Feb. 5, 1946. E. D. HILLEBRAND 2,394,176

OVEN DOOR CONSTRUCTION

Filed June 14, 1944

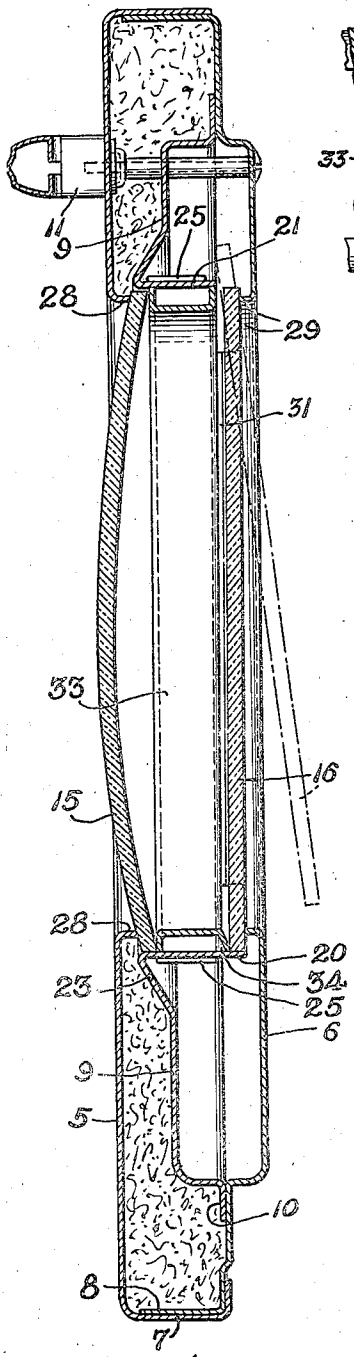


Fig. 1.

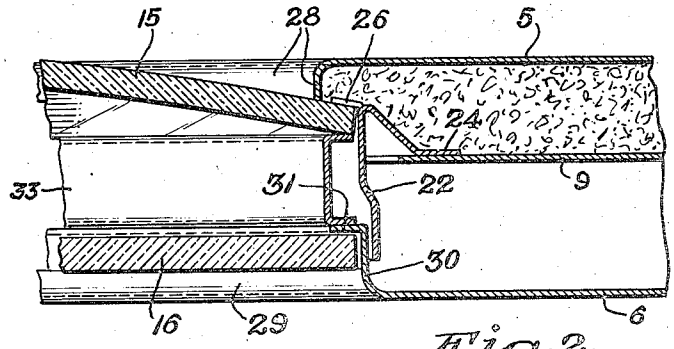


Fig. 2.

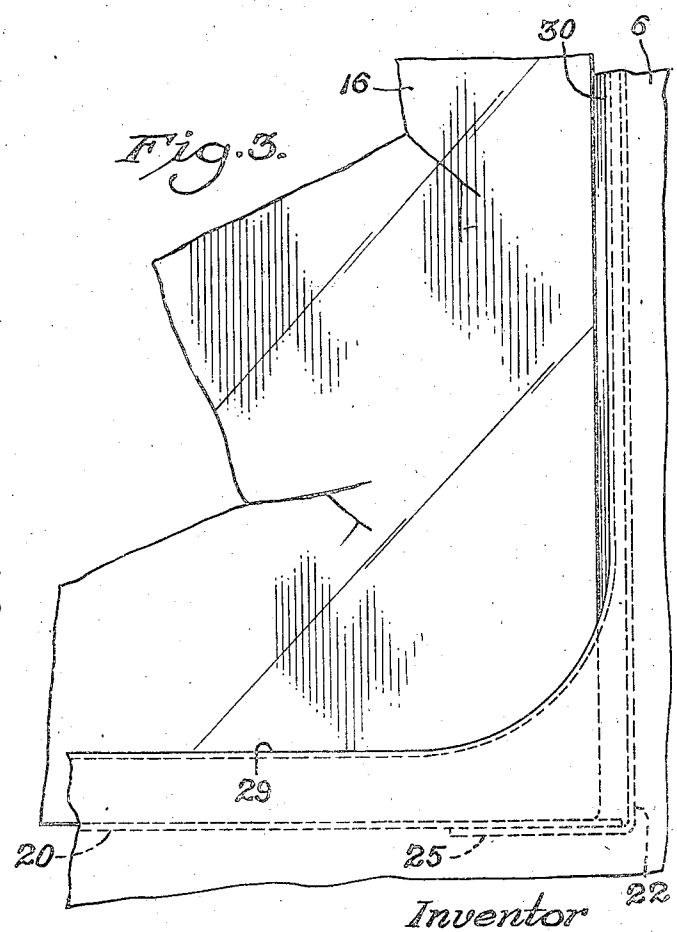


Fig. 3.

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Patented Feb. 5, 1946 2,394,176

UNITED STATES PATENT OFFICE

2,394,176

OVEN DOOR CONSTRUCTION

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Application June 14, 1944, Serial No. 540,277

13 Claims. (Cl. 126—200)

The invention relates to oven doors for domestic cook stoves or ranges and more particularly to oven doors of the type provided with windows.

Oven doors of the above general character commonly have double glazed windows, with the window panels suitably spaced apart so that the outer panel does not become too hot when the oven is in operation. In ordinary cook stoves, various considerations, such as increased costs, make it impractical to completely seal the space between the glass panels against the entry of hot gases from the oven. Thus gases leaking into the door structure tend to condense on the inner surfaces of the panels, especially during the preheating of the oven. As the oven approaches normal baking temperature, the condensation evaporates and leaves a thin film deposited on the inner surface of each panel, and, if such films are not removed frequently, the panels eventually become discolored and visibility therethrough is materially reduced. With oven doors as heretofore constructed, access to the inner surfaces of the window panels can be had only by disassembling the door structure or by removal of retaining means such as screws. Proper cleaning of the panels is thus a difficult and time-consuming operation.

With the foregoing in view, one object of the invention is to provide a double glazed oven door having improved retaining means for holding the glass panels in place and which permits removal of one of the panels without disassembly of the door structure and without the use of any tools whatever, thus greatly facilitating the cleaning of the panels.

A more specific object is to provide a double glazed oven door constructed in a novel manner to permit one of the window panels to be disengaged from the supporting framework by simple edgewise sliding movement so that the panel can be completely removed from the door structure for cleaning purposes.

Other objects and advantages of the invention will become apparent from the following detailed description of the preferred embodiment illustrated in the accompanying drawing in which:

Figure 1 is a transverse vertical sectional view of an oven door embodying the features of the invention.

Fig. 2 is a horizontal sectional view through the door at one side of the window.

Fig. 3 is a fragmentary rear elevational view of the door.

While the invention is susceptible of various modifications and alternative constructions, I have shown in the drawing and will herein describe in detail the preferred embodiment, but it is to be understood that I do not thereby intend to limit the invention to the specific form disclosed, but intend to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

The improved door is constructed in the form of a rigid frame with a central aperture providing a window through which the interior of the oven can be viewed. Preferably, the window opening is double glazed, that is, it is fitted with inner and outer glass panes or panels separated by a substantial air space which acts to maintain the outer panel at a reasonably low temperature when the oven is in use. In carrying out the invention, the frame is constructed in a novel manner so as to permit convenient removal of one of the panels from the door structure by simple edgewise sliding movements of the panel. Accordingly, access is readily had to the inner surfaces of the panels for cleaning purposes.

In the door selected to illustrate the invention the frame structure comprises generally an outer or face member 5 and an inner or liner member 6, both in the form of sheet metal stampings. The members 5 and 6 are formed around their respective peripheral edges with interfitting flanges 7 and 8 which serve to locate them in predetermined spaced relation and which may be secured in assembled relation by spot welding or the like. A reinforcing or stiffening member 9, also in the form of a sheet metal stamping, is installed between the inner and outer door members to impart strength and rigidity to the door structure. In the particular door shown, the member 9 is formed with a rearwardly and outwardly turned flange 10 adapted to abut against the inner member 6 and to be secured thereto in any suitable manner. The space between the member 9 and the outer member 5 may be filled with insulating material to prevent excessive heating of the outer door member when the oven is in use. A conventional handle 11 is provided for opening and closing the door.

To provide the window through which the interior of the oven may be viewed when the door is closed, the frame members 5 and 6 and the stiffening member 9 are formed with generally rectangular openings arranged substantially in alignment. The window thus formed is fitted with front and back panels 15 and 16 of glass or other suitable transparent material.

In accordance with the present invention, the

inner and outer members 5 and 6 of the door are constructed and arranged to provide novel retaining means adapted to hold the panels 15 and 16 in registration with the openings in the inner and outer frame members so as to seal off the interior of the door structure from the oven while permitting convenient removal of one of the panels for cleaning purposes. In the exemplary door, the outer panel 15 is mounted in a fixed position while the inner panel is removably supported on the door structure but normally maintained in window closing position.

In the preferred form of the door structure, the panels 15 and 16 are supported by a generally rectangular shell located between the inner and outer members 5 and 6 and are held in position by said shell in cooperation with retaining means formed on the frame members. As herein shown, the shell comprises a bottom member 20, a top member 21 and side members 22. To form the bottom member 20, a section of the reinforcing member 9 adjacent the lower edge of the window opening therein is bent forwardly as at 23 and then rearwardly to define a horizontal shelf or ledge upon which the lower edges of the glass panels 15 and 16 are adapted to rest. The top member 21 is shaped similarly to the bottom member 20 but is terminated outwardly of the plane of the inner panel 16 for reasons to be described presently.

Side members 22 are preferably formed as separate strips having longitudinal flanges 24 secured to the reinforcing member 9 as by spot welding. Inwardly bent tabs 25 at opposite ends of each member extend over and are spot welded to the bottom and top members 20 and 21. A plurality of lugs 26 struck out from the side members adjacent their forward edges serve as stops for the outer window panel 15.

The retaining means for holding the outer glass panel 15 in assembled relation in the door structure is preferably in the form of an inwardly turned flange 28 extending entirely around the window opening in the outer frame member 5. In order to enable the flange 28 to perform its retaining function, the window opening in the member 5 is made somewhat smaller than the panel 15. Thus by proper location of the supporting shell, the panel 15 may be held in a position to engage the flange 28 at all four edges of the window opening.

To provide for convenient removability of the inner glass panel 16, the window opening in the inner frame member 6 is provided with retaining means engageable only with two oppositely disposed marginal edge portions of the panel. Preferably, the retaining means is arranged for cooperation with the upper and lower edge portions of the panel 16 and, to this end, the height of the window opening in the inner frame member 6 is made slightly less than the corresponding dimension of the panel 16 and the upper and lower edges are formed with forwardly turned retaining flanges 29.

In order to leave the side edges of the panel 16 free, the window opening in the inner member 6 is made slightly wider than the panel. The side edges of the window opening are, in this instance, formed with forwardly turned flanges 30, but these flanges are spaced apart so that the panel 16 is adapted to fit between them as shown in Fig. 2. Preferably, the flanges 30 are extended substantially beyond the inner edges of the flanges 29 and their marginal edge portions are bent inwardly to form vertical guides 31 for the panel 16. In practice, it has been found desirable to space the guides 31 from the inner edges of the flanges 29 so as to enable them to hold the panel 16 relatively close to the retaining flanges while permitting edgewise sliding movement of the panel.

A spacing member 33, herein shown as comprising a generally U-shaped member bent into rectangular configuration and fitted into the frame structure between the guides 31 and the outer panel 15 serves to hold the latter tightly against the retaining flange 28 of the front frame member 5. Rearwardly projecting lugs 34 struck out from the lower ledge of the spacing member operate to hold the inner panel 16 tightly against the lower retaining flange 29 of the frame member 6.

As explained heretofore, the top member 21 of the glass supporting shell is formed so that it does not extend over the upper edge of the inner glass panel 16, the member being cut off in this instance substantially flush with the inner edge of the spacing member 33. By reason of the clearance thus provided, the panel 16 may be shifted upwardly into the space between the frame member 6 and the reinforcing member 9 to clear retaining flange 29 at the lower edge of the window opening. As the panel 16 is fitted between the side flanges 30 of the window opening, it can then be tilted outwardly as shown in the broken lines in Fig. 1 and disengaged from the upper retaining flange 29 by a downward shifting movement. When thus removed, the inner panel 16 can be easily cleaned and, moreover, the inner surface of the panel 15 is exposed for convenient cleaning.

Replacement of the inner panel 16 in the door structure is equally simple. For this purpose, the panel is held in an inclined position while the upper edge is inserted under the upper retaining flange 29 of the frame member 6. The panel may then be lifted sufficiently to clear the lower edge of the window opening and swung into engagement with the guides 31 whereupon it will drop into engagement with the lower retaining flange 29 upon release.

It will be apparent from the foregoing that the invention provides a double glazed oven door of improved construction which greatly facilitates the cleaning of the inner surfaces of the window panels. The door structure embodies novel retaining means for holding the window panels in assembled relation in the door structure which effectually seals the interior of the door, yet permits the inner panel to be removed without requiring disassembly of the door or the use of any tools whatever. Removal of the inner panel provides convenient access to the outer panel for cleaning purposes and the inner panel of course is readily cleaned while removed from the door.

I claim as my invention:

1. In an oven door structure, in combination, inner and outer frame members secured together in spaced relation, each of said members having a window opening, inner and outer glass panels closing said window openings, an inturned flange formed on said outer member engageable with the marginal edge portion of said outer panel, outturned flanges on said inner member engageable with the upper and lower edge portions of said inner panel, a panel engaging shell disposed between said frame members operative to hold said panels in registration with the window openings, and a spacing member interposed between said panels for holding them in engagement with

the flanges of the respective frame members, said shell being spaced from said inner frame member adjacent the upper edge of the window opening to permit said inner panel to be shifted upwardly out of engagement with the flange at the lower edge of the window opening for removal from the door structure.

2. In an oven door structure, in combination, a rigid frame having a generally rectangular window opening, a pair of rectangular glass panels for closing said window opening, means interposed between said panels for holding them in fixed spaced relation, retaining means on said frame engageable with the outer face of one of said panels along all four marginal edges for holding it in permanently assembled relation in the door structure, and other retaining means on said frame engageable with the outer face of the other of said panels along only its upper and lower edges to removably hold the panel in assembled relation in the door structure, said other panel being disengageable from said retaining means at its lower edge by edgewise movement of the panel and being dimensioned to permit it to be withdrawn outwardly through the plane of the window opening.

3. In an oven door structure, in combination, an outer member having a generally rectangular window opening, an inner member spaced from and secured to said outer member, said inner member having a generally rectangular window opening aligned with the opening in said outer member, inner and outer glass panels adapted to close said window openings, the window opening in said outer member being dimensioned to overlap all four edges of said outer panel while the window opening in said inner member is dimensioned to overlap only the upper and lower edges of said inner panel, a shell supported between said members operative to hold said panels in registration with the respective openings, said shell being formed to permit upward movement of said inner panel to clear the lower edge of the opening in said inner member whereby the panel may be tilted rearwardly for removal from the window structure.

4. In an oven door structure, in combination, an outer member having a generally rectangular window opening, retaining means formed on said member extending entirely around said opening, an inner member spaced from and secured to said outer member, said inner member having a generally rectangular opening aligned with the opening in said outer member, retaining means formed on said inner member adjacent two opposite edges of said opening, rectangular glass panels adapted to be supported between said members to close the respective openings, a supporting shell operative to hold one of said panels in a position to be engaged at all four edges by the retaining means of said outer member and to hold the other panel in a position to be engaged at opposite edges by the retaining means of said inner member, said shell being formed to permit edgewise sliding movement of said inner panel to disengage the lower edge thereof from the associated retaining means, the opening in said inner member being slightly wider than said inner panel to permit the panel to be shifted edgewise in the opposite direction while tilted outwardly to disengage the panel from the other retaining means.

5. In an oven door structure, in combination, inner and outer frame members secured together in spaced relation, a stiffening member disposed between said inner and outer members and rigidly secured to one of the members, each of said members having a window opening, inner and outer glass panels closing said window openings, a flange formed on said stiffening member at the lower edge of the window opening for supporting said panels, and a second flange formed on said stiffening member at the upper edge of the window opening engageable with said outer panel to hold the same in fixed position in the door structure, said second flange being spaced from said inner frame member to provide a gap into which said inner panel may be shifted for removal from the door structure.

6. In an oven door structure, in combination, a rigid frame having a generally rectangular window opening, rectangular inner and outer glass panels closing said window opening, retaining means on said frame engageable with all four marginal edge portions of one of said panels to hold the panel in assembled relation in the door structure, other retaining means engageable only with the upper and lower marginal edge portions of the other of said panels, said other panel being disengageable from said other retaining means by a combination of edgewise and tilting movements whereby the panel may be removed from the door structure.

7. In an oven door structure, in combination, a rigid frame having a generally rectangular window opening, inner and outer glass panels closing said window opening, means for retaining one of said panels in permanently assembled relation in the door structure, other means for removably retaining the other of said panels in assembled relation in the door structure, said other retaining means including retaining members engageable with the exposed face of said other panel adjacent two opposite side edges, and guide members engageable with the opposite face of said other panel adjacent the other two side edges, said other panel being disengageable from one of said retaining members by edgewise sliding movement in one direction along said guide members and from the other of said retaining members by edgewise sliding movement in the other direction while tilted at an angle to said guide members.

8. In an oven door structure, in combination, a rigid frame comprising inner and outer sheet metal members each having a generally rectangular window opening, inner and outer glass panels closing said openings, forwardly projecting flanges extending along the upper and lower edges of the opening in said inner member engageable with the upper and lower edges of said inner panel to retain the same in place in the door structure, and flanges along the side edges of the window opening in said inner member projecting forwardly and inwardly to form guides engageable with the side edges of said inner panel, said panel being slidable along said guides to effect disengagement of the same from said upper and lower edge engaging flanges.

9. In an oven door structure, in combination, an outer frame member having a generally rectangular window opening, an inner frame member spaced from and rigidly secured to said outer member, said inner member having a generally rectangular window opening aligned with the opening in said outer member, a pair of glass panels supported adjacent the inner sides of said members for closing said openings, a generally rectangular spacing member of channel shaped cross section loosely fitted between said panels,

and outwardly projecting lugs formed along one edge of said spacing member engageable by one of said panels to hold the panel in tight engagement with its associated frame member.

10. In an oven door structure, in combination, a rigid frame having a central window opening, inner and outer glass panels for closing said opening, a shell for holding said panels in registration with the window opening, said shell including bottom and side members disposed substantially perpendicular to the plane of said opening and engageable with the bottom and side edges of both panels, and a top member disposed substantially perpendicular to the plane of said opening and engageable with the top edge of said outer panel, said top member having its inner edge spaced from the plane of said inner panel to permit edgewise movement of the panel for removal from the door structure.

11. In an oven door structure, in combination, a rigid frame having a generally rectangular window opening, inner and outer glass panels closing said opening, retaining means on said frame engageable with the outer face of one of said panels along all four marginal edges thereof, a spacing member disposed between said panels and engageable with their inner faces along all four marginal edges, said spacing member acting to hold said one panel in permanently assembled relation in the door structure, and other retaining means engageable with the outer face of said other panel only along its upper and lower marginal edges to hold it against said spacing member, said other panel being disengageable from the retaining means at its lower marginal edge by edgewise sliding movement and being dimensioned transversely to permit withdrawal outwardly through the plane of the window opening.

12. In an oven door structure, in combination, an outer member having a generally rectangular window opening, an inner member spaced from and rigidly secured to said outer member, said inner member having a generally rectangular window opening alined with the opening in said outer member, inner and outer glass panels closing said window openings, the window opening in said outer member being dimensioned to overlap all four edges of said outer panel while the window opening in said inner member is dimensioned to overlap only the upper and lower edges of said inner panel, means disposed between said members for retaining said panels in registration with the respective window openings, and spacing means interposed between said panels for holding them in engagement with the overlapping edges of the associated members, said retaining means being formed to permit upward edgewise movement and inward tilting movement of said inner panel to disengage it from the door structure.

13. In an oven door structure, in combination, an outer member having a generally rectangular window opening, an inner member spaced from and rigidly secured to said outer member, said inner member having a generally rectangular window opening alined with the opening in said outer member, inner and outer glass panels closing said window openings, the window opening in said outer member being dimensioned to overlap all four edges of said outer panel while the window opening in said inner member is dimensioned to overlap only the upper and lower edges of said inner panel, and a reinforcing member disposed between said inner and outer members and permanently secured to one of the members, said reinforcing member having retaining elements engageable with the edges of said panels to hold the panels in registration with the respective window openings, one of said elements being formed to permit upward edgewise movement and inward tilting movement of said inner panel to disengage the panel from the door structure.

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