No. 853,892. PATENTED MAY 14, 1907.

E. C. MILES.

ELECTRIC WATER HEATER.

APPLICATION FILED FEB. 11, 1907.

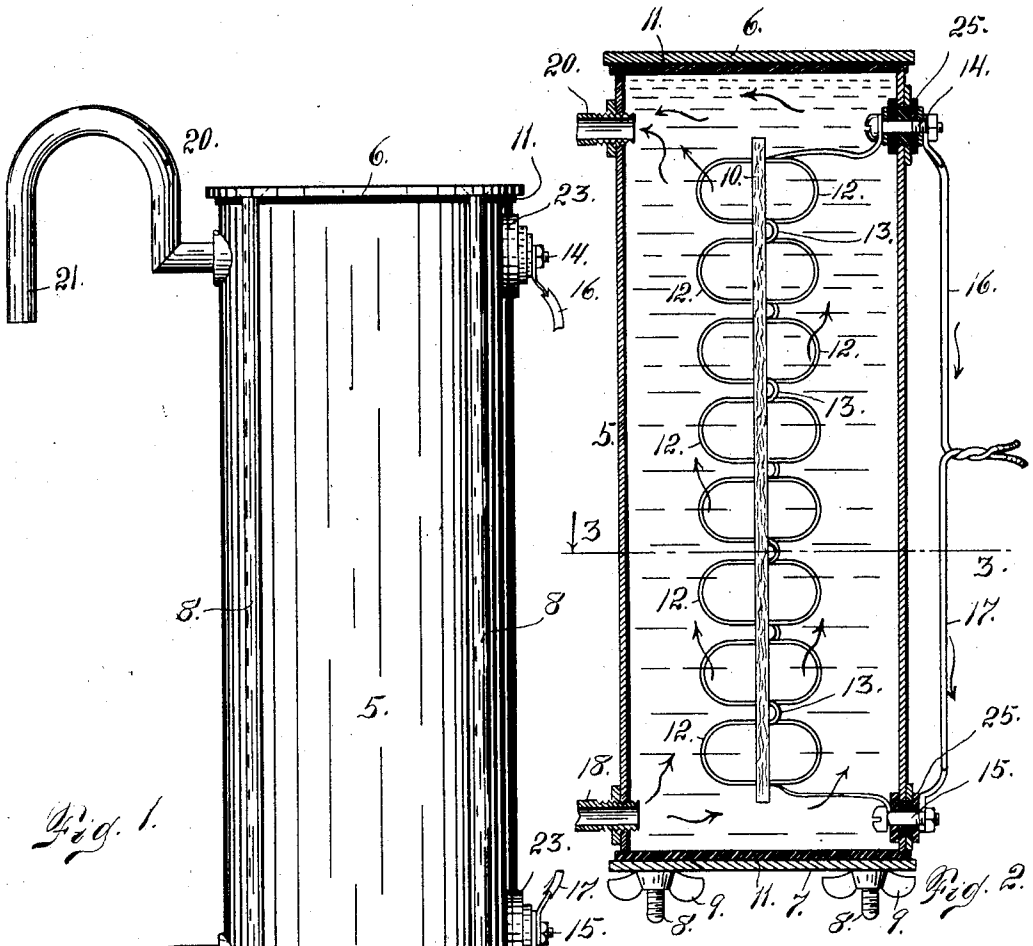

Fig. 1.

Fig. 2.

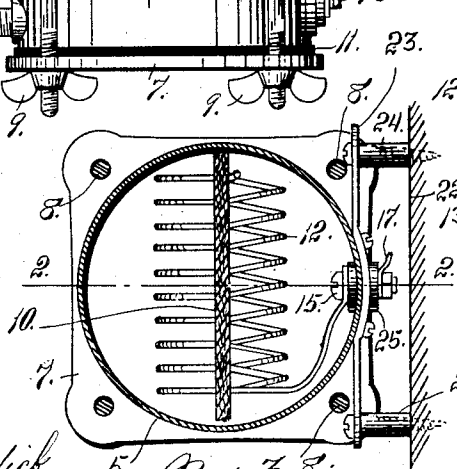

Fig. 3.

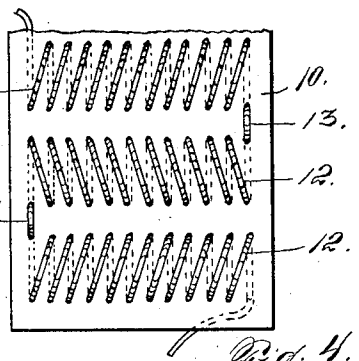

Fig. 4.

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UNITED STATES PATENT OFFICE.

EDWARD C. MILES, OF DENVER, COLORADO.

ELECTRIC WATER-HEATER.

No. 853,892. Specification of Letters Patent. Patented May 14, 1907.

Application filed February 11, 1907. Serial No. 356,747.

To all whom it may concern:

Be it known that I, EDWARD C. MILES, a citizen of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Electric Water-Heaters; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in apparatus more especially intended for heating water.

It is well adapted for use in heating hot water in residences as other places where hot water is required.

It may also be employed for drying fruit, ore or other articles wherever heat is required.

It may also be employed for the generation of steam.

My object is to provide a device of this character which shall be exceedingly simple in construction, and very economical in use.

It is well adapted for domestic use for heating water for the bath and other purposes from the fact that its action is exceedingly quick, while the consumption of electricity is small as compared with the quantity of water heated.

Generally speaking the device consists of a reservoir in which is inserted a vertically disposed diaphragm forming a support for coils or loops of resistance wire preferably what is known as climax German silver wire, the various loops being connected in series. The diaphragm is composed of insulating material and should also be non-combustible at ordinary temperatures such as asbestos fiber board. The reservoir preferably occupies an upright position, the water being introduced in the bottom and drawn off at the top. One extremity of the resistance wire is connected with a binding post at the top of the reservoir and the other extremity with a binding post at the bottom, the binding post being also connected by conductors with a suitable source of electricity (not shown).

Having briefly outlined my improved construction, I will proceed to describe the same in detail reference being made to the accompanying drawing in which is illustrated an embodiment thereof.

In this drawing, Figure 1 is a side elevation of the device. Fig. 2 is a vertical longitudinal section taken on the line 2—2 Fig. 3. Fig. 3 is a cross section taken on the line 3—3 Fig. 2. Fig. 4 is a fragmentary side elevation of the diaphragm provided with resistance coils.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate an upright casing preferably cylindrical in form and provided with top and bottom plates designated 6 and 7 respectively, the said plates being connected with the body of the casing 5 by tie rods 8 passing through openings formed in both plates and secured by thumb nuts 9. These tie rods are located outside of the casing, the plates 6 and 7 being of sufficient size for the purpose (see Fig. 3). Between each extremity of the casing and the adjacent plate, is located a rubber disk or washer 11 forming a perfectly tight joint when the thumb nuts are screwed upon the threaded extremities of the tie rods with sufficient force for the purpose. Within this casing is tightly fitted a vertically disposed diaphragm 10 preferably composed of asbestos fiber board. It is of substantially the same width as the diameter of the casing 5 on the inside and this is secured by forcing it into the casing, its edges engaging the opposite sides of the casing and supporting it in place. This diaphragm is somewhat shorter than the length of the casing leaving a space both at the top and bottom for the circulation of water between the two compartments.

The diaphragm forms a support or holder for a series of coils or loops 12 preferably formed of what is known as climax German silver wire. Any suitable resistance wire, however, may be employed. These coils or series of loops are connected in series by the intervening parts 13. In other words all of the series of loops are formed from one continuous piece of wire. One extremity of this wire is connected with a binding post 14 at the top, while the other extremity is connected with a binding post 15 at the bottom. From these binding posts lead conductors 16 and 17 to a source of electricity (not shown).

Connected with the lower extremity of the casing is an inlet pipe 18 provided with a

valve 19. This pipe may be connected with a water supply conduit of a suitable water system. The upper extremity of the casing is provided with an outlet pipe 20 which has a downwardly extending extremity 21 for convenience of drawing water from the heater.

To facilitate the securing of the casing to a suitable wall or support 22, the casing is provided with top and bottom securing plates designated 23 which are substantially alike and have openings in their opposite extremities to receive fastening devices 24 (see Fig. 3).

The binding posts are of course insulated from the casing by insulating material designated 25. This casing may be composed of metal or any other suitable material, but it is found in practice that the electric current is not carried from the coils through the water to the casing, neither does the current charge the water.

It is evident from the arrangement of the coils of wire, the diaphragm 10 being comparatively thin, that the said coils are open for the free circulation of the water entirely around the wire, thus giving an extensive wire heating surface as compared with coils which are wound around a core whereby the wire is concealed from the water on one side.

When the device is in use and the conductors 16 and 17 are connected with a suitable source of electricity, it is only necessary to turn water into the casing and turn on the current. Within a very short time say less than a minute after the current is turned on, hot water may be drawn off through the outlet pipe 20.

As shown in the drawing the wire forming the coils 12 is passed transversely through openings formed in the diaphragm which thereby gives a support to the coils without other fastening means.

Having thus described my invention, what I claim is:

1. An electric water heater comprising a casing, an insulating diaphragm inserted in the casing, and a series of coils mounted on the diaphragm, the said coils being connected in series, and a source of electricity with which the coils are connected, the reservoir being provided with inlet and outlet conduits, substantially as described.

2. An electric water heater, comprising a vertically disposed casing, a diaphragm vertically disposed in said casing and dividing the same into two compartments, the said compartments being in communication both at the top and bottom, and a series of resistance coils mounted on the diaphragm and extending on both sides of the latter, and a suitable source of electricity with which the coils are connected in series.

3. An electric heater comprising a vertically disposed casing, top and bottom plates engaging the casing, tie rods for connecting the said plates with the casing, said rods being located on the outside of the casing, and means interposed between the two plates for forming water tight joints at the ends of the casing, a diaphragm inserted in the casing and supported therein by the friction between its edges and the opposite side walls of the casing, and coils mounted on the said diaphragm, and a suitable source of electricity with which the coils are connected in series, substantially as described.

4. An electric heater, the combination of a casing, means for securing the casing to a suitable support, a diaphragm inserted in the casing and composed of insulating material, said diaphragm being of less length than the casing whereby the two compartments are in communication both at the top and bottom, resistance coils mounted on the diaphragm, and a suitable source of electricity with which the resistance coils are connected in series, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD C. MILES.

Witnesses:
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