Aug. 28, 1956 F. H. SCHNEIDER 2,761,053

AUXILIARY DEEP WELL BROILING UNIT FOR A RANGE

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Fig. 1.

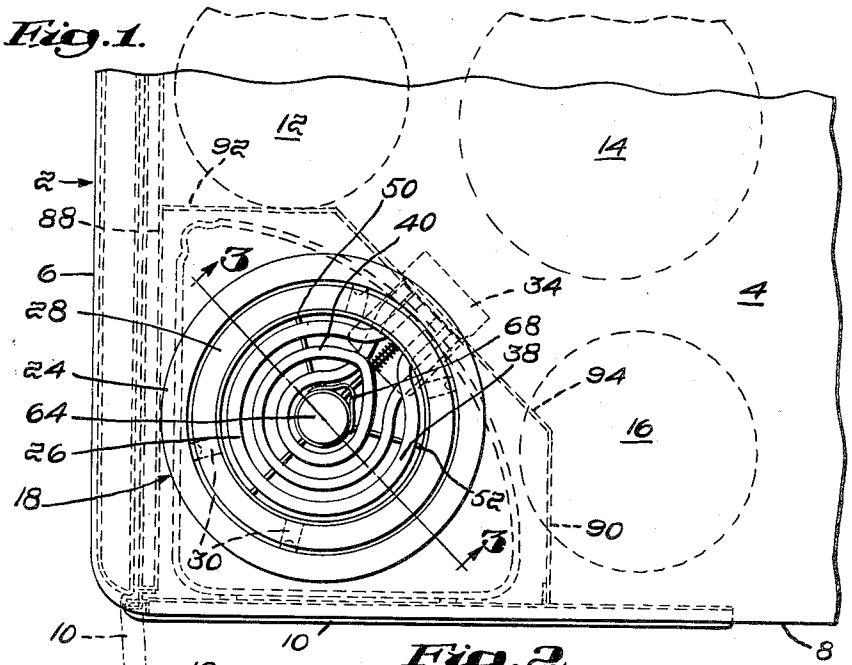
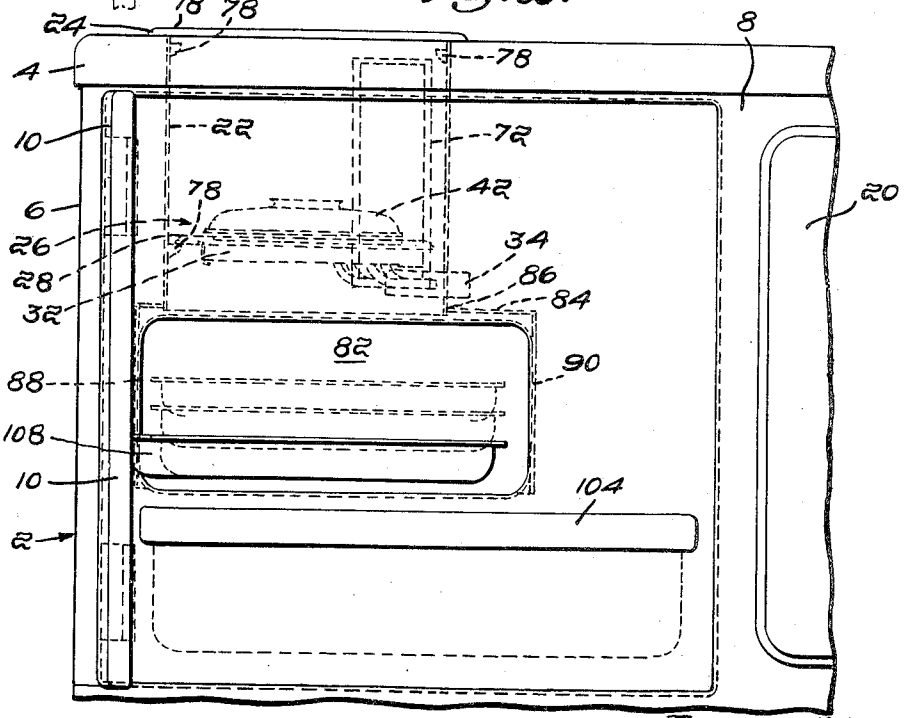


Fig. 2.



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Fig. 3.

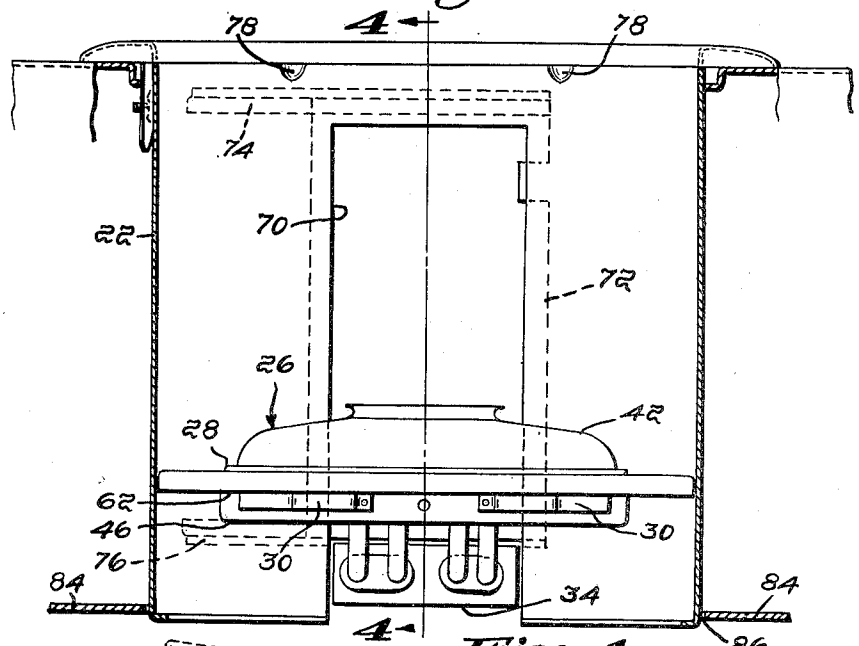
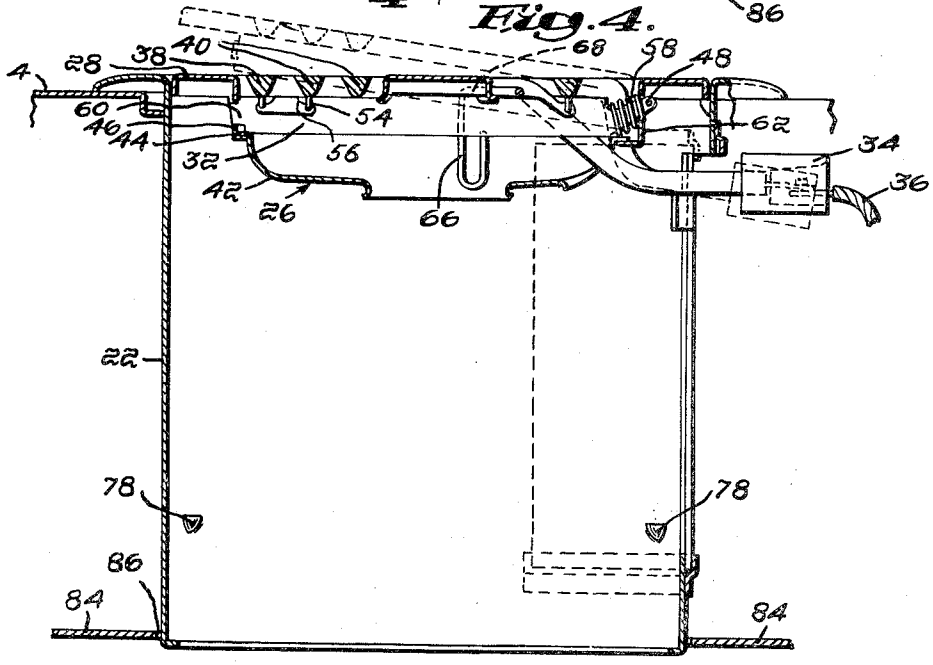


Fig. 4.



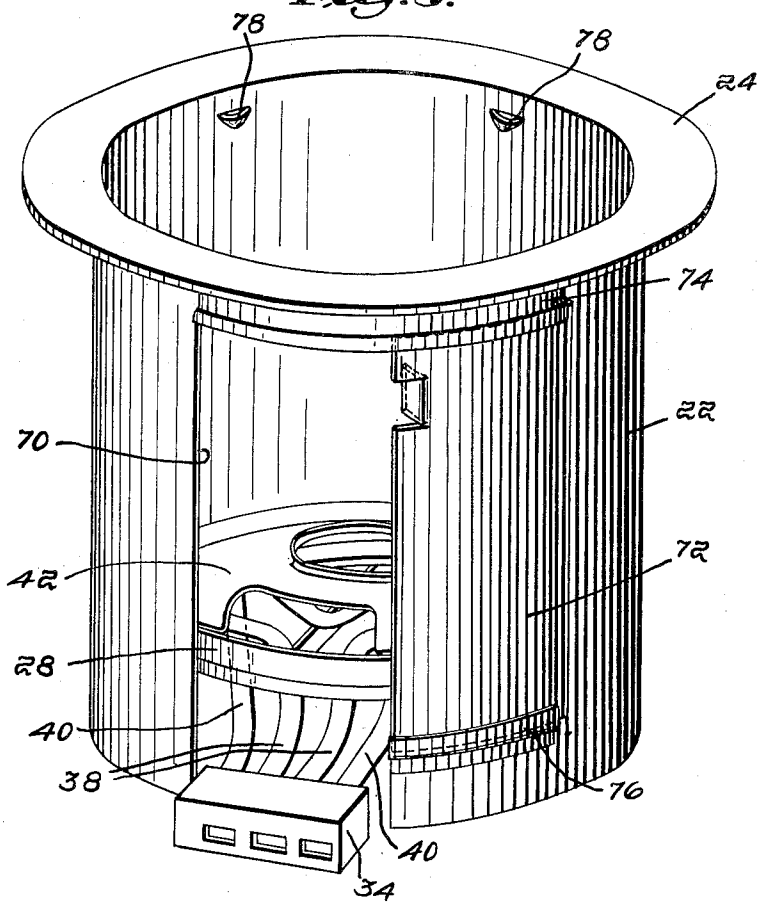
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Fig. 5.



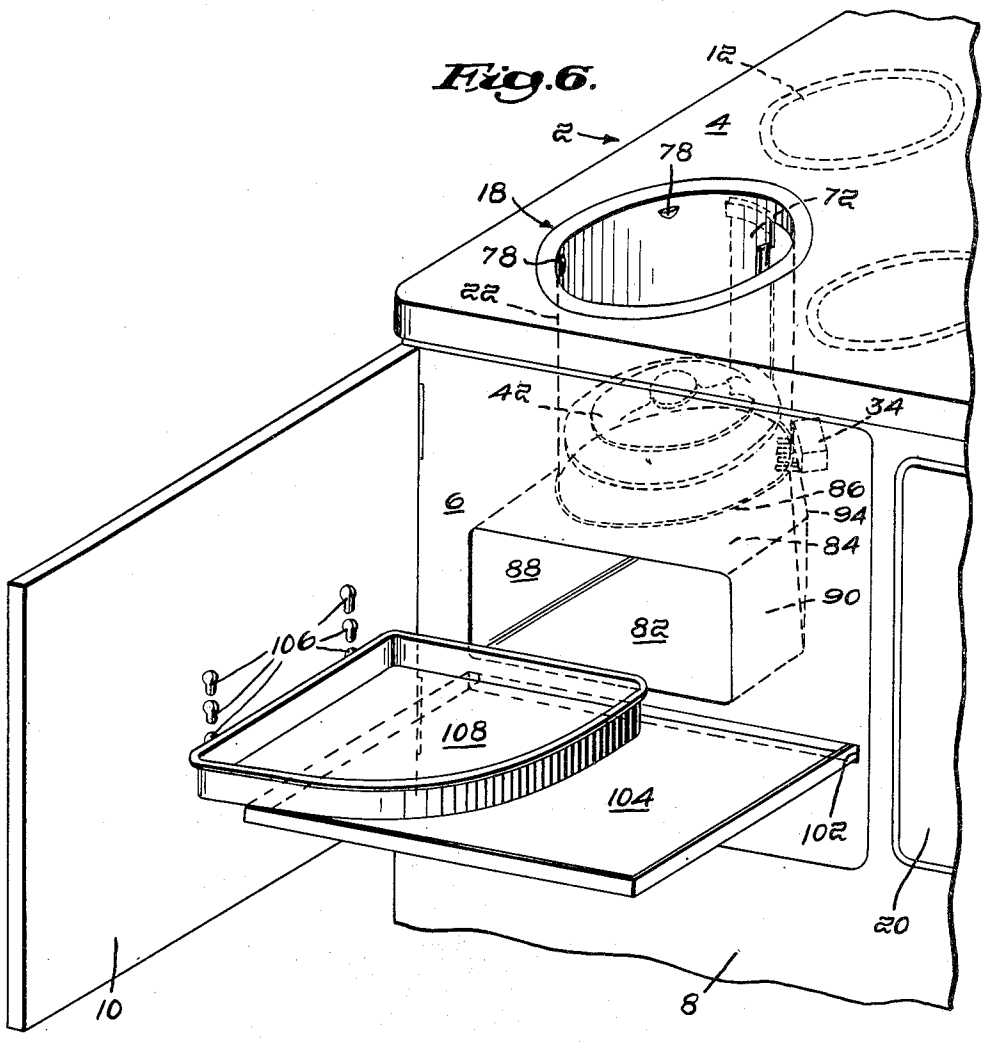
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Fig. 6.



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AUXILIARY DEEP WELL BROILING UNIT FOR A RANGE

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Application March 9, 1954, Serial No. 414,999

5 Claims. (Cl. 219—37)

This invention relates to stoves and is particularly concerned with electric cooking ranges of the general type now in use in homes.

As is well known the typical household electric range now in use is provided with either a separate full size broiling compartment or a combination broiling and baking compartment. Since such conventional broiling and baking compartments are of substantial volume, considerable heat is required to heat these spaces. While the amount of heat required to satisfactorily cook larger conventional articles of food, such as steaks and poultry, is not unduly great, in certain cases operation of such compartments becomes uneconomical. For example, in broiling one or two chops in a conventional broiling compartment using electrical elements, far more current is used than is actually required for the cooking operation could the heat be more effectively applied.

Many electrical ranges now in use also include a deep well cooker which is normally positioned away from the front of the range adjacent the back guard. While deep well cookers have many advantages, in general, they are not employed to the same extent as the other surface units.

Accordingly, it is an object of this invention to provide a small independent broiling compartment which will more efficiently permit broiling of small quantities of food.

More particularly, it is an object of this invention to provide a small independent broiling compartment which obtains its heat from the heating element of a deep well cooker, the heating element still being available for surface or deep well cooking purposes when not supplying heat to the small broiler compartment.

In order to realize the foregoing objects, special provision is made for causing the heat of the deep well cooking element to be directed downwardly during broiling rather than upwardly as in normal use, and at the same time a special small broiling compartment is provided which communicates with the deep well and is adapted to receive a broiling pan in which small quantities of food have been placed. This compartment confines the heat to the immediate vicinity of the food, and because of its particular construction protects adjacent cooking elements from both high temperatures and the deposit thereon of fats and greases normally carried by high temperature broiling vapors. By slight modification of the deep well such vapors will be substantially entirely exhausted to the atmosphere out of the top of the well. The modifications above referred to are accomplished without change in the general external appearance of the range.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood, by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

Fig. 1 is a top view of a portion of an electric range utilizing the present invention, showing in dotted lines

the general configuration of the broiling compartment introduced by this invention.

Fig. 2 is a front vertical view of the range as seen with the door to the broiling compartment introduced by this invention in open position, a deep well heating element being arranged in broiling position and a broiling pan being positioned within the broiling compartment.

Fig. 3 presents an enlarged vertical section of the deep well taken on line 3—3 of Fig. 1, the deep well sliding panel being in closed position, together with an exterior vertical view of the cooking element and the reflector pan in broiling position.

Fig. 4 is an enlarged vertical section of the deep well taken on line 4—4 of Fig. 3, with the cooking element positioned at the top of the deep well and showing in dotted lines how the cooking element is pivoted to permit removal or replacement of the reflector pan, the deep well sliding panel being in open position.

Fig. 5 is a perspective view of the complete deep well unit removed from the range with the cooking element in broiling position and the sliding panel open.

Fig. 6 is a perspective view of a portion of an electric range utilizing the present invention, showing in dotted lines the broiling compartment and the cooking element in broiling position, and further showing a broiling pan mounted on the open door of the compartment.

Referring to Figs. 1, 2 and 6, there is shown an electric range 2 broken away at its right hand end. This range has a top 4 provided with a back guard wall or splasher (not shown), a side wall 6, a front wall 8 provided with a door 10, three surface cooking elements which are indicated in Figs. 1 and 6 at 12, 14 and 16 and a deep well cooking unit 18.

Located on the right hand end of the range and partly shown in Fig. 2, is a conventional broiling and baking oven 20.

Although deep well cooking units are conventionally located at the rear of the range, for the purposes of this invention the deep well unit may be positioned either at a rear or a front corner of the range. In Fig. 1 the deep well unit is shown adjacent the front left hand corner, this being the preferred position. However, as stated above, the deep well unit may be located at the rear of the range. In that case, for the purposes of utilizing the present invention, access must be provided through a side wall of the range to the novel independent broiling compartment described hereinafter.

The deep well cooking unit comprises a receptacle 22 having a rim 24 resting on the edge of a circular hole in the top wall of the range. Mounted within the deep well receptacle is a conventional electrical cooking unit 26.

As seen in Figs. 1, 3 and 4, this cooking unit comprises a supporting circular rim 28 which is provided with a plurality of spacing lugs 30 on its lower side. A spider 32 is carried by the rim and supports an electrical heating element of conventional construction comprising an insulating block 34 to which leads 36 may be connected to supply current and two circularly convoluted elements identified as exterior coiled element 38 and interior coiled element 40. Each of these elements is triangularly shaped in cross-section as shown in Fig. 4. The top surface of each of these elements is flat in order that the heat emanating therefrom will be better conducted to a flat pan resting thereon.

However, it is apparent that each element has a greater exposed surface area facing in a downward direction than in an upward direction. In order to direct the heat radiated from these bottom surfaces of the coiled heating elements upwardly toward a pan resting on top of these elements, a reflector pan 42 is normally carried

below the element during normal surface use of the deep well cooking element.

The reflector pan is shown in Fig. 4 in the position it normally occupies when the heating unit of the deep well cooker is positioned for surface cooking. The upper outwardly extending peripheral lip **44** of the reflector pan rests on the inturned lip **46** of the circular rim **28** of the cooking element. The reflector pan is cut away as shown in Figs. 1, 4 and 5, to accommodate the leads of the heating elements which extend through the wall of the deep well receptacle.

Spider **32** bearing the heating elements is pivoted at **48** to the vertical portion **62** of rim **28** of the cooking unit in order to permit the heating elements **38** and **40** and spider **32** to be swung upwardly to facilitate removal of reflector pan **42**. After the reflector pan has been removed, the heating elements are lowered again to their original horizontal position, and the reflector pan may be placed in an inverted position over the cooking elements, as shown in Figs. 2, 3 and 5.

As shown in Fig. 1 the spider has two laterally extending legs **50** and **52** which also rest on lip **46** of circular rim **28** of the cooking unit. The convoluted heating elements are anchored to the spider legs by loops **54** hooked over fingers **56** formed by cutting away portions of the spider. The right hand end of the spider as seen in Fig. 4 is pivotally secured to the rim in such a manner that the spider and the elements carried thereby can be swung upwardly to the right, as shown by the dotted line position of the spider in Fig. 4. A coiled spring **58**, shown in Fig. 4, permits movement to the right of the spider so that its left hand end can be removed from opening **60** in the vertical depending portion **62** of rim **28**. This hole acts as a latch to hold the spider horizontally secured.

A central cover plate **64** is located within the innermost convolution of the inner heating element and loosely rests on the spider in suitable slots (not shown). A lifting ring or bail is loosely secured to the spider.

This ring has a bottom depending portion **66** at right angles to a top portion **68** which rests loosely upon the spider. When the ring is pulled, its bottom portion comes into contact with the spider, thereby lifting cooking unit **26**. If the spider has been disconnected from circular hole **60** in rim **28**, it will pivot upwardly to the right, as illustrated in Fig. 4, when the ring is pulled.

The deep well receptacle **22** is provided with a vertically positioned slot **70** in its side wall to permit the cooking unit to be slidably moved from its upper surface cooking position, as shown in Fig. 4, to its lower broiling position as shown in Fig. 3. Deep well receptacle **22** is provided with a door **72** which is slidably mounted in cooperating channel members **74** and **76** secured to the exterior of the receptacle. As shown in Fig. 3, this door can be closed when the cooking unit is in the lower broiling or deep well position. This door when closed serves to confine the vapors emanating from the auxiliary broiling compartment, to be described hereinafter, to the deep well unit from which the vapors are exhausted to the atmosphere. Necessarily this door must be in the open position when the cooking element is raised to its topmost position.

The deep well receptacle is provided with two series of circularly arranged protuberances **78** extending inwardly of the receptacle. While they may be separate sections secured to the receptacle, these protuberances are preferably constructed by depressing selected areas of the receptacle. These protuberances serve to accommodate spacing lugs **30** of the cooking unit which are located adjacent the ends of the convoluted heating elements and on the side of the rim diametrically opposite to said heating element ends. The spacing lugs, as seen in Fig. 1 in dotted lines, are secured on the under side of the rim of the cooking unit.

Because of the positions selected for the protuberances which support the cooking unit, it is possible to adjust the cooking unit to either the top position illustrated in Fig. 4, or the bottom position illustrated in Figs. 2 and 3. This adjustment is accomplished by gripping the unit and tilting it about a horizontal axis lying in a plane vertical to the plane of Fig. 4. Obviously, the unit must be tilted sufficiently to clear the lugs in order to be moved upwardly or downwardly. After the unit has been moved to the correct position adjacent the desired top or bottom protuberances, it is returned to its horizontal position and its supporting lugs are allowed to rest on the protuberances.

The deep well receptacle is open at its bottom as shown in Figs. 2 and 6 in order to communicate with a novel auxiliary broiling compartment having an opening **82** in front wall **8**. The compartment comprises a top wall **84** having a circular opening **86** (Fig. 6) conforming to the periphery of the receptacle. Preferably, the top wall depends from the receptacle, being integral with or secured to the bottom edge thereof. The auxiliary broiling compartment also comprises front wall **8** and walls **88**, **90**, and **92**, all but front wall **8** depend from top wall **84**. Walls **88** and **90** are side walls parallel to range side wall **6**. Wall **92** may be viewed as the rear wall, and this rear wall and side wall are connected by a diagonal vertical wall **94**. However, it is to be understood that the construction or shape of the compartment may be otherwise, as desired. For example, the top wall **84** need not be integral with the receptacle. Its opening **86** may be sufficiently large to loosely receive the receptacle bottom and it, together with the walls depending therefrom may be supported from either front wall **8** or side wall **6** or both. Furthermore, the rear wall and the small side wall may be extended to intersect at right angles, or a single curved wall substituted in place of the rear wall, the side wall, and the diagonal wall. The larger side wall **88** is preferably spaced from the exterior side wall of the range, as shown in Fig. 1. The depending walls of the broiling compartment preferably terminate above the floor of the range as shown in Fig. 6.

Located in the front wall **8** of the range below the auxiliary broiling compartment is an elongated horizontal opening **102** in which is slidably mounted a drip or crumb pan **104** as seen in Fig. 6. The position of the crumb pan is preferably sufficiently close to the bottom edges of the depending walls of the broiling compartment to substantially act as a bottom wall of the compartment. The door **10** of the range is provided with keyhole slots **106** or other suitable means adapted to cooperate with complementary supporting means such as rivets on a broiling pan **108** whereby the broiling pan may be adjustably secured to the door. As seen in Figs. 2 and 6, the door is preferably provided with a plurality of keyhole slots, or other suitable supporting means, whereby the broiling pan may be positioned at any one of several vertical levels. Preferably, the broiling pan is shaped to conform to whatever shape the broiling compartment wall construction has been selected and in addition must be of such configuration to move freely into and out of the broiling area as the door **10** is closed or opened.

From the foregoing description, it will be clear that the area under the heating element when the door **10** is closed is an entirely confined area so that the hot gases generated therein may not spread laterally under the larger adjacent surface burners and so that the high temperature in this area may not reach the various components of the heating element that lead into the insulating block **34**.

The operation of this unit is as follows: When normal surface cooking is to be conducted on the range top employing the cooking element of the deep well unit, the heating unit will be in its uppermost position, as shown in Fig. 4. In such case reflector pan **42** will be located in its normal position below the spider to direct heat upwardly.

When the deep well cooker is to be employed for normal deep well cooking, the heating unit will be positioned as shown in Figs. 2 and 3, but with the reflector still in its normal position below the spider. The heating element is moved from its uppermost position to its lowest position in this case by tilting the entire heating unit to clear the protuberances in the side wall of the receptacle, and by thereafter lowering the unit to a position adjacent the lower plurality of protuberances **78** and then returning the unit to its normal horizontal position.

When the deep well cooker is to be employed for broiling purposes, it becomes necessary to unlatch the spider from the supporting rim of the heating unit, tilt the spider up toward the vertical as illustrated in Fig. 4, remove the reflector pan, lower the spider to its original horizontal position until it is again locked to the supporting rim, place the reflector in an inverted position on top of the convoluted heating elements, as shown in Figs. 2, 3 and 5, tilt the whole unit upwardly until it clears the protuberances in the side wall, and then lower the entire unit downwardly toward the broiling position.

Or, if preferred, the heating element may first be lowered to the position of Figs. 2, 3 and 5 after which the reflector pan may be placed in position thereover.

Current is then turned on causing the electrical heating elements to heat in the usual manner. The inverted reflector directs the heat radiating from the heating elements downwardly toward the broiling compartment. The user then places the broiling pan carrying the food to be cooked on the door at the desired level, and closes the door to move the broiling pan into the broiling compartment. When the food has been cooked as desired, the door is opened and the food can then be removed from the broiling pan.

It should be understood that after the reflector pan **42** of the heating unit has been removed from its normal nesting position beneath the spider in anticipation of the broiling operation just described, another reflector pan may be placed above the heating elements if desired. This situation might be found preferable if the first reflector pan were so dirty that it would not reflect the heat properly until cleaned.

It is also pointed out that the inclusion of a door for closing the compartment under the broiling element is not necessary since it is well understood that broiling can be conducted without having a closure at the front of the broiling compartment. In the ordinary case, however, a door will normally be provided. Furthermore, the broiling pan may be varied at will. The conventional sliding type for example could replace the door carried form herein disclosed.

It is also to be understood that the broiling pan may be pivotally supported within the broiling compartment so that it may be swung into or out of the compartment, this type of construction being taught in my U. S. Patent No. 2,669,645 issued September 25, 1951, for Auxiliary Broiling Unit for Ranges.

When reference is made in the claims to a broiling compartment or an auxiliary broiling compartment, it should be understood that such terms are intended to describe or define the space or area below the conventional deep well of an electric range.

Obviously, many modifications and variations of the present invention are possible in the light of the above teachings. It is, therefore, to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

I claim:

1. An electric range having a top and a non-invertible electric cooking element having upper and lower operating positions and located in a deep well having an opening in said top, said cooking element being movable up and down in said deep well to selected positions for surface or deep well cooking, said cooking element being pivoted to be swung upwardly above said range top when positioned substantially flush with said top in said surface cooking position, a removable reflector pan normally located under said element for surface or deep well cooking and removable from said position under said cooking element upon said element being swung upwardly and thereafter positioned on said cooking element when it is desired to use said cooking element for broiling and said cooking element is in deep well cooking position, a broiling compartment beneath said deep well, said compartment defined by side walls and having a top wall provided with an opening communicating with said deep well, whereby fumes originating in said broiling compartment will exhaust upwardly through said deep well, and a closable opening provided in an exterior vertical wall of said range providing access to said broiling compartment.

2. An electric range of the type defined by claim 1 further characterized by a slot in the wall of said deep well through which the electrical connections of the cooking element move as said element is raised or lowered.

3. An electric range of the type defined by claim 2 having a door which is positionable to close the slot in the wall of said deep well when said cooking element is in its down position.

4. An electric range having a deep well receptacle, a non-invertible electric cooking element located within said deep well and adapted to be moved from a first top position to a second bottom position, and a broiling compartment located beneath said deep well, said compartment having a top wall provided with an opening communicating with said deep well, said broiling compartment being isolated from the area below other electrical heating elements located in the top of said range, whereby fumes originating in said broiling compartment will exhaust upwardly through said deep well, said deep well being provided with a vertically extending slot through which extends components of said non-invertible electrical heating element, and a door slidably mounted on the vertical wall of said deep well adapted to close said slot when said cooking element is in its bottom position.

5. An electric range having a deep well receptacle, a non-invertible electric cooking element located within said deep well and adapted to be moved from a first top position to a second bottom position, and a broiling compartment located beneath said deep well, said compartment having a top wall provided with an opening communicating with said deep well, said broiling compartment being isolated from the area below other electrical heating elements located in the top of said range, whereby fumes originating in said broiling compartment will exhaust upwardly through said deep well, said broiling compartment further being provided with an opening in a vertical wall of said range, and a door for closing said opening to said broiling compartment, said deep well being provided with a vertically extending slot through which extends components of said non-invertible electrical heating element, and a door slidably mounted on the vertical wall of said deep well adapted to close said slot when said cooking element is in its bottom position.

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