

May 10, 1938.

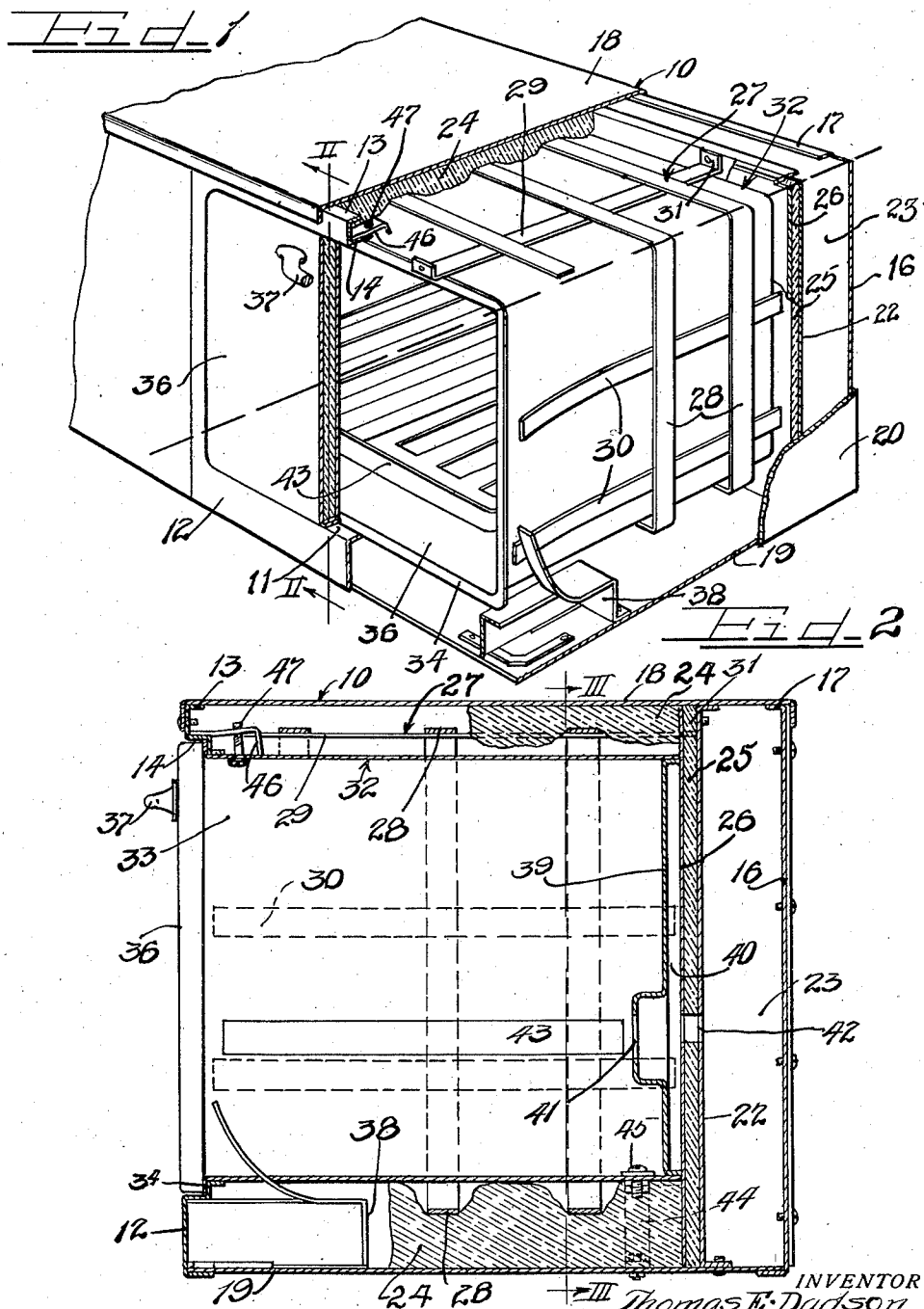
T. E. DADSON

2,116,669

OVEN CONSTRUCTION

Filed Oct. 25, 1937

2 Sheets-Sheet 1



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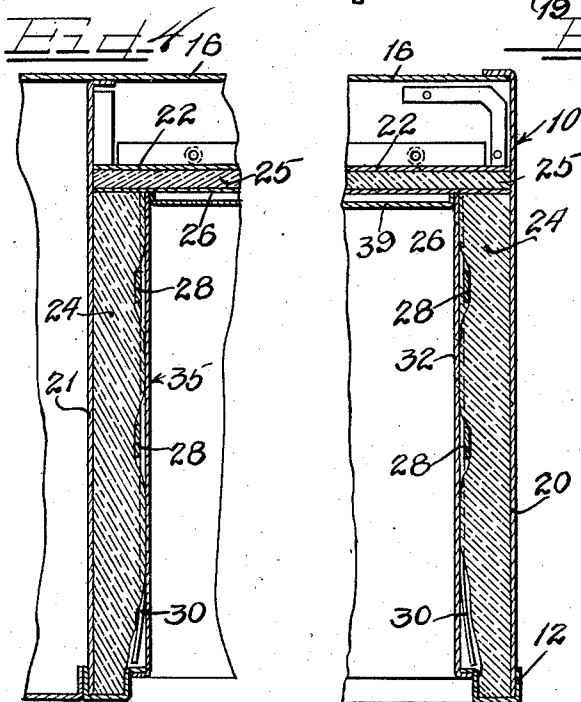
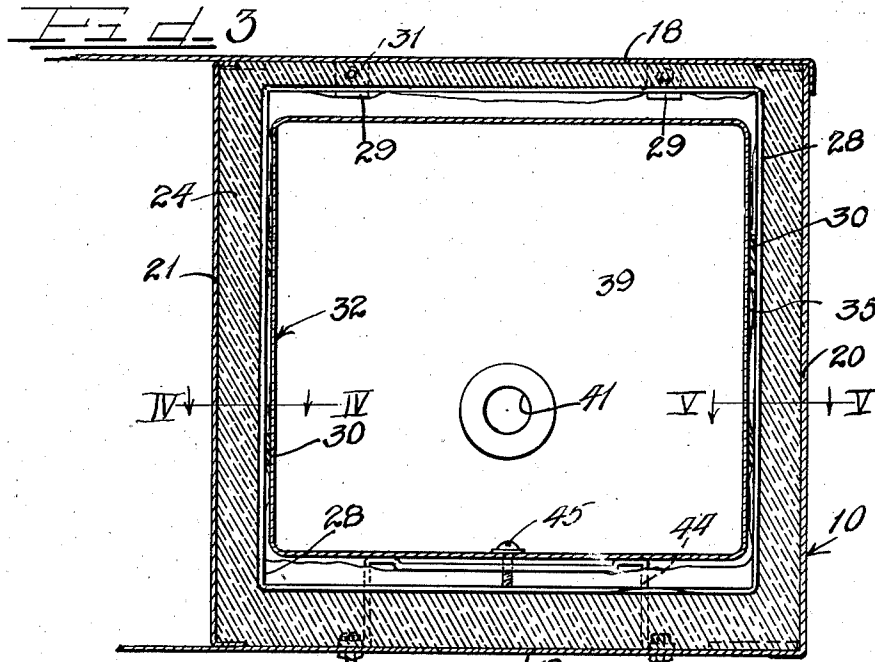
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2 Sheets-Sheet 2



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2,116,669

OVEN CONSTRUCTION

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10 Claims. (Cl. 126—273)

This invention relates in general to an oven construction, and is more particularly concerned with an improved type of electric oven for use in electric ranges of the domestic type.

In oven constructions heretofore utilized, the insulation surrounding the hearth has been so arranged that it makes the replacement of the insulation, when servicing the oven, very difficult. This is due primarily to the fact that the insulation is dependent upon the hearth for its being supported in proper position, and should the hearth be removed, the insulation necessarily is without support and collapses. It is therefore extremely difficult, if not impossible, to replace the hearth with new insulation and get the insulation in proper position.

In order to overcome this primary as well as other disadvantages of present constructions, the present invention proposes to support the insulation independently of the hearth, so that the hearth may be removed without damage to the insulation.

Another object of the invention is to provide an improved electric oven having a sheet metal hearth and a sheet metal outer shell, the hearth and shell being positively and securely connected together by improved means which prevent transfer of any appreciable quantity of heat from the hearth to the outer shell.

A further object of the invention is to provide in an electric oven having an outer shell and a hearth arranged within said shell, improved means for thermally insulating the hearth from the shell.

It is a further object of the present invention to provide an electric oven having a sheet metal hearth and a sheet metal outer shell thermally insulated from each other with the aid of fibrous, flake or powdered insulating materials, means to retain the insulating material within the shell when the hearth is removed therefrom, and prevent the falling out of the insulating material when the hearth is taken out for repairs or for substitution.

Still another object of the invention is to provide an oven for electric ranges having a hearth of unitary construction and a sheet metal outer shell mechanically connected together but thermally insulated from each other, the hearth being adapted to be easily removed from the shell for inspection or repairs, all the fastening means being accessible from the inside of the hearth.

A still further object is to provide an improved electric oven having an insulation retaining frame, which is relieved from the function of

transmitting any load which might be imposed upon the hearth.

An additional object of the present invention is to provide an improved structure of the above character which is simple in construction, relatively inexpensive to manufacture, and easy to repair and service.

Other objects and features of the invention will more fully appear from the following detailed description, taken in connection with the accompanying drawings which illustrate a preferred embodiment thereof, and in which:

Figure 1 is a perspective view, partly in section, illustrating an electric oven embodying the features of the present invention;

Figure 2 is a vertical sectional view of the oven, taken substantially on the line II—II of Figure 1;

Figure 3 is a transverse vertical sectional view of the same, taken substantially on the line III—III of Figure 2;

Figure 4 is a fragmentary sectional view looking downwardly, of the left-hand side wall of the oven, taken substantially on the line IV—IV of Figure 3; and

Figure 5 is a similar view, of the right-hand side wall of the oven, taken substantially on the line V—V of Figure 3.

As shown on the drawings:

In the drawings there is illustrated, by way of example, an electric oven embodying the present invention. The structure illustrated comprises generally a hearth, an outer shell, an insulating system, means for connecting the hearth to the outer shell; a frame adapted to retain the insulation in the outer shell when the hearth is removed, and a heating unit arranged in the hearth.

Referring to the drawings, there is disclosed a box-like sheet metal outer shell 10 having an opening 11 in its front wall. In the present embodiment, the outer shell comprises a stamped front wall 12 shaped to define inwardly extending flanges 13 around its outer edges and door receiving flanges 14 around the front opening 11. A back wall 16 has provided thereon inwardly extending flanges 17. A top sheet 18 and a bottom sheet 19, which may be a continuation of the general shell of the range, are secured to the flanges 13 and 17. Side sheets 20 and 21 and the back wall sheet 16 are secured to their adjoining sheets, as shown, to form the box-like structure. A second back wall 22 is secured inside the outer shell 10 to form an air space 23 at the rear of the shell.

As illustrated, a semi-loose insulation 24, that is to say, an insulation which may to a certain degree retain the shape into which it may be formed, is provided on the shell 10 and arranged to cover the top, bottom and side surfaces thereof. Sheet insulation, as shown at 25, and a cover sheet 26, are arranged at the second back wall 22. The insulation 24 is retained in place by means of a frame generally indicated by the numeral 27, this frame consisting of a plurality of circumferentially extending members 28 connected together by means of a plurality of longitudinally extending members 29 at the top and members 30 at the sides of the frame. The upper longitudinal members 29 are connected at their extremities to the front wall 12 and the second back wall 22, as indicated at 31. By virtue of the construction just described, the frame 27 is secured to the outer shell 10.

A box-like inner shell or hearth 32 having an open mouth 33 and a locating lip or flange 34 is adapted to slide into the frame 27, the side longitudinal members 30 thereof being adapted to guide the hearth. Since the members 30 are secured to the circumferential members 28 at the inside surfaces thereof, an air space 35 is formed between the side walls of the hearth and the members 28, providing for insulation therebetween. The height of the hearth is so selected that there will be sufficient room for insulation of double thickness at the top and bottom of the hearth. In the present embodiment of the invention, the upper and lower portions of the members 28 are deeply embedded into the insulation, although in some instances it may be possible to dispense with the insulation between the frame and hearth, the air spaces between the same being sufficient for the purposes of thermal insulation.

While the present invention has thus far been described and disclosed in connection with the use of a semi-loose type of insulation, it will be readily apparent that the invention may with equal facility be utilized with a slat type insulation which is more or less rigid in construction. The use of a slat type insulation is advantageous in that it does not bulge between the supporting frame members and enables the use of smaller clearances between the frame members and the hearth. Moreover, this type of insulation does not necessitate as many circumferentially extending members 28, and in fact it has been found that the use of only one such member will satisfactorily maintain the slat type insulation in position.

A door 36 of hollow insulated type, having a handle 37, is provided and adapted to close the front opening 11 of the front wall 12 and the mouth of the hearth. The door is hingedly secured to the shell 10, special hinge mechanisms (not shown) being arranged within casings 38 and adapted to balance the door in any position of its movement.

The back wall 39 of the hearth is depressed to form an air space 40. Registering openings 41 and 42 are provided in the wall and the sheet insulation, in order to permit passage therethrough of electrical conductors (not shown) for connecting a heating unit 43 arranged within the hearth to the electric line for providing a suitable source of electrical energy.

A bracket 44 is secured to the bottom of the shell 10, this bracket being adapted to support the hearth in spaced relation thereto. This bracket 44 is connected to the hearth by means of

a screw 45 which is accessible from the inside of the hearth. Brackets 46, secured to the front wall 12, as by spot welding, are arranged to receive screws 47 for connecting the hearth to the outer shell. Thus, the hearth is secured directly to the outer shell 10, the frame 27 being thereby relieved from any stresses which might otherwise be imposed thereon because of the loads carried by the hearth.

From the foregoing, it will be appreciated that transfer of heat from the hearth to the outer shell is reduced to a minimum, direct conduction and radiation as well as convection currents being prevented by the insulation, while conduction through the frame is decreased, because of the greatly decreased metal path. At the same time, removal and replacement of the hearth is made extremely easy. It is only necessary to take out the screws 45 and 47 in order to disconnect the hearth from the outer shell. Since the frame 27 has no positive connection with the hearth, the removal of the latter does not disturb either the frame or the insulation retained thereby.

From the foregoing description, it will be apparent that the present invention provides an improved oven construction which has a hearth and outer shell positively and securely connected together by improved means preventing transfer of any appreciable amount of heat from the hearth to the shell; which contains improved insulating means between the hearth and shell; which embodies novel means for supporting the insulation around the hearth but independently thereof, whereby the hearth may be removed for repairs or inspection without damage to the insulation; in which loads imposed on the hearth are not transmitted to the insulation therearound; and which is simple in construction, relatively inexpensive to manufacture, and easily repaired and serviced.

It is, of course, to be understood that although I have described in detail a single embodiment of my invention, the invention is not to be thus limited, but only insofar as defined by the scope and spirit of the appended claims.

I claim as my invention:

1. An oven construction comprising an outer shell, thermal insulation arranged to cover the inside surfaces of the outer shell, a frame secured to the outer shell and adapted to retain the insulation in place, a hearth arranged to be slid into said frame, a bracket secured to the bottom of said shell adapted to support said hearth, and threaded means securing said hearth to said shell and to said bracket respectively.

2. An oven construction comprising an outer shell, thermal insulation arranged to cover the inside surfaces of the outer shell, a frame secured to the outer shell and adapted to retain the insulation in place, a hearth arranged to be slid into said frame, a bracket secured to the bottom of said shell and adapted to support said hearth, and threaded means securing said hearth to said shell and to said bracket respectively, said means being accessible for disconnection from the inside of said hearth.

3. An oven construction comprising an outer shell; thermal insulation arranged to cover the inside surfaces of the outer shell; a frame composed of a plurality of circumferential members extending in vertical planes perpendicular to the longitudinal axis of the oven and a plurality of longitudinally extending members connecting said circumferential members, means securing the extremities of said longitudinally extending

members to said outer shell, said frame being arranged to retain the insulation in place; and a hearth slidable into said frame and engageable by the longitudinal side members thereof, there being a space between the circumferential members of said frame and said hearth.

4. An oven construction comprising an outer shell; thermal insulation arranged to cover the inside surfaces of the outer shell; a frame composed of a plurality of circumferential members extending in vertical planes perpendicular to the longitudinal axis of the oven and a plurality of longitudinally extending members connecting said circumferential members, means securing the extremities of said longitudinally extending members to said outer shell, said frame being arranged to retain the insulation in place; and a hearth slidable into said frame and engageable by the longitudinal side members thereof, there being a space between the circumferential members of said frame and said hearth, said space being larger at the top and bottom of said hearth to permit deep embedding of the top and bottom of said frame into said thermal insulation.

5. In an oven, an outer shell; a compressible thermal insulation arranged to cover the inside surfaces of said shell at the top, sides, and the bottom thereof; a frame composed of a plurality of circumferential members extending in vertical planes perpendicular to the longitudinal axis of the oven and a plurality of longitudinally extending members secured to the inside surfaces of said circumferential members; means at the extremities of said longitudinally extending members for attaching said frame to said outer shell, thereby retaining the insulation in place; a hearth slidable into said frame making contact with the longitudinal side members thereof, there being air spaces between the circumferential members of the frame and the sides of the hearth; and sheet insulation between the back walls of said outer shell and said hearth.

6. In an oven, an outer shell; compressible thermal insulation arranged to cover the inside surfaces of said shell at the top, sides, and the bottom thereof; a frame composed of a plurality of circumferential members extending in vertical planes perpendicular to the longitudinal axis of the oven and a plurality of longitudinally extending members secured to the inside surfaces of said circumferential members; means at the extremities of said longitudinally extending members for attaching said frame to said outer shell, thereby retaining the insulation in place; a hearth slidable into said frame making engagement with the longitudinal side members thereof, there being air spaces between the circumferential members of the frame and the sides of the hearth; and sheet insulation between the back walls of said outer shell and said hearth, air spaces being provided on both sides of said sheet insulation.

7. In an oven, an outer shell; thermal insulation arranged to cover the inside surfaces of the outer shell at the top, sides and bottom thereof; a frame composed of a plurality of circumferential members extending in vertical planes perpendicular to the longitudinal axis of the oven and a plurality of longitudinally extending members secured to the inside surfaces of said circumferential members; means at the extremities of said longitudinally extending members for at-

taching said frame to said outer shell; a sheet metal hearth having an open mouth and locating flange thereat, said hearth being arranged to slide into said frame and be engaged by the longitudinal side members thereof; and means supporting said hearth in spaced relation to the bottom of said outer shell.

8. In an oven, an outer shell; thermal insulation arranged to cover the inside surfaces of the outer shell at the top, sides and bottom thereof; a frame composed of a plurality of circumferential members extending in vertical planes perpendicular to the longitudinal axis of the oven and a plurality of longitudinally extending members secured to the inside surfaces of said circumferential members; means at the extremities of said longitudinally extending members for attaching said frame to said outer shell; a sheet metal hearth having an open mouth and locating flange thereat, said hearth being arranged to slide into said frame and be engaged by the longitudinal side members thereof; means supporting said hearth in spaced relation to the bottom of said outer shell; means for securing said hearth to said outer shell; and a door hingedly secured to the outer shell and adapted to close and open selectively the mouth of said hearth.

9. In an oven, an outer shell; thermal insulation arranged to cover the inside surfaces of the outer shell at the top, sides and bottom thereof; a frame composed of a plurality of circumferential members extending in vertical planes perpendicular to the longitudinal axis of the oven and a plurality of longitudinally extending members secured to the inside surfaces of said circumferential members; means at the extremities of said longitudinally extending members for attaching said frame to said outer shell; a sheet metal hearth having an open mouth and locating flange thereat, said hearth being arranged to be slid into said frame and engaged by the longitudinal side members thereof; a bracket inside of said outer shell on the bottom thereof supporting said hearth in spaced relation to said shell; a plurality of connectors insertable from the inside of said hearth for attaching said hearth to said shell and to said bracket respectively.

10. An oven construction comprising a box-like outer shell with an opening in its front wall and a second wall spaced from and in front of the back wall; fibrous insulation arranged to cover the inside surfaces of said shell at the top, sides and bottom thereof; a sheet thermal insulation at the front surface of the second wall; a frame adapted to retain the fibrous insulation in place and composed of a plurality of circumferential members extending in vertical planes perpendicular to the longitudinal axis of the oven and a plurality of longitudinally extending members secured to said circumferential members; means for securing the extremities of said longitudinally extending members to the front and to the second wall of said shell; a sheet metal hearth having an open mouth and slidable into said frame and outer shell through the front opening thereof, the back wall of said hearth being depressed to provide an air space between the sheet insulation and the hearth; and means for securing said shell within said frame in spaced relation to said outer shell.

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