Sept. 15, 1925. 1,553,491

A. M. WERNER

ELECTRICAL WATER HEATER

Filed Aug. 21, 1922

Fig. 1

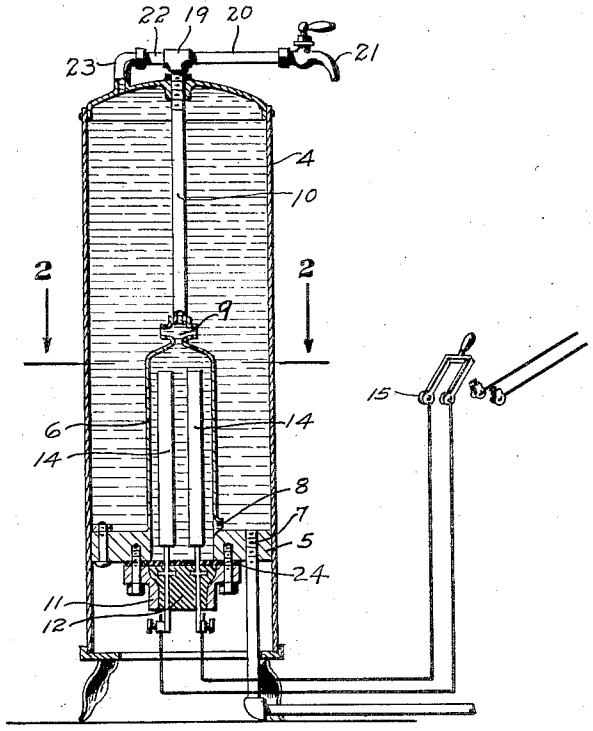


Fig. 3.

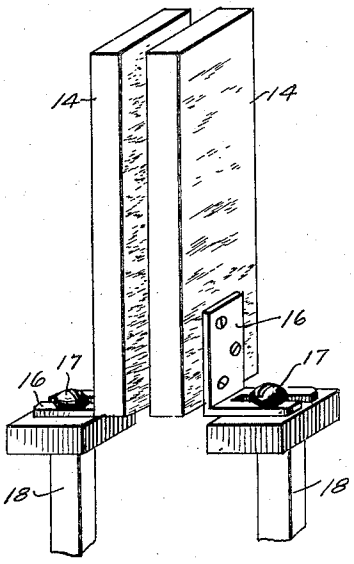
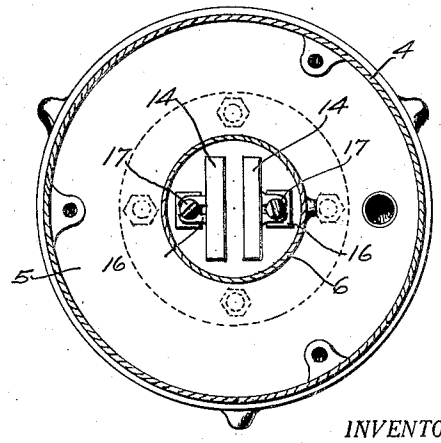


Fig. 2.



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UNITED STATES PATENT OFFICE.

ARTHUR MAX WERNER, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO WERNER ELECTRIC HEATER COMPANY, A CORPORATION OF DELAWARE.

ELECTRICAL WATER HEATER.

Application filed August 21, 1922. Serial No. 583,186.

To all whom it may concern:

Be it known that I, ARTHUR MAX WERNER, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles, State of California, have invented new and useful Improvements in Electrical Water Heaters, of which the following is a specification.

This invention relates to an electrical water heater adapted for withdrawal of heated water at frequent intervals, which will act as an instantaneous heater, and will also store comparatively large quantities of hot water ready for withdrawal.

It is the primary object of this invention to provide a heater of the character described which will supply hot water from a storage chamber until the storage hot water is exhausted, then will supply water from the instantaneous chamber; and, when withdrawal is stopped the instantanous chamber will supply hot water to the storage chamber. The invention consists in a novel instantaneous heater so connected in a storage tank as to provide a circulation of water to accomplish the results above set forth.

These objects, together with other objects and corresponding accomplishments, are obtained by means of the embodiment of my invention illustrated in the accompanying drawing in which:

Fig. 1 is a vertical section through the heater; Fig. 2 is an enlarged section as seen on the line 2—2 of of Fig. 1, but having adjustable electrodes; and Fig. 3 is a perspective view of the adjustable electrodes.

Referring more particularly to the drawing, the storage tank for holding the heated water is indicated by 4. It is provided with a bottom 5, having the heater casing 6 preferably formed integral therewith forming an instantaneous heating chamber. Extending through the bottom is a cold water inlet 7. The instantaneous chamber is cylindrical in form and has an outlet 8 at the bottom thereof. The top is formed with a four-way connection 9, one leg thereof communicating with the top of the heating chamber; the top leg being threaded to receive the pipe 10, and the other leg communicating with the storage tank.

A head 11 for the heating chamber is hollow and has bolts securing it to the bottom 5. A suitable gasket 24 may be inserted between the head and bottom to form a water tight joint. The head is filled with vulcanized rubber 12, in which the electrical terminals may be embedded to form insulation.

Rectangular electrodes of carbon or other suitable material indicated by 14 are spaced apart so that water may fill the space between the conductors and serve as a conductor and resistance for the flow of the electric current. Terminals are connected to a source of electrical energy through the switch 15. If it is desired to make the distance between the electrodes adjustable so as to compensate for the different kinds of water and provide for efficient current consumption, then the structure shown in Figs. 2 and 3 may be employed. Each electrode 14 has a foot 16 secured thereto and between the toes thereof is a screw 17 for adjustably fixing the electrode upon the terminal 18. It is obvious that by this structure the gap between the electrodes may be varied.

Secured to the top of the tank and in communication with the pipe 10, is a fitting 19 having three ways. Connected to one of the ways is a pipe 20 which leads to the house system, and, for convenience in illustration a single faucet 21 is shown attached to the pipe 20. The other way is connected by a section of pipe 22 to the outlet 23 communicating with the top of the tank.

When the switch 15 is closed, electricity flows through a terminal into one electrode, through the water into the other electrode, and through the other terminal to the other side of the line. Completing the circuit permits a flow of electricity through the water which is heated due to its resistance. In order to prevent current passing between the electrodes and casing 6, which is preferably of metal, the latter may be enamled on the inside. Assume that no water is being drawn from the system. As soon as the water is heated, it rises to the top of the tank and is replaced by cooler water which circulates downwardly. The circulation path is through the inlet 8 in the heater chamber around the electrodes, into the tank through the member 9. The water then passes upwardly to the top so long as the faucet 21 or house line is closed. Water can be withdrawn as soon as heated through the faucet 21, as the heated water rises to the top and will pass out as from the storage space in the tank through the outlet 23.

If the tank does not contain a sufficient amount of stored hot water, closing of the switch 15 and opening of the faucet 21 will cause the action to be that of an instantaneous heater. Cold water flows into the tank through inlet 7, into the heater chamber through inlet 8, between the electrodes, through the pipe 10 to the pipe 20. Thus, water is drawn around the heating elements. When the tank is full of hot water and faucet 21 is opened, there will be a withdrawal of water from the heater chamber as well as the storage space.

What I claim is:

1. A device of the class described comprising a storage tank having a hot water outlet at the top communicating with a house system and a cold water inlet at the bottom, a heater casing within said tank, an outlet at the top of said heater casing, a tube directly connecting said casing with said house system, said tube communicating directly with the upper part of said tank, said casing being in open communication with said tank at the top and bottom to permit circulation of water, and a heater within said casing.

2. A device of the class described comprising a storage tank having a hot water outlet at the top and a cold water inlet at the bottom, a heater casing within said tank having an outlet at the top communicating with said tank, and a cold water inlet at the bottom communicating with said tank, a junction fitting connected to the house system, an outlet pipe connecting said heater casing and said fitting, an outlet pipe connecting the top of said tank and said fitting, and a heater within said casing.

In witness that I claim the foregoing I have hereunto subscribed my name this 12th day of August, 1922.

ARTHUR MAX WERNER.