his Attorneys
Synnestvedt & Lechner

Patented Nov. 26, 1929. 1,736,882

UNITED STATES PATENT OFFICE

GEORGE P. JACKSON, OF FLUSHING, NEW YORK, ASSIGNOR TO INTERNATIONAL COMBUSTION ENGINEERING CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE

FURNACE-WALL CONSTRUCTION

Application filed October 2, 1925. Serial No. 60,016.

This invention relates to furnace wall constructions and is particularly adapted for use in connection with pulverized fuel burning furnaces, although its advantages may be useful in other connections.

One of the primary objects of the invention is to provide a simple, inexpensive and effective wall, easy to assemble.

Another object of the invention is the provision of a combined water wall and refractory wall arranged for permanence of the refractories.

How the foregoing, together with such other objects as may hereinafter appear, or are incident to my invention, are realized, is illustrated in the accompanying drawings, wherein:

Fig. 1 is a fragmentary elevation of a portion of the wall with the metallic shell and lining broken out to expose the filler tiles;

Fig. 2 is a vertical section taken on the line 2—2 of Fig. 1; and

Fig. 3 is a plan section taken on the line 3—3 of Fig. 1.

For purposes of description, the wall shown in the drawings may be considered as an upright wall of a pulverized fuel burning furnace, say, for example, the rear wall of the combustion chamber, although it may be used elsewhere to advantage. The wall comprises an outer metallic shell 7; an insulative lining 8 composed, for example, of 13 parts by volume of Sil-o-cel and 1 part by volume of Portland cement or similar material; an inner tube wall 9 next the flame and spaced from the lining 8; and filler tiles or blocks 10 for filling the space between the tube wall 9 and the lining 8.

The tube wall 9 is formed of a plurality of water tubes 11 having oppositely disposed longitudinal fins 12. The tubes are arranged so that the fins approximately abut, thus providing a metallic inner face for the wall. Circulation through the tubes is provided by suitably connecting them into the circulation of the associated boiler.

Reverting now to the filler tiles 10 and the manner of supporting the same, it will be seen that the tiles are arranged in horizontal courses, certain courses of which are anchored to the outer metallic shell 7 as will now appear. These anchored courses are arranged at suitable intervals throughout the height of the wall, two of such courses appearing in Figs. 1 and 2 as indicated by the numerals 13, 13. These courses are secured to the metallic shell as by means of the bolts 14 adapted to engage the flattened portions 15, 15 of adjacent tiles, which tiles are here shown as spaced apart to provide slots for the bolts 14. A washer 16 may be provided under the head of the bolt to ensure proper engagement with the tiles or blocks.

By this arrangement a number of shelves so to speak, are provided for supporting the intermediate tiles or blocks. Furthermore, the filler bricks 10 are supported from the metallic shell at spaced points thus preventing thrusts on the tube wall as might result, for example, if the bricks were free to shift inwardly against the tubes.

The inner face of this filler wall, that is the face adjacent the tube wall is provided with grooves for receiving the tubes.

From the foregoing it will be seen that an effective furnace wall is provided, the tiles and lining serving to insulate the metallic shell and preventing, to a large extent, the radiation of heat to the exterior, and the absorption of heat by the tube wall serving to protect the filler tiles. Thus a wall is formed of a substantially permanent character, which is, however, relatively quite thin.

It is to be observed that the filler wall 10 is entirely supported from the shell 7 with the lining 8 interposed therebetween so that this portion of the wall is a unit which can expand and contract irrespective of the tube wall. In this connection, where the ends of the tubes of the walls extend exteriorly of the wall, sand joints are used between such tube ends and those portions of the refractory wall through which they pass.

It will be seen that the bolts 14 come behind tubes of the water wall and they are thus protected from becoming excessively heated. The bricks of one course have the tube receiving sockets in the middle portion of the inner faces. The next course of bricks

will have the sockets formed at the inner corner portions, as will be clear on inspection of Figs. 1 and 3.

What I claim is:

1. A furnace wall comprising, in combination, structural work, an outer metallic shell secured thereto, a lining on the inside of the shell, a water wall spaced inwardly from said lining and composed of a plurality of upright tubes, filler tiles in the space between the lining and the tube wall, alternate courses of which on their inner faces are respectively socketed at their ends and in the middle to fit the tubes around their outer halves, and means for securing certain of said tiles to the metallic shell, said secured tiles serving to support the balance of the tiles.

2. A furnace wall comprising, in combination, structural work, an outer metallic shell secured thereto, a lining for the shell, a water wall of upright tubes spaced from said lining, refractory blocks in the space between the lining and the tube wall, said blocks having grooves therein whereby the blocks are adapted to fit partly around said tubes, and means for supporting the blocks in groups from the metallic shell.

In testimony whereof, I have hereunto signed my name.

GEORGE P. JACKSON.