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L. SHUMAN

ELECTRIC HEATER

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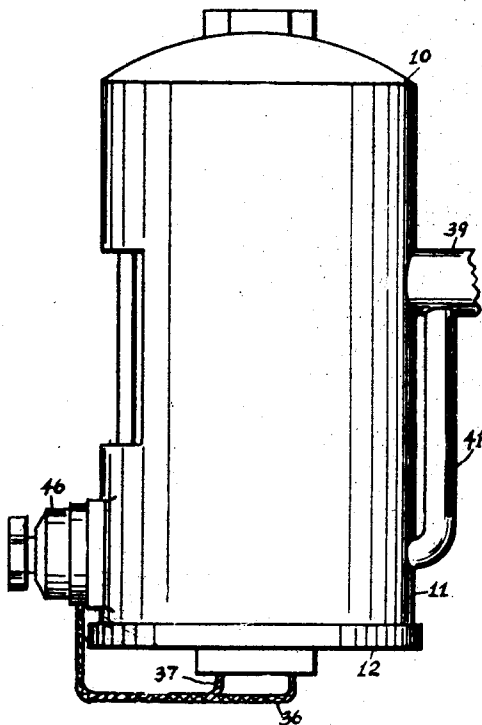


Fig. 1

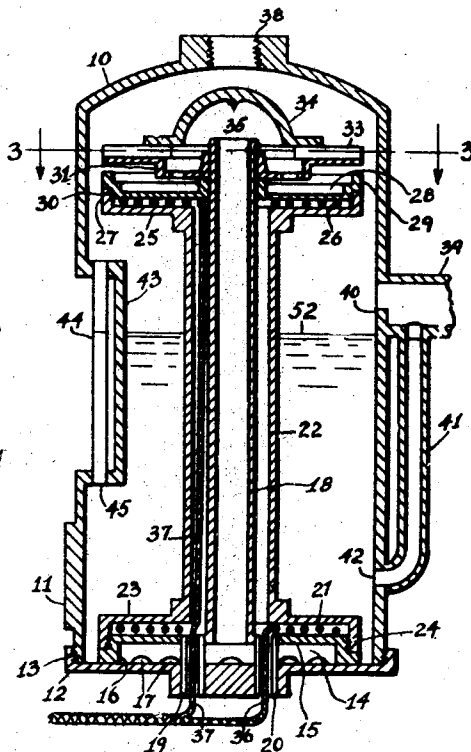


Fig. 2

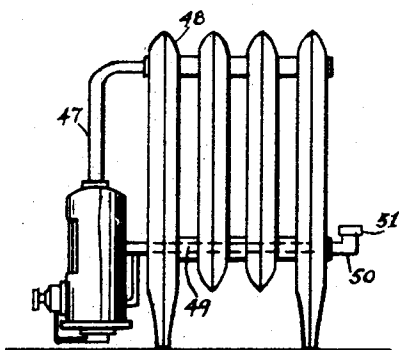


Fig. 4

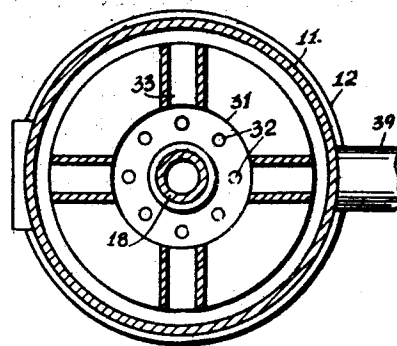


Fig. 3

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ELECTRIC HEATER.

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This invention pertains to heating apparatus, and particularly to the use of electricity for the heating of water and circulating the steam generated therefrom through radiators for the raising of the temperatures of rooms and buildings.

The object of the invention is to so combine electric heating units with a boiler and to so connect the boiler with a radiator, that a measure of water may be filled into the boiler and distributed to the heating units in small quantities, so that small heating units will rapidly turn the water into steam within the boiler, from whence the same is distributed throughout the radiator and after condensation has taken place within the radiator, the same is returned to the boiler for re-heating.

It is recognized that in order to bring electric heating to a general commercial use, that the greatest possible efficiency must be obtained from the amount of electricity used, and it is with this idea in view that the details of the heater are constructed and arranged.

The invention will be hereinafter particularly described, illustrated in the accompanying drawings and pointed out in the appended claims.

In the drawings, Fig. 1 is a side elevation of the heater, Fig. 2 is a central, vertical sectional view of the same, Fig. 3 is a transverse sectional view taken on the line 3—3 of Fig. 2 and Fig. 4 is a side elevation of a radiator with the boiler attached thereto.

In a detail description, in which like numerals refer to like parts throughout the several views, the boiler 10 has side walls 11 joined to a base 12 by means of a threaded connection 13.

A central cavity 14 is formed on the base 12 by means of a plate 15 elevated by means of an annular rim 16 through which are openings 17. Mounted in an opening through the center of the plate 15 is a tube 18, the same being open at both ends, the lower end thereof opening into the cavity 14. Passing through the base 12, cavity 14 and plate 15 are conduits 19 and 20. Mounted on top of the plate 15 is an annular electric heating element 21. Surrounding the tube 18 is a conduit 22 having an annular flange 23 at the bottom, the same forming a covering for the heating element 21.

The flange 23 is joined to the plate 15 by

means of a threaded connection 24. At the top of the conduit 22 is an annular flange 25, upon which and around the tube 18 is mounted an electric heating element 26. The flange 25 is provided with an annular vertical rim 27. Mounted on top of the heating element 26 and around the tube 18 is a basin 28 having an annular rim 29 joined to the rim 27 by a threaded connection 30. Mounted around the top of the tube 18 just above the basin 28 is an annular pan 31 having openings 32 through the bottom thereof and troughs 33 radiating therefrom reaching flush with the outer edge of the flange 29. A cap 34 extends over the top of the tube 18 and over the pan 31, the same being secured to the edge of the pan 31, leaving an open space 35 between the cap 34 and the top of the tube 18. An electrical connection 36 is made with the heating element 21 through the conduit 20 and an electric connection 37 with the heating element 26 through the conduits 19 and 22. A threaded opening 38 is provided in the top of the boiler 10. A tubular connection 39 is made with the side of the boiler 10. The tubular connection 39 with the boiler 10 is partially obstructed by means of an upward extension therein 40.

At the bottom of the tubular connection 39 is a tubular connection 41, reaching downwardly and connecting with the boiler 10 at 42, the same being near the bottom of the boiler 10. In one side of the boiler 10 is an offset 43 extending inwardly, within which is mounted a transparent tube 44 having an opening 45 at the bottom thereof, the same to serve as a gage to indicate the liquid content of the boiler 10. On the side of the boiler 10 beneath the tube 44 is mounted a switch 46 connected with the wires 36 and 37, the same serving to connect the said wires with a source of electric supply.

By means of the threaded connection 38 the boiler 10 is connected by the pipe 47 to the top of a radiator 48. By means of the tubular connection 39 the side of the boiler 10 is connected by the pipe 49 to the bottom of the radiator 48. A filling nipple 50 having a removable cap 51 is provided at the lower end of the rear of the radiator 48. The normal water level in the boiler 10 is indicated by 52. In the practical application of the heater, the same is connected with a radiator as shown in Fig. 4. Sufficient water is filled into the nipple 50 to bring the water level in the boiler 10 to the

point 52. The switch 46 is connected with a source of electric supply and the switch operated to apply the electric current to the heating units 21 and 26. Water passes from the interior of the boiler 10 through the openings 17 into the cavity 14. The water in the cavity 14 is heated to a high degree by the element 21, by reason of which the same percolates upwardly through the tube 18, out at the top thereof, through the cavity 35 to the pan 31, from whence it is distributed by gravity through the openings 32 to the basin 28 above the heating element 26, the overflow, if any, passing through the troughs 33 to the sides of the boiler 10 and from thence back to the main body of water. The water passing upwardly through the tube 18 having been primarily heated by the element 21, when it gets onto the basin 28 above the heating element 26, is spontaneously thrown into steam, which passes out of the opening 38 to and through the pipe 47 to the radiator 48. After condensation has taken place in the radiator 48, the water passes through the pipe 49 and the connections 39 and 41 back to the boiler 10 through the opening 42 near the bottom of the boiler and within the water area thereof. The extension 40 serves to direct the return flow through the connection 41. The cap 34 serves to retard the steam generated by the heating element 21 and to subject the same to super-heating by the heating element 26.

What is claimed is:

1. An electric heater comprising a boiler, an electric heating element mounted in the bottom thereof, a cavity beneath the heating element, openings between the water area of the boiler and said cavity, an enclosure for said heating element, a tube open at both ends extending upwardly from said cavity within the boiler to a point above the water area therein, an electric heating element mounted within the boiler near the top thereof and adjacent said tube, an enclosure for said heating element, the

upper covering thereof being formed into a basin, electric connections with said heating elements and steam outlet and liquid return connections to said boiler.

2. An electric heater comprising a boiler, an electric heating element mounted in the bottom thereof, a cavity beneath the heating element, openings between the water area of the boiler and said cavity, an enclosure for said heating element, a tube open at both ends extending upwardly from said cavity within the boiler to a point above the water area thereof, an electric heating element mounted within the boiler near the top thereof and adjacent said tube, an enclosure for said heating element, the upper covering thereof being formed into a basin, an annular distributing pan mounted around the tube above the basin, electric connections with said heating elements and steam outlet and liquid return connections to said boiler.

3. An electric heater comprising a boiler, an electric heating element mounted in the bottom thereof, a cavity beneath the heating element, openings between the water area of the boiler and said cavity, an enclosure for said heating element, a tube, open at both ends, extending upwardly from said cavity within the boiler to a point above the water area thereof, an electric heating element mounted within the boiler near the top thereof and adjacent said tube, an enclosure for said heating element, the upper covering thereof being formed into a basin, an annular distributing pan mounted around the tube above the basin, a cap over and above the upper end of the tube and the pan, connected with the pan, electric connections with said heating elements and steam outlet and liquid return connections to said boiler.

In testimony whereof, I affix my signature.

LEO SHUMAN.