May 23, 1939. H. E. MILLS 2,159,221

STOVE DOOR

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Fig. 1.

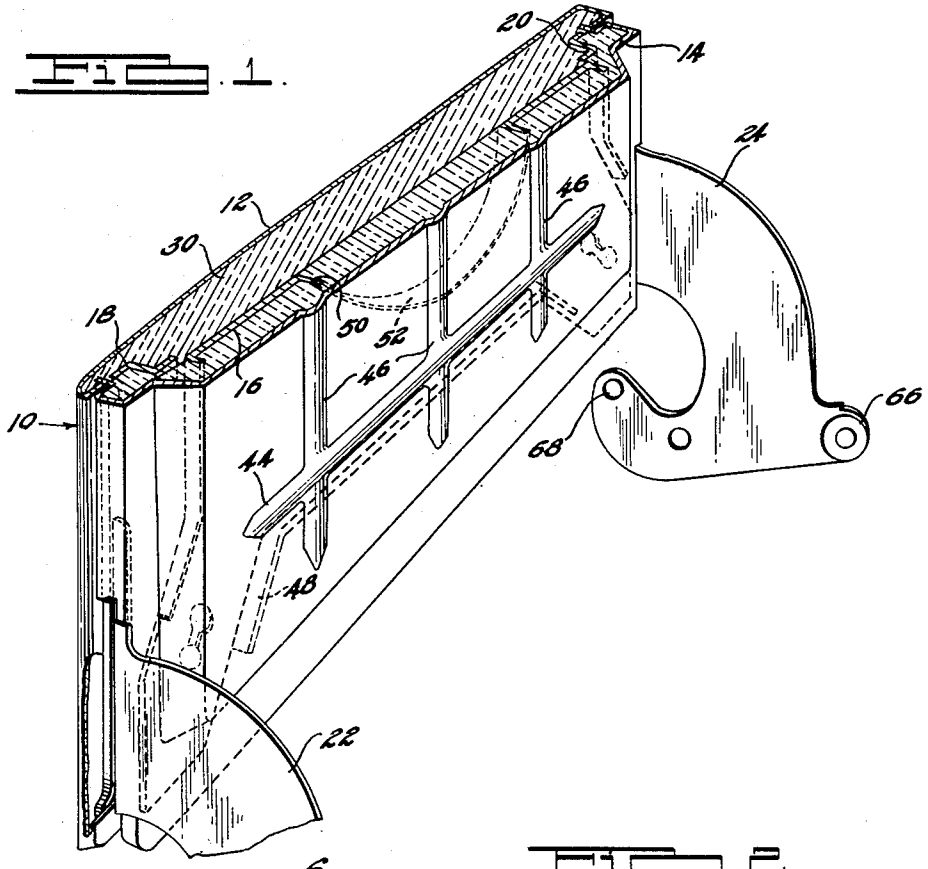
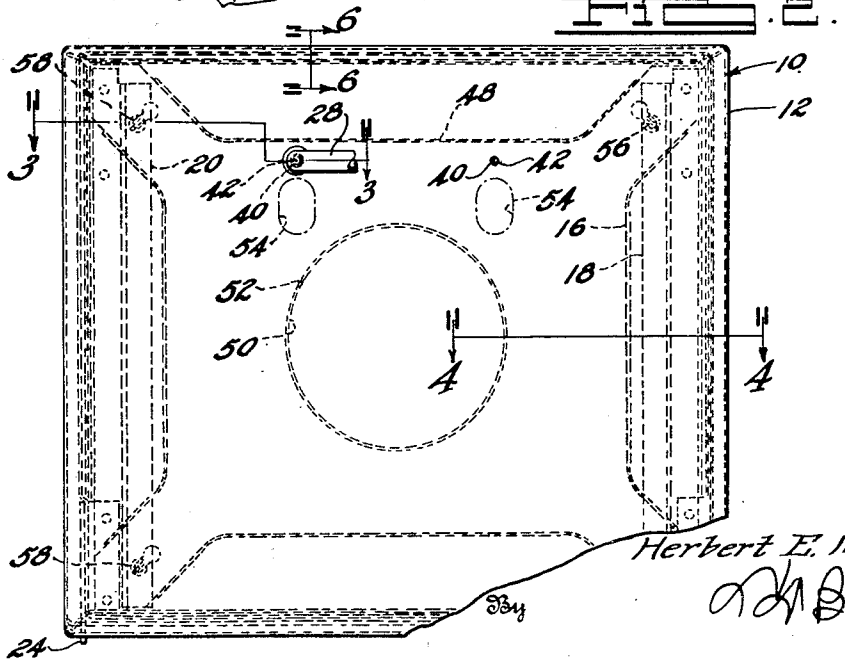


Fig. 2.



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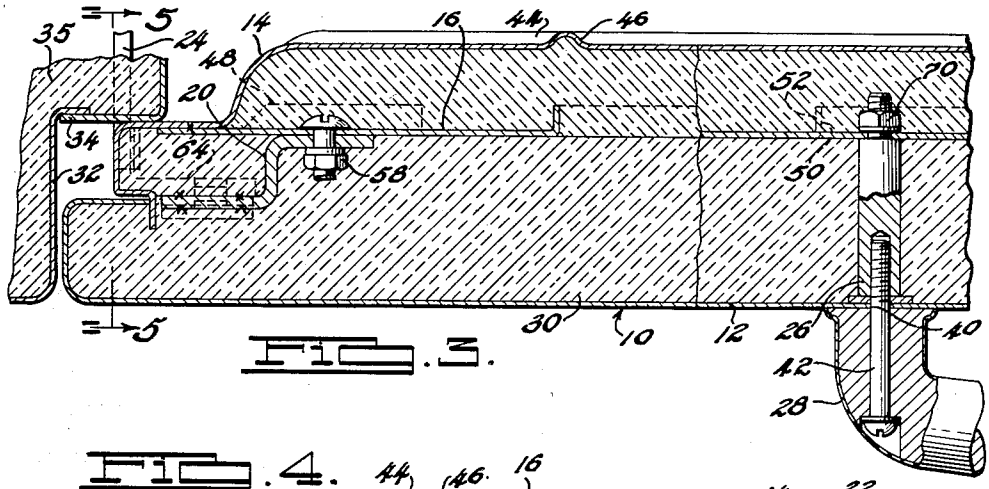
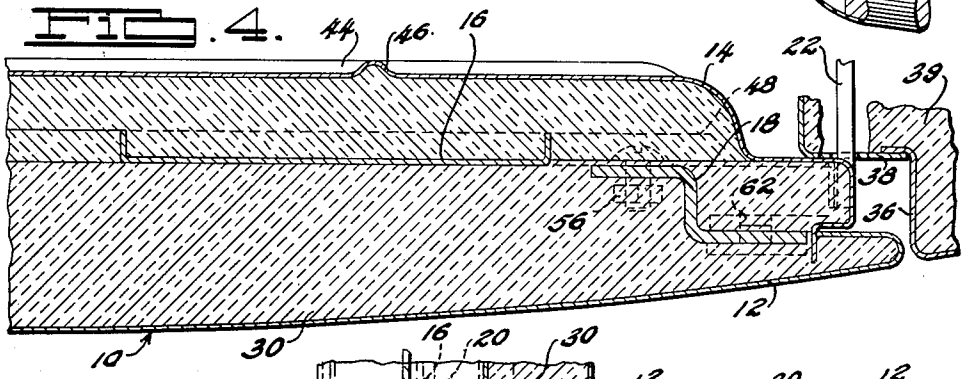


FIG. 3.

FIG. 4.



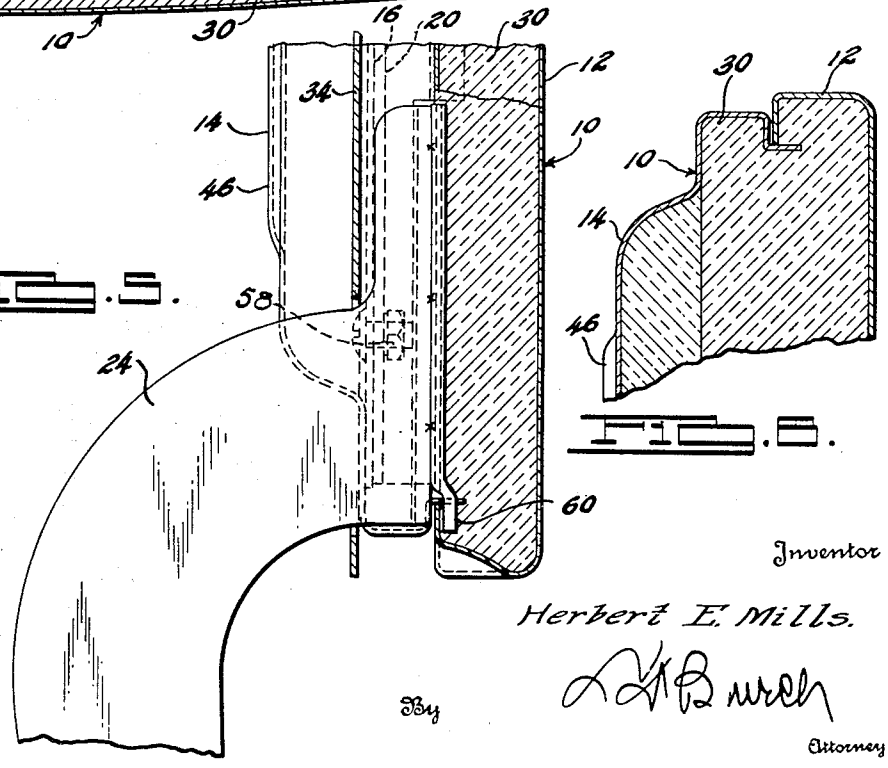


FIG. 5.

FIG. 6.

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UNITED STATES PATENT OFFICE

2,159,221

STOVE DOOR

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Application February 19, 1937, Serial No. 126,578

7 Claims. (Cl. 126—190)

This invention relates, in general, to stoves and has particular reference to an improved construction of the oven door therefor.

In those compartments in a stove wherein cooking is performed it is just as desirable to have the doors in said compartments as easily cleaned and polished as it is to have the walls of said compartments so taken care of. Progress in this direction has been extensive as far as the latter is concerned, but has been very limited as to the former. The construction of this class of door in the past has been such as to leave undesirable obstacles and projections on the surfaces thereof, such as bolt heads, which make the thorough cleaning of said door not only difficult but impossible to some extent. The door has also lacked the beauty and facility in the assembly or disassembly thereof which it might otherwise have possessed had more thought been given to its construction. To better these difficulties, and to remove the stresses and strains from the door paneling (to which said paneling has been subjected heretofore) and to subject these forces to a concealed unfinished member which is disposed between the finished panel and the finished lining of the door, is to be the subject matter herein.

In view of these various difficulties to be overcome, one of the principal objects of this invention is to provide a domestic stove having a heating compartment with a door constructed in such a way as to have the bolt heads and other means for securing the door elements together concealed so that the outer facings of the door are free from undesirable projections and sharp edges which would otherwise present difficulty in the cleaning of said door.

Another object of this invention is to provide the heating compartment in a domestic range with a door which has beauty, simplicity, and durability, and which is as easily disassembled as it is assembled without destruction resulting from either operation.

Other objects and advantages of the invention will be apparent by referring to the following specification taken in conjunction with the accompanying drawings, of which there are two sheets and in which:

Fig. 1 is a fragmentary perspective view, in elevation and partly in section, of a door adapted for use in conjunction with a domestic range and showing the incorporation of the invention therein;

Fig. 2 is a front elevational view of the door in Fig. 1, part of said door being broken away, and said figure showing more in detail the invention as embodied in said door;

Fig. 3 is a cross-sectional view of the door shown in Figs. 1 and 2 and showing its disposition with respect to one of the stove frames, said frame being broken away, and showing the means for opening said door, said means and said door being broken away, and said figure being taken along the lines 3—3 in Fig. 2;

Fig. 4 is a cross-sectional view, in part, of the aforementioned door, and showing its disposition with respect to the stove end wall, and being taken along the lines 4—4 in Fig. 2;

Fig. 5 is a cross-sectional view of one of the hinging means for the aforementioned door and showing in detail the method of incorporating same in said door, and being taken along the lines 5—5 in Fig. 3; and

Fig. 6 is a cross-sectional view of the aforementioned door, said door being partly broken away, and said figure showing the construction of said door from the outer panel to the inner lining and being taken along the lines 6—6 in Fig. 2.

The figures show several different views of a door, generally indicated at 10, adapted for closing a heating compartment, such as the oven compartment, formed within a stove. Door 10 comprises, in general, an outer finished panel 12, an inner finished lining 14, a relatively heavy concealed stiffener or lining brace 16, a pair of gusset plates 18 and 20 (plate 18 and plate 20 being adjacent the stove end of the door and the opposite end thereto, respectively), a pair of hinges 22 and 24 (hinge 22 and hinge 24 being adjacent the stove end of the door and the opposite end thereto, respectively), a lining spacing member 26, a door handle 28 (the finished insert therefor not being shown), and a filling of insulating material 30 between panel 12 and lining 14. The insulating material is preferably of a single consistency but may, as is disclosed, be of double consistency; the important thing to keep in mind, however, is that the insulating material must completely fill the space between the outer panel and inner lining of the door and serve the purpose for which it is provided.

Door 10 is shown in a closed position and seated in a recessed portion formed by the stove panel 32 and lining 34 of one of the oven compartment walls (insulating material 35 being provided in its proper place with respect to said panel and lining, see Fig. 3) and in a recessed portion formed by the stove panel 36 and lining 38 of the opposite oven compartment wall (insulating

material 39 being provided in its proper place with respect to said panel and said lining); the upper and lower recessed portions for the reception thereinto of door 10 are provided but are obviously incapable of being shown in the figures selected for the purpose of illustrating the invention.

Panel 12, being subjected to little or no strain under normal conditions, is made up of a relatively light gauge material, and is porcelained or enameled or otherwise finished and has marginal flanges, said flanges extending rearwardly from the finished outer surface of said panel and then inwardly toward the center of said panel. It will be noted in Figs. 1 and 4 that a substantial portion of panel 12 adjacent the stove end of door 10 is somewhat curved and it is submitted at this time that the purpose for this curved construction is to give the contour effect of the stove proper to the door 10. It will also be noted that, when the door is in its closed position, the panel 12 is flush with the adjacent stove paneling the purpose of which being to give the appearance of a single unitary front panel. In an upper portion of panel 12, and symmetrically disposed with relation thereto, is a pair of spaced openings 40 for the insertion therethrough of a pair of cap screws 42, said cap screws being adapted to removably secure door handle 28 to panel 12 for providing means by which door 10 is moved. In forming panel 12 the end corner of each flanged portion thereof is cut on a 45° angle so that adjacent portions of the flanges may be neatly secured together, as by welding, whereby panel 12 in its entirety presents a finished appearance. The openings 40 are, of course, concealed by the door handle 28.

Lining 14 of door 10 is preferably formed with a heavier material than panel 12 and having the same color as the walls of the oven compartment, said lining being provided with a series of horizontal and normal ridges 44 and 46, respectively. The four marginal portions of lining 14 are formed to provide that portion of the door which is adapted to be seated in the recessed portions provided therefor in the stove front wall, when the door is in its closed position. These marginal portions of lining 14 are provided with channeled flanges which flare outwardly from the finished face of said lining and toward the panel for providing means whereby said lining may be snugly fitted into said panel without the use of rivets, bolts, or other securing means. In other words, the marginal flanges of panel 12 and lining 14 are formed for intercooperation to provide, after assembly, a continuous, walled, box-like structure having a break between said panel and said lining which is neither perceptible nor dirt-collecting. It will be noted that the lower corner portions of lining 14 are provided with narrow slots through which portions of hinges 22 and 24 are adapted to project. These slots are made just large enough for allowing said projections, and in no way take away from the door's appearance.

Door lining stiffener or brace 16 is provided between panel 12 and lining 14 and is formed with outwardly extending corner portions which are spot welded to each corner of the inner face of lining 14. Except for the four corners of member 16, which are flat, member 16 is provided with marginal flanges 48 which are turned in toward the lining 14 rather than toward panel 12. These flanges 48 serve the purpose of adding to the rigidity of member 16 and to the strength of lining 14, and, therefore, to the strength of panel 12. In the center of member 16 is a relatively large opening 50 with its periphery flanged as at 52, said flange projecting inwardly toward the lining 14 rather than toward panel 12 and serving to strengthen member 16. Opening 50 is provided for reducing the weight of member 16 and also to permit him who assembles door 10 to put his hand through opening 50 and thereby be better able to stuff the space between panel 12 and lining 14 with insulating material 30, said operation taking place when either panel 12 or lining 14 is out of position. Above opening 50 in member 16 is disposed a pair of additional openings 54, said openings also serving to lessen the weight of member 16, and it is obvious that more or less of said openings may be provided, it being contemplated that same will be done. It is preferable, as has been said, to weld member 16 to the inner face of lining 14, rather than to use bolts or rivets, since this eliminates unnecessary projections appearing on the visible face of said lining and thereby retains the high outer finish of lining 14.

Removably secured to the face of the upper and lower corners of member 16 which is adjacent the inner face of panel 12 and the stove end of door 10, by means of a pair of nut and bolt arrangements 56, is the aforementioned gusset plate member 18. Gusset plate 20 is similarly secured to the opposite end of member 16 by means of a pair of nut and bolt arrangements 58. Plates 18 and 20 are continuous, lending strength to member 16, and extend upwardly considerably far enough so as to be bolted to the upper projecting corners of member 16 and project downwardly substantially beyond the lower corners of member 16 (to which they are bolted) so as to provide arms 60 which serve as part of the retaining means for the panel 12 (see Fig. 5). In other words, gusset plates 18 and 20 are disposed in such a way as not only to make member 16 more rigid, but also to allow the arms 60 to form a pair of slots defined between said arms and adjacent portions of lining 14 so that the upwardly projecting flange of the lower portion of panel 12 may be inserted in said slots for being partially retained therein after door 10 has been assembled.

Hinges 22 and 24 are provided with flanged portions 62 and 64, respectively, which are adapted to be secured to the lower portions of gusset plates 18 and 20, respectively, by means of spot welding. The portions of hinges 22 and 24 which are exposed after projecting through the slots provided therefor in lining 14 may be finished in any manner but preferably in a way so as to preserve the appearance of the door as a unit. The means for and method of mounting the projecting portions of hinges 22 and 24 in a concealed manner within the stove walls appear in my co-pending application entitled "Stoves", Ser. No. 121,727 and filed January 22, 1937. It does not seem necessary at this time to discuss the cam portions 66, the pivot portions 68, and the means for opposing the opening of door 10, since said features are discussed in detail in said co-pending application.

In order to properly space panel 12 from the stiffening member 16 there are provided the spacing members 26 which lie between the adjacent faces of panel 12 and member 16. Members 26 are provided with internally threaded portions into which the cap screws 42 are adapted to be threadedly secured, said cap screws being adapted to removably secure the door handle 28 to the out-

side face of panel 12. Members 26 and screws 42 are provided with appropriate gaskets, the heads of screws 42 being concealed by means of a metal door handle insert (not shown), the latter being removably secured to the handle 28 by some adopted form of snap-action rather than by bolts or other such securing means. The opposite ends of members 26 are preferably held in place against member 16 by means of a pair of nut and bolt arrangements 70, the latter being confined within the space between the adjacent faces of lining 14 and stiffening member 16.

The method of assembling door 10 may begin with the operation involved in welding the four corners of the lining stiffening member or bracer 16 to the four corners of the inner face of lining 14, after the spacing members 26 have been bolted in their proper places to member 16. The insulating material 30 is then packed into the space between lining 14 and member 16 by using, to a great extent, opening 50 therefor. The gusset plates 18 and 20 are then bolted in their proper places to the face of member 16 opposite lining 14, and the flanged portions of hinges 22 and 24 are then welded to said plates, the only portion of either hinge which is exposed being that portion which extends through the slot provided therefor in lining 14. The next operation which follows is that of joining together the panel and lining members. This is done by fitting the lower flange of panel 12 into the slots provided therefor between adjacent faces of lining 14 and arms 60 of plates 18 and 20, and then bringing the panel 12 and lining 14 as closely together as spacers 26 will allow, and holding them in this position while the handle 28 is screwed to the spacers 26. Of course, before the door is this far assembled, it is presumed that insulating material has been stuffed into the space between the lining and panel members for properly insulating the door. The final operation consists in the snapping of the handle insert onto the handle for providing the finishing touch and the concealment of the heads of the screws which secure both the panel and the handle to the spacing members 26. Door 10 is then a finished product ready to be pivotally mounted to the stove by means of hinges 22 and 24 and which has each and every means for securing the door elements together into a unit concealed. To disassemble the door the operation is, of course, the reverse, namely, beginning with removing the door handle insert and then the cap screws 42.

It is to be understood that the invention is not to be considered as limited to the embodiment and application thereof which has been selected here for the purpose of illustration, but is intended, rather, to embrace and include all other embodiments and applications of the new and useful principles thereof which are to be coinsidered reasonably within the scope of the appended claims.

I claim:

1. In a door for closing a compartment, said door having spaced panel and lining members, a bracing member connected to one of said members, a reenforcing member for said bracing member, and means secured to one of said members at a distance from said first members for supporting said door.

2. In a door for closing a compartment, said door having spaced panel and lining members fastened together by engageable flanges on each member, means for supporting said door about an axis, means for spacing said members so that insulating material can be housed in said space, and a handle for said door and secured to said spacing means rather than to either of said members so that said members are relieved of the strains subjected to said door during the movement thereof.

3. In a compound door structure comprising a pair of outer walls, said walls being spaced from each other and having an inter-lying concealed wall secured to one of said walls, supporting means for said door structure and supported by said concealed wall, and a handle for said door structure and supported by said concealed wall rather than by either of said other walls.

4. A compartment door comprising a front wall removably placed upon a rear wall, an inner wall secured to one face of said rear wall for strengthening the latter and spaced from said front wall, means secured to one of said walls for reinforcing same, a supporting member for said door supported by said means, said means forming a slot with said rear wall for holding said front wall in removable engagement with said rear wall after said door has been assembled.

5. The combination of elements forming a door and comprising a pair of spaced outer walls having marginal flanges, the flanges of one of said walls being formed to lie outside and adjacent to the flanges of the other of said walls and be removably supported thereby, a strengthening wall for one of said outer walls and secured thereto from within, a hinge, and a handle for said door, said hinge and said handle being supported by said strengthening wall rather than by either of said outer walls.

6. The combination of elements forming a door and comprising a pair of spaced outer walls having flanges extending therefrom, one of said flanges returning at right angles to the other of said flanges, said flanges forming a spring engagement for unifying said walls, a concealed stiffening member for one of said walls and rigidly secured thereto and spaced from said other wall, and a hinge supported by said member and extending from one of said walls for supporting said door from without.

7. In a door, a load carrying member, a bracing member attached to said load carrying member, a lining member attached to said load carrying member in spaced relation thereto, an outer panel member mounted on said lining member and spaced from said load carrying member on the opposite side from said lining member, a hinge mounted on said bracing member and projecting through said lining member, and a handle fastened to said load carrying member, said handle projecting through said outer panel.

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