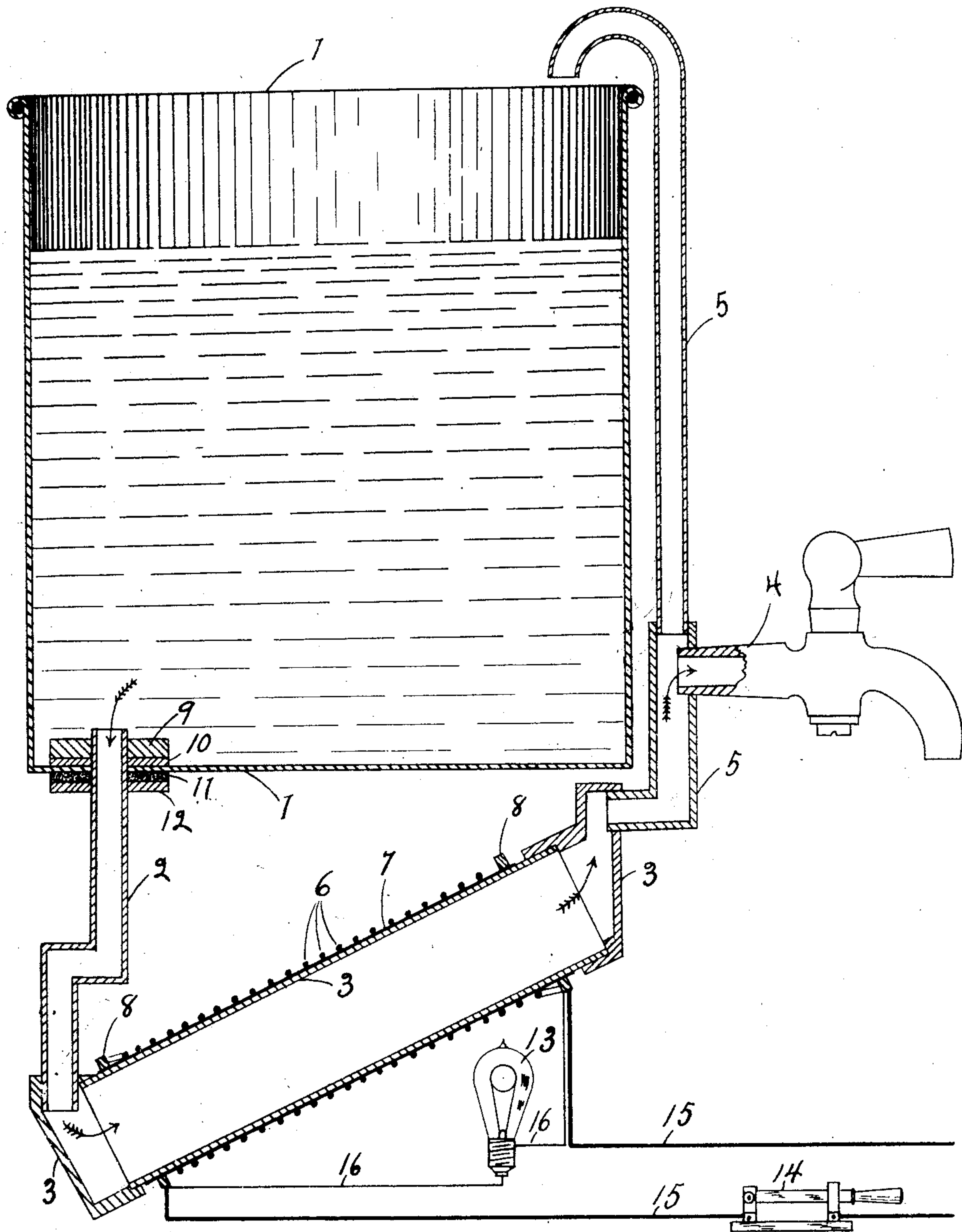


O. H. FIDDES.  
ELECTRIC LIQUID HEATER.  
APPLICATION FILED MAR. 6, 1909.

945,027.

Patented Jan. 4, 1910.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

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## ELECTRIC LIQUID-HEATER.

945,027.

Specification of Letters Patent.

Patented Jan. 4, 1910.

Application filed March 6, 1909. Serial No. 481,835.

*To all whom it may concern:*

Be it known that I, OSCAR H. FIDDES, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented new and useful Improvements in Electric Liquid-Heaters, of which the following is a specification.

The object of the present invention is to provide an electric fluid-heater which may be made portable and in which a given amount of fluid may be very rapidly heated entirely separate from the main body or supply reservoir, and which will be simple in construction, convenient in operation, and not liable to get out of order.

With these ends in view my invention consists in the details of construction and combination of elements hereinafter set forth, and then specifically designated by the claims.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same, I will describe its construction and operation in detail, referring by number to the accompanying drawing, forming a part of this specification, and in which—

The figure is a central vertical section of my apparatus.

In referring to the drawing, I have shown a reservoir or supply tank which may be of any desired size, shape and proportions. A heating reservoir or chamber 3 is located below the bottom of the reservoir 1 in which the fluid from the reservoir is heated. A pipe or tube 2 screw-threaded on both ends connects the bottom of the heating-chamber 3 with the bottom of supply reservoir 1 by means of a screw-threaded nut 9 which forces down on the washer 10 forcing the bottom of the supply reservoir 1 down upon the packing ring 11 and the flange 12 making a water tight connection, the pipe 2 making a free passage for the liquid from the supply reservoir 1 to the bottom of the heating-chamber 3. A vent-pipe 5 is shown connecting to the top of the heating-chamber 3 and extending upward to a point above the top of the reservoir 1. A stop-cock 4 is shown connecting to the vent-pipe 5 at a point above the bottom of the reservoir 1 and is the means by which the heated liquid is drawn off from the heating-chamber 3. The heating-element consists of a single layer of naked high-resistance wire 6, so wound that

the continuous turns of the wire are out of contact with each other so as to prevent short-circuiting. The ends of the resistance-wire 6 are connected or anchored to two clamps 8 shown at each end of the heating-coil which are insulated from the walls of the heating-chamber by means of the insulation 7. The insulation 7 consists of a thin layer of a high-resistance material such as sheet mica, which will not materially interfere with the passage of the heat from the coil 6 to the walls of the chamber 3. An ordinary electric light 13 is connected in multiple with the heating-coil 6 by wires 16 which lead from the lamp 13 and connect to each of the clamps or binding-posts 8. By means of wires 15, current is conducted to the heating-coil 6. A switch 14 is inserted in circuit with one of the wires 15 and completes or opens the circuit which conducts the current for heating the coil 6.

The operation of this apparatus will then be as follows: The reservoir 1 is first filled with water or such fluid that is required to be heated, which flows by gravity down the pipe 2 filling the heating-chamber 3 and then seeks its level in the vent-pipe 5. The current is then turned on by means of the switch 14, heating the coil 6 and lighting the lamp 13 apprising the user that the apparatus is in operation. In a short space of time, which will be in proportion to the size of the heating-chamber 3 and the amount of current consumed by the coil 6 the fluid in the chamber 3 will begin to boil. By means of the stop-cock 4 on the vent-pipe 5 the heated liquid can be drawn off the heating-chamber 3 and will be replaced by an equal amount of cold from the reservoir 1 which can in the same space of time be heated and drawn likewise from the stop-cock 4. The top of the heating-chamber 3 out of communication with the reservoir 1, the vent-pipe 5 leading from the top of heating-chamber 3 and the stop-cock 4 connecting to the vent-pipe 5 at a point above the bottom of reservoir 1 form the main features of this invention. It is evident that if the top of the heating-chamber 3 was connected to or in any way communicated with the reservoir 1 the steam which would be generated in the heating-chamber 3 would naturally rise to the top and discharge and condense into the reservoir 1. The object of having the heating-chamber out of any communication with the reservoir 1 is to confine



the entire heating energy generated by the heating-coil 6 to the fluid in the heating-chamber 3. If any steam could escape through any connection to the reservoir 1 the heating energy of the steam would be taken by the cooler liquid in the reservoir which would greatly lower the efficiency of this apparatus.

It is of the very essence of this invention that the heating-chamber should be connected to atmosphere, by means of a vent-pipe, for the purpose of relieving the pressure which would be generated in the heating-chamber 3; it is evident that if the vent-pipe was not provided, the liquid when boiling would generate steam, which would rise to the top of the heating-chamber 3 and back the liquid up into the tank 1 which would entirely empty the heating-chamber 3 and produce excessive heating of the heating-chamber and heating-element 6, and on opening the stop-cock, steam, instead of liquid, would flow therefrom. If the top of the heating-chamber 3 was not connected to atmosphere by means of the vent-pipe 5 this apparatus would be impracticable as the heating-chamber would contain air and the fluid could not readily flow down into the heating-chamber 3 on being filled for the first time. The stop-cock 4 being connected to the vent-pipe 5 at a point above the bottom of the reservoir 1 is to produce a means by which a portion of the fluid may be retained in the bottom of the reservoir 1 so that the heating-chamber 3 may always contain liquid in case by neglect the operator would leave the current turned on when the liquid was down to the level of the stop-cock 4.

Many variations may be made in the form of the device from that here shown without departing from the spirit of the invention. Thus the form of the heating-chamber may be made square or set in an upright position, and also any of the various means of electric-heating may be employed to heat the same. The vent-pipe may be made of glass and used as a gage-glass to indicate the amount of fluid in the reservoir 1. The stop-cock 4 may be placed any place on the vent-pipe 5.

I claim:—

1. In an electric liquid heater, the combination of a liquid heating chamber, a coil of resistance wire around the same, a reservoir above the heating-chamber, a pipe connecting the bottom of the reservoir to the bottom of the heating-chamber, and a vent-pipe leading from the top of the heating-chamber to the atmosphere above the top of the reservoir, substantially as described.

2. In an electric liquid heater, the combination of a liquid heating chamber, a coil of resistance wire around the same, a reservoir above the heating-chamber, a pipe connecting the bottom of the reservoir to the bottom of the heating-chamber, a vent-pipe leading from the top of the heating-chamber to the atmosphere above the top of the reservoir, and a stop-cock on the vent-pipe above the bottom of the reservoir, substantially as described.

San Francisco, February 27th., 1909.

OSCAR H. FIDDES.

Signed in the presence of—

WILLIAM REIMER,

THOMAS WARBURTON.