G. W. HEWITT.

PORTABLE WATER HEATER.

APPLICATION FILED APR. 16, 1921.

1,420,840. Patented June 27, 1922.

Fig. 1.

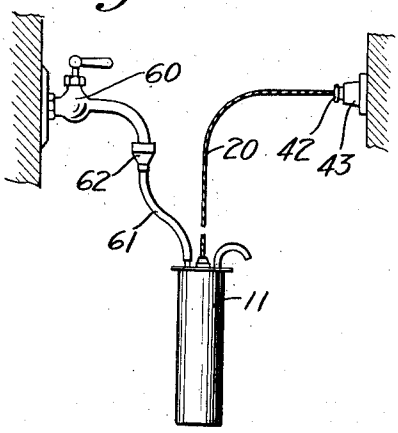


Fig. 3.

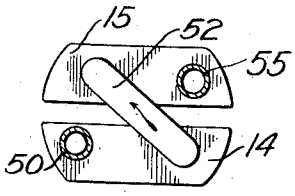


Fig. 2.

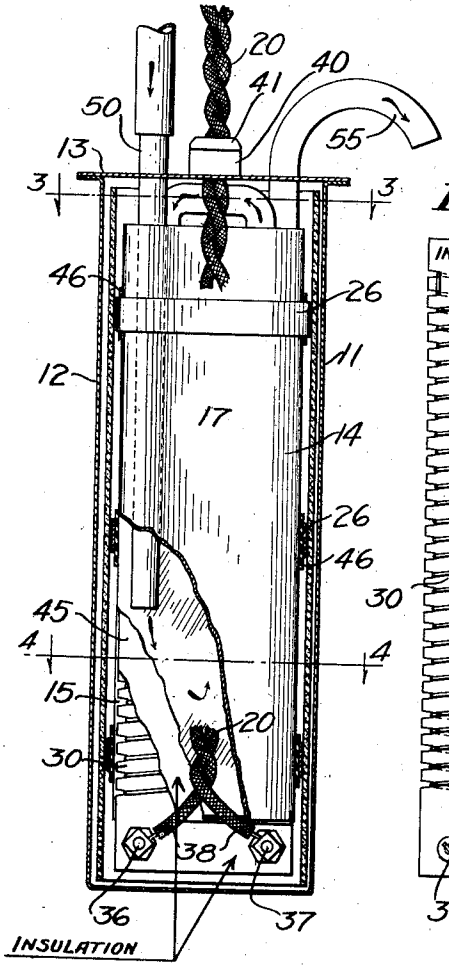


Fig. 5.

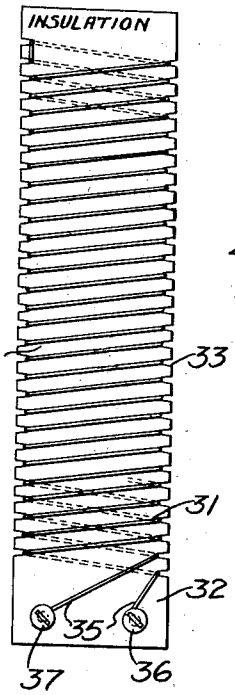
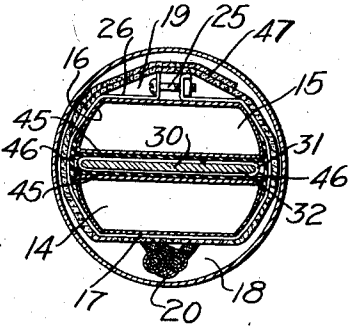


Fig. 4.



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UNITED STATES PATENT OFFICE.

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PORTABLE WATER HEATER.

1,420,840. Specification of Letters Patent. Patented June 27, 1922.

Application filed April 16, 1921. Serial No. 461,792.

To all whom it may concern:

Be it known that I, GEORGE W. HEWITT, a citizen of the United States, residing at Bakersfield, in the county of Kern and State of California, have invented a new and useful Portable Water Heater, of which the following is a specification.

This invention relates to water heaters, and has for its principal object to provide a portable device for heating small quantities of water which will be of such size and shape that it may be conveniently carried in a traveling bag or suitcase, and which will be of simple design and consequently low production cost.

Referring to the drawing which is for illustrative purposes only:

Fig. 1 is a view showing an application of a portable water heater embodying the features of my invention.

Fig. 2 is a vertical section through the water heater in which a portion of one of the circulating chambers is cut away to disclose the heating element and insulating plates.

Fig. 3 is a plan view showing the manner in which the circulating chambers are connected and is taken on a plane represented by line 3—3 of Fig. 1.

Fig. 4 is a section taken on a plane represented by the line 4—4 of Fig. 1.

Fig. 5 is a view of the heating element I employ, the heating element as herein shown being inverted from the position in which it is shown in Fig. 1.

As shown in the drawing, in the practice of my invention I employ a container 11 composed of a shell 12 and a cover 13. Enclosed within the container 11 I provide water circulating chambers 14 and 15 which are preferably formed of a thin sheet metal shell 16 and are approximately semi-circular in cross section flattened as indicated at 17 to provide a space 18 between the circulating chamber 14 and the container shell 12 for the passage of an electric cord 20, and a space 19 between the circulating chamber 15 and the container shell 12 to accommodate bolts 25 which form connecting means for the straps 26 which encircle and bind together the circulating chambers 14 and 15.

Between the circulating chambers 14 and 15 is inserted a heating element 30 comprised of a winding 31 supported upon a plate of insulating material, such as sheet mica, notched 33 to provide a means of maintaining the winding 31 in position. The ends 35 of the heating element winding 31 are attached to binding posts 36 and 37 mounted in the mica plate 32, and to which binding posts are connected, on the opposite side of the plate 32, wires 38 which form the cord 20.

On the cover 13 is mounted a collar 40 fitted with an insulating bushing 41 through which the cord 20 extends so that it may be connected by means of a plug 42 with a receptable 43 located in an exterior circuit. Between the faces of the heating element 30 and the adjacent walls of the circulating chambers are placed insulating sheets 45 to prevent the contact of the winding with the circulating chamber walls, and underneath the straps at the points adjacent to the heating element are also placed small pieces of insulating material 46. Surrounding the entire interior structure I provide a wrapping 47 of asbestos paper to prevent the loss of heat through the shell 12.

Water is admitted to the circulating chambers through a tube 50 extending through the cover 13 into the circulating chamber 14. It will be perceived that the tube extends a considerable distance down into the circulating chamber 14 and delivers the water to a point near the bottom thereof in order that a very complete circulation may be maintained. Rising within the circulating chamber 15, the water passes through an interconnecting tube 52 and is delivered into the circulating chamber 15 in which it again rises and is expelled through a curved outlet nozzle formed of a tube 55. During its passage through the circulating chambers the water is heated by its contact with the walls of the circulating chambers through which the heat generated by the heating element is conducted.

In Fig. 1 of the drawing I show the water heater connected to a basin cock 60 by means of a length of rubber tubing 61 provided with a diaphragm coupling 62. In this application cold water is delivered to the heater from the basin cock and is heated by electricity supplied from an exterior circuit through the cord 20.

I claim as my invention:

1. In a liquid heater, the combination of: a flat heating element; a circulating chamber having a flat side; insulation between said element and said side; and means for holding said element against said insulation.

2. In a liquid heater, the combination of: a flat heating element; a circulating chamber having a flat side; a second circulating chamber also having a flat side; means for insulating said element between said flat sides; and means for pressing said flat sides against said means for insulating.

3. In a liquid heater, the combination of: a flat heating element; a circulating chamber having a flat side; a second circulating chamber also having a flat side; a container surrounding said circulating chambers; means for insulating said element between said flat sides; and means for pressing said flat sides against said means for insulating.

4. In a liquid heater, the combination of: a flat heating element; a circulating chamber having a flat side; a second circulating chamber also having a flat side; a container surrounding said circulating chambers; means for admitting water through the wall of said container and into one of said chambers; water conducting means connecting said chambers; a water outlet for the other of said chambers; means for insulating said element between said flat sides; and means for pressing said flat sides against said means for insulating.

5. In a liquid heater, the combination of: a flat heating element; a circulating chamber having a flat side; a second circulating chamber also having a flat side; a container surrounding said circulating chambers; means for admitting water through the wall of said container and into one of said chambers; water conducting means connecting said chambers; a water outlet connected to the other of said chambers and passing through the walls of said container; means for insulating said element between said flat sides; and means for pressing said flat sides against said means for insulating.

6. In a liquid heater, the combination of: a flat heating element; a flexible cord connecting said heating element to an outside circuit; a circulating chamber having a flat side; insulation between said element and said side; and means for holding said element against said insulation.

7. In a liquid heater, the combination of: a flat heating element; a flexible cord connecting said heating element to an outside circuit; a circulating chamber having a flat side; a second circulating chamber also having a flat side; means for insulating said element between said flat sides; and means for pressing said flat sides against said means for insulating.

8. In a liquid heater, the combination of: a flat heating element; a flexible cord connecting said heating element to an outside circuit; a circulating chamber having a flat side; a second circulating chamber also having a flat side; a container surrounding said circulating chambers; means for insulating said element between said flat sides; and means for pressing said flat sides against said means for insulating.

9. In a liquid heater, the combination of: a flat heating element; a flexible cord connecting said heating element to an outside circuit; a circulating chamber having a flat side; a second circulating chamber also having a flat side; a container surrounding said circulating chambers; means for admitting water through the wall of said container and into one of said chambers; water conducting means connecting said chambers; a water outlet for the other of said chambers; means for insulating said element between said flat sides; and means for pressing said flat sides against said means for insulating.

10. In a liquid heater, the combination of: a flat heating element; a flexible cord connecting said heating element to an outside circuit; a circulating chamber having a flat side; a second circulating chamber also having a flat side; a container surrounding said circulating chambers; means for admitting water through the wall of said container and into one of said chambers; water conducting means connecting said chambers; a water outlet connected to the other of said chambers and passing through the walls of said container; means for insulating said element between said flat sides; and means for pressing said flat sides against said means for insulating.

In testimony whereof, I have hereunto set my hand at Bakersfield, California, this 8th day of April 1921.

GEORGE W. HEWITT.