Oct. 30, 1962 G. E. AMMERMAN 3,061,705

ELECTRIC HEATER ASSEMBLY

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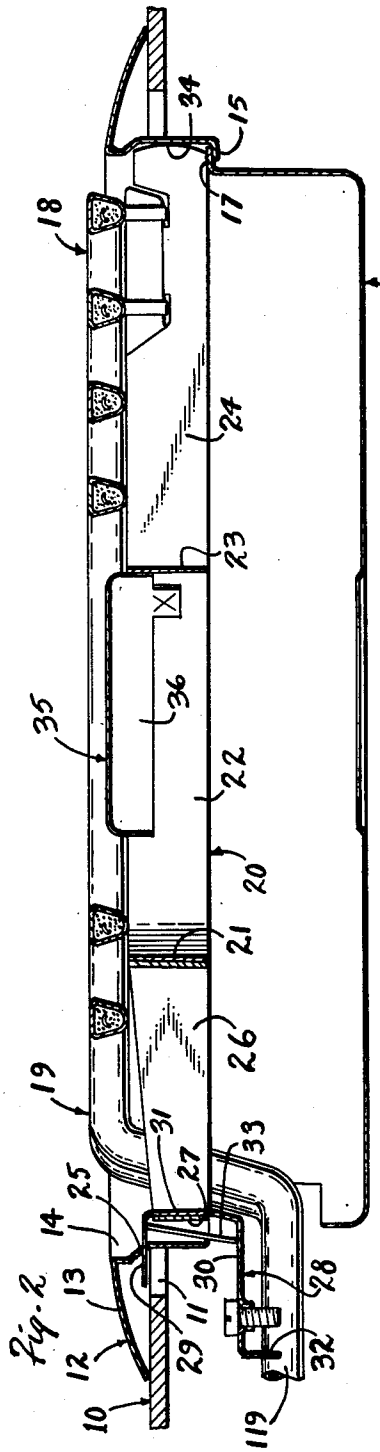


Fig. 2

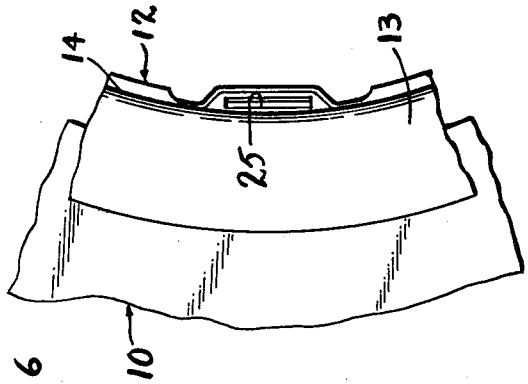


Fig. 6

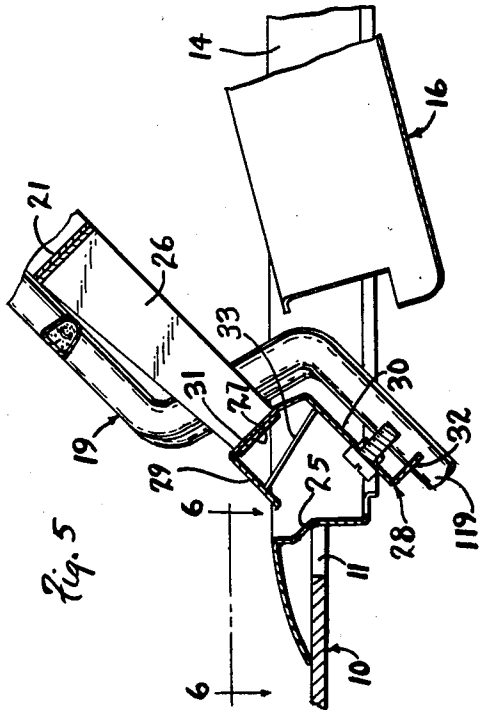


Fig. 5

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Fig. 1

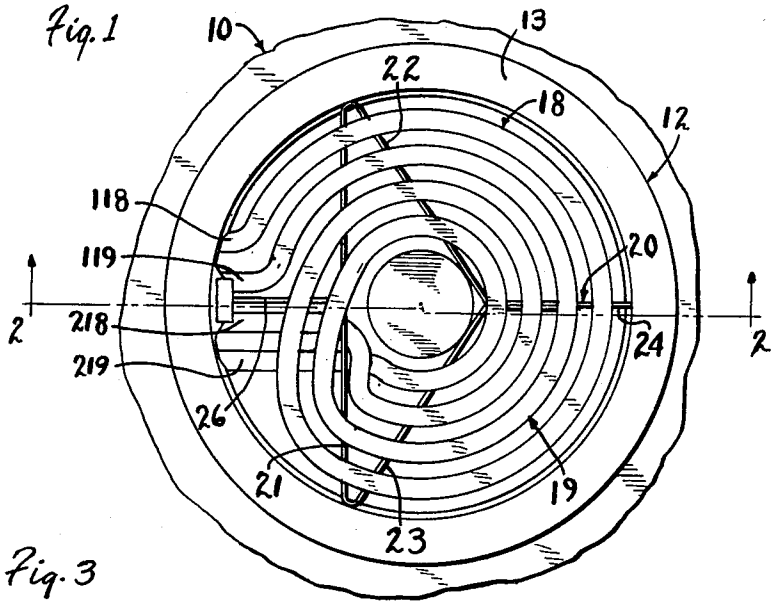


Fig. 3

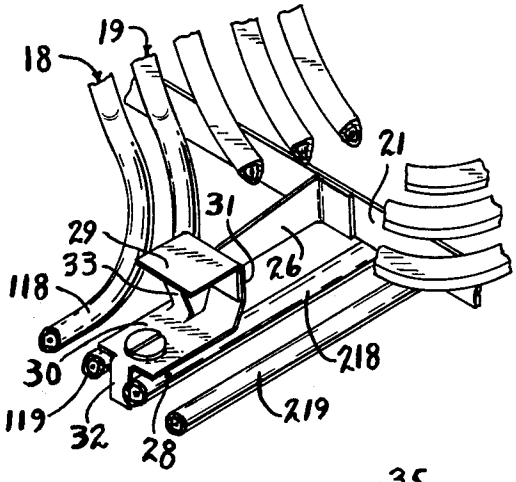


Fig. 4

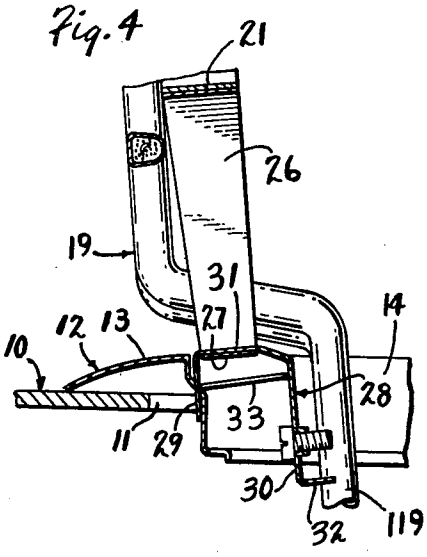
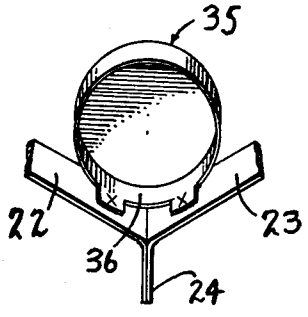


Fig. 7



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ELECTRIC HEATER ASSEMBLY

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6 Claims. (Cl. 219—37)

The present invention relates to electric heaters, more particularly to surface type electric heater assemblies used in ranges and the like, and the principal object of the invention is to provide new and improved assemblies of such character.

The instant construction is in many respects similar to that disclosed in Letters Patent 2,877,334, issued March 10, 1959; however, specific differences in construction simplify the present assembly and reduce production costs thereof. Other advantages will readily become apparent from a study of the following description and from the drawings appended hereto.

In the drawings accompanying this specification and forming a part of this application there is shown, for purpose of illustration, an embodiment which the invention may assume, and in these drawings:

FIGURE 1 is a fragmentary, top plan view of a range incorporating a surface heater assembly constructed in accordance with the present invention,

FIGURE 2 is an enlarged sectional view generally corresponding to the line 2—2 of FIGURE 1.

FIGURE 3 is a fragmentary, broken perspective view of a detail,

FIGURE 4 is a fragmentary view similar to FIGURE 2 but with certain parts in another position,

FIGURE 5 is a fragmentary view similar to FIGURE 2 but showing certain parts in separated relation,

FIGURE 6 is a fragmentary plan view generally corresponding to the line 6—6 of FIGURE 5, and

FIGURE 7 is a reduced size, fragmentary, bottomside perspective view of a detail.

As best seen in FIGURES 1 and 2, the present heater assembly is adapted to be carried by the top 10 of a range having the usual aperture 11 in which, in the present embodiment, a trim ring 12 of the heater assembly is adapted to be positioned. Although not shown, trim ring 12 may carry suitable clips which removably hold the ring in position while permitting its ready removal for cleaning.

As best seen in FIGURE 2, trim ring 12 is conventional in that it comprises a decorative, upper annular flange portion 13 which rests upon and is supported by the range top 10; a generally vertically disposed, depending annular skirt portion 14 which projects through aperture 11; and an inwardly directed, lower annular flange portion 15. The usual drip pan 16 is removably supported by the trim ring 12 and has a radially outwardly extending flange portion 17 which rests upon ring flange portion 15.

In the interest of cost reduction or for other reasons, it may be desirable to eliminate trim ring 12 as a separate part. Under such circumstances it will readily be apparent that the range top 10 could be formed to provide the annular vertical skirt 14 and the annular flange 15.

The present invention employs a pair of heating elements 18, 19 of the well-known tubular sheathed type. Briefly, each element comprises an elongated tubular metallic sheath filled with compacted refractory material and having a resistor conductor embedded within the refractory material intermediate the sheath ends to provide an intermediate heat generating portion and having terminal end portions for conducting electrical energy to the heat generating portion.

Each element 18, 19 has its intermediate heat generating portion spiraled to provide a plurality of convolutions and the convolutions of each element are adapted to be

arranged concentrically about a central opening to provide a generally flat, horizontal heating surface for underlying and supporting a vessel to be heated. The terminal end portions 118, 218 of element 18 and terminal end portions 119, 219 of element 19 are bent downwardly and then outwardly to dispose their free ends beneath and outwardly of the heating surface provided by the convoluted portions of the elements. For convenience, the horizontal portions of the terminal end portions are grouped together in spaced, side-by-side relation.

Elements 18, 19 are adapted to be secured to supporting means 20, commonly known as a spider, which underlies and supports the heat generating, convoluted portions of the elements in their vessel supporting position and which in turn is adapted to be supported by the trim ring 12. While any suitable spider could be employed, it is preferable to employ one of the type disclosed in the previously mentioned Letters Patent 2,877,334.

Briefly, spider 20 has a generally triangular configuration providing legs 21, 22 and 23, and has a leg 24 projecting outwardly from the conjuncture of the legs 22, 23. As herein disclosed, spider 20 is adapted to be positioned with its leg 21 adjacent to and extending transversely of the terminal ends of the elements and with the conjuncture of legs 22, 23 adjacent the central opening of the element convolutions.

The present construction has means providing a removable pivot connection between the heating elements and the trim ring whereby the former may be pivoted from a normal, generally horizontal, vessel supporting position seen in FIGURE 2 to a generally vertical position seen in FIGURE 4 or whereby the elements may be completely disconnected from the trim ring as seen in FIGURE 5. Such means is presently in part provided by the trim ring 12 and in part provided by the spider 20.

Considering first the trim ring 12 and referring particularly to FIGURES 5 and 6, the annular skirt 14 has a narrow, horizontally extending slot 25 formed therein. For a purpose to appear, that portion of skirt 14 which defines the lower margin of slot 25 provides a pintle cooperable with a tongue carried by the spider. Also for a purpose to appear, that portion of skirt 14 which underlies the slot 25 is displaced radially inwardly so that the pintle provided by the lower margin of the slot is spaced from the skirt 14 in a direction toward the elements an amount at least equal to the thickness of a later to be described rectilinear tongue. Thus, the slot 25 faces not only horizontally toward the elements but also faces upwardly to provide operating clearance for the about to be described tongue.

Turning now to that portion of the spider which cooperates with the trim ring to provide the removable pivot connection, an elongated arm 26 has one end welded or otherwise secured to leg 21 of the spider to project radially outwardly of the element convolutions in a direction toward the element terminal legs. The free end of arm 26 terminates just short of the trim ring annular skirt 14 and has a bent over portion 27 to which is welded or otherwise secured a member 28.

Member 28 is presently formed of spring sheet metal of generally U-shape providing a pair of vertically spaced, generally parallel legs 29 and 30 joined together at one end by a structurally integral intermediate portion 31. Portion 31 of member 28 is secured to portion 27 of arm 26, as best seen in FIGURE 3, so that member legs 29, 30 extend radially outwardly of the heating surface provided by the heating elements.

Member 28 performs several functions: Firstly, lower leg 30 overlies the horizontal portions of the two center element terminal ends to prevent elevation of such ends, with respect to the spider, and consequent elevation of

the adjoining intermediate element portions. Secondly, leg 30 has a depending prong 32 which is disposed between the element terminal ends aforesaid and retains the elements and the spider in proper alignment with each other.

Turning now to leg 29, the latter is rectilinear to extend through the slot 25 as seen in FIGURE 2, it being understood that the width of this leg is but slightly less than the length of the slot to snugly fit therewithin with but a minimum of clearance. Leg 29 provides a tongue which cooperates with the pintle provided by the lower defining margin of slot 25 to provide for pivotal movement of the element-spider assembly from the position seen in FIGURE 2 to the position seen in FIGURE 4. Since the tongue provided by member leg 29 is rectilinear, it may readily be withdrawn from the slot, when desired, as indicated in FIGURE 5, and as readily replaced therein.

Means are provided for resiliently limiting the projection of tongue 29 of member 28 through slot 25 and in the present embodiment, such means comprise a resilient finger 33 which is structurally integral with member leg 30. At the present time, finger 33 is struck out from leg 30 and intermediate portion 31 so that its free, upper end is disposed adjacent to but spaced from the free end of tongue 29 in a direction toward the heating surface.

With the parts positioned as seen in FIGURE 2, it will be noted that finger 33 engages the trim ring skirt 14 beneath the slot 25 and urges the spider 20 to the right so that the free end of its leg 24 seats in a recess 34 formed in the trim ring skirt 14. When it is desired to shift the element-spider assembly from the position seen in FIGURE 2 to the position seen in FIGURE 4, it is only necessary to move the assembly slightly to the left, against the resilient urging of finger 33, to displace spider leg 24 from recess 34 and to then rotate the assembly about the pivot provided by the tongue 29 of member 28 and the lower margin of the slot 25. Note that with the parts positioned as seen in FIGURE 4, finger 33 still functions to limit projection of the tongue through the slot since it continues to engage the annular trim ring skirt portion 14.

Means are disposed in the space in the center of the element convolutions and in the present embodiment, such means comprises a disk 35 having a depending annular flange 36 which abuts respective converging legs 22, 23 of the spider. At the place of abutment of flange 36 with respective spider legs, the flange is presently provided with structurally integral, depending tabs 37 (see especially FIGURE 7) which are preferably spot welded to respective spider legs to permanently secure the disk rigidly in place. While in the present embodiment disk 35 is primarily decorative and may carry a suitable design or identifying indicia on its upper surface, it is to be understood that it may at times be replaced by a thermostat assembly which will be secured in position in the same manner as the disk.

In view of the foregoing it will be apparent to those skilled in the art that I have accomplished at least the principal object of my invention and it will also be apparent to those skilled in the art that the embodiment herein described may be variously changed and modified, without departing from the spirit of the invention, and that the invention is capable of uses and has advantages not herein specifically described; hence it will be appreciated that the herein disclosed embodiment is illustrative only, and that my invention is not limited thereto.

I claim:

1. A surface type heater assembly for ranges and the like comprising an elongated sheathed electric heating element having a heat generating portion arranged to provide a generally plane heating surface normally positioned generally horizontally to underlie and support a vessel to be heated, support means connected with said heating element and underlying and supporting the latter in its vessel supporting position and in turn adapted to be supported by the range, a sheet metal member of spring-like material secured to said support means to provide a rectilinear tongue projecting in a direction outwardly of said element and generally parallel to the plane of the element heating surface to dispose its free end beyond the periphery of such surface, a generally vertical wall spaced from the periphery of said heating surface and providing a horizontal pintle for underlying said tongue and cooperable therewith to provide a hinge support for said element, said pintle being spaced from said wall in a direction toward said element to provide for rotation of said element thereabout from its normal horizontal position to a generally vertical position, and a structurally integral tab struck out from said member and having its free end closely adjacent the underside of said tongue and spaced from the latter's free end in the direction of said element to provide a spring finger which engages with said pintle in both the horizontal and vertical positions of said element and thus yieldably limits projection of said tongue beyond said pintle.

2. A surface type heater assembly for ranges and the like comprising an elongated sheathed electric heating element having an intermediate portion arranged to provide a generally plane heating surface normally positioned generally horizontally to underlie and support a vessel to be heated and having terminal end portions disposed in side by side relation beneath said heating surface and projecting beyond the periphery thereof, support means connected with the intermediate portion of said heating element and underlying and supporting such portion in its vessel supporting position and in turn adapted to be supported by the range, a sheet metal member of spring-like material secured to said support means and providing a pair of vertically spaced legs joined together at one end by an intermediate portion and said legs projecting in a direction outwardly of said intermediate element portion to dispose their free ends beyond the periphery of said heating surface, said upper member leg being rectilinear and extending generally parallel to said heating surface and said lower member leg overlying said element terminal legs to restrict elevation thereof relative to said support means, a generally vertical wall spaced from the periphery of said heating surface and providing a horizontal pintle for underlying said upper member leg and cooperable therewith to provide a hinge support for said element, said pintle being spaced from said wall in a direction toward said element to provide for rotation of said element thereabout from its normal horizontal position to a generally vertical position, and a structurally integral tab struck out from the leg and intermediate portions of said member and having its free end closely adjacent the underside of said upper member leg and spaced from the latter's free end in the direction of said element to provide a spring finger which engages with said pintle in both the horizontal and vertical positions of said element and thus yieldably limits projection of said upper member leg beyond said pintle.

3. A surface type heater assembly for ranges and the like comprising an elongated sheathed electric heating element having an intermediate portion arranged to provide a generally plane heating surface normally positioned generally horizontally to underlie and support a vessel to be heated and having terminal end portions disposed in side by side relation beneath said heating surface and projecting beyond the periphery thereof, support means connected with the intermediate portion of said heating element and underlying and supporting such portion in its vessel supporting position and in turn adapted to be supported by the range, a sheet metal member of spring-like material secured to said support means and providing a pair of vertically spaced legs joined together at one end by an intermediate portion and said legs projecting in a

direction outwardly of said intermediate element portion to dispose their free ends beyond the periphery of said heating surface, said upper member leg being rectilinear and extending generally parallel to said heating surface and said lower member leg overlying said element terminal legs to restrict elevation thereof relative to said support means, a generally vertical wall spaced from the periphery of said heating surface and having an opening into which projects the free end of said upper member leg, the lower margin of said opening providing a pintle which underlies said upper member leg and cooperates therewith to provide a hinge support about which said element is rotatable from its normal, generally horizontal position to another, generally vertical position and the lower margin of said opening being offset horizontally toward said element from the upper margin of said opening an amount at least equal to the thickness of said upper member leg whereby said opening faces both horizontally toward said element and also faces upwardly to accommodate said upper member leg in both the horizontal and vertical positions of said element, and a structurally integral tab struck out from the lower leg and intermediate portion of said member and having its free end closely adjacent the underside of said upper member leg and spaced from the latter's free end in the direction of said element to provide a spring finger which engages with said pintle in both the horizontal and vertical positions of said element and thus yieldably limits projection of said upper leg member into said opening and beyond said pintle.

4. A surface type heater assembly for ranges and the like, comprising an electric heating element having a generally plane heating surface adapted to be normally positioned generally horizontally to underlie and support a vessel to be heated, means connected to said element and providing a rectilinear tongue generally parallel with the heating surface plane and said tongue having a free end projecting beyond the heating surface periphery, and a generally vertical wall spaced from the periphery of said heating surface and having an opening into which projects the free end of said tongue, the lower margin of said opening providing a pintle which underlies said tongue and cooperates therewith to provide a hinge support about which said element is rotatable from its normal generally horizontal position to another generally vertical position, said opening facing both horizontally toward said element and upwardly to accommodate said tongue in both horizontal and vertical positions of said element, and a resilient finger underlying said tongue and spaced from its free end in the direction of said element to engage said vertical wall in both the horizontal and vertical positions of said tongue and thus yieldably limit projection of said tongue into said opening.

5. A heater assembly for an apertured stove panel, comprising an adapter ring supported by a panel surface adjacent to said panel aperture and having a vertical cylindrical wall extending into the latter, said wall having a horizontal slot, an elongated sheather electric heating element convoluted to provide a generally plane heating surface normally disposed in horizontal heating position within the compass of said adapter ring, a spider member secured to and underlying said heating element and supported by said adapter ring for in turn supporting said heating element in its normal position, a sheet-metal member held as an assembly with said spider member and said heating element and having a flat tongue extending in a plane generally parallel to the plane of said heating surface and beyond the compass thereof, said tongue projecting into said horizontal slot and cooperating with a defining marginal surface thereof to provide a pivot about which said support means and its connected heating element may be swung from its normal heating position to a non-heating position, and a resilient member in association with said tongue and engaging said adapter ring to yieldably limit projection of said tongue through said slot.

6. The construction according to claim 5 wherein said heating element has a terminal portion beneath and extending radially and outwardly of the convoluted heating surface, and wherein a leg is associated with said sheet-metal member and overlies and bears against said terminal portion to restrict elevation thereof.

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