

F. E. RUSSELL.

STOVE.

APPLICATION FILED FEB. 13, 1920.

1,371,057.

Patented Mar. 8, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

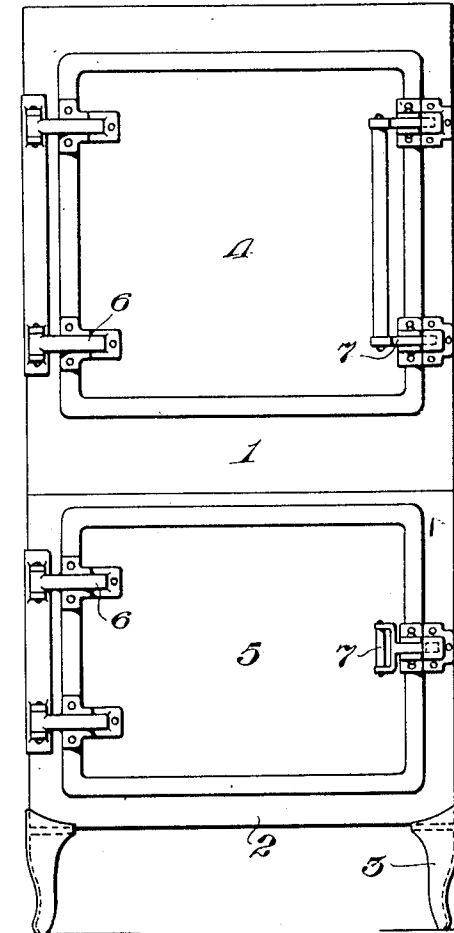


Fig. 2.

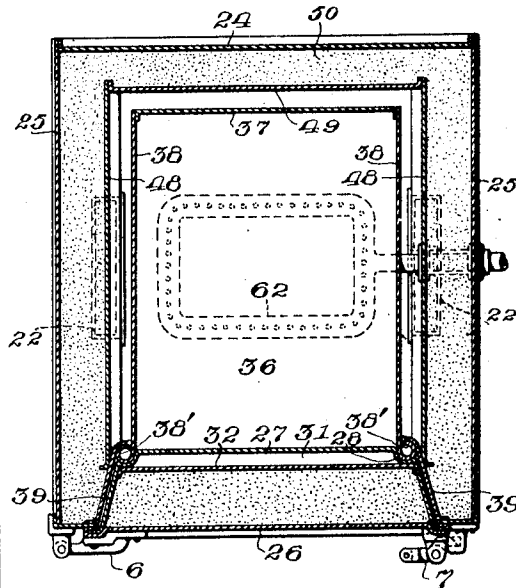


Fig. 8.

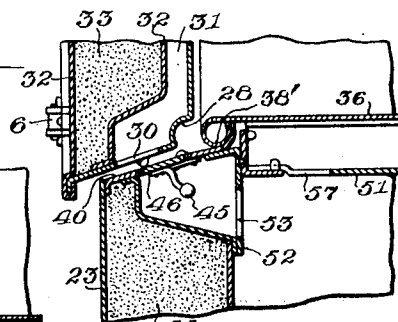
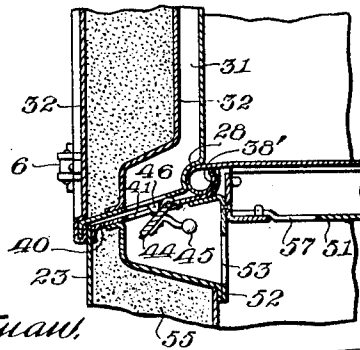


Fig. 7.



WITNESS

F. J. Hartman.

BY

Stuart Truman,
ATTORNEY

INVENTOR

Fred E. Russell,

F. E. RUSSELL.

STOVE.

APPLICATION FILED FEB. 13, 1920.

Patented Mar. 8, 1921.

2 SHEETS—SHEET 2.

1,371,057.

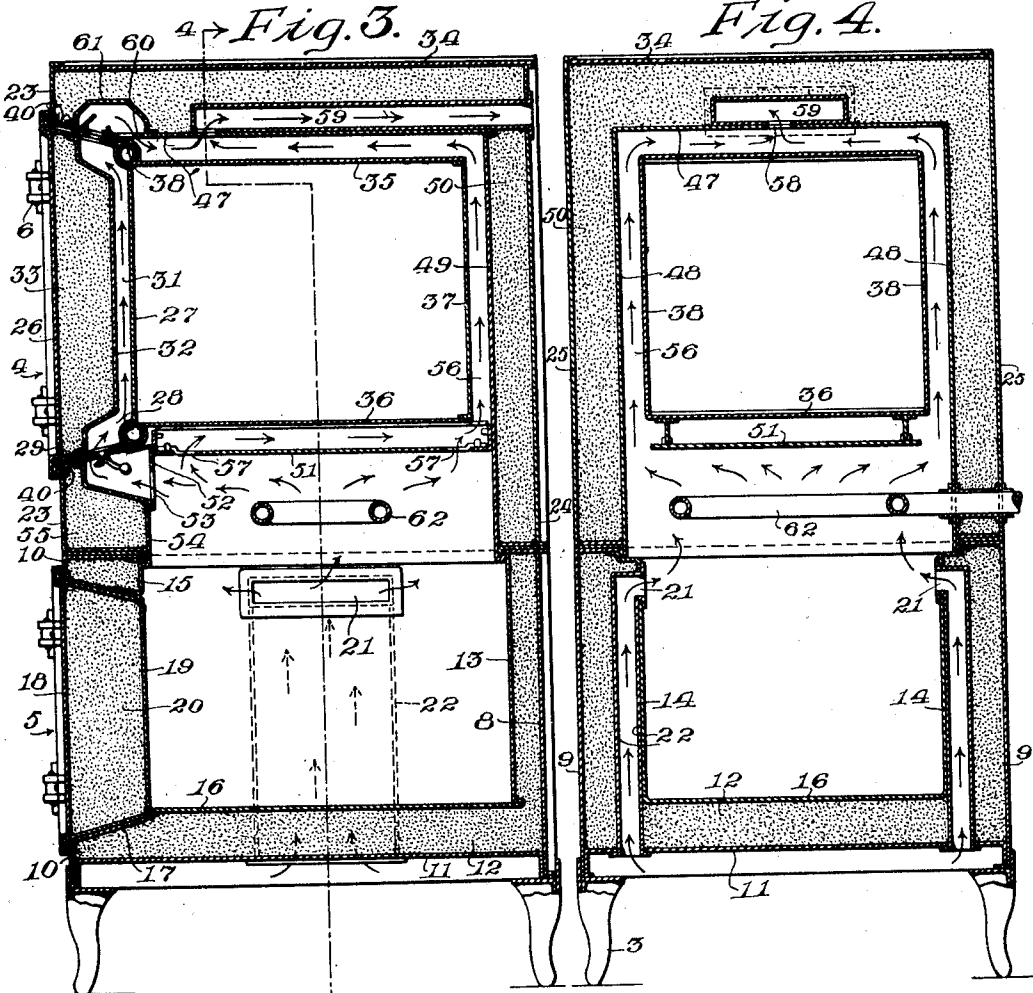


Fig. 5.

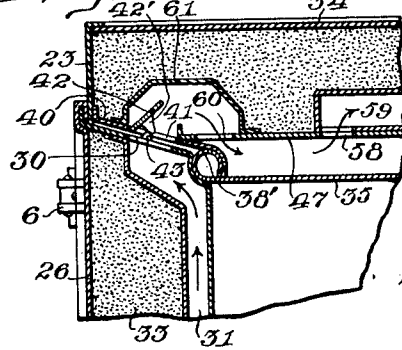
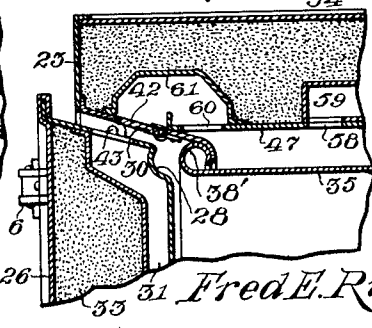


Fig. 6.



INVENTOR

Fred E. Russell,

WITNESS

H. J. Hartman.

BY

Stuart Freeman,
ATTORNEY.

UNITED STATES PATENT OFFICE.

FRED E. RUSSELL, OF LANGHORNE, PENNSYLVANIA.

STOVE.

1,371,057.

Specification of Letters Patent.

Patented Mar. 8, 1921.

Application filed February 13, 1920. Serial No. 358,354.

To all whom it may concern:

Be it known that I, FRED E. RUSSELL, a citizen of the United States, residing at Langhorne, in the county of Bucks and State of Pennsylvania, have invented certain new and useful Improvements in Stoves, of which the following is a specification.

The object of this invention is to provide an improved stove or range construction, particularly applicable to those types which employ a gas or oil flame as the source of heat.

Many, if not all, of the stoves of this class upon the market direct the currents of heated air from the source of heat and thence in substantially the shortest possible route up one or more sides of the oven toward the heat outlet, generally located at the rear of the top.

In this instance, however, the object is to provide a construction such that the heated air currents are caused to flow continuously and with substantially even distribution up both of the laterally opposite sides, the rear and also upwardly between the inner and outer walls of the door or other closure for the front of the oven, and thence all of these currents converging at the top to a substantially central point, whence they unite and proceed rearwardly toward the outlet, or upwardly through a flue as the case may be.

Furthermore, it is the object of this invention to provide a wall construction for the improved oven, such that a surrounding space is provided to receive and retain heat insulating material, the same being operative when the door is closed and, even with the source of heat supply discontinued or shut off, to retain within the oven the heat that has previously been generated therein, so that culinary articles will continue to cook long after the consumption of fuel has ceased and thus obviously effect a distinct economy in the amount of fuel necessary to completely cook a given article.

Then, too, within the oven there is provided a box-like oven lining centrally positioned and its sides in effect constituting a lining for, but spaced from, the heat-insulating walls above referred to. These spaces between the said lining and outer walls of the oven constitute the channels through which the currents of heated air and gases of combustion are adapted to pass, as they convey their heat to the interior of the former.

In order to connect the air current passage of the door with the under chamber within which said currents receive their heat, it is necessary to provide an opening in each of the bottom and top side walls of the door frame, and in order to prevent the hot air from flowing out of the lower of said openings, and cold air into the upper opening, while the door is in an open position, there are provided pivotally mounted closures for said openings, so arranged that they are opened by the door as the latter enters its closed position, and automatically closes the respective openings as the door is made to start its opening movement.

And there is furthermore provided a construction whereby the forward marginal portions of the side walls of the inner oven casing are arranged to resiliently yield outwardly as the door is brought into cooperation with them in closing, and thereby effect an efficient mechanical sealing of the sides of the opening of the oven compartment, said marginal portions returning to their normal positions automatically upon opening the door and thus removing the same from contact therewith.

The lowermost portion of the present stove construction, and that generally known as the broiler compartment, is also preferably provided with surrounding heat-insulating outer walls, from the inner side of which there is positioned in spaced relation a lining, which constitutes the actual sides of the said compartment, while between said walls and said lining is adapted to pass the currents of fresh air, as they enter the stove from below and outside of the same, after which they enter the upper part of the said compartment and come into contact with the source of heat.

With these and other objects in mind, the improved stove or range comprises further novel details of construction and operation fully brought out in the following description, when read in conjunction with the accompanying drawings, in which Figure 1 is the preferred embodiment of the invention; Fig. 2 is a horizontal section taken through the upper compartment of the stove shown in Fig. 1; Fig. 3 is a vertical transverse front to rear section of the stove shown in Figs. 1 and 2; Fig. 4 is a section on the line 4-4 of Fig. 3; Fig. 5 is an enlarged fragmentary sectional view showing the manner

in which the oven-door when closed maintains the upper trap within the door-frame in open position; Fig. 6 is a similar view showing the position of the said trap when the door is slightly opened; Fig. 7 is a view similar to Fig. 5 but illustrating the opening of the lower trap-door; and Fig. 8 is a similar view of Fig. 6, but illustrating the position of the lower door-frame trap when the oven-door is partially or completely opened.

In the following description of this invention, it is to be understood that no reference will be made to the manner in which the various metallic side sections, metallic linings of the device, the flue-walls, etc., are secured together, as it is unessential to carrying out the present invention whether they are spot or seam welded, riveted, or otherwise secured in fixed relation. And, furthermore, it is immaterial as to what metal may be used to comprise the various parts of the stove, as, while sheet-iron has quite universally been employed thus far in the art, other materials are being developed which are more lasting than sheet-iron, in that they resist the tendency of moisture, heat and vegetable acids to corrode them. And, also, no particular insulating material is claimed as a part of the invention, in view of the fact that there are so many that are available and operate toward the same end, except possibly with varying degrees of efficiency.

Referring now to the drawings, a stove or range is provided, which same comprises an upper section 1 superimposed upon and above the lower section 2, these sections being hereafter known as the oven and broiler sections, respectively, and which in most instances would be supported upon some suitable form of feet 3, and adapted to be normally sealed by closures 4 and 5, respectively. These doors may be pivotally mounted upon any approved type of hinges 6, while they are normally held in closed position by means of any suitable form of latch mechanism 7, it, however, having been found preferable to employ a positive locking-latch in view of the interior oven sealing construction hereinafter described, which latch, however, is readily released by pulling directly outwardly upon the handle portion of the same.

The broiler section principally comprises a rear wall 8, side walls 9, and a front wall 10, closed at the bottom by means of a wall 11, while within said combined walls there is positioned in spaced relation a metallic lining, forming in effect a box or inner casing separated from the outer walls by means of heat insulating material 12 and comprising a rear wall 13, side walls 14 and adjacent to its upper portion a forward wall 15, the said rear wall at its

upper portion being directed outwardly to contact with the outer wall 8, the laterally opposite side walls 14 forming oppositely positioned extensions of a bottom wall 16, which is also connected at its rear edge to the corresponding portion of the rear wall 13. The outer wall 10, at its upper portion is directed inwardly and engages the corresponding edge portion of the forward wall 15 of the said casing, while the lower portion of the wall 15 and the forward portion of the bottom wall 16 are connected to the outer wall 10 by means of diagonally extending members 17, which comprises a frame into which is adapted to be snugly positioned the door 5, which latter comprises an outer wall 18 and an inner wall 19, spaced apart by heat insulating material 20, while the wall 19 at its edge portions is directed outwardly to engage and be connected to the corresponding edge portions of the wall 18.

The laterally opposite walls 14 of the inner casing are provided with openings adjacent to their uppermost portions, through which extend flues 21 that enter said casing and having passed upwardly through the heat insulating material 12 from below the broiler compartment, where they enter through the bottom wall 11 and are inclosed by means of suitable spaced walls 22. As before stated, there is superimposed upon the broiler section an oven section, the same comprising forward and rear walls 23 and 24, connected by laterally opposite side walls 25, while the front wall 23 is provided with an opening for a door which is normally closed by means of the door or closure 4, which comprises an outer wall 26 and an inner wall 27, the latter at its edge portions being provided with a concaved recess 28, and thereafter extend outwardly to form portions 29 which join the outer wall 26 and are provided with openings 30 at the lower and upper sides of the said closure, for a purpose hereinafter described, and in communication with an air passage 31 extending between the inner wall 27 of the door and a member 32, which is positioned in spaced relation with said inner wall and also is separated from the outer wall 26 by means of heat insulating material 33.

The front, rear and side walls of the outer shell of the oven section are closed at their uppermost edge portions by means of a top 34, while positioned within said combined outer shell walls is an oven lining comprising a top section 35, bottom section 36, rear section 37 and laterally opposite side sections 38, all of said sections, excepting the rearmost, being curved at their forward edge portions 38' outwardly and reversely toward the outer surface of said lining, while these curved portions and the lining

sides adjacent thereto are unsupported other than by their own structure, so that they are adapted to yield outwardly when the surface of the recess 28 in the closure door 4 cooperate with them. Laterally oppositely positioned members 39 and upper and lower members 40 are provided to form a door or closure-frame to connect the front outer walls 23 with the adjacent portions of the sections comprising the inner oven lining, the innermost portions of the walls 39 and 40 of the said closure-frame being free and resilient, and when the closure 4 is in closed position they are adapted to yield transversely in opposite directions, and there comes into contact with them the curved portions 38 hereinbefore described, thus effecting a very tight and uniform joint between the closure and the walls of the oven lining.

The members 40 are provided with apertures 41, communicating with the apertures 30 in the door when the latter is in closed position. The upper of the apertures 41 is spanned by a trap-door 42, which is pivotally carried by the member 40 and moves into closed position by its own weight upon opening the closure door 4, while on the other hand when the said door is closed, a lug 43 carried by the same engages a lug 42' upon the door 42 and forces the latter open and the door 4 moves into its innermost closed position. The lower aperture 41 is arranged to be closed by means of a trap-door 44, pivotally mounted upon the lower of said members 40 and provided with a weight 45, which automatically operates to close this last-named trap-door when the door 4 is open, while on the other hand the trap-door 44 is itself automatically opened as there is brought into contact with it a suitable projection or other means 46 carried by the said closure-door.

Between the inner lining section 35 and the top wall 34 of the said outer shell is an intervening oven casing comprising an upper member 47, connected at its laterally opposite edge portions to members 48 positioned between the lining sections 38 and side walls 25, and at its rear connected to a member 49 positioned between the lining section 37 and rear wall 24, the said casing members being spaced away from said lining sections by means of air-flues and away from said outer shell walls by means of heat-insulating material 50. Supported by and in spaced relation from the section 36 is a member 51, which extends substantially between the side members 48 and from the rear member 49 forward to a member 52, provided with an opening 53 and comprising an upper extension of a member 54, which bounds the forward lower portion of the oven compartment, and is spaced from the wall 23 by means of insulating material

55. The member 51 terminates laterally in spaced relation with the members 48 in order to permit air currents to pass thereby and upwardly through the passage-way 31 within the door 4, and the passage-way 56 between the outer walls of the oven section and the interior oven lining, said member 51 also being provided at its forward and rear end portions with an aperture 57. Above the member 47, which same is provided with an aperture 58, there is positioned an air-flue 59, which at its forward end communicates with said last-named aperture, and at its rear end extends to and through the rear wall 24 of the oven section.

The member 47 is also provided at its forward portion with an aperture 60, above which is positioned a housing 61, which directs currents of air, which have passed upwardly, through the flue 31 and apertures 30 and 41 rearwardly and reversely downwardly into the space above the section 35 and toward the outlet aperture 58. The upper edge portion of the forward wall section 54 is connected directly with the forward portion of the lower door-frame member 40, and together with the member 52 forms a passage-way for the heated air currents from the fuel burner 62, and through the apertures in the lower member 40 and lower wall of the door, whence said currents pass upwardly through the flue 31.

In the operation of this device, the currents of heated air from the burner 62 are diverted in opposite directions by the member 51, some going up the sides of the oven casing and to the outlet 58, while others pass rearwardly and up the back and thence forwardly to the said outlet, before uniting with the said first currents in and passing through the flue 59. And still other currents pass forwardly and through the hot air flue in the door itself, when the latter is in its closed position, and at the top are turned rearwardly to and also through the outlet mentioned. On the other hand, when the door is opened the said currents pass up the two sides and back, but cannot pass out through the forward exit because of the trap-door 44 which has been automatically closed by the opening of the door 4.

Furthermore, with an oven of this construction, it is obvious that the heat generated within is prevented from escaping through or from the sides of the device, but only through the flue 59, which if desired can be closed automatically as soon as the fuel supply is shut off, to prevent the undesired escape of the heat. Also, if desired, a temporary closure can be arranged to close the lower end of the flue inclosed by the walls 22 after the fuel supply is shut off, but it is essential that if this arrangement is employed, both the closures must be opened before the burner is again light-

ed in order to prevent any possible chance of an explosion.

And again it will be noted from the drawings that the upper or oven section can be shifted as a unit from the lower broiler section of the stove as a whole, the oven section then being adapted to be placed directly over any exposed burner or other source of heat, also being interchangeable with other ovens with respect to the lower broiler section, and being so constructed as to make operating of the ovens alone readily feasible.

Having thus described my invention, what I claim and desire to protect by Letters Patent of the United States is:—

1. A stove, comprising a compartment surrounded by walls having marginal portions adapted to yield resiliently, and a door pivotally mounted and adapted to span the distance between said marginal portions, and to force the same laterally out of their natural positions of rest when said closure is in engagement therewith.

2. A stove, comprising a compartment having an open-side, and a door adapted to close said side, the marginal portions of the walls of said compartment being shifted laterally by said door when in closed position.

3. A stove, comprising a compartment having an open side, and a door adapted to close said side, the marginal portions of the walls of said compartment being shifted laterally by said door when in closed position, and said portions being operative to automatically reassume their natural positions when said door is removed from contact therewith.

4. A stove, comprising a compartment having an opening in one side thereof, a door frame adjacent to said opening and comprising a resilient portion in yielding co-operation with the adjacent portions of the compartment walls, and a door adapted to close said opening and when in closed position to engage and displace from their natural positions the said portions of the compartment walls and of said frame, to effect a substantially air-tight seal around said door.

5. A stove construction, comprising an outer shell having an opening in one side, an oven casing within and spaced from said shell, an oven lining within and spaced from said casing, and having an opening co-operating with said first opening, a closure common to both openings, and air passages extending from below said casing into the space between said casing and lining and upwardly between the opposite sides and rear of the said casing and lining respectively and converging above said lining to an outlet in said casing.

6. A stove construction, comprising an

outer shell having an opening in one side, an oven casing within and spaced from said shell, an oven lining within and spaced from said casing, and having an opening co-operating with said first opening, a closure common to both openings, air passages extending from below said casing into the space between said casing and lining and upwardly between the opposite sides and rear of the said casing and lining respectively and converging above said lining to an outlet in said casing, and a flue between the upper walls of said shell and said casing to convey current from said outlet to and through the rear portion of said shell.

7. A stove construction, comprising an outer shell having an opening in one side, an oven casing within and spaced from said shell, an oven lining within and spaced from said casing, and having an opening co-operating with said first opening, a closure common to both openings, air passages extending from below said casing into the space between said casing and lining and upwardly between the opposite sides and rear of the said casing and lining respectively and converging above said lining to an outlet in said casing, and an air passage within and between the inner and outer walls of said closure to convey currents of heated air up the front side of said oven.

8. A stove construction, comprising an outer shell having an opening in one side, an oven casing within and spaced from said shell and having an opening co-operating with said first opening, a polygonal closure-frame connecting the marginal portions of said openings, a closure common to both openings and fitting within said frame, said frame being provided in its upper and lower surfaces with apertures, and an air passage between the sides of said closure having openings adapted to communicate with said apertures, when said closure is in operative position.

9. A stove construction, comprising an outer shell having an opening in one side, an oven casing within and spaced from said shell and having an opening co-operating with said first opening, a polygonal closure-frame connecting the marginal portions of said openings, a closure common to both openings and fitting within said frame, said frame being provided in its upper and lower surfaces with apertures, a movable closure for one of said apertures, and an air passage between the sides of said first closure having openings adapted to communicate with said apertures, when said closure is in operative position.

10. A stove construction, comprising an outer shell having an opening in one side, an oven casing within and spaced from said shell and having an opening co-operating with said first opening, a polygonal closure-

frame connecting the marginal portions of said openings, a closure common to both openings and fitting within said frame, said frame being provided in its upper and lower surfaces with apertures, a movable closure for one of said apertures, and an air passage between the sides of said first closure having openings adapted to communicate with said apertures, when said closure is in operative position, the movement of said first closure into operative position acting to open said second closures.

11. A stove construction, comprising an outer shell having an opening in one side, an oven casing within and spaced from said shell and having an opening cooperating with said first opening, a polygonal closure-frame connecting the marginal portions of said openings, a closure common to both openings and fitting within said frame, said frame being provided in its upper and lower surfaces with apertures, a movable closure for one of said apertures, and an air passage between the sides of said first closure having openings adapted to communicate with said apertures, when said closure is in operative position, the movement of said first closure into operative position acting to open said second closure, and said second closure being operative to automatically move into closed position when said first closure is to open said second closure.

12. A stove construction, comprising a double wall having an opening and inclosing a mass of heat insulation, a frame surrounding said opening and provided with an aperture, and a removable double walled closure for said opening having a space between its walls communicating with said aperture in said frame when in closed position.

13. A stove construction, comprising a double wall having an opening and inclosing a mass of heat insulation, a frame surrounding said opening and provided with apertures, and a removable double walled closure for said opening having a space be-

tween its walls communicating with said apertures in said frame when in closed position, to provide a flue connection between said apertures.

14. A stove construction, comprising a double wall having an opening and inclosing a mass of heat insulation, a frame surrounding said opening and provided with an aperture, and a removable double walled closure for said opening having a space between its walls communicating with said aperture in said frame when in closed position, and means to close said aperture when said closure is removed from said frame.

15. A stove construction, comprising a double wall having an opening and inclosing a mass of heat insulation, a frame surrounding said opening and provided with an aperture, and a removable double walled closure for said opening having a space between its walls communicating with said aperture in said frame when in closed position, and means to automatically close said aperture when said closure is removed from said frame, and said means being operated by contact with said closure to open said aperture as said closure is moved into closed position with respect to said frame.

16. A stove, comprising a compartment surrounded by walls, one of said walls having a marginal portion adapted to yield resiliently, and a door pivotally mounted and adapted to span the distance between said walls, and to force the said marginal portion laterally out of its natural position of rest when said closure is in engagement therewith.

17. A stove, comprising a compartment having an open side, and a door adapted to close said side, the marginal portion of one of the walls of said compartment being shifted laterally by said door when in closed position.

In testimony whereof I have affixed my signature.

FRED E. RUSSELL.