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R. S. GILLING

2,271,973

ELECTRIC HEATER

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Fig. 1.

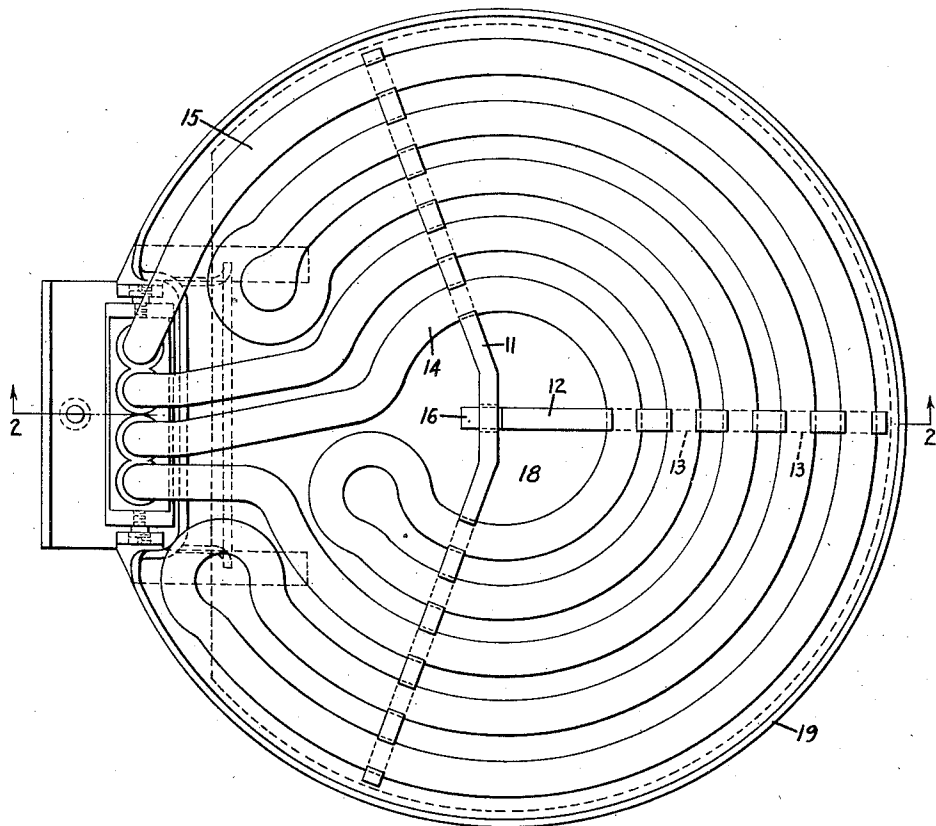
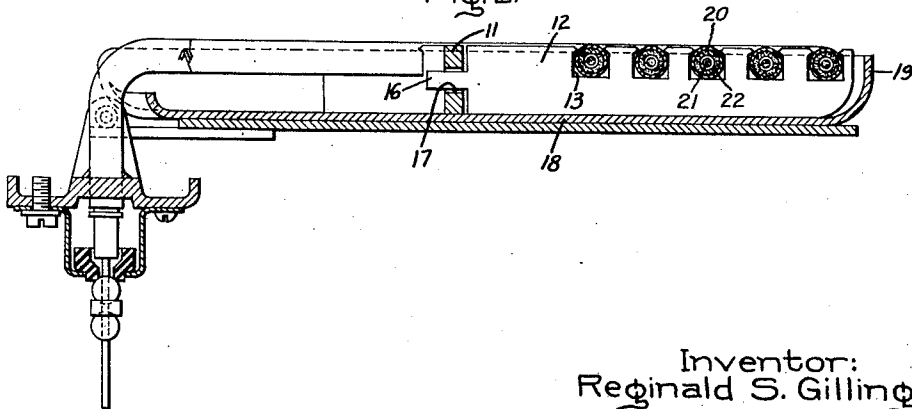


Fig. 2.



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UNITED STATES PATENT OFFICE

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ELECTRIC HEATER

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In Great Britain July 29, 1938

3 Claims. (Cl. 219—37)

This invention relates to electric heaters, more particularly to electric heaters of the hot plate type having one or more lengths of a sheathed wire resistance conductor arranged in one or more substantially flat coils, such as an electric range heating unit, and it has for its object the provision of an improved electric heater of this character.

In one example of a heater of this type, the hot plate has two substantially concentric heating coils, and they are held in their relative positions by means of two strips of metal secured to each other substantially at right angles and provided with a number of indentations in which the turns of the coils are rigidly held.

As there is a very considerable expansion in the coils of the heating elements when raised to their operating temperatures the above means of holding the turns in their relative positions causes considerable distortion of the elements and strains in the fixing strips and may result in buckling of the elements so that they are no longer flat, or whereby the outer ends of the holding strips may get broken off leaving the outer turns of the elements loose.

This invention contemplates an improved electric heater wherein the holding strips for the various convolutions of the heating elements, instead of being rigidly fixed to each other, are relatively movable one to the other, thereby relieving the strains in the strips and heating elements during expansion and contraction of the elements.

For a more complete understanding of this invention, reference should be had to the accompanying drawing in which Fig. 1 is a plan view of an electric hot plate having two heating units arranged substantially concentrically and provided with holding means arranged in accordance with this invention; and Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1.

Referring to the drawing, this invention has been shown in one form as applied to an electric hot plate provided with two holding strips 11 and 12 of metal having indentations 13 in which the turns of the sheathed heating elements 14 and 15 are secured. Instead of securing these holding strips together, as has hitherto been the usual practice, I form the strip 11 roughly in the shape of a V with the apex of the V flattened for a short portion of its length, as shown. The limbs of the V are arranged at about 120° to each other and the second strip 12, which is preferably straight and is shorter than the first is provided with a reduced end portion 16 which

slides easily in a recess or aperture 17 formed in the flattened portion between the two limbs of the V shaped strip 11. The shorter strip 12 is also provided with indentations 13 in which the coils of the heating elements are secured, and is arranged so that it makes an angle of about 120° with the limbs of the V shaped strip 11.

The strips 11 and 12, as shown, rest upon the bottom of a pin-like support 18 having an upright marginal side wall 19. The upper edge of this wall lies below the upper surfaces of the heating elements 14 and 15 so as to leave them free directly to support a cooking vessel.

With such an arrangement for holding the turns of the heater elements in their relative positions I find that the strains set up during expansion and contraction of the elements are greatly reduced and that permanent distortion of the heating elements or breakage of the supporting strips is substantially eliminated.

The heating elements 14 and 15 preferably will be of the type described in the United States patent to C. C. Abbott No. 1,367,341, dated February 1, 1921. Briefly, this heater comprises a casing 20 housing a helical resistance element 21. The element 21 is embedded in a compacted mass of insulating material 22, such as powdered magnesium oxide.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. An electric heating unit comprising a sheathed wire resistance conductor formed into a substantially flat coil, metal supporting strips, means rigidly securing said strips to the convolutions of the coils, one of said strips, being substantially V-shaped with its limbs arranged at about 120° to each other and its apex flattened, and the other strip being straight and having a tongue on one end which passes through a slot or groove provided for it in the flattened portion of the first mentioned strip.

2. An electric heating unit for a range and the like comprising a pan-like support, a metallurgically sheathed heating element arranged in a substantially flat coil in said support, three intersecting supporting strips resting in radial positions on the bottom wall of said support, means rigidly securing said strips to said convolutions, a tongue and slot connection between one of said strips and the other two at their points of intersection to provide for free sliding movement between said one strip and said other two so as to permit said convolutions to expand and contract.

3. An electric hot plate comprising a sheathed heating element formed into a convolution having its terminals on one side of the hot plate, a grid supporting said heating element comprising a pair of legs rigidly secured together and diverging from each other at their point of attachment so as to span said terminals and another leg on the opposite side of said hot plate from said terminals meeting said pair of legs at their point

of attachment, means providing for free sliding relative movement between said third leg and said pair of legs at the point where said legs join, and means rigidly securing said heating element to said legs, said free sliding movement providing for expansion and contraction of the portions of the turns of the heating elements opposite said terminals.

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