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E. L. WIEGAND

1,778,926

PERCOLATOR AND THE LIKE AND HEATING ELEMENT THEREFOR

Filed July 2, 1928

2 Sheets-Sheet 1

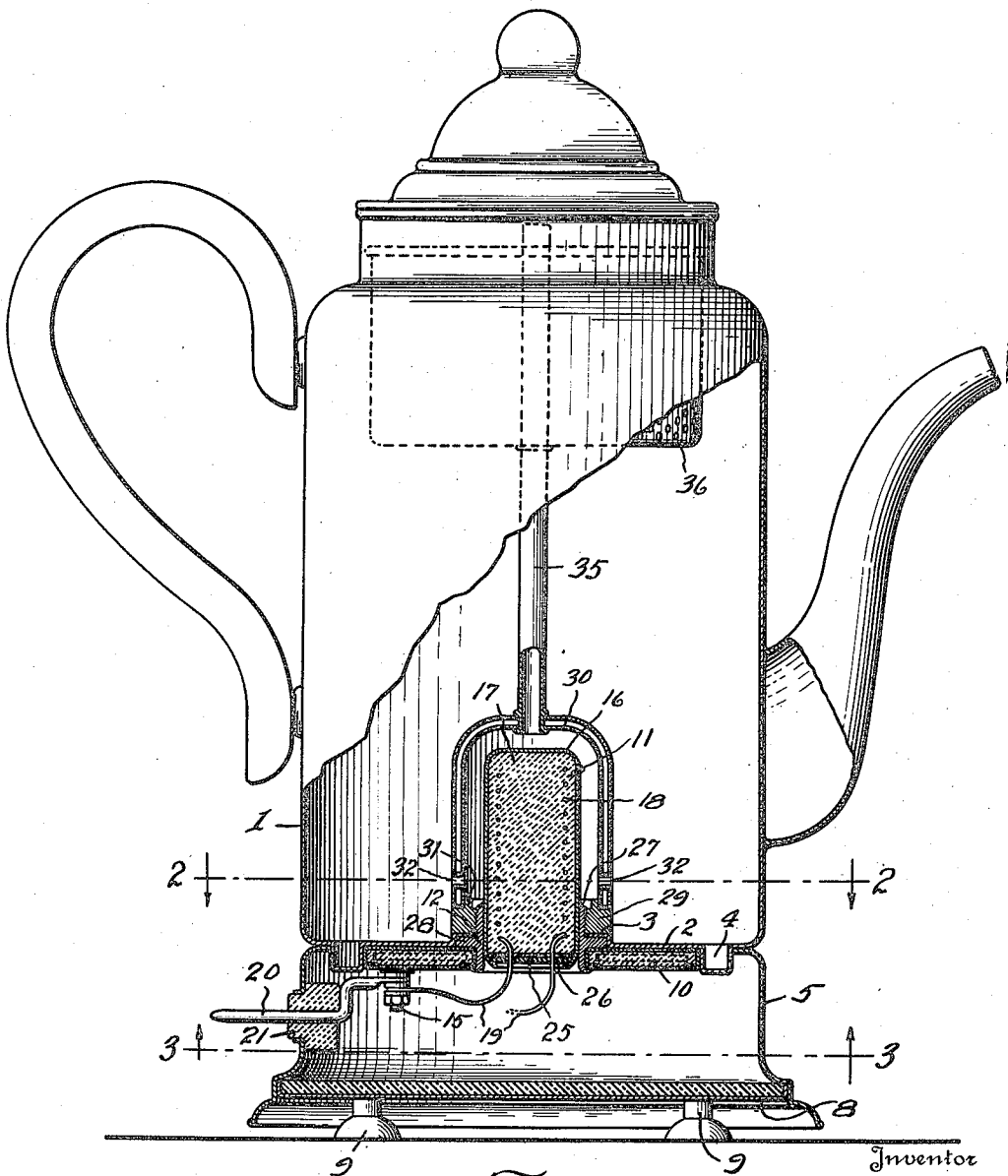


Fig. 1 Edwin L. Wiegand
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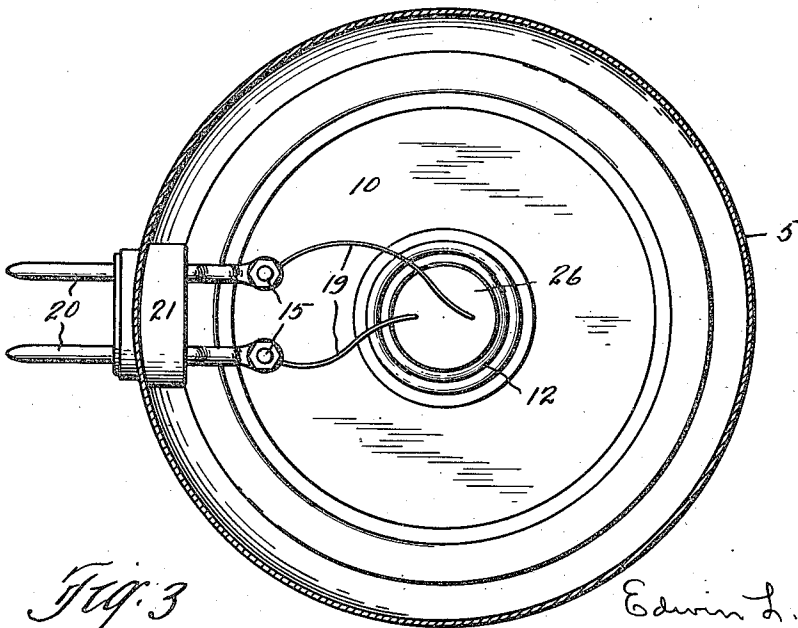
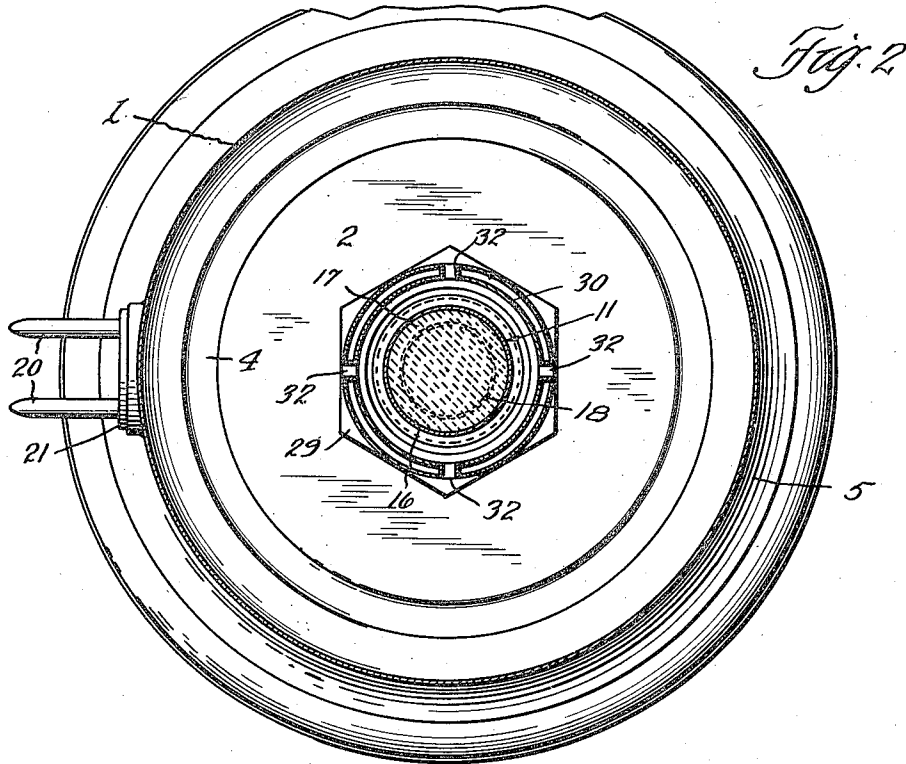
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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PERCOLATOR AND THE LIKE AND HEATING ELEMENT THEREFOR

Application filed July 2, 1928. Serial No. 289,819.

This invention relates to improvements in electrically heated percolators and the like, and it has to do more especially with an improved heating element for use in devices of this class.

Among the objects of the invention are to provide an electrical heating element that is peculiarly adapted for use in vessels of the class above referred to; that is extremely efficient; that is long lived; that is designed to accomplish the most effective distribution of heat; that generates the required degree of heat at the minimum current input; that is relatively simple of construction and is substantial and durable, and that is designed to expedite and cheapen manufacture and facilitate its incorporation in a vessel.

Heretofore, in electrically heated vessels of the class in question, two general varieties of heating elements have been employed, one, a bottom-applied unit which is suitably supported below and in contact with the bottom wall of the vessel, and the other a so-called "immersion type" unit, which is so arranged as to be practically surrounded by the contents of the vessel.

In this invention I combine the bottom-applied and immersion type units, preferably in a self-contained element, with the following peculiar advantages: Less time is required for initiation of the percolating action, which is effected by the immersed portion of the heating element; increased speed in the heating of the entire percolator contents, to which result the bottom-applied portion of the element materially contributes; the division or apportioning of the total wattage derived from socket devices between the two portions of the element thus avoiding overloading or overheating and making it unnecessary to employ as highly efficient and as expensive insulation for the bottom of the vessel as would otherwise be necessary since only a part of the energy input is delivered to the bottom-applied portion of the element; a saving in the cost of heating the entire contents of the vessel is realized, since a better distribution of the heat is effected; and, for the same reason, i. e., a better distri-

bution or diffusion of the heat, the life of the element is not impaired by overrating.

Other objects and advantages will appear as I proceed to describe the invention in detail, reference being had to the accompanying drawings wherein Fig. 1 is a sectional side elevation of a percolator incorporating my improved heating element; and Figs. 2 and 3 are horizontal sections on the respective lines 2—2 and 3—3 of Fig. 1, the views being taken as though looking in the direction of the arrows associated with said lines.

The percolator, designated generally by the reference numeral 1, may be of standard construction excepting as to certain features devised in the application of the invention to the structure. An opening is made in the center of the bottom wall 2 of the percolator, and the same is surrounded by an annular flange 3 that is offset upwardly from the plane of said bottom wall a suitable distance; and an annular depression 4 is formed in the bottom wall a relatively short distance inwardly of its periphery. Suitably secured, as by welding, to the bottom wall 2 outwardly beyond the depression 4 is the inwardly flanged upper end of a base shell 5 that flares outwardly at its lower end and is formed to provide a seat for an insulated bottom 8 that is set upwardly within the base and is shown as equipped with feet 9.

The heating element comprises a flat and relatively thin annular portion or unit 10, and a cylindrical portion or unit 11, that are connected together by a hub 12. The portion 10 of the element preferably consists of a ring unit like that constituting the subject matter of my Letters Patent No. 1,614,331, dated January 11, 1927, the same comprising a sheath of relatively thin sheet metal, a resistor within the sheath that is spaced from the walls thereof, and a body of refractory electrical insulating heat conducting material filling the space between the sheath and resistor. The terminals of the resistor in the portion 10 project from the bottom thereof in the form of binding posts and are designated 15.

The portion 11 of the element is preferably of the same class of heating units

as the portion 10 and is shown as consisting of a relatively deep cup like sheath 16 of sheet metal that is filled with refractory electrical insulating heat conducting material 17 within which is embedded a resistor 18 whose terminals 19 are extended through the bottom of the portion 11 and turned laterally and connected to the posts or terminals 15 of the portion 10. Also secured to the terminals or posts 15 are the inner ends of terminal pins 20 that extend through a block 21 of insulating material that is reduced at its outer end and set into a flanged opening in the wall of the base shell 5. The pins 20 are so formed as to retain the block 21 in place. It is evident from what has just been said that the resistors of the two portions of the heating element are in parallel and that current supplied thereto by the application of a suitable fitting to the terminal pins 20 will be divided between the two portions.

As herein disclosed, the lower end of the portion 18 of the element is closed by an inner washer 25, which may be of suitable metal, and an outer washer 26 of mica or other approved insulating material, and that the terminals 19 of the resistor 18 are led out through relatively larger holes in the washer 25, and through holes of a size to comfortably accommodate the terminals in the washer 26. The terminals are thus maintained out of contact with the metallic washer 25.

The cylindrical portion 11 of the element is fitted into the bore of the hub 12 and is preferably brazed or welded thereto at the upper end of said hub, as indicated at 27. The hub has a circumferential flange 28 intermediate its ends that is fitted upwardly against the annular portion 3 of the bottom wall 2 and occupies the recess beneath said portion so that the bottom of the flange 28 is substantially flush with the under surface of the bottom wall 2. The annular portion or ring unit 10 of the heating element is fitted over the lower end of the hub 12 and is secured thereto as by peening over of the lower extremity of the hub. The element is clamped to the bottom wall 2 of the vessel by means of a nut 29 that is screwed down onto the threaded upper end of the hub 12 thereby to clamp the annular portion 3 of the bottom wall between said nut and the flange 28 of the hub; and with the element thus secured to the vessel, the portion 10 is held in close contact with the bottom wall 2 and within the confines of the annular depression 4. It will be noted that the depression 4 has an internal depth approximately equal to the thickness of the portion 10 of the heating element so that the part of the contents of the vessel that occupies the depression 4 is subjected to the heat radiated outwardly from said portion 10.

The nut 12 has an upwardly extending circular flange 31 about which is positioned a double walled pressure chamber 30, the space between the walls of said chamber being air tight. The interior of the chamber 30 communicates with the space exterior thereof through passageways 32. The usual tube 35 rises from the pressure chamber 30 and supports the coffee basket 36 in receiving relation to its upper or discharge end.

The percolating action in the present case is the same as that in all percolators of the valveless type and therefore it is deemed unnecessary to describe the same. It will be noted, however, that by reason of the intimate contact of the liquid within the chamber 30 with the portion 11 of the element, that said liquid will be very quickly raised to the percolating point; and at the same time the contents of the percolator outside the chamber 30 will be deriving heat from the portion 10 of the element, which will materially hasten the heating of the entire contents of the vessel.

By this means I utilize, with safety to the heating elements, the maximum rate of energy input available from the customary socket outlet.

Having thus described my invention, what I claim is:

1. In combination, a vessel of the class set forth whose bottom wall is provided with an opening, and an electrical heating element comprising a heat generating portion that is applied to the underside of the bottom wall about said opening, a second heat generating portion that rises within the vessel through said opening, a hub connecting said portions together, and a member applied to the hub above the bottom wall for holding the first mentioned portion of the heating element against the underside of said wall.

2. In combination, a vessel of the class set forth whose bottom wall is provided with an opening, and an electrical heating element comprising a heat generating portion that is applied to the underside of the bottom wall about said opening, a second heat generating portion that rises within the vessel through said opening, a hub connecting said portions together and having an externally threaded part extending above said bottom wall, and a nut applied to the threaded part of the hub for holding the first mentioned portion of the heating element against the underside of said wall.

3. In combination, a vessel of the class set forth whose bottom wall is provided with an opening, the portion of said bottom wall immediately surrounding said opening being offset upwardly from the plane of the remaining portion thereof so as to provide a downwardly facing recess, and an electrical heating element comprising a heat generating portion applied to the underside of the bot-

tom wall about said opening, a second heat generating portion that rises within the vessel through said opening, and a hub connecting said portions together and involving a circumferential flange fitting within the aforesaid recess.

4. In combination, a vessel of the class set forth whose bottom wall is provided with an opening, the portion of said bottom wall immediately surrounding said opening being offset upwardly from the plane of the remaining portion thereof so as to provide a downwardly facing recess, and an electrical heating element comprising a heat generating portion applied to the underside of the bottom wall about said opening, a second heat generating portion that rises within the vessel through said opening, a hub connecting said portions together and involving a circumferential flange fitting within the aforesaid recess, and a member applied to the hub above the bottom wall for clamping the portion of said wall adjacent the opening between itself and the flange of the hub.

5. In combination, a vessel of the class set forth whose bottom wall is provided with a substantially central opening, the portion of said bottom wall immediately surrounding said opening being offset upwardly from the plane of the remaining portion thereof so as to provide a downwardly facing recess, and an electrical heating element comprising a heat generating portion that is applied to the underside of the bottom wall about said opening, a second heat generating portion that rises within the vessel through said opening, a hub connecting said portions together and involving a circumferential flange fitting within the aforesaid recess, the hub having a part extending above said flange and being externally threaded, and a nut for application to the threaded part of the hub for clamping between itself and said flange the portion of the bottom wall surrounding said opening.

6. In combination, a vessel of the class set forth whose bottom wall is provided with a central opening, the material of said wall about said opening being offset upwardly from the plane of the remaining portion of said wall thereby to provide a downwardly opening recess, an electrical heating element comprising an annular unit for application to the underside of the bottom wall, a hub having a circumferential flange intermediate its ends, the portion of said hub below said flange extending through the opening in said annular unit and secured to the unit, the part of the hub above said flange being externally threaded, a nut applied to the threaded part of the hub for clamping between itself and the aforesaid flange the material of the bottom wall surrounding said opening, and a cylindrical heating unit rising within the vessel and having its lower end secured within the hub.

7. A percolator comprising a vessel having an opening in its bottom wall, an electrical heating element having a heat generating portion applied directly to the underside of the bottom wall and a second heat generating portion rising through said opening, a member applied to the element above said bottom wall for clamping the element to said wall, a pressure chamber surmounting said member and enclosing the second portion of the heating element, a tube rising from said chamber, and a basket supported in receiving relation to the discharge mouth of said tube.

In testimony whereof, I hereunto affix my signature.

EDWIN L. WIEGAND.

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