M. SIMON.

ELECTRIC WATER HEATER.

APPLICATION FILED DEC. 13, 1915.

1,198,073. Patented Sept. 12, 1916.

Fig. 1.

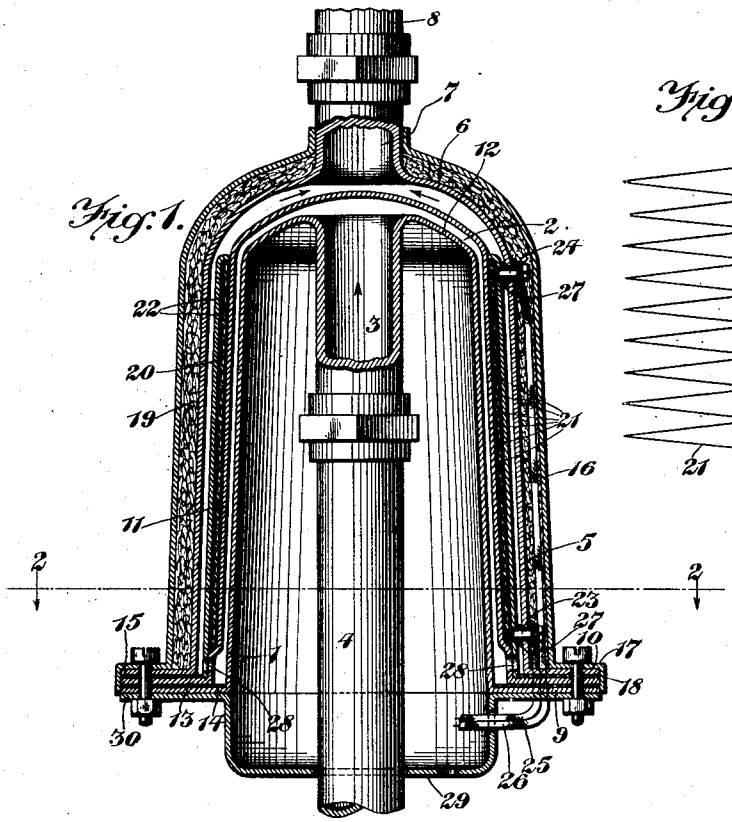
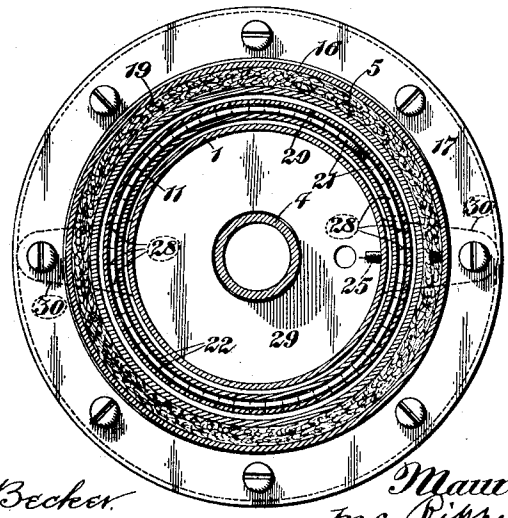


Fig. 3.

Fig. 2.



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

UNITED STATES PATENT OFFICE.

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ELECTRIC WATER-HEATER.

1,198,073. Specification of Letters Patent. Patented Sept. 12, 1916.

Application filed December 13, 1915. Serial No. 66,438.

To all whom it may concern:

Be it known that I, MAURICE SIMON, a citizen of the United States, residing at the city of St. Louis and State of Missouri, have invented a new and useful Electric Water-Heater, of which the following is a specification.

This invention relates to improvements in electric water heaters, and consists in the novel design, arrangement and combination of parts hereinafter more fully disclosed.

An object of the invention is to produce a durable electric water heater arranged to be placed in a liquid supply conduit by which it is supported and which will be economical in construction and in operation.

Another object of the invention is to provide a case for an electric water heater so arranged as to spread the incoming volume of water into a thin sheet in which form it contacts with a heating element arranged in the case.

Another object of the invention is to provide in an electric water heater a case divided into chambers communicating with each other, so arranged that the water entering through the supply conduit will be deflected downwardly in a thin sheet from whence it passes upwardly in the same form to a discharge conduit which is arranged in axial alinement with the supply conduit.

Another object of the invention is to provide a heater case comprising exterior walls and an interior partition wall in which is arranged a heating element, said partition wall being so arranged as to deflect the volume of water entering through the supply conduit downwardly in the form of a thin sheet from whence it passes in the same form upwardly to a discharge conduit, the resistance or heating element being arranged as a part of the partition wall.

Additional advantages and features attainable from the construction of the present invention will be recognized by those skilled in the art without specific mention thereof, in view of the following detailed description of a suitable embodiment of the invention which is illustrated in the drawings, and in which—

Figure 1 is a vertical section through a heater embodying the present invention. Fig. 2 is a cross section through the heater in which one form of the invention is embodied, taken substantially on the line 2—2 of Fig. 1. Fig. 3 is a diagrammatic view of the resistance circuit showing the winding of the resistance element constituting the heating means for heating the volume of water passing through the heater case.

In the embodiment of the invention illustrated in the drawing the heating chamber is formed from an inner casting 1, cylindrical in form and having a dome-shaped top 2 which is deflected downwardly at the apex forming a tubular extension 3 which constitutes the inlet conduit and which is adapted to be connected into a supply passage 4, and an exterior casting 5 also cylindrical in form and having a dome-shaped top 6 with an upward tubular extension 7 from the apex, said extension constituting the discharge outlet and which is adapted to be connected into a service passage 8. The arrangement of the passages 3 and 7 is such that they may be connected into the liquid supply system whereby the heater may be supported.

Projecting laterally from the lower edge of the casting 1 is a flange 9 and from the casting 5 is a flange 10. A partition member, comprising a cylindrical side wall 11 and a closed dome-shaped top 12, is adapted to be supported between the interior faces of the two castings 1 and 5 by bolts passing through the flanges 9 and 10 and through a flange 13 extending laterally from the lower edge of the wall 11. In order to seal the joints between the flanges 9, 10 and 13 gaskets 14 and 15 are interposed between the matching edges of the flanges. A housing 16 having a flange 17 at its lower edge with a depending rim 18 from the outer edge of the flange 17 is adapted to be mounted over the casting 5, thereby forming an incasing chamber over the heater case in which is disposed a quantity of heat non-conducting material 19, such as asbestos, mineral wool, or the like, for preventing radiation of heat from the case.

An incasement for the resistance circuit is formed from a wall 20 which encompasses the side wall 11 of the partition, the incasement 20 being integrally united to the wall 11 at the top and bottom by welding the edges thereof to the wall or by some other means of union, the object being to form a hermetically sealed case in which the resistance element 21 is arranged. The resistance element is wound preferably in a spiral

form about the wall 11 and is insulated from the incasement therefor comprising the wall 11 and the case 20 by interposing between the resistance element and the sides of the case layers of suitable insulating material 22.

Terminal binding posts 23 and 24 project through the outer case into the resistance housing providing means for electrically connecting the resistance circuit at each terminal to supply leads 25 and 26 respectively, the terminal binding posts 23 and 24 being insulated from the heater case by bushings 27 of insulating material.

A series of perforations 28 are formed in the walls 11 and 20 adjacent to the bottom of the heater and constitute passages whereby the fluid is conducted from the inner chamber formed between the casting 1 and the partition to the outer chamber formed between the partition and the casting 5.

A bottom closure 29 provided with extending flanges 30 may be secured in position, if desired, to constitute an inclosed case at the center of the heater in which may be disposed electrical controlling means for the supply circuit.

From the foregoing description of an embodiment of the invention it will be understood that the water or other liquid which enters through the supply conduit 3, coming in contact with the partition element, is deflected downwardly in a thin sheet, contacting during its downward passage with the heated wall 11 from whence it passes through the passages 28 into the outer chamber, flowing upwardly and contacting with the heated wall 20, after which it passes to the discharge outlet.

I am aware that changes in design and construction of the parts may be made without departing from the spirit and scope of the invention. I do not desire to limit myself therefore to exact details, but

What I claim and desire to secure by Letters Patent, is:—

1. An electric water heater comprising a case including a fluid inlet and a fluid outlet passage, an inner wall deflected downwardly from said inlet passage, an outer wall deflected downwardly from said outlet passage, said walls being substantially cylindrical in form and spaced apart, a partition wall intermediate said two first-named walls and having passages therethrough adjacent to the lower edge, a hermetically sealed case of which said partition wall forms one portion, a resistance circuit disposed in said case, and means for energizing said circuit, substantially as specified.

2. An electric water heater comprising an inner casting having cylindrical side walls, a rounded top with a depending tubular projection constituting an inlet passage, an outer casting conforming to the contour of the first-named casting but having a greater diameter so that when matched with said first-named casting there will be a space between the interior faces thereof, said exterior casting having a rounded top and a tubular extension constituting an outlet passage, the inlet and outlet passages being in axial alinement, a partition wall arranged between said castings, an inclosed heating case formed integral with said partition wall, and a resistance circuit mounted in said case, substantially as specified.

3. An electric water heater comprising a case formed from spaced castings, a partition wall supported between said spaced castings and having passages therethrough adjacent to the lower edge thereof, an inlet passage entering the chamber formed between one of said castings and said partition wall, an outlet passage extending from the chamber formed between the other of said castings and said partition wall, an inclosed resistance circuit arranged to heat said partition wall, and means for energizing said resistance circuit.

4. The combination with a fluid inlet passage of a downwardly deflected casting formed integral therewith, an outlet passage in axial alinement with said inlet passage, a downwardly deflected plate from said outlet passage, said last-named plate fitting over said first-named plate, thereby forming a heating chamber therebetween, a partition wall between the inlet and outlet passages, passages in said partition wall remote from the inlet and outlet passages, a wall united therewith to form a heating case and a resistance circuit disposed in said case, substantially as specified.

5. An electrical water heater comprising a cylindrical interior casting having a liquid inlet passage at one end thereof, and a cylindrical exterior casting having a liquid discharge outlet at one end thereof, said inlet and outlet passages being in axial alinement, a partition plate between said castings having passages for connecting the chambers formed between said castings and said partition plate, an inclosed resistance circuit supported by said partition plate, and means for energizing said resistance circuit.

In witness whereof, I have signed this specification in the presence of two subscribing witnesses.

MAURICE SIMON.

Witnesses:
N. G. Butler,
L. C. Kingsland.

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