June 1, 1926. 1,586,859

C. A. STRACHOTA

FURNACE WALL

Filed Dec. 20, 1924

Fig. 1

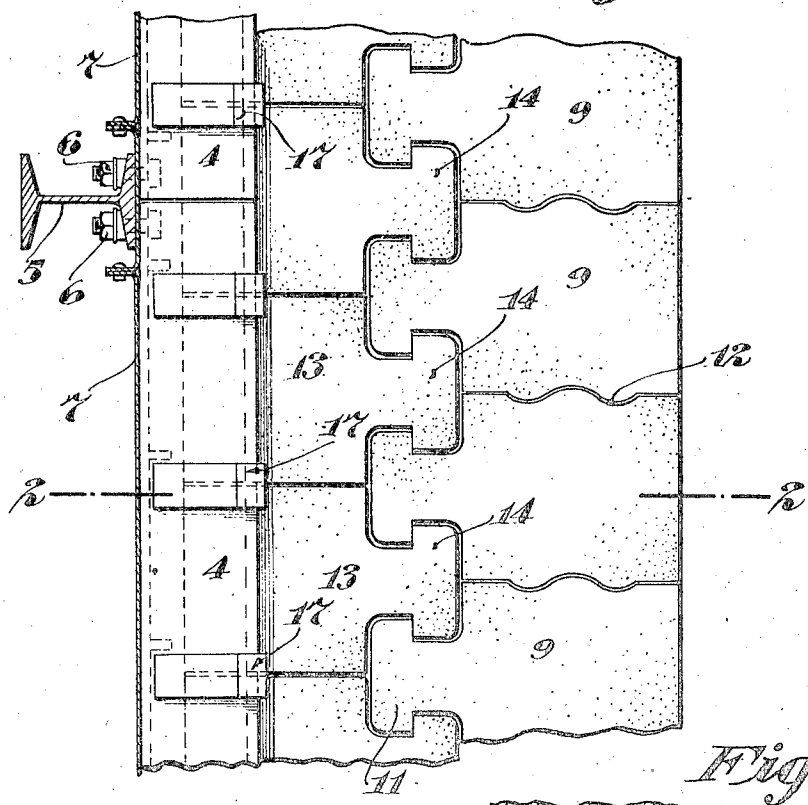
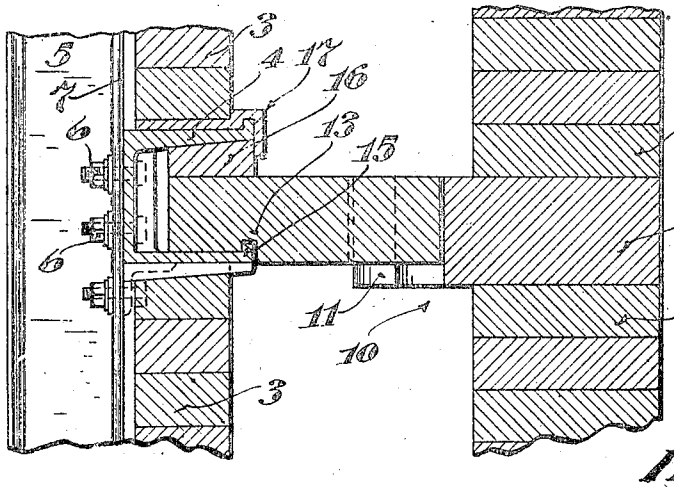


Fig. 2



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UNITED STATES PATENT OFFICE.

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FURNACE WALL.

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My invention provides certain highly important improvements in furnace walls, or walls that will be subject to high heat temperatures, and, generally stated, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

Particularly, the invention relates to wall structures comprising what are termed "permanent outer walls and replaceable inner walls", and which latter are subjected to intense heat, so that they will burn out more rapidly than the outer wall and, hence, require frequent replacement in whole or in part.

In accordance with this invention, the inner and outer walls are interlocked or tied together so that they cannot spread or separate laterally but are so connected that the two are capable of independent vertical expanding and contracting movements due to the different temperatures to which the two walls are subjected and to their different coefficients of expansion. This structure also lends itself particularly to a wall structure in which a large air space may be left between the inner and outer walls and such air space used for the circulation of air to reduce the temperature of the inner wall and to preheat air taken into the furnace to support combustion.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a fragmentary view partly in plan and partly in horizontal section, showing a portion of a wall constructed in accordance with this invention; and

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

The outer wall, as shown, is made up chiefly of bricks or blocks 13 that need not and seldom will be of fire clay or very highly refractory material. These bricks are laid in belts and between the belts are interposed one or more horizontal rows of anchoring channels 4 preferably of cast iron.

Upright buckstays 5, having I-beams, are preferably used to reinforce and sustain the outer wall, and the inner flanges of these buckstays are rigidly connected to the back webs of the anchoring channels 4 by nut-equipped bolts 6. By reference to Fig. 1, it will be noted that, in this preferred arrangement, the opposite sides of the inner flange of the buckstay 5 spans the joint between the ends of two adjacent channel beams 4 and is bolted to both thereof, so that it forms a rigid tie between the two abutting endwise-aligned anchoring channels. As shown, but not necessarily, the outer face of the outer wall 3 is covered with a sheet metal casing 7, a portion of which is interposed between the buckstay and anchoring channels.

The inner wall is built up chiefly of fire bricks or highly refractory blocks 8 laid in belts and, between the belts, one or more horizontal layers of tie blocks 9, that are preferably longer, thicker and wider than the fire bricks 8. The two walls are spaced so as to form a wide air chamber or channel 10. The outwardly projecting ends of the anchoring blocks 9 extend preferably about halfway through the air chamber 10, and while they are reduced in width, are formed with T-shaped heads 11. To more securely lock the adjacent blocks 9 together, they are shown as formed with interlapping waved or serrated adjacent edges 12.

For cooperation with the tie blocks 9, there is provided a second series of tie blocks 13 that extend from the anchoring channels 4 into the air space 10 and are formed with T-shaped heads 14 loosely interlapped but interlocked with the T-shaped heads 11 of said blocks 9. The outer ends of the tie blocks 13 are extended into and seated within the anchoring channels 4. Here it will be noted that the lower flanges of the anchoring channels 4 have upstanding lock ribs 15 that engage lock notches in the under sides of the blocks 13. To hold the inner ends of the blocks 13 seated on the bottom flanges of the anchoring channels 4 to the cooperating lock ribs 15, I provide wedge blocks 16 that are quite tightly pressed between the tops of said blocks and the beveled surfaces of the upper flanges of said anchoring channels. As a means for positively holding the wedge blocks or keys 16 against endwise displacement, I have shown cast metal anchoring clips 17 that are seated directly on the top flanges of the anchoring channels 4. These clips 17 have grooves that engage upstanding ribs on the upper flanges of the anchoring channels 4 and, at their inner ends, said

clips have depending flanges that extend below the tops of the cooperating wedge blocks. The arrangement above described brings the anchoring blocks 9 and 13 into an arrangement with lapped joints and interlocked ends that positively hold the two walls from moving either closer together or farther apart, but afford freely moving vertical joints, such as required to permit the two walls to naturally and independently adjust themselves to different vertical expanding and contracting movements. Moreover, the wall described may be very rapidly laid up and very easily repaired.

In the wall structure described, the inner and outer walls independently carry their own load and will maintain this function, regardless of expansion, contraction or any other forces that tend to cause the two walls to move vertically, the one in respect to the other. The anchoring channels may take various forms and may be cast, rolled, or otherwise produced, but they are preferably castings in which the upper and lower flanges and back or vertical webs are cast integral.

What I claim is:

1. A wall structure comprising an outer wall and an inner wall, each wall being made up of belts of brick and interposed tie blocks, the two walls being spaced and the tie blocks of the two walls projecting into the space between walls and having interlocking ends holding the two walls against lateral shifting movements but permitting the two walls to independently move vertically under varying expansion and contraction or other forces.

2. The structure defined in claim 1 in which the tie blocks of the two walls are staggered and are provided with T-shaped heads that are interlapped and interlocked in the space between the two walls.

3. The structure defined in claim 1 in which the outer wall is provided with metal anchoring channels into which the tie blocks of the outer wall project and with which said blocks are interlocked.

4. The structure defined in claim 1 in which the outer wall is provided with metal anchoring channels into which the tie blocks of the outer wall project and with which said blocks are interlocked, and in further combination with wedge blocks interposed between the tops of said latter noted tie blocks and the upper flanges of said channels.

5. The structure defined in claim 1 in which the outer wall is provided with metal anchoring channels into which the tie blocks of the outer wall project and with which said blocks are interlocked, and in further combination with wedge blocks interposed between the tops of said latter noted tie blocks and the upper flanges of said channels, and metallic clips interlocked to the top flanges of said channels and overlapping the ends of said wedge blocks.

6. The structure defined in claim 1 in which the outer wall is provided with metal anchoring channels into which the tie blocks of the outer wall project and with which said blocks are interlocked, and in further combination with buckstays at the exterior of the outer wall and to which certain of said anchoring channels are connected and anchored.

7. A wall structure comprising outer and inner walls, said outer wall being made up of belts of bricks and interposed horizontal edgewise aligned anchoring channels, buckstays at the exterior of the outer wall overlapping with and secured to the ends of said anchoring channels, tie blocks interposed in the two walls and holding the two walls against lateral movement, the tie blocks of the outer wall being extended into and anchored in said anchoring channels, and wedge blocks interposed between the upper flanges of the anchoring channels and the underlying blocks.

In testimony whereof I affix my signature.

CLARENCE A. STRACHOTA.