March 27, 1928. 1,663,977

R. A. FORESMAN

FURNACE WALL

Filed May 22, 1925

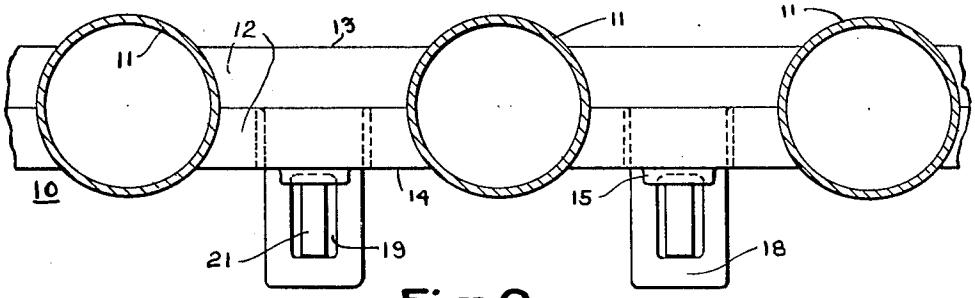


Fig. 2.

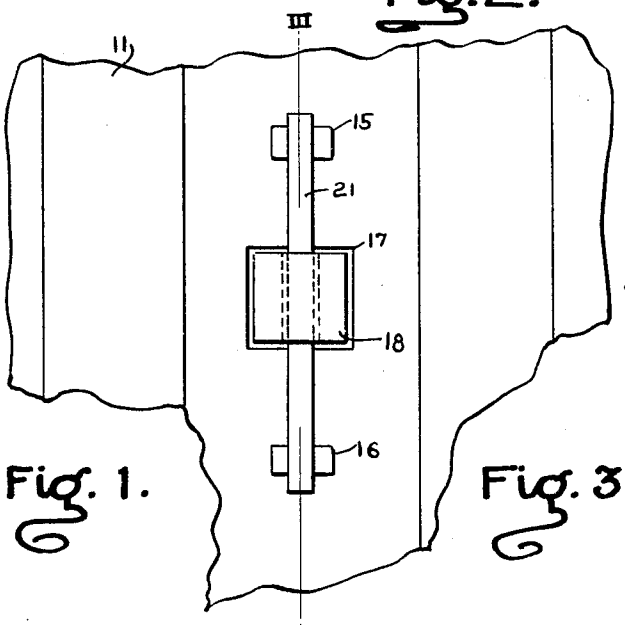


Fig. 1.

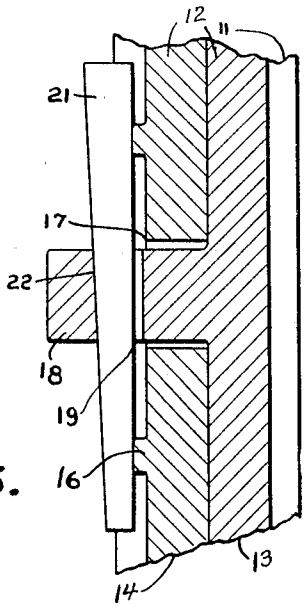


Fig. 3.

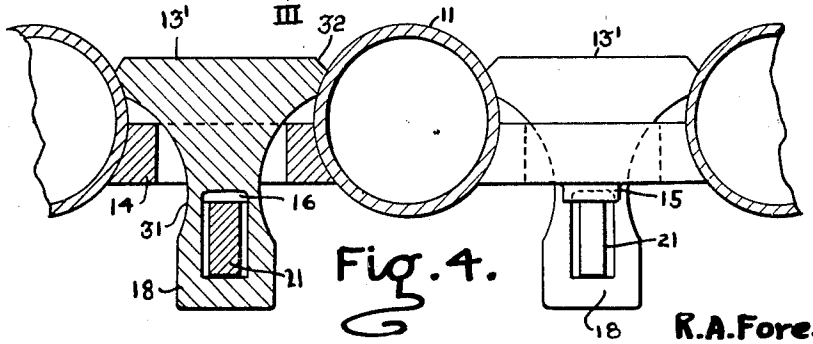


Fig. 4.

WITNESSES:

R. A. Foresman
INVENTOR

BY J. C. Davis

ATTORNEY

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UNITED STATES PATENT OFFICE.

ROBERT A. FORESMAN, OF MOORE, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

FURNACE WALL.

Application filed May 22, 1925. Serial No. 32,111.

This invention relates to high temperature furnaces and it has for an object to provide a furnace of the character described with a wall which shall be so constructed as to withstand the high temperatures of the furnace without rapid deterioration and which shall be capable of being maintained at a sufficiently low temperature to prevent the adhesion of fused slag. In my copending application, Serial No. 718,942, filed June 9, 1924, and assigned to the Westinghouse Electric and Manufacturing Company, I disclose a refractory wall consisting of a series of vertically disposed tubes to induce a rapid circulation of cooling fluid therethrough, and with an impervious lining interfitting therewith.

The main object of this invention is to produce an improved lining of the character designated which shall allow of expansion or slight deformation of the tubes without danger to the lining and which will return to its original shape upon cooling. A further object of my invention is to produce a device of the class described which shall be simple and inexpensive, yet rugged and durable and which shall permit of ready assembly and disassembly.

These and other objects of my invention which are more manifest in the further description may be attained by the apparatus illustrated in the accompanying drawing in which Fig. 1 is a view of a furnace wall embodying my invention, the view being taken from the side away from the furnace; Fig. 2 is a plan view, partially in section of the wall shown in Fig. 1; Fig. 3 is a vertical section taken on the line III—III of Fig. 1 and Fig. 4 is a plan view partially in section of another embodiment of my device.

In the drawing I show one embodiment of my device in which double plates extend between the tubes, the main plate having a projection extending through an aperture in the other plate and being secured in a suitable manner.

Referring to the drawing for a more detailed description of my invention I show at 10 a furnace wall for a high temperature furnace. The wall is composed of the tubes 11 and the lining members 12. Each lining member is formed of a front member 13 and a rear member 14. These members are in contact along a plane which substantially coincides with the plane passing through the center lines of the tubes 11. Each rear member 14 has two lugs 15 and 16 and is provided with an opening 17. Each front member 13 is provided with a lug 18 which is adapted to extend through the opening 17 in the rear member 14. The lug 18 is provided with an opening 19 to receive a wedge 21, the rear wall 22 of this opening being slightly bevelled the better to engage the wedge. The wedge 21 will be made of such size and material that upon the application of pressure it may tend to become slightly bowed.

In assembling my device, the front member is placed between the tubes from the interior of the furnace and the rear member 14 is placed between the tubes from the outside of the furnace, the hole 17 receiving the lug 18. The wedge 21 is then inserted through the opening 19 and forced far enough to bring the members 13 and 14 in contact. Should the tube expand, the members 14 and 13 will be forced slightly apart. This draws the lug 18 toward the member 14 and causes a bowing of the wedge 21 which is pulled forwardly at 22 and pushed rearwardly at 15 and 16. Upon cooling of the furnace and contraction of the tube 11, the wedge 21 resumes its normal shape and forces the front and rear members 13 and 14 back into contact. In case there is any permanent distortion in any part of the wall, this can be compensated for by movement of the wedge 21. In case it is desired to remove the lining members, it is only necessary to drive out the wedge 21 when the front and rear members 13 and 14 can be removed from the tubes.

In order to permit the inner member to be removed from the outside of the furnace, I may make the inner member 13′ of the shape shown in Fig. 4, in which case the wall is disassembled entirely from the outside in the following manner: The wedge 21 is first removed. This permits the outer wall member 14 to be removed. The main wall member 13′ is then moved inwardly and swung so that the cylindrical surface 31 contacts with the tube 11. The inner wall member is then rotated about the center of the tube as a center until it is clear of the adjacent tube when it is moved outwardly clear of the tubes. If the tubes are quite close together, the corners of member 13′ are cut off as shown at 32.

While I have shown my invention in but two forms, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications, without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are imposed by the prior art or as are specifically set forth in the appended claim.

What I claim is:

In a furnace wall the combination with a pair of spaced tubular members, of an inner lining member bridging the space between the tubular members and engaging the tubular members at points arranged at one side of a plane passing through the longitudinal center lines of the tubular members, an outer lining member also bridging the space between the tubular members and engaging the tubular members at points arranged at the other side of the plane passing through the longitudinal center lines of the tubular members, the inner and outer lining members being arranged in juxtaposed position with each other, said outer lining member being provided with an aperture, raised portions on said outer member arranged at opposite sides of the aperture, a projection on said inner member extending through and beyond the aperture in the outer member and having a transverse aperture in the portion thereof extending beyond the outer member, and a locking member extending through the aperture in the projection and engaging the raised portions of the outer member.

In testimony whereof, I have hereunto subscribed my name this first day of May, 1925.

ROBERT A. FORESMAN.