

May 21, 1935.

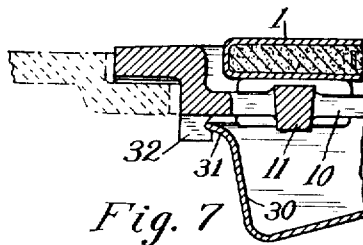
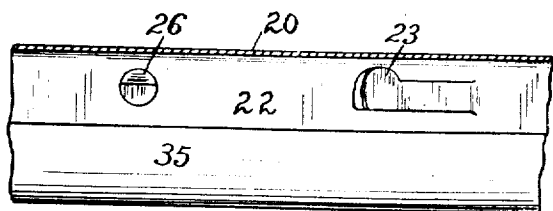
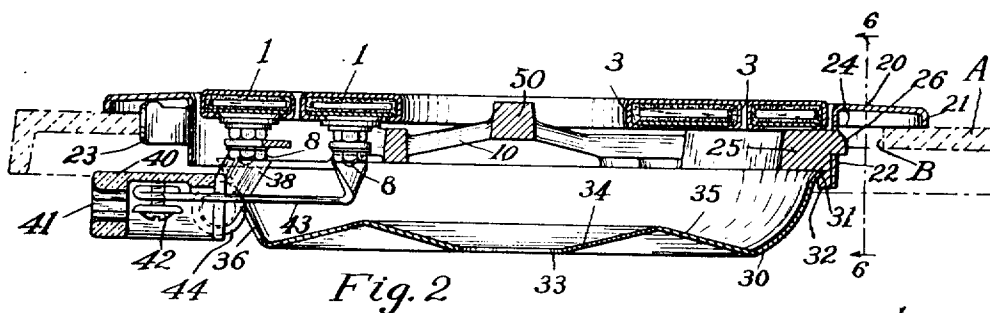
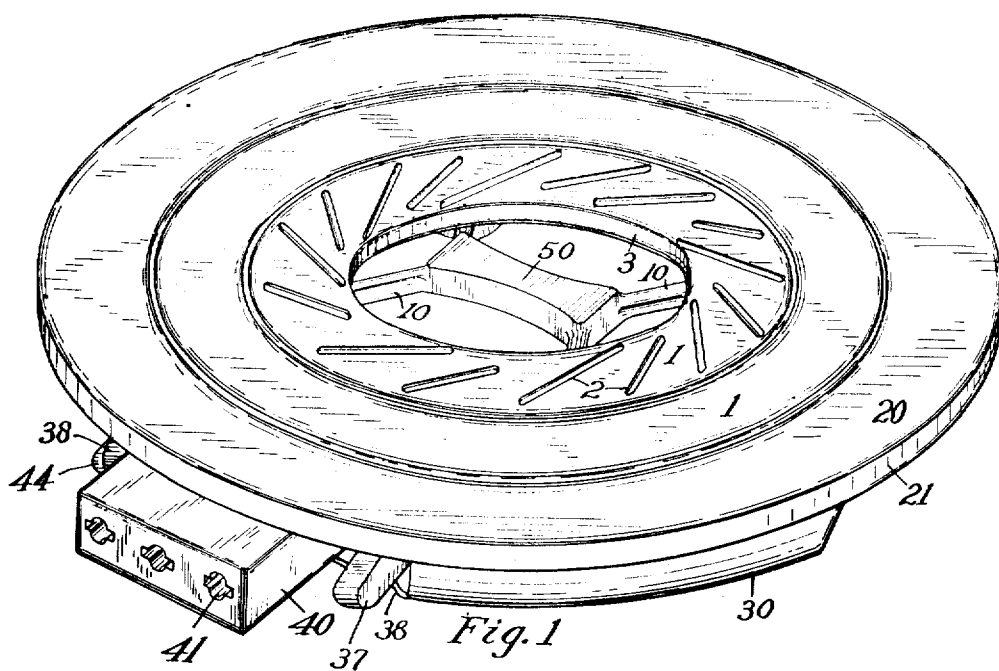
E. L. WIEGAND

2,001,995

ELECTRIC RESISTANCE HEATING ELEMENT

Filed Jan. 8, 1932

2 Sheets-Sheet 1



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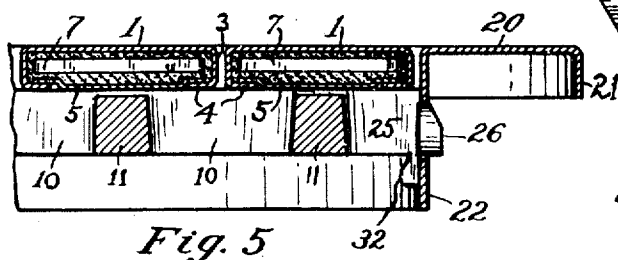
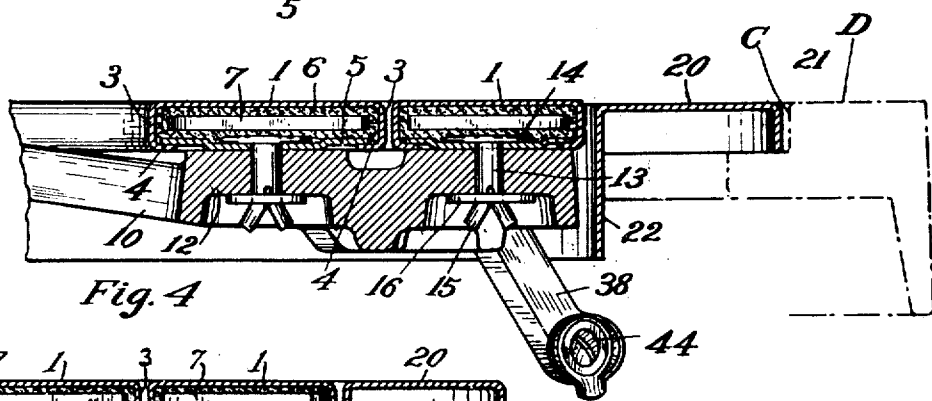
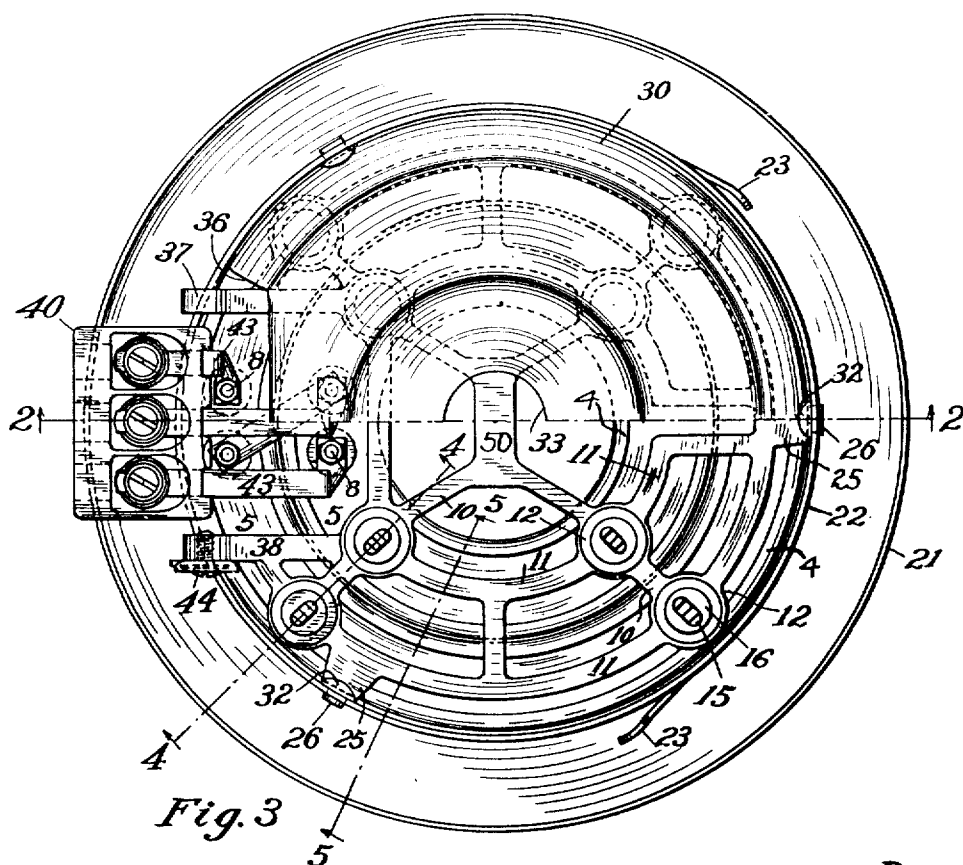
E. L. WIEGAND

2,001,995

ELECTRIC RESISTANCE HEATING ELEMENT

Filed Jan. 8, 1932

2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,001,995

ELECTRIC RESISTANCE HEATING ELEMENT

Edwin L. Wiegand, Pittsburgh, Pa.

Application January 8, 1932, Serial No. 585,494

35 Claims. (Cl. 219—37)

This invention relates to electric resistance heating apparatus and has for its object the provision of a new and improved cooking-element which shall be applicable to a large number of different stove- or range-tops and shall at the same time exhibit peculiar advantages of simplicity of construction, economy as regards heat-loss, safety as regards electrical circuits and short circuits, speed of heating, ease of cleaning, and economy of manufacture. Further objects and advantages of the invention will become apparent as the description proceeds.

In the drawings accompanying and forming a part of this application I have shown for illustrative purposes a specimen embodiment of my invention, in which drawings Fig. 1 is a perspective view of a two-heat stove-unit containing my improvements; Fig. 2 is a vertical, central, sectional view showing my improved unit in place in one type of stove-top, the section corresponding to the line 2—2 of Fig. 3; Fig. 3 is a bottom plan view of the device shown in Figs. 1 and 2, half of the reflector-pan being broken away; Fig. 4 is a detail vertical sectional view corresponding to the line 4—4 of Fig. 3; Fig. 5 is a sectional view on the line 5—5 of Fig. 3; Fig. 6 is a vertical sectional view on the line 6—6 of Fig. 2; and Fig. 7 is a partial section of a modification.

The electrical heating elements which I preferably employ herein are essentially the ring units set forth in my prior Patents Nos. 1,614,330 and 1,614,331, January 11, 1927, these, when a plural number are employed, being arranged in the nested relation set forth and claimed in my Patent No. 1,706,015, March 19, 1929.

Each of the heating elements in the embodiment of the invention disclosed herein comprises an annular, sheet-metal, sheath having a flat top-portion 1 (corrugated diagonally as shown at 2 in some cases for greater freedom from warping as set forth in my copending application Serial No. 585,493 filed January 8, 1932) and having narrow side-portions 3—3 having inturned margins 4—4 lapped over the margins of an annular closure-plate 5, thus producing a completely closed housing embracing and protecting the insulating-material 6 in which is submerged the electric resistance heating wire 7. The ends of this wire are attached to suitable terminals 8 which traverse the closure-plates 5 of the respective ring-elements, and a plurality of these elements may be employed for each unit, two being the number here illustrated, located one inside the other with their top-faces substantially in the same plane. These elements are secured to a skeleton framework, preferably made of cast-iron and in the present embodiment comprising radial arms 10—10 joined to concentric arcuate ribs 11—11 which are for the most part arranged closely underneath the closure plates 5 of the respective

ring units. At the intersections of the different arms and ribs are hollow enlarged bosses 12 to which the ring-elements are secured, a favorite mode of securing being that shown in Fig. 4, wherein a bifurcated rivet 13, having its head 14 located inside the ring-sheath, has the two branches 15 of its shank spread over a washer 16 thus holding the elements firmly while permitting relative thermal expansion between the elements and the frame.

When the unit is employed as standard original equipment by a manufacturer of electric stoves, the least expensive construction is to form the outer margin of the frame for direct engagement with the stove-top as shown in Fig. 7; but when used for replacement purposes, or specially prepared for any reason, an external adapter-ring is secured around this frame. Such a ring is illustrated in Figs. 1 to 6 inclusive, and consists of a thin annular sheet-metal plate 20 having a downturned flange 22 at its inner margin, and also sometimes a depending flange 21 at its outer margin, the latter, when present, usually terminating at a higher level than the inner flange so as to enable said inner flange to depend into a stove-hole while the margin of the ring engages the stove-top in supporting relation. Sometimes in the latter case it is desirable to provide adjustable expanding means to facilitate centering the device relatively to the hole. One convenient way of doing this is to form the flange 22 at intervals around its periphery with flexible tongues 23 partially cut out of the metal but having a sufficient integral portion to enable these tongues to be bent inwardly or outwardly more or less as the occasion requires. This detail construction is shown merely as being typical of an expandable adjusting feature.

With the use of a small number of frames and heating-elements and a series of cheap and simple adapter-rings it becomes possible for any dealer with minimum investment in stock to supply a large variety of demand or range equipment. The attachment of the frame to the adapter-ring is preferably by means of a simple snap-joint. For example the flange 22, here illustrated, is found with spaced apertures 24, and the frame is formed at corresponding spaced portions, preferably three in number, with external projections 25, each terminating in a radial finger 26, so that when pressed into the flange and pressed strongly therein, the fingers may be snapped into the respective openings. The tops of the heating-elements are preferably slightly elevated above the top surface of the adapter-ring when used.

In order to shield other parts of the stove from the heat of the elements and also to increase the efficiency of those elements I secure beneath said elements a metal reflector, the preferable shape

being that shown in Figs. 2 and 3, namely a sort of basin having an upwardly curved outer rim 30 terminating an outwardly turned lip 31, which is snapped into notches shown as formed inside the depending projection 32 with which the frame is formed, whereby the reflector is firmly held, though easily removable. At its center this reflector is formed with an aperture 33, surrounded, first by an upwardly slanting annular surface 34 outside of which is preferably a downwardly slanting annular surface 35. These slants are preferably so arranged that heat reflected downwardly from any heating element shall be reflected (elsewhere than back against the same element, some being reflected up through the aperture defined by that element so as thereby to be available at all times for cooking purposes and part (that falling on the portion 35) being reflected outwardly of said element, though it is permissible that heat radiated downwardly from an outermost element may be reflected back upon itself provided that excessive local temperature is avoided. These considerations are dictated by the desirability of keeping an inner ring or rings from becoming overheated as might occur when the next surrounding ring was also in operation, in case plural ring elements are employed. Overheating of the outermost ring is seldom to be feared since its loss of heat outwardly is never wholly prevented as is the case with the inner rings when the surrounding rings are heated. In order to maintain a high degree of reflecting coefficient for heat this reflector element is plated with some heat-resistant metal such as chromium.

The escape of crumbs or liquids spilled on this reflector is permitted by the aperture 33 and by interrupting the outer wall 30 of the reflector at one side with a notch 36 which extends to the bottom of the channel defined between the slanting portions 30 and 35. Application of the reflector to the frame always in one position is assured by forming the frame with a pair of spaced arms 37, 38 adapted to project through the two extremities of this notch; and between these two arms is located the terminal-box or connecting-element which consists preferably of recessed block 40 of heat-resisting material such as porcelain furnished with suitable apertures 41 and binding screws 42 for the lead-wires, and itself supported by means of the conducting elements 43 by which it is also united to the binding posts 8-8. These conducting elements 43 thus project through the notch 36 in the reflector, being protected at all times from contact with such reflector by the arms 37 and 38. In addition some part of the frame is preferably provided with connecting means whereby a wire may be attached thereto for the purpose of grounding the entire unit to some convenient part of the stove-frame, thus further diminishing the danger of personal injury from electric current. In the present instance this is effected by means of a binding post 44 carried by the arm 38. Also it is found convenient to extend the arms 10-10 inwardly of the innermost ring element and there connect them by a brace 50 which shall reduce the danger of spoons or other tools falling there-through and shall also steady small vessels against upsetting.

It will be understood that although I have shown a two-ring element the number of elements may be either increased or decreased, and that I do not even limit myself to the number or type of heating-elements employed since not only

ring-elements, but also disk-strip-, rod-, tube- or block-elements could be employed without departing from the present invention; that many other changes in detail can be made so that I do not limit myself to any features of detail or construction herein specifically described or illustrated except as the same are specifically recited in my several claims which I desire may be construed broadly, each according to its own limitations and independently of limitations in other claims.

Having thus described my invention what I claim is:

1. A range unit comprising, in combination, a frame, an electric resistance heating device carried by said frame and having an upwardly-directed contact surface, and an external adapter element secured to said frame and adapted to engage a range top and support said device in an opening of said top, the securing means between said frame and said adapter element comprising a snap joint.

2. A range unit, comprising, in combination, an annular sheet metal supporting member having a depending portion formed with apertures, a supporting frame located inside said member and having fingers located one in each aperture and held therein by the elasticity of said depending portion, and electric resistance heating devices carried by said frame.

3. A range unit, comprising, in combination, an electric resistance heating element, a supporting frame therefor, and a reflector located beneath said frame, said reflector and frame having interfitting recesses and projections and being in parts resilient, whereby the same are detachably snapped together.

4. A range unit, comprising, in combination, an electric resistance heating element, a skeleton supporting frame therefor, said frame having depending notched portions, and a sheet-metal reflecting element located beneath said frame and being in part resilient and having portions detachably snapped into said notches.

5. A range unit, comprising, in combination, an electric resistance heating element having an upwardly-facing working surface and having downwardly and laterally projecting terminal members, an annular supporting element surrounding said heating element and overlying said terminal members, said supporting element defining an opening beneath said heating element, a reflector element located beneath said heating element and having a recess at one part defining with said supporting element an aperture for said terminal members, and means for detachably securing said elements together.

6. A range unit, comprising, in combination, a sheet-metal-sheathed electric-resistance-heating-element and electrical connecting elements for said heating element, a supporting frame therefor, an adapter ring attachable and detachable with reference to said frame independently of the elements supported by said frame, and a snap-on reflector detachably mounted beneath the first named elements and independently attachable and detachable without manipulating the other elements.

7. A range unit, comprising, in combination, a skeleton cast-metal frame having its top defining a fiat surface and having its exterior margin defining a circle, an external adapter ring detachably secured to said frame in embracing relation, electric resistance heating devices secured to said frame, said frame comprising a

pair of spaced arms projecting at one side and located at a level below said ring, terminal members located in the space defined by said arms and operatively connected to said heating elements, and a reflector element detachably secured to the bottom of said frame and having a recess therein receiving said arms and terminal members.

8. A range unit, comprising: a ring-shaped heating device defining an aperture; a skeleton frame underlying said heating device and supporting the same; an adapter having a portion adapted to overlie a part of a stove top and also having a portion terminating in a depending flange adapted to depend into a stove hole and to embrace said heating device and skeleton frame in spaced relation, defining a passage through which air may pass and thence through said skeleton frame into contact with said heating device; and a reflector detachably secured to said skeleton frame and having inclined reflecting surfaces adapted to reflect heat through the aperture defined by said heating device and through said skeleton frame.

9. A range unit, comprising: a ring-shaped heating device defining an aperture; a skeleton frame underlying said heating device and supporting the same; an adapter having a portion adapted to overlie a part of a stove top and also having a portion terminating in a depending flange adapted to depend into a stove hole and to embrace said heating device and skeleton frame in spaced relation, defining a passage through which air may pass and thence through said skeleton frame into contact with said heating device; and a reflector detachably secured to said skeleton frame and having inclined reflecting surfaces adapted to reflect heat through the aperture defined by said heating device and through said skeleton frame, said reflector being detachable downwardly without detaching the other elements from each other.

10. An electrical device, comprising: an electric heating unit; supporting means, adapted to span a stove opening and be supported from the adjacent portion of the stove top, and to support said unit in alignment with said opening and of such size as to overlap said top a substantial distance, thereby to cooperate with openings of different sizes; and centering means, carried by said supporting means, engageable with the edge of said opening to hold said supporting means against lateral movement relative to said top, and adjustable, to hold said supporting means thus, in openings of different sizes.

11. An electrical heating device for a stove top, adapted particularly for replacement purposes, comprising: an electric heating unit, adapted to contact and support a cooking vessel, and carrying a first connecting means; and supporting means, for supporting said unit in position in a stove opening, and carrying a second connecting means cooperating with said first connecting means to quick-attachably and quick-detachably connect said unit and said supporting means, whereby said unit and said supporting means are secured against accidental disconnection, but quickly separable, to provide for ready replacement of either part.

12. An electrical heating device, comprising: an electric heating unit; supporting means, adapted to span a stove opening and be supported from the adjacent portion of the stove top, and

to support said unit in alignment with said opening, and of such size as to overlap said top a substantial distance, thereby to cooperate with said openings of different sizes; and centering means, carried by said supporting means, engageable with the edge of said opening to hold said supporting means against lateral movement relative to said top, and resilient, to tightly engage said edge.

13. An electrical heating device, comprising: an electric heating unit; supporting means, adapted to span a stove opening and be supported from the adjacent portion of the stove top, and to support said unit in alignment with said opening, and of such size as to overlap said top a substantial distance, thereby to cooperate with said openings of different sizes; and centering means, carried by said supporting means, laterally engageable with portions of said top to hold said supporting means against lateral movement relative to said top, adjustable, to hold said supporting means thus, in openings of different sizes, and resilient, to tightly engage said top.

14. An electrical heating device, comprising: an electric heating unit; supporting means, adapted to span a stove opening and be supported from the adjacent portion of the stove top, and to support said unit in alignment with said opening, and of such size as to overlap said top a substantial distance, thereby to cooperate with said openings of different sizes; and centering means, integral with and formed from said supporting means, laterally engageable with portions of said top to hold said supporting means against lateral movement relative to said top, and adjustable, to hold said supporting means thus, in openings of different sizes.

15. An electrical heating device, comprising: an electric heating unit; supporting means, adapted to span a stove opening and be supported from the adjacent portion of the stove top, and to support said unit in alignment with said opening, and of such size as to overlap said top a substantial distance, thereby to cooperate with said openings of different sizes; and centering means, integral with and formed from said supporting means, laterally engageable with portions of said top to hold said supporting means against lateral movement relative to said top, and resilient, to tightly engage said top.

16. An electrical heating device, comprising: an electric heating unit; supporting means, adapted to span a stove opening and be supported from the adjacent portion of the stove top, and to support said unit in alignment with said opening, and of such size as to overlap said top a substantial distance, thereby to cooperate with openings of different sizes; said supporting means including a depending sheet-metal skirt, and having obliquely extending fingers struck from said skirt in position to engage said top to hold said supporting means against lateral movement relative to said top.

17. An electrical heating device for a stove top, adapted particularly for replacement purposes, comprising: an electric heating unit, adapted to contact and support a cooking vessel, and carrying a first connecting means; and supporting means, for supporting said unit in position in a stove opening, and carrying a second connecting means cooperating with said first connecting means; one of said connecting means being resilient, to quick-attachably and quick-detachably connect said unit and said supporting means,

whereby said unit and said supporting means are secured against accidental disconnection, but quickly separable, to provide for ready replacement of either part.

18. An electrical heating device for a stove top, adapted particularly for replacement purposes, comprising: an electric heating unit, adapted to contact and support a cooking vessel, and carrying a first connecting means; and supporting means, for supporting said unit in position in a stove opening, and carrying a second connecting means cooperating with said first connecting means; one of said connecting means comprising projections and the other being provided with recesses receiving said projections, to quick-attachably and quick-detachably connect said unit and said supporting means, whereby said unit and said supporting means are secured against accidental disconnection, but quickly separable, to provide for ready replacement of either part.

19. An electrical heating device for a stove top, adapted particularly for replacement purposes, comprising: an electric heating unit, adapted to contact and support a cooking vessel, and carrying a first connecting means; and supporting means, for supporting said unit in position in a stove opening, and carrying a second connecting means cooperating with said first connecting means; one of said connecting means comprising projections and the other being provided with recesses receiving said projections, and one of said connecting means being resilient, to quick-attachably and quick-detachably connect said unit and said supporting means, whereby said unit and said supporting means are secured against accidental disconnection, but quickly separable, to provide for ready replacement of either part.

20. An electrical heating device for a stove top, adapted particularly for replacement purposes, comprising: an electric heating unit, adapted to contact and support a cooking vessel, and carrying a first connecting means; and supporting means, for supporting said unit in position in a stove opening, and carrying a depending resilient skirt constituting a second connecting means cooperating with said first connecting means; one of said connecting means comprising projections, and the other of said connecting means comprising recesses adapted to receive said projections, to quick-attachably and quick-detachably connect said unit and said supporting means, whereby said unit and said supporting means are secured against accidental disconnection, but quickly separable, to provide for ready replacement of either part.

21. An electrical heating device for a stove top, adapted particularly for replacement purposes, comprising: an electric heating unit, adapted to contact and support a cooking vessel, and carrying a plurality of projections constituting a first connecting means; and supporting means, for supporting said unit in position in a stove opening, and carrying a depending resilient skirt constituting a second connecting means and provided with a plurality of recesses into and from which said projections may be snapped, to quick-attachably and quick-detachably connect said unit and said supporting means, whereby said unit and said supporting means are secured against accidental disconnection, but quickly separable, to provide for ready replacement of either part.

22. An electrical heating device for a stove top, adapted particularly for replacement pur-

poses, comprising: an electric heating unit, adapted to contact and support a cooking vessel, and carrying a first connecting means; supporting means, for supporting said unit in position in a stove opening, and carrying a second connecting means cooperating with said first connecting means to quick-attachably and quick-detachably connect said unit and said supporting means, whereby said unit and said supporting means are secured against accidental disconnection, but quickly separable, to provide for ready replacement of either part; said supporting means being adapted to span the stove opening and be supported from the adjacent portion of the stove top, and to support said unit in alignment with said opening, and of such size as to overlap said top a substantial distance, thereby to cooperate with said openings of different sizes; and centering means, carried by said supporting means, engageable with the edge of said opening to hold said supporting means against lateral movement relative to said top, and adjustable, to hold said supporting means thus, in openings of different sizes.

23. In an electrical heating device: supporting means, adapted to span a stove opening and be supported from the adjacent portion of the stove top, and to support an electric heating unit in alignment with said opening, and of such size as to overlap said top a substantial distance, thereby to cooperate with said openings of different sizes; and centering means, carried by said supporting means, engageable with the edge of said opening to hold said supporting means against lateral movement relative to said top, and adjustable, to hold said supporting means thus, in openings of different sizes.

24. In an electrical heating device: supporting means, adapted to span a stove opening and be supported from the adjacent portion of the stove top, and to support an electric heating unit in alignment with said opening, and of such size as to overlap said top a substantial distance, thereby to cooperate with said openings of different sizes; and centering means, carried by said supporting means, engageable with the edge of said opening to hold said supporting means against lateral movement relative to said top, and resilient, to tightly engage said edge.

25. An electrical heating device, comprising: an electric heating unit; supporting means, adapted to span a stove opening and be supported from the adjacent portion of the stove top, and to support said unit in alignment with said opening, and of such size as to overlap said top a substantial distance thereby to cooperate with openings of different sizes; and centering means, carried by said supporting means, engageable with said top to hold said supporting means against lateral movement relative to said top, and radially adjustable, to hold said supporting means thus, in openings of different sizes.

26. An electrical heating device, comprising: an electric heating unit; supporting means, adapted to span a stove opening and be supported from the adjacent portion of the stove top, and to support said unit in alignment with said opening, and of such size as to overlap said top a substantial distance, thereby to cooperate with openings of different sizes; and centering means, carried by said supporting means, laterally engageable with portions of said top to hold said supporting means against lateral movement relative to said top, and adjustable, to hold said sup-

porting means thus, in openings of different sizes.

27. An electrical heating device, comprising: an electric heating unit; supporting means, adapted to span a stove opening and be supported from the adjacent portion of the stove top, and to support said unit in alinement with said opening, and of such size as to overlap said top a substantial distance, thereby to cooperate with said openings of different sizes; and centering means, carried by said supporting means, laterally engageable with portions of said top to hold said supporting means against lateral movement relative to said top, and resilient to tightly engage said top.

28. An electrical heating device, comprising: an electric heating unit; supporting means, adapted to span a stove opening and be supported from the adjacent portion of the stove top, and to support said unit in alinement with said opening, and of such size as to overlap said top a substantial distance, thereby to cooperate with said openings of different sizes; and centering means, carried by said supporting means, engageable with said top to hold said supporting means against lateral movement relative to said top, and radially adjustable, to hold said supporting means thus, in openings of different sizes, and resilient, to tightly engage said top.

29. An electrical heating device, comprising: an electric heating unit; supporting means, adapted to span a stove opening and be supported from the adjacent portion of the stove top, and to support said unit in alinement with said opening, and of such size as to overlap said top a substantial distance, thereby to cooperate with said openings of different sizes; and centering means, integral with and formed from said supporting means, engageable with said top to hold said supporting means against lateral movement relative to said top, and radially adjustable, to hold said supporting means thus, in openings of different sizes.

30. An electrical heating device, comprising: an electric heating unit; supporting means, adapted to span a stove opening and be supported from the adjacent portion of the stove top, and to support said unit in alinement with said opening, and of such size as to overlap said top a substantial distance, thereby to cooperate with openings of different sizes; said supporting means including a depending sheet-metal skirt, and having obliquely extending fingers struck from said skirt in position to engage laterally with portions of said top to hold said supporting means against lateral movement relative to said top.

31. An electrical heating device for a stove top, adapted particularly for replacement purposes, comprising: an electric heating unit, adapted to contact and support a cooking vessel, and carrying a first connecting means; supporting means, for supporting said unit in position in a stove opening, and carrying a second connecting means cooperating with said first connecting means to quick-attachably and quick-detachably connect said unit and said supporting means, whereby said unit and said supporting means are secured against accidental disconnection, but quickly separable, to provide for ready replacement of either part; said supporting means being adapted to span the stove opening and be supported from the adjacent portion of the stove top, and to support said unit in alinement with said open-

ing, and of such size as to overlap said top a substantial distance, thereby to cooperate with said openings of different sizes; and centering means, carried by said supporting means, engageable with said top to hold said supporting means against lateral movement relative to said top, and adjustable, to hold said supporting means thus, in openings of different sizes.

32. An electrical heating device for a stove top, adapted particularly for replacement purposes, comprising: an electric heating unit, adapted to contact and support a cooking vessel, and carrying a first connecting means; supporting means, for supporting said unit in position in a stove opening, and carrying a second connecting means cooperating with said first connecting means to quick-attachably and quick-detachably connect said unit and said supporting means, whereby said unit and said supporting means are secured against accidental disconnection, but quickly separable, to provide for ready replacement of either part; said supporting means being adapted to span the stove opening and be supported from the adjacent portion of the stove top, and to support said unit in alinement with said opening, and of such size as to overlap said top a substantial distance, thereby to cooperate with said openings of different sizes; and centering means, carried by said supporting means, laterally engageable with portions of said top to hold said supporting means against lateral movement relative to said top, and adjustable, to hold said supporting means thus, in openings of different sizes.

33. In an electrical heating device: supporting means, adapted to span a stove opening and be supported from the adjacent portion of the stove top, and to support an electric heating unit in alinement with said opening, and of such size as to overlap said top a substantial distance, thereby to cooperate with said openings of different sizes; and centering means, carried by said supporting means, engageable with said top to hold said supporting means against lateral movement relative to said top, and radially adjustable, to hold said supporting means thus, in openings of different sizes.

34. In an electrical heating device: supporting means, adapted to span a stove opening and be supported from the adjacent portion of the stove top, and to support an electric heating unit in alinement with said opening, and of such size as to overlap said top a substantial distance, thereby to cooperate with said openings of different sizes; and centering means, carried by said supporting means, laterally engageable with portions of said top to hold said supporting means against lateral movement relative to said top, and adjustable, to hold said supporting means thus, in openings of different sizes.

35. In an electrical heating device: supporting means, adapted to span a stove opening and be supported from the adjacent portion of the stove top, and to support an electric heating unit in alinement with said opening, and of such size as to overlap said top a substantial distance, thereby to cooperate with said openings of different sizes; and centering means, carried by said supporting means, laterally engageable with portions of said top to hold said supporting means against lateral movement relative to said top, and resilient, to tightly engage said top.

CERTIFICATE OF CORRECTION.

Patent No. 2,001,995.

May 21, 1935.

EDWIN L. WIEGAND.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, first column, line 13, strike out the bracket "("; and second column, line 35, claim 3, after "projections" insert a comma; and in line 36, for "parts" read part; page 3, first column, line 44, claim 10, after "electrical" insert the word heating; page 4, second column, line 56, claim 25, after "distance" insert a comma; and page 5, first column, line 14, claim 27, after "resilient" insert a comma; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 16th day of July, A. D. 1935.

(Seal)

Leslie Frazer
Acting Commissioner of Patents.