

May 29, 1956

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2,748,248

ELECTRIC HEATING UNITS

Filed June 10, 1953

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Fig. 1

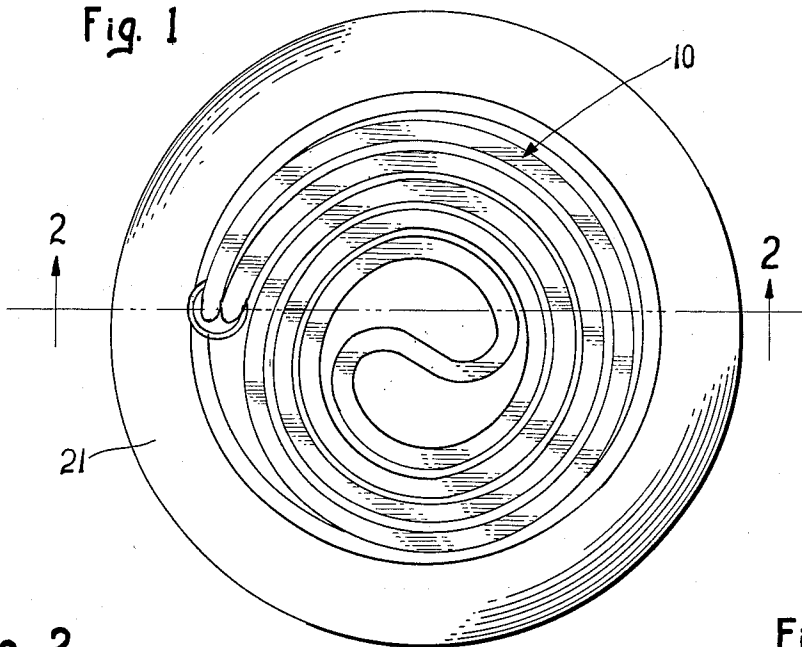


Fig. 2

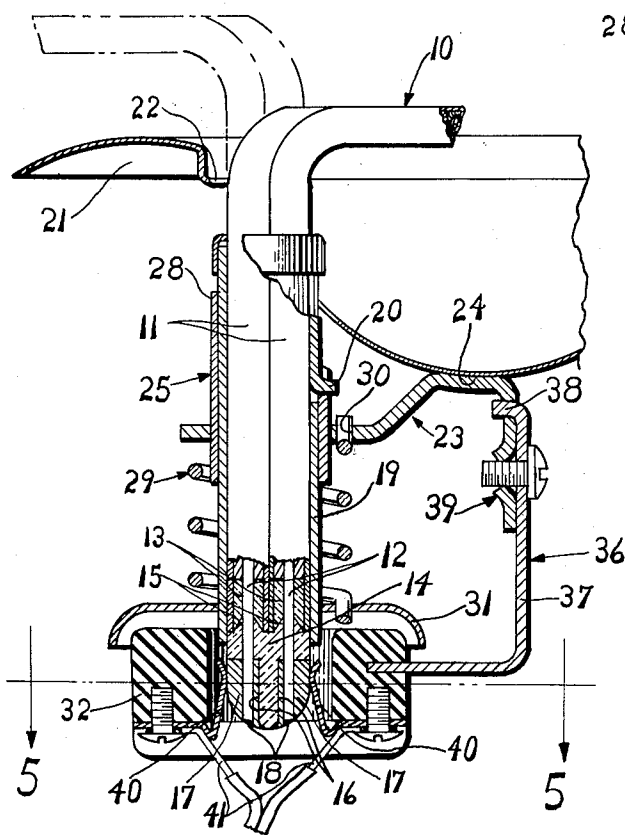
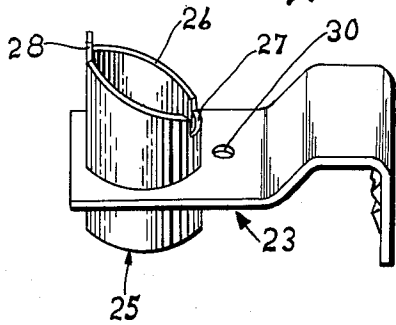


Fig. 3



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Fig. 4

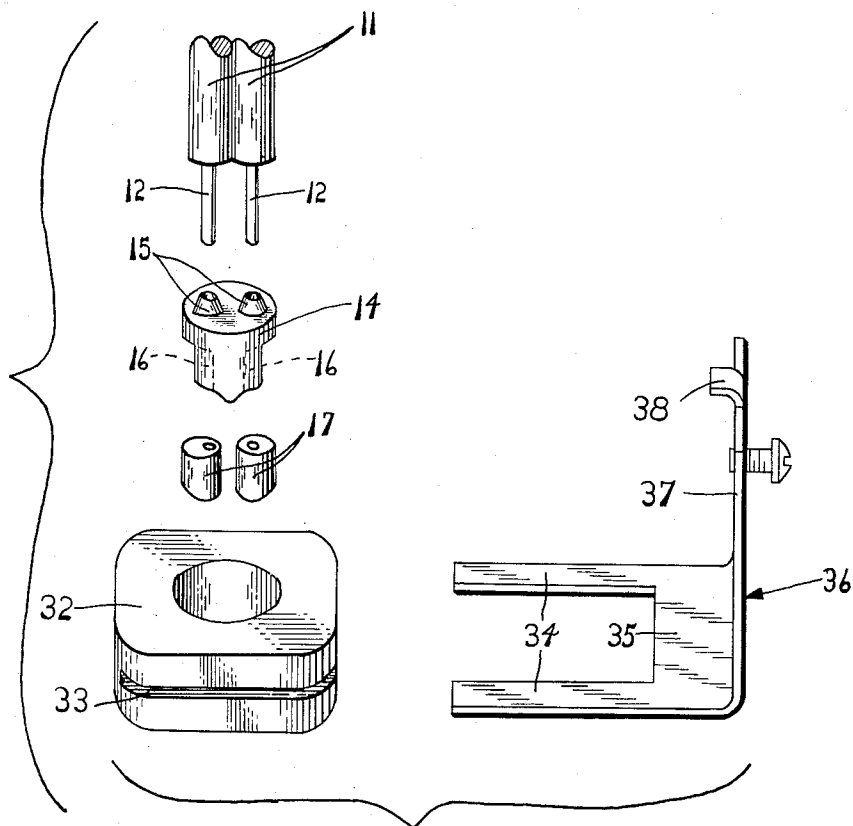
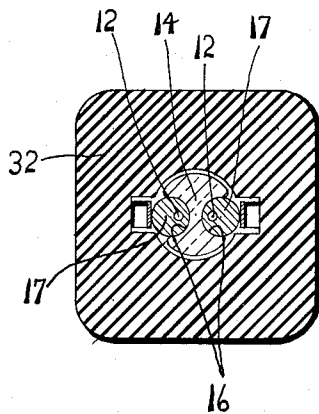


Fig. 5



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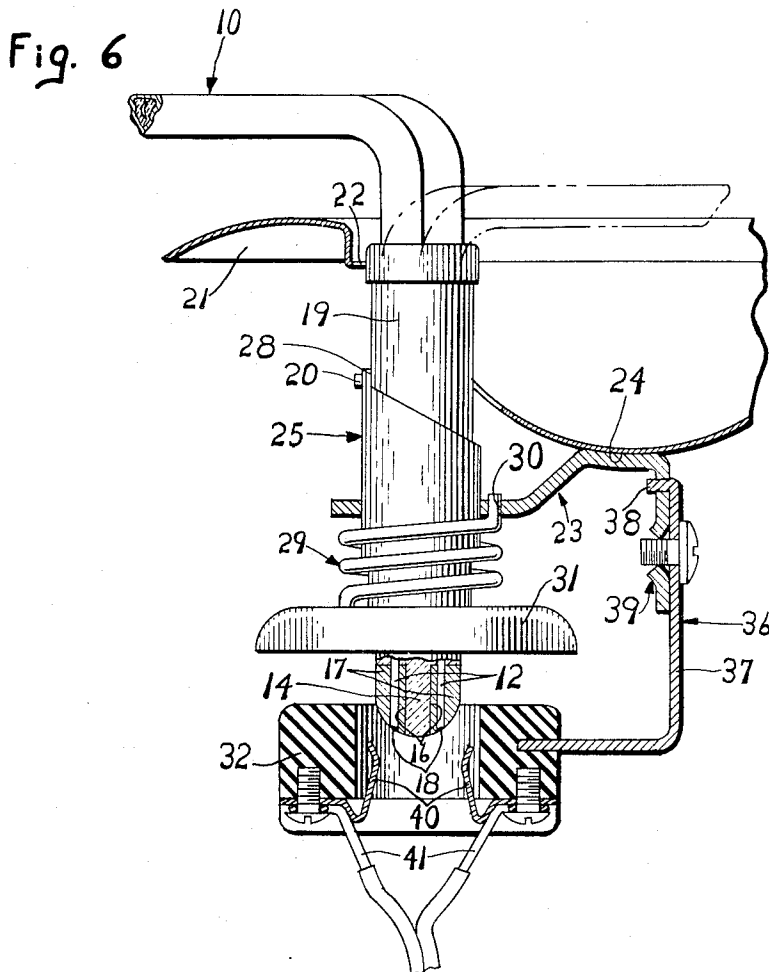
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ELECTRIC HEATING UNITS

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10 Claims. (Cl. 219—37)

My invention relates to electric heating units, more particularly to range-type electric heating units that are shiftable toward and away from a normal heat-dispensing position, and the principal object of my invention is to provide new and improved electric heating units of the character described.

It has long been common practice to provide a range-type electric heating unit that may be shifted to permit cleaning of the reflector that generally underlies the unit in its normal heat dispensing position. However, prior art units have not been entirely satisfactory since repeated movement of the unit caused rapid deterioration of the electrical leads connected thereto. At best, this resulted in frequent replacement of the electrical leads. However, damaged insulation on the leads often resulted in a dangerous short circuit or a serious shock hazard. Furthermore, with prior art units it has been possible to inadvertently energize the unit while it is disposed out of its normal heat-dispensing positions and this creates a hazardous condition since a user can easily become burned in attempting to return a hot unit to its normal position.

My invention possesses none of the aforementioned disadvantages possessed by prior art range-type electric heating units, while at the same time possesses many advantages which will become apparent from a study of the following description and of the drawings appended thereto.

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

Figure 1 is a top plan view of a range-type electric heating unit constructed in accordance with my invention,

Figure 2 is an enlarged, fragmentary sectional view generally corresponding to the line 2—2 of Figure 1 and with certain parts broken away,

Figure 3 is a fragmentary perspective view of a constructional detail,

Figure 4 is an exploded perspective view of certain parts,

Figure 5 is a sectional view generally corresponding to the line 5—5 of Figure 2, and

Figure 6 is a view similar to Figure 2 but showing certain parts in another position.

The embodiment illustrating my invention is shown in Figure 1 to comprise a sheathed electric heating element 10 of conventional design that is convoluted to provide a generally plane heating surface upon which a vessel to be heated may be disposed. Terminal portions of the element 10 are disposed in side-by-side relation and extend laterally of the element to provide a pair of juxtaposed legs 11 for a purpose to be shown. In accordance with conventional construction, a terminal pin 12 extends from each of the legs 11 and each pin has connection

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with a respective end of a resistor wire which is embedded within the sheathed element.

As best shown in Figure 2, a dielectric plug 13 closes the open end of each of the legs 11, each plug being apertured to pass its respective terminal pin and each having a conically recessed end disposed adjacent the free end of its related leg 11.

A round, dielectric body 14 (see Figures 2, 4, 5 and 6) is adapted to be secured in position adjacent the free ends of the juxtaposed legs 11, the body 14 being apertured to pass the terminal pins 12 and having one end provided with spaced-apart conical projections 15 and having the other end rounded as shown. The body 14 is provided with a pair of opposed, spaced-apart recesses 16 that extend as shown from the rounded-end of the body, the recesses stopping short of that end of the body having the projections 15. Each recess is adapted to receive a contact member 17 and each contact member is apertured to pass a respective terminal pin 12.

The body 14 is assembled with the legs 11 by sliding it over the terminal pins until the projections 15 seat in the conical recesses of the plugs 13 and the body abuts the ends of the legs as shown. A contact member 17 is then slid over each of the terminal pins into a respective recess 16 in the body 14 and secured in position by means of solder or the like at 18. As best shown in Figure 2, the free end of each of the members 17 is formed so as to blend in with rounded-end profile of the body 14.

As best seen in Figures 2 and 6, a tubular sleeve 19 is disposed about the legs 11 and is adapted to be secured in position by welding, brazing or the like, and a cap 20, apertured to pass the legs 11, is adapted to be secured by welding or the like over the upper end of the sleeve 19 to prevent entrance of foreign material. A lug 20 is struck out from the wall of the sleeve 19 and extends radially and outwardly therefrom for a purpose to appear.

The heating element 10 is adapted to be supported by a reflector 21 that is in turn supported by a range (not shown) in any suitable manner. As will be clear and as illustrated in Figure 1, the element 10 is normally centered above the reflector 21; however, the element is shiftable mounted so that it may be swung to one side of the reflector for cleaning purposes. To this end, the element 10 is shiftable secured to the reflector 21 in the following manner:

The reflector 21 is apertured at 22 to pass the sleeve 19 which extends therethrough, as shown in Figures 2 and 6. A bracket 23 is adapted to be secured to the reflector 21 by welding or the like 24, and the bracket is apertured to pass a sleeve 25 that is secured to the bracket by any suitable means, such as by welding or the like. As will be clear, the sleeve 25 is coaxially disposed with respect to the axis of the aperture 22 and is adapted to slideably receive the sleeve 19 that is welded about the legs 11.

Referring particularly to Figure 3, and with reference to the position of parts shown in the drawing, the lower end of the sleeve 25 is cut off square with the tube axis but the upper end of the sleeve is cut at an angle to the axis to provide an inclined end wall 26. The lowermost portion of the inclined wall 26 is notched at 27 to receive the lug 20, and a stop lug 28 extends axially from the uppermost portion of the inclined wall 26 for a purpose to be shown.

A torsion spring 29 is adapted to be disposed about the sleeves 25, 19 in assembled relation, the upper end of the torsion spring being anchored in an aperture 30 in the bracket 23 and the spring then being wound-up to place it under torsional stress and the lower end thereof

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then anchored in an aperture in a cup-shaped retainer collar 31. The retainer collar 31 may be secured to the lower end of the sleeve 19 by any suitable means, it being preferable at the present time to secure the collar to the sleeve by a bayonet-type connection to permit easy assembly and disassembly. In addition to anchoring the lower end of the torsion spring 29, the collar 31 protects electrical connections, later to be described, from drippings and the like.

A dielectric block 32, having an enlarged aperture for receiving the lower end of the sleeve 19, is supported coaxially with and adjacent the terminal portion of the legs 11. As shown in Figure 4, a groove 33 extends about three sides of the block 32 and is adapted to receive the spaced-apart legs 34 and the connecting portion 35 of a bifurcated hanger 36. The hanger 36 has a body portion 37 that extends at right angles to the legs 34 and the terminal portion of the body portion 37 is provided with a bent-over lug 38, as shown.

The hanger 36 is removably secured to the bracket 23 by means of a screw which passes through an aperture in the hanger and is threaded into an aperture provided in a depending portion 39 of the bracket 23. As will be clear, the lug 38 is receivable within an aperture in the portion 39 of the bracket 23 for alignment purposes.

As best shown in Figures 2, 5 and 6, a pair of brushes 40 are secured within the aperture in the block 32 and each has connection with a power lead 21 and each is engageable with a respective contact member 17 in the position of parts shown in Figures 2 and 5.

Referring particularly to Figure 2, operation of the present invention is as follows: As illustrated in the normal position of the range-unit, the element 10 is disposed adjacent to and above the reflector 21 and held in this position because of the interengagement between the lug 20 of the sleeve 19 and the notch 27 of the sleeve 25. The weight of the element and frictional forces between the lug 20 and notch 27 hold the lug in the notch and this prevents the torsion spring 29 from rotating the element from its normal position. As before mentioned, each of the brushes 40 is engaged with its respective contact member 17 so as to pass current to the element when it is in this position.

When it is desired to clean the reflector 21 beneath the element 10, it is only necessary to raise the element until the lug 20 disengages from the notch 27. The torsion spring 29 will then rotate the element about the axis of the legs 11, 11, and the lug 20, in riding up the incline 26, will urge the element 10 upwardly from the reflector 21.

Rotation of the element 10 by the torsion spring 29 to one side of and away from the reflector 21 will continue until the lug 20 engages the lug 28 of the sleeve 25. The element 10 will then have been rotated approximately 180 degrees to the position shown in dot-dash lines in Figure 2 and in full lines in Figure 6.

It will be noted that initial rotation of the element will rotate the contact member 17 out of engagement with their respective brushes 40 to thus break the electrical circuit connection and prevent energization of the element when it is shifted from its normal position. Furthermore, when the element is in the position shown in Figure 6, the body 14 and the contact members 17 carried thereby have been shifted axially from engagement with the brushes 40.

When it is desired to return the element 10 to its normal position, it is only necessary to press it downwardly. The lug 20 will then be slid downwardly along the incline 26 causing the element to rotate in a reverse direction until the lug 20 becomes re-engaged with the notch 27. This will return the element to its normal position as shown in Figures 1 and 2 and will wind up the torsion spring once again.

Clearly, the heretofore described shifting movement

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of the element 10 to and from its normal position will not stress the leads 41 since they remain stationary at all times. Further, the wiping contact between the sleeves 17 and the brushes 40 will maintain the electrical connection therebetween in good condition at all times.

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 range-type electric heating unit, comprising a support, a convoluted, sheathed electric heating element having a heat-generating portion and also having a terminal portion extending from said heat-generating portion, said terminal portion being pivotally secured to said support and providing an axis about which said heating element is shiftable toward and away from a heat-dispensing position, and means comprising a first portion carried by said terminal portion and shiftable therewith and a second portion carried by said support, said first and second portions being cooperable in the heat-dispensing position of said heating element to provide for current flow thereto and said first and second portions being shifted from cooperation thereby interrupting current flow upon movement of said heating element from its heat-dispensing position.

2. A range-type electric heating unit, comprising a support, an elongated sheathed electric heating element having its intermediate portion convoluted to provide a heat-generating area and having its terminal portions disposed together in side-by-side relation, said terminal portions being pivotally secured to said support and providing an axis about which said heating element is shiftable toward and away from a heat-dispensing position, and contact means comprising first portions carried by respective terminal portions and second portions carried by said support, each second portion being engageable with a related first portion when said heating element is disposed in heat-dispensing position to provide for current flow thereto and said portions being shifted from interengagement thereby interrupting current flow upon movement of said heating element from its heat dispensing position.

3. A range-type electric heating unit, comprising a support, an elongated sheathed electric heating element having its intermediate portion convoluted to provide a heat-generating area and having its terminal portions disposed together in side-by-side relation, said terminal portions being pivotally secured to said support and providing an axis about which said heating element is shiftable toward and away from a heat-dispensing position, terminal means extending from said terminal portions and each having connection with a resistance wire disposed within the sheath of said heating element, and contact means comprising first portions secured to respective terminal means and second portions carried by said support, said first and second portions being in engagement when said heating element is disposed in its heat-dispensing position to provide for current flow thereto and said first portions being shifted from engagement with said second portions thereby interrupting current flow upon movement of said heating element from its heat-dispensing position.

4. A range-type electric heating unit assembly, comprising a sheathed electric-resistance heating element having its intermediate portion formed to provide a heating surface generally disposed in a plane and having its terminal portions extending at an angle from one side of said plane and brought together to comprise post-like means,

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a support for said heating element having a bearing for rotatably receiving said post-like means whereby said heating element may be rotated relative to said support about the pivot formed by said post-like means, an electrical contact member formed on each of said terminal portions for conducting current to the resistance of said heating element, current conducting members carried by said support and connectable to a source of current and selectively engageable with respective ones of said contact members through rotation of said heating element about the pivot formed by said post-like means.

5. A range-type electric heating unit assembly, comprising a heat reflector member depending from a surface of a range, a sheathed electric-resistance heating element having its intermediate portion formed to provide a heating surface generally disposed in a plane and adapted to extend flat-wise generally parallel to the range surface and in position overlying said reflector member when in heating position and the terminal portions of said heating element being bent and extending downwardly from the plane of said heating surface and brought together in side-by-side relation to comprise post-like means, an upright bearing for rotatably receiving said post-like means whereby the heating surface of said heating element may be rotated from heating position overlying said reflector member to a non-heating position rotated clear of position overlying said reflector member to expose the latter for cleaning purposes, an electrical contact member formed on each of said terminal portions for conducting current to the resistance of said heating element, fixed current conducting members connectable to a source of current and selectively engageable with respective ones of said contact members, respective contact members and current conducting members being in electrical engagement when said heating surface is in heating position and said electrical engagement being broken by rotation of said heating surface to its non-heating position.

6. A range-type electric heating unit assembly, comprising a sheathed electric-resistance heating element having its intermediate portion formed to provide a heating surface generally disposed in a plane and having terminal portions extending at an angle from one side of said plane and brought together in side-by-side relation, a first sleeve about said terminal portions to form a post-like member, a support for said heating element including a second sleeve rotatably receiving said post-like member whereby the heating surface of said heating element may be rotated relative to said support about the pivot formed by said post-like member, an electrical contact member formed on each of said terminal portions for conducting current to the resistance of said heating element, current conducting members carried by said support and connectable to a source of current and selectively engageable with respective ones of said contact members through rotation of said heating surface about the pivot formed by said post-like member.

7. A range-type electric heating unit assembly, comprising a sheathed electric-resistance heating element having its intermediate portion formed to provide a heating surface generally disposed in a plane and having terminal portions extending at an angle from one side of said plane and brought together in side-by-side relation, a first sleeve about said terminal portions to form a post-like member, a support for said heating element including a second sleeve rotatably receiving said post-like member whereby the heating surface of said heating element may be rotated relative to said support about the pivot formed by said post-like member, said first and second sleeves having interengaging cam members providing for relative axial movement of said post-like member and said second sleeve during their relative rotation, an electrical contact member formed on each of said terminal portions for conducting current to the resistance of said heating element, current conducting members carried by said support and connectable to a source of current and selectively engageable with respective ones of said contact members through

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rotation of said heating surface about the pivot formed by said post-like member.

8. A range-type electric heating unit assembly, comprising a sheathed electric-resistance heating element having its intermediate portion formed to provide a heating surface generally disposed in a common plane and having terminal portions extending at an angle from one side of said plane and brought together in side-by-side relation, a first sleeve about said terminal portions to form a post-like member, a support for said heating element including a second sleeve rotatably receiving said post-like member whereby the heating surface of said heating element may be rotated relative to said support about the pivot formed by said post-like member, a dielectric member carried by said post-like member, a plurality of contact members carried in spaced-apart relation by said dielectric member, said contact members conducting current to the resistance of said heating element, current conducting members carried by said support and connectable to a source of current and selectively engageable with respective ones of said contact members, said first and second sleeves having interengaging cam members providing for relative axial movement of said postlike member and said second sleeve during their relative rotation whereby respective cooperating contact members and current conducting members are rotated out of electrical contact and physically separated during certain rotational movement of said heating surface.

9. A range-type electric heating unit assembly for mounting in a range top opening, comprising a heat reflector member having a portion engageable with the surface of the range top margining said opening whereby a central portion of said reflector member depends from the range top and extends inwardly of said opening, a sheathed electric resistance heating element having its intermediate portion formed to provide a heating surface generally disposed in a plane and adapted to extend flat-wise generally parallel to the range surface and in position overlying said reflector member when in heating position and the terminal portions of said heating element being bent and extending downwardly from the plane of said heating surface and brought together in side-by-side relation, a first sleeve fixed to and disposed about said terminal portions to form a post-like member, a second sleeve secured to said reflector member in upright relation for rotatably receiving said post-like member whereby the heating surface of said heating element may be rotated from heating position overlying said reflector member to a non-heating position rotated clear of position overlying said reflector member to expose the latter for cleaning purposes, a dielectric member carried at the lower end of said post-like member and rotatable therewith, a plurality of contact members carried in spaced-apart relation by said dielectric member, each for conducting current to the resistance of said heating element, and a fixed dielectric block carried by said reflector member and supporting spaced-apart current conducting members cooperable with respective contact members, respective contact members, and current conducting members being in electrical engagement when said heating surface is in heating position and said electrical engagement being broken by rotation of said heating means to its non-heating position.

10. A range-type electric heating unit assembly, comprising a sheathed electric-resistance heating element having a generally plane heating portion and a terminal portion extending transversely from one side of said heating portion, a support for said heating element having a socket for rotatably receiving said terminal portion, said socket and said terminal portion having co-acting cam elements which effect a raising of said heating element as the latter is rotated whereby said heating element may be rotated and simultaneously raised from predetermined heating position, electrical contact means carried by said

terminal portion and connected to the resistance of said element and electrical contact means in fixed relation with said socket and connectable to a source of electrical energy, said terminal and socket contact means being in engagement when said heating element is in predetermined heating position to provide for conduction of electrical energy from said source to said resistance, and said terminal and socket contact means being separated by simultaneous rotation and raising of said heating element to effect a break in the electrical circuit from said source to said resistance.

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