Nov. 17, 1931. W. NOBLE 1,831,821

OVEN CONSTRUCTION

Filed March 26, 1930

Fig. 1

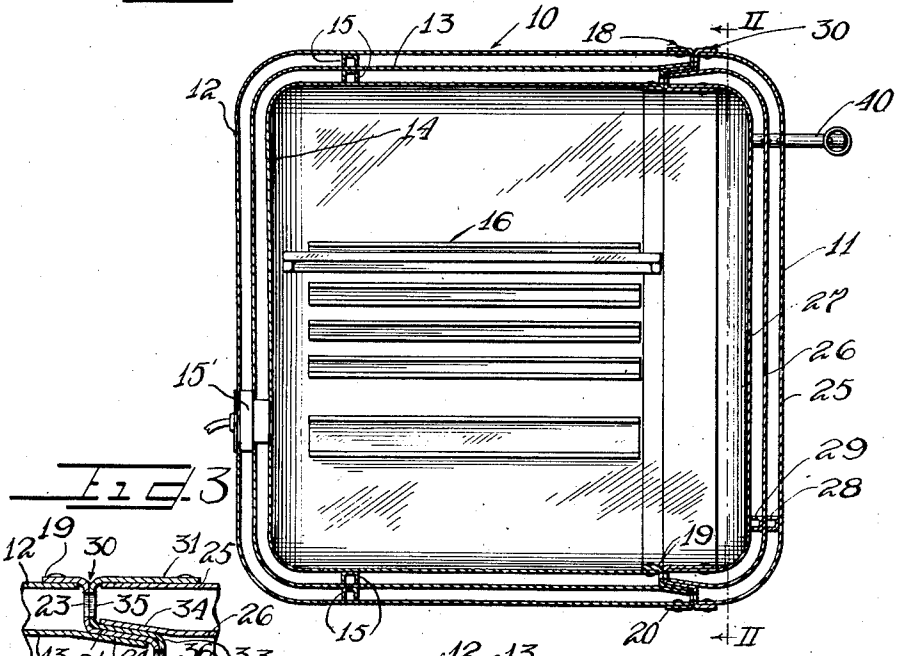
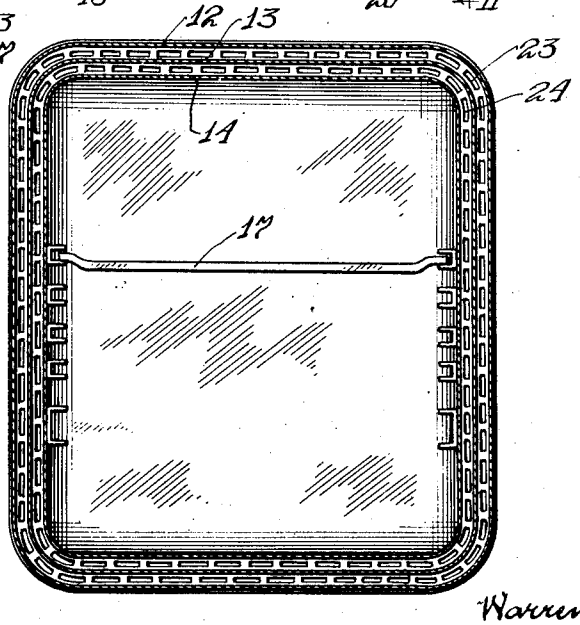


Fig. 3

Fig. 2



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OVEN CONSTRUCTION

Application filed March 26, 1930. Serial No. 439,250.

This invention relates to an improved oven of simple and inexpensive construction and more specifically to ovens of such type as lend themselves most advantageously to use for cooking foods, and which are preferably heated by an electrical element contained internally thereof.

An object of this invention is to provide an improved oven wherein air is employed as the heat insulating means and which air is inclosed in a plurality of isolated layers.

A further object of this invention is to provide walls connecting these layers to form a door jamb in such manner as will minimize the metallic path for a flow of heat in order that the air insulation may attain or be given opportunity to become highly efficient.

It is a further object to provide an oven wherein maximum utility of the heat is possible by setting up the most favorable inherent conditions and eliminating so-called dead air spaces or still air zones wherein the heat may gather. In accomplishing this, provision is made for the radiation or reflection of the heat from all the walls of the oven lining so that as heat is generated by the electrical element therein it finds its way directly to the walls wherein it is reflected until absorbed within the food or other matter placed within the oven for this purpose.

It is a still further object to provide an oven which lends itself readily to cleaning, which object dovetails with the foregoing object inasmuch as the polished surface provided for reflection lends itself readily to cleaning. In order to carry out this aim I also provide an oven lining composed of a refractory metal which in addition to materially aiding in attaining the above object of withholding the heat interiorly of the oven also is resistant to staining, corrosion or deterioration under the fumes generated in cooking foods.

A still further object is to provide an oven which lends itself readily to production by well-known methods, as by stamping and drawing which permits the formation of a plurality of seamless shells each made from a single sheet of material and requires only a door to complete the inclosure. It will be evident that such an oven facilitates the attainment of the above objects wherein heat insulation, maximum utility of the heat and ready cleaning were enumerated inasmuch as there will be no cracks, joints or crevices in which dirt may gather and through which heat losses may occur. This object likewise makes evident the reduced cost of manufacture and production as compared to the conventional types of ovens requiring a complicated and expensive assembly of many parts together with riveting, welding an insertion of bolts and screws.

It is a still further object to provide a door most suitable for use with this oven by incorporating therein the features described in connection with the oven proper. Thus the door is likewise composed of a plurality of spaced shells, the inner one of which is made of a polished refractory metal. Connecting walls connect the shells and these walls are slotted to correspond with the slotting of the door jamb. By this arrangement it will be evident that the interior of the door is in communication with the air insulation around the oven at a plurality of points both longitudinally and transversely of any cross section so that a plurality of layers of insulation is provided, each layer being isolated from each other layer and each layer completely surrounding the interior of the oven.

Other objects and advantages of my invention will more fully appear from the following detailed description taken in connection with the accompanying drawings which illustrate the single embodiment thereof and in which;

Figure 1 is a vertical sectional view through an oven embodying the features of this invention;

Figure 2 is a view taken on substantially line II—II of Figure 1 looking in a direction indicated by the arrows and showing the construction of the door jamb; and

Figure 3 is an enlarged fragmentary sectional view of a portion of the oven taken through the door jamb showing the manner in which the door cooperates with the jamb.

The oven as illustrated in Figure 1 com-

prises an open ended oven proper designated generally by the reference character 10 and a door 11 for cooperation with the open end of the oven 10. Both the oven 10 and door 11 are made of a plurality of spaced metallic layers so as to provide an oven construction with heat insulated walls which I will now describe in detail.

The oven 10 comprises an outer metallic wall 12 which may be formed from suitable sheet metal by a single punch press operation. The outer wall 12 when thus formed is a single piece open ended receptacle, the open end of which is designed for cooperation with the closure or door 11.

Nested within the outer wall 12 I dispose one or more thin metallic shells having a similar shape to that of the wall 12, but each being of a smaller cubic capacity than the outer wall. In the drawings it will be observed that I have illustrated the oven 10 as being composed of three metallic walls, namely, the outer wall 12 and intermediate wall 13 and an inner wall or lining 14. It is, of course, to be understood that the walls of the oven 10 may be made up of as many layers of metallic material as desired without deviating from the features of this invention. The intermediate shell 13 and the liner shell 14 may be formed from sheet metal by a single punch press operation in the same manner that the outer shell 12 is formed. The intermediate shell 13 is spaced from the outer shell and the inner shell by means of spacers 15 which may be apertured or made discontinuous as desired, so as not to interfere with the circulation of air between the nested shells.

It will be evident that the oven 10 lends itself readily to production by well known methods as stamping and drawing, which permits the formation of the shells in such a way that each is seamless and made from a single sheet of material that requires only the door 11 to completely enclose it.

The lining 14 is composed of a polished refractory material and has rounded corners and edges to provide an exposed surface substantially free from tendency to corrode, stain and absorb heat and which readily lends itself to cleaning. I have attained excellent results by providing the lining with a chromium plated surface which I find resists absorption of heat and acts as a reflector for heat radiated and convected thereto.

The oven 10 has an electric socket 15′ extending thru all the shells at one end of the oven for providing a source of electric power to the interior of the oven. A suitable heating element or burner (not shown) may be disposed in the oven 10 and connected to this socket 15′.

Also, attached to the inner shell 14 disposed in the oven 10 are a plurality of angled metal strips 16 adapted to support a tray 17, one of which is shown in Figure 2.

The ends of the three shells 12, 13 and 14 at the open end of the oven 10 are connected together by an end wall 18, (Figure 3) including flanges 19 and 20 fastened to the edges of shells 12 and 14 respectively, and an intermediate slanting portion 21 positioned so as to tightly abut a slanting edge 22 on the intermediate shell 13. The portions of the end member 18 between this intermediate part and the flanges 19 and 20 are slotted as indicated at 23 and 24 so as to provide for the circulation of air between the passageways formed by the shells in the oven 10 and the passageways in the multi-layer door 11 which will be described hereinafter. The openings or slots 23 between the shells 12 and 13 are staggered with respect to the openings or slots 24 between the shells 13 and 14 as is clearly shown in Figure 2. Also, it will be observed that the slanting part 21 of the end member 18 is formed so as to constitute a seat for a similar part on the end member of the door or closure 11, which will now be described in detail.

The door 11 which may be suitably hinged to the oven proper comprises three nested shells, namely, outer shell 25, an intermediate shell 26 and inner shell 27. Each of these shells like those comprising the oven 10, is composed of a single piece of metal suitably drawn from thin sheet metal. These shells are spaced from each other so as to form air passageways by means of spacers 28 and 29 which may be apertured or formed discontinuous so as to enable the air to freely circulate between the shells. Each of the shells going to make up the door like the shells of the oven 10 comprise an open ended receptacle. The ends of the shells at the open end of the door 11 are connected together by means of an end member 30 similar to the end member 18 and adapted for cooperation with the same.

In Figure 3 it will be observed that the end member 30 comprises flanges 31 and 32 fastened to the shells 25 and 27 of the door. This end member 30 like the end member 18 has formed integral with it an intermediate slanting part 33 which abuts the slanting edge 34 of the intermediate shell 26 of the door. The portions of the member 30 between the flanges 31—32 and the part 33 are slotted as indicated at 35 and 36 so as to enable the air between the shells of the oven to circulate in the spaces between the shells of the door. These openings or slots 35 and 36 like the openings 23 and 24 may be staggered so as to be arranged for register with the openings 23 and 24 when the door is in its closed position.

Suitably fastened to the door 11 is a handle 40 by means of which the door may be moved from open to closed position and vice versa.

The inner shell 27 of the door 11 like the inner shell 14 of the oven 10 is provided with a refractory metallic surface whereby this shell may serve as a lining for resisting absorption of heat. I have attained excellent results by providing the inner shell 27 with a chromium plating so as to enable it to act as a reflector for the heat radiated and reflected thereto. Also, it will be observed that the shells of the door like the shells of the oven 10 are provided with rounded corners and edges so as to facilitate the reflection of heat, and to enable the inner shell to be readily cleaned.

Now, I desire it understood that although I have illustrated and described in detail the preferred embodiment of my invention, the invention is not to be thus limited but only insofar as defined by the scope and spirit of appended claims.

What I claim is:

1. In an oven, an outer and an inner cubical shell having the respective sides thereof fixed in relative spaced relation, a door jamb comprising a wall connecting said outer and said inner shell at the outer edges thereof, said door jamb being slotted to provide a multiplicity of air gaps between the walls of said shells whereby the metallic heat path from the inner to the outer of the walls of said shells is restricted, and a door overlying said door jamb.

2. In an oven, a thin metallic substantially cubical shell having one end open, a second thin metallic shell substantially equivalent in dimension to said first shell but of smaller cubic capacity, said second shell being contained within said first shell and maintained in spaced relation with the side walls thereof, and a wall connecting the adjacent edges of the walls of the two shells at the open ends thereof, said wall being slotted at frequent intervals to restrict the metallic heat path from the inner to the outer of said walls, and a door closing the open ends of said shells.

3. In an oven, a substantially cubical outer casing having one end open, a nest of thin metallic shells contained within said casing and maintained in fixed spaced relation with the walls thereof, each shell of said nest having an open end, and walls connecting the adjacent edges of the walls of said shells and said casing, each of said walls being slotted at frequent intervals to restrict the metallic heat path between the inner and the outer walls.

4. In an oven, a one piece metallic shell having a substantially cubical shape and one end thereof open, a plurality of one piece metallic shells nested within said first named shell and maintained therein in substantial spaced relation with the side walls thereof, walls connecting each of said shells with the walls of each adjacent shell at the open edges thereof, each of said walls being slotted at frequent intervals alternately to the slots of the adjacent walls to restrict the metallic heat path between said walls.

5. In an oven, a nest of thin metallic cubical shells having air insulation therebetween, each of said shells having an open end, a wall connecting the edges of each shell at the open end, said wall being slotted at frequent intervals to block the flow of heat outwardly from the oven and a door composed of a nest of thin metallic shells equal in number to the number of oven shells and having walls connecting adjacent walls thereof, said last named walls being likewise slotted at frequent intervals to block the flow of heat to the outer shell of said door.

6. In an oven, a nest of thin metallic cubical shells having air insulation therebetween, each of said shells having an open end, a wall connecting the edges of each shell with each adjacent shell at the open ends thereof, said walls each being slotted at frequent intervals to block the flow of heat outwardly of the oven and a door composed of a plurality of thin metallic shells equal in number to the number of the oven shells and having walls connecting adjacent walls thereof, said last named walls being slotted in a manner corresponding to the slotting of the walls connecting the oven shells whereby the interior of the door is in communication with the air spaces between the walls of the oven.

7. In an oven, an outer metallic cubical shell having one end open, a second metallic shell nested within said first shell and spaced therefrom, the side walls of said second shell extending beyond the outer edges of the walls of said first shell, a third shell within said second shell and spaced therefrom, the walls of said third shell terminating substantially in the plane of the outer edge of said second shell, a wall joining the edges of said second and third shell, a second wall extending from the edge of said first shell substantially at right angles thereto and toward said second shell, said second wall being bent outwardly toward the edges of said second shell, said first and second wall being slotted at frequent intervals and in alternate relation to block the flow of heat outwardly of said shell, and a door, said door comprising three nested shells joined by slotted end walls, the shells of said door terminating in such manner as to form an end which is the counterpart of the end of the oven proper whereby the bent wall between said first and second oven shells comprises a shielded heat path for assisting the slotted portions in blocking the flow of heat to said outer shell.

8. An oven comprising one piece nested cubical shells having one end open and separated each from the other by air insulation, slotted walls joining adjacent shells at the edges of the open ends thereof to form a door jamb, a door hinged thereto comprising nested shells having end walls slotted

to correspond with the slots of said first named walls angled metal strips rigidly attached to the interior of the inner of said first named shells comprising shelf and burner supports and an electric socket extending through all the shells at one end of the oven for providing a source of electric power to the interior of said oven.

9. In an oven, an oven body including an outer shell and a plurality of nested shells therein, said outer and nested shells being spaced from each other to define air spaces between them and each having an open end, the open ends of said shells being connected together to define a stepped seat for a door and a door cooperable with said seat and including a plurality of spaced nested and open ended shells connected at their open ends to form a stepped surface for relatively tight engagement with said seat when the door is in closed position on said body.

10. In an oven, an oven body including an outer shell and a plurality of nested shells therein, said outer and nested shells being spaced from each other to define air spaces between them and each having an open end, the open ends of said shells being connected together to define a stepped seat for a door, a door cooperable with said seat and including a plurality of spaced nested and open ended shells connected at their open ends to form a stepped surface for relatively tight engagement with said seat when the door is in closed position on said body, and spacing means on said body and door formed to space the shells of each and yet permit of the free circulation of air in each.

11. In an oven, an oven body including an outer shell and a plurality of nested shells therein, said outer and nested shells being spaced from each other to define air spaces between them and each having an open end, the open ends of said shells being connected together to define a stepped seat for a door and a door cooperable with said seat and including a plurality of spaced nested and open ended shells connected at their open ends to form a stepped surface for relatively tight engagement with said seat when the door is in closed position on said body, the innermost shell of the body cooperating with the innermost shell of the door to define a lining for the oven, said two innermost shells each presenting a polished metallic surface of chromium adapted to resist absorption of heat.

In testimony whereof I have hereunto subscribed my name at Detroit, Wayne County, Michigan.

WARREN NOBLE.