Oct. 10, 1939. J. F. O. STRATTON 2,175,579

HEAT INSULATING WALL

Filed May 21, 1937

Fig. 2.

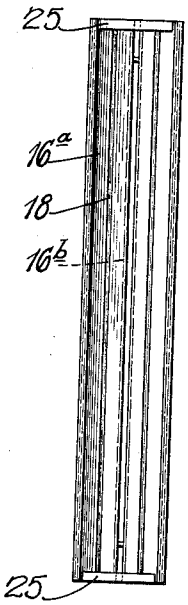


Fig. 1.

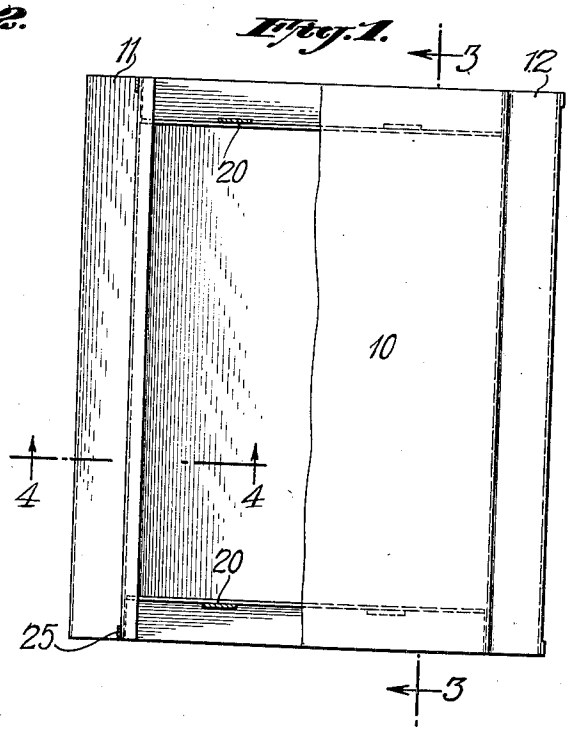


Fig. 3.

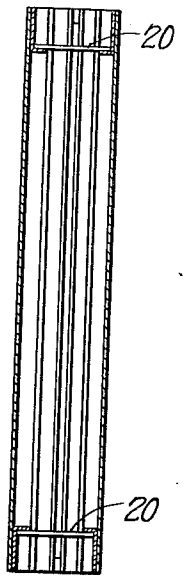


Fig. 5.

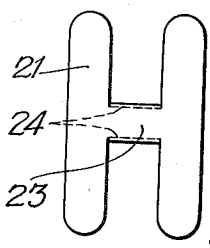


Fig. 6.

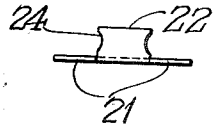
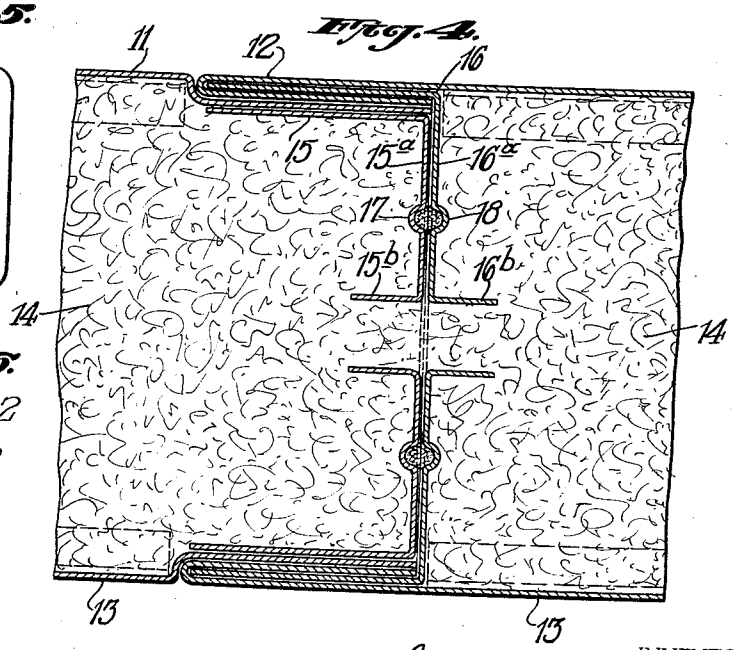


Fig. 4.



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HEAT INSULATING WALL

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Application May 21, 1937, Serial No. 143,952

8 Claims. (Cl. 189—34)

This invention relates to heat insulating walls and more especially to oven walls constructed of interlocking metal panels consisting of a pair of spaced parallel metal plates of induced heat-insulating material, the metal plates being held in spaced relation by any suitable means. The panels are completely fabricated in a factory and shipped to the place of assembly where they are arranged into an oven without any labor other than that to place and fasten them in position.

An object of this invention is a panel of the above-described type having a continuous gas or air gap between the longitudinal ends of the metal plates and having means to prevent leakage of air or gas from or to the interior of an oven composed of such panel through joints between adjacent panels or into the interior of the panels.

In a panel embodying the present invention, the metal plates are offset inwardly at one end so that such end of the panel is receivable within the opposite plate ends of a second panel. Each plate is provided at each end with an inwardly directed or transverse extension terminating in a flange extending longitudinally of the panel. The transverse portions of such extensions are provided with semi-circular grooves which strengthen the portions and also co-operate to form a circular channel when two panels are assembled. Each panel is filled with suitable insulating material and suitable packing material is arranged in each of the channels to prevent passage of air or gas through the joint between the two panels and to prevent passage of air or gas into the interior of a panel.

Other objects, novel features and advantages of this invention will become apparent from the following specification and accompanying drawing, wherein:

Fig. 1 is a side elevation partly broken away of a panel embodying the invention;

Fig. 2 is an end elevation of the panel;

Fig. 3 is a section on the line 3—3 of Fig. 1;

Fig. 4 is a fragmentary horizontal section through two inter-connected panels;

Fig. 5 is a front elevation of a tie strap, and Fig. 6 is a side elevation thereof.

The panel 10 has its opposite ends 11 and 12 so arranged as to co-operate with the ends of similar panels to form a tongue and groove connection as shown in Fig. 4. Each panel comprises a pair of sheet metal plates 13 between which is packed insulating material 14. The plates 13 of each panel are offset inwardly at its end 11 and at its end 12 are bent back on the remainder, the extent of the offset of the plates at the end 11 being sufficient that such end may extend into the end 12 of a similar panel. The tongue and groove connection between the end 11 of one panel and the end 12 of another panel securely interlocks the two panels.

In the panel end 11 are provided strips 15 which contact the inner faces of the side plates 13 and are attached thereto in any suitable manner, such, for example, as by welding. The strips 15 have transversely extending portions 15*a* terminating in flanges 15*b* extending inwardly and longitudinally of the panel, each strip 15 being substantially L-shape in cross-section. In the panel end 12 are provided strips 16 which extend into the return portions of the plates 13 and are firmly clamped thereby. These strips have transversely extending portions 16*a* terminating in flanges 16*b* extending inwardly and longitudinally of the panel, each of the strips 14 being substantially Z-shape in cross-section. The transversely extending portions 15*a* and 16*a* are formed with opposed semi-circular grooves 17 and 18.

The rigidity and supporting effect of the strips 15 and 16 is increased by the provision of the transversely extending portions with the inwardly directed flanges and the strips are further strengthened by the corrugations or grooves 17 and 18. These strips constitute posts supporting the ends of the plates 13 and give support to the panel as a whole.

Upon assembly of two panels as shown in Fig. 4, the portions 15*a* and 16*a* are brought into contact and in each passageway formed by co-operating channels 17 and 18 is arranged a strip 19 of suitable packing material. The packing material 19 forms an air-tight seal between the ends of the panels and prevent leakage of gases from or to the interior of an oven composed of such panels through the joints between such panels and also prevents leakage into the interior of the panels.

The side plates 13 of the panel are interconnected at their top and bottom edges by means of spacer bars 20 or any other suitable equivalent means. At each end of the panel, the arrangement of the strips 15 and 16 is such as to provide an air gap separating the walls, thus completely interrupting the metallic continuity between the side plates at their ends, over the insulation-containing section.

In fabricating an oven wall, panels 10 are assembled by sliding the end 11 of one panel into the end 12 of another panel as shown in Fig. 4,

thus bringing the portions 15a and 16a of the frame plates 15 and 16 into engagement. In the spaces formed by the channels 17 and 18 are introduced the packing strips 19. It is unnecessary to perform any labor on the panels themselves as they are completely fabricated before shipment to the place of assembly. As previously stated, the packing strips 19 form a gas-tight seal between the adjacent ends of two panels and there is provided an air gap between the opposite sides of the oven wall.

Preferably metal tie straps 21 may be used for maintaining the strips 15 and 16 in proper spaced relation. As shown in Figs. 5 and 6, the tie strap 21 is of general H shape with two wings 22 bent at an angle to strengthen the cross or connecting section 23. The wings are cut out at their top and bottom edges at 24 so that these wings present only point contact to the flanges 15b and 16b. When a tie strap is used, it is preferably located midway of the top and bottom of the panel and is so arranged that the two wings 22 extend between flanges 15b or flanges 16b with the legs of the H shape portion contacting the faces of the portions 15a or 16a. The tie strap may be welded or riveted to the frame plates or may be connected thereto in any suitable manner.

For the purpose of facilitating the assembly of the panels, thin narrow metal strips 25 may be attached to the strips 15 and 16 at their top and bottom ends. These strips lie above and below the insulation-containing portion of the panel so that over the extent of such portion there is no metallic continuity between the strips 15 and 16.

I claim:

1. In a heat insulating wall, a pair of panels each of which consists of two sheet metal side plates offset inwardly at one end, the offset end of the first panel being received within the opposite end of the second panel to form a slip joint, and strips attached to the inner surfaces of each end of each panel, said strips having transversely extending portions terminating in flanges extending longitudinally inwardly of each panel to form a gap between corresponding ends of said side plates, the strips at the offset end of the panel having their transversely extending portions flush with the joint edges of the side plates and the other strips having their transversely extending portions set back from the joint edges of the side plates whereby the strips at one end of the first panel are immediately adjacent the strips at the opposite end of the second panel.

2. In a heat insulating wall, a pair of panels each of which consists of two sheet metal side plates offset inwardly at one end, the offset end of the first panel being received within the opposite end of the second panel to form a slip joint, strips attached to the inner surfaces of each end of each panel and having transversely extending portions terminating in flanges extending longitudinally inwardly of each panel to form a gap between corresponding ends of said side plates, the strips at the offset end of the panel having their transversely extending portions flush with the joint edges of the side plates and the other strips having their transversely extending portions set back from the joint edges of the side plates whereby the strips at one end of the first panel are immediately adjacent the strips at the opposite end of the second panel, the transversely extending portions of said strips being formed with opposed grooves and packing material arranged between each pair of opposed grooves.

3. An oven panel comprising two sheet metal side plates offset inwardly at one end and being provided at the opposite end with return bends, L-shaped strips attached to the inner surfaces of said offset ends, each of said L strips having a portion extending transversely of the panel and terminating in a flange extending longitudinally inwardly of the panel, and Z shaped strips having portions received within said return bends, each Z strip having a portion extending transversely of the panel and a portion extending longitudinally inwardly of the panel, the L-shaped strips having their transversely extending portions flush with the joint edges of the side plates and the Z-shaped strips having their transversely extending portions set back from the joint edges of the side plates whereby upon joinder of two panels, the L-shaped strips at one end of the first panel are immediately adjacent the Z-shaped strips at the opposite end of the second panel.

4. An oven panel comprising two sheet metal side plates offset inwardly at one end and being provided at the opposite end with return bends, L-shaped strips attached to the inner surfaces of said offset ends, each of said L strips having a portion extending transversely of the panel and terminating in a flange extending longitudinally inwardly of the panel, and Z shaped strips having portions received within said return bends, each Z strip having a portion extending transversely of the panel and a portion extending longitudinally inwardly of the panel, each of said transversely extending portions of said strips being formed with a groove for co-operation with an opposed groove to receive packing material.

5. In a heat insulating wall, a pair of panels, each of which consists of two sheet metal side walls offset inwardly at one end, the offset end of the first panel being interengaged with the opposite end of the second panel to form a slip joint, and plates attached to the inner surfaces of each end of each panel, said plates having transversely extending portions forming a gap between corresponding ends of said side walls, the plates at the offset end of the panel having their transversely extending portions flush with the joint edges of the side walls and the plates at the other end having their transversely extending portions set back from the joint edges of the side walls whereby the plates at one end of one panel are immediately adjacent the plates at the opposite end of the second panel, the transversely extending portion of each plate being formed with a groove, and packing material arranged between each pair of opposed grooves.

6. In a heat insulating wall, a pair of panels, each of which consists of two metal side plates offset inwardly at one end, the offset end of the first panel being received within the opposite end of the second panel to form a slip joint, said metal side plates having inwardly directed extensions terminating in flanges extending longitudinally inwardly of each panel to form a gap between corresponding ends of said side plates, the extensions at the offset end of the panel being flush with the joint edges of the side plates and the other extensions being set back from the joint edges of the side plates whereby the extensions at one end of the first panel are immediately adjacent the extensions at the opposite end of the second panel.

7. In a heat insulating wall, a pair of panels each of which consists of two metal side plates offset inwardly at one end, the offset end of the first panel being received within the opposite end

of the second panel to form a slip joint, said side plates having inwardly directed extensions terminating in flanges extending longitudinally inward of each panel to form a gap between corresponding ends of said side plates, the extensions at the offset end of the panel being flush with the joint edges of the side plates and the other extensions being set back from the joint edges of the side plates whereby the extensions at one end of the first panel are immediately adjacent the extensions at the opposite end of the second panel, said extensions being formed with opposed grooves and packing material arranged between each pair of opposed grooves.

8. In a heat insulating wall, a pair of panels, each of which consists of two sheet metal side plates inwardly offset at one end, the offset end of the first panel being inter-engaged with the opposite end of the second panel to form a slip joint, said side plates having inwardly directed extensions of such size as to form a gap between corresponding ends of said side plates, the extensions at the offset end of each panel being flush with the joint edges of the side plates and the extensions at the other end being set back from the joint edges of the side plates whereby the extensions at one end of one panel are immediately adjacent the extensions at the opposite end of the second panel, each extension being formed with a groove and packing material arranged between each pair of opposed grooves.

JOHN F. O. STRATTON.