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ELECTRIC HEATER FOR LIQUIDS

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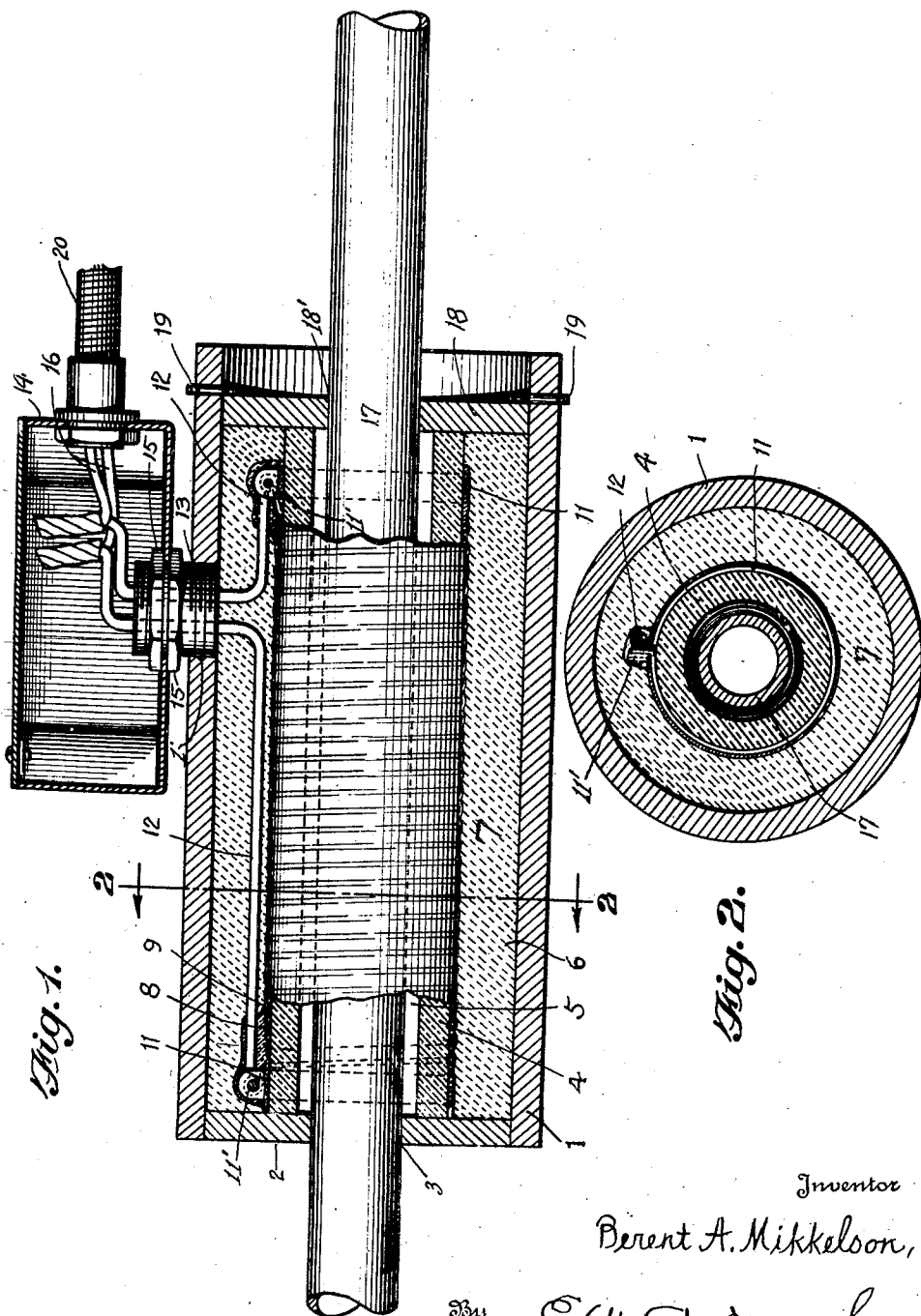


Fig. 1.

Fig. 2.

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ELECTRIC HEATER FOR LIQUIDS

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1 Claim. (Cl. 219—39)

The invention relates to electric heaters for liquids, such as water and oil, and has for an object the provision of an inexpensive device of this description useful in barber shops, homes and other places for the heating of water or as a pre-heater for the oil fed to oil burners, said heater being of comparatively small or portable nature connectible to the ordinary light socket and operating efficiently at small cost for current.

The invention consists in the novel construction and combinations of parts as hereinafter set forth in the claim.

In the accompanying drawing:

Figure 1 is a central longitudinal section of the invention, and

Figure 2 is a cross section on the line 2—2, Figure 1.

In the drawing, the numeral 1 designates a tubular cylindrical metallic casing, having a contracted forward end 2, provided with a central aperture 3, a cylindrical heating element 4 being located within said casing and having an external diameter less than the internal diameter of the casing to provide a circumferential space 6 and an internal diameter greater than the diameter of said aperture, a thermal insulation filling of asbestos 7 being provided for said space. The heating element has a central bore 5.

This heating element comprises a porcelain tube having a resistance wire coil 8, surrounding and in contact with said tube, and a porcelain paste exterior covering 9 for said wire coil, said porcelain paste covering serving to insulate the coils from one another and to firmly secure the coils to the porcelain tube so that they cannot get out of place at any temperature to which the coils may be raised and cause short circuiting.

The casing 1 has a lateral aperture 1' located near the rear end thereof and provided with an exteriorly threaded bushing 13, a junction box 14 being secured to said bushing by lock nuts 15. The lead-in wires 12 for the resistance wire coil 8 are spliced within the junction box and extend through the bushing-lined aperture 1' within said circumferential space 6, being secured at their inner ends to the screws 11' of the metallic terminal bands 11 of the porcelain tube 4, the opposite ends of the resistance wire coil 8 being also secured to the screws of said bands. A removable closure 18 fits within the rear end of the casing 1, abuts against the rear end of the porcelain tube 4, has a central aperture 18' of the same size as that of the forward end of said casing and closes in the rear end of the circumferential space 6. The closure 18 is held in

place by cotter pins 19 engaging perforations of the side wall of said casing.

In assembling the parts, the heating element 4 is inserted within the open rear end of the casing 1 until it contacts the contracted forward end 2 of said casing, the lead-in wires 12 being then manipulated through the bushing-lined lateral aperture 1' of the casing into the junction box by inserting the fingers of one hand through the open rear end of the casing, said lateral aperture being located near the rear end of the casing to admit of such manipulation. The circumferential space 6 is then packed with the loose asbestos thermal insulating material 7, thereby holding the tubular heating element 4 in centralized position within the casing, the removable closure 18 fitting within the rear end of the casing and having a central aperture 18' being then placed in position to abut against the rear end of said heating element and to close in the rear end of the thermal insulation packed circumferential space 6, said removable closure 18 requiring nothing more than the cotter pins 19 engaging lateral perforations of the casing to hold it in place.

The heater is adapted to have the pipe 17 for water or oil to be heated extend slidably through the bore of the heating element or porcelain tube and the apertures of the ends of the casing. Due to the fact that the porcelain tube 4 of the heating element has an internal diameter greater than the apertures of the casing ends, a circumferential air space is provided between the pipe 17 and said porcelain tube, thereby tending to protect the pipe 17 from being superficially fused or roughened by the heat and avoiding any such adherence between the said porcelain tube and said pipe as would interfere with free movement of the heater relative to said pipe.

The tubular casing 1 may be either cylindrical or other suitable shape, that is to say it may be square in cross section. The porcelain tube 4 may be spirally grooved to receive the coils of the resistance wire coil 8.

The heating device is held from rotation on the pipe 17 for conveying the oil or water to be heated by electrical cable 20 carrying the lead-in wires 12, said cable having suitable lock-nut connection with the junction box 14 and with the electrical outlet.

I claim:

In an electric heater for liquids, a tubular casing having a contracted forward end provided with a central aperture, a heating element comprising a porcelain tube having a resistance wire

coil surrounding the same located centrally within said casing, said tube abutting at its forward end against the forward end of said casing and having an external diameter less than the internal diameter of said casing to provide a circumferential space, and an internal diameter greater than the diameter of said aperture, a thermal insulation filling for said circumferential space adapted to hold said tube central of said casing, a removable closure for the rear end of said casing, abutting against the rear end of said

tube, closing in the rear end of said circumferential space and having a central aperture of the same size as that of said first named aperture, said heater being adapted to provide a circumferential air space between said tube and the pipe for conveying the liquid to be heated and engaged with the apertures of said casing ends, thereby tending to protect said pipe from being injured by the heat and to render the heater freely movable at all times relative to said pipe.

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