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TIE CLAMP FOR WALL TUBES

Filed Oct. 8, 1927

Fig. 1.

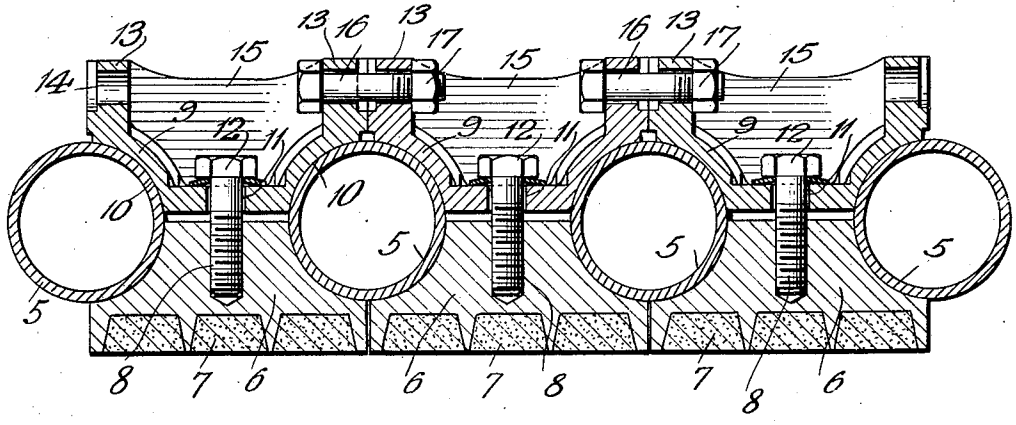
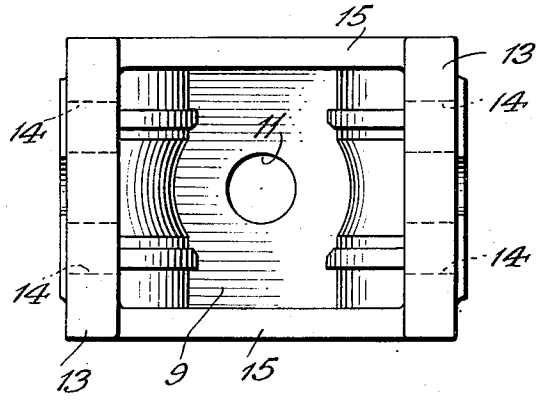


Fig. 2.



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UNITED STATES PATENT OFFICE

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TIE CLAMP FOR WALL TUBES

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This invention relates to a clamp by means of which tile or blocks can be secured to tubes in a furnace wall and the tubes kept at predetermined distances apart without danger of the same becoming separated due to changes in temperature. The invention will be understood from the description in connection with the accompanying drawing in which Fig. 1 is a horizontal section through a furnace wall, and Fig. 2 is a plan view of one of the clamps.

In the drawing, reference character 5 indicates a row of water tubes that are installed in and constitute a portion of the wall of a furnace of a boiler. These tubes may be connected to the circulation system of the boiler, thereby keeping the walls cool. Blocks comprising a back metal portion 6 and a front or face portion 7 of refractory material have rounded portions to fit the tubes and are clamped to the furnace side of the tubes 5 by means of stud bolts that screw into the threaded holes 8 in the metal portion 6 of the blocks.

Saddles or clamps 9 constitute the members for holding the blocks against the tubes and the clamps 9 are so constructed that by means of the same, the tubes 5 are kept at fixed distances apart. The clamps 9 are provided with rounded end portions 10 to fit against the tubes so as to have a large contact area therewith, and holes 11 are provided through the body portion of the clamps. Stud bolts 12 are passed through the holes 11 and are screwed into the holes 8 in the blocks to keep the same in firm engagement with the tubes. Spring washers may be interposed between the heads of the bolts 12 and the clamps 9 if desired. Some of the clamps 9 are provided with flanges 13 at the ends of the clamps, through which flanges holes 14 are provided. The sides of the flanges that face each other are milled and the clamps 9 are made of exactly the correct lengths to cause the tubes to be held correctly spaced apart when the clamps are in place with the milled sides of the flanges in contact with each other. The clamps may be strengthened by longitudinal ribs 15. Threaded bolts 16 extend through the holes in a flange of one clamp and the holes in a flange of an adjacent clamp. It will be obvious that when the nuts 17 are tightened and the blocks 6 are clamped in position by the stud bolts 12, the tubes 5 will be rigidly maintained at fixed distances apart.

We claim:

1. In a furnace wall, a row of tubes, blocks in contact with said tubes and extending partially around the same, laterally adjacent clamps for holding said blocks, said clamps having portions extending into the spaces between the tubes and shaped to fit the tubes, and means to hold said clamps fixed in relation to each other.

2. In a furnace wall, a row of tubes, blocks in contact with said tubes and extending partially around the same, laterally adjacent clamps for holding said blocks, said clamps having portions extending into the spaces between the tubes and shaped to fit the tubes, and means comprising bolts and nuts to hold said clamps fixed in relation to each other.

3. In a furnace wall, a row of tubes, blocks in contact with said tubes and extending partially around the same, laterally adjacent clamps for holding said blocks, said clamps having portions fitting between and contacting with said tubes and having flanges near the ends thereof, and means cooperating with such flanges whereby said clamps may be attached to each other.

4. A tie clamp for furnace wall tubes having rounded end portions to fit said tubes and flanged at the ends thereof, said flanges being provided with openings therethrough.

5. A tie clamp for furnace wall tubes having rounded end portions to fit said tubes and extensions near the ends of said clamp substantially at right angles to the main body portion of said clamp, said extensions being provided with openings therethrough.

6. A furnace wall comprising tubes and blocks, said blocks extending between and contacting with said tubes, and means to keep said tubes at fixed distances apart, said means comprising laterally adjacent clamps extending partially around said tubes and bolts on the outside of said wall connecting said clamps.

7. A tie clamp for furnace wall tubes having rounded end portions to fit said tubes and upstanding flanges at the ends of said clamps, said flanges being provided with openings.

8. The combination with spaced tubes, of a plurality of rigid members having curved tube recesses, means securing laterally adjacent rigid members together to form a rigid structure, a plurality of block units having curved tube recesses, and tension means engaging each unit and a corresponding rigid member.

9. The combination with spaced tubes, of a plurality of rigid members having curved tube recesses, a plurality of block units having curved tube recesses, means for clamping a block unit and a rigid member on a pair of adjacent tubes and means for preventing spreading of said tubes due to said clamping.

10. The combination with spaced tubes, of a plurality of rigid members having curved tube recesses, a plurality of block units having curved tube recesses, means for securing a rigid member and a block unit together in clamped relationship with a pair of tubes and means for preventing spreading of said tubes due to said clamping.

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