Feb. 16, 1937. H. HEITMAN 2,071,069

FURNACE CONSTRUCTION

Filed April 5, 1934

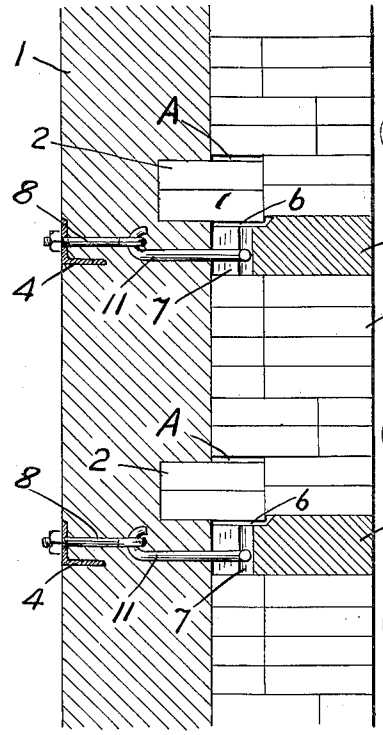

FIG. 1.

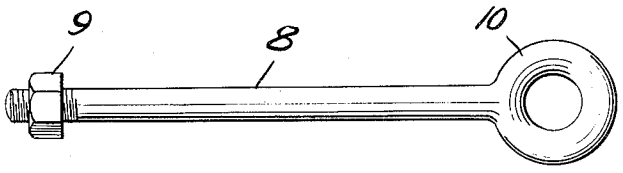

FIG. 3.

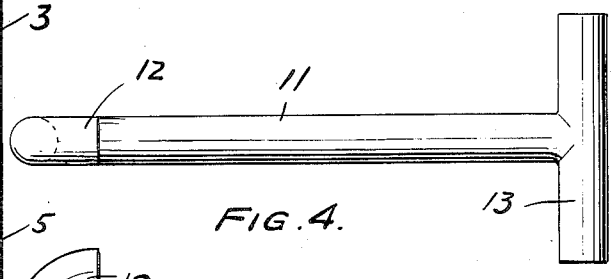

FIG. 4.

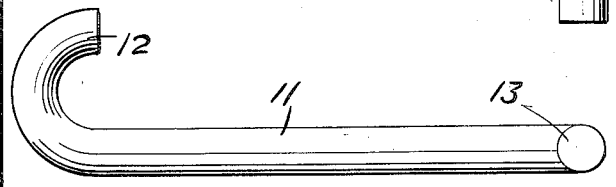

FIG. 5.

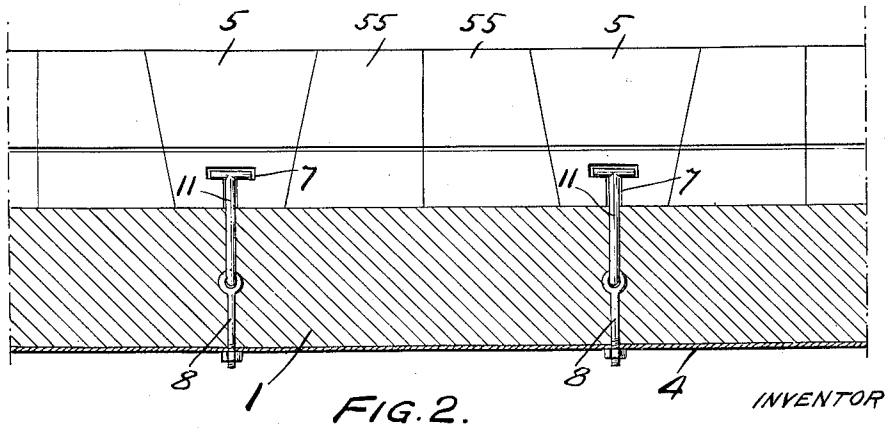

FIG. 2.

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FURNACE CONSTRUCTION

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5 Claims. (Cl. 72—101)

The object of my invention is to provide an improved furnace construction, or boiler setting, in which the inner or refractory wall can move vertically relative to the outer or less refractory wall, but, nevertheless, contact between the two walls is maintained, and in which the inner wall is vertically supported from the outer wall in such a way that lower portions of the inner wall can be separated while the upper portions are vertically supported from the outer wall.

More specifically, my invention consists of a furnace setting comprising, an outer wall, an inner wall of more refractory material than said outer wall, reinforcements for said outer wall, and connectors between said reinforcement and certain of the bricks of said inner wall, said inner wall having provisions between it and said outer wall, and between it and said connectors, for vertical movement of said inner wall relative to said outer wall.

For a further exposition of my invention, reference may be had to the annexed drawing and specification at the end whereof my invention will be specifically pointed out and claimed.

In the drawing:

Fig. 1 is a vertical cross-section, through a part of my device, showing the inner wall in raised position;

Fig. 2 is a horizontal cross-section through a part of my device;

Fig. 3 is a plan view of one connector member;

Fig. 4 is a plan view of another connector member; and

Fig. 5 is a side elevation of the connector member shown in Fig. 4.

In that embodiment of my invention chosen for illustration in the drawing, my device is shown as consisting of an outer wall 1, which may conveniently be made of ordinary brick. 2 indicates a header course of bricks anchored in and projecting from the outer wall and having lost motion engagement with the inner wall. The courses of brick 2 do not operate as a bond between the walls, but they serve to support the upper portion of the inner wall while the lower parts are being separated. The inner wall 3 is conveniently made of bricks or tile of more refractory material than the material of outer wall 1. Outer wall 1 may conveniently be provided with reinforcements 4, shown in the shape of angle-irons having spaced perforations therein.

Inner wall 3 is conveniently provided with connector bricks or tiles 5, which are on their upper surfaces step-shaped and which have, at their inner, upper surfaces, a groove or space 6, and also have, in their rear or inner faces, a slot or notch 7, which is T-shape in horizontal plan or cross-section, as is seen in Fig. 2.

Inner wall 3 and outer wall 1 are held together by connectors. These connectors may conveniently consist of an outer connector or eye-bolt 8, having a nut 9 thereon, and a circular eye or head 10. Eye-bolt 8 may conveniently be made of steel. Co-operating with outer connector or eye-bolt 8 is an inner connector 11, having a hook 12 at one end and a T-head 13 at its other end. Inner connector 11 may conveniently be made of cast iron, as it is exposed to a greater heat than is the eye-bolt 8. The connectors are assembled by passing the eye-bolt 8 through a perforation in reinforcement 4, passing hook 12 through the head of eye-bolt 8, and locating the head 13 of inner connector 11 in the slot 7 of connector brick 5.

As is seen in Fig. 2, connector brick 5 may be of keystone shape in horizontal plan or cross-section, so that its sides serve to retain a plurality of bricks 55, having sloping edges co-operating with the sloping edges of bricks 5 in a horizontal direction. This provides that the inner wall 3 is held to the outer wall 1 without the necessity of providing connectors for every brick of the selected courses of inner wall 3.

In the operation of my device, when inner or refractory wall 3 becomes heated due to the heat of the furnace or boiler, the inner wall 3 expands more than does the outer wall 1. The inner wall 3, therefore, slides in a vertical direction relative to the outer wall 1. Spaces 6 permit the inner wall 3 to rise relative to the header courses 2 of the outer wall 1, so that a space A is formed between the header courses 2 and the inner wall 3. Simultaneously, head 13 slides in slot 7 of brick 5, the round shape of head 13 permitting this sliding with a minimum of friction, and serving to retain the inner wall 3 in contact with the outer wall 1.

The header courses 2 provide a convenient support for the inner wall 3 when the latter is cool. This permits lower portions of the inner wall 3 to be removed and replaced, without disturbing the upper portions of the inner wall 3 which are supported on the header courses 2 during such removal and replacement.

The connectors may be formed of one member if desired, but, by providing a connector formed, as shown, of two elements having a bendable joint therein, the connectors may be more conveniently assembled, as the courses of brick of the outer

wall 1 may not be at exactly the same height as the courses of brick of the inner wall 3.

I do not intend to be limited save as the scope of the prior art and of the attached claims may require.

I claim:—

1. A furnace construction comprising, an outer wall, reinforcements for said outer wall, an inner wall of refractory material, connectors retaining said inner and outer walls together and having horizontally extending portions at their inner ends, and bricks in said inner wall connected to the inner ends of said connectors by receiving the inner ends of said connectors in vertical slots in said bricks, said bricks having their top faces in step shape leaving spaces for movement of the connectors in the event of expansion of said inner wall relative to said outer wall.

2. A furnace construction comprising, an outer wall, header courses projecting from the inner face of said outer wall, angle-irons forming reinforcements for said outer wall, an inner wall, connector bricks of keystone and of complemental shape in horizontal plan forming courses of said inner wall and having at their inner sides slots of T-shape in horizontal plan and having their top surfaces formed in step shape leaving spaces underlying said header courses, eye-bolts passing through said angle-irons and connected thereto, and inner connectors having hooks connected through said eye-bolts and having heads at their inner ends located in said slots of T-shape in said connector bricks.

3. A furnace construction comprising, an outer wall of brick and an inner wall of interlocked refractory tiles constructed and arranged for relative movement and to oppose the transfer of heat, a course of header bricks fast in the outer wall and loose in the inner wall to oppose heat transfer there being spaces underlying said header bricks to permit movement of the inner wall and to support the upper portions of the latter when portions of the inner wall rest on the upper faces of said header bricks, and hinged through-bolts connecting said walls substantially as described.

4. A furnace construction comprising, an outer wall, header courses projecting horizontally from the inner face of said outer wall, said header courses being fast in said outer wall, an inner wall having vertical faces abutting said outer wall and having orifices therein to loosely receive the projecting portions of said header courses therein, said orifices providing space underlying the projecting portions of said header courses to provide for vertical movement of said inner wall relative to said outer wall, and connectors retaining said inner and outer walls together, said connectors each having one end fast in said outer wall and each having the opposite end mounted in a vertical slot in said inner wall so that said inner wall is held against horizontal movement but is free for vertical movement.

5. A furnace construction comprising, an outer wall, header courses fast in said outer wall and having portions projecting from the inner face of said outer wall, an inner wall having vertical faces abutting the inner face of said outer wall and having orifices therein of sufficient size to loosely receive the projecting portions of said header courses, said orifices being of sufficient size to provide space underlying the projecting portions of said header courses to allow vertical movement of said inner wall relative to said outer wall, reinforcements for said outer wall, and connectors retaining said inner and outer walls together, said connectors each having one end fast in said outer wall and each having the opposite end mounted in a vertical slot in said inner wall so that said inner wall is held against horizontal movement but is free for vertical movement.

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