Sept. 18, 1945. H. C. THAYER 2,384,859

HEAT RESISTING WALL CONSTRUCTION

Filed Feb. 15, 1939 3 Sheets-Sheet 1

Fig. 1.

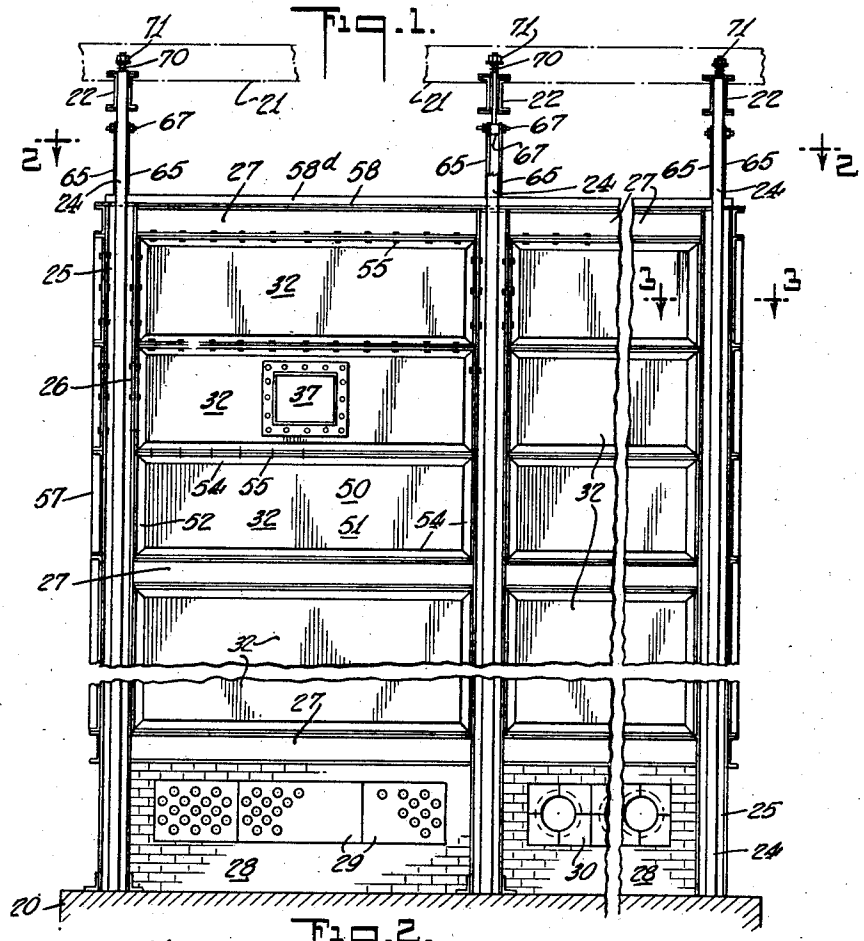
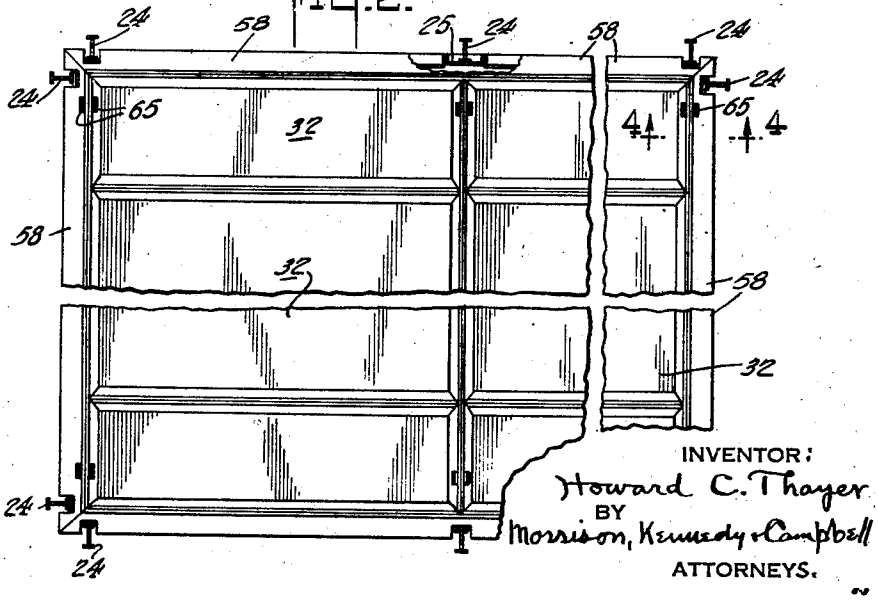


Fig. 2.



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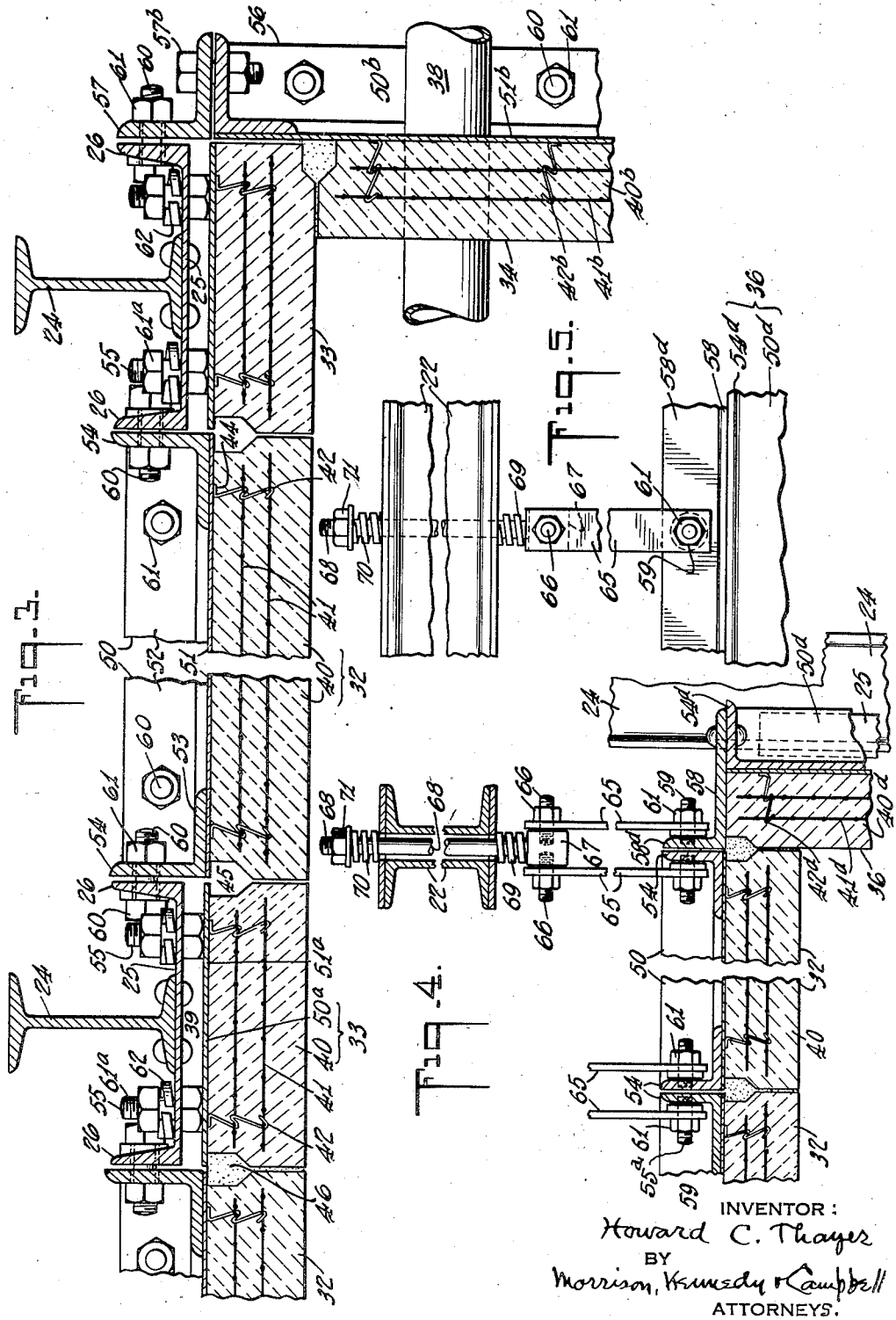


Fig. 4.

Fig. 5.

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Filed Feb. 15, 1939 3 Sheets-Sheet 3

Fig. 7.

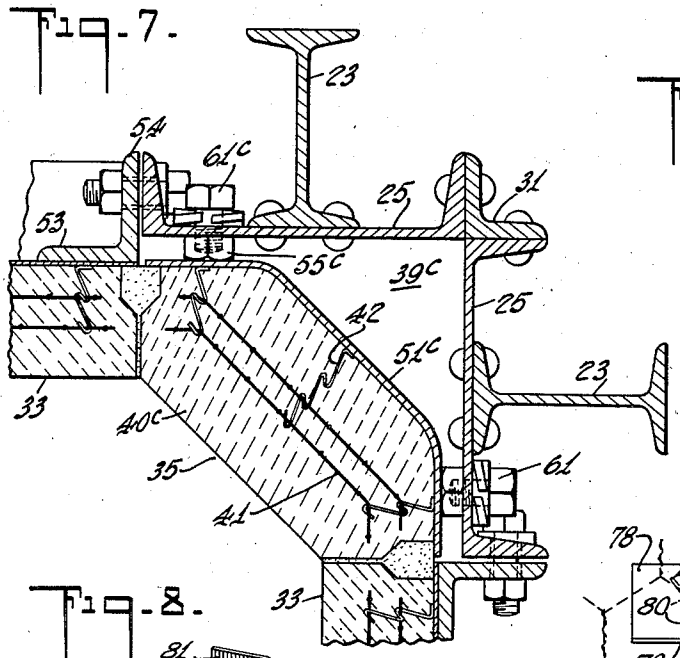


Fig. 6.

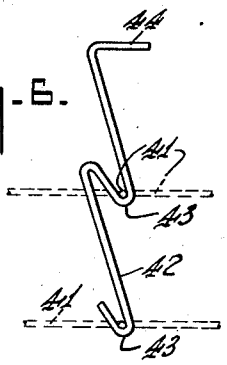


Fig. 9.

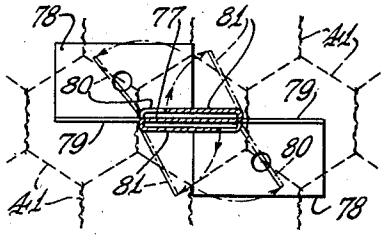


Fig. 8.

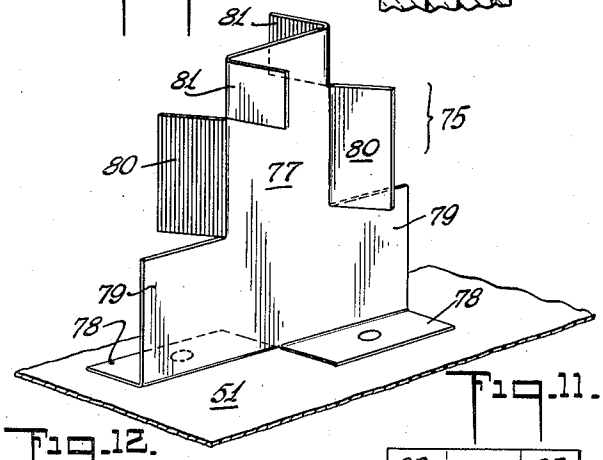


Fig. 10.

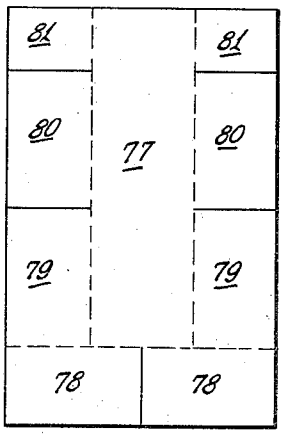


Fig. 11.

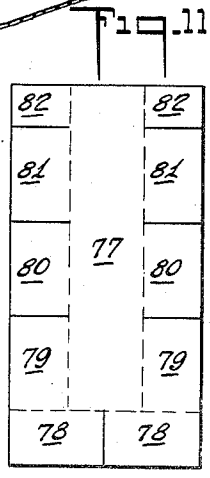


Fig. 12.

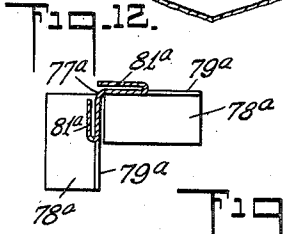
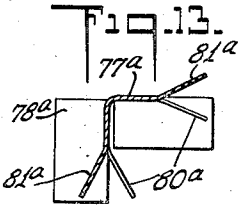


Fig. 13.



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UNITED STATES PATENT OFFICE

2,384,859

HEAT-RESISTING WALL CONSTRUCTION

Howard C. Thayer, Jersey City, N. J., assignor to Quigley Company, Inc., New York, N. Y., a corporation of New York

Application February 15, 1939, Serial No. 256,609

8 Claims. (Cl. 72—101)

This invention is a novel heat-resisting wall construction, and has especial reference to an improved system of constructing heat-resisting or refractory walls, comprising features both of method and structure. The word "wall" in this specification is intended to include any wall or housing of an enclosure or chamber subject to heating, whether a side wall, top wall or bottom wall, whether flat or curved, and whether square or of other general contour. The invention pertains more particularly to walls adapted to surround hot chambers of various kinds, the word "chamber" being intended in its broad sense of including flues and other enclosed spaces; a typical instance being the enclosing walls of the combustion chamber of a furnace, whether cylindrical or of a shape having corners, although the invention is practically available for many other types of heat apparatus, for various uses in various industries, such as for bins, cars, dryers, kilns, ovens or stills.

More particularly the present invention deals with the matter of ready renewal or replacement of defective or burned out wall areas or sections in furnaces or other apparatus, especially in cases wherein the wall system or chamber comprises a permanent metal skeleton, as of structural steel members, and supported therefrom a built-up wall closure composed of preformed panels, so arranged and mounted as to afford a closed wall, the interior or facing part of which is composed of plastic, molded or cast heat-resisting or refractory material exposed to the heat of the chamber, and more specifically composed of an insulating refractory material, such as those hereinafter set forth. In this statement the term "panel" is intended to include any desired shape of wall sections or units which collectively constitute the closed part of the wall or chamber housing.

In the particular field thus set forth an important object of the present invention is to afford a refractory wall construction of panels, preferably on a skeleton frame, which is complete in itself, and is of such structure and arrangement that the individual panels, or at least the major part of them, are readily removable exteriorly; whereby, in case of interior damage or burning, any defective panel or panels may be removed by simple exterior detachment and extraction, and replaced by a similar substitute, in an easy and quick manner. It is believed that there has been no prior wall construction which was of practical character and has attained any appreciable success for purposes such as described, notwithstanding the substantial desirability of such a construction due to serious losses in time and expense incurred in various industrial plants by the prevailing necessity of shutting down a complete series of operations in a plant, which may sometimes consist of connected successive units, in order to permit repair operations on one unit from the inner side of the wall thereof, in severe cases requiring as much as several days work, as compared with a few hours or less by the use of a practically successful construction wherein any damaged panel or wall section may be exteriorly disconnected, detached, replaced and reconnected for prompt resumption after brief suspension of operations.

Further objects include affording an improved form of attaching or anchoring means for exteriorly removable wall panels; also a simple and effective mode and means of reinforcement of the cast or molded portions of panels, particularly of light weight or insulating refractory, which reinforcement will be inexpensive of manufacture, simple in use, and adapted to be combined with the panel anchoring or attaching devices. Other and further objects and advantages of the present invention will be explained in the hereinafter following description of an illustrative embodiment thereof or will be manifest to those conversant with the subject.

In the accompanying drawings

Fig. 1 is a front elevation view of a walled chamber or furnace embodying the present invention; the view being broken away both vertically and horizontally to indicate possible further extension of structure in these directions.

Fig. 2 is a top plan view of the furnace of Fig. 1 taken partly in section on the horizontal line 2—2.

Fig. 3 on a considerably larger scale is a top view in section taken on the horizontal line 3—3 of Fig. 1, showing the invention embodied in one or more side walls of the furnace.

Fig. 4 is a front elevation view, partly in vertical section taken on the line 4—4 of Fig. 2, and showing an application of the invention to the top wall of the chamber.

Fig. 5 is a right hand elevation view of the structure shown in Fig. 4.

Fig. 6 is a detail view on a much enlarged scale of a part of the reinforcement of Figs. 3 and 4, showing the wire construction of embedded post member.

Fig. 7, in top view and section, like a portion

of Fig. 3, shows a modification of structure, particularly at the corner where two side walls meet.

Fig. 8 is a perspective view showing a modified form of reinforcng post member, constructed of sheet material or metal instead of wire. Fig. 9 is a top view of the reinforcing post of Fig. 8, associated with a reinforcing mesh element; the post portion being shown in full lines with its wings bent compactly for the purpose of threading the same through the mesh, and in dotted lines with the wings in final or angular positions, corresponding with Fig. 8. Fig. 10 shows a sheet metal blank which has been cut in suitable manner to permit bending of its feet and wings according to Figs. 8 and 9.

Fig. 11 is a view similar to Fig. 10 showing a modification which permits three tiers or levels of wire mesh instead of only two.

Fig. 12 shows in top view a post element analogous to that of Figs. 8 to 11, but centrally bent at right angles for use near the corner of a slab, the wings being shown bent to threading position. Fig. 13 is a view corresponding to Fig. 12 showing the wings bent into their final or locking position.

Referring in detail to the drawings, Figs. 1 and 2 indicate a walled chamber or furnace as an illustrative example in which the present invention is embodied. The chamber or furnace stands upon a foundation 20 and over the entire structure is a cover or roof 21 supported by a system of cross girders 22. The chamber is built up primarily of panels, and these preferably are supported on a structural frame which, as illustrated, may comprise tall column members 24 shown in the form of I-beams, these being extended upwardly above the chamber proper and giving support to the cross girders 22. For structural purposes the taller column members 24 are combined with shorter column members 25, shown in the form of channels, which are riveted to the I-beams 24, and the opposite side flanges 26 of which are utilized, as will be described, to support the system of wall panels. The framework members described are preferably part of an open or skeleton frame of structural metal adapted to give support to the panels or closed part of the wall while being protected thereby. The skeleton framework thus is shown completed by a system of horizontal frame members 27, being girders in the form of channels. Below the lowermost frame girder 27 are shown firebrick walls 28 enclosing the bottom space or pit of the chamber; and in this part of the structure, for illustration, are shown a system of heating devices, including for example blocks or plates 29 containing gas burners or openings therefor, and other blocks or plates 30 constituting fittings for oil burners, in the case of a plant which may be changed over from gas to oil combustion. The described skeleton framework may be variously modified or supplemented, as for example in the modified arrangement shown in Fig. 7 wherein two column channels 25 are shown as being adjacently arranged, and rigidly interconnected by corner column pieces or angles 31.

The chamber wall then comprises wall members including essentially the removable panel members and preferably the frame members which are permanent.

Referring next to the panel system, Fig. 1 shows the side walls closed by a series of panels 32, a plurality thereof being arranged within each frame space bounded by two columns and two girders; while Fig. 2 shows a generally analogous structure for the top wall or ceiling of the chamber. As will be described in further detail each panel of this invention consists of two main parts, unitarily connected, namely an interior non-metallic facing part or slab portion 40 and an exterior rigid backing or carrier portion 50 composed either of metal or of some rigid non-metallic structural material. The major portion of the wall area may be composed of panels 32 so constructed, but at special situations, or for special purposes, modified panel structures are provided.

Whereas each panel 32 may be simply detached and exteriorly removed, as will be further described, this is not possible with a panel located directly inwards of the structural frame members. Therefore as shown for example in Fig. 3, there have been provided a number of supplemental panels 33, each at least of the full width of the column channel 26, and being removable in case of damage by first detaching and removing an adjacent main panel 32 and thereupon detaching and extracting the supplemental panel 33 through the opening left by the removal of the main panel.

So also, at upright chamber corners, a special arrangement is necessary, and Fig. 3 shows an arrangement in which a special corner panel 34 is provided, the backing or carrier portion of which projects at 56, as will be further described, beyond the end of the contiguous panel in the adjacent wall. In Fig. 7 is shown a modified form of corner panel 35, disposed at 45° and bridging the gap between the adjacent panels in the two meeting walls.

In these and similar ways the special problems of design at particular locations may be met, within the principles of the invention. For example when the chamber ceiling is considered, while this may be composed mainly of regular panels 32, a special panel 36 is shown at the corner, this having secured to its carrier portion a special angle piece 58, overlying and protecting the facing of the panel and having an upright flange 58^d for detachable connection purposes. In the case of any of the panels, occasional ones of them may be provided with a window 37, as shown in Fig. 1, comprising a transparent refractory material through which interior operations may be observed.

Referring in detail to a main panel 32 as an illustration of the principles involved, and referring for example to Fig. 3, the panel consists in general of the interior facing or refractory slab portion 40 unitarily connected with the rigid exterior backing or carrier portion 50. The facing portion is preferably a monolithic slab of heat-resisting plastic material, by which is meant any material that may be molded, cast or plastered on to the product, adapted to withstand the interior conditions, and in the case of a furnace preferably heat insulating. As an example the slap 40 may be composed of concrete, either solid or cellular, although many marketed materials have material advantages thereover in regard to refractory character, light weight, or insulating properties. Porous materials weighing not much over 1 pound per cubic foot may be used, or others of better quality weighing 10 or 20 or 36 pounds per cubic foot, and in the case of refractory cement or concrete as heavy as 250 pounds. An advantageous slab construction is one which is built up with its outer strata of maximum porosity and lightness, tapering thence to a more dense and heat-resisting interior stratum, with perhaps a sprayed or trowelled refractory coating at the face

of the slab, where corrosion is to be resisted.

Such marketed materials, mixed with or without cement, but moldable and settable at ordinary temperatures without need of baking or fire-hardening, including various prior well known plastic or castable materials adapted to be poured, blown or otherwise molded into a facing slab directly upon a panel backing, such as the following products of the assignee of this patent. Hearth-Crete is a castable refractory plastic material of high density and heat resistance, weighing about 175 lbs. per cubic foot, and resistant to molten slag. Cast-Refract, weighing about 125 lbs., affords some insulation but is less refractory, withstanding to about 2600° F.; it contains crushed burned fireclay aggregate, and on wetting and molding it cold-sets quickly. Insulcrete possesses good insulating properties and weighs about 64 lbs., withstanding up to 2500°. For a stratum well shielded from the fire Insulag gives high insulation, being cellular, weighing from 36 lbs., down to below 20 lbs. more or less, and resistant to about 2000°. A satisfactory panel slab may consist of any of these or other known materials of the same type, either singly or in various combinations according to temperature and operating conditions.

The panel facing portion or slab 40 preferably contains metallic reinforcement, and Fig. 3 shows two layers of reinforcement 41 which may consist of wire mesh, expanded metal or the like, in more or less number of layers. The reinforcement is shown also as comprising a system of what will be termed posts, which may be of various types, which interlock with the mesh layers, and which extend outwardly to where they may be secured to the backing portion of the panel, as for example to the sheet metal intermediate plate 51 thereof. Thus each reinforcement post 42, shown as composed of wire, has bends or notches 43, see also Fig. 6, forming shoulders which interlock with the layers 41, and each post having a foot or base 44 exposed outwardly of the facing slab and there secured to the backing plate 51 in any desired manner, preferably by welding, brazing or soldering, but otherwise by bolting, screwing or riveting. The preferred mode of manufacture is to assemble first the reinforcement system with the backing or carrier element and then apply the plastic material of the facing, by molding, casting or projecting with a gun, so as to form a monolithic slab embedding the reinforcement as described. The facing slab should be constructed in a manner to leave recesses 45 contiguous to similar recesses in adjacent panel slabs, which recesses may be filled with suitable filling material 46, in the form of cement, mortar or the like, as indicated at selective places in Fig. 3. Such material may serve also for packing the clearance between two slabs.

The rigid carrier or backing 50 comprises preferably the intermediate sheet metal piece 51 already mentioned, against which the facing slab is secured, and outwards thereof suitable extensions for attaching purposes. For instance in the main panel 32 the backing comprises a hollow body or box 52, either cast or built up of angles, having preferably an open center for lightness, with a flat wall 53 against the plate 51 and with an outstanding rim or flange 54 constructed or perforated for engagement by the attaching devices to be described. The interconnection between the panel backing and facing portions serves to lock the facing to the rigid backing, and may be considered as consisting of the extensions or posts 42 extending from the backing and projecting inwardly therefrom into the interior of the facing for locking engagement therewith, to render unitary the two portions of the panel; and when the facing is a cast slab the interconnection may serve the further function of reinforcing the same.

As so designed and constructed the main panel 32 will be seen to be extractible from the exterior if detached from adjacent wall members. While each such panel might be mounted between a series of similar panels, attached to and detachable therefrom for removal, preferably each panel is connected directly to a skeleton frame member, column or girder, or a plurality thereof, so that no panel is dependent solely on adjacent panels for its support. As a mechanical attachment or device there is shown a series of bolts 60 extended through perforations in the rims 54 of the panel backings, and through the flanges 26 of the channel columns 25, each bolt being secured and tightened in place by its removable nut 61; and there may be included suitable washers, for example spring lock washers 62, shown at certain locations. The locations of these attaching devices are indicated in a general way as to the panels 32 at the upper left portion of Fig. 1, each panel being safely attached to the surrounding wall members. Since each attachment device or bolt is readily accessible and releasable from the exterior it follows that any individual panel, or at least the major part of the panels, may be individually detached, extracted and removed exteriorly, as for repair or replacement, and then restored and reattached.

The top wall or ceiling of the chamber is preferably suspended from above, by means of hanger devices, for example depending from the overhead girders 22, as shown in Figs. 4 and 5. Each main panel 32 is shown so suspended, and the same arrangement is applied to the topmost upright special panel 36 of the vertical wall at the right of Fig. 4. This special panel has its facing 40^d containing embedded reinforcement 41^d with posts 42^d connected to the backing member 50^d, and the topmost flange 54^d of this backing is shown as having a special or extension angle piece 58 secured to it, this overlying the facing 40^d and having an upstanding flange 58^d alongside of a flange 54 of the adjacent main panel. Each of the main panels is shown suspended by means of drop links 65 extending upwardly from bolts 55^d projecting from the flanges 54, and a similar link 65 extends upwardly from a bolt 59 projecting from the angle flange 58^d.

The ceiling hanger links 65 in each case are shown as hung by a bolt and nut attachment 66 from the head 67 of a vertical plunger or a long bolt 68, which in turn extends through the hollow interior of the girder 22. The suspension may be cushioned to allow for thermal expansion and contraction or other movement, for example by means of a coil spring 69 confined between the girder 22 and the plunger head 67, and another such spring 70 confined between the girder and top nut 71 threaded on to the end of the plunger. By these arrangements an extended top wall or furnace ceiling may be safely and adjustably mounted.

The special panel 33, inward of the frame column 25, requires special description. Its refractory facing 40 is connected as before to the intermediate plate 51^a of the backing or carrier 50^a, which in this case is quite unlike the backing 50. Instead of the box structure 52, the backing 50^a comprises simply a set of bolts 55, which may be

welded directly to the plate 51a, their shanks extending through perforations in the channel 25 for the exterior application of attaching nuts 61a. Thus when an adjacent main panel has been removed the nuts 61a may be removed, and by reaching in behind the column the special panel may be detached, first with an interior movement, and then sideways for extraction through the adjacent wall gap.

The special panel 34 has been partially described. Its backing 50b is extended horizontally at 56 to complete the corner structure, and it is there connected indirectly to the column flange 26 by means of a special vertical angle piece 57, the panel being secured to the angle by bolts 57b and the angle to the column by bolts 60 and nuts 61 as before. Any of the panels may be specially provided with apertures to receive tubes or passages for boiler circulation or other purposes, and Fig. 3 shows tubes 38 passing into the chamber through the panel 34.

The special diagonal corner panel 35 shown in Fig. 7 is in principle similar to the main panels, but with redesign. The facing slab 40c has 45° ends to match the adjacent wall panels. The intermediate plate 51c is partly diagonal, and partly bent into alinement with the adjacent panels. The reinforcement posts are welded to this plate. The backing or carrier comprises the plate 51c and welded nuts 55c with which exterior attaching means or bolts 61c may be engaged through perforations in the column 25.

In Fig. 3 the special panel 33 has its backing plate 51a connected with bolts 55 to receive exterior nuts 61a for attachment of the panels. In Fig. 7 on the contrary it is the nuts 55c which are connected or welded to the plates, the bolts 61c being the attaching elements. These reversible arrangements are equivalents in general, but the latter plan somewhat facilitates the attaching and detaching of the corner panel 35.

Referring further to the reinforcement for the illustrative facing slab, this may be described as comprising preferably a plurality of layers of mesh, meaning any analogous reinforcing structure, together with a plurality of posts, each locked with each layer, and each extended to the exterior face of the slab for connection with the panel backing. While a bent wire post is illustrated in Figs. 3 to 7, the different type of posts shown in Figs. 8 to 13 has important advantage in certain situations. Each of these may be described as a sheet metal post having a bent base portion or feet, with a body or shank rising from the base, this being so shaped or slitted as to afford a series of integral wings extending laterally; this permitting the wings to be folded snugly in against the shank for insertion or threading through the mesh, as shown in full lines in Fig. 9, and then bent out again, as shown in dotted lines, to interlock the layers of mesh with the post.

In detail, the sheet metal post 75 is struck or formed from a blank 76, which may be a square blank of suitable sheet metal, such as steel, galvanized iron, copper or zinc. The blank of Fig. 10 corresponds with the post shown in Figs. 8 and 9. Its longitudinal or shank portion or body 77 has its lower end bent into one or more feet 78, attached to the plate 51, as by welding if the plate be of metal. The post has certain projecting laterals or wings, the lowest of which, laterals 79, may be fixed, constituting a support for the first layer of mesh. Therebeyond are a pair of bendable wings 80, on top of which may rest the second layer of mesh, and above these is another pair of wings 81. In Fig. 11 is shown a modification with a fourth pair of wings 82. In any case each mesh layer is supported and positively positioned by the lateral or wing underlying it, and the bent wing overlying it. Assembling is readily performed by bending all the wings snugly in against the shank, as in Fig. 9, then threading the shank through the first layer of mesh, opening out the wings 80, 80 to angular positions, threading the top of the shank through the second layer of mesh, and opening out the next wings 81, 81 into different angular positions; and so on in the case of additional layers and wings.

In Figs. 12 and 13 the structure is substantially the same, the reference numbers corresponding, but with the exponent *a*, the main difference being that the upstanding shank 77a is now centrally bent to a suitable angle, so that the entire post is better fitted to be embedded in a facing slab adjacent to one of the corners thereof. As the shank and wings are threaded through the successive layers of mesh, the wings are bent outwardly to the Fig. 13 position. When the reinforcement is all relatively in position the plastic material is applied and allowed to set.

Various adaptations of design and detail may be necessary for various circumstances; and upon the underlying ideas hereof various improvements are possible. The slab reinforcing structure affords an inexpensive but effective system; a simplification would be to strike from the plate 51 integral tongues each bent rearward and shaped to act as mesh-positioning posts. Air spaces may be allowed for circulation and protection of steelwork, for example such a vertical space 39 appears in Fig. 3, and a corner space 39a in Fig. 7. The filling material 46 between slabs may act not merely as a joint-sealer, but in some cases as a bond. The slabs may have their faces of special shapes, for example of sinuous contour when bounding a chamber containing staggered tiers of boiler or other tubes.

There have thus been described the several features of the present invention, embodied in a chamber or chamber wall, including a replaceable panel system, the relation of the panels to the entire structure, the construction of the panels per se and of the component parts thereof, and the method or procedure in constructing the same; and since the different features or elements may be variously modified without departing from the principles disclosed, it is not intended to limit the invention to such matters except to the extent set forth in the appended claims.

What is claimed is:

1. A heat-resisting furnace wall construction having a skeleton frame of structural members and supported thereby a system of exteriorly removable separate panels collectively closing the wall area and protecting the skeleton frame, each of such panels consisting of a preformed and unitary assemblage of backing and facing portions, the panel backing comprising a rigid panel-size carrier for the facing and having exterior extensions for the readily removable attachment of the panel to the wall frame by exteriorly accessible mechanical attaching devices, the panel facing comprising a molded and set slab of heat-resisting plastic material, with means unifying tightly the facing slab and rigid backing comprising slab reinforcement including posts projecting from the backing into the facing, and said reinforcement being wholly embedded

and permanently locked in said plastically molded facing slab; and the system of panels being positioned in the wall with their slabs in mutual alinement and with some panels which are positioned inwards of skeleton frame members having means by which they are spaced inwardly from such frame members, thereby to provide air spaces therebetween.

2. A heat-resisting wall construction for a heat chamber, having an open structure frame of columns and beams and supported thereby a system of exteriorly removable panels collectively closing the wall area and protecting the frame, each of such panels consisting of an independent and unitary assemblage of backing and facing portions, the panel backing comprising a rigid panel-size carrier for the facing and having extensions for the readily removable attachment of the panel to the wall frame by exteriorly accessible mechanical attaching devices, the panel facing comprising a molded and set slab of heat-resisting plastic material, with means unifying tightly the facing slab and rigid backing comprising slab reinforcement including posts projecting from the backing into the facing, and said reinforcement being wholly embedded and permanently locked in said plastically molded facing slab; and the system of panels being positioned in the wall with their slabs in mutual alinement and with the backings of some panels spaced inwardly from the frame column members, thereby to provide air circulation spaces therebetween.

3. A furnace or other heat-resisting wall adapted to enclose a heat chamber, the same comprising an open structural frame supporting a system of wall members including exteriorly removable panels collectively closing the wall area and protecting the frame, and each panel consisting of a tight assemblage of facing and backing portions, the backing being a rigid metallic carrier for the facing and having extension flanges for the independent attachment of the panel to the wall frame by exteriorly accessible mechanical attaching devices, the facing comprising a monolithic slab of non-metallic heat-resisting plastic containing longitudinal reinforcement and outwardly extending posts connected thereto all plastically embedded in the slab, said posts being tightly connected with the backing thereby to render unitary the intercombination of facing and backing constituting the panel; and said panels including special panels inwards of and protecting frame members, each such panel being mounted inwardly removed from its frame member, thereby to leave air circulation space inwards of the frame member.

4. A heat-resisting wall construction for a heat chamber, having an open structure frame of columns and beams and supported thereby a system of exteriorly removable panels collectively closing the wall area and protecting the frame, each of such panels consisting of an independent and unitary assemblage of backing and facing portions, the panel backing comprising a rigid panel-size carrier for the facing and having extensions for the readily removable attachment of the panel to the wall frame by exteriorly accessible mechanical attaching devices, the panel facing comprising a molded and set slab of heat-resisting plastic material, with means unifying tightly the facing slab and rigid backing comprising slab reinforcement including posts projecting from the backing into the facing and said reinforcement being wholly embedded and permanently locked in said plastically molded facing slab; and the system of panels comprising one or more special wall panels each adapted for an angular corner between two chamber walls and whose backing is a plate having its middle portion at a diagonal and its end portions substantially parallel respectively to the two walls, with detachable mechanical means to attach such end portions to frame members of the wall; and whose facing slab has its face surface substantially parallel to the middle portion of the backing plate.

5. For a chamber wall comprising a system of exteriorly replaceable wall panels collectively closing the wall, a panel shaped to permit exterior removal from position and consisting of an interior non-metallic monolithic facing portion of plastic material and an exterior rigid backing portion, the facing being a slab having permanently embedded in it a longitudinal reinforcement system and a plurality of outwardly extending posts connected with said backing to constitute of said facing and backing a tightly unitary panel, and the backing having projections extending outwardly and adapted to cooperate with mechanical attachments by which the panel may be releasably attached to the exterior portion of an adjacent wall member; said facing slab reinforcement comprising a plurality of layers of mesh and said posts consisting of metal posts each having as a base a bent foot for attachment to a backing, a post shank rising from said base, and integral wings extending laterally outwardly from said shank into interlocking relation with said mesh and each wing being adapted to be folded in adjacent to the shank for insertion through the mesh.

6. In a plastic facing slab having a reinforcing system consisting of at least one layer of mesh and a distributed plurality of posts; a construction of post consisting of a piece of bendable material formed with an upstanding shank portion, and with at least one lateral extending from the shank and forming a support upon which may be positioned a mesh layer, and above said lateral at least one wing extending laterally outwardly from the shank in position to overlie a mesh supported on said lateral, and said wing being adapted to be first infolded adjacent to the shank to pass through a mesh before being unfolded to overlie such mesh and confine it upon the lateral.

7. In a plastic facing slab having a reinforcing system consisting of a plurality of layers of mesh and a distributed plurality of posts; a construction of post consisting of a piece of bendable metal formed with a transverse upstanding shank portion, and with at least one lateral extending from the shank and forming a seat upon which may be positioned a first mesh layer, and above said lateral at least one wing extending laterally outwardly from the shank in position to overlie the mesh supported on said lateral, and said wing being adapted to be first folded in to pass through the mesh before being unfolded to overlie the mesh and confine it down upon the lateral; and with a second such wing extending from a higher point on the shank in position to overlie a second layer of mesh and confine it down upon the first wing as a seat.

8. In a plastic facing or slab, a reinforcing system consisting of at least one layer of mesh and a distributed plurality of posts; each post constructed of a piece of bendable sheet material and formed with an upstanding shank por-

tion transverse to the slab, and with at least one lateral extending from the shank and forming a support upon which is positioned a mesh layer, and above said lateral at least one wing extending laterally outwardly from the shank in position to overlie the mesh supported on said lateral, and said wing being adapted to be first infolded to pass through the mesh before being unfolded to overlie the mesh and confine it upon the lateral; and with a further such wing at a higher point on the shank for each additional layer of mesh in the slab; and a base extension at the low end of said shank for attachment of the slab to another part.

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