Nov. 4, 1941. A. H. HAPPE ET AL. 2,261,496

ELECTRIC HEATING UNIT

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FIG.1.

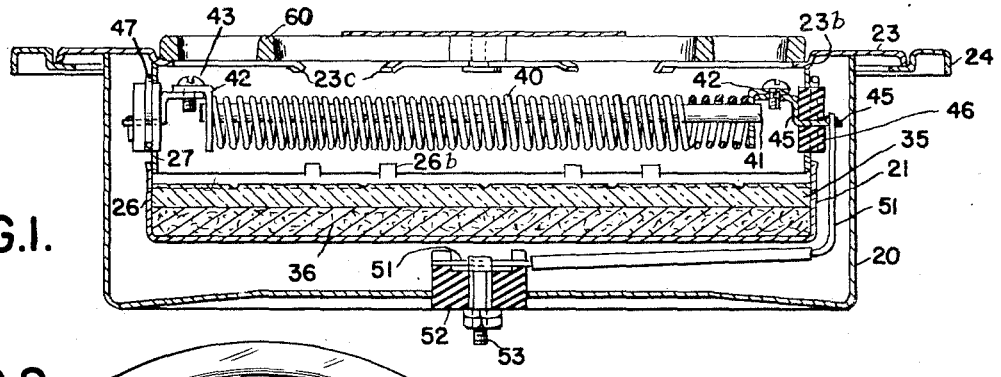


FIG.2.

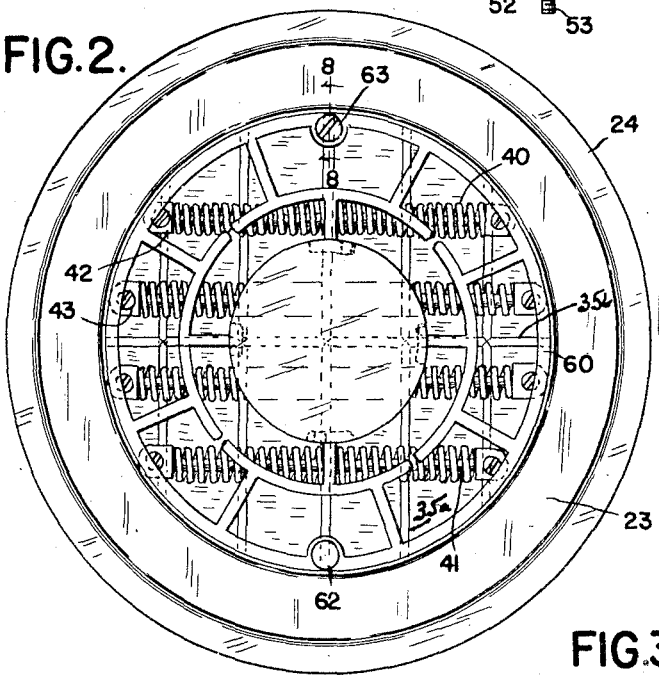


FIG.10.

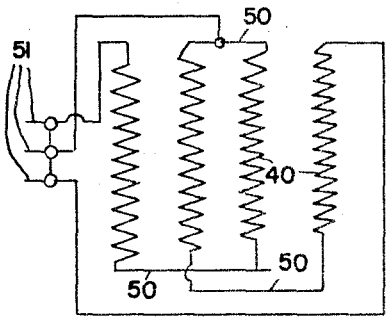


FIG.3.

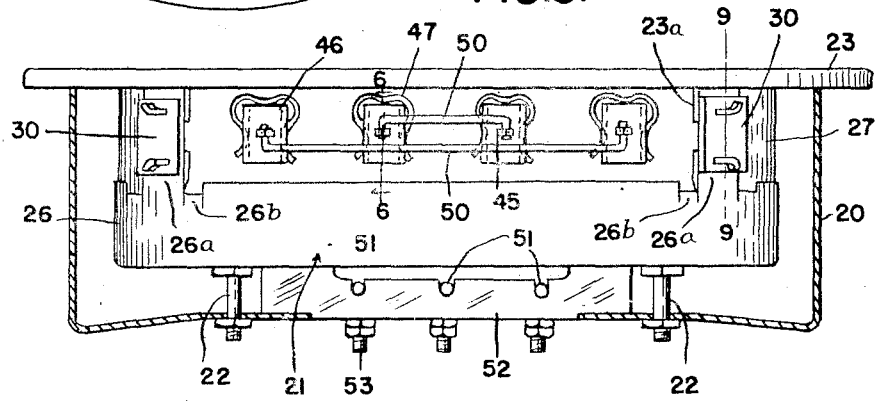


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FIG.4.

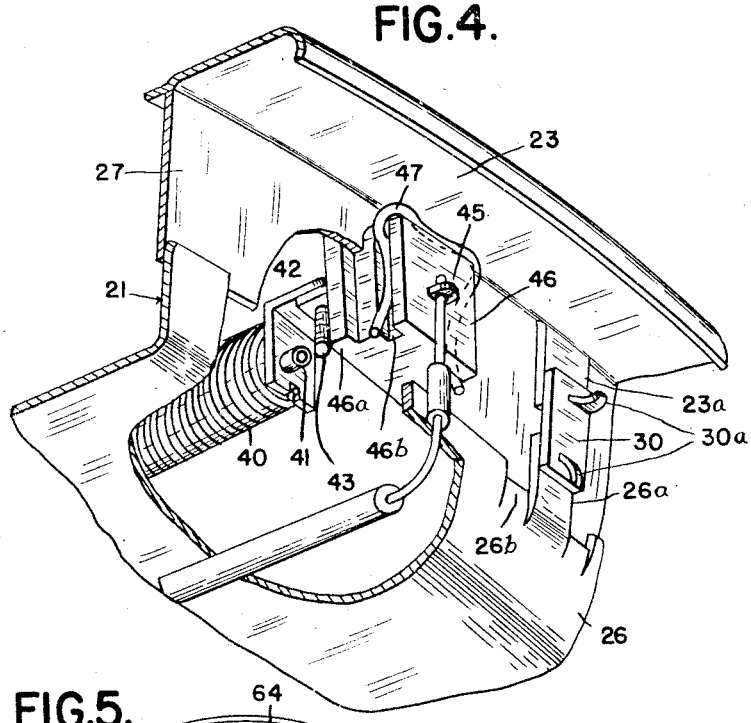



FIG.6.

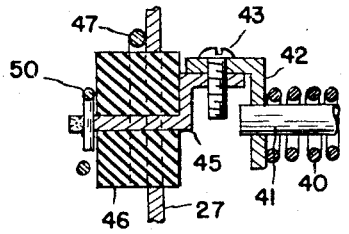



FIG.7.

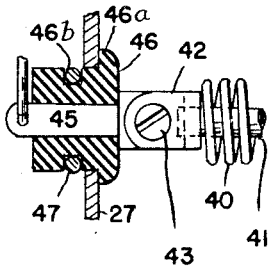



FIG.5.

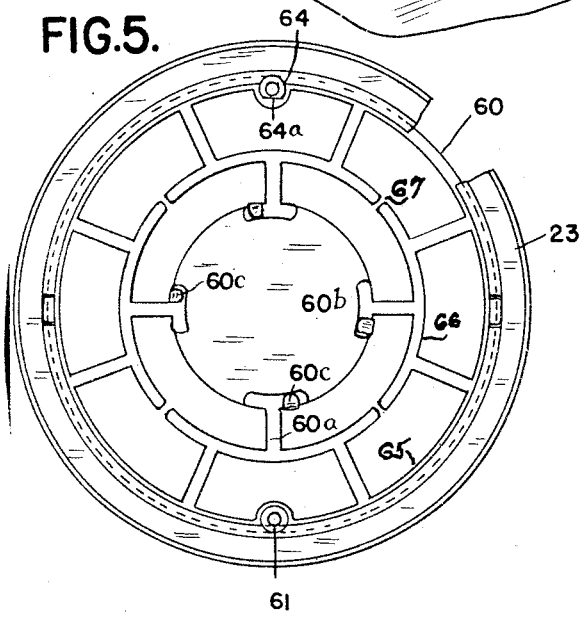
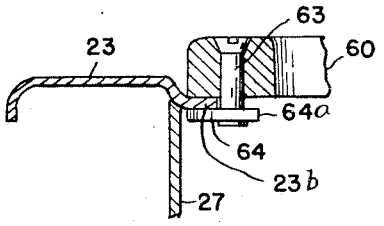



FIG.8



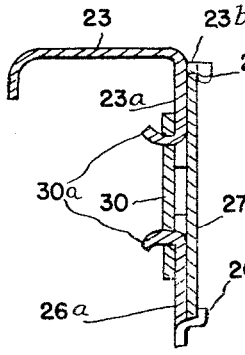




FIG.9.

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Patented Nov. 4, 1941

2,261,496

# UNITED STATES PATENT OFFICE

2,261,496

## ELECTRIC HEATING UNIT

Arthur H. Happe and Herman A. Sperlich,
Detroit, Mich.

Application November 23, 1938, Serial No. 242,045

2 Claims. (Cl. 219—37)

The present invention relates to electric heating units or "burners" for electric stoves, ranges and the like and specifically to the features of construction of a unit involving a heating coil such as is described in U. S. Letters Patent No. 2,163,036, issued June 20, 1939, to Arthur H. Happe, for "Electric heaters."

Among the objects of the invention are to provide a more efficient and economical construction than those heretofore used and one which admits of easy low-cost repair when necessary.

Other objects will readily occur to those skilled in the art upon reference to the following description and drawings, in which

Figure 1 is a central vertical section of a unit involving the invention.

Figure 2 is a top plan view.

Figure 3 is a side elevation with the enclosing housing in section.

Figure 4 is an enlarged perspective view of a detail of construction.

Figure 5 is an underside view of the grill.

Figures 6 and 7 are respectively vertical and horizontal sections of a coil support, Figure 6 being taken on line 6—6, of Figure 3.

Figure 8 is a sectional view of the grill fastening means.

Figure 9 is a section on line 9—9 of Figure 3, and

Figure 10 is a wiring diagram for the unit.

As illustrated, the unit comprises an outer housing 20 and an inner housing 21 spaced therefrom and held in place in the outer housing by studs 22. The cover ring 23 forms part of the inner assembly and serves to support the latter upon the upper edge of the housing 20 and also to support the unit upon a suitable marginal ring 24.

The inner assembly consists of the housing, indicated as a whole at 21, and the active electrical elements and insulation.

The housing 21 comprises, first, the lower cup shaped portion 26 having at a plurality of points about its upper edge, upstanding tongues 26*a* and inturned tongues 26*b*. Second, the housing comprises a ring 27 having a plurality of rectangular openings therein for a purpose to be described. Third, it also comprises the cover ring 23, which has depending tongues 23*a*, in the same number and relative location as tongues 26*a*, and has also its inner periphery depressed to form a shoulder 23*b* upon which may be seated the grill and, as indicated in Figures 1 and 9, portions of the shoulder are further depressed to form tongues 23*c* to act as inner locating means for ring 27. The ring 27, as shown in Figure 9, rests upon tongues 26*b* and between tongues 23*a* and 23*c*.

The rings 23 and 27 and cup 26 are held together by perforated clips 30, suitable tongues 30*a* being punched out of tongues 26*a* and 23*a* and passed through the perforations in the clips and bent over.

In the bottom of the inner housing 21, is placed a hearth plate 35 of a suitable material having high heat and electric insulation properties and this may be placed upon a second layer 36 of insulating material if desired or a single layer of the desired thickness may be used. The preferred material for the hearth plate is such a material as vermiculite which, in addition to being an insulator, also has pronounced heat reflective properties.

The electrical elements are mounted in the ring 27, and comprise, preferably, four resistance heating coils 40 of the type disclosed and claimed in the prior application mentioned. They consist of open helices of suitable wire loosely hung upon small diameter porcelain or other suitable insulating rods or tubes 41. Each of the coils 40 has fixed to each end an L-shaped clip 42 perforated to receive a screw 43 and also to receive one end of the rod 41.

By means of the screw 43, each clip 42 is fixed to a Z-shaped bracket 45, one arm of which passes through a rectangular porcelain block 46 (shown best in Figures 4, 6, and 7) extending a short distance beyond the outer surface thereof and preferably slotted to receive a conducting wire or bar.

The block 46 is rectangular in section and is provided with a head or flanged portion 46*a* and also with grooves 46*b* in two of its opposite sides, the grooves being spaced from the flanges 46*a* by about the thickness of the metal of the ring 27.

These blocks 46 may readily be secured in the openings in ring 27 by slipping into the grooves 46*b* the spring wire clips 47.

After the blocks 46 have been secured in place in the ring 27 the outer ends of brackets 45 are connected in proper arrangement by conductors 50, the ends of the latter being placed in the slots in the bracket ends and welded in place. The lead wires 51 are secured in the same manner and extend to a suitable terminal block 52 having binding posts 53 extending to the outside of housing 20.

In order to protect the coils and provide a support for vessels to be heated, a grill 60 is

mounted upon the shoulder 23*b* of ring 23 and secured in place as indicated in Figures 5 and 8. In Figure 5, which shows the under side of ring 23, the grill 60 is shown as carrying a round washer 61 fixed to the lower end of a rivet 62 (Figure 2), which washer underlies the shoulder 23*b*. At the opposite edge of the grill is a second rivet 63 carrying a washer 64 of which one edge is flat as shown at 64*a*. This washer 64 is fixed to the rivet and the head of the latter slotted as shown, to permit rotating the rivet so as to bring the round side under the shoulder 23*b* and thereby retain the grill 60 in place.

The grill 60 is for the most part preferably of cast metal—for example, cast iron—having the web omitted at the center but provided with radial inwardly projecting parts 60*a* with T-shaped heads, and upon these is fixed a sheet metal disc 60*b*, this having small tongues 60*c* adapted to be bent over the T-shaped heads to hold the disc in place but permit unequal expansion and contraction.

It will be noted that the grill 60 consists of an outer peripheral ring 65 and an inner ring 66 separated by gaps 67 into sections. By providing the gaps 67 free expansion is permitted and likewise room for metal growth.

Further, it has been found advantageous to score or groove the plate 35 of insulating material to prevent setting up stresses. Such grooves are indicated at 35*a* and 35*b*.

Now having described the preferred form of embodiment of the invention, it is to be understood that the invention is not to be limited thereto but only by the scope of the claims which follow.

What we claim is:

1. An electric heater of the class described comprising a substantially cylindrical vertically positioned sheet metal support open at the top, a hearth plate closing the bottom of such sheet metal support, bracket elements extending through said support and insulated therefrom and spaced above the hearth plate, a heating element support extending across and spacedly above the hearth plate and carrying a heating element and in turn carried by said bracket elements, a housing for said first mentioned support and spaced therefrom about its periphery and at the bottom, and conducting elements connected to said brackets and located in the space beneath the hearth plate.

2. An electric burner of the character described, comprising a substantially cylindrical sheet metal member, insulating heating element supports spaced from each other and supported in said frame member, heating elements also supported by said supports and suspended in free space, means for preventing escape of heat laterally and downwardly from the space enclosed by said cylindrical frame member, said insulating supports fitting into openings in said sheet metal frame member, means for preventing sagging of said heating elements, and conducting bracket members extending through said insulating supports and connected to said heating elements, said brackets serving as the means by which both the heating elements and sag preventing means are mounted upon said insulating supports.

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