March 30, 1926. 1,578,937

A. H. TINNERMAN

STOVE CONSTRUCTION

Filed Oct. 30, 1922 3 Sheets-Sheet 1

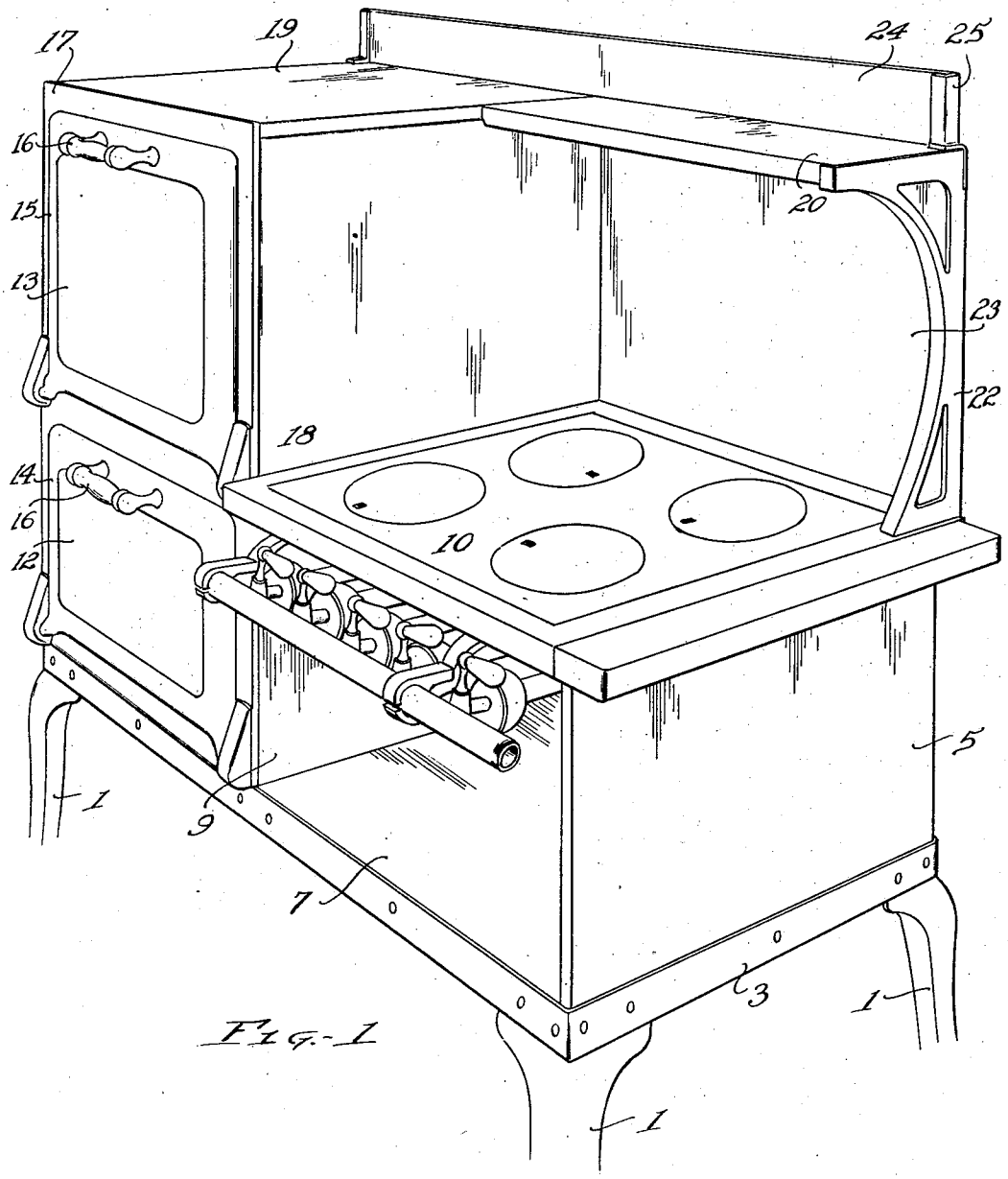


Fig. 1

Inventor
Albert H. Tinnerman,
By Bates & Macklin,
Attorneys

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A. H. TINNERMAN

STOVE CONSTRUCTION

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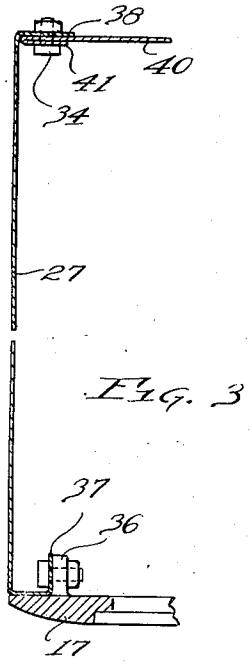


Fig. 3

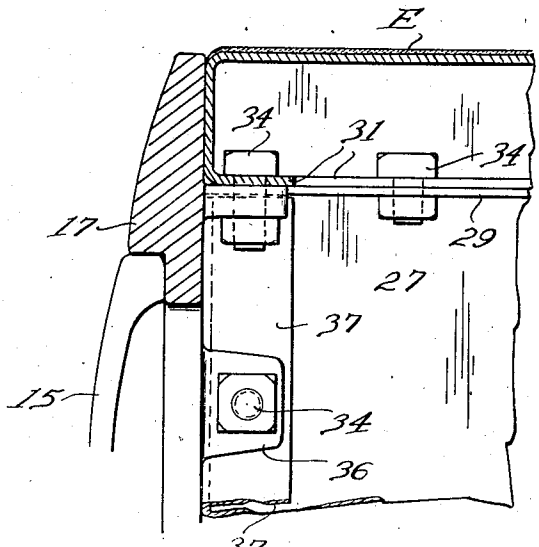


Fig. 4

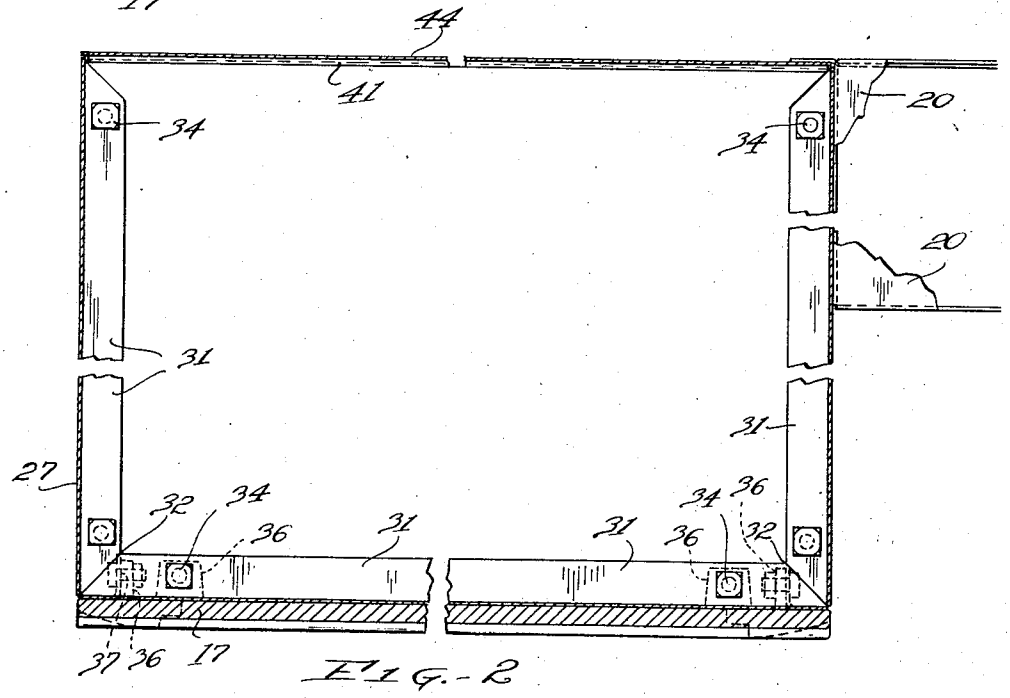


Fig. 2

INVENTOR
Albert H. Tinnerman,
By Baker & Macklin,
ATTORNEYS

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A. H. TINNERMAN

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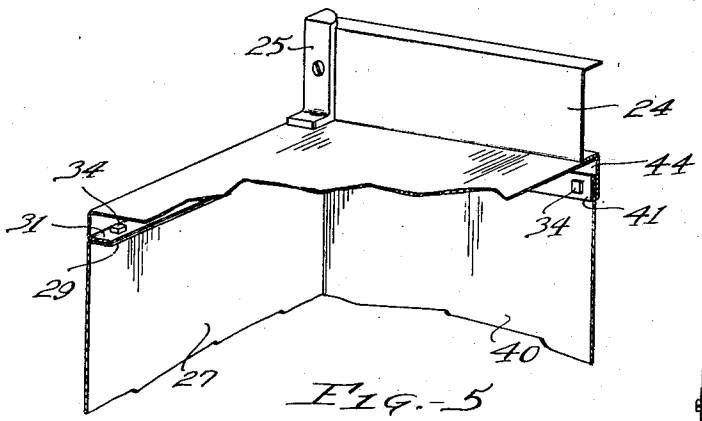


FIG.-5

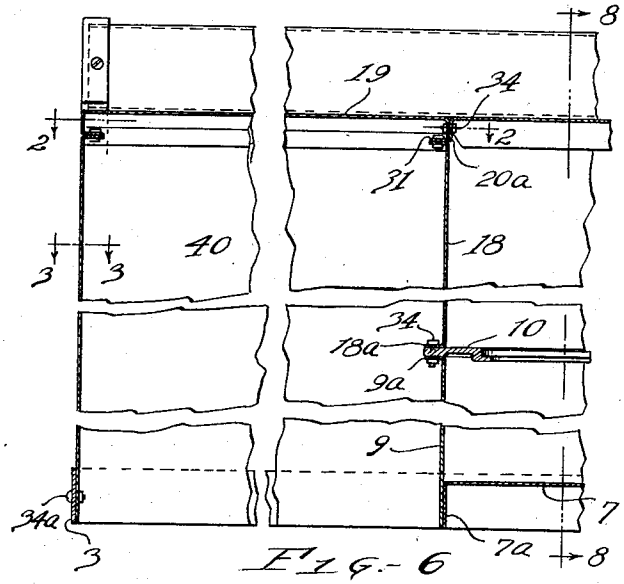


FIG.-6

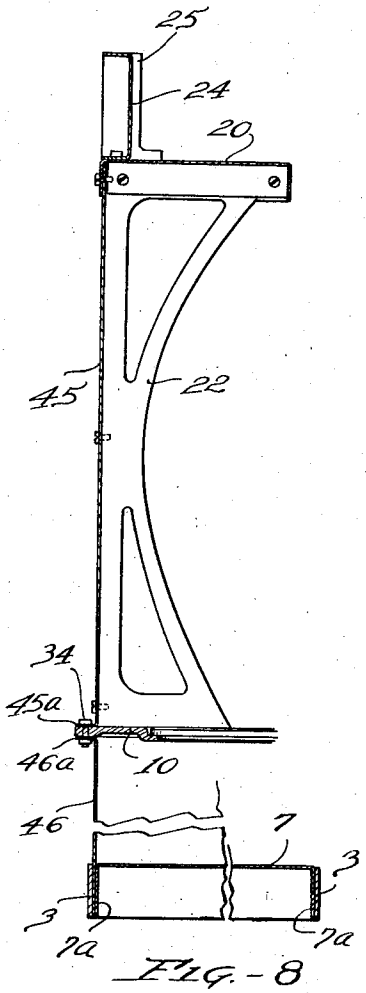


FIG.-8

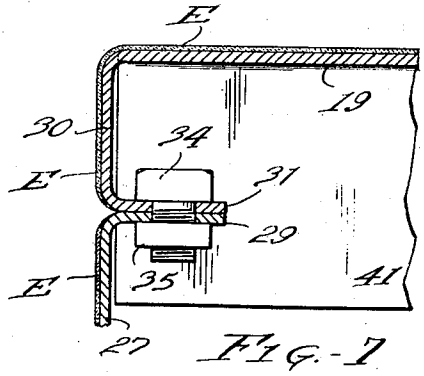


FIG.-7

INVENTOR
Albert H. Tinnerman,
By Bates & Macklin,
ATTORNEYS

Patented Mar. 30, 1926. 1,578,937

UNITED STATES PATENT OFFICE.

ALBERT H. TINNERMAN, OF CLEVELAND, OHIO.

STOVE CONSTRUCTION.

Application filed October 30, 1922. Serial No. 597,755.

To all whom it may concern:

Be it known that I, ALBERT H. TINNERMAN, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Stove Construction, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to stoves, and has for its general object the provision of a novel method and means for connecting the plates comprising the panels and sides and ends of such stoves, for example, as gas ranges, whereby a more desirable finish may be obtained, particularly in that uninterrupted enamel surfaces are so joined as to provide for both neatness in appearance and ease in keeping in a sanitary condition.

The recent demands regarding kitchen ranges require the largest possible amount of surfaces to be enameled or polished for the sake of appearance and cleanliness. The enamel used is usually vitreous and is more or less brittle and, therefore, various difficulties in the manufacture and shipment of such stoves include particularly the cracking of enamel in the handling of the plates before placing them in position during assembling, and the destruction of enamel and the defacement of it during the shipment. Replacement of the panels and walls is frequently necessary before the dealer can ship the stove to the customer and it is again sometimes necessary to replace the panels after the stove is installed in the home.

One of the principal causes of this difficulty is that wherever a bolt, rivet or similar securing devices passes through the enameled plate, any strain thereon results in cracking the enamel. Such strains occur particularly during the assembling of the bolts or rivets, and again during handling of the stove.

The purpose of this invention is to provide a construction relating particularly to the shaping and fastening of the enamel plates, to avoid the above difficulties and more specifically accomplish other objects as follows: To secure full smooth enamel surfaces where they are exposed; ease of assembling; allowance for expansion and contraction when in use to avoid resulting cracking of the enamel; elimination of all exposed rough edges at connecting corners and avoiding the use of seam strips and similar devices frequently used to join the plates of this character; to cause the plates, where joined, to form, in effect, their own reinforced corners and edges, thus eliminating unsightly and expensive frame members at the same time forming firm but resilient supports at such corners; and in addition, so designing the plates that they may be cheaply cut or stamped, and formed, and then enameled, and with the result that, being reinforced along the edges, the amount of bending incident to handling is reduced correspondingly avoiding cracking of the enamel.

Other specific objects are to arrange for the use of standard fastening means, such as stove bolts conveniently inserted and tightened in concealed positions and without interfering with the lining walls used, for example, as in the oven.

To accomplish the above results, it has been necessary to work out a manner of formation of the edges of the plates so that they may be joined to each other and to the frame members where used, as well as to hot plates or stove table portions, with a uniformity of practice, resulting in the smooth surfaces and features to prevent damage to the enamel in all such various places. A preferred embodiment of the invention is illustrated in the accompanying drawings, and the essential characteristics are summarized in the claims. Other specific objects and advantages resulting will become apparent in the following description.

In the drawings, Fig. 1 is a perspective view of a gas range embodying my invention; Fig. 2 is a horizontal sectional plan cut through the upper portion of the oven, the plane of the section being taken just under the upper panel of the oven and parallel therewith; Fig. 3 is a horizontal sectional detail showing the manner of fastening the side panels of the oven to the oven frame and to the back plate; Fig. 4 is an enlarged sectional detail showing the manner of attaching the oven plates to the door frame; Fig. 5 is a sectional perspective through the oven walls; Fig. 6 is a vertical section through the oven portions of the stove taken on a plane parallel with the back of the stove and looking toward the back; Fig. 7 is an enlarged sectional detail showing the connections between the top panel and the side panel of the oven; Fig. 8 is a sectional detail taken on a plane transversely to the back wall and looking toward the right hand

end of the stove as shown in Fig. 1. In the sectional views 2 to 7, the usual lining walls of the oven are omitted for clearness.

The type of stove chosen to illustrate a practical and demonstrated use of my invention is shown in perspective in Fig. 1, from which it will be seen that there is a minimum number of frame elements. When it is considered that the walls of the oven and the back panel at the rear of the griddle or hot plate table, the sides and top of the oven as well as the upper shelf are all an enameled surface, while the frame and doors of the oven and the base frame are polished metal, it will be seen that a very fine appearance is given to the whole. Attaining such appearance with efficiency and economy and with the intention of permanently protecting the enamel from cracks as heretofore set out, constitutes in substance the problem which is solved by this invention.

I may refer to the drawings by using reference characters to designate the parts. Accordingly the legs of the stove are indicated by the numeral 1 and the usual base frame, supporting the structure of the range by reference numeral 3, there being an end panel 5 and a rear panel (not shown) and a base shelf plate 7 and an oven panel 9 above which is a cooking top 10, which may comprise plates and griddle or open grid formation as desired. 12 and 13 indicate the oven doors having frames 14 and 15 and the usual handles 16, the doors being mounted on the usual front frame oven member 17. The oven panel above the cooking top is designated 18 and the horizontal top or panel is designated 19. An abbreviated hood or upper shelf 20 is supported at one end of the oven and at the other end upon a bracket 22 extending forwardly from a vertical panel 23. A top cresting in the form of a panel 24 is secured in brackets or supports at each end, designated 25.

To join two panels at right angles to each other and avoid having the seam at the corner and avoid putting bolts through the enamel as has been customary, I have worked out the arrangement shown particularly in Fig. 7. Assuming, for example, that this section illustrates the top plate 19 and a left hand end or side panel of the oven, designated 27, it will be seen that the panel 19 has a downwardly extending flange 30 integral with an inwardly extending portion 31 parallel with the main body of the plate 19. The plate 19 and its flange are covered by enamel designated E, which preferably terminates where the flange 30 joins its extension 31, extending somewhat around the not quite square corner formed between these two parts of the sheet of metal comprising the panel. The plate 27 is shown as turned inwardly at 29 to come into parallelism with the flange member 31, whereby these may meet and be clamped together by a short stove bolt 34 having the usual nut 35. The panel 27 may also be enameled as shown in section and designated E, which enamel also terminates preferably short of the inturned flange 9, but covering the same around the corner as before. These flange members 29 and 31 stand in the space provided for insulating space between the inner and outer walls of the oven, where they are entirely concealed.

It will be seen that as the plate 19 springs or moves during the handling of the stove, or expands or contracts under the influence of heat, that the movement is allowed for by the natural resiliency of the metal, the flanges 30 and 31 yielding, due to the spring of the metal at the corners. The bolts or other fastening means used to clamp the fastening members together may be set down very tightly and permanently, and yet no crack can be thereby started in the enamel which will run out and show. If in clamping these two flanges together, the enamel is crushed or cracked slightly between the flange members 31 and 29, it occurs in the place where it cannot be seen.

It is to be understood that the securing of such flange members, as at 29 and 31, and others to be hereinafter described, can be accomplished by rivets, integral tongues on one projecting through openings on the other, spot-welding and the like, as during the construction of the stove these parts are very accessible and allow for convenient use of any of these different methods,—none of them damaging the enamel owing to the construction.

The top panel 19 in the construction shown is provided with down-turned flanges of this character on its front and two sides, whereby there are three of the flange members 31 brought together along the bevel line at the corners, as at 32, if desired. The front flange 31, instead of being secured to the flanges of the panels, is attached by the same method to the door frame 17 of the oven; there being inwardly turned horizontal lugs 36 at suitably spaced intervals, preferably one near each corner, as shown, while bolts 34 may pass through registering openings in the flange and lugs and be tightly and permanently secured.

The side panels of the oven are secured to this door frame 17 by the same method of attachment by which the enamel is protected as before, and the securing is permanently and effectively accomplished. For example, the panel 27 shows at the left in Fig. 2 and shown also in Fig. 3 is provided with a flange member having a portion at right angles and the inward portion parallel to the body 10, as shown at 37, one portion of this flange resting against the inner face of the frame 17 and the other against the

lugs 36, parallel with the panel 27, while the bolts 34 or other means secure them as before.

The connection of this panel 27 with the rear wall of the oven need not have the same construction, but may be accomplished by the expedient of the single flange turned inwardly as indicated at 38, Fig. 3, while the back panel 40 may have an edge portion turned back upon itself, as indicated at 41, and be secured to the flange 38 and its stove bolt 34. The lower edge of the panel 27 may simply be extended therethrough with the nut of this bolt on the inside, as shown in Fig. 6.

The top panel 19 at the back may have a longer down turned flange, as indicated at 44, (Figs. 5 and 7) overlapping the rear panel 40 which is shown turned over upon itself again, as at 41, and the bolt may be secured to the flange 44 by the bolts 34. The other side of the oven, preferably has a divided panel, that is, a panel 9 and 18. The panel 18 is provided with inwardly turned horizontal flanges, the upper of which is bolted to the flange 31, and the lower of which, rests upon and is bolted to the plate 10 of the cooking top frame projecting inwardly between these two panels, a distance corresponding to the width of the securing flange 18^a. The flange of the upper edge of the panel 9 is designated 9^a in Fig. 6 and the bolt 34 extends through both these flanges and the opening in the plate, clamping the plate between the flanges, as shown, This effects a support for the plate frame, as well as a manner of securing these panels to it, without exposing the securing means, and also allows for the slight relative movement of these parts incident to moving and heating and cooling, etc., without endangering the enamel outer surfaces of the panels 9 and 18. At the lower edge of the panel 9, is a shelf plate 7, which is also preferably enameled on its upper surface and is secured by simply turning downwardly the flange 7^a to lie parallel with the lower portion of the plate 9, securing it thereto in any suitable fashion.

The idea of turning the flanges away from the exposed surface to present them to securing means at places not seen, as carried out with a guard rail or top panel 24, which is turned in the form of a channel and rests upon the plate or panel 19 and upon the shelf 20, is shown in Fig. 8, the ends being joined to the bracket members 25 in any suitable fashion.

The panel back of the cooking table, designated 23, may be secured to the flanges on the bracket 22 in the usual manner, but at its lower edge, it has a flange resting upon the upper surface of the frame plate of the cooking table 10 while the back panel 46 for the space below the table, also has a similar flange, whereby the frame plate is joined to these two panels and incidentally supported in the same manner as described in connection with the panels 9 and 18. As shown in Fig. 8, where the flanges are designated 45^a and 46^a, the bolts 34 pass through these flanges and openings in the plate.

The panel 19 is shown as connecting the shelf 20 and the side flange of the panel 19. This affords an opportunity for a connection between these enameled parts without sacrificing the features previously set forth, by the use of a downturned flange 20^a, Fig. 6, which meets the outer enamel surface of the flange portion 30, and may be attached thereto by bolts 34 which, while passing through some of the enamel surface, is however concealed and any damage done to the enamel is not exposed.

It will be seen from the foregoing description that I have provided joints between the enameled panels going to make up the complete stove, which comprise either single or two-part flanges turned inwardly to provide in effect, edges which may be permanently secured together without exposing the enamel surfaces. Where the greatest difficulties are afforded, that is, where the panel must be fastened along the edges most exposed, such for example, as the top panel which is most subject to strains likely to destroy the surface, I have provided an unusual resiliency by turning downwardly a portion of the plate and covering this with enamel merging with the top surface and then turning inwardly at right angles to that flange, an extension forming in effect, a U-shaped flange, affording the greatest resiliency of connection. The inwardly turned flanges are formed in the manner shown, entirely within the oven portion where it is necessary to provide an insulating air space, and the width of these flanges does not increase the usual space or interfere with the placement of the inner wall plates. The only exposed flange connection is at the back of the stove where the cooking top frame is connected to the panels 45 and 46. The appearance of the stove is very much enhanced by freedom from all exposed bolt heads, or even from the usual polished strips and corner clips which are obviated by this invention.

A further advantageous characteristic in the construction shown, is that the downwardly turned flanges of the panel 19 form in effect, a horizontal border for the top of the panel and eliminate the sharp corners, and at the same time reinforce this connection. Practice has demonstrated that by so constructing these parts and assembling them in this manner, I am enabled to very tightly and permanently secure the parts together and completely assemble the range. Ordinary handling in shipment does not

damage it, nor strains incident to moving and installing, do not affect the enamel finish. Marked economy is effected over the present method which frequently resulted in replacement of one or more of the panels by the time the stove reached the user.

It will be seen that the formation of these panels with the connecting flanges as shown and described, may be accomplished by very simple methods. The panels will not crack because they are braced by integral flanges at least two and sometimes all four edges. This makes for the elimination of waste and economy of handling the plates during the assembling operation and permits the formation of the plates in large quantities without appreciable loss.

I claim:

1. In a stove construction having enamel panel plates forming the outer walls of the oven, a top panel for the oven having downwardly turned flanges on its edges, and inwardly turned flanges extending parallel with the body of the panel and wide enough to receive stove bolts or like fastening devices, and a front panel having inwardly extending lugs meeting the flange extensions and secured thereto.

2. In a stove construction having enamel covered panel plates for the exposed surfaces and forming the outer walls of the oven, the combination of a top panel for the oven having downwardly turned flanges on its edges carried inwardly and extending parallel with the body of the panel to receive fastening devices, side panels having inwardly turned flanges meeting the inward flange extensions and secured thereto, and an oven door frame having inwardly extending projections meeting another of said flange extensions and secured thereto.

3. A range oven construction having enameled top and side panels, enamel on all exposed surfaces of said panels, and securing means within the panels when assembled, comprising flanges turned inwardly into parallelism with one of the panels and spaced therefrom, and flanges turned inwardly to meet the first named flanges, and securing means connecting the meeting flanges, said flanges and securing means being adapted to stand within the usual space between the inner and outer walls of the oven and a front frame member having inwardly extending lugs at the top and sides thereof secured to the inner flanges of the top and side panels.

4. In a range oven, the combination of a top panel having an inwardly turned flange extending parallel to the top surface thereof, two side panels, one of said side panels being positioned in the oven structure with parallel edges thereof having spaced apart flanges extending horizontally and a lid frame secured to said side panel members by means extending through the frame and said parallel spaced apart flanges.

5. In a stove structure having enameled panel plates forming the outer walls of the oven, a top panel for the oven having downwardly turned flanges on its edges and inwardly turned flanges extending parallel with the body of the panel, an outer side panel similarly flanged and a front frame member having inwardly extending lugs meeting the flanged extensions of the top and side panels, said lugs being spaced from the marginal edges of the front frame member a distance equal to the width of the downwardly turned flanges and inwardly turned flange of the top and side panel members respectively, whereby the marginal edges of the front frame member will be coincident with the exterior planes of the top and side panel members.

In testimony whereof, I hereunto affix my signature.

ALBERT H. TINNERMAN.