

March 23, 1937.

W. G. VOGEL

2,074,874

BOILER AND SMOKE BREECHING CASING

Filed Oct. 19, 1934

4 Sheets-Sheet 1

Fig. 1.

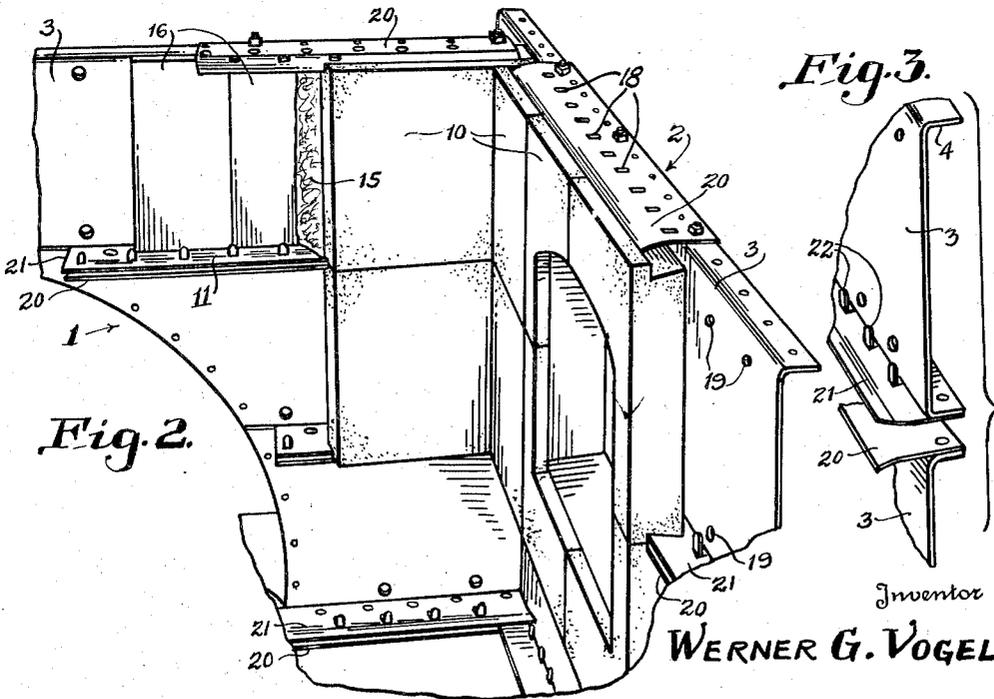
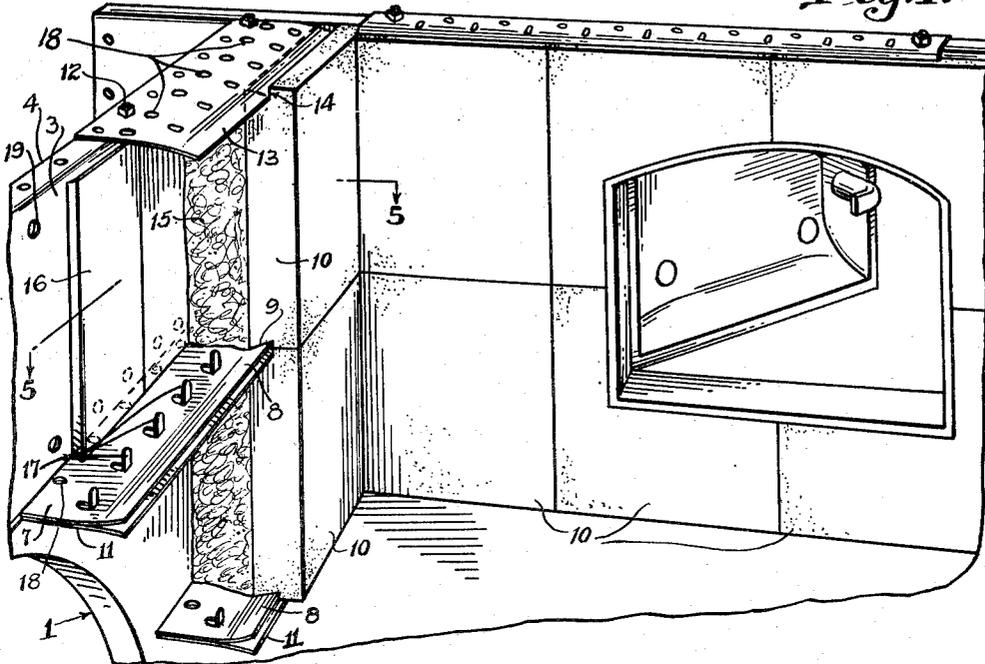


Fig. 2.

Fig. 3.

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Fig. 5.

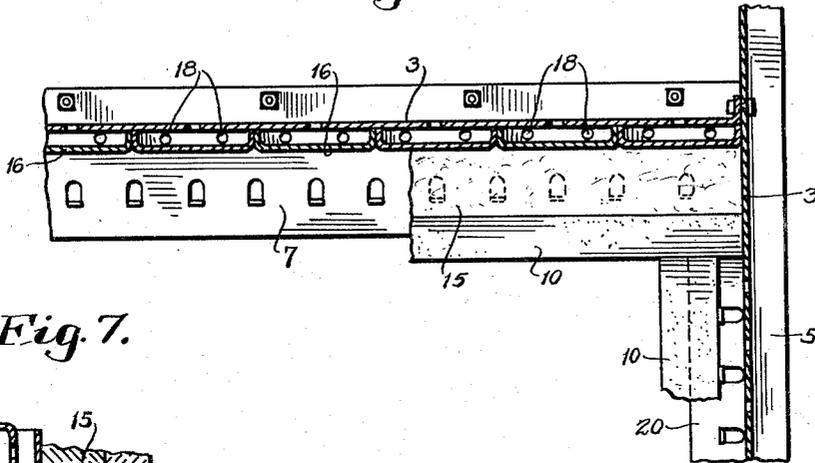


Fig. 7.

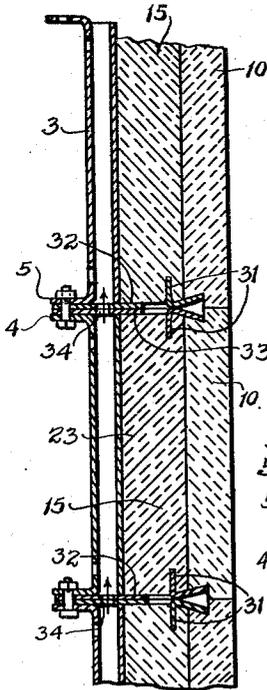
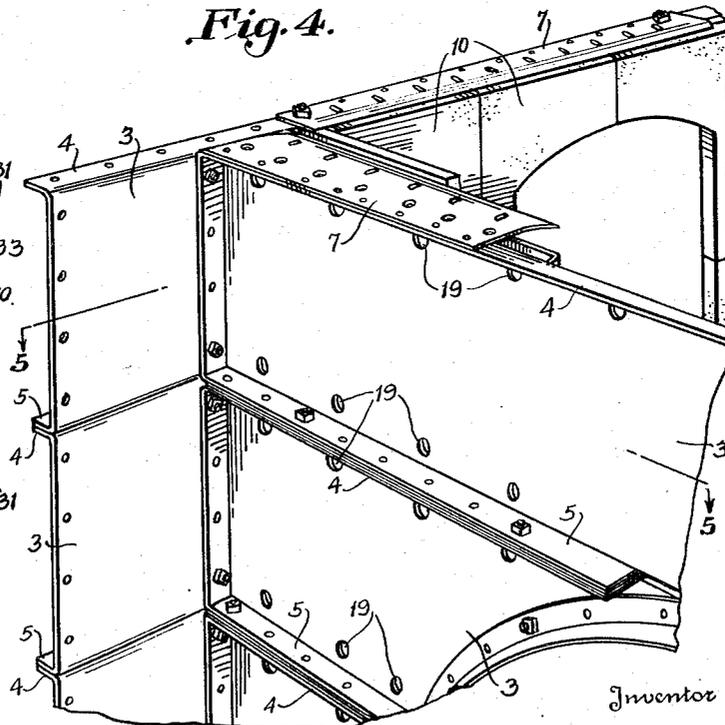


Fig. 4.



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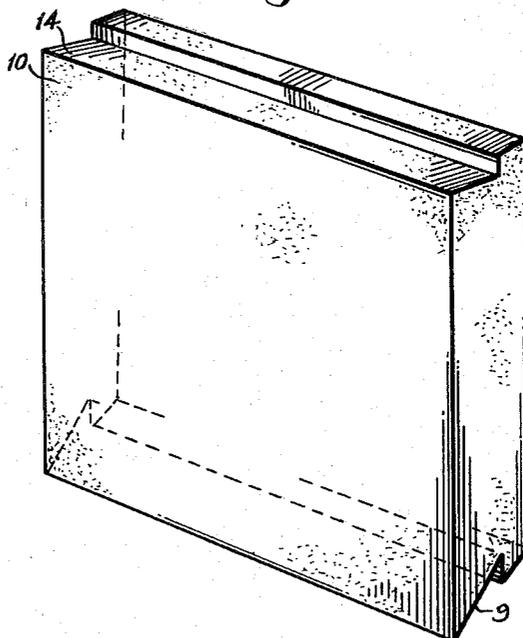
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Fig. 6.



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4 Sheets-Sheet 4

Fig. 8.

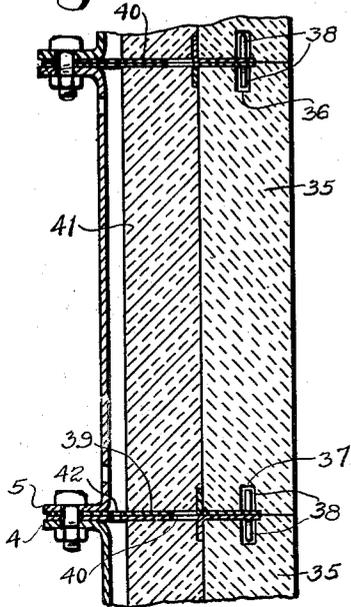


Fig. 9.

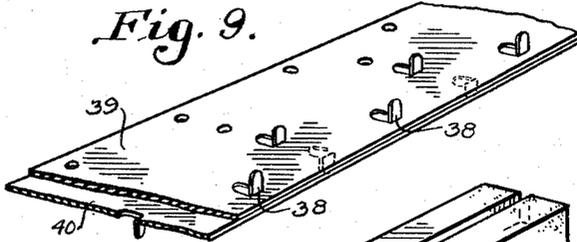


Fig. 10.

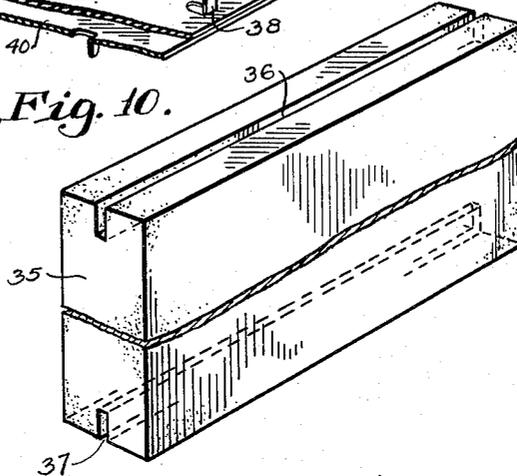


Fig. 11.

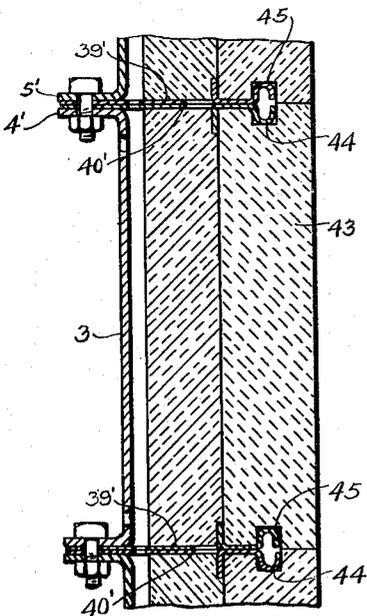


Fig. 12.

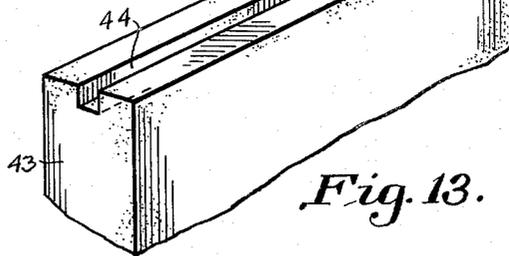
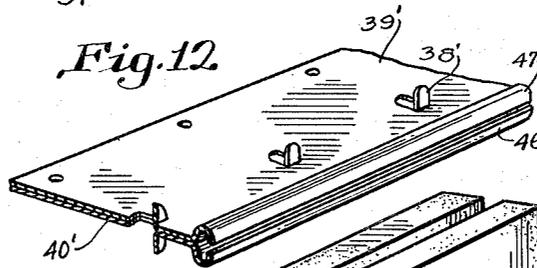


Fig. 13.

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UNITED STATES PATENT OFFICE

2,074,874

BOILER AND SMOKE BREECHING CASING

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Henry Vogt Machine Co., Louisville, Ky., a corporation of Kentucky

Application October 19, 1934, Serial No. 749,119

8 Claims. (Cl. 110—1)

The main object of the invention is to provide a casing formed of panels adapted to carry sections of refractory furnace linings in such manner that these sections can be readily removed with their supporting panels, without disturbing the remaining panels and sections connected thereto.

Another object of the invention is to provide a casing for a boiler or a smoke breeching, in which the refractory lining requires frequent renewal, so constructed that it will only be necessary to remove a panel of the casing in order to give access to the part of the lining to be removed.

A further object of the invention is to provide for circulation of air between the casing and the refractory lining when inferior insulating material is used between the casing and such lining.

A still further object of the invention is to provide a casing, of the character referred to, which is provided with means for maintaining the inner, vertical surface of the refractory lining in positive alignment.

Other objects will be disclosed in the specification and drawings.

In the drawings:

Figure 1 is a fragmentary perspective view of two adjoining walls forming part of the present invention;

Figure 2 is a similar view of the walls shown in Figure 1, but with the parts viewed from a different angle to illustrate more clearly certain details of construction;

Figure 3 is a fragmentary perspective view exploded to show details of construction of adjacent casing panels, with fastening clips connected thereto;

Figure 4 is a fragmentary perspective view of the adjoining walls shown in Figures 1 and 2, but illustrated as viewed from the outside of the casings of said walls;

Figure 5 is a horizontal section taken on the line 5—5 of Figures 1 and 4;

Figure 6 is a perspective view of a slab of refractory material adapted for use with fastening clips of the type illustrated in Figures 1, 2, and 4;

Figure 7 is a central, vertical section through another modification of the wall and casing embodied in this invention;

Figure 8 is a fragmentary vertical section through a further modified form of wall embodied in this invention;

Figure 9 is a fragmentary perspective view of cooperating fastening clips adapted for use with

the form of the invention illustrated in Figure 8;

Figure 10 is a perspective view of the refractory block adapted for use with the fastening devices and casing illustrated in Figures 8 and 9;

Figure 11 is a fragmentary vertical section through a further modified form of the wall and casing forming part of this invention;

Figure 12 is a perspective view of the fastening devices adapted for use in the form of the invention illustrated in Figure 11; and

Figure 13 is a fragmentary perspective of a refractory block designed for use in the form of the invention shown in Figure 11.

Referring to the drawings, in which similar parts are designated by like numerals:

The wall 1 comprises a casing constructed of panels 3 having flanges 4 and 5 at their opposite edges, provided with apertures 6 adapted to receive bolts for the purpose of connecting adjacent flanges to each other. The lower flange 5 has an inwardly directed fastening plate 7 spot-welded or otherwise fixed thereto. The plate 7 has its outer edge turned upwardly to form a member 8 adapted to fit into an undercut rabbet 9 formed in the lower edge of the slab 10 of refractory material.

A fastening plate 11 similar to the plate 7 is detachably secured to the upper flange 4 of the panels 3 by means of the bolts 12, which are used to secure adjacent panels to each other. The plate 11 is turned downwardly at its outer edge to form a member 13 adapted to fit in an undercut rabbet 14 formed in the upper edge of the slab 10. When the casing is assembled, the two fastening devices are in contact with each other throughout their width to the members 8 and 13. These members 8 and 13 form in effect a dovetailed tongue seating in a dovetailed groove formed by the undercut rabbets 9 and 14 of the adjacent slabs 10.

In the wall 1 the slabs 10 are located a considerable distance from the casing formed by the panels 3; and in this space insulating material 15 is secured between the fastening plates 7 and 11. Between the insulating material and the back wall of the casing formed by the panels 3, there is mounted a series of spacers 16, which are U-shaped in horizontal cross section, and are arranged with the edges of their flanges in contact with the rear wall of the panels 3.

Gauge stops 17 are formed on the plates 7 and 11 by stamping out the material thereof so as to position the stops to form a gauge for the purpose of maintaining the slabs 10 in fixed vertical position between the fastening plates. A series

of apertures 18 extend through the plates 7 and 11 in position to register with the space between the spacers 16, and the rear face of the panels 3. A series of apertures 19 are formed through each of the panels, near the flanges thereof, to admit air into the spaces formed at the back of the panels by the spacers 16. The holes 18 permit the air to circulate between upper and lower chambers which are formed by the spacers 16 in adjacent panels. The holes 19 permit air from outside the casing to circulate in the air chamber formed by said panels and spacers.

In the wall 2, shown as connected to the wall 1, the panels 3 and slabs 10 are the same as are used in the wall 1. In this case, however, the insulation 15 and the air circulating spacers 16 are omitted. The fastening devices 20 and 21 are substantially the same as the devices 7 and 11 in so far as their outer edges are turned to form a dove-tail tongue adapted to seat in the groove formed by the undercut rabbets 9 and 14 in adjacent slabs 10. This construction is to be used on a breeching; and the air circulation is secured by the air passing through the apertures 19 and through the holes formed in adjacent fastening plates by stamping up the gauge stops 22.

It will be obvious from inspection of the drawings that whenever it becomes necessary to remove any layer of slabs connected to any panel 3, it is only necessary to remove the bolts connecting adjacent panels to each other; and then, by means of a hook inserted in the holes 19, pull out any panel of the casing. The panel carries with it the air spacers 16, the insulation 15, and the refractory slabs 10.

In the modification shown in Figure 7, the panels of the casing are the same as are indicated by the reference numeral 3 in Figures 1, 2, and 3 of the drawings. The fastening devices 32 and 33 are shaped at their inner ends to form flanges bent to seat in the undercut rabbets of the slabs 10. These fastening devices 32 and 33 are formed from flat plates adapted to be inserted between the flanges 4 and 5 of adjacent panels 3, and to be secured in position by the usual bolts. Apertures 34 formed in the plates 32 and 33 provide for circulation of air in the air space formed between the insulation 23 and the back of the panels 3.

In the modification shown in Figures 8, 9 and 10, the slab 35 of refractory material is provided, along its opposite edges, with grooves 36 and 37, adapted to receive the tongues 38 formed by stamping out of the fastening plates 39 and 40. These plates 39 and 40 are detachably secured between the flanges 4 and 5 of panels 3 which form the casing. Slabs 41 of insulating material are secured between opposite plates 39 and 40 and in contact with the rear face of the refractory slab 35. Registering apertures 42 in the plates 39 and 40 provide for circulation of air in the space between the slabs of insulation and the inner surfaces of the panels 3.

The modification shown in Figures 11, 12 and 13 is substantially the same as that shown in Figures 8, 9 and 10. Corresponding parts are designated by the same reference numerals primed. In this form, however, the slab 43 of refractory material is provided, at its opposite edges, with grooves 44 and 45 somewhat wider than the grooves 36 and 37, in order to receive the tongues 46 and 47 which are bent in substantially semi-circular form at the outer edges of the plates 39' and 40'. It is believed the operation of the

various forms of this invention will be apparent to persons skilled in the art.

What I claim is:

1. A wall for a boiler, or the like, formed of sections, each section comprising a sheet metal panel, plates extending substantially perpendicular to said panel from opposite ends thereof, and a slab of refractory material detachably secured at its opposite edges to the outer ends of said plates the plates of each panel being movable, relative to the plates extending from the ends of the adjacent panel, and at least one of the plates extending from a panel being fixedly secured thereto.
2. A wall for a boiler, or the like, formed of sections, each section comprising a sheet metal panel, plates extending substantially perpendicular to said panel from opposite edges thereof, and a slab of refractory material having its opposite edges provided with undercut rabbets, said plates having their free edges inclined to seat in said rabbets the plates of each panel being movable, relative to the plates extending from the ends of the adjacent panel, and at least one of the plates extending from a panel being fixedly secured thereto.
3. A wall for a boiler, or the like, formed of sections, each section comprising a sheet metal panel, plates extending substantially perpendicular to said panel from opposite edges thereof, a slab of refractory material having its opposite edges provided with undercut rabbets, said plates having their free edges inclined to seat in said rabbets, and insulating material secured between said plates in the space between said slab and panel the plates of each panel being movable, relative to the plates extending from the ends of the adjacent panel, and at least one of the plates extending from a panel being fixedly secured thereto.
4. A wall for a boiler, or the like, formed of sections detachably connected to each other, each section comprising a sheet metal panel, plates extending substantially perpendicular to said panel from opposite edges thereof, and a slab of refractory material having its opposite edges provided with undercut rabbets, said plates having their free edges inclined to seat in said rabbets, insulating material secured between said plates and against said slab, and spacers interposed between said material and panel to provide air circulating chambers, said panel and plates being apertured to permit circulation of air between the chambers of adjacent sections.
5. A wall for a boiler, or the like, formed of sections detachably connected to each other, each section comprising a sheet metal panel, plates extending substantially perpendicular to said panel from opposite edges thereof, a slab of refractory material having its opposite edges provided with grooves, tongues extending from said plates into said grooves, insulating material secured between said plates and against said slab, said panel being spaced from said material to provide air circulation chambers.
6. A wall for a boiler, or the like, formed of sections detachably connected to each other, each section comprising a sheet metal panel, plates extending substantially perpendicular to said panel from opposite edges thereof, a slab of refractory material having its opposite edges provided with grooves, tongues extending from said plates into said grooves, and insulating material secured between said plates and against said slab, and means for spacing said material from said panel to form an air circulation chamber.

7. A wall for a boiler, or the like, formed of sections, each section comprising a sheet metal panel, plates extending substantially perpendicular to said panel from opposite edges thereof, a slab of refractory material detachably secured at its opposite edges to the outer ends of said plates, and insulating material secured between said plates and in contact with said slab the plates of each panel being movable, relative to the plates extending from the ends of the adjacent panel, and at least one of the plates extending from a panel being fixedly secured thereto.

8. A wall for a boiler, or the like, formed of sections detachably connected to each other, each section comprising a sheet metal panel, plates extending substantially perpendicular to said panel from opposite edges thereof, a slab of refractory material detachably secured at its opposite edges to the outer ends of said plates, and insulating material secured between said plates and in contact with said slab, and means for holding said material spaced from said panel to provide air circulation chambers.

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