M. SIMON.

ELECTRIC WATER HEATER.

APPLICATION FILED DEC. 7, 1915.

1,195,615. Patented Aug. 22, 1916.

Fig. 1.

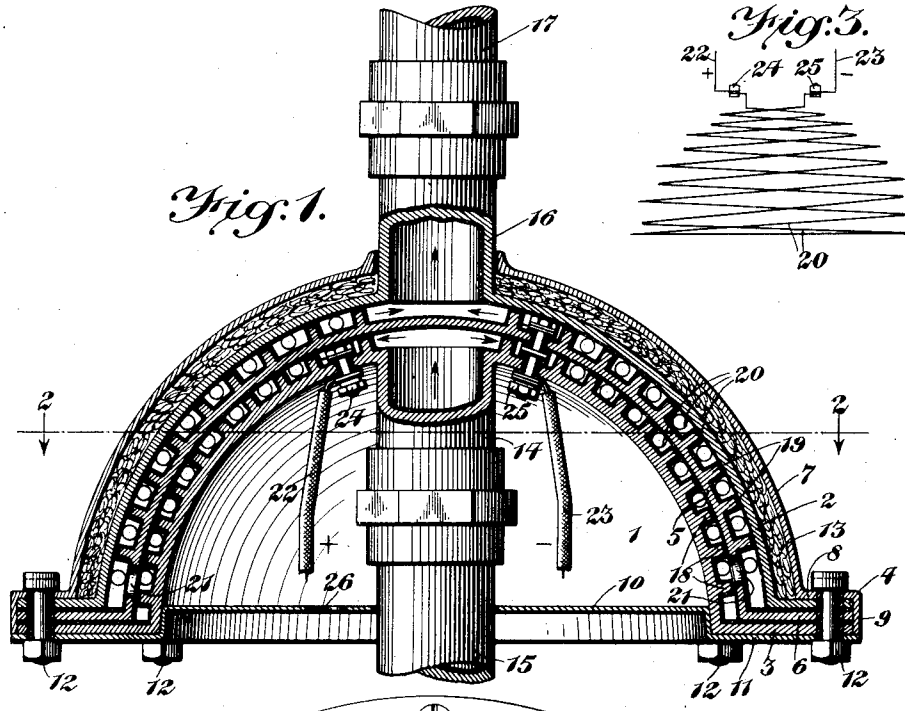
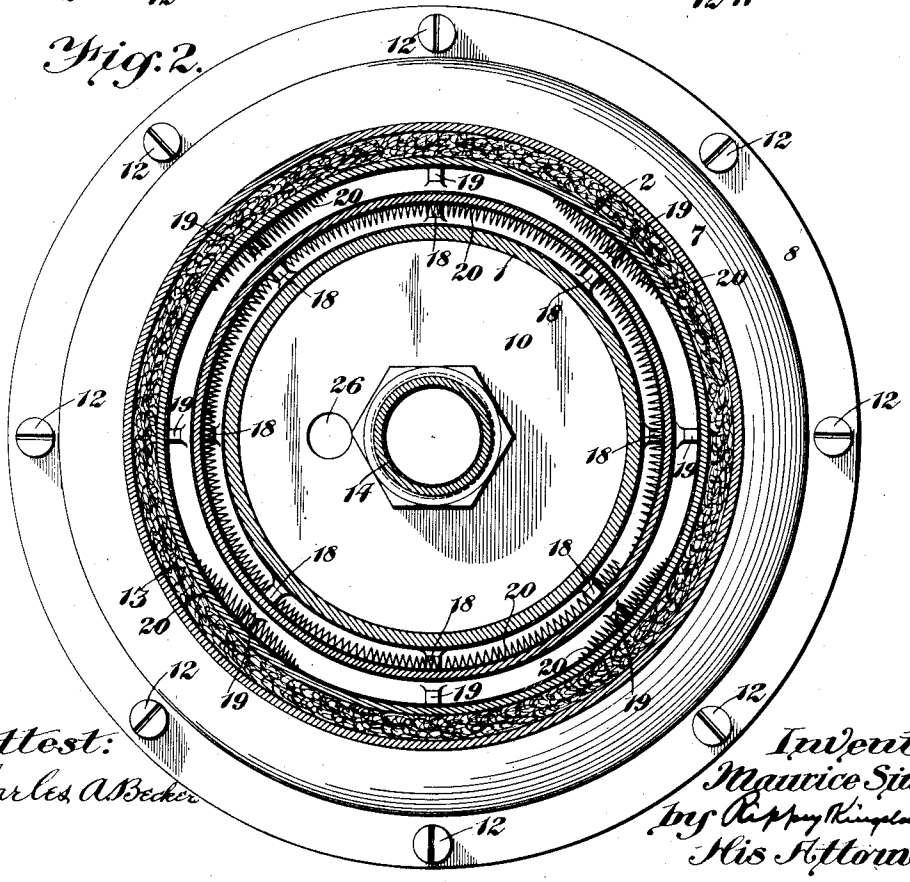


Fig. 3.

Fig. 2.



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UNITED STATES PATENT OFFICE.

MAURICE SIMON, OF ST. LOUIS, MISSOURI.

ELECTRIC WATER-HEATER.

1,195,615. Specification of Letters Patent. Patented Aug. 22, 1916.

Application filed December 7, 1915. Serial No. 65,484.

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 water heater, arranged to be placed in a water supply conduit and supported thereby, which will be economical in construction and in operation.

Another object of the invention is to provide a water heater comprising chambers so arranged as to spread the volume of water entering the heater into a thin sheet, with a resistance circuit disposed in the path of the flow of the water.

Another object of the invention is to provide a heater comprising a chamber divided so as to cause the fluid entering the same to spread into a thin sheet, with an inlet conduit so disposed that the water will enter adjacent to the top of the heater and pass downwardly and upwardly and be discharged from an outlet conduit at the apex of the heater, with a resistance circuit disposed in the path of flow of the fluid.

Additional advantages and features attainable from the construction will be apparent to those skilled in the art without specific mention from the following detailed description of an embodiment of the invention taken in connection with the illustration thereof in the drawing, in which—

Figure 1 is a vertical section through a heater embodying the features of the present invention. Fig. 2 is a cross section through the heater embodying the present invention taken substantially on the line 2—2 of Fig. 1. Fig. 3 is a diagrammatical view illustrating the resistance circuit embodied in connection with the heater of the present invention.

In the embodiment of the invention illustrated in the drawings, the heating chamber is formed from a bottom plate 1 and a top plate 2, said plates being hemispherical in form, the plate 2 having a greater radius than the plate 1 so that there will be a space therebetween when the plates are secured together. The plate 1 has extending from its lower edges an annular flange 3 and the plate 2 has an annular flange 4. A partition plate 5 of a hemispherical contour with a radius intermediate that of the plates 1 and 2 is mounted between the plates, there being a horizontally extending annular flange 6 extending from the lower edge of the plate 5. Over the plate 2 is a hemispherical housing 7 which has a horizontally extending annular flange 8 from the outer edge of which depends a vertical rim 9.

A closure having a dished body portion 10 with horizontally extending flanges 11 is adapted to be secured at the bottom of the heater, forming an inclosed space beween the inner surface of the plate 1 and the dished portion 10 of the closure. This space provides an inclosed chamber in which may be mounted automatic controlling devices for the resistance circuit.

The parts are matched together and retained in position as illustrated in Fig. 1 by removable bolts 12 passing through the flanges 11, 3, 4 and 8, thereby providing a means whereby the parts may be assembled with facility.

Between the housing 7 and the upper face of the plate 2 is a quantity of some suitable heat non-conducting material 13, such as mineral wool, asbestos or the like.

Depending from the apex of the plate 1 is a tubular extension 14 constituting an inlet conduit adapted to be coupled to a supply conduit 15. Extending upwardly from the apex of the plate 2 and integrally formed therewith is a tubular extension 16 constituting an outlet passage adapted to be connected into a service conduit 17. The passages 15 and 17 constitute a main fluid supply, and the arrangement and design of the heater supply 14 and discharge 16 permits the heater element to be mounted in this main supply line, whereby the same is supported and in which the same may be connected without disturbing, to any extent, the normal installation of a fluid supply in dwellings, or other buildings.

The inner surfaces of the plates 1, 2 and 5, as well as the conduits 14 and 16 are coated with enamel, or other insulating material so that the current for the resistance circuit cannot be short-circuited through the heater case.

The upper face of the plate 1 is provided with a series of spaced lugs 18 and on the upper face of the plate 5 are a series of simi-

lar lugs 19, the lugs 18 and 19 being arranged at equal intervals on arcuate lines forming spaced tiers on the surfaces of the plates for supporting the resistance wire. The resistance wire 20 is continuous and is wound upon the plate 1 and the plate 5, said plates constituting a core for supporting the resistance circuit.

Adjacent to the lower edge of the plate 5 and disposed at intervals on a circumferential cross sectional line are a series of passages 21 through the plate 5. Thus a fluid entering the conduit 14 enters the chamber between the upper face of the plate 1 and the lower face of the plate 5 and is deflected downwardly in a thin sheet to the bottom of the heater, from whence it passes through the passages 21 into the chamber between the upper face of the plate 5 and the inner face of the plate 2, and flows upwardly to the discharge outlet 16 at the top of the heater. Thus, the volume of liquid, coming into contact with the resistance wire in its flow through the heater in a thin sheet, is readily heated and, discharging from the uppermost part of the heater, discharges at the maximum degree of temperature.

The resistance circuit is energized by an electrical supply circuit comprising the leads 22 and 23, the lead 22 being attached to a terminal binding post 24 connected to one end of the stretch of resistance wire and the lead 23 being connected to a terminal binding post 25 connected to the other end of the stretch of resistance wire.

An opening 26 is provided in the closure 10 for the accommodation of the leads 22 and 23 of the main electrical supply circuit.

I am aware that numerous 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 outlet passage, an outer wall deflected downwardly from said inlet passage, an outer wall deflected downwardly from said outlet passage spaced apart from said first-named wall, a partition wall intermediate said two walls conforming to the contour thereof and having passages therethrough adjacent to the lower edge, a resistance circuit disposed in said case between said two first-named walls and said partition wall, and means for energizing said circuit, substantially as specified.

2. An electric water heater comprising a hemispherical bottom plate, an inlet passage in integral union with said bottom plate and opening at the apex thereof, a hemispherical top plate having a greater radius than said first-named plate, an outlet passage in integral union with said top plate and extending upwardly from the apex thereof, a hemispherical partition plate of a radius substantially intermediate of said first two-named plates disposed therebetween and having passages therethrough adjacent to the lower edge thereof, a resistance circuit comprising a continuous stretch of resistance wire arranged in a spiral form and wound upon said bottom plate and over said partition plate, and an electrical supply circuit for energizing said resistance circuit, substantially as specified.

3. An electric water heater comprising a hemispherical bottom plate, an inlet passage in integral union with said bottom plate and opening at the apex thereof, a hemispherical top plate having a greater radius than said first-named plate, an outlet passage in integral union with said top plate and extending upwardly from the apex thereof, a hemispherical partition plate of a radius substantially intermediate of said first two-named plates disposed therebetween and having passages therethrough adjacent to the lower edge thereof, lugs on the upper surface of said bottom plate, lugs on the upper surface of said partition plate, a resistance circuit comprising a continuous stretch of resistance wire arranged in spiral form and wound upon said bottom plate and over said partition plate and supported by said lugs in spaced relationship, and an electrical supply circuit for energizing said resistance circuit, substantially as specified.

4. An electric water heater comprising a case formed from spaced exterior plates, a partition plate supported between said spaced plates and having passages therethrough adjacent to the edge thereof, an inlet passage entering the chamber formed between one of said exterior plates and said partition plate intermediate of said passages, an outlet passage from the chamber formed between the other of said exterior plates and said partition plate intermediate of said passages, whereby fluid entering the heater is deflected to the edges of said first-named chamber from whence it passes through said passages and flows to said outlet passage, and a stretch of resistance wire disposed in the path of flow of the fluid, substantially as specified.

5. In an electric water heater, a heating chamber, comprising a bottom plate, an inlet passage integrally formed with said bottom plate, a top plate spaced from said first-named plate, an outlet passage integrally formed with said top plate in axial alinement with said inlet passage thereby adapting the heater to be supported within a supply conduit, a partition plate interposed between the inlet passage and the outlet passage, passages through said partition plate spaced from the opening of said inlet passage thereby causing the fluid to be de-

flected laterally from said inlet passage before entering said outlet passage, and a stretch of coiled resistance wire disposed in the path of flow of the fluid passing through said heater, substantially as specified.

6. In an electric water heater, a heating chamber, comprising a bottom plate, an inlet passage integrally formed with said bottom plate, a top plate spaced from said first-named plate, an outlet passage integrally formed with said top plate in axial alinement with said inlet passage thereby adapting the heater to be supported within a supply conduit, a housing incasing the upper surface of said heater inclosing a quantity of heat non-conducting material, a partition plate interposed between the inlet passage and the outlet passage, passages through said partition plate spaced from the opening of said inlet passage thereby causing the fluid to be deflected laterally from said inlet passage before entering said outlet passage, and a stretch of coiled resistance wire disposed in the path of flow of the fluid passing through said heater, substantially as specified.

7. The combination with a fluid inlet passage, of a downwardly deflected plate formed integral therewith, an outlet passage in axial alinement with said inlet passage, a downwardly deflected plate from said outlet passage having a greater radius than said first-named plate, whereby when said plates are assembled there is provided a space therebetween, a partition plate mounted between said first two-named plates, passages in said partition plate remote from said inlet and outlet passages, and heating means within the chamber formed by said first two-named plates, substantially as specified.

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

MAURICE SIMON.

Witnesses:
L. C. KINGSLAND,
N. G. BUTLER.