July 26, 1927. 1,637,155

J. E. MARSDEN

ELECTRIC STOVE

Filed Jan. 14, 1926 2 Sheets-Sheet 1

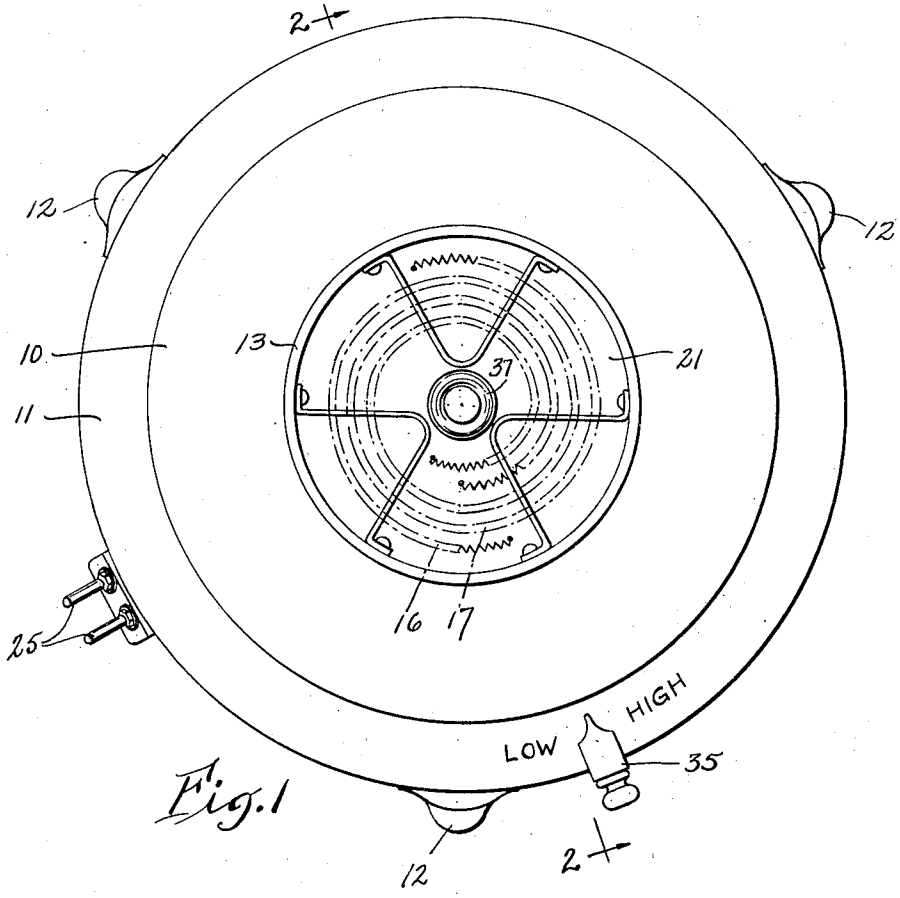


Fig. 1

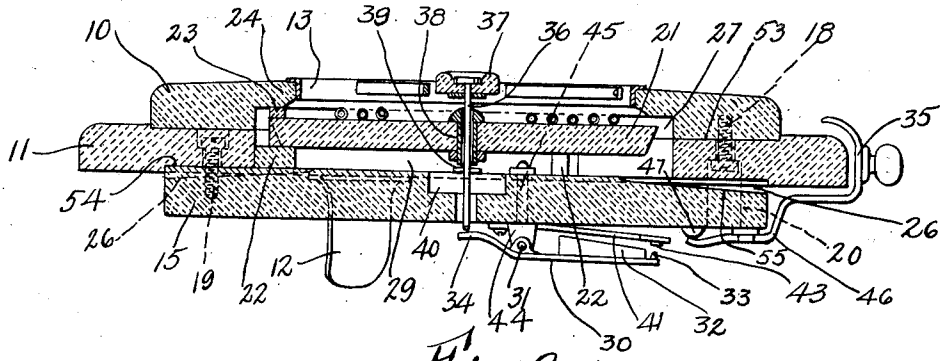


Fig. 2

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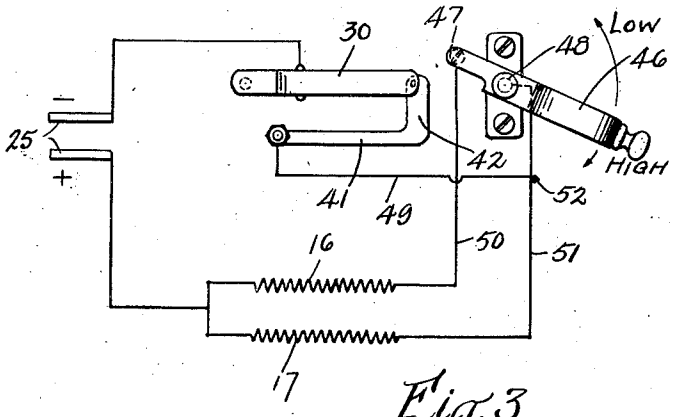


Fig. 3

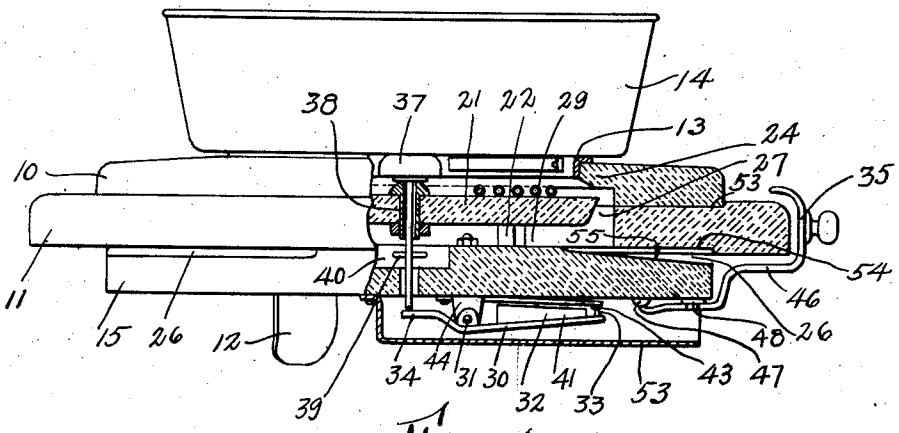


Fig. 4

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UNITED STATES PATENT OFFICE.

JOHN E. MARSDEN, OF PHILADELPHIA, PENNSYLVANIA.

ELECTRIC STOVE.

Application filed January 14, 1926. Serial No. 81,178.

This invention relates to electrical appliances and has particular reference to an electrical stove having means whereby the generation of heat is controlled automatically coincident with the act of placing a vessel or the like upon the stove or removing the same therefrom.

Among the objects of this invention is to provide an electric stove having an electric heating coil and means automatically controlling the generation of heat by the coil, whereby when the article positioned on the stove has been sufficiently heated and is accordingly removed from the stove, the switch means is operative to break the circuit without requiring any attention of the operator.

Another object of this invention is to provide an electric stove comprising a usual body or supporting means for an article to be heated, and means for generating the heat to be supplied to said article, actuating means being provided which are operative co-incident with the placing of said article upon the stove so as to cause the heating means to function, or upon withdrawal of said article to cause the heating means to be thrown out of operation.

Still another object of this invention is to provide an electric stove comprising a body formed wholly of refractory material so as to be entirely proof against any deterioration and at the same time to conserve to a maximum degree the heat generated in the stove, said body comprising a plurality of parts arranged in a novel manner to secure the maximum simplicity and inexpensiveness in construction, and comprising ducts or the like to permit a limited or predetermined quantity of air to circulate through the stove and then along the sides of the article to be heated so as to increase the effective area along which the heat transfer action occurs, thereby rendering the efficiency of the stove a maximum.

With the foregoing and other objects in view the invention consists in the arrangement and combination of parts hereinafter described and claimed, and while the invention is not restricted to the exact details of construction disclosed or suggested herein, still for the purpose of illustrating a practical embodiment thereof reference is had to the accompanying drawings in which like reference characters designate the same parts in the several views, and in which—

Figure 1 is a plan view of the invention.

Fig. 2 is a sectional view approximately along the line 2—2 of Fig. 1.

Fig. 3 is a diagrammatic view showing the circuit and with the switch means as observed by looking at the bottom of the stove.

Fig. 4 is a view in elevation of the stove with parts broken away and corresponding substantially to Fig. 2, but with the switch means closed in the normal manner of operation.

Referring now more specifically to the drawings I show my invention as comprising a suitable body or supporting means comprising an upper ring 10 and a mid portion or lower ring 11 supported by the legs 12 and in turn supporting the upper ring. The rings 10 and 11 are arranged in substantially horizontal relation and coaxial with each other. The upper ring is provided with an annular metal guard member 13 arranged to sustain directly a vessel 14 to be heated, and thus to prevent the upper ring from being subjected to any wear especially as said ring is preferably formed of refractory material. The lower ring 11 is likewise preferably formed of refractory material, both of the rings being constructed in any suitable manner as by casting or molding. A plate 15 of refractory material is located at the bottom of the stove so as to substantially enclose the space within the ring members 10 and 11 and within which heating coils 16 and 17 are placed. Suitable means is provided for fastening together the various parts of the stove thus far described including screws 18 which pass upward through the lower ring member and secure the upper ring member 10 thereto. Likewise screws 19 are arranged to pass through the lower ring member and into the plate 15 with which they have threaded engagement. The members 11 and 15 are first assembled by driving the screws 19 home and then the member 10 is secured to the other parts by the screws 18 which are actuated through registering openings 20 formed through the lower plate and through which a tool can be inserted for the purpose.

Suitable heating means is provided in the space within the ring members 10 and 11, which heating means takes preferably the form of the electric coils 16 and 17 referred to, said coils being mounted upon a plate of refractory material 21 which is supported

by the blocks 22 that are cemented or otherwise secured in engagement therewith. These blocks 22 likewise serve to retain the plate 21 against movement in a horizontal direction. Likewise the spacing blocks 23 are provided which are secured to the plate 21 at points along its upper surface and cooperate with the inwardly directed flange 24 of the upper ring member 10 so as to prevent the plate 21 in conjunction with the blocks 22 from moving in a direction axial with the stove. The heating coils 16 and 17 are retained in suitably spaced relation to each other by any conventional fastening devices. Electrical connection is provided for with the heating coils as will be described more specifically hereinafter by means of the contact posts 25 which are arranged externally upon the stove so as to facilitate connection to any suitable or convenient source of house current.

The plate 15 is arranged in spaced relation with the member 11 at various points so as to provide a plurality of ducts 26 through which air may enter and circulate through the stove by the action of natural draft, and then rise up and pass along the walls of a vessel that is placed upon the stove. For this purpose the coil supporting plate 21 is so arranged as to provide an annular space 27 through which the air may pass. Likewise a chamber 29 is provided between the plates 15 and 21 within which the air is heated before passing into the upper part of the stove. In this way the temperature of the air that finally leaves the stove to contact the article that is being heated will be at a maximum. It will be noted in this connection that sufficient spacing is provided as between the guard member 13 and the adjacent members or parts contacting the same to provide for a limited flow of air outward from the stove. Likewise the ducts 26 are so proportioned as to permit of the flow into the stove of a predetermined quantity of air. The plate 15 thus substantially encloses the heating coil and prevents the unnecessary and wasteful loss of heat from the heating coil.

My automatic switch means comprises a lever 30 pivoted at 31 and having a weight 32 at the end thereof which carries a contact point 33. The other end 34 of the lever is arranged to support a vertically movable actuating member that projects axially through the body of the stove, the weight being superior to the actuating member so as to support the actuating member with its upper end projected above the upper plane of the stove. The actuating member comprises a pin or rod 36 which has a porcelain button 37 or the like fixed rigidly at its upper end and is retained slidably within a sleeve 38 supported by the plate 21. Stop means or pins 39 limit the upward movement of the actuating member. The downward movement thereof is limited as by abutment of the upper button or head thereof against the top of the sleeve 38. The plate 15 is provided with a recess 40 to permit the pins 39 to move downward when the actuating member is depressed as shown in Fig. 4. A spring 41 having an arm 42 carrying a contact point 43 is supported directly by the plate 15 so as to be contacted by the point 33 when a vessel 14 is placed upon the stove, the weight of the vessel in all cases being effective to depress the actuating member as shown in Fig. 4 and tilt the lever 30. However, when such vessel is removed the weight 33 is effective automatically for opening the switch and thereby throwing the heating coils out of circuit. The specific form of the switch and its co-operating or actuating members or parts may be arranged as desired within the scope of this invention. An anchor member 44 co-operating with a screw 45 is arranged to support the lever in tilting position. An auxiliary switch comprising an arm 46 arranged to make contact with a point 47 is pivotally mounted at 48 and is provided with an actuating arm 35 extending around the outer edge of the ring 11 and operative for throwing one of the heating coils out of circuit depending upon whether a low or high heat is desired. As shown in Fig. 3 the switch arm is arranged to make contact with the point 47 and is for this purpose thrown in the direction of the word "high". Both of the coils 16 and 17 are now in circuit and upon removal of the article being heated both of the coils will be automatically thrown out of circuit. Thus one of the contact posts 25 has electrical connection with the anchor member 44 and the lever 30 so that when an article is placed upon the stove the electric current will flow through said lever and through the spring 41 along the wire 49 and then to the screw 48 across the switch 46, through the wire 50, and then through the resistance 16. Likewise current will pass from the wire 49 through the wire 51 from the junction 52 and then through the resistance 17. The circuit provided is of a simple and fool proof character. The porcelain button 37 arranged at the upper end of the actuating member prevents electrical contact and any possibility of short circuit through the vessel 14 placed upon the stove. A casing 53 at the bottom of the stove encloses the switch means in a neat and reliable manner.

My invention thus provides an electric stove of neat and rigid construction. The cost is reduced to a minimum inasmuch as unskilled labor can be employed in the construction thereof. The fastenings of the members forming the body of the stove are especially arranged for strength and for neatness of appearance. Thus the screws 18

and 19 are entirely concealed. The member 11 is provided with a recess 53 within which the member 10 is seated, thus increasing the reliability of the engagement of these members and presenting a unitary appearance. Likewise the member 11 is recessed at its lower surface at 54 to receive those portions of the plate 15 between the ducts 26. The ducts include the area of the recess 54 and of that portion of the plate 15 which is beveled downward toward the periphery of the plate as shown by the surface 55.

My invention provides an electric stove which in operation is automatic in that the electric current does not have to be turned on and off. Particularly do I avoid the inconvenience which generally occurs in that upon removal of a vessel from an electric heater, the current must be turned off in order to conserve the current.

I claim:

1. An electric stove comprising a body having a plurality of coaxial rings of refractory material, one of the rings being below the other and supporting the same, there being a space disposed centrally of said rings, legs supporting the lower ring, a plate of refractory material positioned below the lower ring and co-operating therewith to form a plurality of air ducts therebetween and leading to said central space, an electrical heating coil in the space aforesaid, a switch for said coil positioned below the refractory plate and supported thereby, said switch comprising a member movable vertically under actuation of an article placed upon the upper ring to be heated by the heating coil, and a metallic guard co-operating with the upper ring to support said article and prevent damage to the upper ring, said guard permitting heat to pass from the heating coil to the article, the vertically movable member projecting above the plane of the guard.

2. An electric stove comprising a body having an open central space, an electrical heating coil therein, and an automatic switch for the coil positioned below the body including a pivoted lever having a weight at one end thereof, an actuating member for the switch projecting through the body above the upper plane thereof, and supported by the other end of said lever, the weight being superior in heft to the actuating member to retain the same in normally upwardly projected position, the actuating member being depressed when an article is placed on the stove, the effect of the weight being overcome and the switch closed, the switch being opened automatically by said weight when the article is removed.

3. The herein described electric stove comprising two annular plates arranged concentrically and having an open central space common to both, means invisible from the top to secure the annular plates together, a disk located below the annular plates and having contact therewith but being provided with air ducts leading toward said open central space, means to secure the disk to the lower annular plate in rigid position, the disk having a vertical hole, a pin movable vertically in said hole, an automatic switch lever pivotally supported upon the bottom of said disk and having one end in contact constantly with said pin, a weight acting upon the other end of the lever tending normally to lift the pin so as to be engaged by a vessel supported upon the stove for depressing the pin, a heating coil located within the space aforesaid, a pair of contacts, one carried by the weighted end of the lever, and the other spaced normally above it and in circuit with the coil, said contacts being closed by depression of the pin, and means to support the rings and disk providing for free action of the automatic switch.

4. A structure as set forth in claim 3 in which the lower annular plate is wider than the upper plate and is provided with indicating marks upon the projecting edge thereof, there being a plurality of heating coils, and a manual switch pivoted below the disk and having a pointer extending upward and thence inward with respect to the indicator marks and serving when moved to vary the degree of heat with respect to the plurality of coils.

In testimony whereof I affix my signature.

JOHN E. MARSDEN.