March 4, 1941. H. G. SIMPSON 2,234,132

ELECTRIC RANGE AND HEATER

Filed May 21, 1938 2 Sheets-Sheet 1

Fig. 1

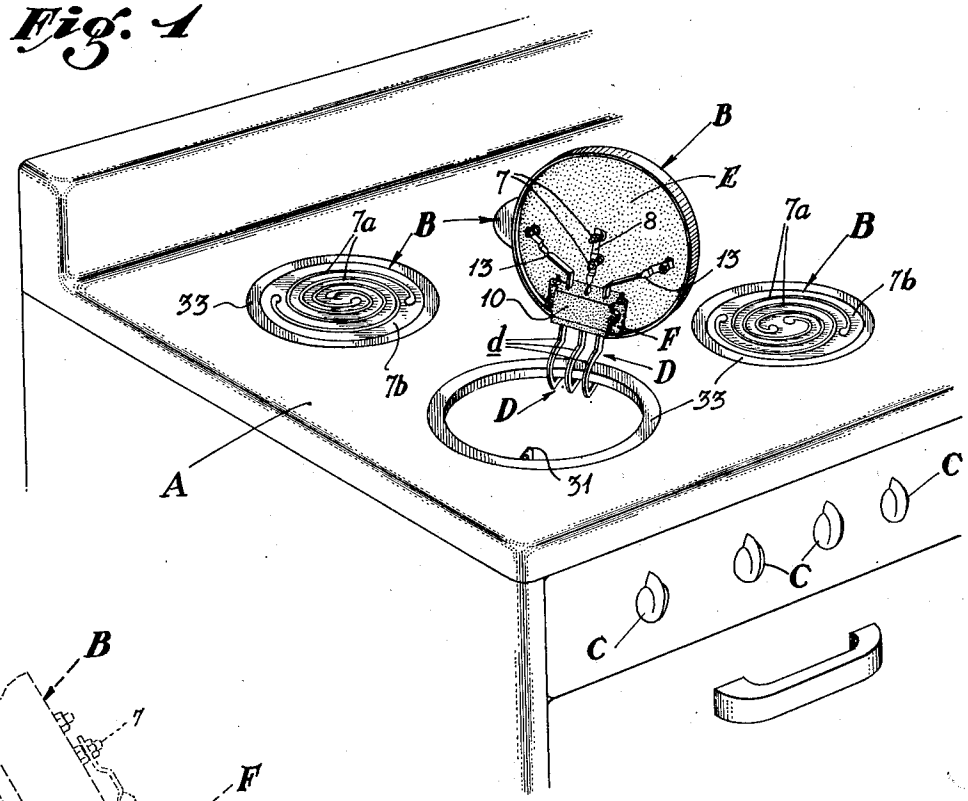
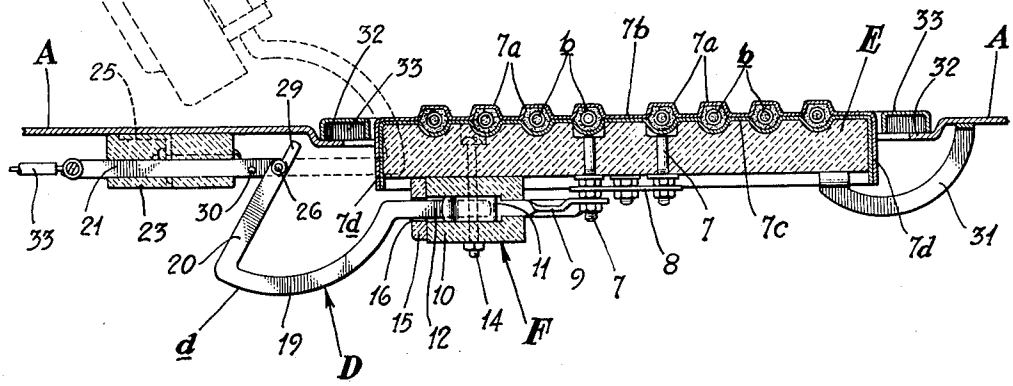






Fig. 3




HARRY G. SIMPSON,
INVENTOR:

BY Raymond Lacey & Lacey
ATTORNEY.

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ELECTRIC RANGE AND HEATER

Filed May 21, 1938 2 Sheets-Sheet 2

Fig. 2

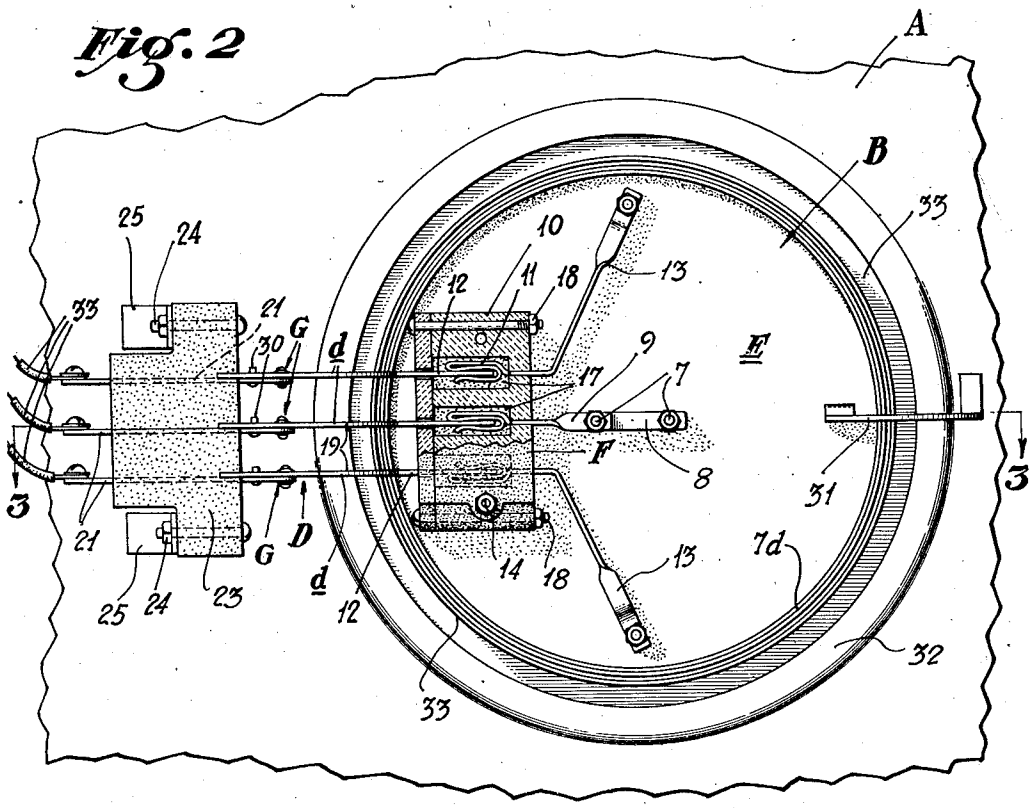



Fig. 4

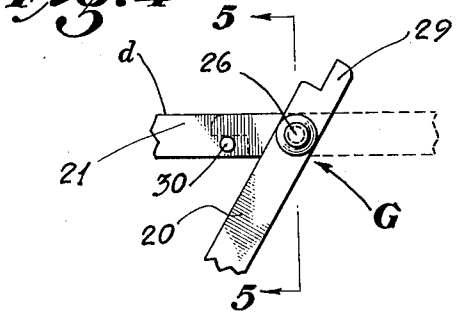
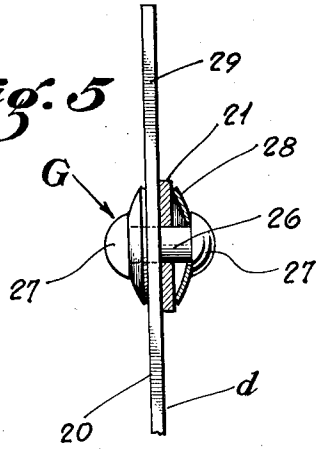



Fig. 5




HARRY G. SIMPSON,
INVENTOR;

BY Raymond Jones & Clarke,
ATTORNEY.

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# UNITED STATES PATENT OFFICE

2,234,132

## ELECTRIC RANGE AND HEATER

Harry G. Simpson, Los Angeles, Calif., assignor of one-fourth to Vincent C. Hickson, Los Angeles, Calif., and one-fourth to Raymond Ives Blakeslee, Pasadena, Calif.

Application May 21, 1938, Serial No. 209,308

11 Claims. (Cl. 219—37)

This invention relates to electrical cookers and heaters, and more particularly to electrical cookers such as ranges, stoves and the like, which employ one or more resistance units or assemblies disposed at or adjacent to the surface of the range or stove, with lead wires for supplying electrical energy thereto and suitable switches for controlling the flow of the current. As one example of the invention, namely, that specifically shown in the drawings and hereinafter described in detail, these units or assemblies are removably supported in openings resembling stove lid openings, and may be lifted therefrom for purpose of cleaning the marginal portion of the unit or assembly and the surfaces within which the same fit or rest upon. Of course, in the use of such electrical ranges, fluid materials will overflow and be discharged downwardly around such units or assemblies and into the stove top openings, and deposits and accumulations will be caused upon and beneath the surfaces mentioned. In present practice, it is customary to connect the lead wires for supplying current directly with the units or assemblies, and the result is that when materials flow or are deposited downwardly as mentioned, the same find their way to the electrical conductors and soil and coat same, and if the electrical paths and terminals are not thoroughly insulated, grounding or shorting may thereby be caused. Also, in raising such units or assemblies for purposes of such cleaning, or for the purpose of making any repairs or renewals of parts or features, the lead wires are, perforce, dragged upwardly through the stove top opening and abrasion of the insulation thereon is liable to occur, and even breakage of the wires or detachment thereof under the pull of such removal is apt to occur, and the exposure of such wires to the view of the housewife or user of the range or stove creates apprehension and fear of short circuiting, grounding and shock. Particularly are all of these objections met with in every-day experience, because the stove top and frame are ordinarily metallic and every opportunity exists for such grounding or shorting.

In accordance with the present invention, I so mount each such unit or assembly that the means of mounting itself serves as an electrical path or paths from the lead wires to the respective unit or assembly. In other words, I provide means of adjustment or manipulation of each unit or assembly which in itself contains and embraces the electrical path or paths, and these may be thoroughly insulated as desired, by coating of porcelain or enamel or the like ceramic or vitreous material, with the danger of shorting or grounding of the current to all intent eliminated. More particularly is it found advantageous to mount the unit or assembly upon hinge means constraining the movement of the unit or assembly to a fixed path of travel, such hinge means providing and constituting electrical path or paths for the current. All that is necessary is to merely tilt up the unit or assembly and it will rise to an extent limited by suitable stop, whereupon the surfaces of the range or stove top and its opening and the periphery of the unit or assembly may be readily and quickly cleaned and the unit or assembly hinged and dropped back into position of service.

This arrangement, and equivalent arrangements, even including sliding adjustability in a vertical direction, which is not illustrated but which is deemed equivalent to hinge mounting, produces an elimination of the dangers of shorting or grounding, prevents the exposure of any of the lead wires through the range or stove top opening, provides for sightliness of appearance, and eliminates danger to and apprehension upon the part of the housewife or attendant, and permits of convenient and quick cleaning of the soiled or coated or impaired surfaces, and assures a quick and ready restoration of the unit or assembly back into its normal position of service.

Also, the invention in its various aspects permits of quick and ready adjustment or manipulation of the unit or assembly for purpose of giving attention to the electrical resistance features and paths and contacts and binding posts and terminals at the nether side of the unit or assembly. The lead wires, in the practice of the invention, are never dragged about or exposed through the range or stove top opening or dragged above such opening, with the dangers and unsightliness and unnecessary causation of apprehension which attend such former practices. Likewise, the lead wires terminate remotely from the unit or assembly and the insulation thereof is preserved and protected against deterioration or destruction by heat, as well as the spilling and falling of foods and other substances being heated or cooked upon the unit. The use of the invention also prevents scratching of the stove or range top.

The invention has for its objects the provisions of an improved electrical range or heater of the general character and having the general attributes and features and advantages above set

forth, and which will be generally superior in point of efficiency, inexpensiveness, sightliness, convenience in use nd manipulation, durability or length of life and general adaptability to convenience and service.

With the above and other objects in view, the invention consists in the novel and useful arrangement, provision, formation, construction, interrelation and combination of parts, members and features all as hereinafter described, shown in the drawings, and finally pointed out in claims.

In the drawings:

Fig. 1 is a perspective view of a portion of an electrical range or heater, and more particularly the upper portion or top thereof, showing a plurality of heating or cooking units or assemblies mounted in connection therewith or in relation thereto in accordance with the present invention;

Fig. 2 is a bottom plan view, partly in section, of a portion of the under side of the range or stove top and electrical unit or assembly, upon an enlarged scale;

Fig. 3 is a transverse sectional view, partly in full lines, taken upon the line 3—3, Fig. 2, and looking in the direction of the appended arrows;

Fig. 4 is a fragmentary detail enlarged elevation of a portion of the adjustable mounting for one of the units or assemblies shown in the other figures; and

Fig. 5 is a detail sectional view, taken upon the line 5—5, Fig. 4, and looking in the direction of the appended arrows, parts being in full lines.

Corresponding parts and features in the figures are given the same reference characters.

Referring with particularity to the drawings, I have shown therein a range or stove having a top, A, and a plurality of electrical heating or cooking units or assemblies, B, arranged suitably with relation to such top, and upon which may be supported or rested vessels, articles or objects to which heat is to be imparted from the energy of such units or assemblies.

C are manually operable switches, one for each of the units or assemblies. These switches, of course, are organized to produce intermediate, high or low heats, by combining the various electrical paths in the usual method, and in accordance with the present invention these electrical paths are incorporated and embraced in mounting means D or means for adjustably mounting each such unit or assembly B, and comprising in each instance a plurality of members *d* each of which provides such an electrical path. The resistance elements *b*, particularly shown in Fig. 3, are mounted in connection with a vitreous or ceramic body E, in the conventional or any preferred manner, and are arranged spirally and are enclosed within spiral casings 7*a* set into the body E, each of which casings is embraced within or constitutes part of a formed plate 7*b* applied to the top of the resistance body E, there being a similar plate 7*c* set into such body beneath the resistance element *b*, and both of said plates 7*b* and 7*c* being flanged downwardly at their marginal portions as at 7*d* to surround the periphery of the insulating body E for purposes of finished exterior and ready cleaning, and also to lead any drippings or deposits down between the adapter ring 33 hereinafter described and such flanged portions into the range or stove space beneath the respective unit or element and from which space same may be readily removed. All the casings may be connected together as shown.

Suitable terminals 7 pass through each insulating body E and connect up respectively with its resistance spirals *b*, and at the inner terminations of the spirals they are bridged together by conductor 8, and from one of these terminals 7 extends a conductor 9 entering a porcelain or other insulating receptacle 10 where it is provided with one contact 11 which co-acts with another contact 12 constituting a quickly detachable electrical couple. Three of these are provided within the receptacle F, one for each electrical path *d*, all three of same being embraced within the means of adjustment or hinge means D. Between the other two terminals 11 and the respective outer terminations of the spirally interrelated resistance elements *b* extends a conductor 13. The receptacle F is bolted to the under side of the insulating body E as at 14, and the inner face of said receptacle F carries a face plate 15 with reduced openings 16 respectively communicating with larger chambers 17 in the receptacle F to reduce the possibility of any intrusion or invasion by any extraneous matter or material and produces a final assembly of simple form and of convenience. This face plate is bolted to the said face of the receptacle, as at 18.

Each of the conductor members *d* which is plotted to definite arcuate form and constitutes a relatively rigid metallic arm portion 19, terminates in a relatively straight arm portion 20 which enters into a pivotal joint G, the relation between the curvature of the arm portion 19 and the other arm portion 20 being such, and the fulcrum of the arm being so disposed, that the heating or cooking unit or assembly above described may be swung upwardly from the position shown with respect to all of the units but one in Fig. 1 to the position shown with respect to the intermediate unit in that figure, in hinge action and play. Each of the fulcrums above mentioned is provided at the end of a conducting strip 21 passed through an insulating block 23 secured beneath the range or stove top A and bolted as at 24 to brackets 25 spot welded to and beneath the range or stove top. Each such fulcrum is completed by a hinge pin 26 passing through the conducting strip 21 and through the hinge arm portion 20, such pin being capped or headed at each end as at 27, and being of greater length than the cross-sectional dimensions of the parts 20, 21 to provide for inclusion between both heads 27 and the parts 20 and 21 of curved compression springs 28, insuring close electrical contact between such parts 20 and 21. The extreme end portion of the arm portion 20 is provided with a finger 29 which comes into contact with a stop pin 30 carried by the conducting strip 21, when the element or unit B is in its extreme position pursuant to elevation and adjustment thereof and tilted preferably slightly out of the vertical with respect to its major plane, as shown in Fig. 3. A further curved stop arm 31 is mounted upon and beneath the range or stove top A diametrically opposite to the insulating block 23 and it extends downwardly and inwardly of the range or stove top into position to engage with the nether portion of the insulating block E and maintain the same in lowered or normal cooking position. Thus each unit assembly is supported in such position by one of the means D and the respective stop arm 31.

The range or stove top is provided with an annular depressed rim 32 somewhat beneath its major surface and surrounding the unit or assembly B, and an adapter ring, preferably of inverted channel iron formation 33, rests upon said rim or flange serving to prevent deposit of

materials by spilling or otherwise down onto said flange and beneath the stove top. Lead wires 33 extend from sources of electrical current supply to and are electrically connected with the conducting strips 21 through the switches C for that unit or element B.

The operation, method and use and advantages of the invention, as exemplified in the form disclosed in the drawings and herein described, will be readily understood from the foregoing description, and said drawings, and will be apparent therefrom without further statement.

In order to obtain acess to the lower part of each element or unit B and to remove the same from its normal position of service for purposes of cleaning the range or stove top respective opening and its surfaces and adjuncts and the periphery of the unit or element B, which latter includes the flanges 7*d*, and also to permit removal of accumulated materials from within the stove or range beneath the top, the respective unit or element B swings upwardly in hinge action upon the respective hinge pins 26, in an arcuate path, the arms *d* which serve as electrical paths for such unit or element likewise serving as supporting arms and hinge members for the unit or element. At no time is any lead wire, insulated or uninsulated, brought into view in this action or during the cleaning action or restoration of parts to normal position, and the arms *d* may be suitably insulated by coating with porcelain or other insulating material, or enclosed in such insulating material as desired. All danger of shorting or grounding of electrical current is avoided, sightliness and cleanliness are promoted, and the apprehension and fear of the use of exposed lead wires is eliminated and a quick and simple cleaning operation is provided for, and repair and replacement of parts of the respective unit or element made more convenient and speedy.

In the use of the present invention there is only a minimum of heat transferred to the range or stove top, and accompanying heat loss, because each unit or assembly B only has contact with the stove top at four points, namely, through the mounting means D at the hinge pins 26 and stop pins 30 thereof and the stop arm 31. There is a clearance all around each said unit, and the flanges 7*d* of the plates 7*b* and 7*c* do not touch the unit or assembly. The stop arm 31 contacts with the under side of the insulating body E. In the use of units as ordinarily installed and mounted, the lead wires when dragged up through the respective opening in the range or stove top are subject to abrasion and this can frequently produce shorting or grounding. Material dangers from fire and shock are eliminated by the use of the present invention.

Having described my invention in connection with illustrative embodiments, forms, proportions and arrangements of parts, it will be understood that many variants thereof are possible to those skilled in the art, and my invention in its broader aspects is not limited to the specific construction herein described and shown, as changes in the sizes, proportions, configurations, arrangements, assemblage, interaction, juxtaposition and mechanical relations, as well as additions, ommissions, substitutions, combinations and alterations of forms, parts, members and features, may be made without departing from the broad spirit of this invention.

Having thus disclosed my invention, I claim and desire to secure by Letters Patent:

1. The combination with a stove top having an opening therein, of a heater device adapted to normally fill said opening and including a resistor element having terminals, a plurality of conductor bars pivoted beneath the top in spaced relation to said opening and having arcuate portions concentric to the pivot axis and spaced therefrom to rise through said opening, and means mounting said device upon said bars said bars being electrically connected to said terminals.

2. The combination with a stove top having an opening therein, of a heater device adapted to normally fill said opening and including a resistor element having terminals, a plurality of conductor bars pivoted beneath the top in spaced relation to said opening and having arcuate portions concentric to the pivot axis and spaced therefrom to rise through said opening, means mounting said device upon said bars said bars being electrically connected to said terminals, and means limiting swinging movement of said bars in movement to lift said heater device.

3. The combination with a stove top having an opening therein, of an insulating disk normally held in said opening, a terminal block secured beneath the disk and having a plurality of lateral openings therein, a resistor element carried by the upper side of the disk, terminal members connected to said element and having forked spring ends seated in the terminal block openings, and a plurality of conductor bars pivoted beneath the stove top in spaced relation to the opening therein, said bars having arcuate portions concentric to the pivot axis and spaced therefrom to rise through the opening in the stove top, said bars having free terminal portions slidably engaging in said forked spring ends.

4. The combination with a stove top having an opening therein, of an insulating disk normally held in said opening, a terminal block secured beneath the disk and having a plurality of lateral openings therein, a resistor element carried by the upper side of the disk, terminal members connected to said element and having forked spring ends seated in the terminal block openings, a plurality of conductor bars pivoted beneath the stove top in spaced relation to the opening therein, said bars having arcuate portions concentric to the pivot axis and spaced therefrom to rise through the opening in the stove top, said bars having free terminal portions slidably engaging in said forked spring ends, and means limiting swinging movement of said bars in movement to lift said disk.

5. The combination with a stove top having an opening therein, of a heater device normally seated in said opening and including a resistor coil having a plurality of terminals, an insulating terminal block fixed to the under side of the stove top adjacent said opening, a plurality of supply terminals carried by said block and having ends projecting from the block toward said opening, conductor bars each pivoted to the projecting end of a respective supply terminal and having an angularly disposed section spaced from the pivot axis to rise through said opening, and means mounting said device upon said conductor bars and electrically connecting the bars to the resistor terminals.

6. The combination with a stove top having an opening therein, of a heater device normally seated in said opening and including a resistor

coil having a plurality of terminals, an insulating terminal block fixed to the under side of the stove top adjacent said opening, a plurality of supply terminals carried by said block and having ends projecting from the block toward said opening, conductor bars each pivoted to the projecting end of a respective supply terminal and having an angularly disposed section spaced from the pivot axis to rise through said opening, said resistor terminals having spring forked ends detachably gripping the free ends of said bars whereby the heater device is detachably mounted upon said conductor bars and whereby said supply terminals are electrically connected through said conductor bars with said resistor coil.

7. An electric stove including a top, an electric heating device to be disposed, when operative, substantially horizontally relative to said top, said heating device including an electrical resistance element having terminals, rigid current supply members fixed with respect to said stove top, and hinge members pivoted to and supported by said current supply members and having said heating device mounted thereon so that said heating device is swingable between its operative position and a raised, inoperative position relative to said stove top, said hinge members being electrically conductive and being electrically connected with the terminals of said resistance element whereby they also serve for conducting current from said supply terminals to said resistance element.

8. An electric stove including a top, an electric heating device to be disposed, when operative, substantially horizontally relative to said top, said heating device including an electrical resistance element having terminals, rigid current supply members fixed with respect to said stove top, and electrically conductive hinge members pivoted to and supported by said current supply members and having slidable, quick-detachable connections with the terminals of said resistance element, whereby the heating device is mounted on the stove for swinging movement between its operative position and a raised, inoperative position relative to the stove top and is readily detachable from the stove and whereby the supply of current from said current supply members to said resistance element is through said hinge members.

9. An electric stove including a top having an opening, an electric heating device to be disposed, when operative, substantially horizontally in closing relationship to said opening, said heating device including an electrical resistance element having terminals, rigid current supply members fixed with respect to said stove top beneath the latter, and hinge members pivoted to and supported by said current supply members and having said heating device mounted thereon, said hinge members having portions shaped to rise through said opening to permit the heating device to be swung from its operative position to a raised, inoperative position relative to the stove top uncovering said opening, said hinge members being electrically conductive and being electrically connected with the terminals of said resistance element whereby they also serve for conducting current from said supply terminals to said resistance element.

10. An electric stove including a top, an electric heating device to be disposed, when operative, substantially horizontally relative to said top, said heating device including an electrical resistance element having socket terminals, rigid current supply members fixed with respect to the stove top, and electrically conductive hinge members pivoted to and supported by said current supply members and having free terminal portions slidably, quick-detachably engaged in the socket terminals of said resistance element, whereby the heating device is mounted upon the stove for swinging movement between its operative position and a raised, inoperative position relative to the stove top and is quickly detachable from the stove and whereby the supply of current from said supply members to said resistance element is through said hinge members.

11. An electric stove including a top having an opening, an electric heating element to be disposed, when operative, substantially horizontally and within said opening, and electrically conductive means for supplying current to said heating element, said means being pivoted beneath the stove top and having the heating element mounted thereon and being swingable through the opening in the stove top to permit the heating element to be raised relative to the stove top, said means constituting the sole electrical paths for said heating element and being sufficiently inherently rigid to constitute the sole support for the heating element in its raised position.

HARRY G. SIMPSON.