C. E. HINKLE.

PORTABLE ELECTRIC WATER HEATER.

APPLICATION FILED DEC. 13, 1916.

1,225,631.

Patented May 8, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

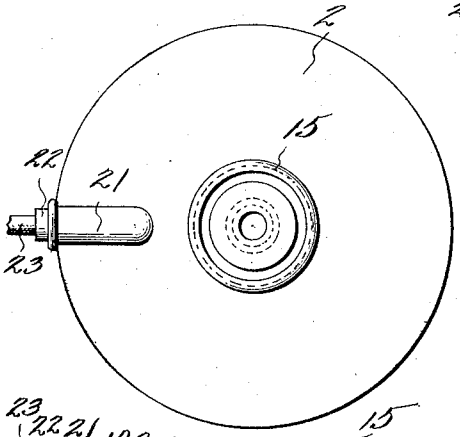


Fig. 2.

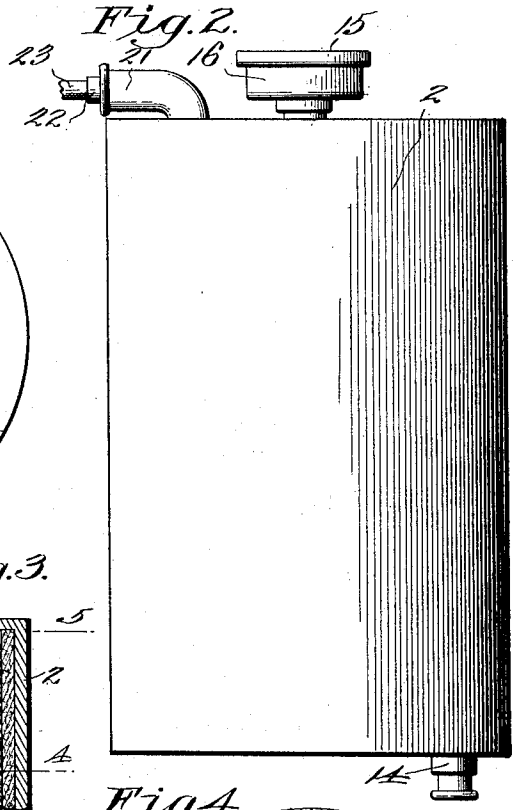


Fig. 3.

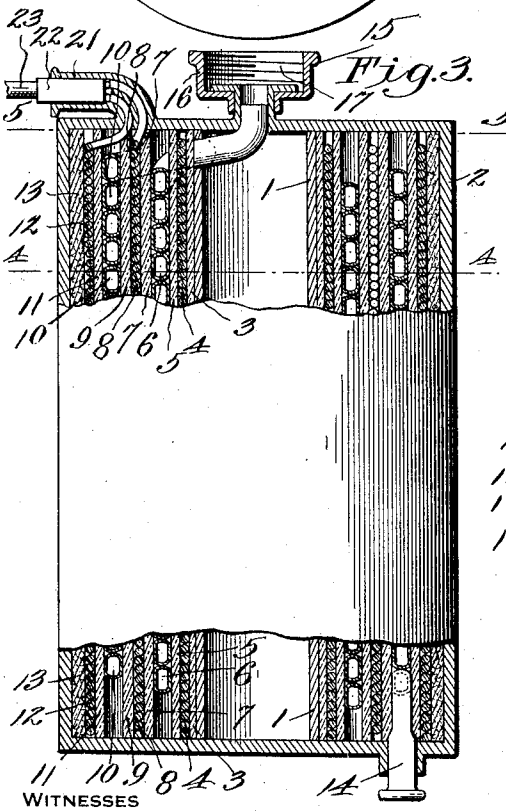
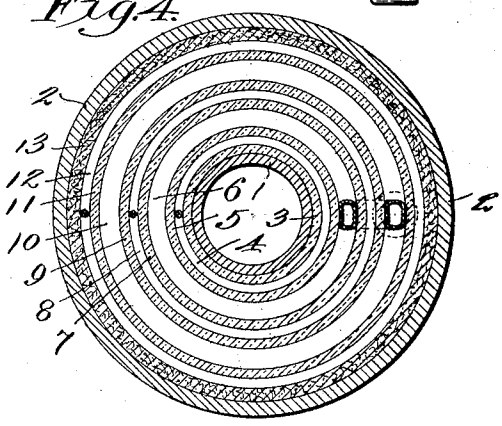


Fig. 4.



WITNESSES

M. Mae Durall.

A. A. Hines.

INVENTOR

C. E. Hinkle,

BY Victor J. Evans

ATTORNEY

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

C. E. HINKLE.

PORTABLE ELECTRIC WATER HEATER.

APPLICATION FILED DEC. 13, 1916.

1,225,631.

Patented May 8, 1917.

2 SHEETS—SHEET 2.

Fig. 5.

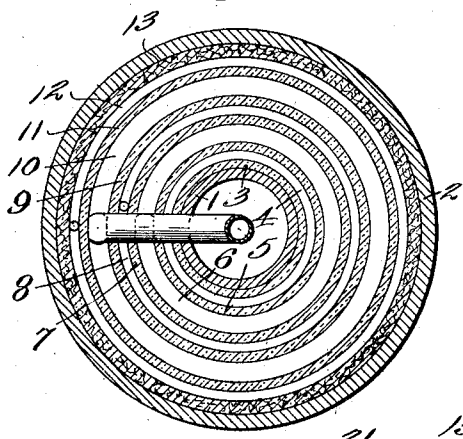


Fig. 6.

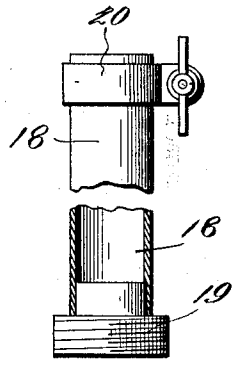
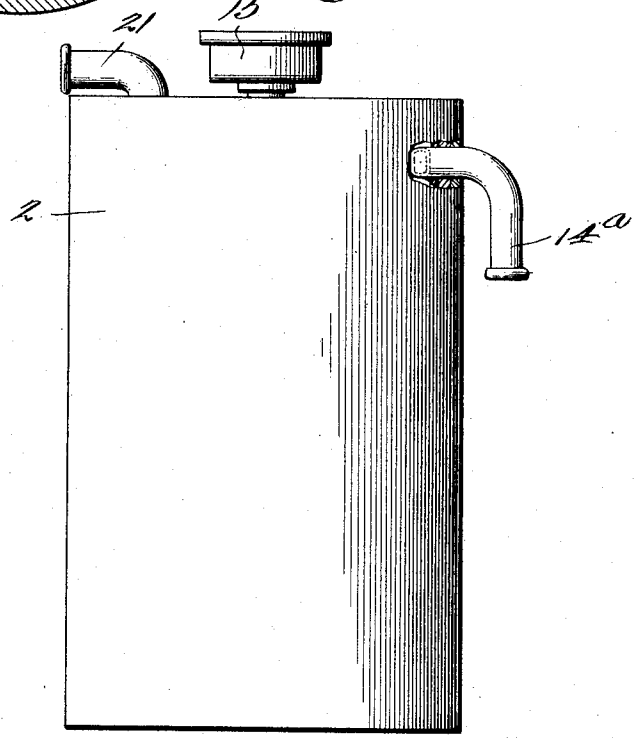


Fig. 7.



WITNESSES

M. Mae. Duvall.

E. E. Hines

INVENTOR

C. E. Hinkle,

BY Victor J. Evans

ATTORNEY

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CLARENCE E. HINKLE, OF ROSWELL, NEW MEXICO.

PORTABLE ELECTRIC WATER-HEATER.

1,225,631. Specification of Letters Patent. Patented May 8, 1917.

Application filed December 13, 1916. Serial No. 136,719.

To all whom it may concern:

Be it known that I, CLARENCE E. HINKLE, a citizen of the United States, residing at Roswell, in the county of Chaves and State of New Mexico, have invented new and useful Improvements in Portable Electric Water-Heaters, of which the following is a specification.

This invention relates to a portable electric water heater, designed particularly for use in heating water for domestic and analogous uses, the object of the invention being to provide a heater which is simple of construction, reliable and efficient in action, comparatively small in size and light in weight so that it may be conveniently handled, carried in a suitcase or other suitable receptacle, and applied for use to any ordinary type of faucet.

A further object of the invention is to provide an electrical water heater, which, although small in size and comparatively inexpensive of construction so as to be furnished at a low cost, will heat the water from a faucet in a rapid and economical manner.

The invention consists of the features of construction, combination and arrangement of parts hereinafter fully described and claimed, reference being had to the accompanying drawings in which:—

Figure 1 is a top plan view of an electrical water heater embodying my invention.

Fig. 2 is a side elevation of the same.

Fig. 3 is a vertical longitudinal section through the water heater.

Fig. 4 is a horizontal transverse section thereof taken on the line 4—4 of Fig. 3.

Fig. 5 is a similar view taken on the line 5—5 of Fig. 3.

Fig. 6 is a detail view of a form of coupling which may be employed.

Fig. 7 is a view showing a slightly modified form of heater.

In carrying my invention into practice, I provide an electrical heater comprising an inner tube or core 1, consisting of a metallic tube or pipe, an outer metallic casing 2, and sets of resistance units and heating coils interposed between said core and casing. Each of these sets of resistance units and coils, consists of a coil of resistance wire, and a water conducting pipe or tube of some good conducting material, such as copper, together with layers of insulating material, constructed and arranged as hereinafter described.

As shown clearly in Figs. 3, 4 and 5, the core 1 is surrounded by an outer sheathing of mica or suitable insulating material 3, about which is wound a coil of resistance wire 4. Inclosing this coil of resistance wire 4 is a second sheathing or layer of mica or insulating material 5, which separates the resistance coil 4 from a water conducting coil 6, surrounding the sheathing 5. The coil 6 is in turn surrounded by a sheathing 7 of mica or insulating material, about which is wound a second or intermediate wire resistance coil 8 inclosed between the sheathing 7 and a fourth sheathing 9 of mica or other suitable material. The sheathing 9 is inclosed by a second water conducting coil or tube 10, surrounded by a fifth sheathing 11 of mica or other suitable material separating the same from an outer or third wire resistance coil 12, which resistance coil 12 is separated from the casing 2 by an interposed layer 13 of asbestos or other suitable heat insulating material, whereby the heat will be confined for the purpose of heating the water passing through the coils and preventing loss of heat units. It will thus be seen that inner and outer coils are provided, surrounded on their inner and outer sides by three resistance units, the intermediate resistance unit being common to both conducting coils for the purpose of transmitting heat thereto. By this construction and arrangement of the coils and the resistance units, economy of construction and a reduction in the number of units required to heat the coils is obtained, and a compact arrangement of parts furnished, whereby the amount of water flowing from an ordinary faucet may be heated rapidly and efficiently without the necessity of employing a heater of materially great size or weight. The mica or insulation layers between the resistance coils and the heating tubes effectually insulate these elements electrically from each other, while

at the same time permitting of the free transmission of heat to the water flowing through the conducting coils.

The water heating coils or tubes 6 and 10 are connected at their delivery ends with an outlet tube or connection 14 and at their receiving ends with an inlet tube or connection 15, and each of these tubes is preferably of oval form in cross section so as to afford a wide heating area. In the construction shown in Figs. 1 to 5, inclusive, the discharge connection 14 is shown as arranged at the bottom of the heater, whereas in the modified form of my invention shown in Fig. 7 I have illustrated the water heating coils as provided with an outlet connection 14^a extending outwardly through the side of the heater adjacent the top and depending a short distance below the top of the coils. This modified construction is employed for greater convenience where the space between the faucet or water connection and underlying support, such as the bottom of a sink is not sufficient to allow the heater to be conveniently applied and removed, or arranged for the discharge of the water into a receiving vessel. The modified construction is also used with advantage when the heater is disposed at a point remote from the faucet for the discharge of the water into the tub or other vessel.

The inlet tube or connection 15 is preferably provided with an upstanding tubular guard 16 to receive the end of the faucet, and which is swiveled to the tube and provided with a threaded portion 17 for connection with the threaded end of a faucet, whereby the heater may be coupled thereto. Where the faucet is not threaded, or is of a size different from standard faucets or provided with a threaded portion of a size different from standard, I may provide for use a coupling connection which may be employed according to the nature of the faucet to which the device is to be coupled. This connection may consist of a rubber hose or tube 18 secured at one end to a threaded nipple 19 and provided at its opposite end with a split band 20 for coupling it to the faucet, the nipple 19 being adapted for threaded engagement with the threaded connection 17. By the use of different sizes of threaded nipples, hose and bands, which will be supplied with the heater as occasion may require the heater may be adapted for coupling connection with any kind of faucet.

The terminals of the resistance wires, which are connected in multiple, lead to a socket 21 which is adapted to receive a plug 22 connected with a conductor 23 leading from any suitable source of current supply, which may be from an ordinary 110 volt electric lighting circuit. It will thus be understood that in the use of the device it is connected by its inlet with the faucet from which the water is to be obtained, the plug being then inserted in the socket and the electric current turned on. After a suitable interval during which the water becomes heated, the faucet is opened for drawing the water. The heat generated by the resistance wires will thus be taken up by the flowing water, which will be heated to the desired temperature on its travel through the coils, the hot water discharging through the outlet connection into a suitable receptacle.

A material advantage of my construction resides in the fact that great economy is secured in the use of the insulating and other materials by the arrangement described, allowing them to be properly grouped in close compass, so that a heater which may be easily handled and transported may be furnished which at the same time will heat a flowing column of water rapidly and efficiently to a high temperature. Such a construction of heater may be made comparatively small, capable of being carried in an ordinary traveling bag or suitcase and used with convenience by a traveler, as well as of being transported from place to place and used at different points in a household. By the use of rubber tubing it will of course be understood that the heater may be disposed any desired distance from the faucet.

I claim:—

1. An electrical water heater including an inner core, an outer casing, a series of sets of electrically insulated resistance units and heating coils disposed between said core and casing, said coils having a common inlet and common outlet, means for connecting the resistance wires with a source of electric supply and electrical insulating material between the coils and resistance units, said material permitting the free transmission of heat.

2. An electrical heater including an inner core, an outer casing, a pair of spaced concentric water conducting coils disposed between the core and casing, said coils having a common inlet and a common outlet, electrical resistance coils disposed respectively between the outer coil and the casing and between the inner coil and the core, a third resistance coil between the water heating coils and common to both coils, electrical insulating and heat non-insulating material between the resistance coils and heating coils, and means for connecting the resistance coil with a source of current supply.

3. An electrical water heater comprising an inner core, an outer casing, a pair of resistance coils between the core and casing, a pair of water heating coils disposed be-

tween said resistance coils, a third resistance coil disposed between the water heating coils, layers of electric insulating heat-conducting material between said resistance wires and heating coils, a layer of heat non-conducting material between the outer resistance coil and the casing, and means for connecting the resistance coils with a source of electric supply.

In testimony whereof I affix my signature.

CLARENCE E. HINKLE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."