No. 867,863. PATENTED OCT. 8, 1907.

M. W. WILLSON.

ELECTRIC WATER HEATER.

APPLICATION FILED DEC. 26, 1906.

FIG. 1.

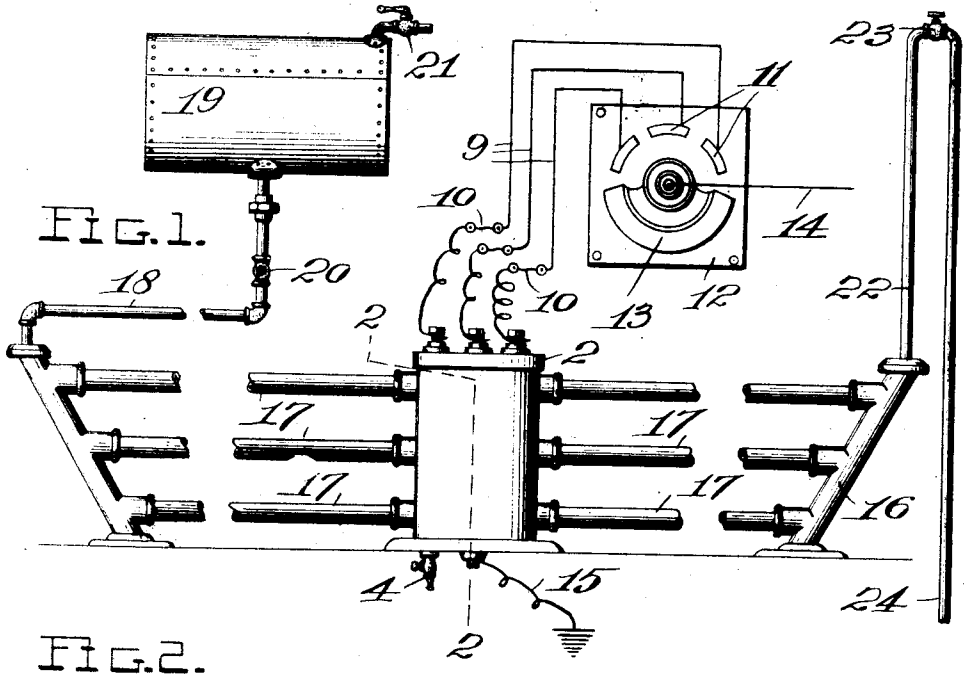


FIG. 2.

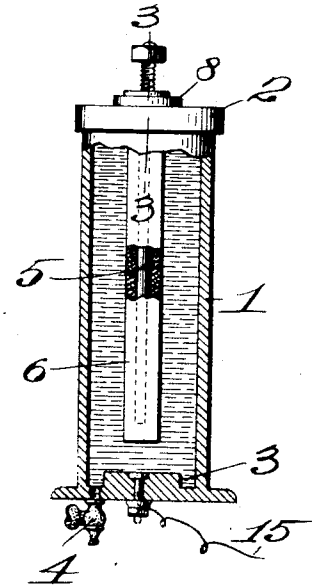
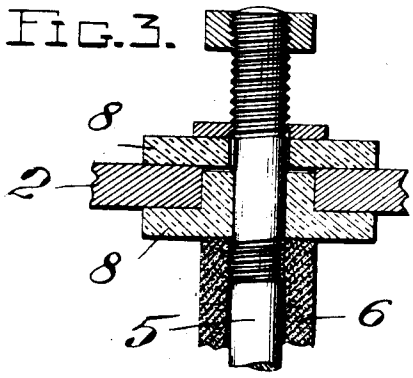


FIG. 3.



ATTEST.

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UNITED STATES PATENT OFFICE.

MENDAL W. WILLSON, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-THIRD TO JAMES R. WALKER AND ONE-THIRD TO LEWIS P. LEATHERS, OF ST. LOUIS, MISSOURI.

ELECTRIC WATER-HEATER.

No. 867,863. Specification of Letters Patent. Patented Oct. 8, 1907.

Application filed December 26, 1906. Serial No. 349,408.

To all whom it may concern:

Be it known that I, MENDAL W. WILLSON, a citizen of the United States, and a resident of St. Louis, Missouri, have invented certain new and useful Improvements in Electric Water-Heaters, of which the following is a specification, containing a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to an electric water heater, and the object of my invention is to provide a simple apparatus particularly adapted for use on steam and electric railways, for economically and quickly heating water which is circulated through pipes for the purpose of heating the interior of cars.

My improved apparatus is also adapted for use as a water heater in dwellings, stores, or any place desired where an electric current of sufficient voltage is obtainable.

To the above purposes, my invention consists in certain novel features of construction and arrangement of parts, which will be hereinafter more fully set forth, pointed out in the claims, and illustrated in the accompanying drawings, in which:—

Figure 1 is an elevation of a heater of my improved construction, the water and electrical connections being shown in diagram; Fig. 2 is an enlarged vertical section taken approximately on the line 2—2 of Fig. 1; Fig. 3 is an enlarged vertical section taken on the line 3—3 of Fig. 2.

My improved heating apparatus as shown comprises a heating tank 1, in which the electrodes are suspended, which tank 1 is provided with a top 2, and formed in the bottom of said tank around the edge thereof is a groove 3, which is for the purpose of receiving any sediment contained in the water, and which sediment may be drawn off through a suitable outlet valve 4 located in the bottom of said tank.

The electrodes used for heating the water in the tank 1 comprise metal bars 5, incased in tubes 6, of carbon, or analogous material, and the upper ends of said electrodes extend through openings 7 formed in the top 2 of the tank, there being washers 8, of glass, or porcelain, arranged around the electrodes to insulate them from said top 2. Any number of these electrodes may be made use of, corresponding of course to the capacity of the tank in which they are positioned, and said electrodes are preferably arranged at equal distances apart, in order that each individual electrode may be surrounded by a corresponding area of water, as it has been demonstrated in practice that this arrangement produces the best results in heating.

Connected to the upper ends of the electrodes are conductors 9, in which are located suitable fuses 10, said conductors leading to the contact points 11 of a switch 12, and leading to the movable member 13 of said switch is a conductor 14 which carries the current from a suitable generator. The current after passing through the water contained in the tank 1 passes to the ground through a suitable conductor 15 leading from the bottom of the tank 1. Located a suitable distance from the tank 1, on opposite sides thereof, are tubular posts 16, and connecting the same with the tank 1 are the horizontally disposed circulating tubes 17.

The posts 16 are preferably inclined in order that the water will more readily tend to circulate through said posts, and the tubes 17, upon the first application of heat in the tank 1. Connected to the upper end of one of the posts 16 is a tube 18, which leads to a reservoir 19, there being a valve 20 located in said tube 18, and said reservoir being provided with a tubular connection in which is located a valve 21 by means of which said reservoir is filled.

Connected to the upper end of the opposite post 16 is a vertically disposed pipe 22, which extends to a point above the top of the reservoir 19, and said pipe being there provided with a valve 23, and leading downwardly therefrom is a pipe 24. This pipe 22 provides means for accommodating the expansion of the water in the apparatus, when said water is heated.

When the apparatus is in operation, and the movable member 13 of the switch is turned so as to engage the contact plates 11, the current from the generator passes through the conductor 14, and from thence through the conductors 9 to the electrodes, which are suspended in the water within the tank 1, and said electrodes becoming heated, very quickly heat the water in the tank and a circulation of the water is established through the tube 17 and tubular posts 16. The current leaving the electrodes and passing through the water in the tank 1 passes to the ground through the conductor 15.

A number of the electrodes are provided in order that a varying degree of heat may be obtained on the interior of the tank 1 by cutting in or out the current to the various electrodes by means of the switch, and in this manner the degree of heat can be varied as desired.

The tubes 17 may be extended in any direction from the tank 1, as desired, and the entire apparatus, when installed in a car or room, occupies very little space and provides simple, inexpensive, and efficient means for generating and distributing heat.

I claim:—

1. In an electric water heater, an electrode, comprising a metal rod, and a jacket of carbon detachably fixed on said rod.

2. In an electric water heater, the combination with a tank, of an electrode extending into said tank, which electrode comprises a metallic rod, a carbon jacket detachably fixed upon and inclosing the greater portion of the rod, and insulator blocks arranged between the rod and the body of the tank.

3. In an electric water heater, the combination with a

tank, there being a groove formed in the bottom of the tank adjacent the wall thereof, and a series of electrodes projecting into said tank.

4. An electric water heater, constructed with a tank, there being a groove formed in the bottom thereof, adjacent the wall, a plurality of circulation tubes connected to the tank and extending in opposite directions therefrom, inclined hollow posts connecting the outer ends of each series of circulation tubes, a reservoir connected to the tubes for maintaining a reserve supply of water, means whereby an electric current is delivered to the electrodes, and means whereby said electric current is delivered to any number of said electrodes.

In testimony whereof, I have signed my name to this specification, in presence of two subscribing witnesses.

MENDAL W. WILLSON.

Witnesses:
M. P. SMITH,
E. L. WALLACE.