

Nov. 7, 1944.

G. A. SIVLEY

2,362,415

COOKING DEVICE

Filed April 29, 1942

4 Sheets-Sheet 1

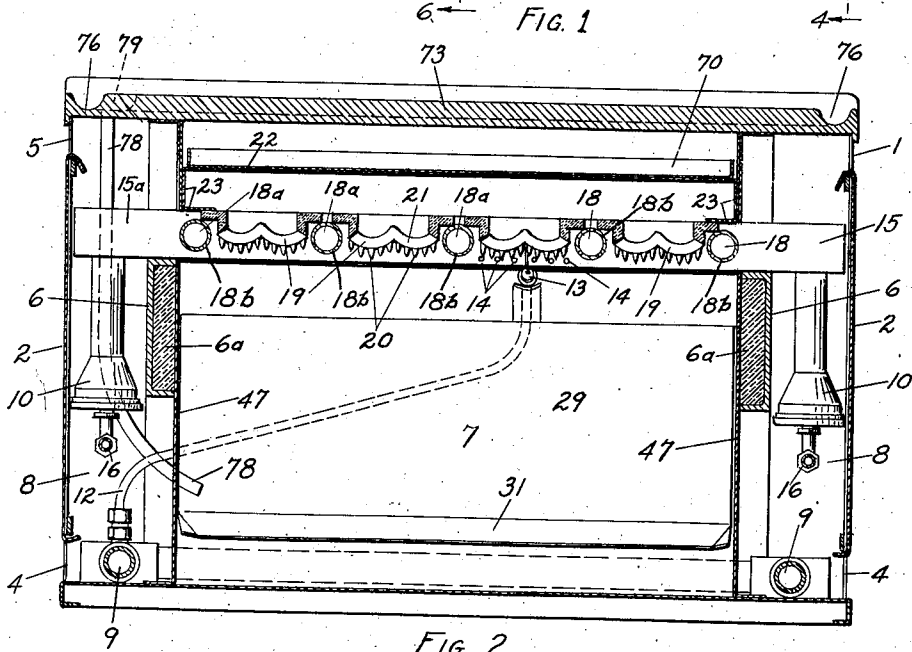
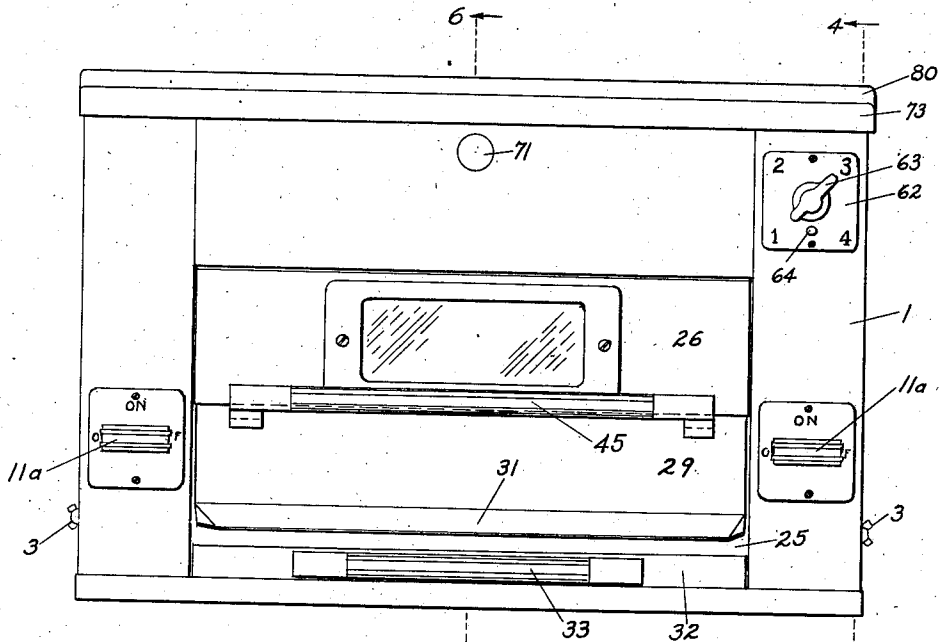


FIG. 2

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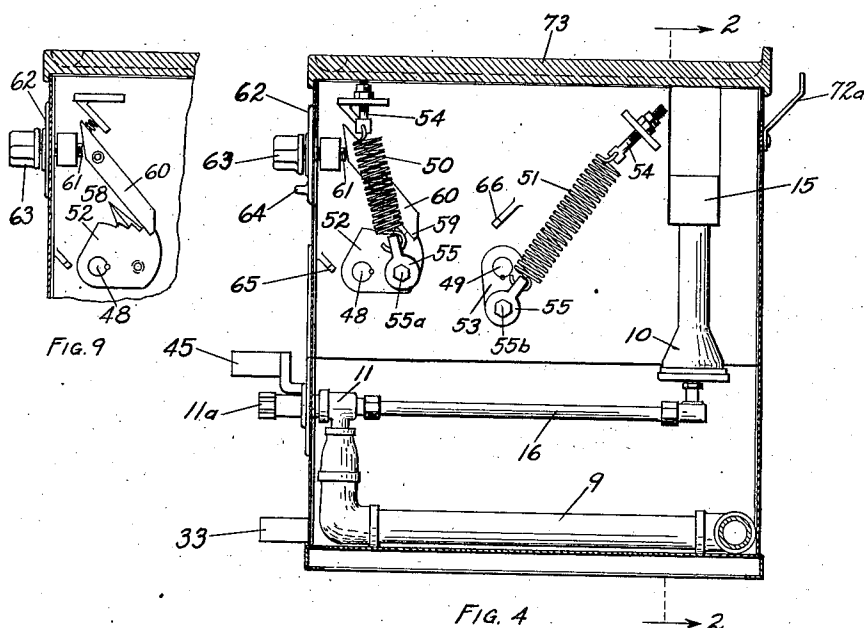
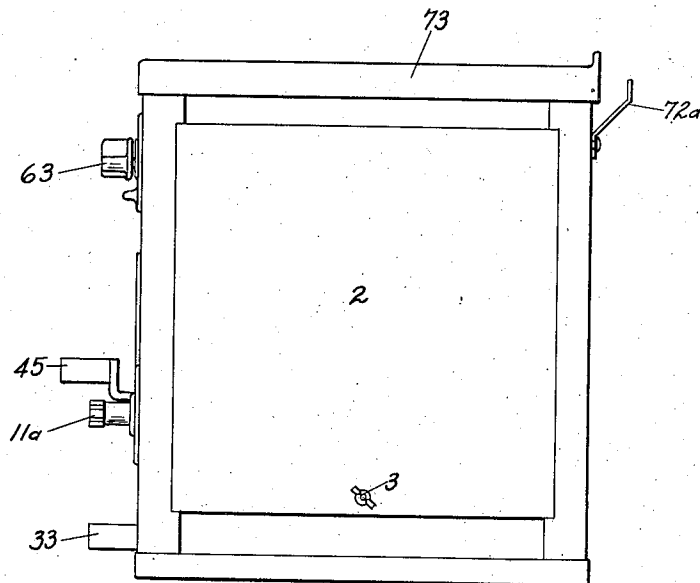
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4 Sheets-Sheet 3

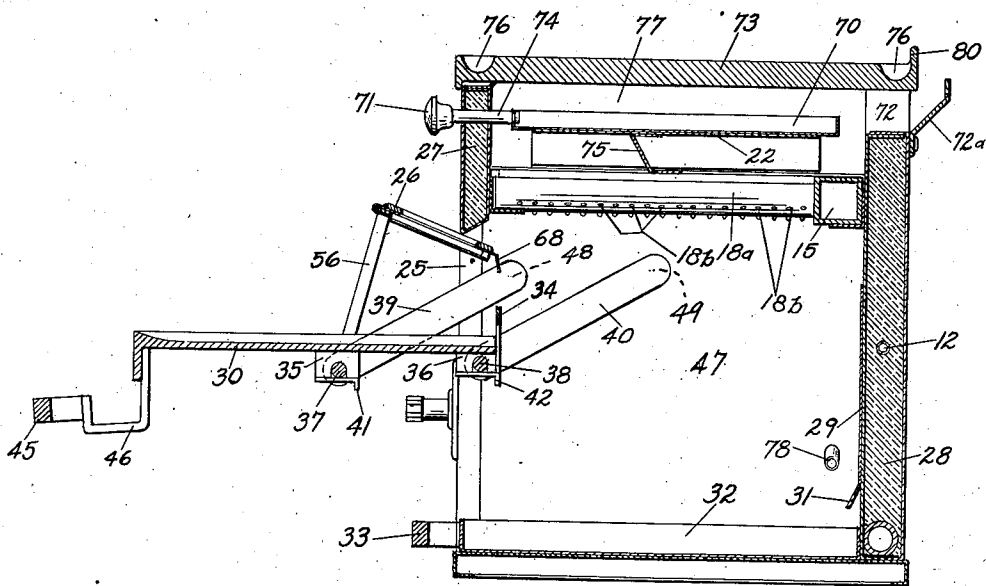


FIG. 5

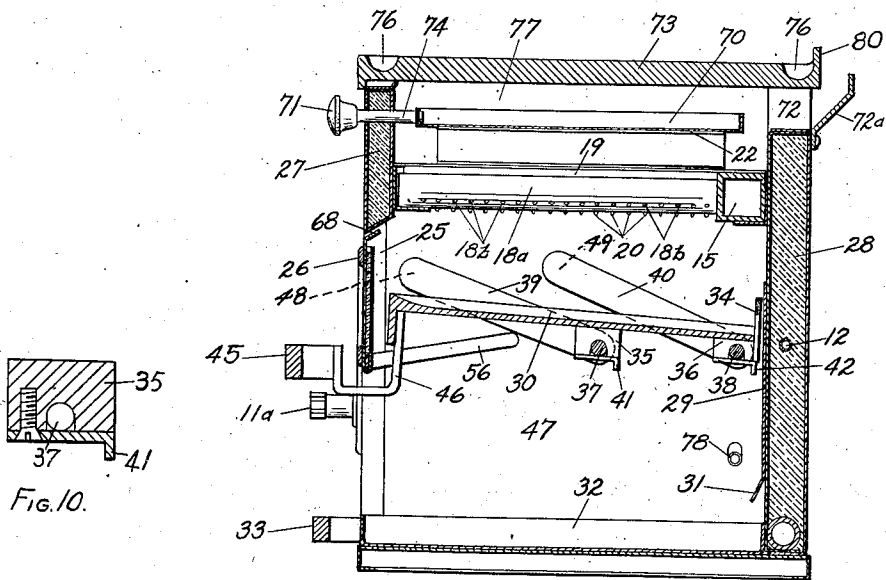


FIG. 6

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4 Sheets-Sheet 4

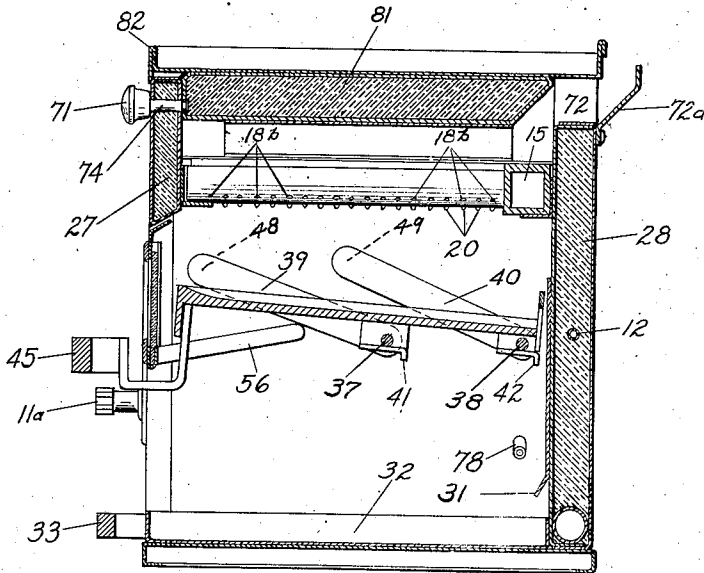


FIG. 7

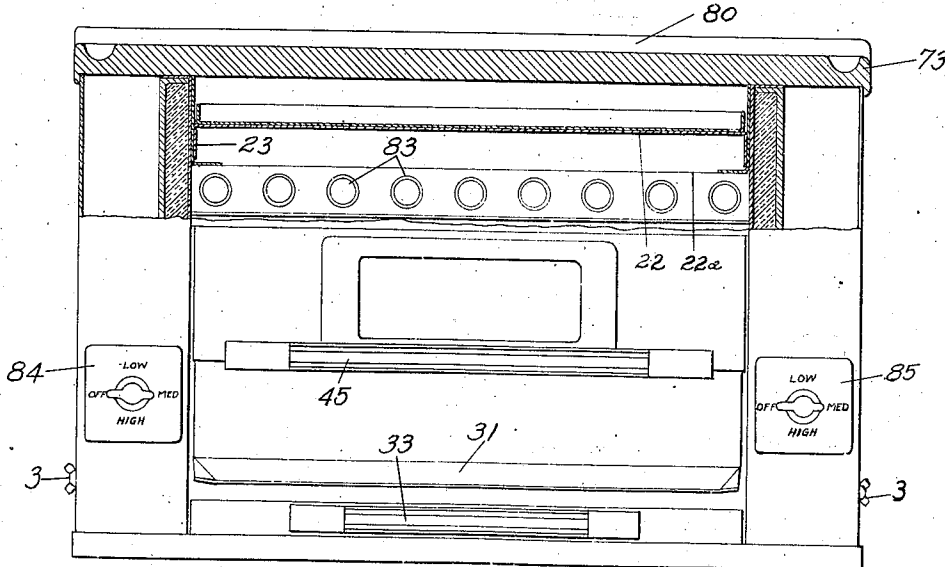


FIG. 8

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UNITED STATES PATENT OFFICE

2,362,415

COOKING DEVICE

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Application April 29, 1942, Serial No. 441,043

11 Claims. (Cl. 126—41)

The present invention relates to cooking apparatus of the general type of a broiler oven and is, in general, an improvement upon the structure shown in an application about to be filed by Lowden I. Sheldon.

Among the objects of the present invention are—

To provide an apparatus of the nature indicated having an intermediate cooking compartment with ventilating compartments at the ends thereof which have air inlets and outlets whereby air may be circulated through the ventilating compartments to assist in keeping them cool;

To provide, in a structure of the character indicated, improved supporting walls at the two ends of the cooking compartment;

To provide, in a structure of the character indicated, means for keeping down the temperature of counterbalancing springs;

To provide, in a structure of the character indicated, bearings of a type which will reduce to a minimum the wear of supporting bearings;

To provide, in a structure of the character indicated, a minimum number of openings between the cooking compartment and other compartments in which are located actuating springs;

To provide, in a structure of the character indicated, a food-supporting griddle which may be oscillated from a position inside of the cooking compartment to a position outside thereof and vice versa, and, when so oscillated, the griddle will be substantially level when outside of the compartment and, when inside, will slope toward the rear of the compartment;

To provide, in a structure of the character indicated, a supporting linkage in which the supporting links will not be parallel at any point in their useful travel;

To provide, in a structure of the character indicated, adjustable, positive, stop mechanism for predetermining the location of a food-supporting plate or griddle with reference to the heating units;

To provide, in a structure of the character indicated, an easily removable, heat-control damper and deflector to facilitate the removal of heat radiants and heating units;

To provide easily removable end panels, making possible easy and quick inspection and repair of operating parts;

To provide for easy regulation of the temperature of the cooking compartment by making possible the use of one or another or all heating units, if desired;

To provide simple means for opening and closing

the oven door of a structure of the character indicated by the act of swinging the food-supporting plate out of or into the oven;

To provide for easy and separate removal of parts whereby to render cleaning of the machine as simple as possible;

To provide a structure of the character indicated which may be readily converted from the use of either gas or electricity as a heating medium to the other;

To provide an arrangement of counterbalancing springs for a griddle plate which will eliminate dead spots in the travel of the food-supporting griddle or plate;

To provide for dividing the counterbalancing tension of the springs into four parts, instead of two, whereby to reduce the wear on bearings and whereby to assure continuous operation in event of breakage or failure of a single spring;

To provide for easy adjustment of the counterbalancing action; and

To provide for easy and simple removal of gas cocks in event they need cleaning, greasing, or repairing.

In the drawings annexed hereto and forming a part hereof,

Fig. 1 is a front elevational view of a structure embodying my present invention;

Fig. 2 represents a longitudinal section substantially along the plane indicated by the line 2—2, Fig. 4;

Fig. 3 is an end elevational view of the right hand end of the structure shown in Fig. 1;

Fig. 4 represents a transverse section substantially along the plane indicated by the line 4—4, Fig. 1, the section being taken just inside of the right hand end wall;

Fig. 5 represents a transverse section through the apparatus between the right hand end and the middle thereof, the food-supporting plate being shown in extended position;

Fig. 6 represents a transverse section taken substantially along the plane indicated by the line 6—6, Fig. 1;

Fig. 7 is a view similar to Fig. 6 showing a modified form of construction;

Fig. 8 is a front elevation, partly broken away, of a modified form of construction utilizing electric heating units;

Fig. 9 is a detail view of a part of the structure shown in Fig. 4; and

Fig. 10 represents a cross-section illustrating the latching means releasably connecting the cooking plate with its hangers.

Reference will now be made in greater detail

to the annexed drawings for a more complete description of this invention. Essentially, the casing of this cooking apparatus is a sheet metal casing 1 with easily removable ends 2, held in place by securing means 3, shown as a wing nut. At the bottom of each end panel is an air-inlet opening 4 and, at the top thereof, an air-outlet opening 5. This provides for circulation of air between the panels 2 and the grey iron cast plates 6 forming housings for insulating material 6a at the ends of the cooking compartment 7. The upper edges of the plates 2 are bent inwardly and downwardly to form recurved flanges which may enter the outlet openings 5, whereby to support the panels 2.

Located primarily in the ventilating air chambers 8 and in the bottom part of the apparatus is a system of pipes 9, venturis 10 and valves 11. From this gas pipe system extends a pilot tube 12 terminating in the pilot nozzle 13 adjacent certain gas openings 14 in the pipe 15 at the top of the cooking compartment. The pipes 16 extend from the valves 11 to the venturis 10 to convey gas thereto for mixing with air in the venturis whereby to secure a proper combustible mixture. Hence, when the valve control handles 11a are turned to "on" position, the gas escaping through the openings 14 and the openings in the burner pipes will be ignited by the pilot flame. The gas pipe at the right side of the apparatus is designated by the numeral 15 while that at the left side is designated by the numeral 15a, the two pipes 15 and 15a being of different lengths. This is in order to provide for regulation of the temperature of the heating compartment or to adjust the heating according to the amount of meat or other products being cooked. The division between the pipes 15 and 15a is shown in Fig. 2 just above the burner nozzle 13. At the right of this division there are two burner pipes designated by the numeral 18 while, at the left thereof, are three such burner pipes, the same being designated by the numeral 18a.

Upon the pipes 18 and 18a are supported mineral radiants 19 provided on their lower surfaces with tapered radiant points 20, these radiants being each provided with a number of transverse slots 21 extending throughout that portion of the radiants which is provided with the heat radiating points 20. Located in the chamber above these radiants is a holding means 22 which has at its ends flanges 23 for holding the outside flanges of the outside radiants down upon the pipes 18 and 18a, provided, as shown in Figs. 2, 5, 6, and 7, with openings 18b for the escape of gas from the pipes 18 and 18a. Between these flanges 23 are other downwardly extending holding means which are secured to the under surface of the member 22 and bear downwardly on the flanges of the radiants to hold them tightly against the burner pipes. This helps to prevent fracture of these fragile radiants which seem to be important in properly radiating heat to the foods being cooked.

In the front wall of the cooker is a door-opening 25 in which a door 26 is pivoted by its upper edge to swing outwardly from the position shown in Fig. 6 to that shown in Fig. 5 and conversely. Above the door-opening, the front wall of the cooker is provided with heat insulation 27, there also being heat insulating material in the back wall, as indicated at 28. On the inside of the back wall is a plate 29, secured in such a position that its upper edge is well above the back edge of the food-support-

ing plate or griddle 30, the lower edge of the plate 29 being bent forwardly, as shown at 31, to form a drip-flange, the function of which is to insure that any juices running off from the back edge of the griddle 30 will be directed into the drip pan 32. This latter is provided with a handle 33 for easy operation. At its rear edge, the griddle 30 is provided with a retaining bar 34, the purpose of which is to prevent articles of food being cooked from inadvertently sliding off from the back edge of the griddle, if the latter is moved too rapidly. At its ends, the bar 34 is secured to the griddle 30 and, at its intermediate portion, it is spaced upwardly therefrom in order to permit food juices to escape freely from the griddle to the pan or tray 32. Also, articles of food which adhere to the griddle during cooking may be scraped therefrom and shoved under the bar 34 to fall into the drip pan, when the griddle is wholly or mostly drawn out into the position shown in Fig. 5.

Bosses or studs are formed on the under surface of the griddle 30, or are secured thereto. These bosses are designated by the numerals 35 and 36 and each is notched in its lower part for the reception of the rods 37 and 38 by means of which the links 39 and 40 are pivotally connected to the bosses and, therefore, to the griddle itself. Latches 41 and 42 are pivotally connected to the lower faces of the bosses and serve to hold the rods 37 and 38 in place therein. If it is desired to remove the griddle for cleaning purposes, it is pulled out into the position shown in Fig. 5 and the latches 41 and 42 are turned about their pivots to free the rods 37 and 38. The griddle can then be lifted away from these rods and taken to wherever it is desired to have it for the washing of same.

A handle 45 is connected by the arm 46 to the front edge of the griddle, as is shown clearly in Figs. 5 and 6, and furnishes means whereby the griddle may be drawn out through the door-opening 25. At their upper ends, the links 39 and 40 are provided with studs which extend laterally through the cooking chamber lining 47, the heat insulation 6a, and the grey iron casting 6. These studs or pivot members 48 and 49 (see Fig. 4) pass through high temperature oilless type bearing bushings which reduce to a minimum the amount of wear incident to the use of the counterbalancing springs 50 and 51. On the outer ends of the studs 48 and 49 are rigidly secured crank arms 52 and 53 which serve to convert the tension of the springs into rotary motion of the studs 48 and 49, thereby causing oscillation of the links 39 and 40 from one to the other of the positions shown in Figs. 5 and 6.

The two ends of the springs 50 and 51 are secured to fastening means 54 and 55, the former of which are adjustable to vary the tension of the springs 50 and 51. Since the fastening means 55 are secured to the crank arms 52 and 53, the springs exert force thereon tending to rotate the studs 48 and 49 whereby to lift the griddle 30, inside of the cooking chamber, as shown in Fig. 6, or outside thereof, as shown in Fig. 5.

While the distance between pivots 48 and shaft 37 is the same as that between the pivots 49 and shaft 38, the links 39 and 40 are not parallel because the distance between pivots 48 and 49 is not the same as that between shafts 37 and 38. Since shafts 37 and 38 are at the same height above the bottom of the cooker and since the distances between these shafts and the griddle 30 are different, the griddle slants and, as shown in

Fig. 6, this slope is toward the rear. However, the pivot 49 is enough higher than the pivot 48 to compensate for the difference in distance between the shafts 37 and 38 and the plate 30, resulting in the plate 30 being horizontal when brought out into the position shown in Fig. 5. From this it is obvious that at no time during the useful operation of the griddle and links are the latter parallel.

Attention is directed to the fact that the springs 50 and 51 make an acute angle with each other and also to the fact that the lines connecting the centers of the pivots 48 and 55a and 49 and 55b are not parallel to each other and, therefore, the pull of the springs cannot pass any dead spots when both springs would be pulling in the direction of the line of centers, as referred to above. As shown in Fig. 4, the crank arm 52 would have to rotate about 90° before the line of centers would be in alignment with spring 50, while the crank arm 53 will rotate between 30° and 35° before passing dead center. Hence, the crank arm 53 would be considerably beyond dead center before crank arm 52 would reach that point, when going toward the position shown in Fig. 5. Hence, the pull of the springs is such that there is no tendency to pass a dead center and then suddenly move on to an end position. During the period after the crank arm 53 passes dead center and before 52 reaches it, the two springs 50 and 51 will be pulling against each other. Hence, there will be better balanced action and the griddle will not move so suddenly as to throw food off therefrom by reason of sudden action.

An arm 56 is secured adjacent each of the lower corners of the door 26 and is so positioned as to bear against the edges of the links 39 so that when downward pressure and a pull is exerted upon the handle 45 to remove the griddle 30 from the broiler oven, the links 39 will push on the ends of the arms 56 and force the door to open, as shown in Fig. 5. This door is slightly shorter in a horizontal direction than the door-opening 25 in which it swings so that the door will not be tight when heat causes expansion of the door and surrounding parts. Therefore, the door is free to close under the influence of gravity when the griddle is pushed back into the cooker compartment. Hence it will be seen that the opening and closing of the door 26 is entirely automatic and requires no attention on the part of the operator who merely pulls the griddle out of the cooker compartment or shoves it back in again.

In its upper edge, one of the crank arms 52 is provided with a series of notches 58 to be engaged by the nose 59 of pawl 60 pivoted on the casting 6. Adjusting means 61 engages the upper end portion of the pawl 60 for stopping this pawl at various points in its rotation about its pivot and predetermining the stopping position of the nose 59 which engages in one or another of the notches 58. On the front of the casing is an indicating plate 62 over which moves an indicating pointer 63, the latter cooperating with the numerals on the face of the plate 62 to indicate which of the notches will be engaged by the pawl and therefore will indicate whether the door 26 will close wholly or only partially. This also indicates the relative closeness of the griddle 30 to the heating units. A stop 64 limits the amount which the pointer 63 may turn in either direction. It is clear this arrangement provides for regulation of the intensity of the heat to which the food products on the griddle are subjected.

Stops 65 and 66 limit the amount to which the

crank arms 52 and 53, respectively, may turn when the griddle is removed from the cooking compartment. Since rotation of the crank arms is stopped by the abutments 65 and 66, oscillation of the links 39 and 40 and, consequently, of the rods 37 and 38, must be positively stopped by these abutments. Therefore, it is obvious that the position of the griddle, outside of the cooking compartment, is always the same when stopped by the abutments.

At its upper edge, the door 26 is provided with a baffle 68 which, as clearly shown in Fig. 6, would tend to prevent escape of steam, smoke, and fumes between the door 26 and the upper part of the front wall of the casing. The damper 70, having an upstanding flange around its edges and being provided with an operating handle 71, is slidable on the plate 22 to vary the direction of travel of the heat and fumes passing upwardly through the cooking chamber and out through the opening 72 below the top 73. As is clear from Figs. 5 and 6, it is impossible entirely to shut off the opening at the back of the damper 70 for the reason that the spindle 74, constituting a part of the handle 71, is not long enough to permit this to happen. It may be pulled forwardly to substantially completely close the opening at the front edge of the damper, thus forcing substantially all of the gases to pass outwardly past the back edge of the damper and through the opening 72. A baffle 72a is removably secured to the back of the cooker below the opening 72 and directs the gases upwardly rather than directly outwardly against the adjacent wall where they might result in causing a greasy condition to develop.

The flange of the damper 70 has a notch in its front edge and the spindle 74 has a groove adjacent its inner end into which the edges of the flange notch fit to make a readily separable connection between the flange and spindle. Therefore, by removing the top 73, moving the damper 70 forwardly to the front wall of the casing, and raising the back edge of the damper, the connection between the flange and the spindle may be separated and the damper removed. This makes it possible to easily get at the radiant holder and remove same so that the radiants and heating parts can be removed, if desired. One of the hold-down members for the radiants is shown at 75 in Fig. 5, this being secured to the under side of the plate 22 and pressing resiliently against the top of the radiants. It is of course understood that an electric heating system may replace the gas heating system, shown in Figs. 1 to 6.

The top 73 is shown as a heavy cast metal frying-plate provided around its periphery with a groove 76 for the collection of fryings which may chance to run toward the edge of the plate. In the left hand back corner of the plate, at the intersection of the back and side grooves, is a well 79 having an opening in the bottom thereof from which runs a pipe 78 leading to the lower part of the cooking chamber, as shown clearly in Fig. 2, where the fryings drip into the drip pan 32. When it is desired to use the plate 73 for frying, it is best to adjust the damper 70 as far rearwardly as possible to force as much of the heat as possible around the front edge of the damper and in contact with the frying plate 73. However, if it is desired to temporarily discontinue the use of the frying plate, using only the broiler, then the damper may be adjusted to the front of the top chamber 77 and the gases will

then largely pass rearwardly under the damper and out of the opening 72.

When an end panel is removed by removing the securing means 3, swinging the lower edge of the panel outwardly and then lifting it slightly, the interior of the ventilating chamber is exposed and it is possible to get at the structures therein for cleaning or adjustment.

The end walls 47 have a minimum number of openings so as to reduce as much as possible the chance for heat to pass directly from the cooking chamber through openings into the ventilating chambers at the two ends of the machine. Both end plates 47 have openings for the passage of the shafts 48 and 49, and the left panel 47 has an opening for the passage of the pipe 78. Because of the substantially uninterrupted surface of the plates 47 and the back plate, the interior of the cooker is easily cleaned. The back edge of the frying plate 73 is provided with an abutment 80 to assist in picking up articles of food from the plate and to prevent scrapings on the plate from being pushed over the back thereof.

If it is not desired to use the cast metal plate 73 as a cooking top, this may be replaced by a sheet metal plate having a downwardly extending flange on three sides to keep it properly positioned with relation to the casing of which it forms a part. In such an arrangement, insulating material 81 is placed on the damper 70 and a shorter spindle 74 replaces that shown in Figs. 5 and 6 so that the damper body will be held substantially against the forward wall of the chamber 77. Hence, the location of the damper 70 and the presence of the heat insulating material 81 will tend to keep the sheet metal top 82 from becoming excessively hot. For this construction, reference is made to Fig. 7.

In order to convert this into an electrically heated cooking device, the radiants, gas burners, pipes, and valves are removed and a brightly polished reflecting plate 22a having electric heating units 83 mounted on the under side thereof takes the place of these and furnishes adjustable heat by reason of the fact that the electric heating units are divided into two parts, as in the case of the gas heating units, and each part is divided into a plurality of circuits for the purpose of adjustment, it being possible to adjust these circuits by means of the switches 84 and 85 for low, medium, and high temperatures. For this construction, reference is made to Fig. 8.

It will of course be understood that the specific description of structure set forth above may be departed from without departing from the spirit of this invention as set forth in this specification and the appended claims.

Having now described my invention, I claim:

1. In a cooking apparatus of the nature described, a casing having a cooking chamber in its central part and other chambers at its two ends, a griddle suspended within the cooking chamber for oscillating movement out of said chamber and return, pivotally mounted hangers to support said griddle within the cooking chamber, said hangers having pivot members extending through the end walls of the cooking chamber, said pivot members having crank arms mounted upon the ends thereof within the end chambers, one of said crank arms having notches formed in the edge thereof to serve as a ratchet, a pawl pivotally mounted on an end wall of said cooking chamber and adapted to cooperate with said ratchet whereby to limit the amount of oscillation of the ratchet and therefore of the pivot member con-

nected therewith, counterbalancing springs located in the end compartments and arranged at an acute angle to each other, said springs being attached to the crank arms with their axes making unequal angles to the length of the crank arms and holding the griddle in raised position as determined by said pawl and ratchet, either inside or outside of the casing, and means for predetermining which one of the notches in the ratchet will serve to determine the location of the griddle with relation to the heating unit when cooking.

2. A structure as defined by claim 1 having on an outside wall of the apparatus indicating means for indicating which of several positions with relation to the heating unit the griddle will occupy when the pawl engages a notch of the ratchet.

3. A structure as defined by claim 1 having adjusting means for adjusting the tension of the springs.

4. A structure as defined by claim 1 in which the springs are arranged to pass across the axes of rotation of the pivot members and do not pass said axes at the same time.

5. In a cooking apparatus, a casing having end walls of grey iron castings and having in its end walls, front and rear, openings for the reception of pivot members, said openings being arranged in pairs, corresponding openings at the two ends being at approximately the same height from the bottom but the rear openings being higher than the front openings, hangers having upper and lower pivot members and having their upper pivot members extending through the end wall openings and the lower pivot members serving as supports for a griddle, and a griddle having pivotal connection with the lower pivot members, the upper pivot members at the same side of the casing being farther apart than the corresponding lower pivot members, the griddle being swingable from a position within the casing to a position outside of the casing and vice versa, when outside the casing being substantially horizontal and when within the casing being inclined rearwardly, and the hangers, during the swinging of the griddle, at no time during their usable travel, being parallel.

6. In a cooking apparatus of the type indicated, a casing having a central cooking chamber and ventilating chambers at the two ends thereof, the end walls of the casing having inlet openings at the bottom, outlet openings adjacent the top, and larger openings in the central part thereof, closure means for said larger openings, said closure means having inwardly turned flanges at the top and bottom thereof to engage in said inlet and outlet openings, and manipulable securing means for preventing removal of said closure means.

7. In a cooking apparatus of the character described having an intermediate cooking compartment; a food supporting plate in the compartment, supporting rods for said plate extending transversely through said compartment, notched lugs extending downwardly from said plate and receiving said rods within the notches, and pivoted latching means on the lower ends of said lugs to be turned laterally about their pivots whereby to enable easy removal of the supporting plate from the supporting rods.

8. In a cooking device having a central cooking compartment and a ventilating compartment at one end thereof; the combination of a food-supporting tray in said cooking compartment, pivoted means for supporting said tray either in-

side or outside of said compartment, crank arms in the ventilating compartment connected to said pivoted means to cause oscillation thereof to hold the tray in elevated position, and spring means in the ventilating compartment attached to said crank arms to cause them to oscillate, said arms and springs being respectively arranged at an angle to each other to insure that the arms, in their oscillation, will not simultaneously pass dead center.

9. A structure as defined by claim 8 having means for adjusting the tension of said springs.

10. A structure as defined by claim 8 in which the cooking compartment has end walls and in which there are stop members on the outside of each end wall of the cooking compartment, located in the paths of the lever arms to definitely limit the amount of rotation of said pivot members to thereby limit the amount of travel of the food-supporting member.

11. A cooking chamber having a food-support-

ing griddle therein supported at its two ends by pairs of pivoted links of substantially equal length, said links having upper and lower pivots, the upper pivots being connected to the chamber walls for pivotal motion therein, the upper pivots at the rear being higher up in the chamber walls than those farther forward and the upper pivots on each side being farther apart than the lower pivots on the same side, corresponding pivots at opposite sides of the chamber being co-axial, the rear lower pivots being connected to the griddle adjacent its rear edge and together constituting a rear pivotal axis, and the pivotal axis at the rear edge of the griddle being oscillatable into and out of the chamber, and the positioning of the pivots being such that the rear edge of the griddle when within the chamber is lower than the front edge and, when the griddle is outside of the chamber, it is substantially horizontal.

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