June 7, 1927. 1,631,753

B. MIDULLA

ELECTRIC HEATER

Original Filed May 21, 1925

Fig. 1.

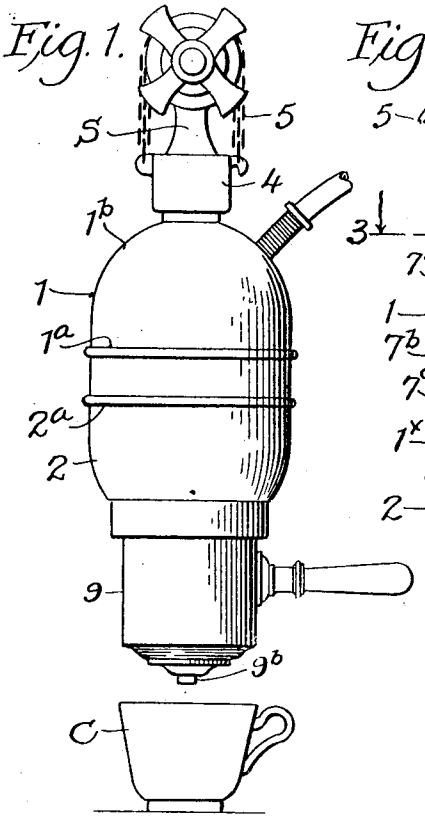

Fig. 2.

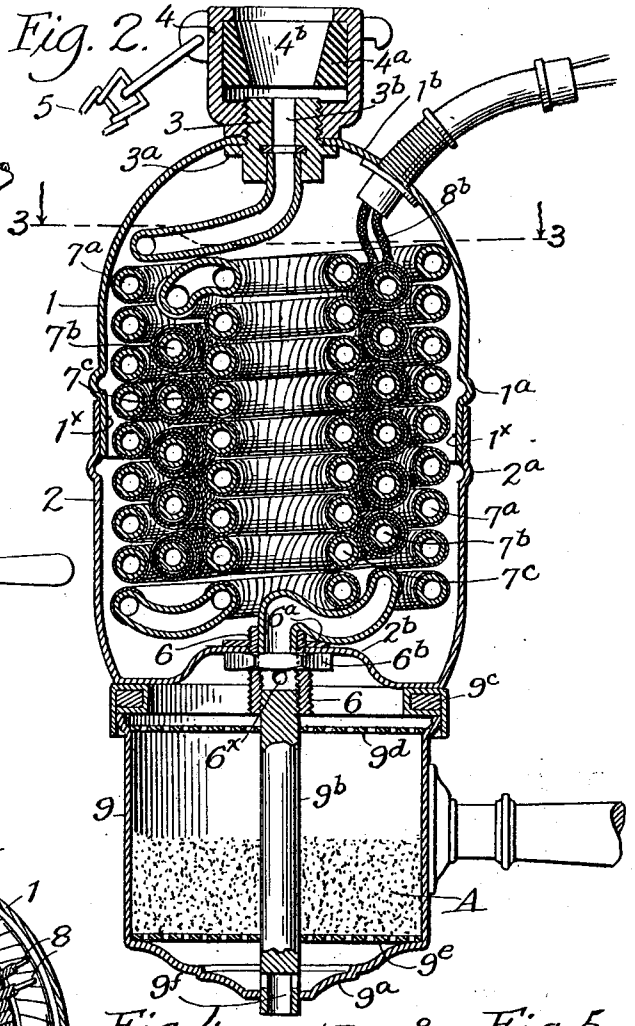

Fig. 3.

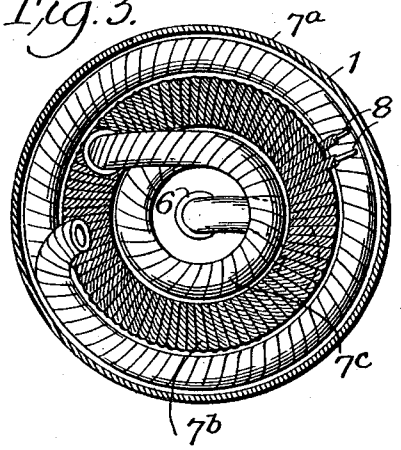

Fig. 4.

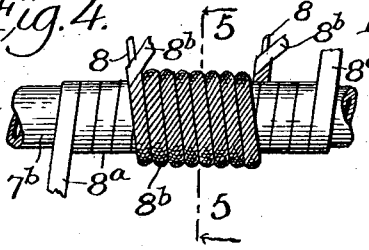

Fig. 5.

Inventor

Benjamin Midulla

By Alexander & Sell

Attorneys

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UNITED STATES PATENT OFFICE.

BENJAMIN MIDULLA, OF WILKINSBURG, PENNSYLVANIA.

ELECTRIC HEATER.

Continuation of application Serial No. 31,936, filed May 21, 1925. This application filed August 17, 1926. Serial No. 129,783.

This invention relates to instantaneous electric water heaters and the principal object thereof is to provide a novel, efficient, and simple heater embodying certain novel features hereinafter set forth.

This application is a continuation of my application filed May 21, 1925, Serial No. 31,936.

I will explain the invention with reference to the accompanying drawing which illustrates one practical embodiment thereof to enable others to adopt and use the same, and will summarize in the claims the novel features of construction, and the novel combinations of parts for which protection is desired.

In the drawings:

Figure 1 is an elevation of the heater attached to a spigot.

Figure 2 is an enlarged vertical section through the heater, showing the arrangement of the coils.

Figure 3 is a section on the line 3—3 Figure 2.

Figure 4 is a diagrammatic view showing the method of wrapping coils with insulating material, and with the insulated heating element.

Figure 5 is a section on the line 5—5, Figure 4.

As shown in the drawings, the heater preferably comprises a casing of suitable material and preferably of cylindrical shape, made two sections 1 and 2, having beads 1^a, 2^a, adjacent their meeting edges, the section 1 making a sliding fit, as at 1^x, within the section 2. The casing may however be of any other desired shape, and the sections 1 and 2 fitted together in any other desired manner.

The upper section 1 is open at its lower end while the upper end thereof is contracted as at 1^b, and an externally threaded inlet plug 3 having an annular shoulder 3^a and central bore 3^b extends through a perforation in the center of the contracted upper end 1^b of section 1 the shoulder 3^a engaging the inner side of said section.

Upon the threaded portion of plug 3 is a cup-shaped member 4, screwed down upon said plug until the same engages the outer side of portion 1^b. In cup-shaped member 4 is an annular rubber washer 4^a, the bore 4^b of which is preferably conical or contracted at its lower end, and adapted to receive the end of a water spigot or pipe S inserted into said bore, as shown in Fig. 1.

A chain 5 is provided attached to member 4 for conveniently suspending the heater adjacent the water spigot S, or the like, as shown in Fig. 1.

The upper end of section 2 is open, said section being closed at its bottom by a plate 2^b which plate 2^b is provided with a central perforation through which extends an outlet plug 6, having a bore and an annular shoulder 6^a adapted to seat upon the inner face of bottom plate 2^b. The plug 6 below the shoulder 6^a is preferably externally threaded for a locknut 6^b which holds plug 6 in place.

Within the casings are three coaxial coils 7^a, 7^b, 7^c, contained one within the other, which coils are preferably of copper tubing, or the like. As shown in Fig. 2, the upper end of the outer coil 7^a is connected directly to the bore 3^b of inlet plug 3, and the bottom end of the outer coil 7^a is connected to the bottom of the inner coil 7^c, the upper end of the inner coil 7^c being connected to the upper end of the middle coil 7^b. The lower end of middle coil 7^b is connected directly to the bore of plug 6. Hence the water from the spigot or pipe passes down through the outer coil 7^a, then up through the inner coil 7^c, and from thence down through the middle coil 7^b and out through the bore in outlet plug 6.

Preferably asbestos wire or ribbon 8^a is wrapped spirally around the tubing of coils 7^a, 7^b, and 7^c, for their entire lengths, as diagrammatically shown in Figs. 4 and 5, and then an electrical heating or resistance element 8, which has itself been previously wrapped with asbestos wire or ribbon 8^b (see Fig. 4) is then wrapped around the asbestos covering 8^a of the middle coil 7^b only; the conductor wires for the heating element passing through the casing 1 adjacent its upper end in any desired manner, such as shown in Fig. 2. By the above construction and arrangement of the resistance element 8, heat is absorbed by the water or other liquid running through coils 7^a, 7^b, 7^c, the water in coils 7^a and 7^c absorbing the heat of radiation from the external surface of the coil 7^b, and the water in coil 7^b being heated directly by the heating element 8. The temperature of the water issuing from the outlet plug 6 of the heater de-

pends of course, upon the rate of flow of the water in the coils 7^a, 7^b, and 7^c.

The coils 7^a, 7^b, 7^c, may be either integral or separable and connected by pipe joints, unions or the like, and if desired, the three coils may be made in the form of flat coils disposed in three different planes, the coil in the middle layer carrying the heating element.

The heater above described is capable of many uses where hot water at different temperature is desired, and will raise the temperature of the water, or other liquid in the coils, up to the boiling point in very quick time.

The heater illustrated in the drawings is used in connection with a percolator for coffee, and the like. A cup 9 having an open top and closed bottom 9^a is provided with a central stem 9^b which is preferably solid and extends slightly above and below the cup 9. Preferably the upper end of stem 9^b is threaded for engagement with internal threads in the bore of plug 6 whereby the cup 9 is securely fastened to the underside of section 2. A gasket 9^c interposed between the upper edge of cup 9 and the bottom of section 2 makes the connection sufficiently water tight. Radially disposed holes 6^x in the plug 6 above the top of stem 9^b permit the boiling liquid issuing from the bore of plug 6 to pass into cup 9, the liquid spreading over a screen or sieve 9^d in the upper end of the cup. A second screen or sieve 9^e near the bottom of cup 9 may hold a quantity of coffee A or other beverage ingredient, the boiling water passing through coffee, or the like, on screen 9^e, and out through the bore 9^f in the lower part of stem 9^b.

By the time the water from the spigot S has reached plug 6 its temperature will be near the boiling point, and in passing through the percolator 9 will make coffee or the like which may be collected in a cup C or the like placed below the bore 9^f of stem 9^b. The cup 9 is readily detachable from the casing 2 and may be refilled with coffee as desired.

The percolator illustrates only one use to which the heater may be applied, and I therefore do not limit my invention to the exact form shown in the drawing for obviously changes in the details of construction may be made within the scope of the claims.

I claim:—

1. A heater comprising a plurality of coaxial coils connected in series and having an inlet and outlet; the coils being so connected that the liquid must pass through the outermost coil first, then through the innermost coil, and lastly through the middle coil; and an electrical heating element around the middle coil.

2. In a heater as set forth in claim 1. the middle coil being wrapped with insulating material, and the heating element being itself wrapped with insulating material and then wrapped around the insulating material on said middle coil.

3. A water heater comprising a plurality of coaxial coils of different diameters arranged one within the other, and connected in series and having an inlet and outlet; the coils being so connected that the liquid must pass through the outermost coil first, then through the innermost coil, and then through the middle coil last; and an electrical heating element wrapped around the middle coil.

4. In a heater as set forth in claim 3, the middle coil being wrapped with insulating material, and the heating element being itself wrapped with insulating material and then wrapped around the insulating material on said middle coil.

5. A water heater comprising a plurality of coaxial coils connected in series and having an inlet and outlet; means for connecting the inlet to a liquid supply; the coils being so connected that the liquid must pass through the outermost coil first, then through the innermost coil, and through the middle coil last; the coils being wrapped with insulating material, and an electrical heating element wrapped with insulating material, and wrapped around the insulated portion of the middle coil.

6. A water heater comprising a plurality of coaxial coils of different diameters and arranged one within the other, and connected in series, and having an inlet and outlet; means for connecting the inlet to a liquid supply; the coils being so connected that the liquid must pass through the outermost coil first, then through the innermost coil, and through the middle coil last; the coils being wrapped with insulating material, and an electric heating element itself wrapped with insulating material and coiled around the insulated portion of the middle coil.

7. A water heater comprising a casing having an inlet and outlet; a plurality of coaxial coils within the casing connected in series, means for connecting the outermost coil to the inlet and the middle coil to the outlet of the casing; means for connecting the inlet of the casing to a liquid supply; the coils being so connected that the liquid must pass through the outermost coil first, then through the innermost coil, and through the middle coil last; the coils being wrapped with asbestos wire, and an electrical heating element wrapped in asbestos wire, and wrapped around the insulated portion of the middle coil.

8. A water heater comprising a casing having an inlet and outlet; a plurality of coaxial coils within the casing of different

diameters, and arranged one within the other, and connected in series, means for connecting the outermost coil to the inlet and the middle coil to the outlet of the casing; means for connecting the inlet of the casing to a liquid supply; the coils being so connected that the liquid must pass through the outermost coil first, then through the innermost coil, and through the middle coil last; the coils being wrapped with asbestos wire, and an electrical heating element wrapped in asbestos wire, and wrapped around the insulated portion of the middle coil.

In testimony that I claim the foregoing as my own I affix my signature.

BENJAMIN MIDULLA.