

Nov. 19, 1940.

J. E. LEONARD

2,222,436

COMBINATION COOKING AND HEATING UNIT

Filed Jan. 17, 1938

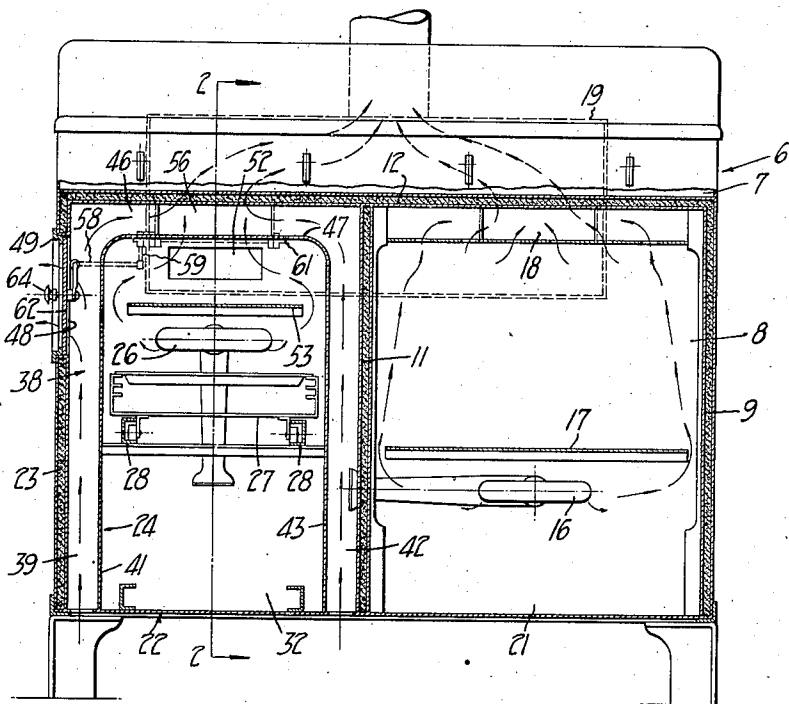


FIG. 1.

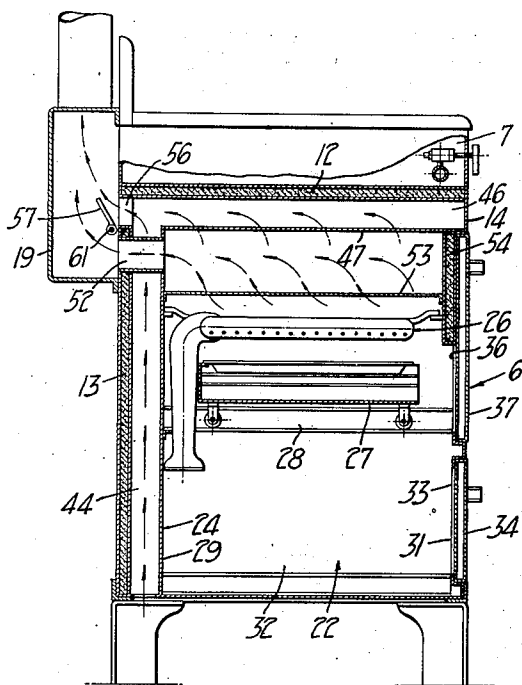


FIG. 2.

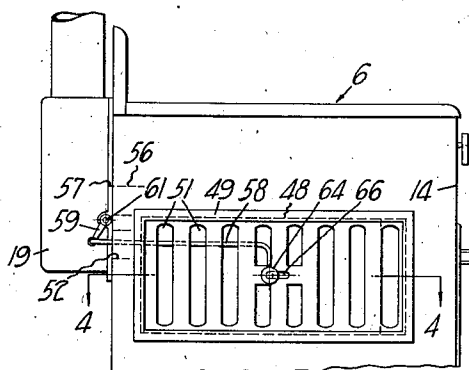


FIG. 3.

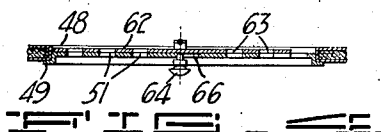


FIG. 4.

INVENTOR.
Joseph E. Leonard
BY *Joseph B. Gardner*
ATTORNEY.

UNITED STATES PATENT OFFICE

2,222,436

COMBINATION COOKING AND HEATING
UNIT

Joseph E. Leonard, Berkeley, Calif., assignor to
Hammer-Bray Company, Ltd., Oakland, Calif.,
a corporation of Nevada

Application January 17, 1938, Serial No. 185,267

3 Claims. (Cl. 126-4)

The invention relates to heating and cooking stoves of more or less standard design, including a top burner compartment for cooking and an oven and broiler compartment and the like.

It has been the custom to construct the broiler and oven of a stove of the character described with the broiler compartment directly under the oven compartment and to utilize a single burner for both broiling and heating the oven. This arrangement has been popular with stove manufacturers principally for constructional reasons, in that it simplified the construction of the stove and permitted the dual use of the burner as aforesaid. However, from a functional standpoint, there is little reason for combining the broiler and oven inasmuch as these units are seldom simultaneously used and generally in using the broiler, the heat transmitted to and absorbed in the oven is put to no real beneficial use. On the other hand, the arrangement has certain disadvantages, among which is the undesirable low position of the broiler and the inconvenience caused the user in opening and closing the broiler drawer and observing the food being cooked at such a relatively low elevation in the stove. There has, therefore, been a growing desire to raise the elevation of the broiler in the stove and to also separate the broiler from the oven.

In addition to the above, there has been a modern trend to incorporate in the stove an efficient heater of an air circulating or radiant type which may be used to warm the kitchen and adjacent rooms. In accordance with the present invention and as a principal object thereof, I provide a combination broiler and heater unit which may be incorporated in a stove of standard dimensions at a substantially higher position in the stove than the broiler compartment heretofore, and at the same time to make an efficient use of the heat generated by the broiler burner for heating the surrounding atmosphere. This unit preferably is arranged in the stove as an air circulating heater so that a comparatively large volume of air is drawn through the unit and heated and passes into the room for heating the latter by convection, although the same may be used as a radiant heater if desired. In either case, the unit possesses substantial advantages over the former oven and broiler combination from a heating standpoint inasmuch as the use of the oven for heating the room has never been satisfactory. In the first place, the oven is generally well insulated in the stove and produces, therefore, an extremely low radiation to the surrounding room and does not embody any efficient

air passage means for circulating heated air by convection. On the other hand, the opening of the oven door to heat the surrounding room, as is often done, may permit the escape of the products of combustion from the burner into the room and is for this reason undesirable.

A further object of the present invention is to provide a heating and cooking unit of the character described in which the heated air streams normally vented into the room for heating the same may, where such heating is undesirable, be shunted into the flue and the heat passed to the surrounding atmosphere reduced to a minimum. This arrangement is especially designed for use of the unit during the warmer seasons of the year.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of the invention which is illustrated in the drawing accompanying and forming part of the specification. It is to be understood, however, that variations in the showing made by the said drawing and description may be adopted within the scope of the invention as set forth in the claims.

Referring to said drawing:

Figure 1 is a vertical sectional view of a stove constructed in accordance with the present invention.

Figure 2 is a vertical sectional view of the stove taken substantially on the plane of line 2-2 of Figure 1.

Figure 3 is an end elevation of the stove.

Figure 4 is a fragmentary sectional view taken substantially on the plane of line 4-4 of Figure 3.

The heating and cooking unit of the present device and as illustrated in the accompanying drawing, consists briefly in a casing or heater shell having its side walls exposed for heating, by radiation and conduction, the surrounding atmosphere in a room or an intermediate air passage for heating and circulating air into the room. The unit further includes an open side portion in the casing for affording access to the interior thereof, a burner in the casing and a food supporting tray mounted in the casing and positioned for heating of food carried thereby by the burner.

Preferably, the unit is embodied in a stove of more or less standard construction having a top gas burner chamber 7 and an oven compartment 8 provided between an insulated end wall 9, an interior intermediate insulated wall 11, a top insulated wall 12 which may form the top of

the stove or the under side of the top gas burner chamber as here shown, an insulated rear wall 13 and a front wall 14 of the stove. Mounted adjacent the bottom of the oven compartment is a burner 16 for heating the oven and positioned thereover is a baffle 17 forming the bottom wall proper of the oven compartment for distributing the heat uniformly across the bottom of the oven and distributing the heated products of combustion around the sides of the oven. A discharge outlet 18 is provided adjacent the top and rear of the compartment for the products and this outlet is connected to a flue box 19 provided at the rear of the stove. The space 21 in the compartment 8 under the burner 16 may be used to accommodate a broiler tray if desired.

The heater and cooking unit aforementioned is preferably embodied in a chamber 22 defined between the intermediate wall 11 and an opposite end wall 23 of the stove, between the front and rear walls 14 and 13 of the stove and under the top wall 12. The elements of the unit as aforementioned, include a heater casing or shell 24, a burner 26 and a broiler tray 27. Preferably, the burner and tray are mounted in the upper portion of the casing so as to provide a relatively high positioning of the broiler tray and as here shown, the latter is supported by a pair of spaced runners 28 extending from the rear side 29 of the casing to the front side 31, which in the present arrangement, is formed in part by the front wall 14 of the stove. The bottom portion 32 of the shell under the supporting structure for the broiler may be used for a general utility compartment for storing pots and pans or the like and is preferably provided with an open front side portion 33 which may be closed by an exterior door 34. Similarly, the upper part of the casing is provided with an open front portion 36 opposite to the tray 27 to permit withdrawal of the tray through the opening 36 and this opening is also preferably closed by a door 37 carried by the front wall 14 of the stove.

In accordance with the present arrangement the shell, with the exception of the front wall, is completely spaced from the adjacent side walls of the stove so as to define an air passage 38 surrounding the casing. This surrounding air passage is made up in its component parts by a vertical air passage 39 between the end wall 23 of the stove and the adjacent side wall 41 of the casing, a vertical air passage 42 between the intermediate wall 11 and the adjacent side wall 43 of the casing, a vertical air passage 44 between the rear wall 13 of the stove and the rear wall 29 of the casing, and a horizontal air passage 46 between the top wall 12 of the stove and the adjacent top wall 47 of the casing and which connects the upper ends of the vertical passages 39, 42 and 44. One or more of these passages may be deleted if desired, but in view of obtaining a maximum efficiency from the heater unit and a maximum volume output of heated air, I prefer to use an arrangement substantially as shown with the heater casing substantially completely surrounded by the air passages. The air heated in these passages is vented from the stove body by way of an opening 48 provided in the end wall 23 of the stove. This opening may be partially obstructed such as here shown, by means of a grill plate 49 having a plurality of vertically extending horizontally spaced slots 51 for passage of air.

The products of combustion from the burner 26 are discharged into the flue box 19 from the

upper rear side of the casing by means of a discharge conduit 52 extending from the casing through the passage 44 and rear wall 13 of the stove into the flue box 19. Preferably, a baffle plate 53 is mounted over the burner 26 in the casing so as to cause a lateral deflection of these products to retard their passage into the flue and to detain the products in the casing sufficiently long to enable a transfer of a majority of the heat therein to the casing. The baffle also operates to reflect heat downwardly in the casing to heat the lower portions of the side walls and thereby increase the heat transfer to the air passages aforesaid. Also preferably, there is mounted at the front of the casing across a portion of the opening 36 to the front of the burner 26 a transversely extending member 54 which operates to shield the burner from the opening and direct radiation therethrough upon opening of the door 37.

It will now be understood that the heater and cooking unit provides an efficient dual use for both heating the room and for broiling or other cooking operation and that whenever the heater is in operation, the unit is available for broiling and on the other hand, whenever the unit is used for broiling, there is an efficient and plentiful circulation of pure heated air into the room. During the warmer seasons of the year, however, it is desirable to use the unit for broiling or cooking purposes only and to minimize heat transmitted into the room. During the summer months the average housewife as a rule does little baking or roasting in the oven compartment, yet frequently uses the broiler for preparing steaks or chops or other foods quickly and as a substitute for the roasts and other heavier foods generally prepared in the oven during the cooler months. However, the use of the broiler in the ordinary stove construction always entails a heating up of the oven and which heat is to a large extent felt in the room. In accordance with the present arrangement, however, by discharging the heated air into the flue a very small amount of heat is transmitted into the room. This arrangement is carried out in the present construction by the provision of a discharge opening 56 in the rear wall 13 of the stove at the rear side of the top air passage 46 and the rear vertical air passage 44 and communicating these passages with the flue box 19. This opening is normally closed by a flap valve plate 57 mounted in the flue box 19 and which is displaceable from the opening 56 to vent the heated air into the flue box if desired. As here shown, the plate 57 is hinged to the rear wall 13 of the stove at the bottom of the opening 56 and may be swung to an open position, as illustrated in Figure 2, by means of a push rod 58 carried along the inner side of end wall 23 of the stove and pivoted to the depending end 59 of a rod 61 fixed to the plate 57 along the axis of the pivotal connection thereof to the wall 13. In the present arrangement the opening of the door 57 is arranged to be effected simultaneously with a closing of the hot air discharge opening 48 and to this end a plate 62 is mounted to the rear of grill plate 49 and is provided with a plurality of vertical slotted openings 63 and is slidable relative to the grill plate so as to move the openings 63 into and out of registration with the openings 51 in the grill plate 49, to respectively open and close the discharge passage 48. This relative movement of the plate 62 may be effected by means of a knob 64 fixed to the plate 62 and ex-

tended through a horizontal slot 66 in the grill plate for engagement at the outer side of the grill plate for opening and closing the hot air discharge passage. In the present construction the push rod 58 is connected to the plate 62 at the knob 64 so that upon movement of the plate to open the hot air discharge passage, the valve plate 57 will be swung to a closed position and upon movement of the plate 62 to close the hot air discharge passage, the valve plate 57 will be swung to an open position. Preferably, the end wall 23 and the rear wall 13 of the stove are insulated so that there will be but a minimum transfer of heat therethrough upon closing of the hot air discharge register and a venting of the hot air into the flue. It will be understood that when the hot air discharge register is closed and the circulating passages connected to the flue, relatively large volumes of cool air will be drawn along the inner surfaces of the stove side walls to keep these surfaces relatively cool during the use of the heater and cooking unit as a broiler.

I claim:

1. An air circulating heater comprising, inner and outer casings mounted in spaced relation to define an air passage therebetween, means venting said passage to the exterior of said outer casing, said casings having registering open front portions, a closure for said open portion in said outer casing and affording access to the interior of said inner casing, a gas burner in said inner casing, a flue connected to said inner casing for venting the products from said burner, and means for shunting said air passage into said flue and away from said first means.

2. An air circulating heater and cooking unit comprising, a casing having an open side portion, a displaceable closure for said portion affording access to the interior of said casing, an inverted gas burner in said casing, an outer casing surrounding part of said first casing and being spaced therefrom to define therewith an air heating and circulating passage, a door connecting said passage with the atmosphere, a flue adjacent the top of said inner casing for venting the products from said burner, a baffle mounted over said burner and under said flue for deflecting said products away from said flue and for deflecting heat downwardly in said inner casing, and means whereby upon displacement of said door said passage is disconnected from the atmosphere and vented to said flue.

3. As a unit in a cooking stove having a top wall and an oven compartment under one side of said wall, a casing mounted under said wall adjacent said oven compartment and having the side walls thereof spaced from said oven compartment and an end wall of said stove to define vertical air passages at the outer sides of said casing, a wall serving as front closure for said air passages and said casing, whereby said passages are completely sealed from the space inside said casing, passage means for venting said passages to the exterior of said stove, said front wall of said casing and stove having an opening defined therein, a displaceable closure for said last named opening and affording access to the interior of said casing, and a burner in said casing.

JOSEPH E. LEONARD.