Aug. 4, 1942. E. H. LOCKWOOD 2,291,737

RANGE CONSTRUCTION

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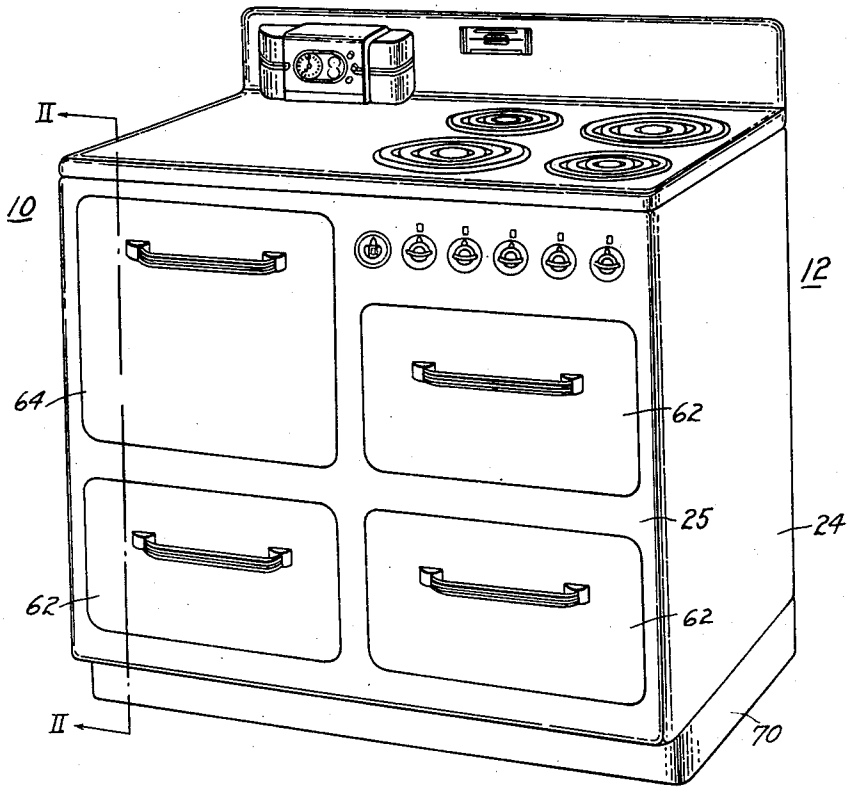

Fig. 1.

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Aug. 4, 1942. E. H. LOCKWOOD 2,291,737

RANGE CONSTRUCTION

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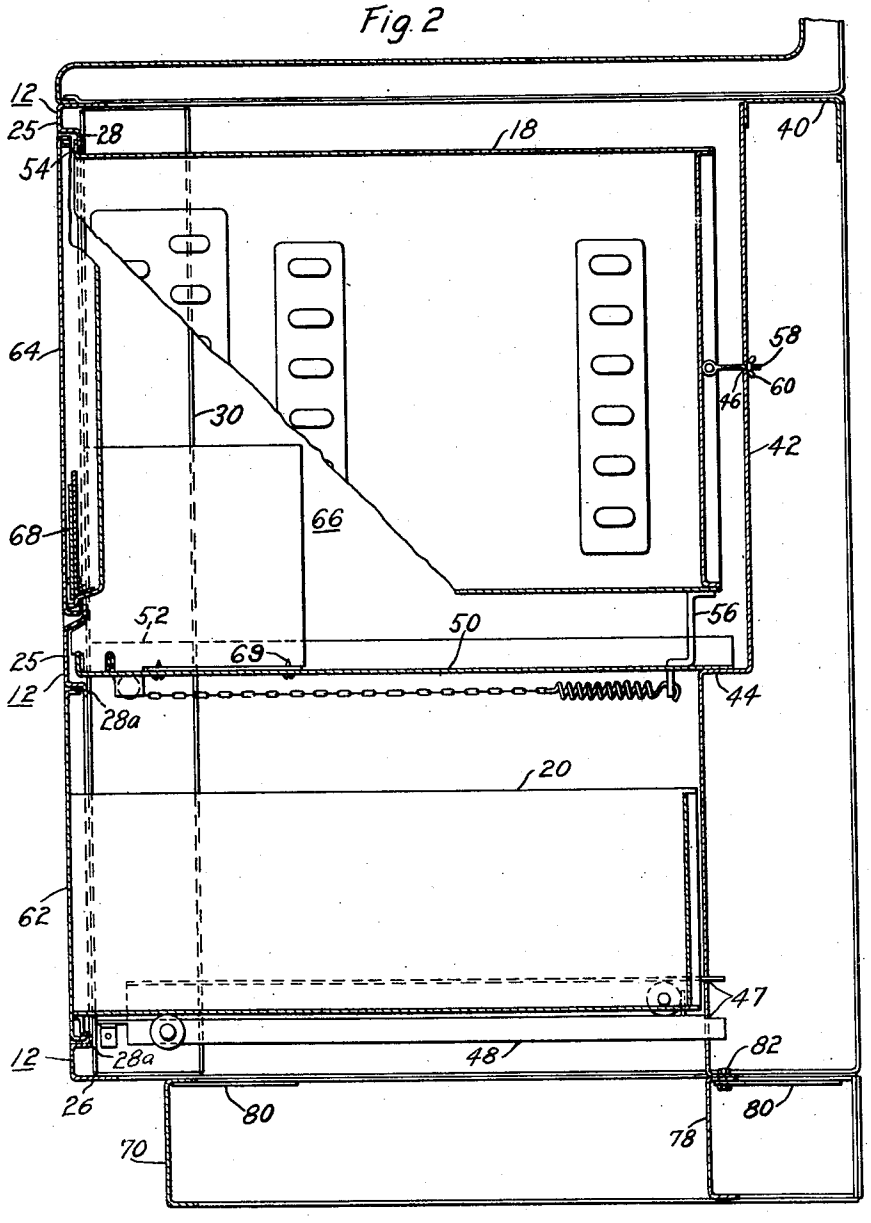
Fig. 2



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RANGE CONSTRUCTION

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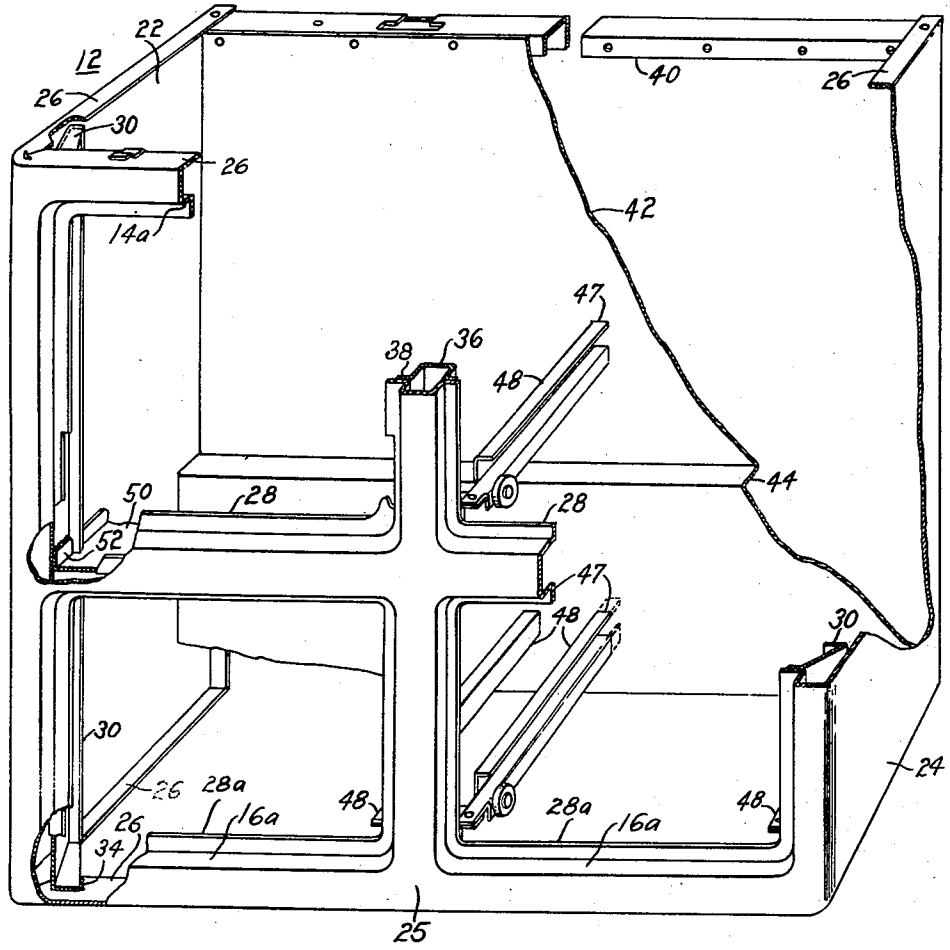
Fig. 3.



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RANGE CONSTRUCTION

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Fig. 4.

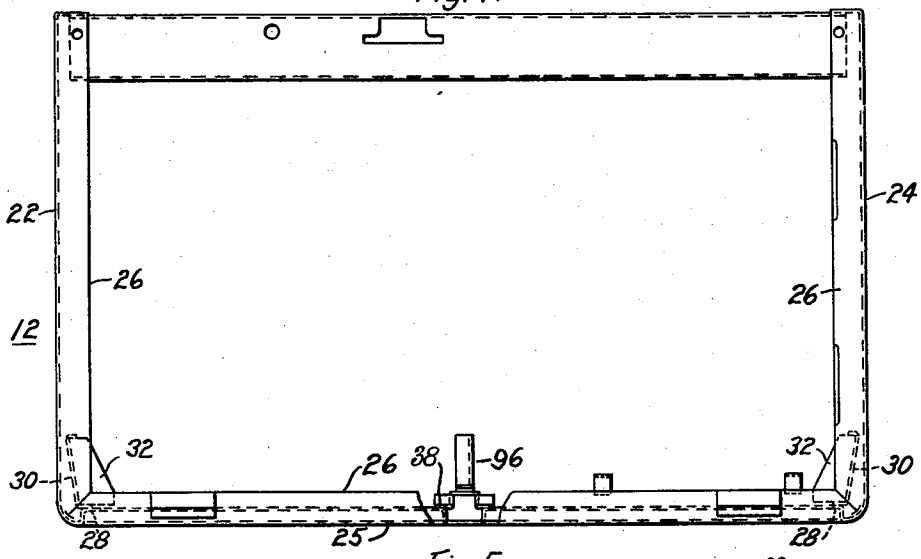
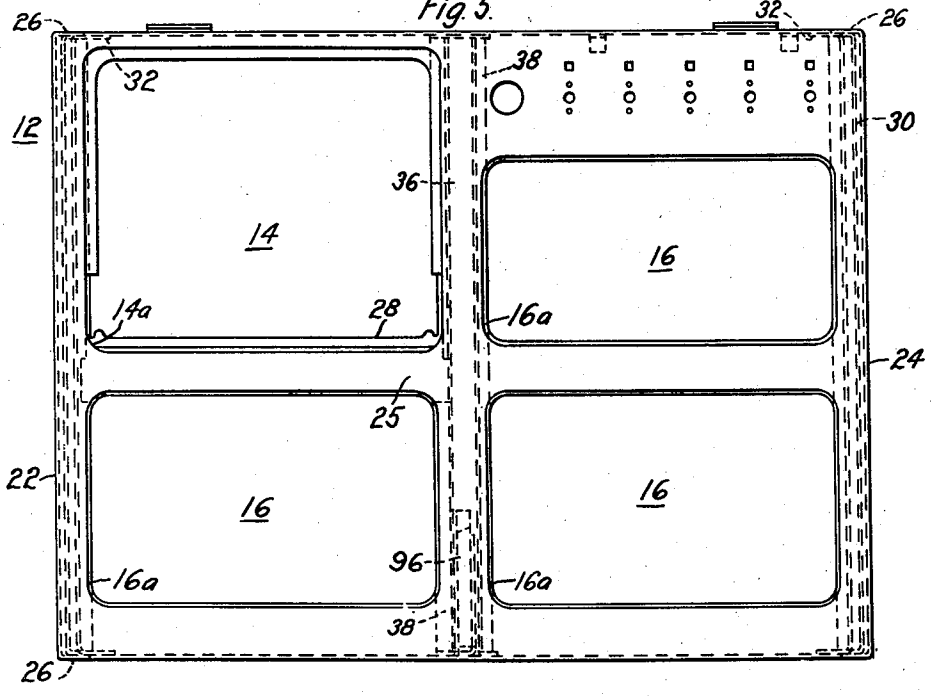


Fig. 5.



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RANGE CONSTRUCTION

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Fig. 6.

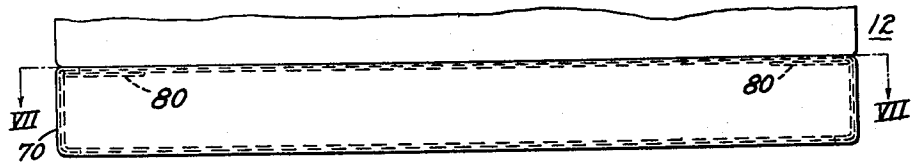


Fig. 7.

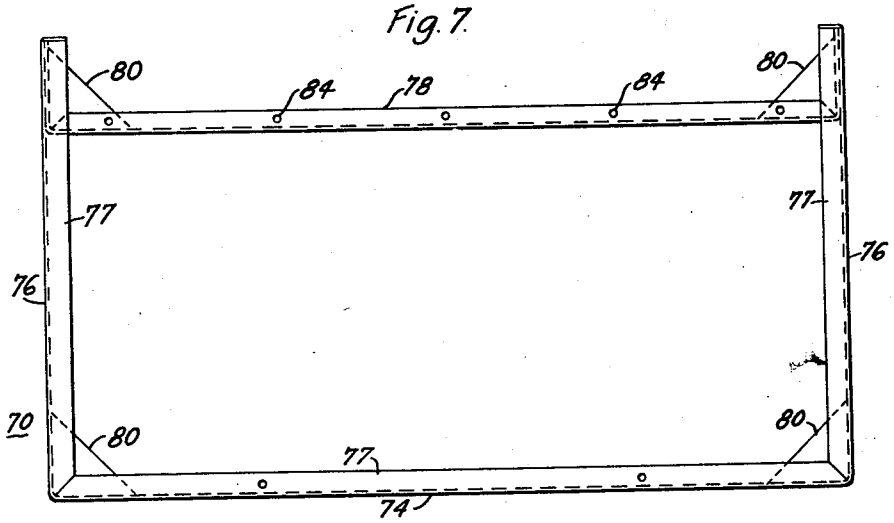


Fig. 8.

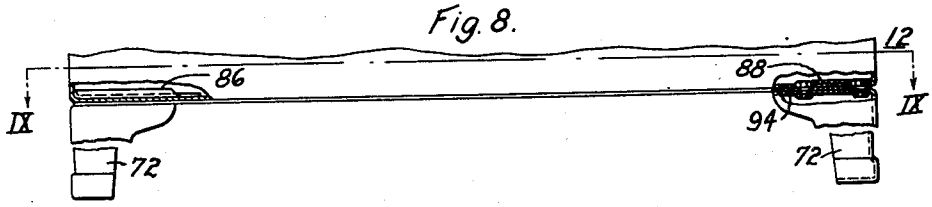
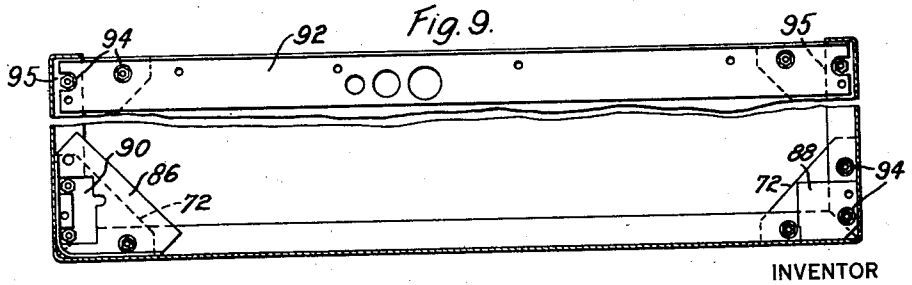


Fig. 9.



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RANGE CONSTRUCTION

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Fig. 10.

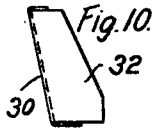


Fig. 12.

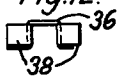


Fig. 14.

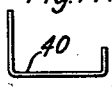


Fig. 11

Fig. 13.

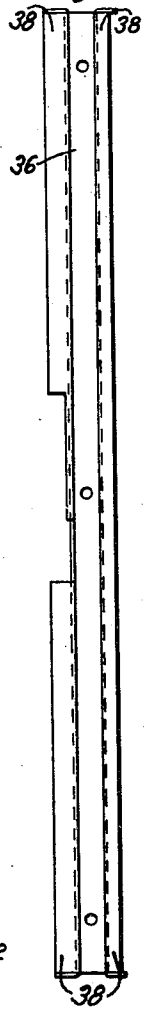
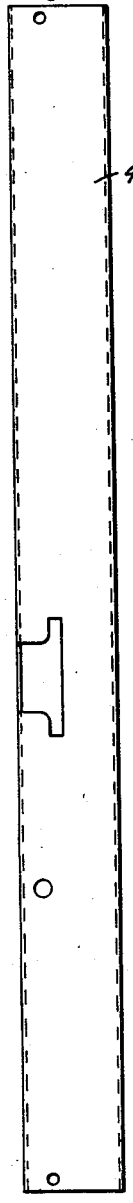


Fig. 15.



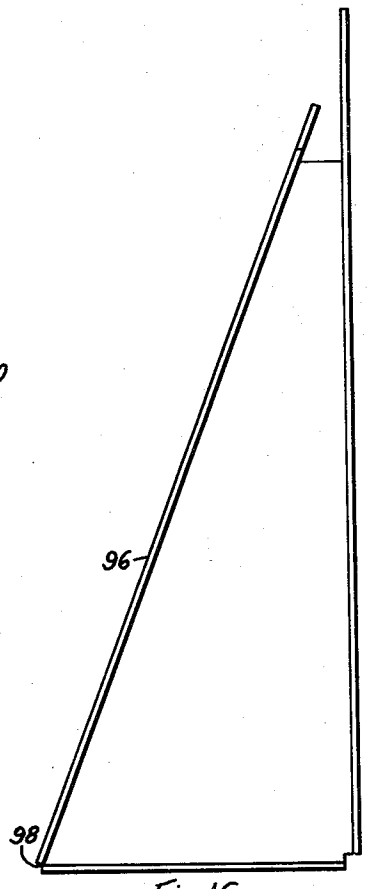


Fig. 16.

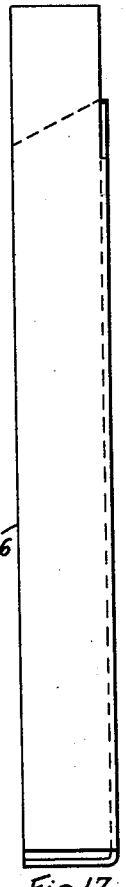


Fig. 17.

Fig. 18.

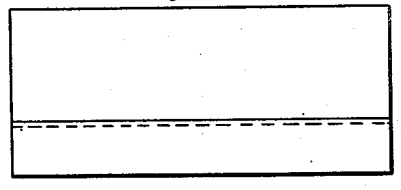


Fig. 19.

Fig. 20.

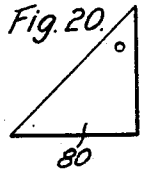


Fig. 21.

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Patented Aug. 4, 1942 2,291,737

UNITED STATES PATENT OFFICE

2,291,737

RANGE CONSTRUCTION

Edwin H. Lockwood, Mansfield, Ohio, assignor to Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., a corporation of Pennsylvania

Application December 28, 1939, Serial No. 311,249

5 Claims. (Cl. 126—39)

My invention relates to range construction and more particularly to a range assembly constructed without an internal supporting structure for the outer walls thereof; and is a continuation-in-part of my application Serial No. 177,726, filed December 2, 1937, and assigned to the Westinghouse Electric & Manufacturing Company.

In those ranges known to the art, it has been the practice to have an internal frame or supporting structure about which the assembly has been constructed, that is, upon which the oven linings and compartment drawers are mounted and to which the front and side walls are removably attached. Ranges built in such a manner have been bulky and of relatively great weight. It is, therefore, an object of my invention to provide a range structure in which the outer walls are supported without the use of an internal frame or supporting structure.

Various attempts have been made to rigidly attach the enclosing walls of ranges directly to an internal frame or supporting structure, for example, by welding or the like. However, this procedure has been found to be entirely unsatisfactory in the manufacture of present day ranges because of the practice of enameling the outer surface of the enclosing walls. The enamel, when applied to the rigidly attached enclosing walls, cracks during the baking operation or during shipment thereof because the rigid attachment of the enclosing walls to the frame concentrates strains at the points of attachment.

It is, therefore, a further object of my invention to provide a range structure having enameled enclosing walls, the exposed and enameled surfaces of which are relatively independent of internal structure which supports the range oven, doors, etc., whereby the enclosing walls may expand or contract independently of the internal structure without causing the enamel thereon to crack.

Other objects of my invention will either be pointed out specifically in the course of the following description of a device embodying my invention, or will be apparent from such description.

In the accompanying drawings:

Figure 1 is a perspective view of a range embodying my invention;

Fig. 2 is a sectional view taken along the line II—II of Fig. 1, with parts thereof broken away to better illustrate the invention;

Fig. 3 is a fragmentary perspective view of the enclosing wall structure of the range including independent supporting structures for the oven linings, compartment drawers, etc.;

Fig. 4 is a top plan view and Fig. 5 is a front elevational view of the structure shown in Fig. 3;

Fig. 6 is a partial front elevational view showing one form of a range support structure;

Fig. 7 is a sectional view taken on the line VII—VII of Fig. 6;

Fig. 8 is a partial elevational view of a range showing a modified form of support therefor;

Fig. 9 is a sectional view taken along the line IX—IX of Fig. 8;

Figs. 10 and 11 are top and side elevational views, respectively, of a reenforcing bracket;

Figs. 12 and 13 are respectively a top and a side elevational view of an additional reenforcing bracket used within the range;

Figs. 14 and 15 are respectively an end and a top view of the top rear reenforcing bracket;

Figs. 16 and 17 are respectively a side and a front elevational view of an additional angular bracket used within the range;

Figs. 18 and 19 are respectively a top and an end view of clamps used to clamp the top surface of the range to the wall structure; and

Figs. 20 and 21 are respectively an elevational and a side view of a gusset used in the walls.

Like reference characters indicate like parts in the several figures.

Referring to the accompanying drawings, as best shown in Figs. 1, 2, and 5 I show a range structure 10, including an enameled wrap-around enclosing wall structure 12 which embraces a plurality of spaced compartments 14 and 16, an inner oven wall structure 18 and drawers 20, respectively.

The enclosing wall structure 12 comprises a plurality of angularly related integral walls, which include enameled side walls 22 and 24, and an enameled front wall 25, which are preferably enameled on their outer surfaces only. The enclosing wall structure 12 is preferably formed from a single sheet of material, as shown in Figs. 3, 4 and 5. However, it is to be understood that such wall structure 12 may comprise a plurality of sheets rigidly attached together so as to form a functionally integral structure. Should the wall structure be formed from a single sheet of sheet material, such material is smoothly bent at the corners to form the junction between the side walls 22 and 24, and the front wall 25, as shown in Fig. 4.

As best shown in Figs. 4 and 5, a plurality of unenameled flange portions 26 are bent inwardly from the wall structure 12 at the top and bottom thereof. These flanges 26 provide means for

mounting a plurality of range-part-supporting brackets, as hereinafter described.

The front wall 25 of the enclosing wall structure 12 has a plurality of openings 14a and 16a formed therein for entrance into the oven and storage compartments 14 and 16, respectively. These openings 14a and 16a are displaced slightly inwardly from the main surface of the front wall and have laterally extending flanges 28, as shown in Figs. 2 to 5, inclusive.

Unenameled corner channel brackets 30 provided with horizontally extending flanges 32, shown in Figs. 3, 4, 10 and 11 are located intermediate the top and bottom flanges 26 of the wall structure 12, and are displaced inwardly from the inner surface of the side walls 22 and 24 and front wall 25 (see Figs. 3 and 4). After the corner brackets 30 are positioned within the corners of the wall structure 12 between the upper and lower flanges 26, the flanges 32 are rigidly attached to the flanges 26 independently of the enclosing walls, preferably by spot welding, as shown at 34 in Fig. 3. The channel brackets 30, although rigidly attached to the flanges 26 of the enclosing walls 12, permit the side and front walls 22, 24, and 25 to move relative to the channel brackets 30.

The channel brackets 30 perform a dual function, namely, they reenforce the corners of the wall structure 12 and also provide for attachment and support of the internal parts of the range, such as the oven inner lining 18 and drawers 20.

A vertically extending channel-shaped bracket 36 is likewise attached to the central portion of the wall structure 12 without being directly attached to the front wall 25 and performs a dual function in reenforcing the enameled front wall 25 of the range structure and also supporting portions of the internal range parts, as hereinafter described. The channel bracket 36, as shown in Figs. 12 and 13, has a plurality of vertically extending flanges 38 at each side thereof. When the channel member 36 is disposed between the flanges 26 of the wall structure 12, the flanges 38 are rigidly attached to flanges 28 of the front oven wall 25 independently of the enameled portions of the front wall 25, preferably by spot welding.

An additional reenforcing member 40, preferably of a channel shape, substantially as shown in Figs. 3, 14 and 15 extends across the topmost portion of the rear of the range structure to join the upper rear corners of the wall structure 12, as shown in Figs. 3 and 4. The reenforcing member 40 is likewise attached to the flanges 26 of the wall structure independently of the enameled side walls 22 and 24.

It is, therefore, apparent that the range structure 10 primarily comprises the enameled wall structure 12, which is internally reenforced by the corner channel brackets 30 located in the front corners thereof, the channel member 36 located at the central portion of the front wall and the channel member 40 joining the rear upper corners thereof, independent of the enameled side and front walls thereof. It is further apparent that with such a wall structure, it is not necessary to have a rigid massive bulky internal frame or supporting structure for a range, as has been the case in prior art ranges, and that the outer walls may move relative to the supports without any straining actions produced therebetween.

The wall structure 12 is, in this instance, enameled in the usual manner, for example, by spraying or dipping. The enamel coating (not shown) is relatively thin and is located, as a general rule, upon the exposed surface only of the outer walls 22, 24 and 25. A portion of the enamel coating may coat the flange portions 26, especially when the enamel is placed upon the wall structure by the dipping process. However, such enamel coating, which is unnecessary on the flanges, may then be wiped off to permit the channels and brackets to be attached thereto by welding.

The range structure 10, including wall structure 12, may thus have an outer coating of enamel with the enameled wall structure 12 thereof being free to expand and contract during the baking operation without the danger of developing any cracks or defects in the enamel coating thereon. Further, as the outer walls are independent of the supporting brackets, the range structure may be freely handled and shipped without any danger of concentrated strains on the enamel coating thereon.

In the assembled range structure a back cover sheet 42 is attached at the upper rear portion thereof to the channel member 40 and at the lower rear portion to the flanges 26. The back cover sheet 42 has a horizontally extending offset portion 44 located intermediate the ends thereof, upon which a portion of the internal structure, rests, substantially as shown in Fig. 2. In addition to this, the back cover sheet 42 is provided with a plurality of apertures, such as apertures 46 by means of which the oven inner lining 18 is rigidly attached within the wall structure 12. If it should be desired to use drawers such as drawer 20 shown in Fig. 2, additional apertures 47 may be located within the back cover sheet 42 to support the drawer runner channels 48, as shown in Figs. 2 and 3.

A horizontally extending supporting plate 50 is mounted at substantially the mid-point of the range or range structure by resting the rear end thereof upon the offset portion 44 of the back cover plate 42, and by having an upwardly protruding end flange portion 52 thereof rigidly attached to the left-hand corner channel bracket 30, as shown in Fig. 3. The horizontal supporting plate 50 is likewise supported at its second or right front corner by being rigidly attached to the channel bracket 36 in a similar manner. It is, therefore, apparent that with the horizontal bracket rigidly attached to the brackets 30 and 36, as described, at its front end and by resting on the offset portion 44 of the back cover plate 42, such supporting plate will adequately support the oven insulating material (not shown) that is located intermediate the inner oven wall 18 and the horizontal plate. It is further apparent that the supporting plate 50, being retained by the brackets 30 and 36, is retained independently of the enameled walls 22, 24 and 25.

The oven inner lining 18 may be formed as a single member in a manner well known to the art. The oven inner lining 18 formed in such a manner will have a continuous outwardly extending flange 54 extending about the front edge thereof, whereupon as the oven lining 18 is inserted within the wall structure 12 through aperture 14, the outwardly extending flange 54 will cooperate with the inwardly extending flanges 28 of the wall structure 12. If desired, the oven wall lining 18 may then be rigidly attached to the oven wall structure by spot welding the flanges

28 and 54 together. The oven lining 18 is thus attached to the wall structure 12 without being directly attached to the enameled outer walls 22, 24 or 25 so as to apply any damaging strain thereto. A plurality of Z-shaped brackets 56 are positioned upon the horizontal plate 50 at the rear end thereof to support the back end of the oven lining 18, substantially as shown in Fig. 2.

Should it be desired to have the oven lining 18 removably attached to the oven wall structure 12, a plurality of eye-bolts 58 may be rigidly attached to the rear wall of the oven lining 18 at such a position that, as the oven wall lining 18 is positioned within the wall structure 12, the eye-bolts 58 extend through the aperture 46 in the back cover plate 42, whereupon wing nuts 60 are attached to the eye-bolts 58, permitting the oven inner lining 18 to be drawn tightly against the flange 28 of the wall structure 12, as hereinabove described.

With the oven inner lining mounted within the wall structure in such a manner, it is apparent that suitable insulating material such as rock wool or the like (not shown) may be located between the inner oven wall lining 18 and the enameled walls of wall structure 12, so as to adequately insulate the oven therefrom. In addition to this, with the horizontally mounted plate 50 located below the inner oven wall lining 18 suitable insulating material may be located therebetween also. Should it be desired to have the range with only one oven substantially like that shown, a vertically extending plate (not shown) may be positioned substantially in line with the channel bracket 36 and rigidly attached thereto at the front portion and at the back cover plate 42 with the rear portion, whereupon suitable insulating material may be positioned between the oven inner wall lining 18 and such vertically mounted plate. However, if it should be desired to have two ovens located horizontally side by side, it would not be necessary to use such a vertically mounted plate, inasmuch as the insulating material may be placed directly between the two ovens on the walls.

Should it be desired to slidably mount drawers within the compartments 16, it is merely necessary to position suitable channel members, or the like, 48, within the range assembly where they may be rigidly attached to the channel brackets 36 at the front ends thereof and to the back cover plate 42 at the other end. The drawer members 20, as shown in Fig. 2, may then be readily mounted or slid within the compartments 16 without exerting any damaging strains upon the enameled outer walls. It is understood that if drawers 20 are to be operatively disposed within the compartments 16, such drawers 20 have front covers 62 constructed in such a manner that they will extend within the inwardly pressed portion of the openings 16*a* which are formed by the flanges 28*a*. With drawers mounted within the enclosing wall structure 12 in such a manner, it is apparent that they will, when closed, form a continuous front portion of the range structure substantially as shown in Fig. 1.

A swingably mounted oven door 64 is positioned within the aperture 14 by means of a hinged mechanism 66 including a hinged lever 68, substantially as shown in Fig. 2. With the oven door mounted in such a manner, it is apparent that as the door is closed it will likewise be substantially in line with the front portion of the range structure.

The door hinge mechanism 66, which is adjustably mounted upon the horizontally supporting plate 50, as indicated by screws 69 (Fig. 2) independent of the enameled outer walls forms no part of my present invention, and is fully set forth in a copending application of E. E. Sutherland and L. E. Lown, filed December 1, 1937, Serial No. 177,722, and assigned to the Westinghouse Electric & Manufacturing Company.

It is, therefore, apparent that, with a range structure utilizing a wrap-around enclosing wall structure comprising a plurality of integral enameled outer walls and inwardly positioned enameled channels and brackets operatively associated therewith, substantially as hereinabove described, such wall structure, through the cooperation of the internally mounted channels and brackets or range-part supporting means, readily supports the oven inner wall lining, oven insulating material and utensil supporting drawers within the enclosing wall structure without causing any damaging stresses or strains within the enameled outer walls and at the same time affords necessary expansion and contraction of such outer walls relative to the interior supporting members.

It is further apparent that with a range structure formed in a manner as hereinabove described, such structure may be readily placed upon the floor or any other suitable supporting device without the use or aid of internally extending leg or support members, as such range structure may be positioned upon the floor supporting structure by merely having the range as described above, rest thereon.

The range structure as hereinabove described may, alternatively to sitting directly on the floor, be supported upon any suitable supporting structure such as the toe space structure 70 as shown in Figs. 1, 2, 6 and 7, or by means of suitable legs 72 as shown in Figs. 8 and 9.

The toe space supporting structure 70 is formed primarily of a channel member which is bent so as to form a main front portion 74 and two side portions 76 substantially as shown in Fig. 7. An additional smaller channel member 78, formed in a similar manner, may be positioned in the rear portion of the main channel member 70 for reenforcing the rear end thereof, substantially as shown in Fig. 7. The smaller channel portion 78 may be rigidly attached to and within the larger channel 70 by being spot welded thereto or in any other suitable manner. Gusset plates 80, as shown in Figs. 20 and 21, may be positioned within the corners of the channel members 74, 76 and 78 of the supporting member 70 as shown in Figs. 6 and 7.

The supporting structure 70 may then be positioned beneath the range structure 10 or wall support 12 formed as hereinabove described in such a manner that the flange portions 77 of the channel members 74 and 76 will be substantially in line with the lower flange portions 26 of the wall structure 12. The supporting structure 70 is rigidly attached thereto by spot welding or riveting or in any other suitable manner. Should the supporting structure 70 be utilized as shown in Fig. 2, the back cover plate 42 extends down to and is rigidly attached to the rear channel portion 78 by means of nuts and bolts 82 which extend through apertures 84 in the channel member 78.

When the range structure is supported by means of the supporting structure 70, the front wall 25 of the wall structure 12 is joined to the

front portion of the supporting structure 70 through the cooperation of channel member 36 and an angle bracket 96 shown in Figs. 16 and 17. The angle bracket 96 is positioned at the lower portion of the range structure and rigidly attached to the front wall portion by spot welding to the channel member 36 substantially as shown in Figs. 4 and 5, whereupon the inwardly extending portion 98 of the angular bracket 96 is readily attached to the supporting structure 70 by spot welding.

Should it be desired to support the wall structure 12 and range 10 by means of legs, such as when the range does not have the lower drawer compartments 16 operatively associated therewith, a plurality of gussets 86 and 88 are located in the front corners thereof substantially as shown in Figs. 8 and 9. The gussets 86 and 88 are rigidly attached to the wall structure 12 by being located therein and attached to the lower flange portion 26 thereof. With a range mounted in such a manner and being devoid of the lower drawer compartment 16, it is apparent that the gusset 86 will be in close proximity with the inner oven lining 18 located in the compartment 14. Accordingly, the gusset plate 86 will have an aperture 90 located therein to permit the operation of a suitable counterweight mechanism (not shown) for the hinge mechanism 66. An additional angle member 92 is located across the rear portions of the range structure 10 and rigidly attached to the lower portion of the wall structure 12 by attachment to lower flanges 95, substantially as shown in Fig. 9, as an additional brace or support for the range structure. It is, therefore, apparent that any suitable legs 72 may be rigidly attached to the gussets 86 and 88 and to the angle member 92 and flange 26 through the use of suitable apertures 94 located therein substantially as shown.

It is, therefore, apparent that with a range formed in accordance with my invention, such range structure may be adequately supported by merely setting the structure on the floor, whereupon the range wall structure will function as a support therefor, or such range structure may be set upon any suitable supporting structure 70, such as hereinabove described, or may be readily supported by means of suitable legs 72.

Various other further modifications may be made in the apparatus embodying my invention without departing from the spirit and scope thereof, and I desire, therefore, that only such limitations shall be placed thereon as are imposed by the prior art and the appended claims.

I claim as my invention:

1. In a range body, the combination of an outer, continuously-extending metallic wrapper sheet forming two vertically-extending side walls and a front wall of the range body, said wrapper sheet being provided with an external ceramic coating bonded to the metal wrapper sheet to provide a pleasing appearance, substantially horizontally-extending internal flanges projecting from said front and side walls at the top and bottom portions thereof, internal range structure including an oven liner disposed within the confines of the wrapper sheet, vertically-extending members for supporting the internal range structure disposed in the two front corner portions of the wrapper sheet and in an intermediate front portion thereof, said vertically-extending supporting members being disposed adjacent to the wrapper sheet out of contact with inner surfaces opposite exposed outer surfaces of the wrapper sheet and having inturned substantially horizontally-extending flanges provided at their upper and lower ends, and means for fixedly attaching the horizontally-extending inturned flanges of at least one of the vertically-extending members to adjacent horizontally-extending flange portions of the wrapper sheet.

2. In a range body, the combination of an outer continuously-extending metallic wrapper sheet forming two vertically-extending side walls and a front wall of the range body, said wrapper sheet being provided with an access opening in its front wall and with an external ceramic coating bonded to the metal wrapper sheet to provide a pleasing appearance, said wrapper sheet having a vertical inwardly offset flange extending along a vertical edge of said access opening, internal range structure including an oven liner disposed within the confines of the wrapper sheet, vertically-extending members for supporting the internal range structure disposed in the two front corner portions of the wrapper sheet and in an intermediate portion thereof, said vertically-extending supporting members being disposed adjacent to the wrapper sheet out of contact with inner surfaces opposite exposed outer surfaces of the wrapper sheet and having a vertically-extending flange thereon, and means for fixedly securing the vertically-extending flange of at least one of the vertically-extending members to the vertically-extending flange on said wrapper sheet.

3. In a range body, the combination of an outer continuously-extending metallic wrapper sheet forming two vertically-extending side walls and a front wall of the range body, said wrapper sheet being provided with an external ceramic coating bonded to the metal wrapper sheet to provide a pleasing appearance and also being provided with an access opening in its front wall, said wrapper sheet having a vertical inwardly offset flange extending along a vertical edge of the access opening, substantially horizontally-extending internal flanges projecting from said front and side walls at the top and bottom portions thereof, internal range structure including an oven liner disposed within the wrapper sheet, vertically-extending members for supporting the internal range structure disposed in the two front corner portions of the wrapper sheet and in an intermediate front portion thereof, said vertically-extending supporting members being disposed adjacent to the wrapper sheet and having inturned substantially horizontally-extending flanges at their upper and lower ends and having a vertically-extending flange thereon, means for fixedly attaching the horizontally-extending inturned flanges of at least one of the vertically-extending members to adjacent horizontally-extending flange portions of the wrapper sheet and means for fixedly attaching the vertically-extending flange of at least one of the vertically-extending members to said vertically-extending flange on said wrapper sheet.

4. In a range body, the combination of an outer, continuously-extending metallic wrapper sheet forming two vertically-extending side walls and a front wall of the range body, said wrapper sheet being provided with an external ceramic coating bonded to the metal wrapper sheet to provide a pleasing appearance, substantially horizontally-extending internal flanges projecting from said front and side walls at the top and bottom portions thereof, internal range structure including an oven liner disposed within the

confines of the wrapper sheet, a vertically-extending member for supporting the internal range structure disposed adjacent to the front of the wrapper sheet out of contact with inner surfaces opposite exposed outer surfaces of the wrapper sheet and having inturned substantially horizontally-extending flanges at its upper and lower ends and means for fixedly attaching the horizontally-extending inturned flanges of said vertically-extending member to adjacent horizontally-extending flange portions of the wrapper sheet.

5. In a range body, the combination of an outer continuously-extending metallic wrapper sheet forming two vertically-extending side walls and a front wall of the range body, said wrapper sheet being provided with an access opening in its front wall and with an external ceramic coating bonded to the metal wrapper sheet to provide a pleasing appearance, said wrapper sheet having a vertical inwardly offset flange extending along a vertical edge of said access opening, internal range structure including an oven liner disposed within the confines of the wrapper sheet, a vertically-extending member for supporting the internal range structure disposed adjacent the front of the wrapper sheet out of contact with inner surfaces opposite exposed outer surfaces of the wrapper sheet having a vertically-extending flange thereon and means for fixedly securing the vertically-extending flange of said vertically-extending member to the vertically-extending flange on said wrapper sheet.

EDWIN H. LOCKWOOD.