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2,604,033

BROILING EQUIPMENT FOR USE IN OVENS

Filed Sept. 16, 1949

3 Sheets-Sheet 1

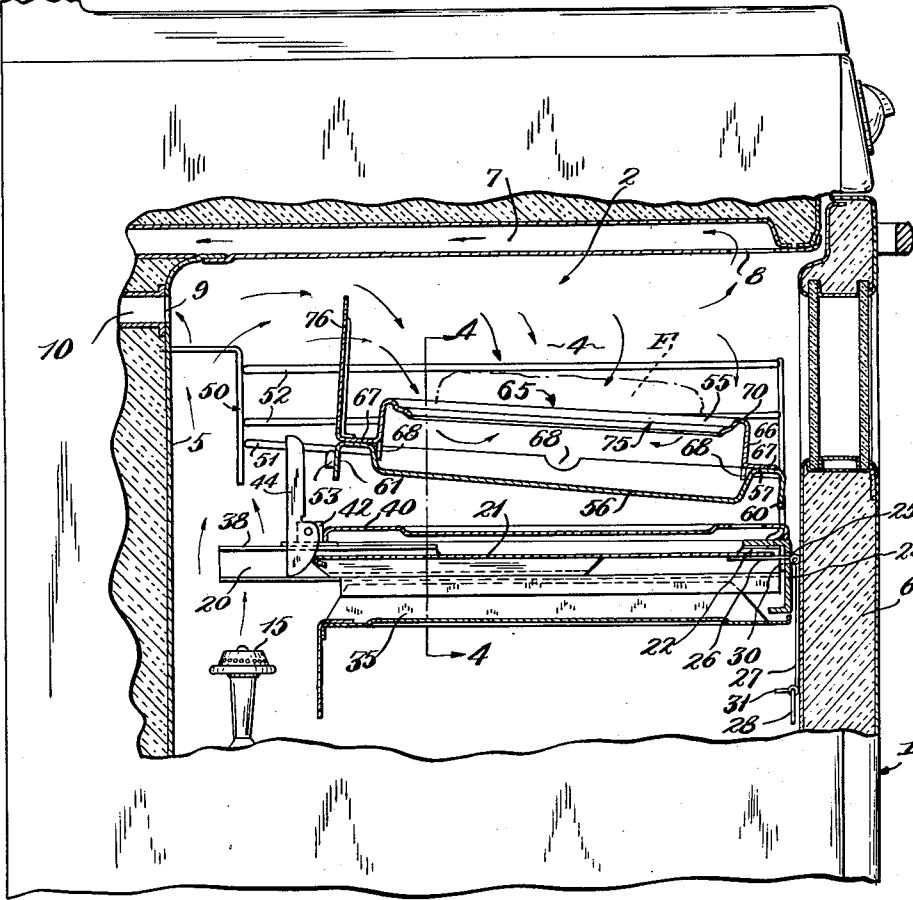


FIG. 1

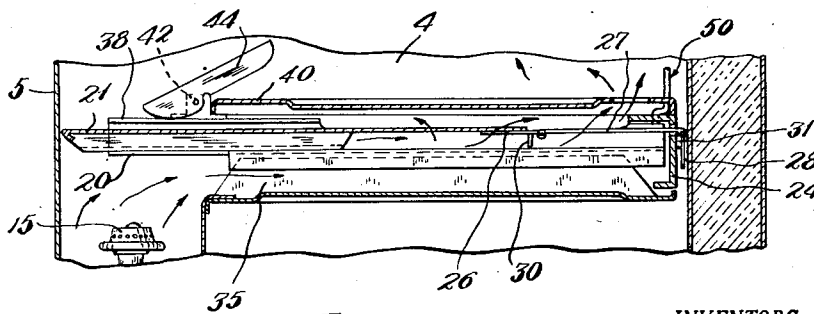


FIG. 2

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3 Sheets-Sheet 2

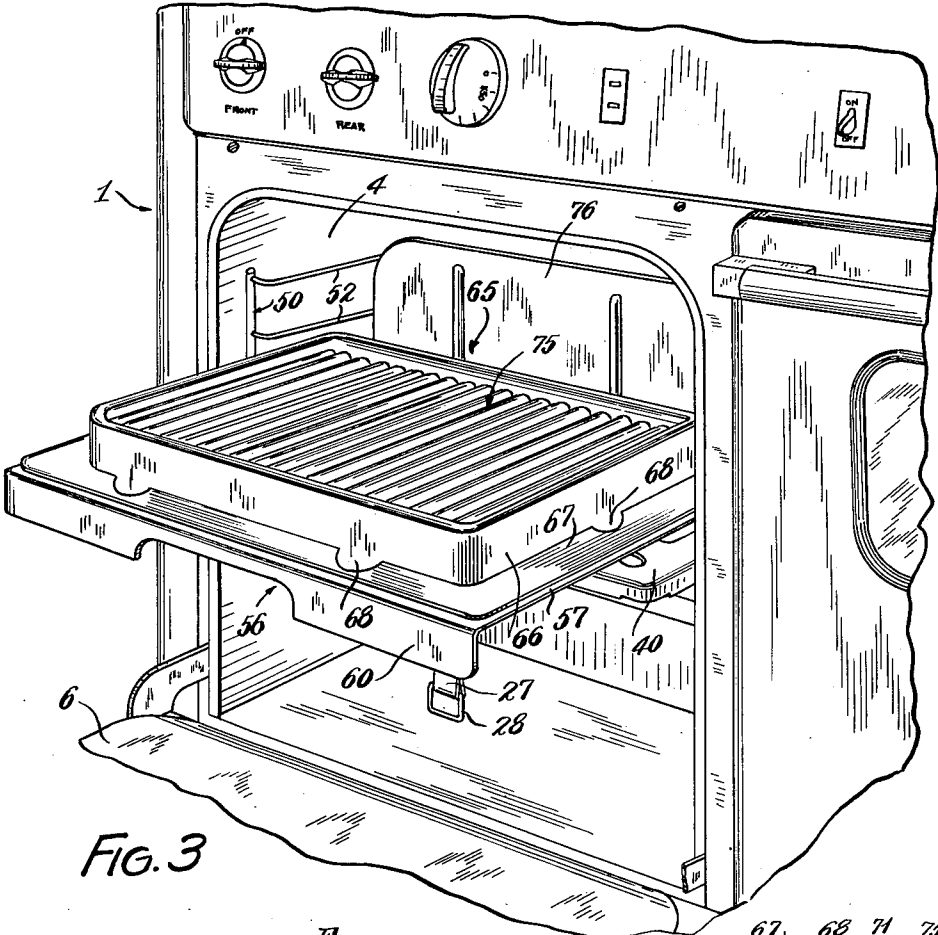


FIG. 3

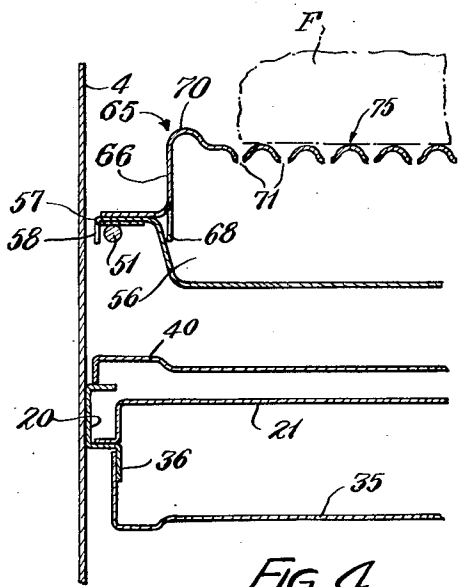


FIG. 4

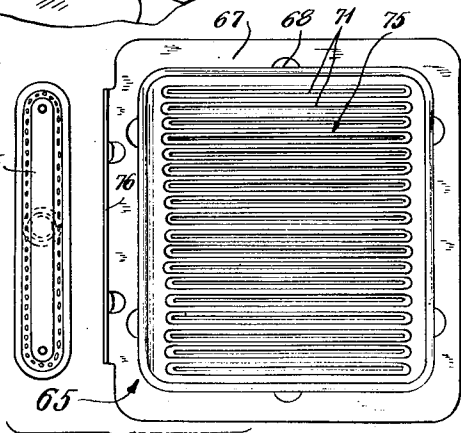


FIG. 5

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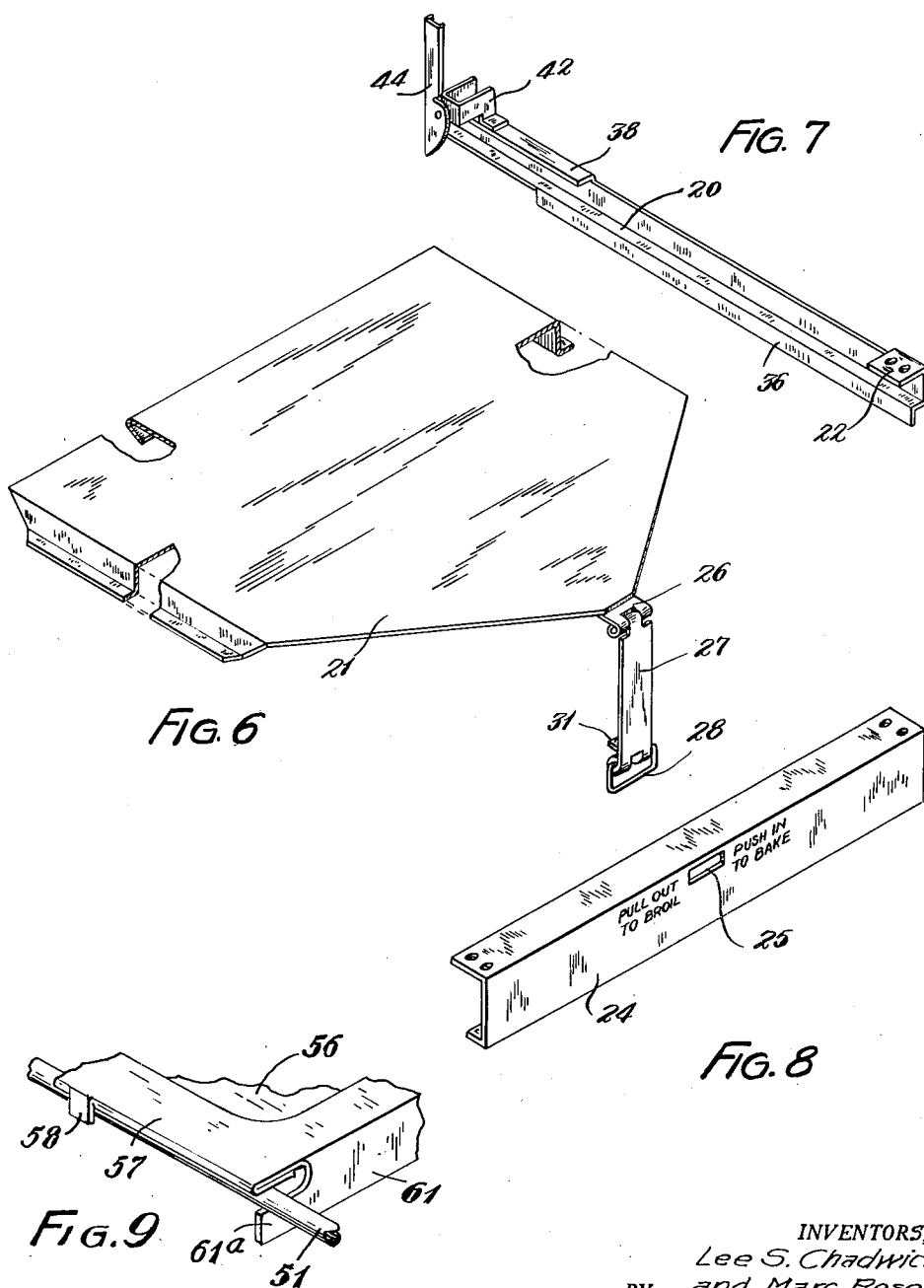
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,604,033

BROILING EQUIPMENT FOR USE IN OVENS

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Application September 16, 1949, Serial No. 116,176

8 Claims. (Cl. 99-447)

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This invention relates to improvements in broiling apparatus especially intended for use in ovens similar to that which form the subject matter of the application of Marc Resek, et al., Serial No. 20,784, filed April 13, 1948.

In the convertible oven of the former case, as in the one herein disclosed in connection with the present invention, there is a so-called flow-control element or deflector that is shiftable from one position to another in the conversion of the oven.

An object of the present invention is to provide a broiling apparatus by which low-temperature broiling, a method that is very desirable and advantageous for many reasons, may be performed in a highly satisfactory manner.

Another object is to provide broiling equipment which supports the food in such a way, and in such relation to the source of heat, and which distributes the heat in such manner, as to broil the food on both sides simultaneously and uniformly, thus saving the time and trouble of turning the food, and making it unnecessary to open the oven door during a broiling operation, the door preferably including a window through which the food may be observed from time to time and progress of the operation followed.

As is customary, a broiler drip pan constitutes a part of the equipment; and another object of the invention is to so direct and control the flow of heated fluid through the oven during the broiling operation as to prevent said pan from becoming overheated, thus avoiding smoke and disagreeable odors, as well as preventing grease in the pan from catching fire, and the consequential burning of the food from this source.

The foregoing objects and advantages, with others hereinafter appearing, are attained in the embodiment of the invention illustrated in the accompanying drawings wherein Fig. 1 is a fragmentary side elevational view of a cooking range with parts broken away to show the convertible oven in vertical section and conditioned for a broiling operation; Fig. 2 is a similar sectional view through a part of the oven, showing the oven conditioned for baking, heating, etc.; Fig. 3 is a fragmentary perspective view of the range, showing the broiling equipment partially withdrawn from the oven; Fig. 4 is a sectional detail, substantially on the line 4-4 of Fig. 1, and on a scale considerably enlarged over that of the latter view, the present figure being somewhat in the nature of a diagram, parts beyond the plane of section being omitted; Fig. 5 is a plan view of the broiler grid and burner, showing approxi-

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mately the relationship between the grid and burner during a broiling operation; Fig. 6 is a perspective view of the deflector, Fig. 7 is a similar view of one of the guides by which the deflector is slidably supported, this view including, also, the obstructer for the broiling equipment; Fig. 8 is a perspective view of the front channel, and Fig. 9, a detail of the broiler pan and guide.

Like reference characters designate like parts in the several views of the drawings.

1 denotes, generally, a range body that encloses, with other compartments, a convertible oven compartment 2. This compartment is defined by a top wall 3, side walls 4, a rear wall 5, and a bottom wall 11 that appears only in Fig. 3. The open front of the compartment 2 is normally closed by a door 6. A flue 7 surmounts the top wall 3 and extends therealong from near the front end of said wall rearwardly to the usual vent passage (not shown), the compartment communicating with said flue through an opening 8 in the top wall adjacent the front end of the latter. The rear and side walls merge with the top wall through curved portions of considerable radius to aid in cleaning the oven. In the foregoing respects, the present oven is substantially the same as the construction disclosed in the previously mentioned application Serial No. 20,784.

In the present construction there is, desirably, a second outlet opening 9, located in the central top portion of the rear wall 5. This opening communicates, through a short flue 10, with the previously mentioned vent passage.

Situated in the lower rear part of the oven compartment 2 is an elongated gas burner 15 (Figs. 1, 2 and 5), the same being connected in the usual way with the piping of the range and having the supply of gas thereto controlled by the customary manual and thermostatic valves. Also, the usual flash tube and pilot are provided for initially lighting the burner and for relighting it in the action of the thermostat, all of which will be readily understood by those skilled in the art. These features are omitted from the drawings as they constitute no part of the present invention and would tend to confuse rather than clarify the reading of the drawings as they pertain to the invention at hand.

Suitably secured to the side walls 4 of the oven compartment, in the same horizontal plane, are guides (the one on the right hand side of the compartment being shown in the drawings and designated 20). These guides slidably support a deflector 21. Perspective view of the de-

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flector, and one of said guides, constitute Figs. 6 and 7, respectively. Supported across the front of the oven compartment, with its top flange resting upon and attached to lugs 22, that are desirably formed integral with the guides 20, is a front member or channel 24 having, in its web, a slot 25 through which may extend a tongue 26 that is suitably fastened to the front end of the deflector 21. Hingedly connected to the end of said tongue remote from the deflector, is a handle 27, having a ring 28 pivoted to its free end. The tongue 26 and handle 27 are formed of sheet metal, and material struck from the respective parts provide stops 30 and 31, the former serving, by engagement with the inner side of the web of the channel 24, to limit the forward movement of the deflector, while rearward movement thereof is arrested by contact of the stop 31 with the front surface of said web.

The portion of the oven compartment below the plane of the front member or channel 24 is set off from the space thereabove by a panel 35, shown as carried by and between depending flanges 36 of the guides 20. Removably supported by the front member or channel 24 and by rear top flanges 38 of the guides 20 is the oven bottom plate 40, which is similar to the corresponding element of the oven construction disclosed in the before-mentioned application. Said bottom plate is positioned in a lateral direction by the side walls of the oven, and in a direction at right angles thereto by stops 42 wherewith its rear edge engages. These stops are secured to and rise from the flanges 38 of the guides 20 and extend inwardly a distance therefrom, as best shown in the perspective view of Fig. 7. Loosely pivoted to one of the stops (in the present instance to the one adjacent the right hand side of the oven) is an obstructer 44 that is so weighted as to automatically assume a substantially vertical and ineffective position (as shown in Fig. 1) when free to do so. This is permitted when the deflector 21 is in its forward position, which position it occupies when the oven is conditioned for broiling. The lower end of the obstructer 44 is in the path of the deflector and is engaged by the rear edge thereof and thrown to and held in a forwardly and upwardly inclined position, as shown in Fig. 2, when the deflector is shifted to its rear position, or that which it occupies when the oven is conditioned for baking or other similar operations, under which circumstances the broiling equipment is removed from the oven. When the obstructer is in the last described or effective position, as shown in Fig. 2, it prevents the broiling equipment from assuming broiling position in the oven. In fact, under this circumstance, the broiler equipment protrudes from the front of the oven and prevents the door 6 from closing.

So-called rack guides 50 are removably supported in the oven compartment adjacent the side walls thereof. These rack guides form the subject matter of a separate application, Serial No. 124,158 filed by us on the 28th day of October 1949. It may here be explained, however, that each rack guide is fabricated of heavy wire or rod-like elements that are welded together and each guide includes a rearwardly and upwardly inclined bar 51 and horizontal bars 52 that are suitably spaced above the bar 51. The bottom bars of the rack guides have depending stops 53, and support the broiling equipment.

The broiling equipment comprises a broiler grid 55 and a broiler pan 56. The pan is deeper

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at the front than at the back, as shown in Fig. 1, and it is surrounded by a substantially flat marginal portion 57 that is turned under along its lateral edges where it is adapted to rest on the bars 51 of the opposed rack guides, and it is held against lateral displacement from said bars by depending lugs 58 (Fig. 4). Front and rear flanges 60 and 61, respectively, which are of the same vertical dimensions, depend from the corresponding edges of the marginal portion 57 to a depth below the plane of the deepest part of the pan, so that when the pan is placed upon a supporting surface, the marginal portion 57 is parallel thereto, while any liquid in the pan will collect in the front portion thereof. It may be explained that the flanges 60 and 61 extend the full width of the marginal portion 57, and that the back flange is notched to accommodate the bars 51 and so as to extend beneath said bar for engagement with the stops 53.

The broiler grid 55, in its present preferred form, is made from a single piece of sheet metal, and it includes an elevated food support 65 of about the same outline in plan as the depressed portion or sump of the broiler pan 56. Said food support includes a peripheral wall 66; and a base flange 67 flares outwardly from the lower end of the wall 66 and is adapted to bear upon the marginal portion 57 of the pan when the broiler equipment is in assembled condition. Lugs 68, that are struck from the flange 67, lie in the plane of the peripheral wall 66 and engage the inner side of the marginal wall of the pan 56 so as to hold the grid 55 in position thereon. The peripheral wall 66 joins, through an upwardly and inwardly curved portion or bead 70, a generally flat and slightly depressed top section that is provided with closely spaced slots 71 that are parallel with the sides of the grid. Between adjacent slots, said section is curved upwardly, as shown best in Fig. 4, to produce, in effect, a series of bars constituting a grill 75 for the support of the food, the latter being indicated at F, in Figs. 1 and 4, by broken lines. Rising from the rear edge of the base flange 67, to a height well above the plane of the grill 75, is a shield 76.

As previously explained, the oven is illustrated in Fig. 1 in condition for broiling, with the deflector 21 in forward position where it is located by the engagement of the stop 30 with the inner side of the web of the front channel 24, this having been accomplished by grasping the ring 28 and pulling the handle 27 forwardly through the slot 25, as indicated by legend appearing on the front of said channel. With the deflector in its forward position the obstructer 44 is retained by gravity in ineffective, substantially vertical, position. Accordingly nothing interferes with pushing the broiler equipment inwardly along the bottom bars 51 of the opposed guides 50 until the rear flange 61 of the broiler pan engages the stops 53.

Assuming that the grid is in position on the broiler pan, and that the food F has been placed upon the grill 75, and, further, that the burner has been lit and the door 6 closed, the broiling operation proceeds. Heat from the burner rises within the rear of the oven and spreads forwardly throughout the top portion thereof, passing over and about the shield 76 and impinging upon the food F. A part of the heat passes downwardly about and beneath the food through the slots 71 and along the channels formed by the upwardly arched bar-like parts of the grill between said slots. Thus, the heat has access to substantially

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the entire surface of the food simultaneously and broils it uniformly on both sides without the necessity of turning the food over. Obviously, the shield 76 becomes quite hot during a broiling operation by reason of its proximity to the column of products rising from the burner; and it is further evident that, as a consequence thereof, due to the continuity of the parts, considerable heat is conducted from the shield to the under side of the food by way of the rear portion of the base flange 67 and the bar-like parts of the grill, thus enhancing the broiling operation. The progress of the broiling operation may be observed through the window in the door 6, it being mentioned in passing that the oven is desirably equipped with an electric light (not shown) in accordance with modern practice. Juices and greases from the food drop through the slots 71 into the pan 56 and accumulate in the lower portion thereof, remote from the source of heat, and the pan is prevented from becoming hot enough to cause smoke and resultant odors by reason of its being shielded from the intense heat of the burner by the deflector 21 and the bottom 40.

When the broiler equipment is partially withdrawn from the oven, as in Fig. 3, for the purpose of placing food on the grid or removing it therefrom, the broiler pan and grid are prevented from tilting forwardly by stops 61^a (one of which is shown in Fig. 9) that are disposed beneath the bars 51 of the opposed rack guides 50. These stops, in the present instance, are provided by notching the rear flange 61 of the broiler pan at the upper corners of its opposite ends for the accommodation of the bars 51.

In order to place the oven in condition for baking or similar purposes, as illustrated in Fig. 2, the broiler pan and grid are withdrawn from the oven, and the handle 27 is lifted and pushed in through the slot 25 in the front channel 24, according to the instructions appearing on said channel to the right of said slot in Fig. 8, thereby to shift the deflector 21 to the rear until its movement is arrested by the engagement of the stop 31 with the front surface of the channel 24. This movement of the deflector causes the obstructor 44 to be swung to a forwardly and upwardly inclined position, in which it is effective for preventing the broiler equipment from being fully inserted into the oven, thus safeguarding against the error of attempting a broiling operation with the deflector 21 in its rear position. With the broiler equipment removed from the top portion of the oven, a rack of suitable design may be inserted on either the upper or the lower bars 52 of the opposed rack supports; and when either the rack, or the broiling equipment, is not in use, it may be stored conveniently in the bottom portion of the oven compartment below the panel 35.

Having thus described our invention, what we claim is:

1. Broiling equipment for use in an oven of a given size and of the type enclosed in part by opposed substantially vertical walls and a top wall and characterized by combustion means located adjacent the lower part of one of said vertical walls; said equipment including a broiler grid having a substantially flat food supporting surface, a shield carried by the grid and rising adjacent one edge thereof a substantial distance above the plane of said surface, and means for removably supporting said equipment in such an oven with said food supporting surface substan-

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tially horizontal and with said shield disposed in an approximately vertical plane between said surface and the combustion means, said shield being of such size and shape relative to the oven wherewith it is intended for use that its side and top edges will be in spaced relation to the opposed walls and the top wall of the oven.

2. Broiling equipment for use in an oven of a given size and of the type enclosed in part by opposed substantially vertical walls and a top wall and characterized by combustion means located adjacent the lower part of one of said side walls; said equipment comprising a broiler pan, means for removably supporting said pan in a generally horizontal position in such an oven, a broiler grid surmounting and sustained solely by the pan and having a substantially flat food supporting surface, a shield carried by the grid and rising adjacent one edge thereof a substantial distance above the plane of said surface and being of such size and shape relative to the oven wherewith it is intended for use that its side and top edges will be spaced from the opposed walls and the top wall of the oven when the pan, surmounted by the grid, is supported by the aforesaid means.

3. Broiling equipment for use in an oven of a given size and of the type enclosed in part by substantially vertical side and rear walls and a substantially horizontal top wall and characterized by combustion means extending along the bottom of the oven adjacent the rear wall and by opposed guides adjacent the side walls that are inclined at a slight angle rearwardly and upwardly from the front portion of the oven, certain of said walls having outlet means adjacent the top of the oven; said equipment comprising a broiler pan having marginal portions along its lateral sides adapted to bear upon said guides, a broiler grid surmounting and sustained solely by the pan and having a substantially flat food supporting surface in a plane substantially parallel to the plane of said marginal portions of the pan, a shield carried by the grid and rising from the rear edge thereof a substantial distance above the plane of said food supporting surface and being of such size and shape relative to the oven wherewith it is intended for use that its top and side edges will be spaced from the top and side walls of the oven when the pan, surmounted by the grid, is supported by the aforesaid means, and stop means for definitely locating the pan in the oven so that said shield is spaced a substantial distance from the rear wall of the oven thereby to produce, in effect, a vertical flue in which the products from the combustion means rise.

4. Broiling equipment comprising a broiler pan formed from a single piece of sheet metal to provide a depression surrounded adjacent its top by a flat marginal portion, said depression being deeper at front than at rear, front and rear flanges of substantially equal depth depending from the front and rear edges, respectively, of said marginal portion, the sheet metal being turned downwardly and inwardly against itself along the sides of said portion; and a grid surmounting the pan, the same having a base flange designed to rest upon said marginal portion of the pan and a peripheral wall rising from the inner edge of said base flange, a flat food supporting grill in approximately the plane of the top of said peripheral wall and joined thereto, and lugs depending from the grid at intervals thereabout

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into the depression of the broiler pan adjacent said marginal portion thereof.

5. Broiling equipment comprising a broiler pan surrounded adjacent its top by a flat marginal portion and being deeper at front than at rear, front and rear flanges of substantially equal depth depending from the front and rear edges, respectively, of said marginal portion, and a grid surmounting the pan, the grid having a base flange designed to rest upon said marginal portion of the pan and a peripheral wall rising from the inner edge of said base flange, a flat food supporting grill in approximately the plane of the top of said peripheral wall and joined thereto, and a shield rising from the rear edge of the base flange of the grid a substantial distance above the plane of the grill.

6. Broiler equipment according to claim 5, wherein said grid, including the shield, is formed from a continuous piece of sheet metal.

7. Broiling equipment comprising a broiler pan including a peripheral wall surrounded adjacent its top by a flat marginal portion, and a grid surmounting the pan, said grid being formed from a single piece of sheet metal and comprising a base flange designed to rest upon said marginal portion of the pan, a substantially vertical wall rising from the inner edge of said base flange, a flat food supporting grill in approximately the plane of the top of said peripheral wall and consisting of a substantially rectangular area occupied by a series of parallel slots, the material between adjacent slots being arched upwardly to form ribs for the support of the food to be broiled, and lugs depending from the grid at intervals thereabout

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for contact with the inner surface of the peripheral wall of the broiler pan.

8. Broiling equipment according to claim 7, wherein said lugs are struck from the base flange of the grid and depend in the approximate plane of said substantially vertical wall.

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MARC RESEK.

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