March 15, 1927. 1,620,745

W. W. WAINWRIGHT

ELECTRIC WATER HEATER

Filed July 15, 1925

Fig. 2.

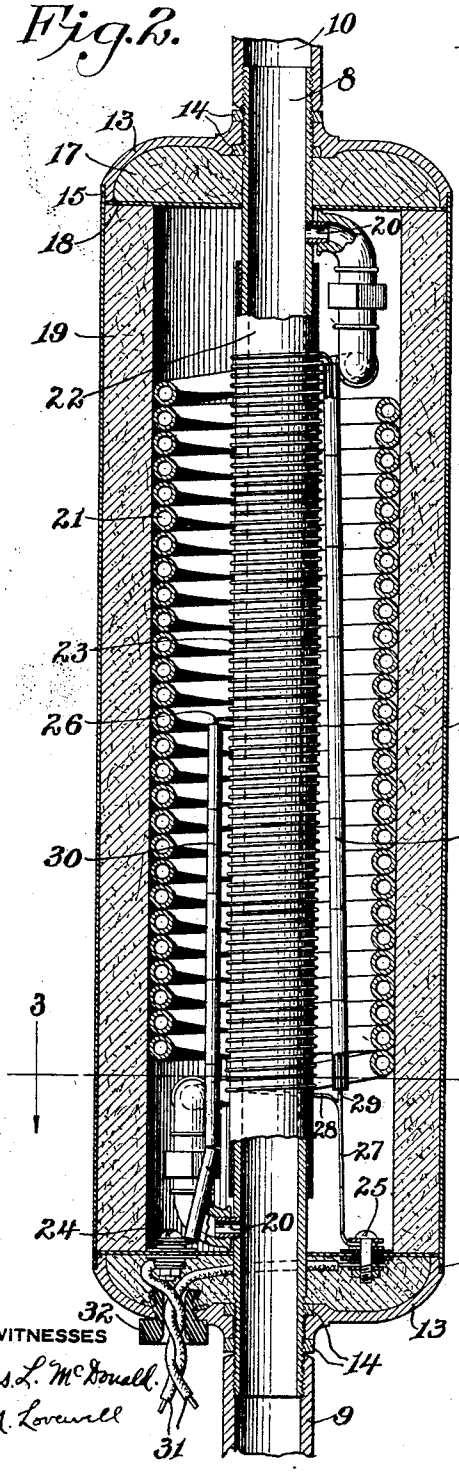


Fig. 4.

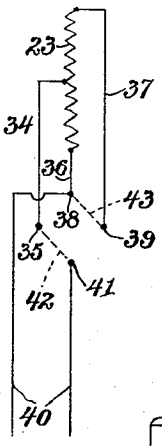


Fig. 1.

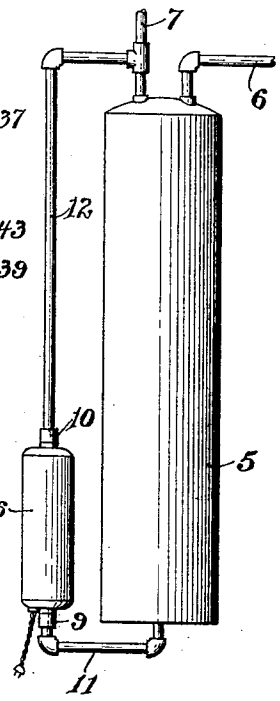
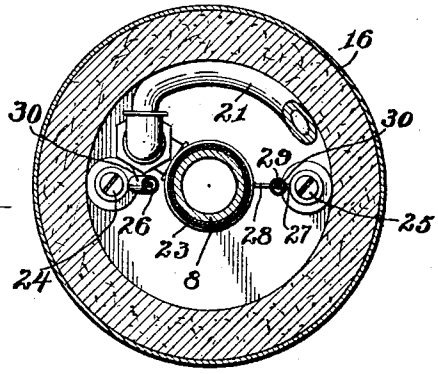


Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

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ELECTRIC WATER HEATER.

Application filed July 15, 1925. Serial No. 43,820.

This invention relates to an electric water heater, primarily adapted to be connected to a hot water supply tank for use in homes, restaurants, hotels and the like.

The general object of the invention is to provide a heater of this type, which is strong and durable, which will heat the water quickly at a low cost, and which will not readily get out of order. It comprises a closed drum having its walls lined with magnesia, or other suitable heat insulator, and containing the resistance element and water pipes, preferably of copper, which extend from top to bottom thereof. It is adapted to be connected either end up to branch pipes leading respectively from the upper and lower ends of the tank. The heating element is so arranged that by providing suitable switches and connections different degrees of heat may be obtained.

The invention will be more specically described with reference to the accompanying drawing, which illustrates the detailed construction thereof.

In the drawing:

Figure 1 is a side elevation of the heater connected to a hot water supply tank.

Figure 2 is a longitudinal section through the heater.

Figure 3 is a transverse section thereof taken on the line 3—3 of Figure 2.

Figure 4 is a diagrammatic view showing the wiring connections by means of which different degrees of heat may be obtained.

The invention is illustrated in connection with a hot water supply tank 5, of the usual construction, having an inlet pipe 6, which discharges near the bottom thereof, and an outlet pipe 7 leading from its upper end. The heater comprises a centrally disposed pipe 8, preferably of copper, having threaded ends adapted to be connected by suitable unions 9 and 10 to branch pipes 11 and 12, which are respectively connected to the bottom of the tank 5, and to the outlet pipe 7 near the upper end of the tank. Two end caps 13 of iron or other suitable metal are adjustably secured on the threaded ends of the pipe 8 by means of lock nuts 14. The rims of the caps 13 are chamfered at 15 to receive the ends of a cylindrical sheet metal casing 16, which surrounds the body portion of the heater. The caps 13 are lined with magnesia 17, or other suitable heat insulating material, held therein by metallic disks 18, which bear against the ends of a lining 19 of similar material inside the casing 16. Brass nipples 20 are connected to the pipe 8 just within the end caps 13, and are connected by suitable brass fittings to the opposite ends of a coiled copper pipe 21, and serve to support the same within the casing. The heating element comprises a resistance coil 23 wound about a double sleeve of insulating material 22 which surrounds the pipe 8, and extends substantially from one of the nipples 20 to the other. For supplying current to the coil 23, binding posts 24 and 25 are secured to one of the metallic disks 18, from which they are insulated in the usual manner. The post 24 is connected to the coil 23, near its middle, by a conductor wire 26. The other conductor wire 27 leads from the post 25, and has two branches 28 and 29 connected respectively to opposite ends of the coil 23. The conductors are suitably encased in insulating tubes 30. It will be seen, therefore, that the coil 23 is in effect composed of two sections electrically parallel, the current coming in through the wire 27 and branches 28 and 29, and through the two sections of the coil 23 to the return wire 26. The heating coil is connected to the line wires of the circuit by connecting wires 31 which pass through an insulating bushing 32 to the binding posts 24 and 25, respectively.

If it is desired to arrange the heater so that different degrees of heat may be obtained, it may be wired as illustrated in Figure 4. In this case, the middle point of the coil 23 is connected by a wire 34 to the contact point 35. One end of the coil 23 is connected by a wire 36 to a contact point 38, and the other end of the coil is connected by a wire 37 to a third contact point 39. The line wires 40 are connected respectively to the contact point 38 and a fourth contact point 41. When the highest degree of heat is desired, the point 41 is connected by a suitable switch to the point 35, as indicated in dotted lines at 42, and the point 39 is similarly connected to the point 38, as indicated at 43. The two sections of the coil 23 are then electrically parallel, and the maximum amount of current passes therethrough. If a medium degree of heat is required, the connection between the points 38 and 39 is broken, so that the current passes through one section only of the coil. If the lowest degree of heat is required, the points 41 and 39 only are connected, so that

both sections of the coil are in series, and the minimum amount of current passes therethrough.

From the foregoing description, it will be seen that the heater is of substantial construction, and so arranged that it may be connected either end up to the pipes leading to the tank, and may be installed in any convenient location. The control switch may be located either near the heater or at a more distant point. The resistance coil is completely enclosed within heat insulating walls so that the heater may be operated with the utmost economy. The heater may be easily installed, or easily disassembled when repairs are necessary.

While I have shown and described in detail the preferred embodiment of the invention, it is apparent that various modifications may be made therein without any material departure from the salient features thereof, and it is my purpose, therefore, to include all such modifications within the scope of the appended claims.

What is claimed is:

1. In an electric water heater, the combination of a cylindrical casing member, a central pipe section extending longitudinally through the casing member, end caps mounted on the end portions of the pipe section and adjustable longitudinally thereof, the rims of said caps being chamfered to receive the ends of the cylindrical casing member and to support the same, a pipe coil within the casing and connected to said central pipe section near the ends thereof, and an electric heating element within the pipe coil and surrounding the central pipe section, the ends of said central pipe section projecting beyond the ends of the casing, so that after the heater has been completely assembled, the ends of said pipe section may be connected to pipe sections leading to a tank containing water to be heated.

2. In an electric water heater, the combination of a cylindrical casing member, a central pipe section extending longitudinally through the casing member, end caps mounted on the end portions of the pipe section and adjustable longitudinally thereof into supporting relation to the cylindrical casing member and forming closures for the ends thereof, two nipples connected to the central pipe section within the casing and near the respective end caps, a pipe coil within the casing and connected to said nipples, an insulating sleeve surrounding the central pipe section and extending substantially from one nipple to the other, and an electric heating element wound about said sleeve within the pipe coil.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature.

WILLIAM WILSON WAINWRIGHT.