

June 17, 1958

P. M. WEYRICK
RANGE APPARATUS

2,839,656

Filed Dec. 3, 1956

3 Sheets-Sheet 1

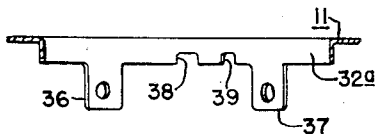
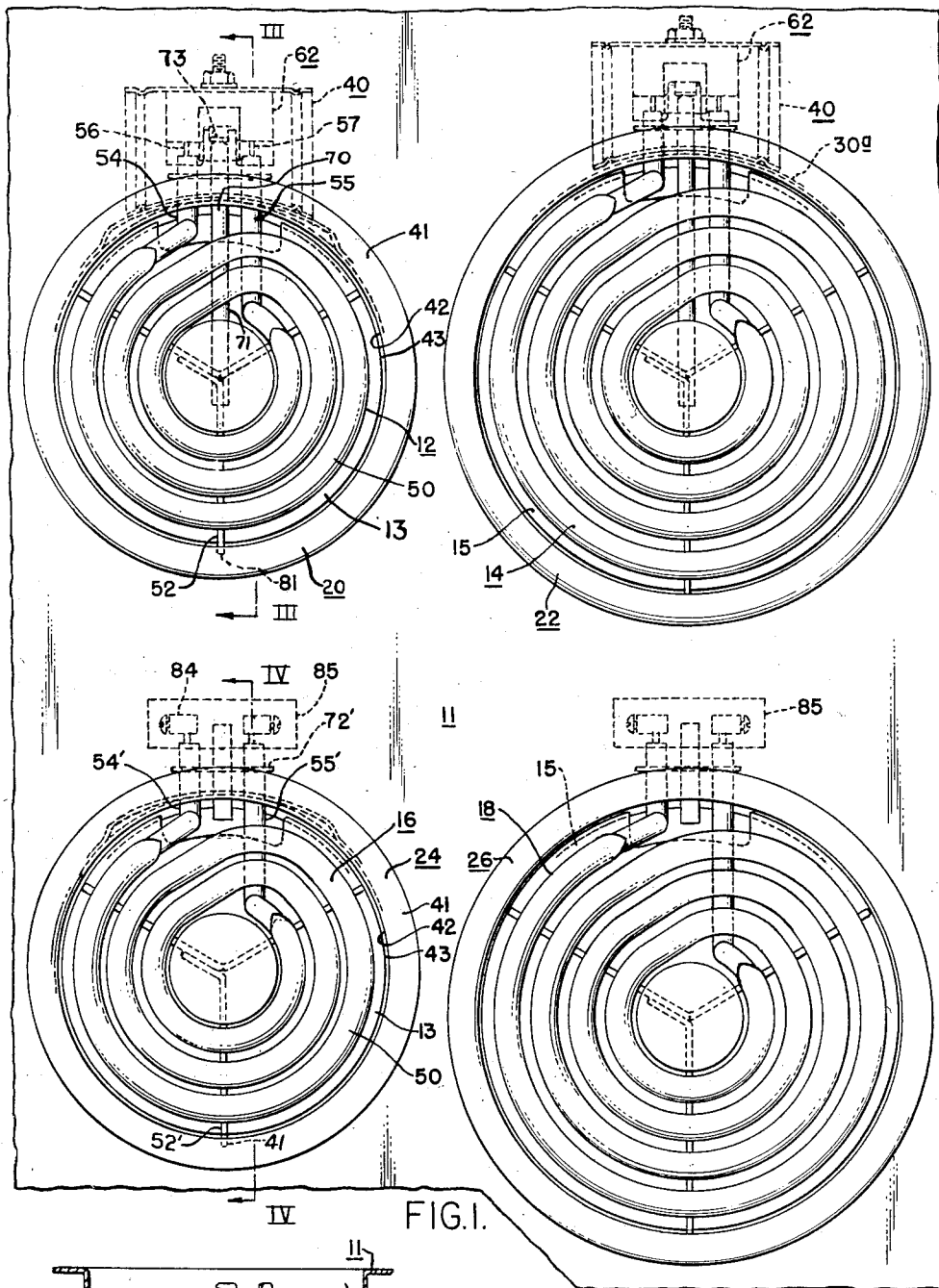


FIG. 5.

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3 Sheets-Sheet 2

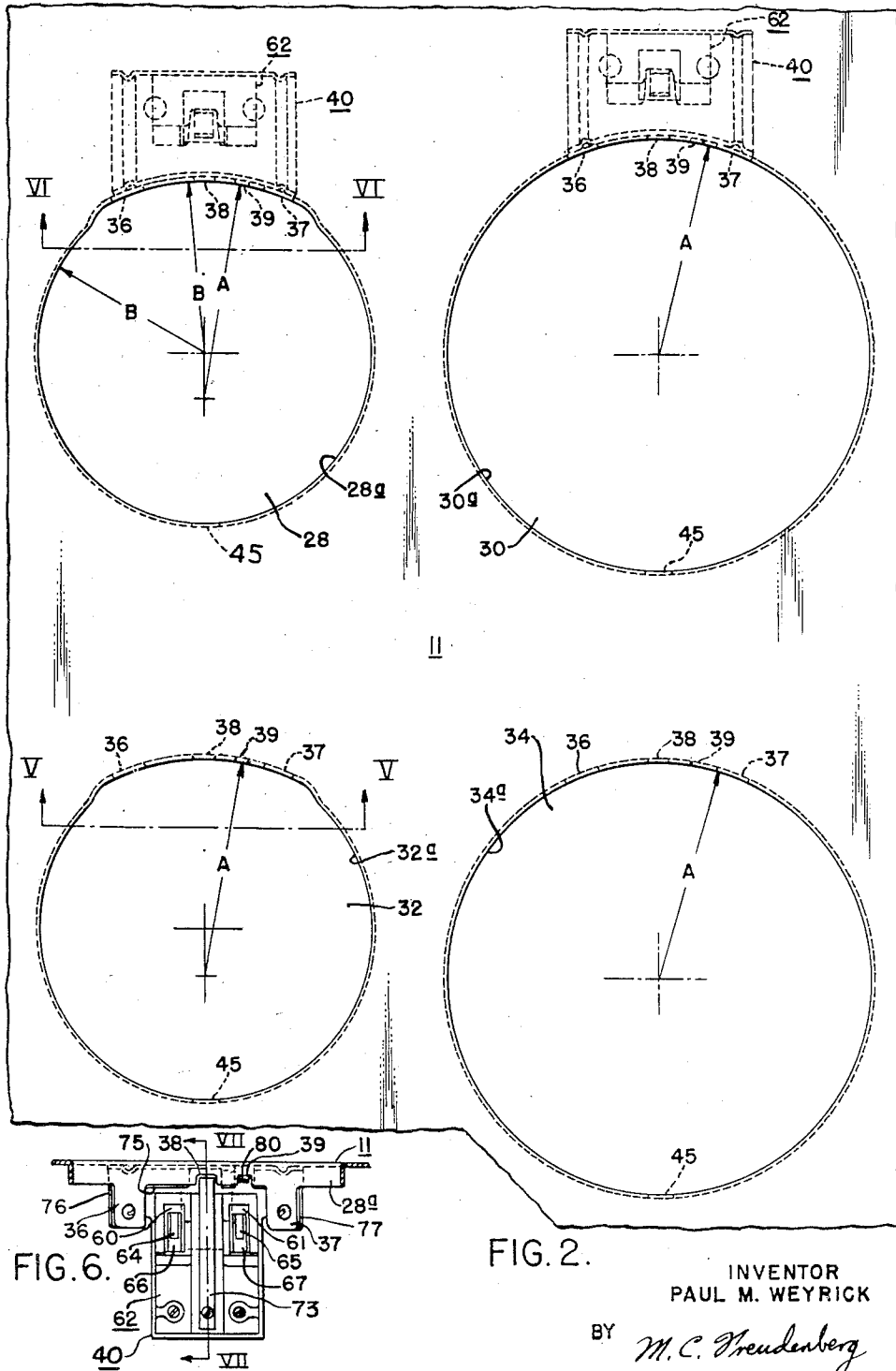


FIG. 2.

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3 Sheets-Sheet 3

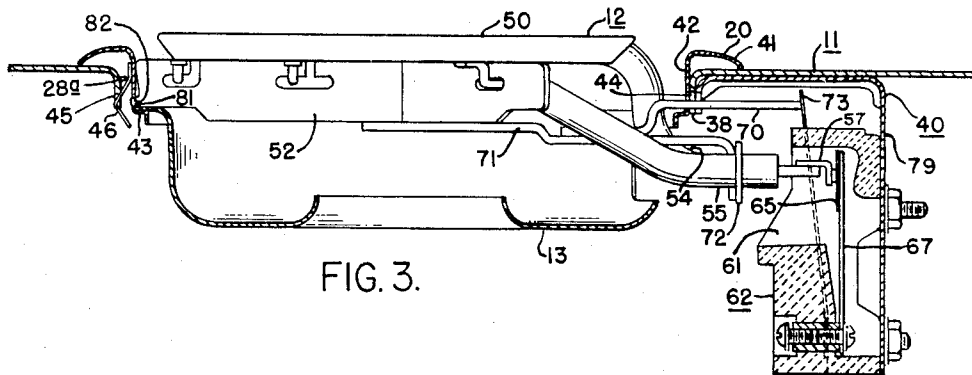


FIG. 3.

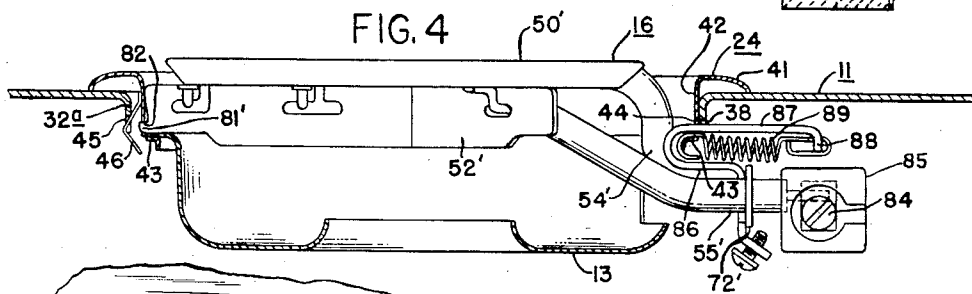


FIG. 4.

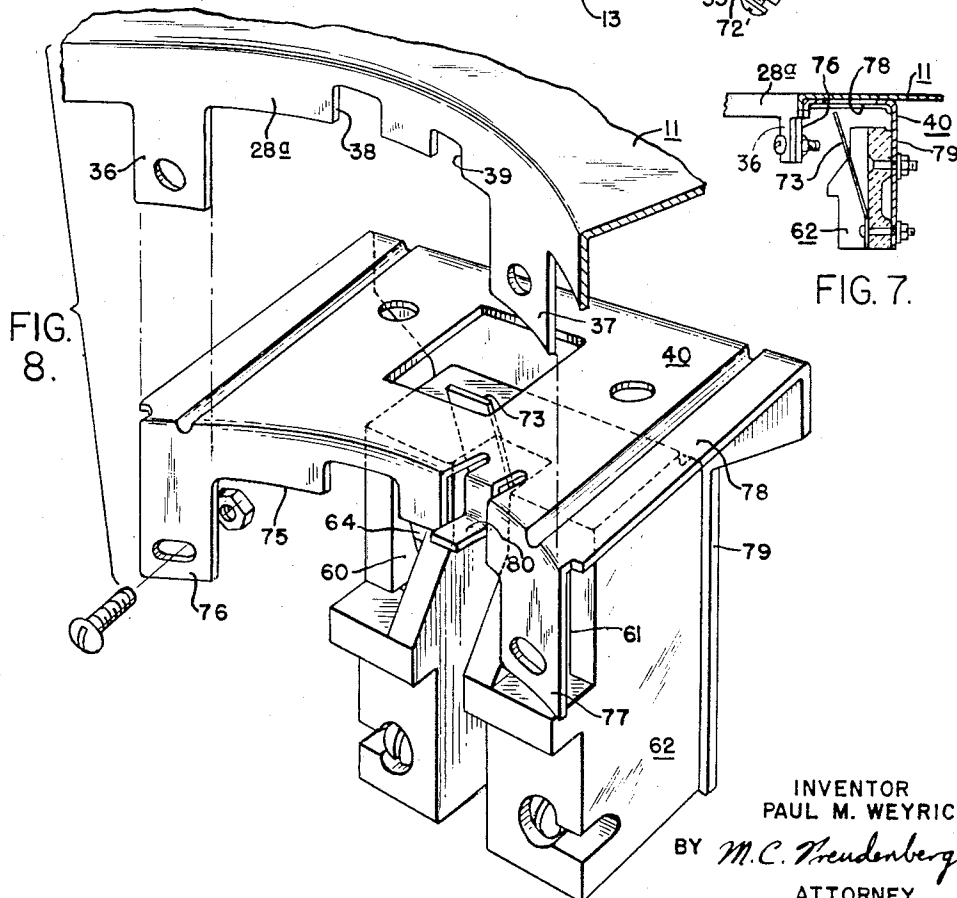


FIG. 8.

FIG. 7.

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Application December 3, 1956, Serial No. 625,744

6 Claims. (Cl. 219—37)

This invention relates to an improved heating unit construction for the platform of a domestic electric range or the like.

It is an object of this invention to reduce the cost of a cooking platform that may be used to support both permanently wired heating units and plug-in heating units, the latter requiring a terminal block that must be permanently attached to the platform.

Another object of this invention is to simplify the conversion of a cooking platform from permanently wired heating units to plug-in type heating units and to facilitate replacement of the latter type.

It is another object of this invention to improve the construction of a cooking platform and heating units therefor so that a minimum number of different parts need be required to manufacture platforms having a plurality of permanently wired or plug-in type heating units of different sizes.

Another object of this invention is to improve the construction of a cooking platform so that electrically insulating terminal blocks for making connections to plug-in terminals of a heating unit may be attached thereto after the platform is finished with a porcelain or other coating without marring the exposed surfaces thereof.

This invention may be applied to a cooking platform having openings of two different sizes in which may be supported electrical sheathed heating units of two corresponding sizes. Each of the heaters is supported by a trim ring having a flange overlying the edge of the platform opening, a wall depending within the platform opening and a heater supporting ledge at the lower portion of this wall. Each of the heaters has a pair of terminals extending from the ends of the heater sheath beneath and to one side of the heater. Either of two types of terminal constructions may be used for any heater unit. In one type of heater, these terminals may be permanently wired by insulated electrical leads that may be connected to a suitable power source through a conventional heater switch. The other type of heating unit is adapted for making plug-in connections to spring biased terminals in a stationary insulating terminal block, the spring terminals being electrically connectable to the power source.

The term plug-in as used herein is intended to relate to the electrical connections including the heater terminals and the terminals in the terminal block which are quickly disconnectable by the mere manipulation of a heater for removal from its platform opening without requiring any unbolting, unscrewing, unsoldering or the like of electrical leads to disconnect the heater. The electrical connections may be made by abutting spring biased contacts as shown or by any other readily separable contacts.

The plug-in terminal block is rigidly supported by a metal bracket attached to a flange depending from the platform and located at the edge of the platform opening. This flange is hidden by the trim ring and provides a surface to which the bracket may be bolted after the platform is finished with a porcelain or other coating so that the

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attachment of the bracket will not mar the exposed surfaces of the platform.

The terminal blocks and supporting brackets for the plug-in heater have the same configuration for both a large and a small heating unit. Although the platform openings are of different sizes, each has a peripheral wall portion of identical configuration forming a flange capable of supporting one of the brackets. In order to make the flange at each opening the same, the configuration of the smaller platform opening is irregular, but this does not affect the appearance of the platform since the edge or outline of this opening is hidden by the trim ring. In the event that permanently wired heaters are used in place of the plug-in heating units, the plug-in terminal block and supporting bracket are omitted. A range assembled with the permanently wired heating units may be readily converted for the use of plug-in units by merely attaching a plug-in terminal block and bracket to the depending flange at each platform opening.

The foregoing and other objects are effected by the invention as will be apparent from the following description and claims taken in connection with the accompanying drawings, forming a part of this application, in which:

Fig. 1 is a plan view of a portion of a cooking platform showing a plurality of different heating units supported therein;

Fig. 2 is a plan view of the platform of Fig. 1 with the heaters removed;

Fig. 3 is a vertical section taken on line III—III of Fig. 1 showing a plug-in type heater unit construction;

Fig. 4 is a vertical section taken on line IV—IV of Fig. 1 showing a permanently wired type heater unit construction.

Fig. 5 is a vertical section taken on line V—V of Fig. 2;

Fig. 6 is a vertical section taken on line VI—VI of Fig. 2;

Fig. 7 is a vertical section taken on line VII—VII of Fig. 6; and

Fig. 8 is a perspective view showing a portion of a cooking platform and a plug-in terminal block and supporting bracket assembly to be attached to the platform.

Referring to Fig. 1 of the drawings, a portion of a range platform 11 is shown with a pair of plug-in heating units 12 and 14 and a pair of wire connected heating units 16 and 18 supported therein. The heaters 12 and 16 are of approximately equal size but smaller than the heaters 14 and 18 which are also of approximately equal size. The details of these heaters will be described hereinafter.

The heaters 12, 14, 16 and 18 are supported in openings in the platform by rings 20, 22, 24 and 26, respectively. These rings are all identical except that the rings 20 and 24 are of smaller diameter than the rings 22 and 26. Heat reflecting drip pans 13 and 15 supported by the rings beneath the heaters are similar in construction but of different sizes for use with the small and large heaters, respectively.

Referring to Fig. 2 of the drawings, the platform 11 is shown with the supporting rings and heaters removed. The platform has two identical smaller openings 28 and 32 for the heaters 12 and 16, respectively, and two identical larger openings 30 and 34 for the larger heaters 14 and 18, respectively. The openings are bounded, at least in part, by walls 28a, 30a, 32a and 34a, respectively, formed integrally with the platform 11 and depending therefrom. A portion of each wall at one side of each of the openings is formed with a pair of depending legs 36 and 37 and notches 38 and 39 formed in the wall, between the legs as seen in Figs. 5 and 8. Since the legs 36 and 37 and notches 38 and 39 at each opening are identical, the reference numerals used for these details in Figs. 5 and 8 will apply to all platform openings.

The openings 28, 30, 32 and 34 are all generally round, but the portion of walls 28a and 32a, from which the legs 36 and 37 depend at the smaller openings 28 and 32, have a radius of curvature A that is the same as the radius A of the round openings 30 and 34. Except for the notch 39, the platform openings are each symmetrical about their centerlines, which extend from top to bottom as seen in Fig. 2. The arcuate portion of walls 28a and 32a having the radius A is tangent at its center to the circle of radius B defined by the major portion of the walls around the openings 28 and 32. The common curvature referred to above facilitates the attachment of identical terminal block supporting brackets 40 to the legs 36 and 37 so that any platform opening may be equipped with a plug-in heater unit, such as heater 12 or 14.

The construction of each of the rings 20, 22, 24 and 26 will be described by referring to the identical rings 20 and 24 of Figs. 3 and 4. The reference numerals for details of the rings will be common for each of the rings 20, 22, 24 and 26. Each ring comprises a flange 41 extending horizontally above the edge of the platform opening and overlying a portion of the platform 11. This flange supports a cylindrical wall 42 extending through the platform opening and supporting at its lower edge a ledge 43 upon which the associated heater and drip pan are carried. The ring and associated drip pan at each of the platform openings are so disposed when the heaters are in place as to conceal the walls of the platform openings. In the event there is a chipping or other marring of these walls by the attachment of the brackets 40, such disfiguration will be concealed as are the outlines of the openings. Thus, from all outward appearances, the platform openings will be similar except for the difference in size and the irregular configuration of the smaller openings will not be noticeable. Each ring is provided with an aperture 44 located in alignment with the notch 38 at one side of the platform opening, further reference to which is made hereinafter. Each of the walls 28a, 30a, 32a, and 34a is provided with another notch 45 at the other side of the platform opening for receiving a leaf spring detent 46 attached to the ring, as shown in Figs. 3 and 4.

Referring to Fig. 3, the plug-in heater 12 comprises a formed tubular sheath 50 enclosing an electrical resistance heating element, the latter being insulated from the sheath by a suitable granular insulating material, such as magnesium oxide, or the like. The sheath 50 is coiled to form a flat heating surface and is supported upon a three-legged metal frame or spider 52 made in accordance with Paul M. Weyrick Patent No. 2,725,456, assigned to the assignee of the present invention. The ends 54 and 55 of the heater sheath extend beneath and to the side of the heating unit 12. Extending from the end portions of the sheath are terminal members 56 and 57 for making electrical connections to the resistance element within the sheath 50. When the heating unit 12 is in the position shown in Fig. 3, these terminal members 56 and 57 extend into an insulating terminal block 62 for making electrical connections thereto.

A horizontally extending metal tongue 70 is disposed above the terminal portions 54 and 55 of the heater sheath 50 and extends through the aperture 44 in the ring 20 and the notch 38 in the wall 28a to guide the heater terminals 56 and 57 into the recesses 60 and 61 in the terminal block. The end of this tongue nearest the center of the heater 12 is supported by a metal brace 71 extending between, and fastened to, the center of the heater supporting spider 52 and a drip shield 72 on the terminal portions 54 and 55 of the sheath. The outer end of the tongue extending through the aperture 44 engages an electrically conducting spring strip 73 supported by the terminal block 62 to form an electrical ground for the exposed surfaces of the heater 12.

The terminal block 62 for plug-in heaters is formed with recesses 60 and 61, as seen in Fig. 6, for receiving the heater terminal members 56 and 57, respectively. In the recesses the terminals 56 and 57 engage contacts 64 and 65 which are biased theretoward and supported by electrically conducting spring blades 66 and 67, respectively, secured to the block 62.

The terminal block 62 is supported by the metal bracket 40 which is, in turn, fastened to the platform 11. The bracket 40 has an arcuate flange portion 75 having a curvature corresponding to the portions of the walls 28a, 30a, 32a and 34a between their respective legs 36 and 37. The legs 76 and 77 depending from this arcuate portion of the bracket are disposed to be bolted or riveted to the legs 36 and 37 depending from the platform, as seen in Figs. 6 and 8.

The bracket 40 is formed with a horizontal portion 78 extending away from the heater opening along the under side of the platform 11. Depending from this horizontal extension is an integral wall 79 to which the terminal block 62 is bolted, as seen in Fig. 7. The bracket 40 is provided with an integral positioning stub 80 adjacent its arcuate flange portion 75 extending into the notch 39 in the platform to facilitate locating the bracket properly with respect to the depending legs during assembly.

The grounding spring 73 together with the contact carrying springs 66 and 67 bias the heater 12 to the left, as seen in Fig. 3, so that a projection 81 on the heater spider is held in an aperture 82 at the opposite side of the ring to latch the heater 12 in horizontal position. The plug-in heater 12 may be removed by moving it horizontally against this spring bias to release the projection 81, lifting the portion that is most remote from the terminal block 62 and then moving the entire heater 12 in a direction away from the terminal block to remove the tongue 70 from the aperture 44 in the ring.

Referring to Fig. 4 of the drawings, the heater 16 is of the type having terminal connections to which electrical lead wires may be permanently attached. The heater structure shown in Fig. 4 is similar to that described and claimed in the patent application of George Price, Ser. No. 601,253, filed July 31, 1956, and assigned to the assignee of the present invention. The heater 16 is generally similar to the heater 12 as far as the sheath 50' and supporting spider 52' are concerned. However, the terminals extending from the ends 54' and 55' of the sheath 50' are provided with screw type connectors 84 which are enclosed and protected by an electrically insulating block 85 carried by the heater. A drip shield 72' attached to the ends of the heater sheath prevents spillage from flowing therealong to the electrical connections.

A formed metal strip 86 is attached to the drip shield 72' between the heater end portions 54' and 55' and extends toward the center of the heater then upwardly and then forms a bar 87 extending horizontally in the direction away from the center of the heater and through the aperture 44 in the mounting ring. The outer end of this bar is formed with an abutment 88 to which one end of a coiled tension spring 89 is attached. The other end of the spring extends through the aperture 44 and encircles the ledge 43 of the ring. This coiled spring biases the heater toward the left as seen in Fig. 4 so that the projection 81' on the spider 52' is held in the aperture 82 in the ring to retain the heater in a horizontal position. When this projection 81' is unlatched from the aperture 82 by moving the heater to the right, the bar permits the heater to be tilted to gain access to the drip pan therebeneath but the spring prevents the bar 87 from being removed from the aperture in the ring.

While the invention has been shown in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof.

What is claimed is:

1. An electrical heating unit structure comprising a thin metal platform having an opening therein, a heater supporting ring disposed in said opening and having a flange overlying the periphery of said opening, a heater removably supported in said opening by said ring, said heater having terminals extending beneath and to one side thereof, said terminals extending laterally beyond the edge of the opening, a stationary terminal block supported beneath said platform and containing contact members abutted by said terminals and readily detachable means for securing said block to said platform, said means being attached to the latter at the edge of said opening and at a point concealed by said ring when viewed from above.

2. An electrical heating unit structure comprising a platform having an opening therein, said platform having a wall integral therewith and depending therefrom at the edge of said opening, an electrical heating unit supported within the platform opening, said heating unit having electrical terminal members rigidly secured thereto and disposed beneath and to the side of said unit, said terminal members extending laterally beyond the edge of the opening, a metal bracket attached to said wall, a stationary electrically insulating terminal block carried by said bracket and disposed adjacent said terminal members, and spring biased contacts carried by said terminal block engaged by said terminal members.

3. An electrical heating unit structure comprising a platform having an opening therein, said platform having a wall integral therewith and depending therefrom at the edge of said opening, a heater supporting ring extending into said opening and having a flange overlying the edge of said opening and resting on said platform, an electrical heating unit supported in said ring, said heating unit having electrical terminal members rigidly secured thereto and disposed beneath and to one side of said unit, said terminal members extending laterally beyond the edge of the opening, a metal bracket attached to said wall, a stationary electrically insulating terminal block carried by said bracket and disposed adjacent said terminal members, and spring biased contacts carried by said terminal block for engaging said terminal members, the portion of said wall to which said bracket is attached being concealed by said ring when viewing the structure from above.

4. A cooking platform construction comprising a platform having a plurality of openings therein, one of said openings being larger than another and being round, a wall depending from said platform at each of said openings and defining at least a portion of the periphery of each of said openings, a heater supporting ring extending into each of said openings, each ring having a flange overlying said platform, a heater supported by each of said rings within said platform openings, each said heater having electrical terminal members rigidly secured thereto and extending beneath and to one side thereof beneath the platform, a stationary electrically insulating terminal block for each heater supporting resilient contacts engageable by said terminal members for making electrical connections to the heater and a metal bracket attached to a portion of the wall adjacent each platform opening for supporting said terminal block, said metal bracket having an arcuate portion conforming to the outer side of the

wall of the larger platform opening, the bracket attaching portion of the wall of said other smaller platform opening being of the same arcuate configuration as the corresponding portion of the wall the larger platform opening to which the terminal block supporting bracket is attached, said heater supporting rings extending a sufficient distance within the openings and overlying said platform sufficiently to substantially conceal the periphery of each opening.

5. A cooking platform construction comprising a platform having a plurality of openings therein, one of said openings being larger than another, a wall depending from said platform at each of said openings and defining at least a portion of the periphery of each of said openings, a heater supporting ring extending into each of said openings and having a flange overlying said platform, a heater supported by each of said rings within said platform openings, each heater having electrical terminal members rigidly secured thereto and extending beneath and to one side thereof beneath the platform, there being associated with each heater a stationary insulating terminal block supporting resilient electrical contacts engageable by said terminal members for making electrical connections to each heater, a separate metal bracket for supporting each said terminal block, each of said metal brackets having a portion conforming to a part of the outer side of the wall of the larger platform opening to facilitate attachment thereto, the wall of the smaller platform opening having a portion with the same configuration as that part of the wall of the larger platform opening to which its associated terminal block supporting bracket is attached, said heater supporting rings overlying said platform sufficiently to conceal the peripheral configurations of said openings.

6. An electrical heating unit structure comprising a sheet metal platform having a plurality of different size heater openings therein, there being associated with each opening a wall integral with the platform and depending therefrom at the edge of the opening, a heater supporting ring disposed in each of said openings, each of said rings including a flange portion overlying the edge of its associated opening, a heating unit carried by each of said rings, the size of said rings and heating units corresponding to the size of said openings, each said heating unit including electrical terminal members rigidly secured thereto and disposed beneath and to one side thereof, a stationary terminal block structure rigidly supported beneath the platform adjacent each opening and having electrical contacts engaged by the terminal members of the heater in the opening, said terminal block structures being of substantially identical size and configuration, each said wall being concealed by one of said rings and so constructed and arranged as to facilitate attachment or removal of said stationary terminal block structure relative said platform without marring or changing the appearance of the exposed surfaces of said platform.

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