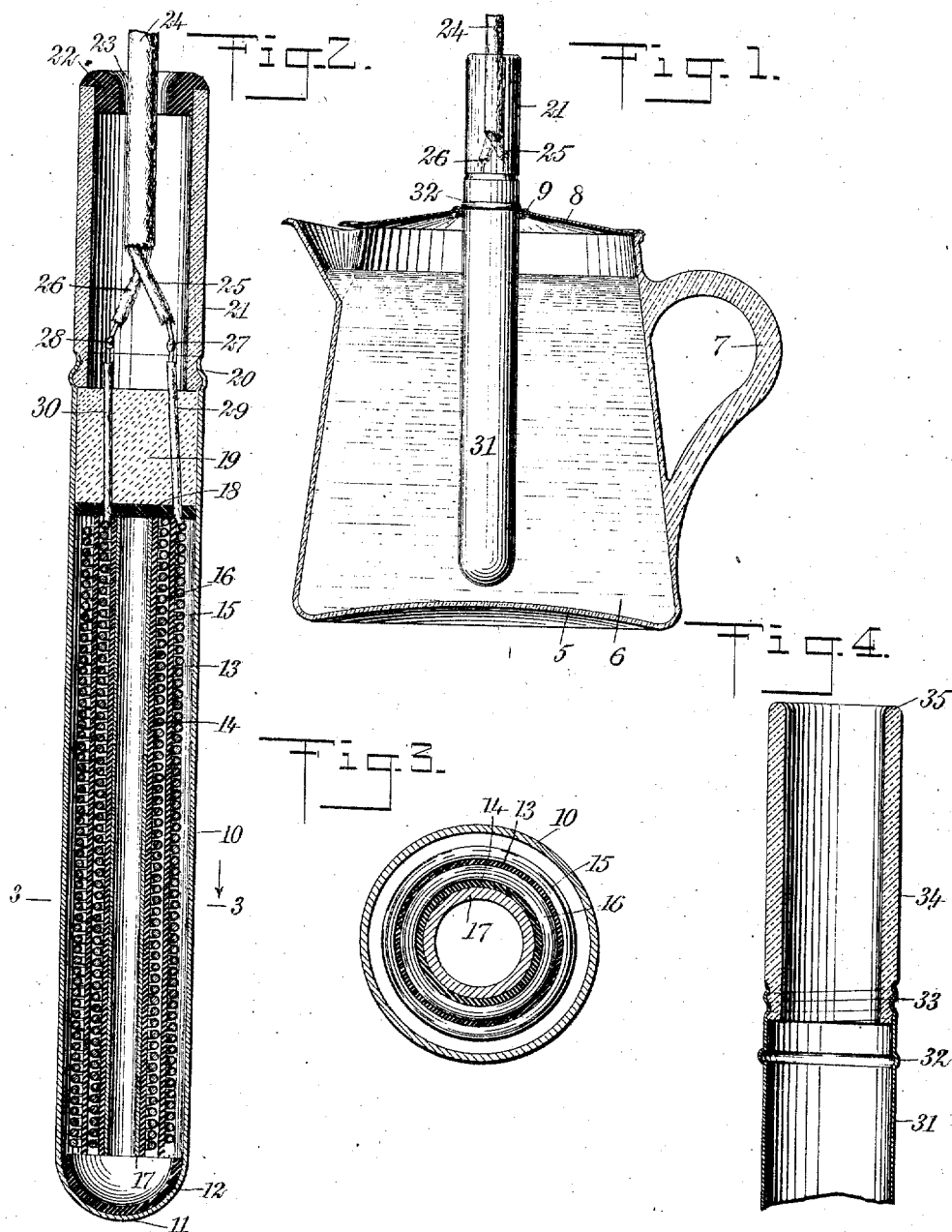


No. 888,277.

PATENTED MAY 19, 1908.

H. WAHLQUIST.
ELECTRIC HEATER.

APPLICATION FILED DEC. 12, 1907.



WITNESSES

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HJALMAR WAHLQUIST, OF PHILADELPHIA, PENNSYLVANIA.

ELECTRIC HEATER.

No. 888,277.

Specification of Letters Patent.

Patented May 19, 1908.

Application filed December 12, 1907. Serial No. 406,136.

To all whom it may concern:

Be it known that I, HJALMAR WAHLQUIST, a citizen of the United States, and a resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and Improved Electric Heater, of which the following is a full, clear, and exact description.

My invention relates to electric heaters, and more particularly to those of a type suitable for heating liquids in small receptacles, such as tea-kettles, drinking cups and the like.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical section through a tea-pot provided with means for supporting my improved heater which is suspended therein, for the purpose of heating the contained liquid; Fig. 2 is an enlarged central section through the heater, showing the arrangement of the heating coils within the outer tube; and also showing the various insulating tubes associated with the coils for supporting the latter; Fig. 3 is an enlarged section upon the line 3—3 of Fig. 2, looking in the direction of the arrow, and showing more in detail the arrangement of the heating coils and the concentric tubes; and Fig. 4 is a fragmentary central section through another form of tube used as a part of my improved heater.

A vessel 5, such as a tea-pot, containing a liquid 6 to be heated, is provided with a handle 7 and with a cover 8. The cover is provided centrally with an annular bead 9 for supporting the heater. A tube 10 of metal is provided with a hemispherical end 11, and mounted within the latter is a hemispherical washer 12 of insulating material, preferably mica. Tubes 13, 14 are disposed concentrically to each other and are made of any suitable insulating material, for instance mica, clay or porcelain. The heating windings are shown at 15, 16, and may be of German silver or any other metal offering a high resistance to the passage of electric current and which is not easily melted.

A metallic tube 17 is located within the tube 14 of insulating material. All of the tubes 13, 14 and 17 are supported by a washer 18 of mica or other insulating material. A filling 19 of cement or plaster is disposed above the washer 18 and adheres

firmly to the inner surface of the outer tube 10. The upper end of the tube 10 carries a bead 20 which may be used for supporting the tube in the manner indicated in Fig. 1. A handle 21, of glass or porcelain, is secured to the bead 20. I employ glass for this purpose because it is a poor conductor of heat.

A rubber bushing 22, having a rounded passage 23 through it, is mounted upon the upper end of the glass handle 21. A cable 24, containing two insulated wires 25, 26, extends through the bushing. The two wires 25, 26 are connected by soldered or brazed joints 27, 28 with wires 29, 30 which are practically continuations of the heating coils.

In the form shown in Fig. 4 an outer tube 31 is provided with an annular bead 32 and above this is a thread 33 engaging a mating thread upon the lower end of a glass tube 34 which serves as a handle. In this instance, the upper end of the glass tube is rounded at 35 for the purpose of preventing abrasion of the cable 24.

My invention is used as follows: The operator grasps the heater by the handle 21 or 34, as the case may be, and extends the heater downwardly into the vessel, as indicated in Fig. 1. The electric current being turned on through the cable, elevates the temperature of the heating coils in the manner well known. The outer tube 10 contains air and as this air becomes heated it develops pressure greater than ordinary atmospheric pressure and also serves to distribute the heat. The outer tube 10 being both airtight and watertight, of course no water can reach the heating coils.

The cushion of air intermediate the outermost of the heating coils and the outer tube 10, prevents liability of overheating of the tube 10. The degree of heat attainable may, of course, be regulated by regulating the electric current, but if through accident, an excessive current should be sent through the heating coils, there is little liability of causing any damage, for the reason that the air jacket encircling the outermost heating coil does not become instantly hot enough to do the damage in question.

By aid of the device above described the degree of heat generated may be regulated with great nicety. The heat may be regulated to a great extent without affecting the electric current, if desired, by simply allowing the heater to descend to a predetermined

distance (ascertainable by experience) in the liquid to be heated. It may be further regulated by inserting the heater deeply into the liquid, and as soon as the latter approaches the boiling point, withdrawing the heater to any desired extent and holding it by the handle until all of the liquid acquires the desired temperature.

I sometimes construct the outer tube 10 of copper, in which event it acts as a sterilizer and serves to kill certain germs which may be in the water. As the outer tube is a plain, straight cylinder, it is easily kept clean.

While I show and describe the form of the device suitable for heating in small vessels, I do not limit myself to this use of the invention, as it may be employed in other rela-

tions coming fairly within the scope of my claims.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

The combination of a vessel, and an electric heater provided with a bead for engaging a portion of said vessel so as to support said heater.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HJALMAR WAHLQUIST.

Witnesses:

ROBERT STEVENSON,
CARL L. WAHLQUIST.