

March 19, 1929.

S. S. THOMAS

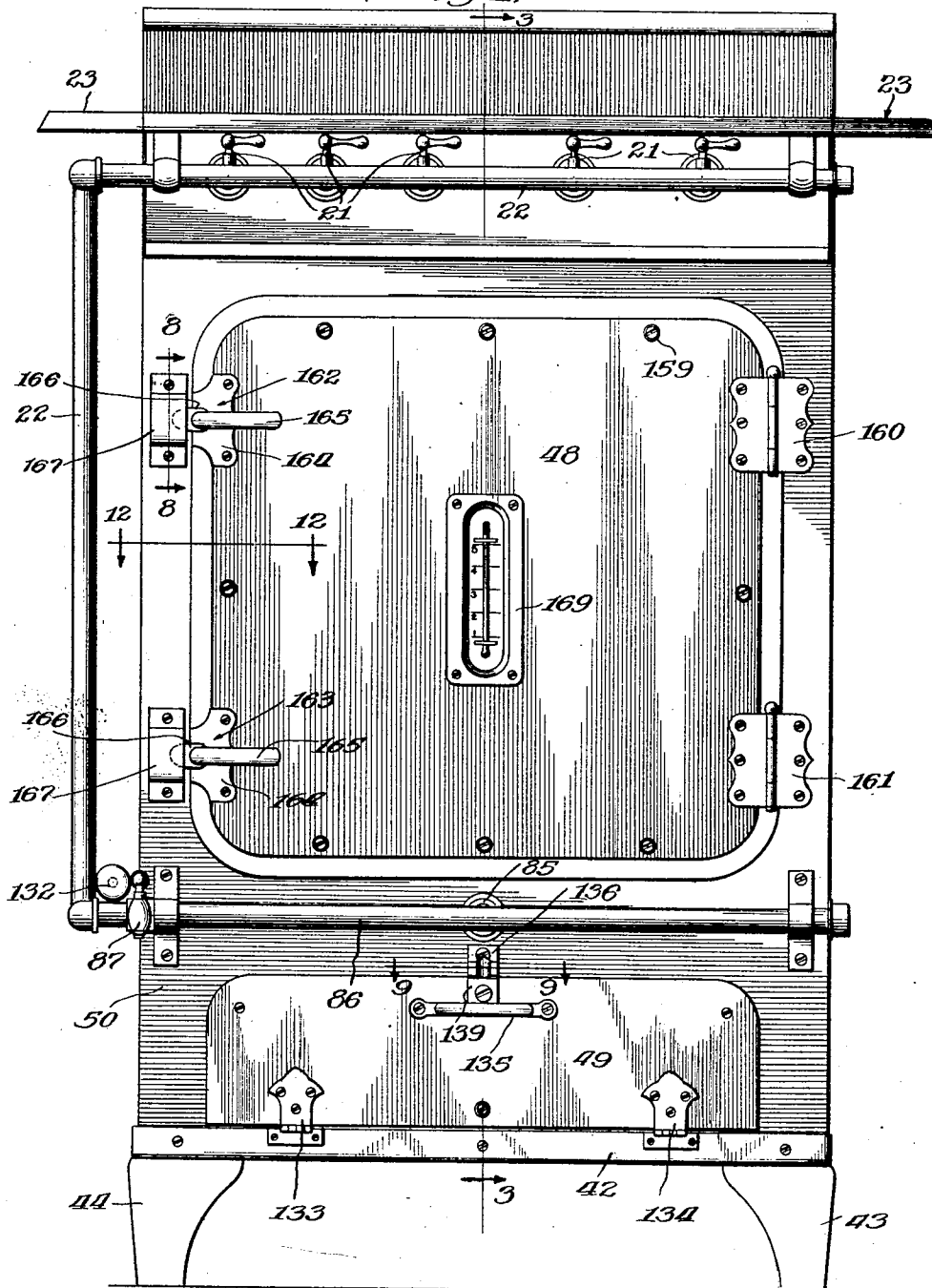
1,706,264

STOVE AND THE LIKE

Filed Oct. 3, 1927

8 Sheets-Sheet 1

Fig. 1.



Inventor
Stephen S. Thomas
By Shp. A. Dumas
Att.

March 19, 1929.

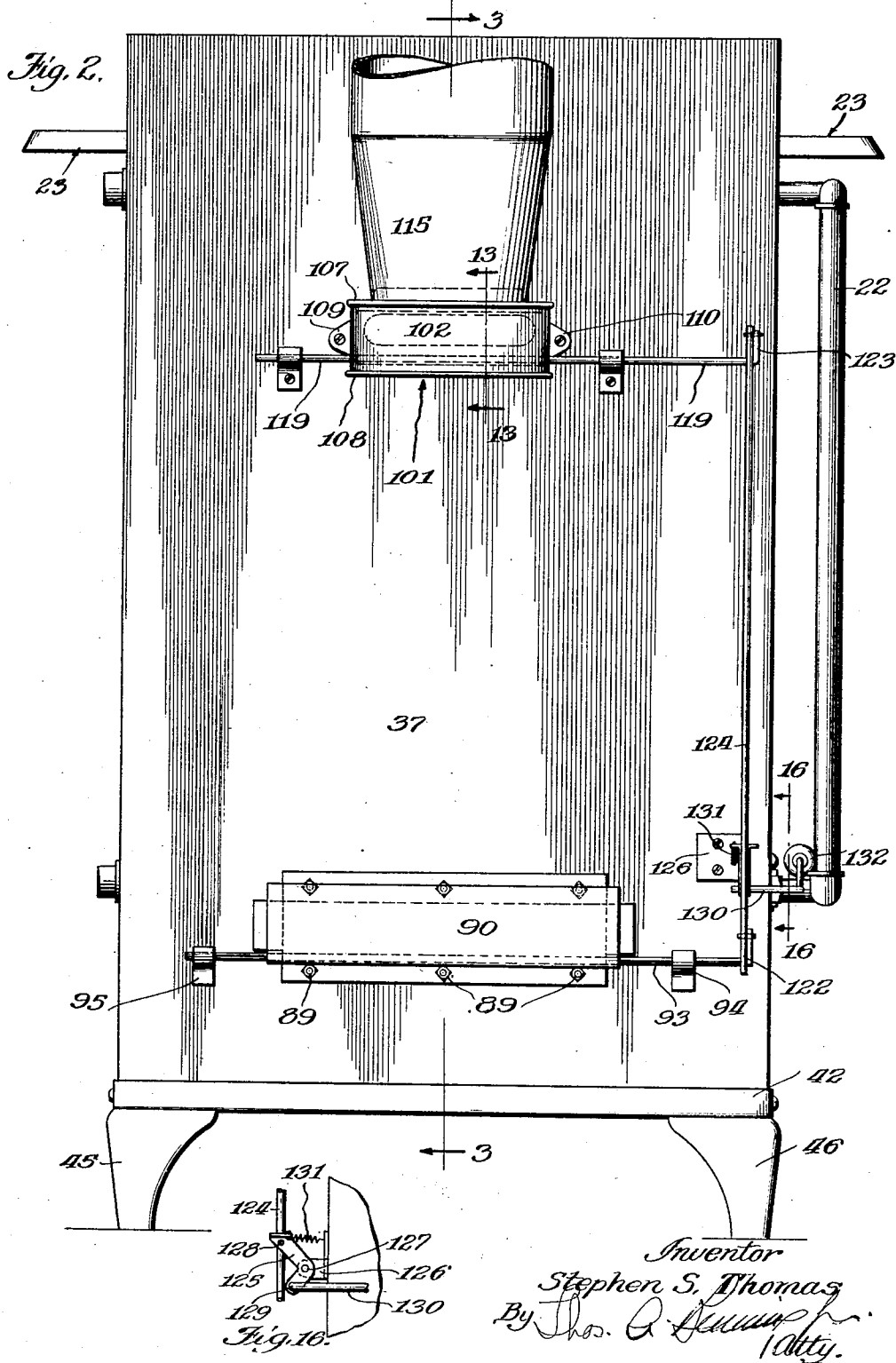
S. S. THOMAS

1,706,264

STOVE AND THE LIKE

Filed Oct. 3, 1927

8 Sheets-Sheet 2



March 19, 1929.

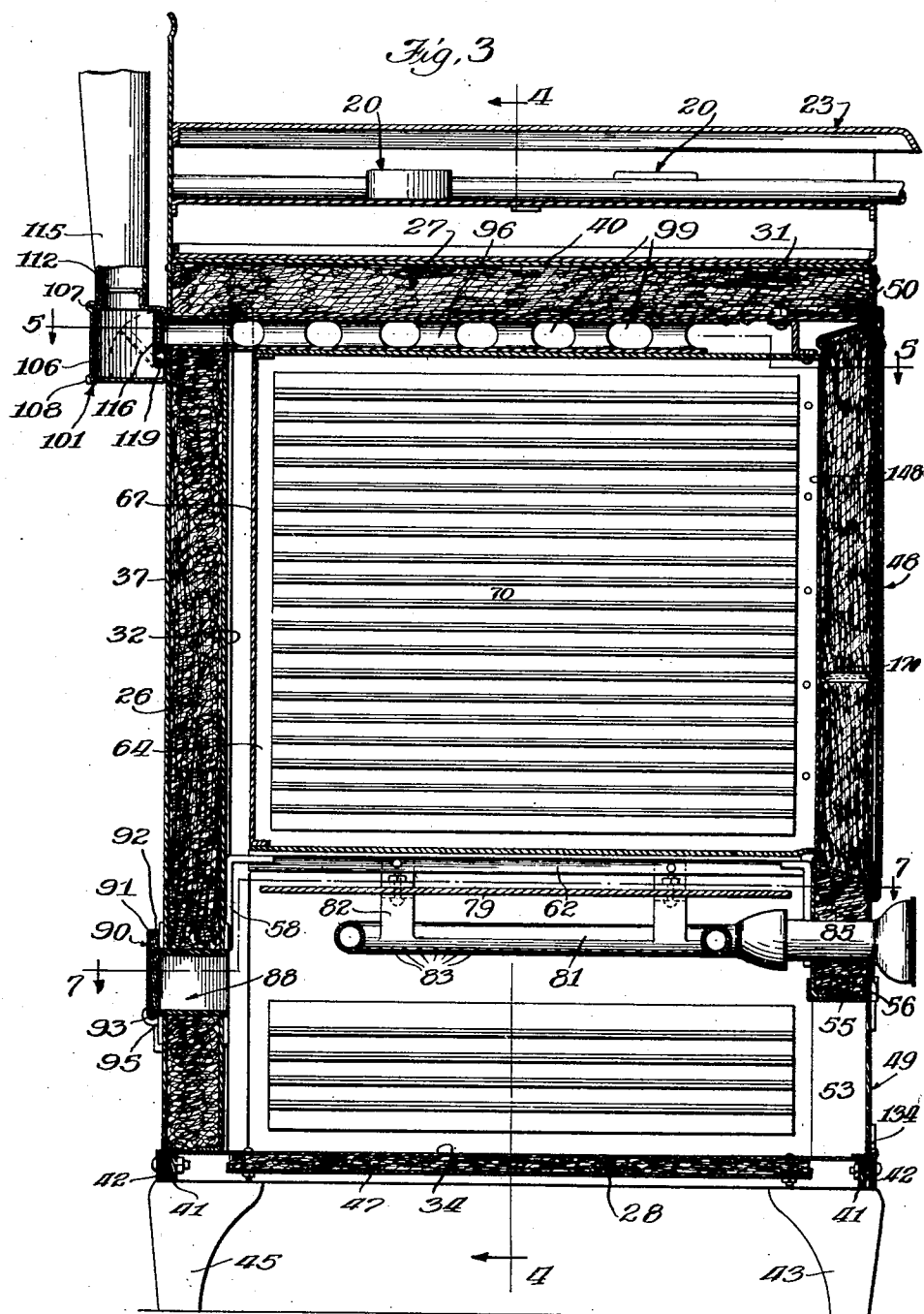
S. S. THOMAS

1,706,264

STOVE AND THE LIKE

Filed Oct. 3, 1927

8 Sheets-Sheet 3



Inventor
Stephen S. Thomas
 By *Thos. Q. Sullivan* Atty.

March 19, 1929.

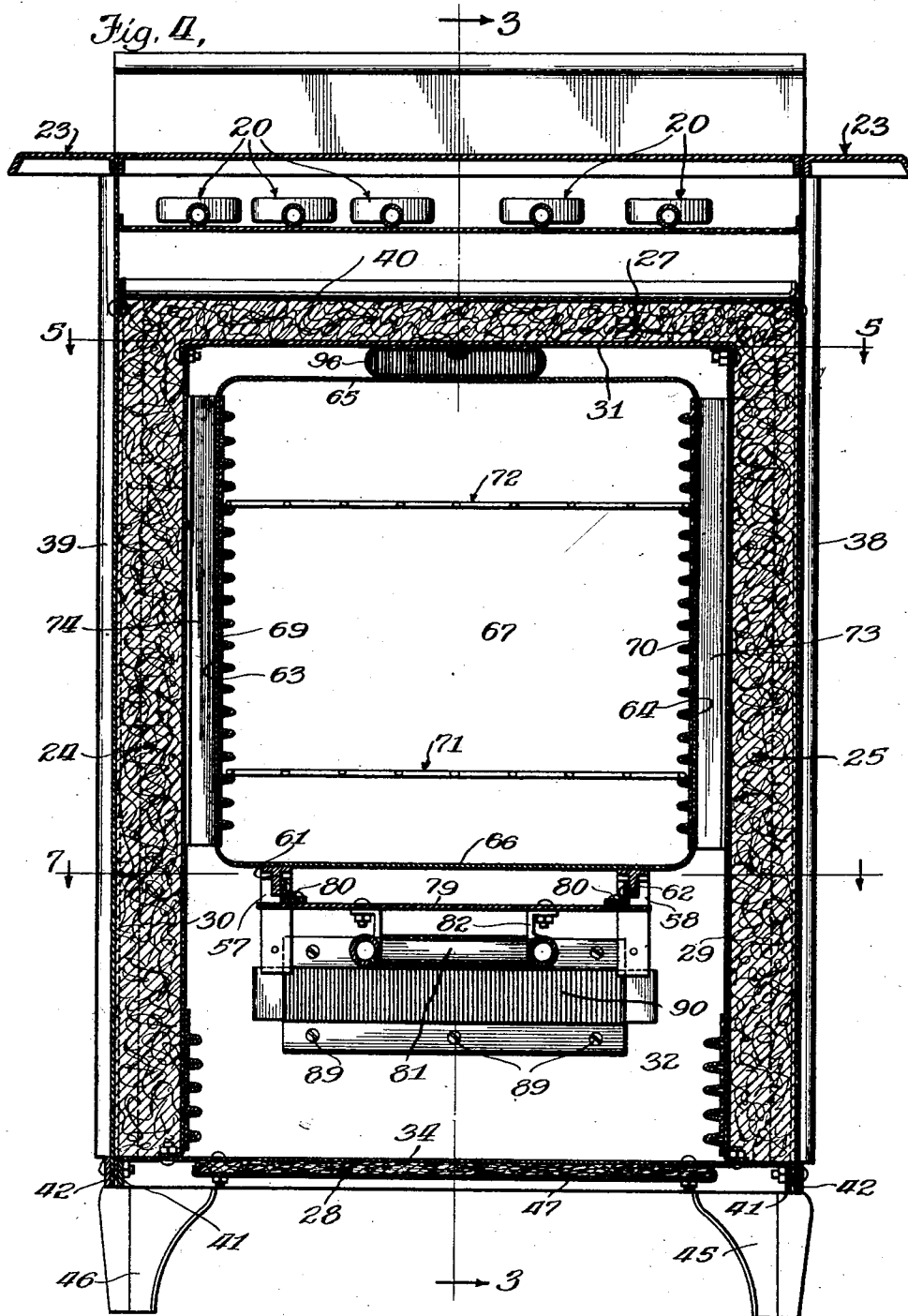
S. S. THOMAS

1,706,264

STOVE AND THE LIKE

Filed Oct. 3, 1927

8 Sheets-Sheet 4



Inventor
Stephen S. Thomas
By Thos. A. [Signature] Atty.

March 19, 1929.

S. S. THOMAS

1,706,264

STOVE AND THE LIKE

Filed Oct. 3, 1927

8 Sheets-Sheet 5

Fig. 5.

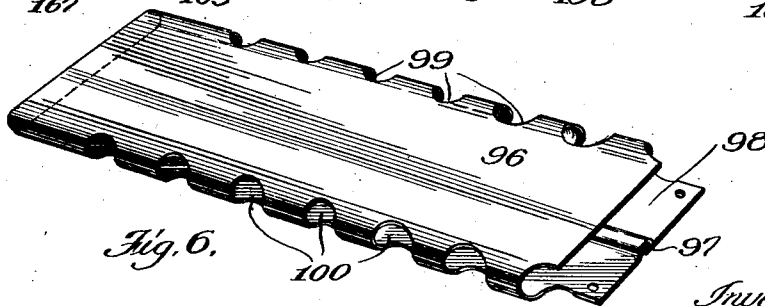
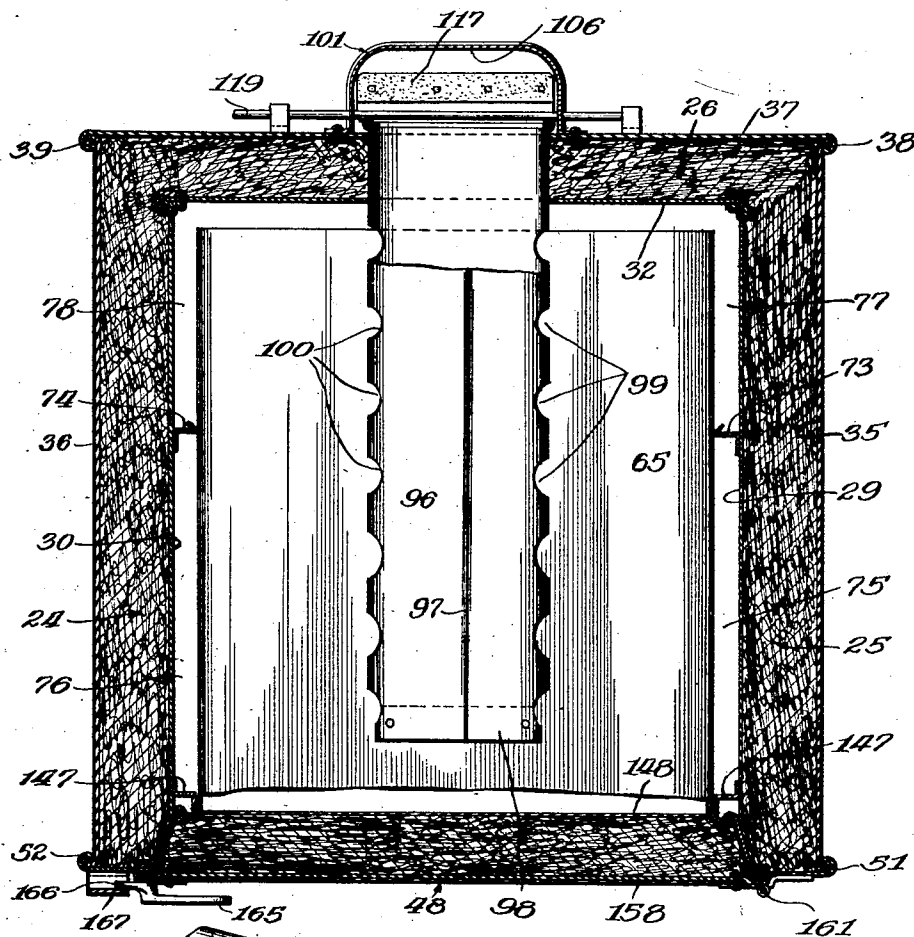


Fig. 6.

Inventor

Stephen S. Thomas.

By J. A. Rawlinson

March 19, 1929.

S. S. THOMAS

1,706,264

STOVE AND THE LIKE

Filed Oct. 3, 1927

8 Sheets-Sheet 6

Fig. 7.

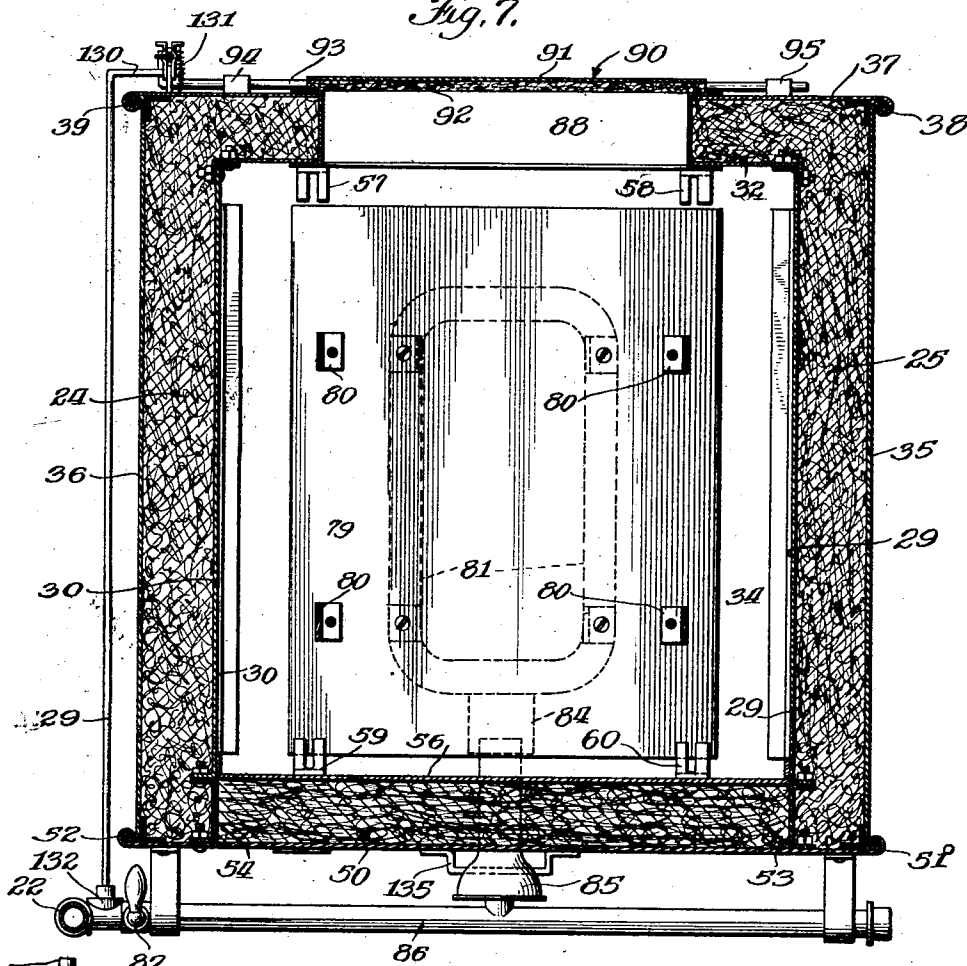


Fig. 8.

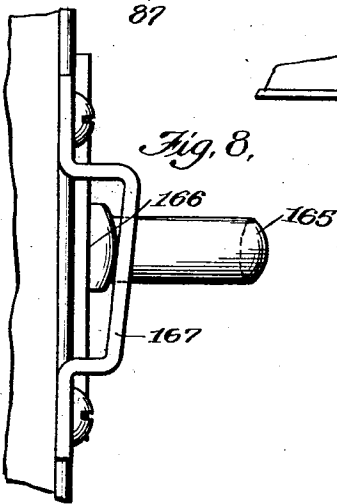
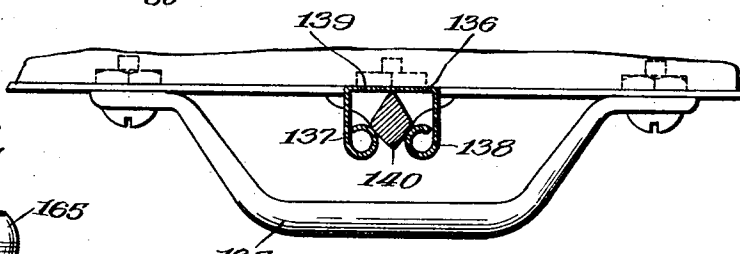


Fig. 9.



Inventor
Stephen S. Thomas
By *Thos. G. Downing* Atty.

March 19, 1929.

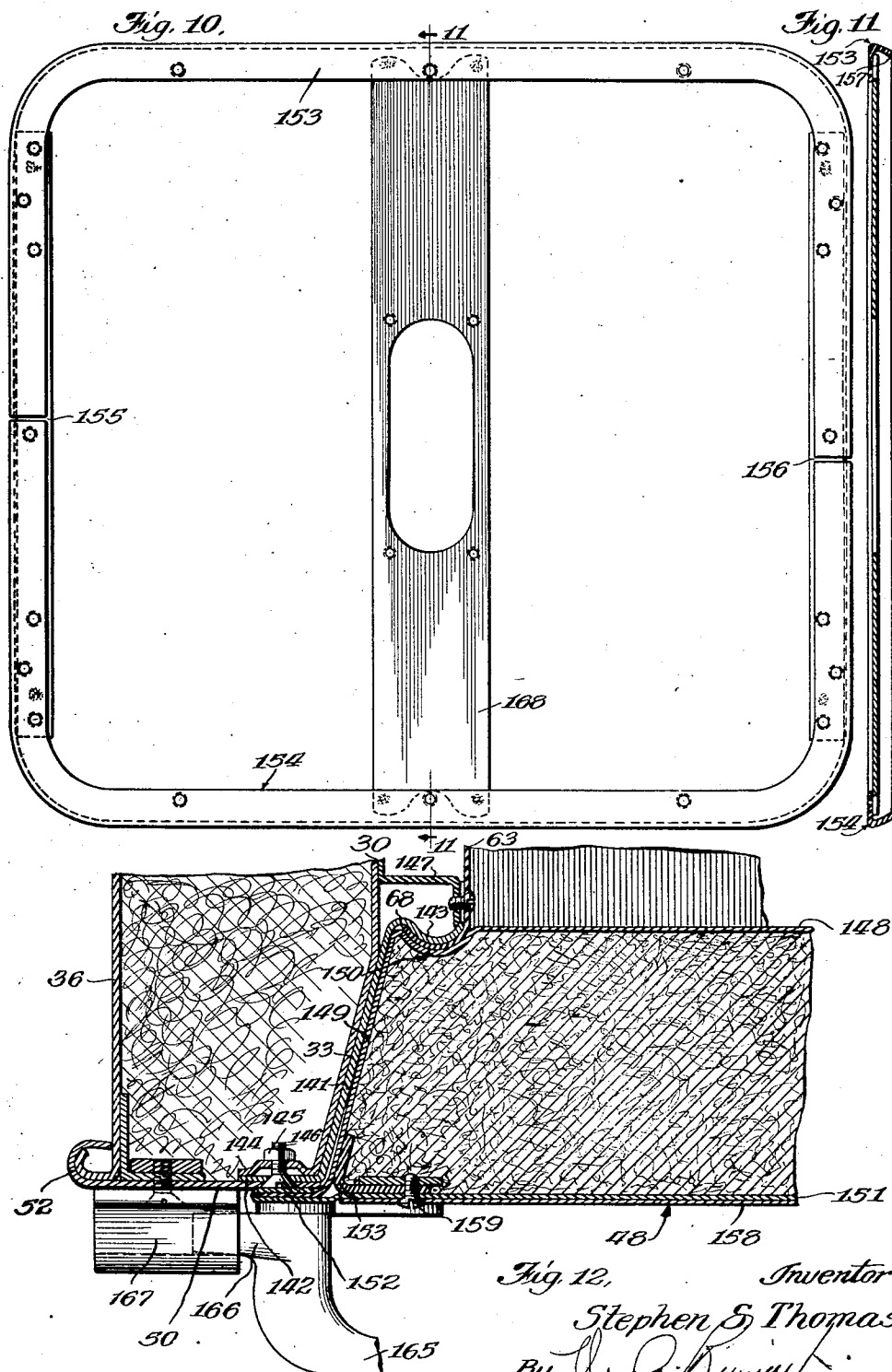
S. S. THOMAS

1,706,264

STOVE AND THE LIKE

Filed Oct. 3, 1927

8 Sheets-Sheet 7



Inventor
Stephen S. Thomas
By *Thos. A. Dunaway* *Atty.*

March 19, 1929.

S. S. THOMAS
STOVE AND THE LIKE

1,706,264

Filed Oct. 3, 1927

8 Sheets-Sheet 8.

Fig. 15.

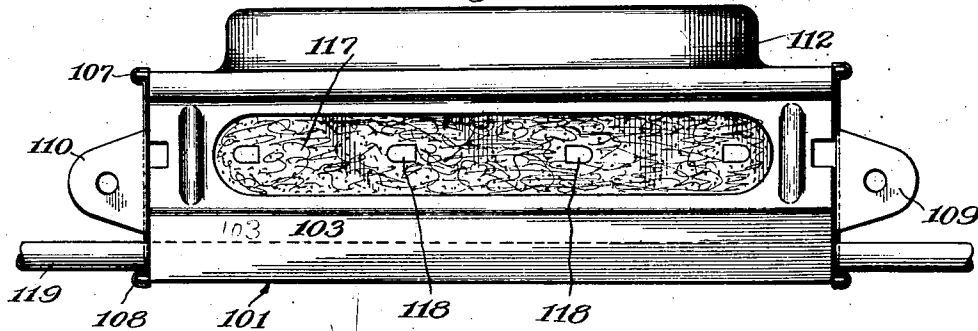


Fig. 14.

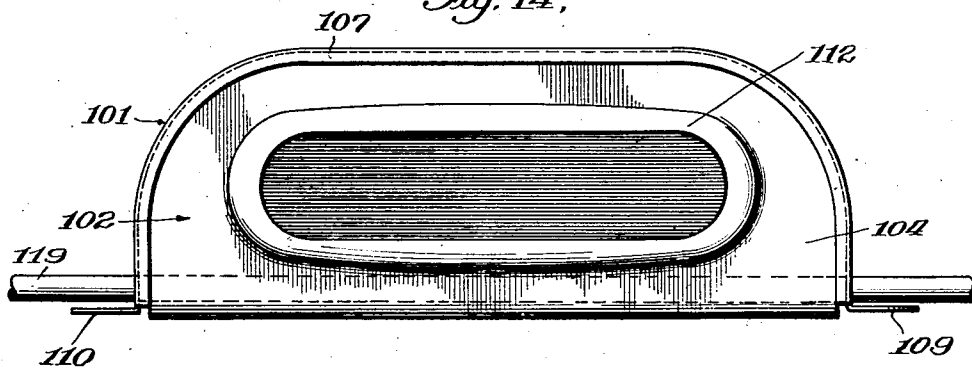
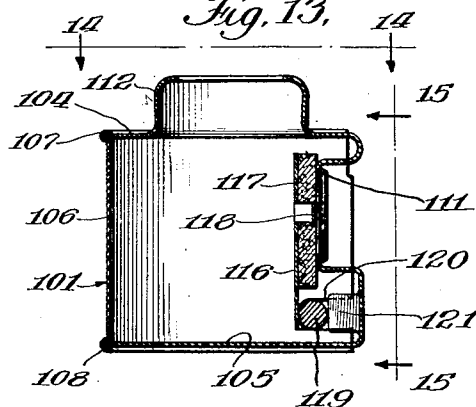


Fig. 13.



Inventor
Stephen S. Thomas
By *Sh. O. Dawingf.*
Atty.

UNITED STATES PATENT OFFICE.

STEPHEN S. THOMAS, OF LEBANON, OHIO.

STOVE AND THE LIKE.

Application filed October 3, 1927. Serial No. 223,674.

This invention has to do with improvements in stoves and the like. More particularly the invention has to do with improvements in ovens for cooking and similar operations.

Generally speaking, the oven construction herein disclosed is so arranged that it can be closed and sealed in a substantially steam tight manner during the cooking operations. Furthermore, ovens embodying the features of the present invention may be heated in such a uniform manner that greatly improved cooking conditions are established within the oven chamber. These improved conditions are such that it is possible to simultaneously carry on various kinds of cooking operations in the same oven, and cooking operations involving various kinds and flavors of foods, substantially without any cross transfer of flavors and the like from one article to another.

The ovens herein disclosed are also heat insulated so that the necessary cooking operations may be carried forward with a minimum consumption of fuel or heating energy and with a minimum amount of heat radiation to surrounding objects.

One of the features of the invention relates to an improved construction of oven involving the use of a pan-shaped oven shell which can be slipped into place and properly supported at the correct spacing from the surrounding heat insulating walls so as to establish certain of the passages for the heating gases or heating element. This shell is constructed as a self-contained unit which may be slipped into place and then fastened in permanent manner, these operations being among the last operations in the assembly of the structure. Conversely this shell may be readily removed from the remaining structure without the necessity of completely disassembling the oven. This will make it possible to either replace or repair the oven shell from time to time without having to undertake very extensive operations on the remaining structure.

A further feature of the invention relates to the provision of an improved door construction for sealing the openings, particularly that leading into the oven chamber. This door is provided with a heat insulating space which is ordinarily filled with suitable material; and within the door structure there is provided a supporting and reinforcing frame

to which the shell sections themselves are attached and by which they are reinforced. This frame is itself of sufficient mechanical rigidity and strength to withstand the severe stress to which the door is subjected in ordinary service, so that the relatively thin sheet metal shells are properly reinforced and stiffened.

The door frame already referred to also serves as a convenient and desirable arrangement to which the hinges and latches necessary may be connected so as to distribute the stresses thereof and avoid danger of screws pulling through the relatively thin sheets of the shell itself.

A further feature of the door construction is to provide an arrangement such that when the door is forced shut it makes effective contact with the projecting edge portion of the inner shell of the oven proper. In this way a satisfactory and tight joint is established directly between the door and the edge of the oven shell. This will insure a maximum of seal effect in the simplest manner.

A further feature of the invention relates to the provision of an improved construction of blow-out door for relieving internal pressure in case of necessity, arising, for example, from an explosion of gases in the combustion chamber and passages surrounding the oven itself. This blow-out door is provided with an improved form of latch which will effectively retain the door in closed position under all normal conditions, but will allow said door to almost instantly blow open to establish a full opening in case of necessity.

A further feature of the invention relates to the provision of an improved form of education flue for withdrawing the burned and spent gases from around the upper portion of the oven shell and for delivering them to the vent flue or connection. This passage is so constructed that it is a self-contained unit, and also it is so arranged that it will naturally tend to urge the heating gases to distribute themselves uniformly and evenly around all portions of the oven shell so as to heat the same in a uniform manner. The use of this flue will accomplish the foregoing result without the necessity of other and complicated arrangements of passages.

A further feature of the invention relates to the provision of an improved damper arrangement for controlling the delivery end of the flue aforesaid and also for controlling

the connection thereof with the delivery flue. This damper arrangement includes a novel box structure or chamber within which the damper is pivotally mounted, said chamber itself being made up largely of sheet metal elements pressed into simple form which can be readily slid together. These parts when so assembled serve also to establish the pivotal mounting for the damper itself.

A further feature of the invention relates to the provision of an improved form of interlocking between said damper and the gas valve which controls the supply of gas to the burner. This interlock arrangement is such that the gas valve cannot be turned on without first opening the damper; and conversely, the damper cannot be closed without first shutting off the gas valve.

Another feature of the invention relates to the provision of an improved construction for supporting the lower portion of the oven shell when in place; and also relates to an improved construction of false bottom beneath the oven shell for preventing the creation of excessively hot spots on the floor of the oven shell.

Another feature of the invention relates to the provision of an improved form of latch for locking the door in closed and sealed position.

Other objects and uses of the invention will appear from a detailed description of the same which consists in the features of construction and combinations of parts herein-after described and claimed.

In the drawings:

Fig. 1 shows a front elevation of an improved stove embodying the features of the present invention;

Fig. 2 shows a back elevation corresponding to Fig. 1;

Fig. 3 shows a vertical section taken on the lines 3—3 of Figs. 1, 2 and 4 looking in the directions of the arrows;

Fig. 4 shows a vertical section on the line 4—4 of Fig. 3 looking in the direction of the arrows;

Fig. 5 shows a horizontal section on the lines 5—5 of Figs. 3 and 4 looking in the direction of the arrows;

Fig. 6 shows a perspective view of the gas distribution flue which is located immediately above the oven shell, the flue being shown up-side-down;

Fig. 7 shows a horizontal section taken on the lines 7—7 of Figs. 3 and 4 looking in the direction of the arrows;

Fig. 8 shows a detail section on the line 8—8 of Fig. 1 looking in the direction of the arrows but on enlarged scale;

Fig. 9 shows a detail section on the line 9—9 of Fig. 1 looking in the direction of the arrows but on enlarged scale;

Fig. 10 shows a front face view of the door frame removed from the door;

Fig. 11 shows a vertical cross section on the line 11—11 of Fig. 10 looking in the direction of the arrows;

Fig. 12 shows a fragmentary horizontal section on the line 12—12 of Fig. 1 looking in the direction of the arrows but on enlarged scale, being practically full sized;

Fig. 13 shows a vertical cross section through the upper damper box unit removed from the rest of the oven structure, with the damper closed, being a view substantially on the line 13—13 of Fig. 2 looking in the direction of the arrows but on enlarged scale;

Fig. 14 shows a plan view corresponding to Fig. 13 looking down in the direction of the arrows 14—14 of Fig. 13;

Fig. 15 shows a front face view corresponding to Fig. 13 being a view substantially on the line 15—15 of Fig. 13 looking in the direction of the arrows; and

Fig. 16 is a fragmentary side elevation on the line 16—16 of Fig. 2 looking in the direction of the arrows.

In certain of the figures, notably Figs. 1, 2, 3 and 4, I have shown the features of the present invention as being incorporated in an oven structure which is a portion of a stove which stove is also equipped with a series of open burners located above the oven itself. These are the burners 20 illustrated in said figures. Said burners are controlled by the usual gas cocks 21 supplied from the gas main 22. This upper structure is also provided with the customary shelving 23 for support of dishes and utensils in the well understood manner. All of these features are shown in the present application merely by way of illustration and these structures may or may not be used in conjunction with oven embodying the features of the present invention.

The oven structure proper which constitutes the subject matter of the present invention is preferably heat insulated in its side walls 24 and 25, as well as in its back wall 26, roof 27, and bottom 28. These parts, with the exception of the bottom 28, are therefore made false or of double thickness so that the intervening space may be filled with suitable material such as mineral wool, asbestos or other suitable material.

The structure is conveniently built up from an inner shell comprising the side plates 29 and 30 together with the top plate 31, and a back plate 32. The rear edges of the side plates 29 and 30 are flanged inwardly as shown particularly in Figs. 5 and 7 and are seated within forwardly projecting flanges on the sides of the back sheet 32. These corners are then connected together in any convenient manner as by means of bolts. The parts 29, 30 and 32 may be made as a single sheet.

The top sheet 31 has its side edges flanged downwardly and embracing the upper edges

of the side sheets 29 and 30 as clearly shown in Fig. 4; and the rear edge of the top sheet 31 is also flared downwardly over the upper edge of the back sheet 32 with the exception of the position of the gas flue presently to be explained.

The particular oven illustrated includes a single large door leading directly into the oven proper, together with a relatively smaller door located at a lower level and leading into the burner compartment. These door features will be explained more in detail presently. At the position of the main door, the side sheets 29 and 30 have their front edges beveled outwardly as shown particularly in the detail of Fig. 12 at the point 33. Below the position of this door seat the front edges of the side sheets 29 and 30 are flanged outwardly as shown in Fig. 7. There is a bottom sheet 34 upon which the lower edges of the side sheets 29 and 30 and back sheet 32 rest as particularly shown in Figs. 3 and 4. This bottom sheet 34 is carried sidewise beyond the positions of the side sheets 29 and 30 and rearwardly beyond the position of the back sheet 32, and is also carried forwardly beyond the flanged forward edges of the side sheets 29 and 30 so as to establish the necessary spaces for accommodation of the heat insulating material.

The sides of the outside of the oven are established by a pair of side sheets 35 and 36 spaced from the companion inner side sheets 29 and 30. The back of the outside of the oven is established by a back sheet 37 which is spaced rearwardly from the back sheet 32 already referred to; and reference may be had particularly to Figs. 3 and 4, 5 and 7 in this connection. The rear edges of the sheets 35 and 36, together with the side edges of the back sheet 37 are rolled together as shown at 38 and 39 so that these sheets are effectively locked together.

The side sheets 35 and 36 are preferably carried up high enough above the position of the oven itself to establish side walls at the sides of the top burners 20 when the latter are to be used so as to finish the stove at these points as is best shown at Figs. 3 and 4. Likewise the back sheet 32 may be carried up high enough to close in the structure behind the burners 20 as best shown in Figs. 3 and 4.

A top sheet 40 is set down between the side sheets 35 and 36 and back sheet 37, said top sheet 40 having its edges flanged downwardly as best shown in Figs. 3 and 4. The side sheets 35 and 36 and the back sheet 37 are all carried down low enough to embrace the bottom sheet 34 between them as clearly shown in Figs. 3 and 4 so that in this case the different sheets may be brought together at their lower edges and also the lower portions of the false spaces for accommodation of the heat insulating materials are closed up.

Preferably rings or bands of iron or steel

41 and 42 are placed around the lower edges just referred to so as to reinforce the same. and also to establish solid parts through which may be passed the tie bolts for drawing the sheets solidly together. These rings also serve to establish a firm support, to which may be attached the legs 43, 44, 45 and 46 so that the entire structure will be given adequate substantial support.

If desired the bottom plate 34 may be heat insulated as shown at 28 in Figs. 3 and 4, in which case the layer of heat insulating material may be held in place by a sheet 47 connected to the bottom sheet 34 by means of suitable through bolts.

As already mentioned the present oven is provided with a main door 48 and with a burner door 49 (see Figs. 1 and 3). There is a front sheet 50 set against the front edges of the side sheets 35 and 36 and also against the front edges of the top sheet 40 and bottom sheet 34. This front sheet 50 is flanged onto the front edges of the side sheets 35 and 36 as shown at 51 and 52; and is bolted or otherwise secured to the front edge of the top sheet 40 as shown in Fig. 3.

The front sheet 50 is provided with door openings of full size corresponding to the doors 48 and 49. Below the position of the opening for the door 48 there are the channel bars 53 and 54 which reach down to the position of the bottom sheet 34, and said channel bars serve also to define the top of the opening for the door 49. Another sheet 56 is placed behind the front sheet 50 and between the two door openings; and the lower edge of the sheet 56 rests within the horizontal channel 55 as shown in Fig. 3. This sheet 56 is for the purpose of establishing a space for heat insulating material intermediate between the two doors.

There is a pair of L shaped brackets or clips 57 and 58 secured to the back sheet 32; and a pair of companion L shaped clips or brackets 59 and 60 secured to the front sheet 56 already referred to. These clips are located in the same horizontal plane. The clips 57 and 59 support a horizontal T bar bracket 61 and the clips 58 and 60 support another horizontal T bar bracket 62. Examination of the Fig. 7 will show that the clips are notched to receive the webs of the T bars. Consequently when said T bars are set down into place with their webs projecting through these notches they are effectively locked in place and cannot slide out sidewise.

These T bars serve to support the removable oven shell which I will now describe in detail.

The oven shell comprises a rectangular box like structure establishing the side walls 63 and 64, together with the top 65 and bottom 66. This box like shell is preferably a contiguous integral sheet and may be made up

from tubing or else may be made of a sheet folded around and then welded together.

A back plate 67 is set into the shell thus established, said back plate having its edges flanged as best shown in Fig. 3 and set into the shell proper.

The front edges of the shell are flared out and rounded into the form of lips 68 (best shown in Figs. 3 and 12). These lips are adapted to set back against the door casing presently to be described when the same is set into place. Consequently it is possible to slip the oven shell back into place and thus bring the lips 68 into engagement with the door casing so as to seal at that point.

The bottom 66 of the oven shell rests directly upon the T bars 62 and 61 by which it is supported. Inasmuch as these T bars are rigidly supported by the main portion of the oven structure then it follows that there is ample support for the shell, together with the various foods which are cooking within the oven.

On the inside faces of the shell side walls 63 and 64 there are placed sheets 69 and 70 which are provided with horizontal ridges or lips to receive the wire trays 71 and 72. These trays can be slipped into place at selected elevations in accordance with well understood practice.

The oven shell is made of such size as to establish vertical passages at the sides and rear of the oven shell. Preferably also the oven shell is afforded lateral support by means of suitable side brackets or spacers; and these side spacers when provided may also be used to divide the side spaces into individual passages. Thus, for example, I have shown the vertical Z bars 73 and 74 which are secured to the side sheets 29 and 30 respectively and project inwardly far enough to contact the oven shell when the latter is slipped into place. These Z bars extend vertically substantially the height of the oven shell as indicated in Fig. 4. They are also preferably set somewhat rearwardly of the center part of the oven shell; and they establish the vertical passages 75 and 76 along the front portions of the sides of the oven shell together with other L shaped vertical passages 77 and 78, at the rear portions of the sides of the shell and reaching around to its back face. These passages 77 and 78 communicate and in effect constitute a single U shaped passage at the back of the shell and embracing the rear portions of its sides.

The heating of the oven shell is performed in whatever manner is selected; and the present type of construction is well adapted for heating either by the use of gas burners or by the use of electric heating elements. In either case the heating effect substantially embraces the entire shell and may be uniformly distributed around the same so that the heating effect is very uniform.

In the particular construction illustrated in the present application I have shown a gas burner for heating the oven, together with suitable control dampers, etc.; and in a co-pending application for Letters Patent of the United States on improvements in ovens and the like I have also shown and described a similar construction, but with a provision made for heating the same by means of an electric heating unit.

In the present case I have illustrated a false bottom in the form of a sheet 79 spaced below the position of the floor 66 of the oven shell. This false bottom is provided with a series of lugs 80 by which it is supported by the T bars 61 and 62. There is also a gas burner 81 of rectangular form supported from the false bottom 79 and a series of brackets 82. This gas burner has a series of burner openings 83 throughout its length so that the false bottom is uniformly heated. Furthermore there is a common gas supply inlet connection 84 at the front side of the burner, said connection being adapted to receive its supply of gas from a mixer 85 which extends through that portion of the front of the oven lying intermediate between the two doors. This mixer 85 receives its gas from the supply pipe 86 which in turn is supplied with gas from the pipe 22 under control of a gas cock 87.

The foregoing false bottom construction is such that the T bars 61 and 62, together with the false bottom and burner, may be lifted away from the brackets 57, 58, 59 and 60 after the oven shell has been removed.

There is an air inlet port 88 in the central portion of the back wall of the structure, preferably at a level somewhat lower than the burner. This port 88 is established by channel sections together with other plates extending between the sheets 32 and 37 as clearly illustrated in Figs. 3, 4 and 7. The flanges of these channels and plates are secured to the sheets 32 and 37 by means of screws 89 (see Fig. 4).

A damper 90 is provided for controlling the air inlet port 88. Said damper comprises a sheet 91 which is lined on its front face with asbestos or other suitable material 92 so that when the damper is turned up into the vertical position illustrated in Figs. 2, 3 and 7, this lining 92 will make firm contact around the entire periphery of the port and thus effectively seal the same. The sheet 91 is mounted upon a rock shaft 93 which is journaled in suitable bearing blocks 94 and 95 on the back sheet 37 as best shown in Figs. 3 and 7.

There is a waste gas flue 96 placed above the central portion of the oven shell to collect all of the waste gases and deliver them outside of the structure. This flue 96 is best illustrated in Fig. 6 (as well as in Figs. 3, 4 and 5). It is formed of a single sheet folded

around into a rather shallow and broad structure, its edges being folded together as shown at 97 in Fig. 6. The vertical thickness of this flue is such that it occupies the space 5 between the top 65 of the oven shell and the sheet 31 already referred to. This is clearly shown in Figs. 3 and 4. The length of this flue is such that it reaches from the forward portion of the top of the oven shell through a port in the rear portion of the structure and projects slightly beyond said rear portion as clearly shown in Fig. 5. Furthermore, the top of the flue 96 is provided with a forwardly projecting lip 98 (Fig. 6 showing the flue upside down), said lip 98 being riveted or 15 screwed to the sheet 91 already referred to.

The sides of the flue 96 are provided with a series of ports 99 and 100 which are graduated in size, being somewhat smaller in the rear 20 portion of the flue structure, than in its front portion. These ports therefore allow for an induction of the burner gases into the flue throughout its length, but owing to the graduated sizes of these ports there is a tendency to compel more of the spent gases to 25 enter the front portion of the flue than would otherwise be the case. In this connection it must be kept in mind that the general direction of gas travel is upwardly and backwardly in a diagonal direction towards the upper portion of the back of the structure; and by making the ports at the rear portion of the flue 96 somewhat smaller than those in its front portion there is created a crowding of 30 gases passing through said rear ports such as to compel a greater percentage of said gases to pass into the front ports.

There is provided a damper for the rear end of the flue 96, which damper I will now 40 explain in detail.

Said damper is shown in detail in Figs. 13, 14 and 15 and is also well illustrated in Figs. 2, 3 and 5. It includes a housing 101 which housing is formed from a plate 102 bent to 45 establish a front face 103 (see Fig. 15), a top face 104 (see Fig. 14), and a bottom face 105 (see Fig. 13). There is also a curved sheet 106 the upper and lower edges 107 and 108 of which are crimped to receive the edges of the top and bottom sheets 104 and 105 already 50 referred to. This sheet 106 is suitably shaped so that it can be slid into place with respect to the sheet 102 and when this is done the box like housing is established. The sheet 106 is also provided with a pair of ears 109 and 110 which are adapted to make flat contact 55 with the back sheet 37 already referred to as best shown in Fig. 2. These ears may be then screwed in place to such back sheet and will hold the housing securely in place thereon. 60

The front face 103 established as already explained, is suitably formed to provide an inwardly projecting socket 111 which receives the outer end of the flue 96 as is best 65 evidenced from Fig. 5. Suitable asbestos or

the like may be placed within the socket 111 at the time the housing 101 is set up against the end of the flue so as to establish a gas tight connection.

A box 112 is stamped out from the top 102 70 of the housing 101, said box being perforated to establish a large delivery port as is evident from Fig. 14. A flue 115 may be set down over this box so as to receive the spent gases delivered from the flue 96. 75

There is a damper located in the housing 101. The same includes a plate 116 the front face of which is lined with an asbestos or other plug 117 (see Figs. 13 and 15 in particular) and said asbestos block is held onto the 80 plate 116 by a series of ears 118.

The lower edge of the plate 116 is secured to a horizontal rock shaft 119; and said rock shaft passes through notches 120 formed in the edges of the plate 106 below the position 85 of the ears 109 and 110. There are other ears 121 formed in the front wall 103 of the plate 102; said ears 121 projecting rearwardly to a suitable position to act as stops for the rock shaft 119 and thus hold the same properly positioned in the notches 120 without creating 90 unnecessary friction. Thus when the housing is assembled with the rock shaft and damper in place there are simultaneously established suitable bearings for the rock shaft. 95

The rock shaft is so journaled that when the damper is turned into the vertical position it comes against the projecting portion 111 of the front face 103, and thus effectively 100 closes the rear end of the flue 96.

The two damper rock shafts 93 and 119 are so connected together that they may be simultaneously operated. For this purpose these shafts are provided with the crank arms 122 105 and 123 respectively, said crank arms being joined together by a vertical link 124. A bell crank 125 is pivoted to a bracket 126 secured to the back sheet 37, the pivotal point 127 thereof being in line with the two shafts 93 and 119. One arm of the bell crank 125 110 is connected to the link 124 by a pivotal connection 128; and this arm of the bell crank as well as the crank arms 122 and 123 are parallel to each other so that as the bell crank is rocked both of the shafts 93 and 119 115 are simultaneously rocked.

There is an operating rod 129 which reaches along the side of the oven from a point adjacent to the gas cock 87 to the rear of the oven. 120 The rear end of said rod 129 is bent over as shown at 130 in Figs. 2 and 7, and this portion 130 is then connected directly to the vertical arm of the bell crank 125. A spring 131 tends to move the bell crank to the damper closing position. 125

The front end of the rod 129 is provided with a knob 132 of substantial size, which knob is in close proximity to the handle of the gas cock 87. When the spring 131 draws the dampers and connected parts to the closed 130

position, the button 132 stands in the path of the handle of the gas cock so that the gas cannot be turned on. When the button 132 is drawn forward the gas cock handle can be turned to the open position where it will stand behind the button 132. Thus the dampers will be held in the open position against the force of the spring 131. As soon as the gas is turned off the dampers may be closed; and conversely, if the button 132 should be forced back to close the dampers the gas cock will be simultaneously closed.

The door 49 which controls the opening into the burner space beneath the oven proper is preferably hinged at its lower edge to the base ring 42 by the hinges 133 and 134. A suitable handle 135 is provided on this door.

There is a bracket 136 secured to the front sheet 50 at a position above the central portion of the burner opening. This bracket 136 has a pair of forwardly projecting ears 137 and 138 which are of spring material, and the front ends of said ears are rounded as shown in detail at Fig. 9. Another bracket 139 is fastened to the door 49 and has an upwardly projecting finger 140 which is of diamond shape as best shown in Fig. 9. The arrangement is such that when the door 49 is closed said finger will force its way between the lugs 137 and 138; whereas when the door is pulled open said fingers will again force themselves between said lugs. Normally when the door stands in the closed position the effect of the legs is sufficient to retain the door closed against all ordinary forces tending to open it; but in case of creation of an excessive internal pressure within the oven the door will blow open without damage to any parts.

Around the door opening for the main door 48 there is placed a jamb plate which is of beveled shape and is designated by 141 in Fig. 12. This plate has at its front edge a flange 142 which rests against the back face of the front plate 50, and extends backwardly along the flanged edges 33 of the shell plates. The rear edge of the jamb plate 141 is flanged inwardly as shown at 143 on a curve which corresponds to the flanged edge 68 of the oven shell proper. This flanged edge 143 is the part against which the flared edge of the oven shell proper seats when the oven shell is set into place.

The front edge of the flanged portion 33 is bent outwardly at right angles as shown at 144 and rests directly against the flanged portion 142 of the door jamb. This portion 144 is provided with upset portions 145 at the position of the screws 146, said portions 145 having sufficient resiliency to insure said locking of the parts together under the influence of said screws and without the use of lock nuts.

Preferably there are brackets or Z bars 147 placed intermediate between the shell of

the oven proper and the side plates 29 and 30, at positions close to the front edge of the shell of the oven so as to space the same irrespective of the flanges 143. These Z bars or brackets also serve as convenient parts to which the oven shell may be connected by means of screws as shown in Fig. 10.

The construction of the main door 48 is best shown in detail in Figs. 10, 11 and 12. It includes pan 148 the edge portions 149 of which are flanged on a bevel corresponding generally to the door jamb 141. This pan 148 is also provided with a rounded groove portion 150 which takes against the front portion edge of the oven shell when the door is closed.

The door also includes a front plate 151 which overlies the extreme front edge portion of the pan 148, which extreme front edge portion is flattened out as shown at 152 in Fig. 12. The edge of the plate 151 is then folded backwardly over the portion 152 as shown at Fig. 12 so as to lock the sheet 151 to the pan without the use of screws, rivets or other parts.

Within the peripheral portion of the pan there is located a reinforcing frame the details of which are shown in Figs. 10 and 11. This frame includes a pair of companion U shaped sections of angle material 153 and 154. The flat surfaces of these sections are joined together by bars 155 and 156 so that a rectangular frame is established.

The flanges 157 of this frame are formed on an angle conforming to the beveled portion 149 of the pan, so that the frame will be set back into the pan before the front sheet 151 is set onto the pan. The parts are so proportioned that when the sheet 151 is set into place the frame will occupy a position immediately behind said pan as shown in Fig. 12.

There is a supplemental cover sheet 158 which sets over the central portion of the front sheet 151; and the sheet 151 is preferably recessed slightly as shown in Fig. 12 to accommodate the sheet 158. Screws 159 may be passed through the different sheets and into the frame so as to lock them directly to the frame itself.

The bars 155 and 156 which join the flat sections together are preferably welded to said sections.

One side of the door is hinged by a pair of hinges 160 and 161. The screws for these hinges pass into the door frame at that side so that the weight and forces imposed by the door are communicated to these hinges through the instrumentality of said frame.

At the other side of the structure there are provided a pair of locks 162 and 163 for locking the door in closed position. Each of these includes a plate 164 which is secured to the door frame by screws; and a handle member has a tongue 166 which reaches side-

wise when the handle is turned into the horizontal position to engage a companion bracket 167 secured to the oven casing alongside of each of the locks 162 and 163; and each of these brackets has a slanting portion beneath which the tongue 166 may wedge so as to securely jamb the door in closed position.

If desired a vertical cross piece 168 may be provided in the door frame member, said cross piece serving not only to reinforce the frame member but also as a convenient element to which a thermometer frame 169 may be fastened. The bulb 170 of this thermometer frame reaches to a point close to the inside surface of the door so as to indicate the temperature existing within the oven.

The door 48 is packed with suitable heat insulating material which substantially fills the pan 148 thereof.

While I have herein shown and described only a single embodiment of the features of my present invention still I do not intend to limit myself thereto except as I may do so in the claims.

I claim:

1. In a device of the class described the combination of a heat insulated chamber having side walls, top, bottom and back of heat insulating construction, there being a rectangular oven opening in the front wall of said chamber, the edges of said opening being beveled inwardly, together with a flange surrounding the inner edge of said opening and reaching into the opening and establishing an oven shell abutment, said flange being curved on a cylindrical surface having its concave surface facing towards the interior of the structure, a removable oven shell comprising sides, top, bottom and back of proper size to be set backwardly through the oven opening and past the flange aforesaid, said oven shell being of smaller size than the heat insulated chamber aforesaid, to thereby establish vertical passages between the sides and back of the oven shell and the heat insulated chamber, an outwardly extending lip around the front open edge of said oven shell concave rearwardly and adapted to seat against the flange aforesaid, means for securing the oven shell in said position, pairs of bracket clips secured to the inside of the heat insulated structure below the position of the oven shell and including inwardly reaching horizontal arms, rails supported by said clips immediately below the position of the oven shell and supporting said shell, a door for the oven opening having its edge portion beveled and adapted to wedge into the oven opening and into contact with the flange on the edge of the oven shell, a false bottom plate supported by the rails aforesaid below the position of the oven shell, a burner supported beneath said false bottom plate, and suitable openings in the structure for the admission of

fresh air and for the discharge of products of combustion, substantially as described.

2. In a device of the class described the combination of a heat insulated chamber of heat insulated construction, there being a rectangular oven opening in the front wall of said chamber, the edges of said opening being beveled inwardly, together with a flange surrounding the inner edge of said opening and reaching into the opening and establishing an oven shell abutment, said flange being curved on a cylindrical surface having its concave surface facing towards the interior of the structure, a removable oven shell of proper size to be set backwardly through the oven opening and past the flange aforesaid, said oven shell being of smaller size than the heat insulated chamber aforesaid, to thereby establish vertical passages between the sides and back of the oven shell and the heat insulated chamber, an outwardly extending lip around the front open edge of said oven shell concave rearwardly and adapted to seat against the flange aforesaid, means for securing the oven shell in said position, pairs of bracket clips secured to the inside of the heat insulated structure below the position of the oven shell and including inwardly reaching horizontal arms, rails supported by said clips immediately below the position of the oven shell and supporting said shell and a door for the oven opening having its edge portion beveled and adapted to wedge into the oven opening and into contact with the flange on the edge of the oven shell, substantially as described.

3. In a device of the class described the combination of a heat insulated chamber of heat insulating construction, there being a rectangular oven opening in the front wall of said chamber, the edges of said opening being beveled inwardly, together with a flange surrounding the inner edge of said opening and reaching into the opening and establishing an oven shell abutment, said flange being curved on a cylindrical surface having its concave surface facing towards the interior of the structure, a removable oven shell of proper size to be set backwardly through the oven opening and past the flange aforesaid, said oven shell being of smaller size than the heat insulated chamber aforesaid, to thereby establish vertical passages between the sides and back of the oven shell and the heat insulated chamber, an outwardly extending lip around the front open edge of said oven shell concave rearwardly and adapted to seat against the flange aforesaid, means for securing the oven shell in said position and a door for the oven opening having its edge portion beveled and adapted to wedge into the oven opening and into contact with the flange on the edge of the oven shell, substantially as described.

4. In a device of the class described the combination of a heat insulated chamber of heat insulating construction, there being a rectangular oven opening in the front wall of said chamber, the edges of said opening being
 5 beveled inwardly, together with a flange surrounding the inner edge of said opening and reaching into the opening and establishing an oven shell abutment, said flange being
 10 curved on a cylindrical surface having its concave surface facing towards the interior of the structure, a removable oven shell of proper size to be set backwardly through the oven opening and past the flange aforesaid,
 15 an outwardly extending lip around the front open edge of said oven shell concave rearwardly and adapted to seat against the flange aforesaid, means for securing the oven shell in said position and a door for the oven opening
 20 having its edge portion beveled and adapted to wedge into the oven opening and into contact with the flange on the edge of the oven shell, substantially as described.

5. In a device of the class described the combination of a heat insulated chamber of heat insulating construction, there being a rectangular oven opening in the front wall of said chamber, together with a flange surrounding the inner edge of said opening and
 25 reaching into the opening and establishing an oven shell abutment, said flange being curved on a cylindrical surface having its concave surface facing towards the interior of the structure, a removable oven shell of
 30 proper size to be set backwardly through the oven opening and past the flange aforesaid, an outwardly extending lip around the front open edge of said oven shell concave rearwardly and adapted to seat against the flange
 35 aforesaid, means for securing the oven shell in said position and a door for the oven opening having its edge portion adapted to wedge into the oven opening and into contact with the flange on the edge of the oven shell, substantially
 40 as described.

6. In a device of the class described the combination of a heat insulated chamber of heat insulating construction, there being a rectangular oven opening in the front wall of
 45 said chamber, pairs of bracket clips secured to the inside of the heat insulated structure below the position of the oven opening and including inwardly reaching horizontal arms, rails supported by said clips immediately below
 50 the position of the oven opening, a flange surrounding the inner edge of said oven opening and reaching into the opening and establishing an oven shell abutment, a removable oven shell of proper size to be set backwardly
 55 through the oven opening and past the flange aforesaid, said oven shell being of smaller size than the heat insulated chamber aforesaid to thereby establish vertical passages between the sides and back of the oven shell and
 60 the heat insulated chamber, an outwardly extending lip around the front open edge of the

said oven shell adapted to set against the flange aforesaid, and means for securing the oven shell in said position, substantially as described.

7. In a device of the class described the combination of a heat insulated chamber of heat insulating construction, there being a rectangular oven opening in the front wall of
 65 said chamber, a removable oven shell of proper size to be set backwardly through the oven opening, said oven shell being of smaller size than the heat insulated chamber aforesaid to thereby establish vertical passages between the sides and back of the oven shell and the
 70 heat insulated chamber, means for securing the oven shell in said position, a suitable burner beneath the oven shell, there being an air inlet opening in the lower portion of the heat insulated chamber for the admission of air to
 75 said burner, a flue located in the space between the top of the oven shell and the top of the heat insulated chamber, said flue being relatively thin and broad and extending from front to back of said space, and occupying the
 80 full height of said space, a waste gas delivery connection in conjunction with the rear end of said flue, a damper therefor, and there being a series of openings in the sides of the flue, said openings being of graduated size from
 85 front to back and larger in the front portion of the flue than in the back portion thereof, substantially as described.

8. In a device of the class described the combination of a heat insulated chamber of
 90 heat insulating construction there being a rectangular oven opening in the front wall of said chamber, an oven shell of proper size located within the chamber and having its front open side registering with the oven
 95 opening, said oven shell being of smaller size than the heat insulated chamber to thereby establish vertical passages between the sides and back of the oven shell and the chamber, a suitable burner beneath the oven shell, there
 100 being an air inlet opening into the lower portion of the heat insulated chamber for the admission of air to said burner, a flue located in the space between the top of the oven shell and the top of the heat insulated chamber,
 105 said flue being relatively thin and broad and extending from front to back of said spaces, and occupying the full height of said spaces, a waste gas delivery connection in conjunction with the rear end of said flue, a damper therefor,
 110 and there being a series of openings in the sides of the flue, said openings being of graduated size from front to back and larger in the front portion of the flue than in the back portion thereof, substantially as described.

9. In a device of the class described the combination of a heat insulated chamber of heat insulating construction there being a rectangular oven opening in the front wall of said
 115 chamber, an oven shell of proper size located

within the chamber and having its front open side registering with the oven opening, said oven shell being of smaller size than the heat insulated chamber to thereby establish vertical passages between the sides and back of the oven shell and the chamber, a suitable burner beneath the oven shell, there being an air inlet opening into the lower portion of the heat insulated chamber for the admission of air to said burner, a flue located in the space between the top of the oven shell and the top of the heat insulated chamber, said flue being relatively thin and broad and extending from front to back of said spaces, and occupying the full height of said spaces, a waste gas delivery connection in conjunction with the rear end of said flue, a damper therefor, and there being a series of openings in the sides of the flue, substantially as described.

10. In a device of the class described the combination of a heat insulated chamber of heat insulating construction, having an oven opening in one of its walls, the edge portion of said opening being beveled from its outer to its inner portion, together with a closure for said opening, said closure comprising a sheet metal pan having its peripheral portion beveled to correspond with the bevel of the door opening, the outer edge of said pan being flanged outwardly, a rectangular frame of angle bar construction seated into the pan adjacent to its flanged edge portion and of proper size to engage the pan around said portion, a cover sheet for the pan seated against said frame, the marginal portion of said cover sheet being folded over the flange of the pan and thereby attached thereto, a reinforcing plate on the front face of the cover sheet and overlying the frame aforesaid, means for connecting the reinforcing plate to the frame through the cover sheet, and a filling of heat

insulating material within the pan and beneath the cover sheet, substantially as described.

11. As a new article of manufacture a door closure for the opening of a heat insulated structure said closure comprising a sheet metal pan having its peripheral portion beveled to correspond with the bevel of the door opening, the outer edge of said pan being flanged outwardly, a rectangular relatively rigid frame seated into the pan adjacent to its flanged edge portion and of proper size to engage the pan around said portion, a cover sheet for the pan seated against said frame, the marginal portion of said cover sheet being folded over the flange of the pan and thereby attached thereto, a reinforcing plate on the front face of the cover sheet and overlying the frame aforesaid, means for connecting the reinforcing plate to the frame through the cover sheet, and a filling of heat insulating material within the pan and beneath the cover sheet substantially as described.

12. As a new article of manufacture a door closure for the opening of a heat insulated structure, said closure comprising a sheet metal pan having its peripheral portion beveled to correspond with the bevel of the door opening, the outer edge of said pan being flanged outwardly, a rectangular relatively rigid frame seated into the pan adjacent to its flanged edge portion and of proper size to engage the pan around said portion, a cover sheet for the pan seated against said frame, the marginal portion of said cover sheet being folded over the edge of the flange of the pan and thereby attached thereto, and a filling of heat insulating material within the pan and beneath the cover sheet, substantially as described.

STEPHEN S. THOMAS.