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IMMERSION HEATER

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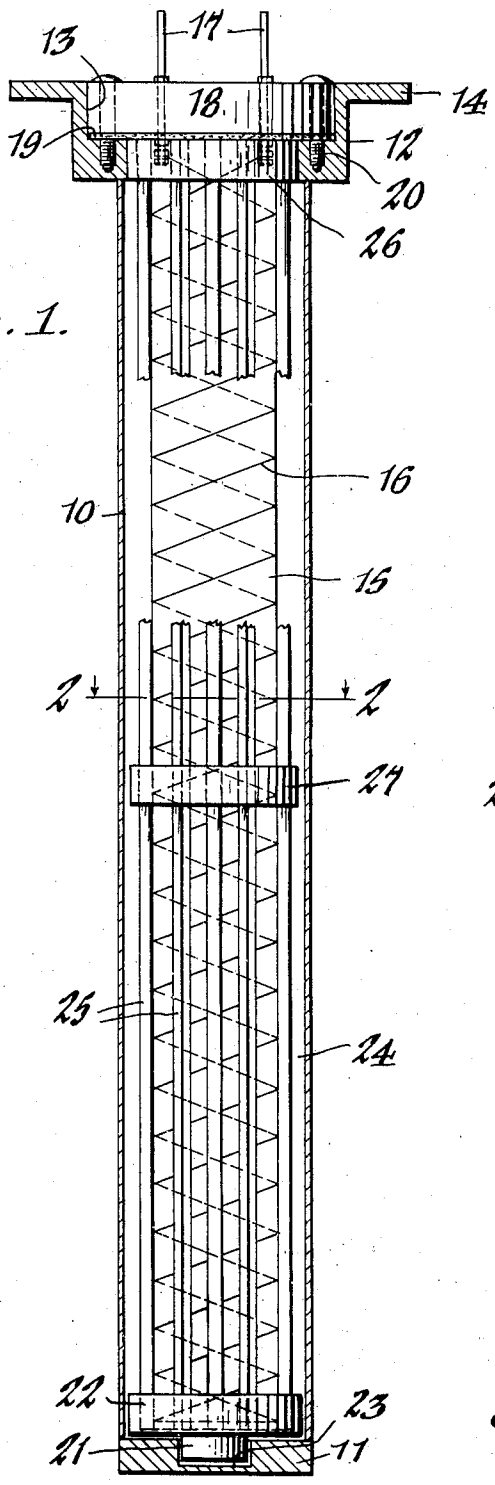
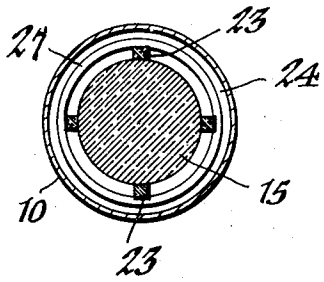



Fig. 1.

Fig. 2.




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## IMMERSION HEATER

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3 Claims. (Cl. 219—41)

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This invention relates generally to immersion heaters but more particularly to certain new and useful improvements in an electric immersion type of heater for domestic use.

It has for one of its objects to provide a heater of this character which is so designed and constructed as to provide an air space or chamber therein between the heating coil and body of the heater, and wherein such coil can be readily removed from the body when desired for replacement or the like.

Another object of the invention is to provide an electric immersion heater for water and the like which is simple, compact and durable in construction, whose parts can be readily assembled, which has a maximum life, and which is efficient in operation.

Other features of the invention reside in the construction and arrangement of parts hereinafter described and particularly pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a sectional elevation of the heater embodying my invention. Figure 2 is a cross section thereof taken on line 2—2, Figure 1.

Similar characters of reference indicate corresponding parts throughout the several views.

Referring now to the drawings showing the preferred embodiment of my invention, 10 indicates the body or shell of the heater made of sheet metal or the like and provided at one end with a plug or closure 11 at its opposite or suspension end with an attaching collar 12 having a recess 13 therein and an annular flange 14 for attaching the heater to a tank or other vessel containing the liquid to be heated.

The heating element or unit is removably arranged in the shell 10 and consists of a core 15 of porcelain or like insulating material about which a heating coil 16 is wound from end to end thereof forward and backwardly and connected at its ends to terminal posts 17 anchored in and projecting outwardly from a head 18 provided at the outer end of the core and seated in the recess 13 of the attaching collar 12. An asbestos gasket 19 is interposed between the opposing faces of such head and recess and the core assembly is detachably connected at its outer or upper end to the flanged collar 12 by screws 20 while the inner or lower end thereof is properly centered within the shell by a boss 21 formed on a ring or collar 22 applied to the lower end of the core 15 and engaging a socket 23 formed in the plug 11. The core assembly is spaced from the surrounding wall of the shell 10 to provide an annular air space 24 for conducting the heat from the coil 16 to the shell and thence to the liquid in which the heater is immersed.

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The heating coil 16 is held firmly and snugly to the core 15 by a plurality of longitudinal retaining strips 25 extending coextensive with and spaced annularly about the core and held in place at their outer or upper ends by a ring or collar 26 which is supported at its periphery in the opening of the attaching collar 12. A third strip-retaining ring or collar 27 encircles the intermediate portion of these strips, whereby the coil is effectually and protectively retained in place.

In use, the heater is immersed in the vessel containing the water or other liquid to be heated and is suspended therefrom by the flange 14 of the attaching collar 12. The terminals 17 are then connected in an obvious manner with the domestic circuit, resulting in the heating of the coil 16 and the transmission of the heat to the surrounding air chamber 24 and thence conducted to the shell 10 and the liquid in the vessel. Should it become necessary to repair or replace the heating unit, it can be readily removed by loosening the screws 20 and withdrawing the same from the shell-like body.

I claim as my invention:

1. An electrical immersion heater unit, comprising a metallic tube-like body provided at one end with a plug and at its other end with an attaching ring, and a heating element removably arranged in said body and including a core extending substantially from end to end thereof in annular spaced relation thereto to provide an air chamber and provided at its outer end with a terminal-bearing head, a heating coil disposed about said core and having its ends connected to the terminals of said head, longitudinal retaining strips disposed in spaced relation about said coil, and retaining rings spaced lengthwise of the core about said strips.

2. An electrical immersion heater unit, comprising a metallic tube-like body provided at one end with a recessed plug and at its other end with an attaching ring, and a heating element removably arranged in said body and including a core in spaced relation thereto to provide an air chamber and having a terminal head at its outer end for connection to said attaching ring, a heating coil wound about said core with the ends thereof connected to the terminals of said head, and means applied to said core in spaced relation to each other and to said body for retaining the coil thereon, certain of said retaining

means consisting of longitudinal strips in overlying protecting engagement with the coil and other of said means consisting of rings encircling said strips with the innermost ring having a projection thereon engaging the recess in said body-plug.

3. A heating element for an immersion heater, comprising a core having a terminal head at its outer end, a heating coil wound about said core with the free ends thereof connected to the terminals of said head, longitudinal coil-retaining strips disposed in spaced relation about the core and overlying the coil thereof, and retaining rings for the strips fitted about the end and intermediate portions of said strips.

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