

Dec. 6, 1955

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2,725,833

BASIC REFRACTORY SUPPORT

Filed March 15, 1950

2 Sheets-Sheet 1

Fig. 1

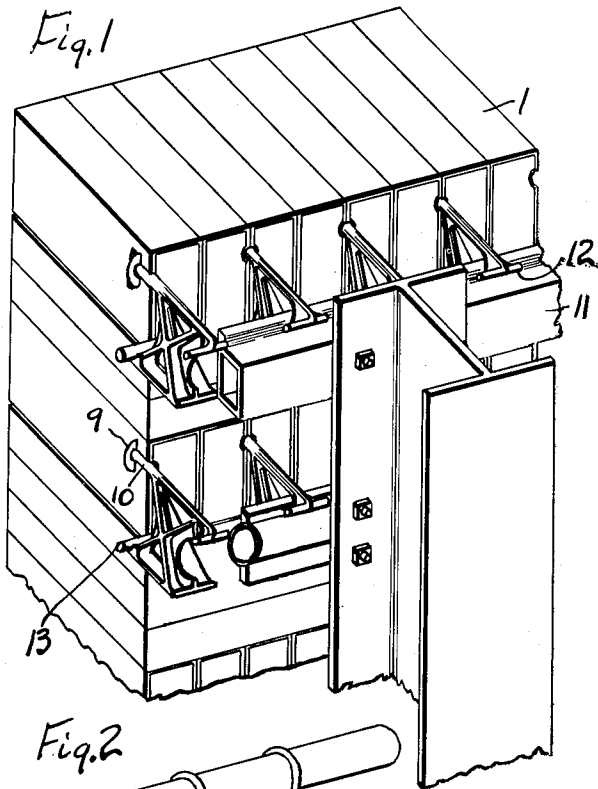


Fig. 2

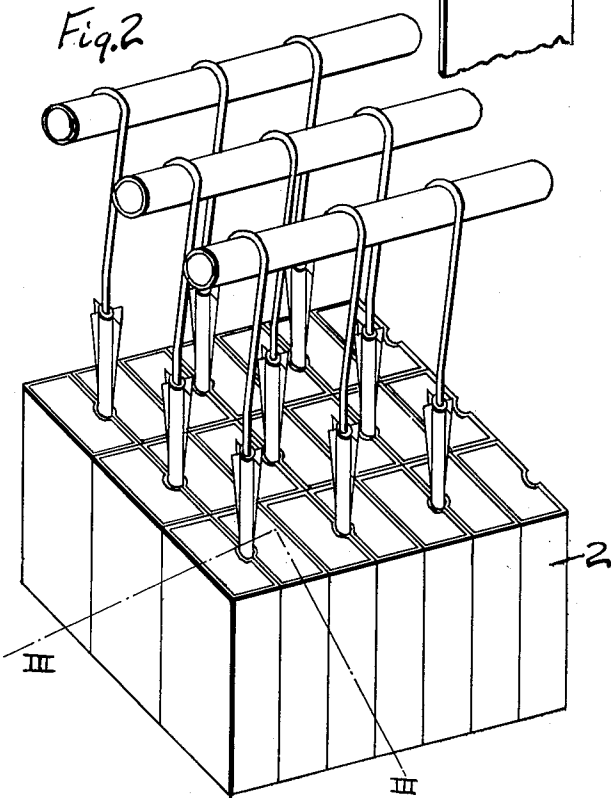


Fig. 4

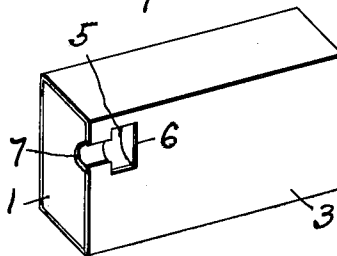


Fig. 5

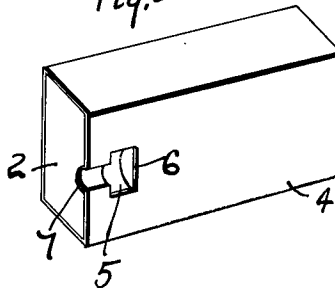
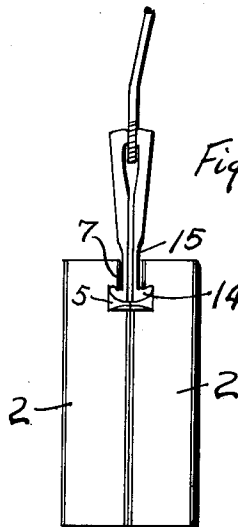


Fig. 3



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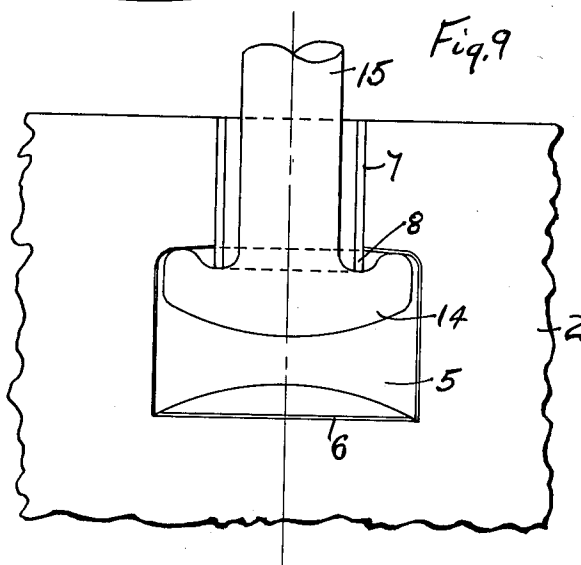
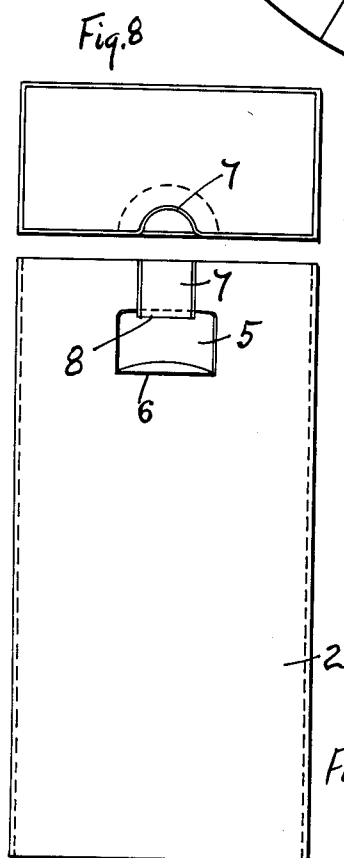
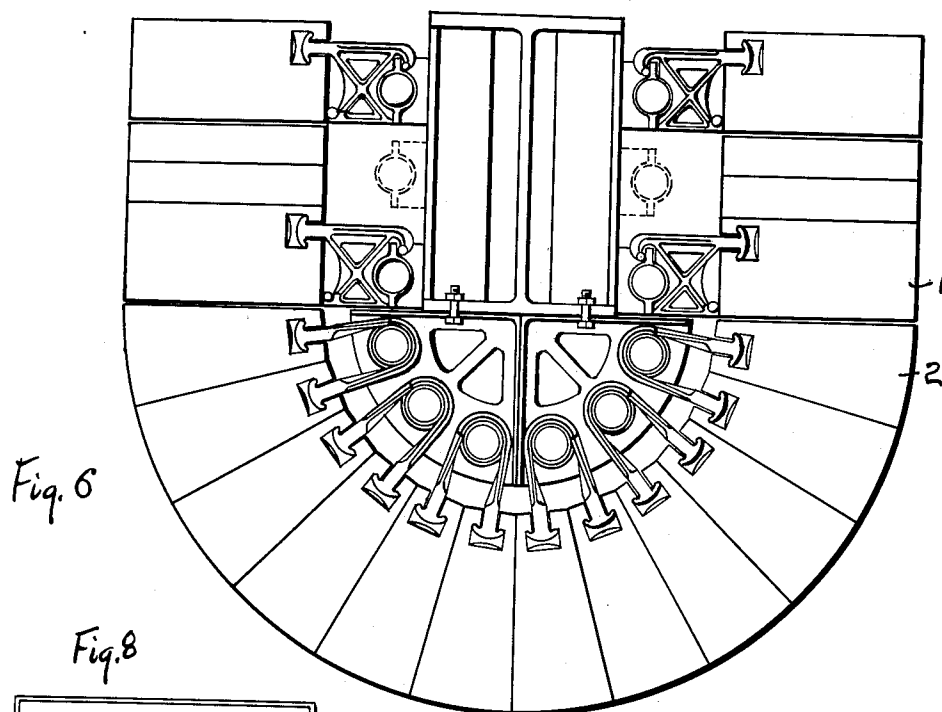
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2 Sheets-Sheet 2



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BASIC REFRACTORY SUPPORT

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Application March 15, 1950, Serial No. 149,838

4 Claims. (Cl. 110—99)

This invention relates to basic brick for use in walls and roofs of furnaces of that type using oxidizable metal spacers and to roofs and walls made therefrom.

One of the objects of the invention is to provide basic brick formed with metal-reinforced cavities for engagement with suspension or support means so that the brick when used in a wall are self-sustaining in horizontal position, and when used in a roof are suspended from overlying hangers.

A further object of the invention is to provide metal reinforcements so that the refractory or brick material used in a wall will be relieved of the greater part of the load making it possible to cantilever the brick without underlying shelves or other supports.

Another object of the invention is to provide a roof construction of such nature that the brick are placed in pairs tending to swing toward each other and close the joint to protect the hangers or supports against exposure to direct radiation from the furnace.

A still further object of the invention is to provide a connection between the roof brick and supporting hangers having relative rotative engagement so that the vertical height of the parts may be adjusted.

With the general objects named in view and others as will hereinafter appear the invention consists in certain novel and useful features of construction and organization of parts as hereinafter described and claimed; and in order that it may be fully understood, reference is to be had to the accompanying drawing, in which:

Figure 1 is a perspective view of the rear or outer face of a basic refractory wall embodying brick of the invention.

Figure 2 is a perspective view of the top or outer side of a basic roof embodying the brick of the invention.

Figure 3 is a fragmental cross-section on the line II—II of Figure 2.

Figure 4 is a perspective view of one of the wall bricks.

Figure 5 is a perspective view of one of the roof bricks.

Figure 6 is a section through a furnace nosing embodying basic brick of the invention.

Figure 7 is an enlarged face view of a brick to illustrate the relation of the reinforcement to the refractory.

Figure 8 is an end view of the structure shown in Figure 7.

Figure 9 is an enlarged section through the reinforcement and hanger engaged therewith.

In the said drawing, where like reference characters identify corresponding parts in all of the figures, the roof and wall constructions embody the same principle, namely, to provide a metal reinforcement for the brick so that the load is largely carried by the metal insert or encasement. The load on the refractory is very slight. With prior constructions of basic refractory or brick it has been necessary to embed the hangers relatively deeply in the refractory material in order to have a sufficiently strong cross-sectional area to stand the load. With the construction of the invention, however, the metal encase-

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ment itself carries the load and on firing of the furnace, a large part of the encasement at its front end coalesces or integrally unites with the refractory to form a relatively monolithic wall or roof. Although the reinforcement in both wall and roof brick, is applied in the same manner, the point of application is somewhat different due to the fact the wall brick are supported horizontally and the roof brick are suspended, as will hereinafter more particularly appear. For convenience of illustration the brick are shown as metal clad on four sides although the reinforcement of the invention requires metal cladding or partial cladding on one side only, the encasement being bonded to the brick in any suitable manner, as by being molded integrally with the refractory material and fired after installation in a furnace, or by firing the refractory prior to installation and then encasing the fired brick in the metal enclosure.

In the drawing, the wall refractory or basic material is shown as 1, and the roof basic brick are identified as 2. The three sided metal encasement for the above brick are identified as 3 and 4 respectively.

To provide means for supporting the wall brick in horizontal position in a furnace wall, these brick are formed in pairs, rights and lefts, to cooperate in flatwise abutting relation. Formed in the abutting faces of the brick adjacent their upper outer corners, are relatively offset cavities 5, said cavities in cross section, preferably being semi-circular, and having grooves of lesser cross section extending outwardly at right angles and opening through the adjacent end wall of the brick. The metal encasement 3 of said brick has a rectangular cut out 6 corresponding to the shape of the mouth of the cavity, but the relatively narrow ribbon of metal which spans the groove is bent downwardly as at 7 into close contact with the refractory material. By preference, this reinforcing neck extends somewhat into the cavity as at 8 so that the edge of the metal reinforcement carries the load, see Figure 9. With this arrangement the cavities in the brick may be relatively shallow since no heavy cross sectional area of the refractory is essential for load-sustaining purposes since if the refractory material should fail the load will be assumed by the metal encasement.

The hanger which supports the wall brick 1 comprises a circular head 9 receiving within the cavities of the brick, said head 9 being formed on the end of a reduced neck 10 passing outwardly through the groove, and being adapted for attachment to any suitable horizontal stringer, box, or other support 11, as by a downwardly opening hook 12.

The parts are so designed that each pair of wall brick are self-sustaining without any underlying horizontal shelf, the strain on the brick tending to rock or fulcrum them around the hanger heads 9 being resisted by contact of the back of the head with the metal extension or lip 8 of the stem reinforcement. To prevent oscillation and disconnection from the hangers, they are preferably provided with rather long abutments 13 contacting the outer face of the brick adjacent their lower outer corners as shown in Figure 1.

The hanger which supports the roof brick 2 has a head 14 and neck 15, in right angular relation corresponding to those described in connection with the wall brick. In the roof brick construction, however, as the load is vertical, the cavity in the face of the brick is centered in relation to the sides of the brick so that the brick will hang vertically and not swing in an edgewise direction as would occur with the off-center construction of the wall brick. The roof brick 2 are also mounted in pairs suspended from a single hanger. In this connection it is to be noted that the brick will tend to fulcrum on the hanger heads 14 and swing toward each other at their

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outer or fire ends, which maintains a tight joint and protects the hangers against direct radiation from the furnace.

From the above description and drawings it will be apparent that I have produced a construction embodying all of the features of advantage set forth as desirable, and while I have described and illustrated the preferred construction, it is to be understood that I reserve the right to all changes within the spirit and scope of the appended claims.

I claim:

1. A basic refractory having a cavity in one face adjacent one end of the refractory, said face also having a groove connecting the cavity to said adjacent end of the refractory, and a metal encasement for the face of the refractory having a cut-out coinciding with the cavity and a metal neck integral with the encasement lining the groove, said lining projecting beyond the groove into the cavity.

2. A basic refractory for furnaces having a groove in one side face leading from one end of the refractory, said groove at a point remote from the end being enlarged to form a cavity in the said side face of the refractory, and a metal plate facing said refractory and having a cut-out accommodating the cavity, the metal facing being depressed into proximity with the groove so that should the loaded portion of the refractory fail the depressed metal in the groove will assume the load.

3. A basic refractory wall comprising a support and a plurality of pairs of refractories having companion cavities

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ties in their adjoining faces, said cavities communicating with one end of the refractories by grooves in said faces of lesser cross-section than the cavities, metal reinforcements locked to the refractories and having cut-outs accommodating the cavities, said metal being formed to line the grooves, and a hanger accommodated by the grooves and having a head within the cavities for supporting said refractories, the metal groove-liner absorbing the load if the refractories should fail.

4. A furnace having a support, a basic refractory having a cavity in one face communicating with one end of the refractory by a groove in said face of lesser cross-section than the cavity, a metal encasement for the refractory having a cut-out coinciding with the cavity and a metal neck integral with the encasement lining said groove, and a hanger carried by the support and extending through the groove and terminating in a head received within the cavity, the neck of the metal encasement absorbing the load if the refractory should fail.

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