Sept. 20, 1949. C. M. RHODEHAMEL 2,482,369

AIR HEATING WALL FURNACE

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Fig. 1.

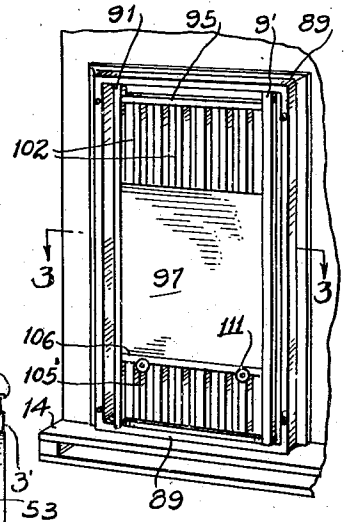
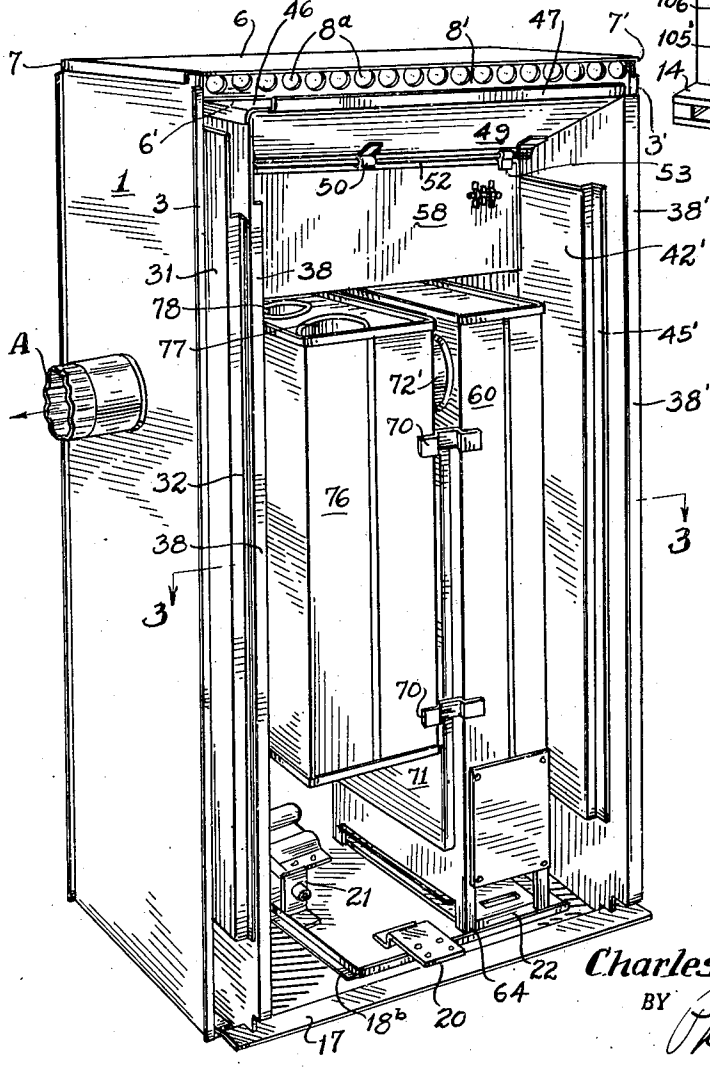


Fig. 2.



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AIR HEATING WALL FURNACE

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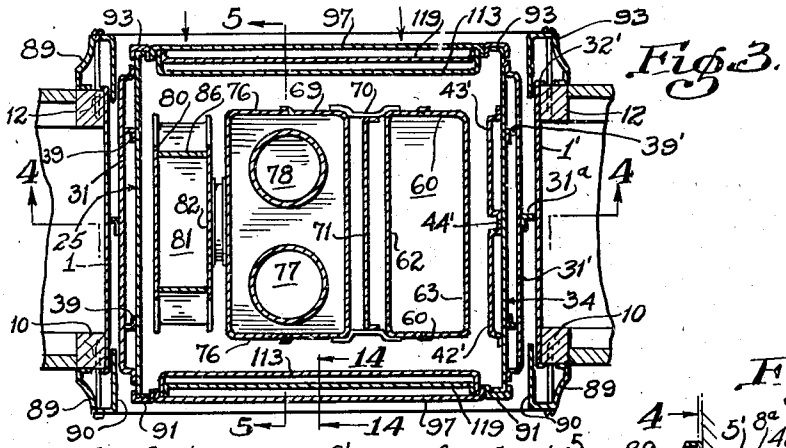


Fig. 3.

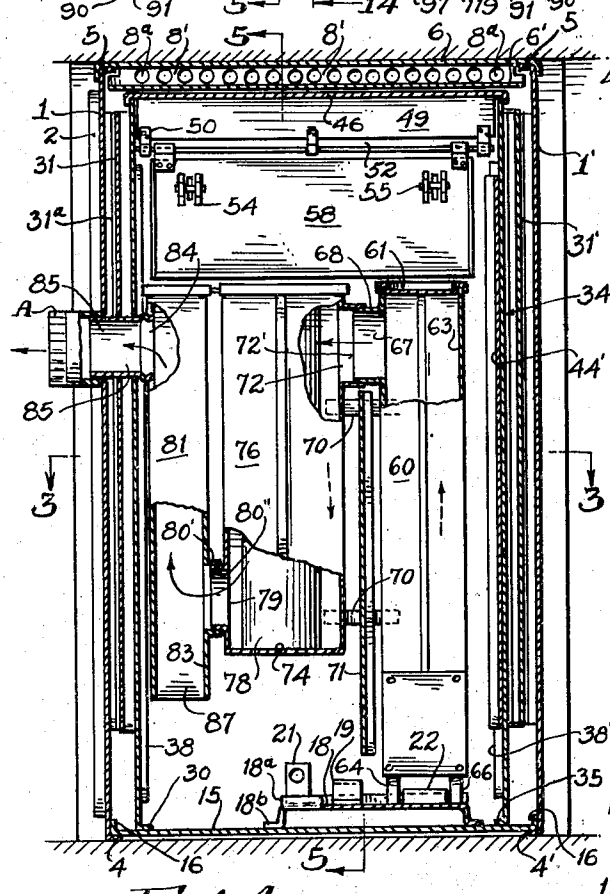


Fig. 4.

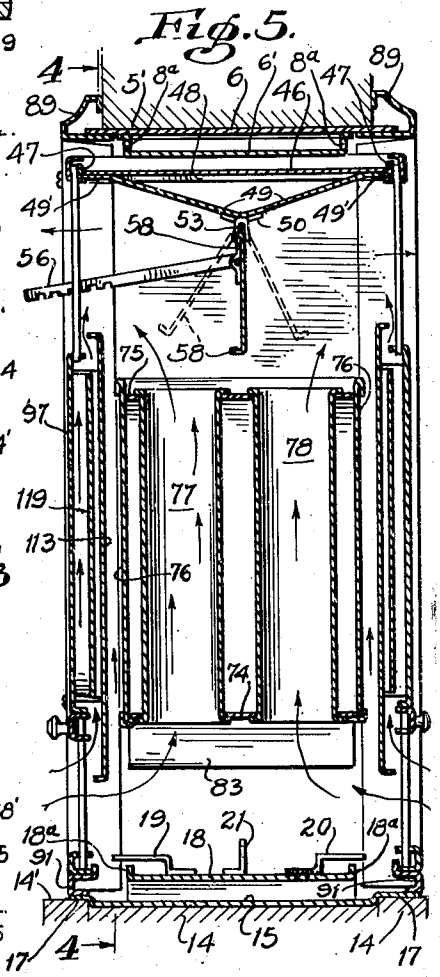


Fig. 5.

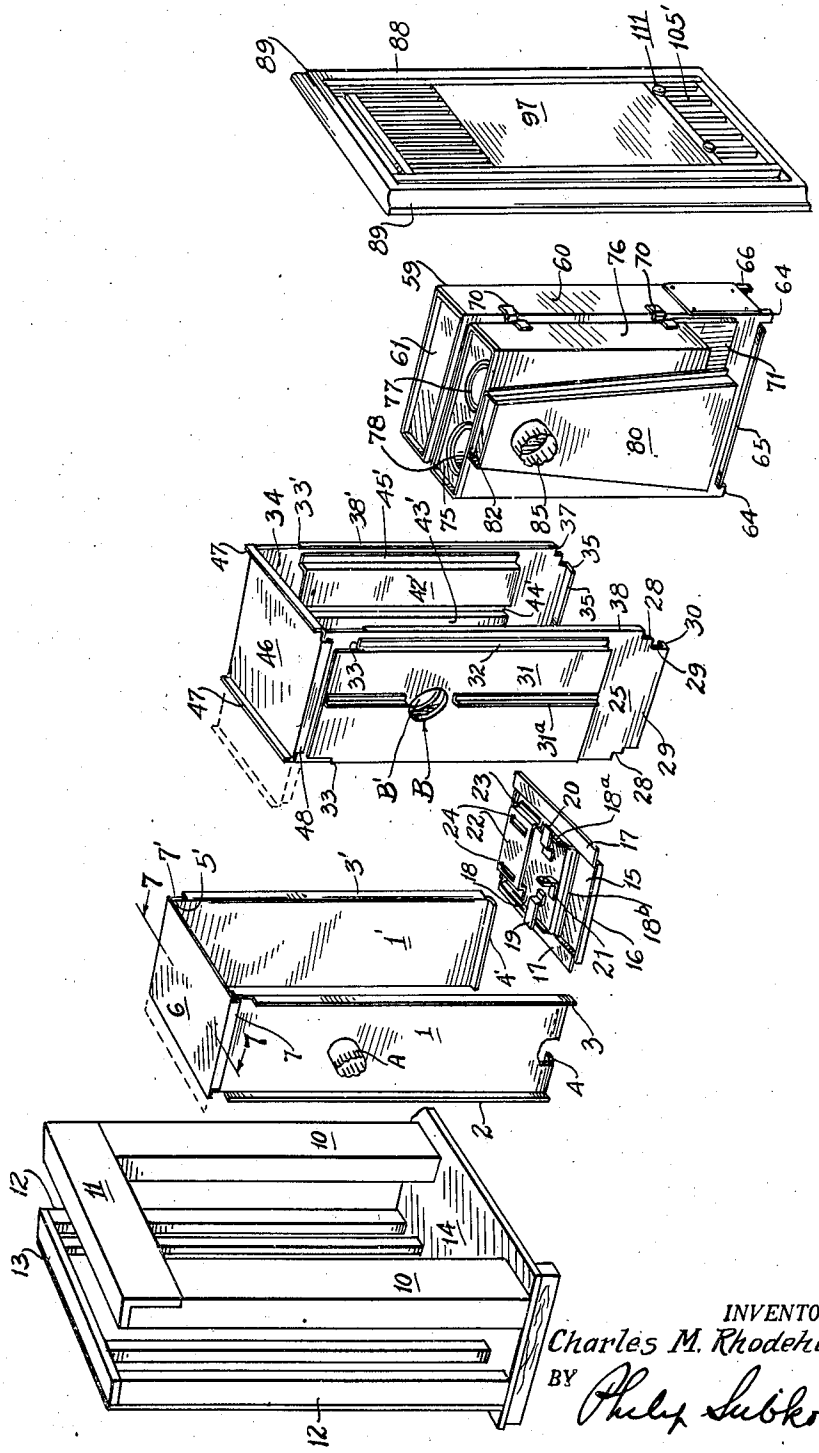
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AIR HEATING WALL FURNACE

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Fig. 6.



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AIR HEATING WALL FURNACE

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Fig. 7.

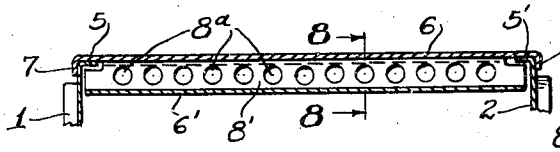


Fig. 8.

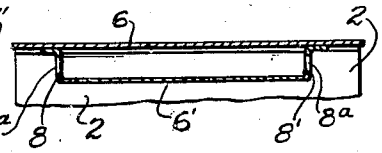


Fig. 9.

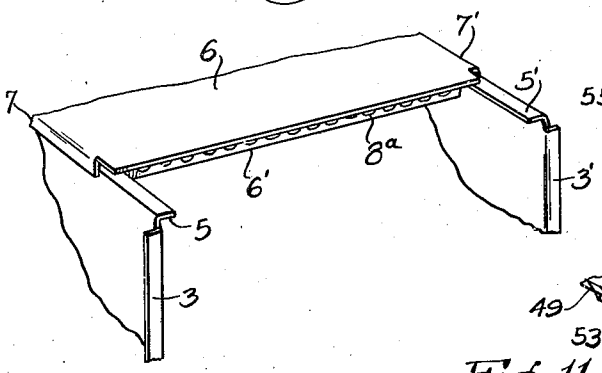


Fig. 12.

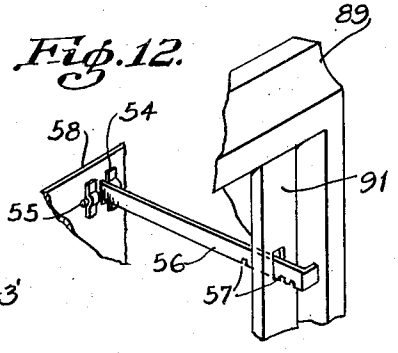


Fig. 11.

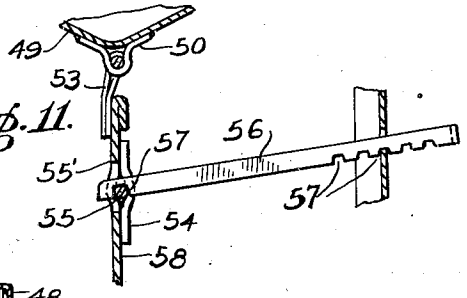
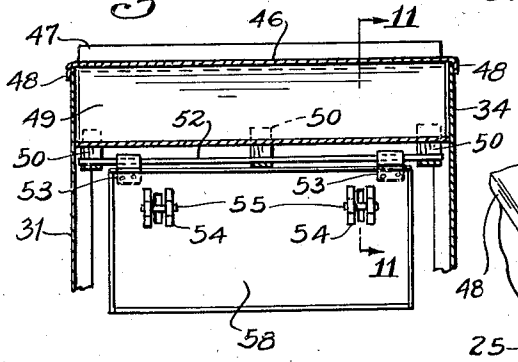


Fig. 10.



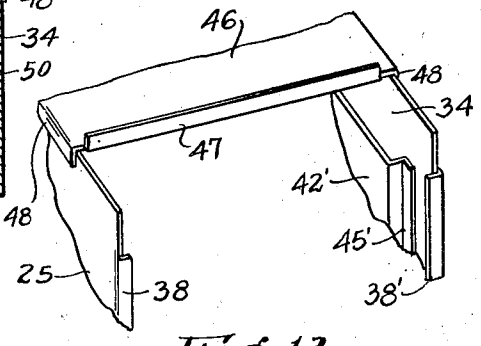


Fig. 13.

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AIR HEATING WALL FURNACE

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Fig. 14.

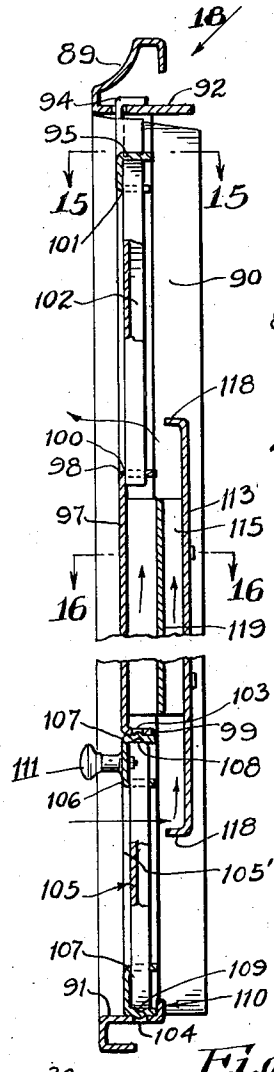


Fig. 15.

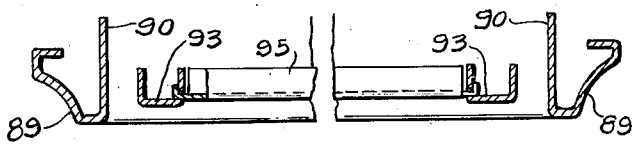


Fig. 16.

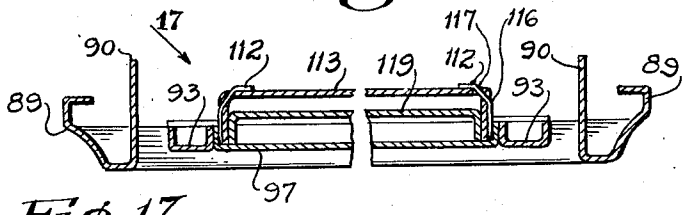


Fig. 17.

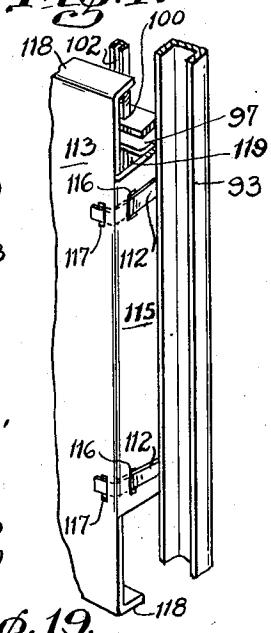


Fig. 18.

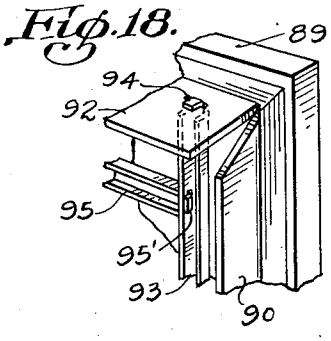


Fig. 19.

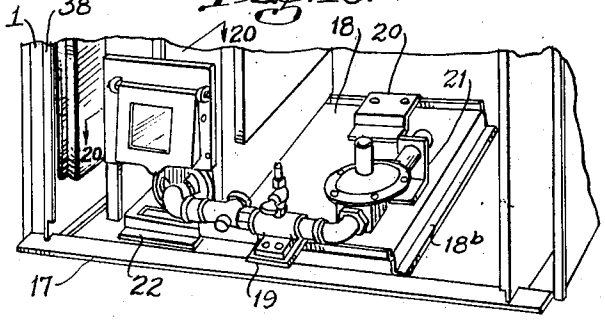
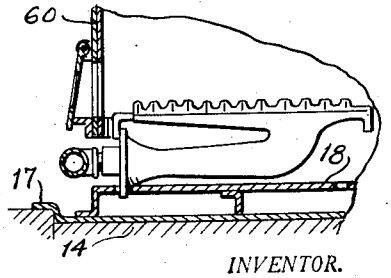


Fig. 20.



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UNITED STATES PATENT OFFICE

2,482,369

AIR-HEATING WALL FURNACE

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Application November 4, 1944, Serial No. 561,975

16 Claims. (Cl. 126—116)

1

This invention relates to a furnace construction, and particularly to an assemblable and disassemblable furnace construction formed of interlocking elements, permitting the assembly of the furnace without the use of bolts or welding and permitting disassembly without destruction of the several parts of the furnace.

This invention is particularly adapted for use with wall furnaces of the warm air type. Such furnaces are usually inserted into openings in a wall structure between studs and headers provided for their reception. Such furnaces are constructed with a fire box and flues around which the air passes before entry into the grill-work in the walls of a room. It is a requirement in such furnaces that the wall or any portion thereof contiguous to the furnace show but a few degrees rise in temperature. For such reason the fire box and internal flues of these furnaces are usually baffled to provide air spaces around the furnace between the heating element and wall structure to act as insulation. It is usual in such type of furnaces to construct the baffle structure as one unit for insertion in opening provided therefor in the wall.

The several parts of the furnace are either bolted or welded together, requiring a large number of operations in their construction, resulting in a costly furnace. The furnace, being bulky and heavy, is costly in shipment and handling, thus increasing the cost of installation of the furnace.

In my furnace I employ sectional elements, formed of sheet metal, which may be separately packaged or be nested in each other to form a small package. Each of the elements is formed with interlocking joints and spacers which permit of their ready assembly on the job without the use of bolts, welding or other such means of connection. As a result of this method of construction the furnace is readily assembled into a rigid structure and may be removed readily from the wall without any disturbance of the wall structure.

In the case of the prior art units, should any of the elements burn out or corrode, the whole unit must be removed and the welds broken or the bolts removed at the factory and a new element introduced. In the furnace of my invention the unit may be disassembled and a new element slipped in place and the furnace reassembled without sending the furnace to the factory and without requiring a re-plastering job on the wall.

This invention will be further described with reference to the drawings, in which

Fig. 1 shows the grill of the furnace;

Fig. 2 is an isometric view of the assembly of the furnace with the grill removed;

Fig. 3 is a sectional view taken along the line 3—3 of Fig. 2 and 3—3 of Fig. 4;

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Fig. 4 is a section taken along the line 4—4 of Fig. 3;

Fig. 5 is a section taken along the line 5—5 of Figs. 3 and 4;

Fig. 6 is an exploded view of the furnace, showing various units and their order of assembly;

Fig. 7 is a detailed section taken along the line 7—7 of Fig. 6;

Fig. 8 is a section taken along the line 8—8 of Fig. 7;

Fig. 9 is a detail showing the method of assembly of the first element of Fig. 6;

Fig. 10 is a view partly in section, showing the construction and method of assembly of the baffle construction;

Fig. 11 is a detail view of the method employed for controlling the position of the damper;

Fig. 12 is a further detail of the construction shown in Figs. 10 and 11;

Fig. 13 is an isometric fragmentary view of the construction of the interior baffle unit shown in Fig. 6 and Fig. 10;

Fig. 14 is a section taken along the line 14—14 of Fig. 3, showing the front grill construction;

Fig. 15 is a section taken along the line 15—15 of Fig. 14;

Fig. 16 is a section taken along the line 16—16 of Fig. 14;

Fig. 17 is a fragmentary view taken in the direction of the arrow as shown in Fig. 16;

Fig. 18 is a fragmentary view taken in the direction shown by the arrow 18 on Fig. 14;

Fig. 19 is an isometric detail of the burner and fire box construction; and

Fig. 20 is a fragmentary section taken along the line 20—20 of Fig. 19.

As shown in Fig. 6, the wall section, including the furnace-receiving opening, illustrated by the studding construction shown therein, is formed of vertical studs 10 and 12 which form the ordinary studs of the wall structure connected by headers 11 and 13. The sub-floor of the room is represented by 14. The furnace is set into the opening formed between the floor 14, the studs 10 and 12, and headers 13 and 11.

The furnace is composed of an external baffle unit formed of vertical panels 1 and 1', top 6, and base 15. This unit will be called the external baffle unit. An internal baffle unit is provided composed of baffles 25 and 34 connected by a top 46. This baffle unit inside the external baffle unit sits upon the base 15 and is spaced from the external baffle unit. Inside the internal baffle unit is a fire box and flue unit. This fire box and flue unit sits upon the base 15 and is spaced from the internal baffle unit. The wall opening is covered by grill construction, one of which is shown in Fig. 6. To further describe the several elements and construction and assembly, reference may

be had to Fig. 6 and sectional details of other figures.

The external baffle construction is formed of sheet metal to give a panel 1, the sides of which are bent at right angles to give flanges 2 and 3 extending in a direction exteriorly of the interior of the furnace. These flanges are cut out at their tops and bottoms to permit the bending of the top and bottom of panel 1 at a right angle in a direction opposed to the direction of bending of the flanges 2 and 3 to give flanges 3 and 4. Panel 1' is constructed in a similar manner to give side flanges 2' and 3' and top and bottom flanges 4' and 5'.

Panels 1 and 1' are connected by top 6 (see detail of Figs. 7–9). The top 6 is formed of a panel carrying right angle bends along its width to form flanges 7 and 7'. A baffle 6', formed with right angle flanges 8 and 8' bent at right angles to panel 6 and with a reverse bend, is attached at such reverse bends to the underneath side of panel 6 to give a hollow baffle construction shown in Figs. 4, 5, 7, and 8. These right angle bends or flanges 8 and 8' carry holes 8a.

The exterior baffle element or panel 1 is placed within the opening in the wall so that the flanges 2 and 3 engage the edges of the plaster, which has been previously placed on the wall, at studs 10 and 12, and the flue pipe A is inserted within the flue which is provided in the wall (see Figs. 4 and 5). The flange 4 rests upon the sub-floor 14 (see Fig. 5). The baffle unit 1' is placed so that the flange 3' engages the corner of the plaster at studs 12 and the flange 2' engages the corner of the plaster at stud 10. The flange 4' rests upon the sub-floor 14. The top 6 slides underneath the header 11 and over the flanges 1 and 1' so that flanges 7 and 7' slide exteriorly of the panels 1 and 1'. The depth of 7 and 7' is sufficiently short to clear flanges 2 and 3 and 2' and 3'. The baffle 6' is of a length just sufficient to fit in between the panels 1 and 1' (see Fig. 4). The flanges 8' are notched (see Figs. 4 and 7) to permit the passage of the flanges 5 and 5' This spaces the panels 1 and 1' at the desired distance. The width of panel 6' is not equal to the width of panel 6 (see Fig. 5), thus providing clearance on the underneath side of the panel 6 for the purposes to be described later. With the element thus positioned the floor or base plate 15 is next slid into place.

The floor plate 15 is formed as a dished plate, having upstanding flanges 16 along the width of the plate and a flange with a broad reverse lip 17 along the length of the base. Mounted upon the base 15 between the flanges 17 is a sub-base 18 formed by two reverse bends forming legs 18b upon which the sub-base 18 sits. The sub-base is also bent so as to provide transverse lips or ribs 18a to increase the rigidity of the base. There is thus provided a clear passage for circulation of air underneath the sub-base 18. At one side of the sub-base 18 is mounted a burner bracket 22 formed by bending sheet metal to give flanges 23 which act as supports to provide a clear air passage underneath the bracket 22. Slots 24 are provided to receive the burner, as will be described later. The width and length of the plate 22 and the width of the base 20 are such as to permit the fire box to rest on the sub-base 18 and to enclose the bracket 22 and hold the fire box in proper position, as will be described.

The flanges 16 engage flanges 4 and 4' when the base 18 is slid into place as shown in Figs. 4 and 5. Thus, the base, acting with the top 6, spaces the panels 1 and 1' and forms an interlocking box-like construction. The flanges 17, when the base plate is in place, extend over the main floor 14' laid over the rough sub-floor 14. Flanges 17 are thus upset to give the necessary clearance to extend over the main floor and also to provide necessary clearance to permit bottom flange 89 of the grill-work covering the opening to engage with the flanges 17, as will be described below.

The sub-base 18 also carries brackets 19, 20, and 21 to act as supports for the burner piping, as will be described later.

The interior baffle unit is composed of three elements; a baffle 25, baffle 34, and top 46. The baffle 25 is formed of a panel 25 carrying two right angle bends 38 forming flanges along its length. The lower end of the panel is notched at 28 and 29. The bends 38 are cut away near the top of the panel. The bottom of the panel 25 is bent at a right angle in the same direction as 38 to give a bottom flange 30 extending between the notches 28. A hole B' (see Fig. 6) is provided in the panel 25. Angles 39 (see Fig. 3) are mounted exteriorly of the panel 25 to act as spacers and reinforcing ribs, as will be described below. Mounted exteriorly of the panel is a baffle element 31. The length of the baffle 31 is bent with a reverse bend to provide two flanges 32 upon which baffle 31 is mounted on 25. The flanges 32 are cut out at 33. The baffle is also provided with a longitudinal rib 31a which acts to strengthen the baffle 31 and also provide a spacing element, as will be described below. A hole B is cut in baffle 31 to register with the hole B' in panel 25. The baffle 31 is thus open at the top and bottom providing a longitudinal air circulation passage between 31 and 25. This vertical channel is divided into three compartments by the vertical spacer angles 39. The cut out portion 33 also provides an opening for the lateral passage of air from the sides of the upper end 25 between the panels 31 and 25.

The panel 34 is constructed in a similar manner to 25, except for the addition of an interior baffle. It is provided with two longitudinal flanges 38' and a bottom flange 35 similar to 38 and 30 of panel 25. Ribs 39' are similarly provided. On the exterior of the baffle is mounted a baffle 31' constructed and mounted similarly to the baffle 31 except that it has no hole B'. It is thus composed of a panel 31' carrying flanges 32' and an exterior rib and spacer angle 31'a The flanges 32' are cut away at 33' to provide a side opening similarly to the side opening provided in panel 31.

The baffle 34 also carries an interior baffle plate 42' and 43' formed by bending sheet metal to give flanges 41' and channel 45'. It is attached to the interior of the panel 34 by flanges 45' and channel 44'.

The top 46 is formed from sheet metal by bending the ends to form depending flanges 48. Underneath the top 46 is mounted the damper 58. The damper is hung on a support 49 formed by bending a sheet of metal into a V-shape. The plate ends are bent in a double reverse bend to form the flanges 49' and upstanding flange 47. The baffle support is spot-welded at 49' to the top 46 which fits between the flanges 47. The baffle support extends between the flanges 48, leaving, however, sufficient clearance to permit the entry of the panels 25 and 34, as will be described below.

Straps 50, provided at the apex of the hanger 49, carry a rod 52 on which the damper 58 is hung by means of hinge straps 53. Two brackets 54 mounted on damper 58 each carry a pin 55. A hole in damper 58 is provided behind each pin 55. A damper bar 56, having a notch 57, which engages the pins 55 and also carrying notches 51, is provided. The notch 57 is so formed that when the damper is pulled to one side the notch 57 slips easily over the pin 55 with one end entering the registering hole. When the hanger moves inwardly to the position shown at 58, the rod 56 is secured in place against the pin 55, preventing the rod 56 from becoming displaced.

The fire box and flue unit is composed of a fire box, an intermediate flue 76, and a terminal flue 81. The units are of box construction made of sheet metal. The fire box is formed of end walls 60 and side walls 62 and 63 covered by a top 61. The walls 62 and 63 end in legs 64 and 66 and carry flanges 65 spot-welded thereto for stiffening for deflecting a secondary air stream into the burner. One of the walls 63 carries a hole 67 and a collar 68. The bottom of wall 60 is cut out to receive the burner and may be covered by a removable plate. Figs. 5 and 2 show the removable plate in position, while Fig. 19 shows the unit with the plate removed and the burner in position.

The intermediate flue is formed of a box 76 having end cover plates 74 and 75 forming a closed box. A hole 72 is provided in the upper end of the wall 76'. This carries a collar 72' adapted to make a sliding fit with collar 68. The opposite wall has a hole 79 at the other end. Open-ended pipe flues 77 and 78 are set in the top and bottom 74 and 75. The terminal flue 81 is a wedge-shaped box closed by a top 82 but open at its end 87. The flues 81 and 76 are connected by pipes 80' and 80'' connected in wall 83 and in wall 76 of the intermediate flue. An opposed hole 84 in the opposite wall of 83 carries a flue pipe 85. The intermediate flue 76 is connected to fire box 60 by straps 70. A baffle 71 is attached to the straps 70.

The next step in the assembly of the furnace comprises the introduction of the internal baffle and fire box units. After the external baffle has been set place as described above, panel 25 is set in place so that channel 31*a* abuts panel 1 and flange 30 rests on base 15. The notches 29 engage the flanges 17. This locates the panel 25. The fire box and internal flue unit are then set in place by fitting the pipe 85 through holes B' and B and into the flue pipe A. The legs 64 and 66 are fitted over the bracket 22. This locates the flue and fire box unit. The panel 34 is then set in place with the flange 31'*a* abutting panel 1' and notches 36 engaging the flanges 17. This locates panel 34. The top 46 may then be slid over the top of the panels 25 and 34. The panels enter the space between the flanges 48 and the edges of the damper hanger 49. The top of the flange 47 just clears the bottom of the baffle 6' and the straps 50 clear the top of the flanges 38 and 38'. The top 6, therefore, holds the top 46 in place and the top 46 holds the panels separated, since the panels are held between the flanges 48 and the V-shaped hanger 49.

The burner is then introduced through the hole provided therefor by the removal of the plate in the fire box and set on the bracket 22 in the holes 24 provided therefor (see Figs. 19 and 20). The piping connections are set up on the brackets 20 and 21 provided for such purpose (see Fig. 19).

The front and back grills are then set in place. They are both constructed in identical manner as illustrated in Figs. 1, 3, 5, 6, 14, to 18, inclusive. As shown in detail in Figs. 14 to 18, inclusive, the ornamental frame 89 is formed with a top flange 92, a bottom angle 91 and side flanges 90. The frame carries vertical channels 93 formed with cut-out lips 94 which fit in holes in flanges 92 and 91. When these lips are bent over, as shown in Figs. 14 and 18, the vertical channels 93 are held in place. Horizontal cross channels are provided near the top and bottom, as shown at 95 and 107 in Fig. 14. These channels also carry lips 95' (see Fig. 18) which enter holes provided in 93. The channels are held in place by bending the lips 95'. The channels 95 and 107 are locked in place and cross-brace the channels 93.

A plurality of grill channels 102 (see Figs. 1, 6, and 14) are set in channel 95 through holes 101 provided in channel 95. The portions of the channels 102 passing through the holes 101 into the angle 95 are distorted so as to wedge the channels in the holes. A panel 97 having backwardly extending flanges 98 and 99 is mounted on the channels 102 by passing the channels 102 through appropriate holes 100 provided in the flange 98. When these channels are introduced into the holes 100, the depending portions of the channels 102 passing through the holes 100 are distorted to wedge the channels in place. A removable grill door 105 is provided underneath the panel 97. It is composed of an upper channel 106 and lower channel 107 and a plurality of channels 105' which pass through appropriate holes provided in upper channel 106 and in lower channel 107. When the channels 105' are inserted into these holes the entering portions of the channels 105' are distorted to wedge them in place. The upper channel 106 carries knobs 111. The upper channel 106 has a detent 108 which engages the detent-receiving hole 103 in 99. The bottom channel 107 has a detent 109 which engages a detent-receiving hole 104. The channel 89 has an upwardly bent portion 110.

The door may be set in place by setting the channel 107 against 110 which causes the engagement of the detent 109 with the detent hole 104, and the door is then pushed into position until the detent element 108 engages the hole 103.

Mounted upon the back of the grill assembly is a baffle 113 having rearwardly extending flanges 118 at the top and bottom and a flange 115 extending forwardly on both sides of the panel 113 (see Figs. 14 to 17). The panel 113 carries an internal panel 119 spot-welded thereto. Mounted on the inside of panel 97 (see Fig. 16) and spot-welded thereto are four straps 112. They pass through holes 116 and 117 provided in baffle 113 (see Figs. 15 to 17, inclusive). The straps hold the baffles 113 and 119 onto the baffle 97.

To mount this grill assembly, the flange 92 is inserted underneath the top 6 and the flanges 90 are inserted inside the panels 1 and 2 (see Figs. 3 and 5). The rearwardly extending flange of channel 89 is placed on top of the flange 17 of the base 15 (see Fig. 5). The grill is then pushed in place until flange 92 abuts the flange 8' of the baffle 6'. The flanges 38 and 38' enter the channels 91. This locates the grill in place. It may then be screwed to the studs 10 or 12, re-

spectively, by four screws provided therefor. The rear grill is of the same construction and is inserted in the same way.

While the grill construction has been described as composed of vertical channels 102 and 105, they may be substituted by louvers or other types of grill construction.

As described above the assembly of the furnace is facilitated by spacers and interlocking flange constructions. The unit is made strong and substantially rigid by the same interlocking arrangement. Thus, the weight of the fire box and flue construction resting upon the base 15 holds the outside panels 1 and 2 in position due to the interlocking of the channels 16 and 4 and 4'. The interlocking of the channels 5 and 5' at the top of the panels 1 and 2 and the positioning of the channels 5 and 5' in the recess of the flanges 8' position and hold securely the top of the panels 1 and 2. The abutment of the channels 47 and 47' against the underneath side of the baffle 6' transmits the weight of the internal fire box construction to the top 46, thus holding down the vertical panels 35 and 34. The positioning and the locking of the unit are insured by the grill-work by means of the flanges 90 which engage and bear against the panels 1 and 1' and by the channel 92 which engages the top 6. The panels 25 and 34 are additionally spaced and braced by the interlocking of the flanges 38 and 38' with the channels 91. This interlocking braces the unit. However, the interlock is a sliding type in that a small relative movement of the interlocking elements of the unit is permissible. Thus, when the unit is heated an accommodation of relative expansion of one unit with respect to the other is made possible.

The baffle construction forms a highly efficient heat insulation, preventing the transmission of heat to the wall structure. Thus, the heating is almost substantially entirely by convection and not by radiation. When the fire is lighted the combustion gases pass upwardly through the fire box 60, through the intermediate flue around the vertical pipes 77 and 78, through the flue 81, and out the flue pipe 85.

The terminal flue 81 is vented at 87 to maintain the fire box and flue at substantially atmospheric pressure. This prevents any explosion due to accumulation of gas or due to a high flue back-pressure. Intake air comes through the grill 105 and passes through the pipes 77 and 78 and around the flue and fire box unit, and the heated air passes through the front or rear grill through 102 thereof, depending upon the positioning of the damper 58. A portion of the cold air passes between the baffles 113 and 119 and between the baffles 119 and 97 in order to keep the front panel 97 cool. Portions of the cold air also pass upwardly between the baffle 1 and baffle 31, between the baffle 31 and the panel 25. In like manner cold air entering the rear grill passes between the baffle 1' and baffle 31', between the baffle 31' and the panel 25', and between the panel 25' and the baffles 45' and 44'. In addition, the top of the furnace is also baffled by means of the dead-air spaces between the damper hanger 49 and the top 46, between the top 46 and the bottom of plate 6', and between 6' and 6. Air circulation is provided by means of the holes 8a in flanges 8'. The fire box is insulated from the floor 14 by means of the air passageways provided between the flanges 18b and underneath the bracket 22. In this manner

the temperature of the surrounding woodwork and the floor is not raised above room temperature by more than 90° F.

While I have described a particular embodiment of my invention for the purpose of illustration, it should be understood that various modifications and adaptations thereof may be made within the spirit of the invention as set forth in the appended claims.

I claim:

1. A furnace structure adapted to be inserted into an opening in the wall of a structure provided in said wall structure to receive said furnace, comprising an external baffle unit formed to be placed in said opening, said external baffle unit being composed of vertical panels, said vertical panels being disposed in opposed spaced parallel relation, and a top, composed of a panel horizontally disposed across the space between the upper edges of the vertical panels, flanges on said vertical panels, the flanges of said vertical panels extending horizontally and transversely of the faces of said vertical panels, means adjacent the ends of the top engaging the flanges of the vertical panels in interlocking slidable relationship in a direction longitudinally of said flanges, said flanges and means holding said vertical panels in spaced relation with each other and in engagement with said top, a base for said furnace, said base being disposed in transversely slidable engagement therewith between the lower ends of the vertical panels to hold them in spaced apart relationship, a fire box and flue unit demountably mounted upon said base and positioned in spaced relation with said panels and top, and a grill construction disposed over the opening defined by the vertical panels, top, and base, whereby it is adapted to cover the opening into which the furnace is to be placed in the wall.

2. A furnace structure adapted to be inserted into an opening in the wall of a structure provided in said wall structure to receive said furnace, comprising an external baffle unit formed to be placed in said opening, said external baffle unit being composed of vertical panels, said vertical panels being disposed in opposed spaced parallel relation, and a top, composed of a panel horizontally disposed across the space between the upper edges of the vertical panels, flanges on said vertical panels, the flanges of said vertical panels extending horizontally and transversely of the faces of such vertical panels, means adjacent the ends of the top engaging the flanges of the vertical panels in interlocking slidable relationship in a direction longitudinally of said flanges, said flanges and means holding said vertical panels in spaced relation with each other and in engagement with said top, a base for said furnace, said base being disposed in transversely slidable engagement therewith between the lower ends of the vertical panels to hold them in spaced apart relationship, a fire box and flue unit demountably mounted upon said base and positioned in spaced relation with said panels and top, and a grill construction disposed over the opening defined by the vertical panels, top, and base, whereby it is adapted to cover the opening into which the furnace is to be placed in the wall, said grill construction comprising flanges extending rearwardly from the outer face of said grill construction and engaging the inner faces of said vertical panels and said top and said base to space and hold said top, base, and vertical panels in spaced relation.

3. A furnace structure formed to be inserted

into an opening in a wall structure and upon the floor upon which said wall structure is placed, which comprises vertical panels, said vertical panels being disposed in opposed spaced parallel relation, vertical flanges along the vertical edges thereof, said flanges being substantially perpendicular to said vertical panels and extending in a direction away from the interior of said furnace structure to engage the edges of the opening in the wall, top and bottom flanges on said panels, said last-named flanges on said vertical panels extending horizontally and transversely of the faces of such vertical panels, a top composed of a panel horizontally disposed across the space between the upper edges of the vertical panels, depending flanges for said top, said depending flanges being slidable in a direction longitudinal of said top flanges of said vertical panels and in engaging relation to said top flanges of said vertical panels, a baffle, said baffle being formed with reverse flanges extending in a horizontal direction transversely of said depending flanges for said top and attached to the underneath side of said top to space said baffle from the underneath side of said top to provide an air space, notches positioned in said reverse flanges at the ends thereof and underneath said top of length and width greater than the width and thickness of the top flanges of said vertical panels, the width of said baffle between said reverse flanges being substantially less than the width of said top whereby said top may be slid into position over said top flanges of said panels, said top flanges passing through said notches to hold said panels in spaced relation with each other and in engagement with said top, a base for said furnace, said base being disposed in transversely slidable engagement therewith between the lower ends of the vertical panels to hold them in spaced apart relationship, a fire box and flue unit demountably mounted upon said base and positioned in spaced relation with said panels and top, and a grill construction disposed over the opening defined by the vertical panels, top, and base, whereby it is adapted to cover the opening into which the furnace is to be placed in the wall.

4. A furnace structure formed to be inserted into an opening in a wall structure and upon the floor upon which said wall structure is placed, which comprises vertical panels, said vertical panels being disposed in opposed spaced parallel relation, flanges along the vertical edges thereof, said flanges being substantially perpendicular to said vertical panels and extending in a direction away from the interior of said furnace structure to engage the edges of the opening in the wall, top and bottom flanges on said panels, the flanges of said vertical panels extending horizontally and transversely of the faces of such vertical panels, a top composed of a panel horizontally disposed across the space between the upper edges of the vertical panels, depending flanges for said top, said depending flanges being slidable in a direction longitudinal of said top flanges of said vertical panels and in engaging relation to said top flanges of said vertical panels, a baffle, said baffle being formed with reverse flanges extending in a horizontal direction transversely of said depending flanges for said top and attached to the underneath side of said top to space said baffle from the underneath side of said top to provide an air space, notches positioned in said reverse flanges at the ends thereof and underneath said top of length and width greater than the width and thickness of the top flanges of said vertical panels and the width of said baffle between said reverse flanges being substantially less than the width of said top whereby said top may be slid into position over said top flanges of said panels, said top flanges passing through said notches to hold said panels in spaced relation with each other and in engagement with said top, a base for said furnace, said base being disposed in transversely slidable engagement therewith between the lower ends of the vertical panels to hold them in spacd apart relationship, a fire box and flue unit demountably mounted upon said base and positioned in spaced relation with said panels and top, a grill construction disposed over the opening defined by the vertical panels, top and base, whereby it is adapted to cover the opening into which the furnace is to be placed in the wall, said grill construction comprising flanges extending rearwardly from the outer face of said grill along the length of said grill and formed to engage the inner faces of said vertical panels when said grill is placed in position, and a flange along the width of said grill extending rearwardly from the outer face of said grill and positioned to be inserted underneath said top in the space provided between the end of said top and the flange of said baffle, when said grill is placed in position, said grill engaging said bottom when said grill is in position.

5. A furnace structure formed to be inserted into the wall of a structure and into an opening on each side of said wall between studs and headers provided in said wall structure to receive said furnace, comprising an external baffle unit adapted to be placed against said studs and headers, said external baffle unit being composed of vertical panels said vertical panels being disposed in opposed spaced parallel relation to engage the inwardly facing surfaces of a pair of adjacent wall studs, a top composed of a panel horizontally disposed across the space between the upper edges of the vertical panels, top flanges on the vertical panels, the flanges of said vertical panels extending horizontally and transversely of the faces of such vertical panels, means adjacent the ends of the top engaging the flanges of the vertical panels in interlocking sliding relationship in a direction longitudinally of said flanges and at a right angle to the plane of the wall wherein the furnace is adapted to be located, said flanges and means holding said vertical panels in spaced relation with each other and in engagement with said top, a base for said furnace, said base being disposed in transversely slidable engagement therewith between the lower ends of the vertical panels to hold them in spaced apart relationship, an internal baffle unit comprising vertical panels slidably positioned on said base within the space between the vertical panels of said external baffle unit, said vertical panels of said internal baffle unit being disposed in opposed spaced parallel relation, a top for said internal baffle unit extending horizontally over the space between, and slidably positioned on, the top of said last-named vertical panels and slidably positioned underneath the top positioned on the vertical panels of said external baffle unit, a spacer mounted on the exterior of and extending between each of said vertical panels of the internal baffle unit and the vertical panels of the external baffle unit, said spacers spacing said panels from said first-mentioned panels when said panels of said internal baffle structure are placed in position in said furnace upon said base, a fire box and flue unit demountably mounted

upon said base and positioned in spaced relation with and between said vertical panels of the internal baffle unit and underneath the top of said internal baffle unit, a grill construction disposed over each of the openings defined by the vertical panels, top and base, whereby said grill construction is adapted to cover the openings on each side of the wall into which the furnace is to be placed in the wall, means to selectively direct heat from said fire box outwardly through said grills, said means including a damper mounted on the underneath side of the top, which is positioned on the vertical panels of said internal baffle unit, above said fire box and flue unit, and means for moving said damper on said mounting between said grills to selectively direct the heat from said fire box and flue unit through said grills.

6. A furnace structure formed to be inserted into the wall of a structure and into an opening on each side of said wall between studs and headers provided in said wall structure to receive said furnace, comprising an external baffle unit formed to be placed against said studs and headers, said external baffle unit being composed of vertical panels, said vertical panels being disposed in opposed spaced parallel relation to engage the inwardly facing surfaces of a pair of adjacent wall studs, and a top composed of a panel horizontally disposed across the space between the upper edges of the vertical panels, flanges on said vertical panels, the flanges of said vertical panels extending horizontally and transversely of the faces of such vertical panels, means adjacent the ends of the top engaging the flanges of the vertical panels in interlocking sliding relationship in a direction longitudinally of said flanges and at a right angle to the plane of the wall wherein the furnace is adapted to be placed, said flanges and means holding said vertical panels in said spaced relation with each other and in engagement with said top, a base on said furnace, bottom flanges on said vertical panels, the bottom flanges of said vertical panels extending horizontally and transversely of the faces of such vertical panels, said base being disposed in transversely slidable engagement between the lower ends of said vertical panels on the said bottom flanges, said base spacing and holding said panels in spaced apart relationship with each other, an internal baffle unit comprising vertical panels slidably positioned on said base within the space between the vertical panels of said external baffle unit, said vertical panels of said internal baffle unit being disposed in opposed spaced parallel relation, a top for said internal baffle unit horizontally and slidably positioned on the top of said vertical panels of said interior baffle unit and slidably positioned underneath the top positioned on the vertical panels of said external baffle unit, a spacer mounted on the exterior of each of the vertical panels of the internal baffle unit and extending between said last-named panels and the vertical panels of the exterior baffle unit, said spacers spacing said last-named panels from said first-mentioned panels when said panels of said internal baffle unit are placed in position in said furnace upon said base, a fire box and flue unit demountably mounted upon said base and positioned in spaced relation with and between said vertical panels of the internal baffle unit and underneath said last-named top of said internal baffle unit, a grill construction extending over the openings on each side of the wall into which said furnace is placed, said grill construction being each disposed over the openings defined by the vertical panels, top, and base, whereby each is adapted to cover the opening in each side of the wall into which the furnace is to be placed in the wall, each grill comprising flanges extending rearwardly from the outer face of said grill and formed to engage the inner faces of said first-named vertical panels and said first-named top and the said base, said grills spacing and holding said first named top, base, and first-named vertical panels in spaced relation, means to selectively direct heat from said fire box outwardly through said grills, said means including a damper mounted on the underneath side of said top which is mounted on the vertical panels of said internal baffle unit above said fire box and flue unit, and means for moving said damper on said mounting between said grills to selectively direct the heat from said fire box and flue unit through said grills.

7. A furnace structure formed to be inserted into the wall of a structure between studs and headers provided in said wall structure to receive said furnace, comprising an external baffle unit formed to be placed against said studs and headers, said external baffle unit being composed of vertical panels, said vertical panels being disposed in opposed spaced parallel relation to engage the inwardly facing surfaces of a pair of adjacent wall studs, and a top composed of a panel horizontally disposed across the space between the upper edges of the vertical panels, flanges on said vertical panels, the flanges of said vertical panels extending horizontally and transversely of the faces of said vertical panels, means adjacent the ends of the top engaging the flanges of the vertical panels in interlocking relationship in a direction longitudinally of said flanges and at a right angle to the plane of the wall wherein the furnace is adapted to be placed, said flanges and means holding said vertical panels in said spaced relationship with each other and in engagement with said top, a base for said furnace, bottom flanges on said vertical panels, the bottom flanges of said vertical panels extending horizontally and transversely of the faces of such vertical panels, said base being disposed in transversely slidable engagement on the lower ends of said vertical panels and on said bottom flanges and spacing and holding said panels in spaced apart relationship to each other, an internal baffle unit comprising vertical panels slidably positioned on said base within the space between the vertical panels of said external baffle unit, said vertical panels of said internal baffle unit being disposed in opposed spaced parallel relation, a top for said internal baffle unit horizontally and slidably positioned on the top of said vertical panels of said internal baffle unit and slidably positioned underneath the top positioned on the vertical panels of said external baffle unit, baffles mounted on and spaced from the exterior surface of said vertical panels of the internal baffle unit, a spacer mounted on the exterior of each of said last-named baffles and extending between said baffles and the vertical panels of the external baffle unit, said spacers spacing said last-named panels from said vertical panels of the internal baffle unit when said panels of said internal baffle unit are placed in position in said furnace upon said base, a fire box and flue unit demountably mounted upon said base and positioned in spaced relation with and between the vertical panels of the internal baffle unit and underneath the top of said internal baffle unit, and a grill con-

struction disposed over the opening defined by the vertical panels, top, and base, whereby it is adapted to cover the opening into which the furnace is to be placed in the wall.

8. A furnace structure formed to be inserted into the wall of a structure and into openings on both sides of the wall between studs and headers provided in said wall structure to receive said furnace, comprising an external baffle unit formed to be placed against said studs and headers, said external baffle unit being composed of vertical panels, said vertical panels being in opposed spaced parallel relation to engage the inwardly facing surfaces of a pair of adjacent wall studs, and a top composed of a panel horizontally disposed across the space between the upper edges of the vertical panels, flanges on the vertical panels, the flanges of said vertical panels extending horizontally and transversely of the faces of such vertical panels, means adjacent the ends of the top engaging the flanges of the vertical panels in interlocking sliding relationship in a direction longitudinal of said flanges on said vertical panels, said flanges and means holding said vertical panels in said spaced relationship with each other and in engagement with said top, a base on said furnace, bottom flanges on said panels, the bottom flanges of said vertical panels extending horizontally and transversely of the faces of such vertical panels, said base being disposed in transversely slidable engagement between the lower ends of said vertical panels and on said bottom flanges and spacing and holding said panels in spaced apart relationship to each other, an internal baffle unit comprising vertical panels slidably positioned on said base within the space between the vertical panels of said external baffle unit, said vertical panels of said internal baffle unit being disposed in opposed spaced parallel relation, baffles mounted on and spaced from the exterior surface of said last-named panels, a panel top for said internal baffle unit horizontally and slidably positioned over the top of said vertical panels of said internal baffle unit and slidably positioned underneath the top positioned on the vertical panels of the external baffle unit, a spacer mounted on the exterior of each of said last-named baffles and extending between said baffles and the vertical panels of the external baffle unit, said spacers spacing said vertical panels of the external baffle unit from said vertical panels of the internal baffle unit when said panels of said internal baffle unit are placed in said furnace upon said base, a fire box and flue unit demountably mounted upon said base and positioned in spaced relation with and between the said vertical panels of the internal baffle unit and underneath the top of said internal baffle unit, a grill construction disposed over each of the openings defined by the vertical panels, top, and base, whereby said grill construction is adapted to cover the openings on each side of the wall into which the furnace is to be placed in the wall, each of said grill constructions comprising flanges extending rearwardly from the outer face of said grill and formed to engage the inner faces of said first-mentioned vertical panels and said first-mentioned top and said base, each of said grills spacing and holding said first-mentioned top, base, and first-mentioned vertical panels in spaced relation, means to selectively direct heat from said fire box outwardly through said grills, said means including a damper mounted between the underneath side of said top on the vertical panels of said internal baffle unit and said fire box and flue unit, and means for moving said damper on said mounting between said grills to selectively direct the heat from said fire box and flue unit through said grills.

9. A furnace structure formed to be inserted into the wall of a structure and into openings on both sides of the wall between studs and headers provided in said wall structure to receive said furnace, comprising an external baffle unit formed to be placed against said studs and headers, said external baffle unit being composed of vertical panels, said vertical panels being disposed in opposed spaced parallel relation to engage the inwardly facing surfaces of a pair of adjacent wall studs, and a top composed of a panel horizontally disposed across the space between the upper edges of the vertical panels, flanges on said vertical panels, the flanges of said vertical panels extending horizontally and transversely of the faces of said vertical panels, means adjacent the ends of said top engaging the flanges of said vertical panels in interlocking slidable relationship in a direction longitudinally of said flanges on said vertical panels, said flanges and means holding said vertical panels in said spaced relationship with each other and in engagement with said top, a base on said furnace, bottom flanges on the vertical panels, the bottom flanges of said vertical panels extending horizontally and transversely of the faces of such vertical panels, said base being disposed in transversely slidable engagement between the lower ends of said vertical panels and on said bottom flanges and spacing and holding said vertical panels in spaced apart relationship to each other, an internal baffle unit comprising vertical panels slidably positioned on said base within the space between the vertical panels of said external baffle unit, a panel top for said internal baffle unit horizontally and slidably positioned over the top of said vertical panels of the internal baffle unit and slidably positioned underneath the top positioned on the vertical panels of said external baffle unit, a spacer mounted on the exterior of each of the vertical panels of the internal baffle unit and extending between the said last-named panels and the panels of the external baffle unit, said spacers spacing said vertical panels of the internal baffle unit from the vertical panels of the external baffle unit when said panels of said internal baffle unit are placed in position in said furnace upon said base, a fire box and flue unit demountably mounted upon said base and positioned in spaced relation with and between the vertical panels of the internal baffle unit and underneath the top of said internal baffle unit, a grill construction disposed over each of the openings defined by the vertical panels, top, and base, whereby each grill is adapted to cover the openings on each side of the wall into which the furnace is to be placed in the wall, each said grill construction comprising flanges extending rearwardly from the outer face of said grill and formed to engage the inner faces of said first-mentioned vertical panels and said first-mentioned top and the said base and spacing and holding said first-mentioned top, base, and said first-mentioned vertical panels in spaced relation, said grill comprising also vertical channels positioned to engage said panels of said internal baffle along the length thereof, means to selectively direct heat from said fire box outwardly through said grills, said means including a damper mounted between the underneath side of said top mounted on the vertical panels of said internal baffle unit and said fire

box and flue unit, and means for moving said damper on said mounting between said grills to selectively direct the heat from said fire box and flue unit through said grills.

10. A furnace structure formed to be inserted into the wall of a structure and into openings on both sides of the wall between studs and headers provided in said wall structure to receive said furnace, comprising an external baffle unit formed to be placed against said studs and headers, said external baffle unit being composed of vertical panels, said vertical panels being disposed in opposed spaced parallel relation to engage the inwardly facing surfaces of a pair of adjacent wall studs, and a top composed of a panel horizontally disposed across the space between the upper edges of the vertical panels, flanges on the vertical panels, the flanges of said vertical panels extending horizontally and transversely of the faces of said vertical panels, means adjacent the ends of said top engaging the flanges of said vertical panels, said top engaging the flanges of said vertical panels in interlocking and slidable relationship in a direction longitudinally of said flanges for said vertical panels, said flanges and means holding said vertical panels in said spaced relationship with each other and in engagement with said top, a base on said furnace, bottom flanges on said vertical panels, the bottom flanges of said vertical panels extending horizontally and transversely of the faces of such vertical panels, said base being disposed in transversely slidable engagement between the lower ends of said panels and on said bottom flanges and spacing and holding said vertical panels in spaced apart relationship to each other, an internal baffle unit comprising vertical panels slidably positioned on said base within the space between the vertical panels of said external baffle unit, a panel top for said internal baffle unit slidably and horizontally positioned over the top of said vertical panels of said internal baffle unit and slidably positioned underneath the top positioned on the vertical panels of the external baffle unit, a spacer mounted on the exterior of each of said vertical panels of the internal baffle unit and extending between the said vertical panels of the internal baffle unit and the vertical panels of the external baffle unit, said spacers spacing said last-named panels from said first-mentioned panels when said vertical panels of said internal baffle unit are placed in position in said furnace upon said base, a fire box and flue unit demountably mounted upon said base and positioned in spaced relation with and between said vertical panels of the internal baffle unit and underneath said last-named top, a grill construction disposed over each of the openings defined by the vertical panels, top, and base, whereby said grill construction is adapted to cover the openings on each side of the wall into which the furnace is to be placed in the wall, each said grill construction comprising vertical flanges extending rearwardly from the outer face of the grill and formed to engage the inner faces of said first-named vertical panels and said first-named top and said base and spacing and holding said first-named top, base, and first-named vertical panels in spaced relation, each said grill construction having perforate top and bottom portions and an imperforate center portion, baffles mounted on the interior of said grill upon said central portion, means to selectively direct heat from said fire box outwardly through each of said grills, said means including a damper mounted between the vertical panels of said internal baffle unit and the underneath side of said top positioned on the said vertical panels of said internal baffle unit above said fire box and flue unit, and means for moving said damper on said mounting between said grills to selectively direct heat from said fire box and flue unit through said grills.

11. A furnace structure formed to be inserted into the wall of a structure and into openings on both sides of the wall between studs and headers provided in said wall structure to receive said furnace, comprising an external baffle unit formed to be placed against said studs and headers, said external baffle unit being composed of vertical panels, said vertical panels being disposed in opposed spaced parallel relation to engage the inwardly facing surfaces of a pair of adjacent wall studs, and a top composed of a panel horizontally disposed across the space between the upper edges of the vertical panels, flanges on the vertical panels, the flanges of said vertical panels extending horizontally and transversely of the faces of such vertical panels, means adjacent the ends of said top engaging the flanges of said vertical panels, said top engaging the flanges of said vertical panels in interlocking slidable relationship in a direction longitudinally of said flanges for said vertical panels, said flanges and means holding said vertical panels in said spaced relationship with each other and in engagement with said top, a base on said furnace, bottom flanges on said vertical panels, the bottom flanges of said vertical panels extending horizontally and transversely of the faces of such vertical panels, said base being disposed in transversely slidable engagement between the lower ends of said panels and on said bottom flanges and spacing and holding said panels in spaced apart relationship to each other, an internal baffle unit comprising vertical panels slidably positioned on said base within the space between the vertical panels of said external baffle unit, a panel top for said internal baffle unit horizontally and slidably positioned on the top of said vertical panels of said internal baffle unit and slidably positioned underneath the top positioned on the vertical panels of said external baffle unit, baffles mounted on and spaced from the exterior surface of said vertical panels of said internal baffle unit, a spacer mounted on the exterior of each of said last-named baffles and extending between said baffles and the vertical panels of the external baffle unit, said spacers spacing said last-named panels from said first-mentioned panels when said vertical panels of said internal baffle unit are placed in position in said furnace upon said base, a fire box and flue unit demountably mounted upon said base and positioned in spaced relation with and between said vertical panels of said internal baffle unit and underneath the top of said internal baffle unit, a grill construction disposed over each of the openings defined by the vertical panels, top, and base, whereby said grill construction is adapted to cover the openings on each side of the wall into which the furnace is to be placed in the wall, each said grill construction having a perforate top and bottom portion and an imperforate center portion, baffles mounted on the interior of said grill upon said central portion, means to selectively direct heat from said fire box outwardly through said grills, said means including a damper mounted between the underneath side of said top on the vertical panels of said internal baffle unit and said fire box and flue unit, and means for moving said damper on said mounting between said grills to selectively direct the heat

from said fire box and flue unit through said grills.

12. A furnace structure formed to be inserted into the wall of a structure and into openings on both sides of the wall between studs and headers provided in said wall structure to receive said furnace, comprising an external baffle unit formed to be placed against said studs and headers, said external baffle unit being composed of vertical panels, said vertical panels being disposed in opposed spaced parallel relation to engage the inwardly facing surfaces of a pair of adjacent wall studs, and a top composed of a panel horizontally disposed across the space between the upper edges of the vertical panels, flanges on the vertical panels, the flanges of said vertical panels extending horizontally and transversely of the faces of such vertical panels, means adjacent the ends of said top engaging the flanges of said vertical panels, said top engaging the flanges of said vertical panels in interlocking slidable relationship in a direction longitudinally of said flanges for said vertical panels, said flanges and means holding said vertical panels in said spaced relationship with each other and in engagement with said top, a base for said furnace, bottom flanges on said vertical panels, the bottom flanges of said vertical panels extending horizontally and transversely of the faces of such vertical panels, said base being disposed in transversely slidable engagement between the lower ends of said panels and on said bottom flanges and spacing and holding said vertical panels in spaced apart relationship to each other on said base, an internal baffle unit comprising vertical panels slidably positioned on said base within the space between the vertical panels of said external baffle unit, a top for said internal baffle unit horizontally and slidably positioned on the top of said panels of said internal baffle unit and slidably positioned underneath the top on the panels of the external baffle unit, baffles mounted on and spaced from the exterior surface of said vertical panels of said internal baffle unit, a spacer mounted on the exterior of each of said last-named baffles and extending between said baffles and the vertical panels of the external baffle unit, said spacers spacing said last-named panels from said first-mentioned panels when said vertical panels of said internal baffle unit are placed in position in said furnace upon said base, a fire box and flue unit demountably mounted upon said base and positioned in spaced relation with and between said vertical panels of said internal baffle unit and underneath the top of said internal baffle unit, a grill construction disposed over each of the openings defined by the vertical panels, top, and base, whereby said grill construction is adapted to cover the opening on each side of the wall into which the furnace is to be placed in the wall, said grill construction comprising flanges extending along the length of said grill and rearwardly from the outer face of said grill and formed to engage the inner faces of said first-mentioned vertical panels and said first-mentioned top and said base and spacing and holding said first-mentioned top, base, and first-mentioned vertical panels in spaced relation, said grill construction having a perforate top and bottom portion and an imperforate center portion, baffles mounted on the interior of said grill upon said central portion, means to selectively direct heat from said fire box outwardly through said grills, said means including a damper mounted between the underneath side of said top positioned on the vertical panels of said internal baffle unit and said fire box and flue unit, and means for moving said damper on said mounting between said grills to selectively direct the heat from said fire box and flue unit through said grills.

13. A furnace structure adapted to be inserted into an opening in the wall of a structure provided in said wall structure to receive said furnace, comprising an external baffle unit formed to be placed in said opening, said external baffle unit being composed of vertical panels, said vertical panels being disposed in opposed spaced parallel relation, and a top composed of a panel horizontally disposed across the space between the upper edges of the vertical panels in slidable relationship with the tops of the vertical panels, means adjacent the ends of the top engaging the top of each of the vertical panels in interlocking relationship, means holding said vertical panels in spaced relation with each other and in engagement with said top, a base for said furnace, said base being slidably disposed between the lower ends of the vertical panels, a fire box and flue unit demountably mounted upon said base and positioned in spaced relation with said panels and top, and a grill construction disposed over the opening defined by the vertical panels, top, and base, whereby it is adapted to cover the opening into which the furnace is to be placed in the wall.

14. The furnace structure defined in claim 13 in which said grill construction comprises flanges engaging the inner faces of said vertical panels.

15. The furnace structure defined in claim 14 characterized by an internal baffle unit comprising vertical panels positioned within the space between each of the vertical panels of said external baffle unit and said fire box, said vertical panels of said internal baffle unit being disposed in opposed spaced parallel relation, a top for said internal baffle unit extending across the space between said vertical baffles of said internal baffle unit, said grill including also channels positioned to engage said vertical panels of said internal baffle along the length thereof.

16. The furnace structure defined in claim 13 characterized by an internal baffle unit comprising vertical panels positioned within the space between each of the vertical panels of said external baffle unit and said fire box, said vertical panels of said internal baffle unit being disposed in opposed spaced parallel relation, a top for said internal baffle unit extending across the space between said vertical baffles of said internal baffle unit.

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1,660,690	Terry	Feb. 28, 1928
1,927,174	Jones	Sept. 19, 1933
2,324,710	Livar	July 20, 1943
2,360,087	Tuck	Oct. 10, 1944