

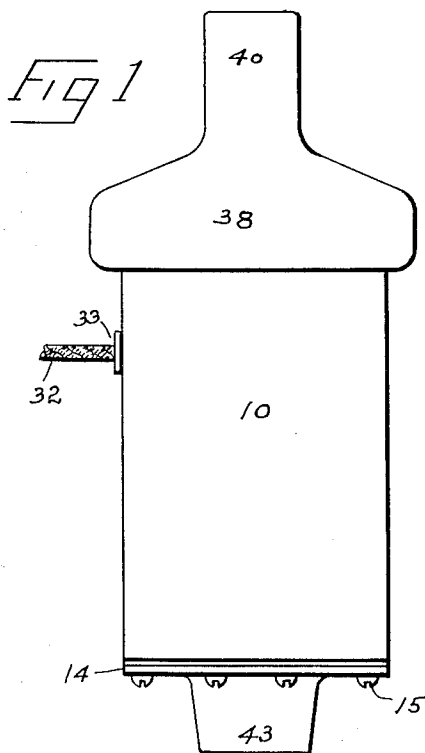
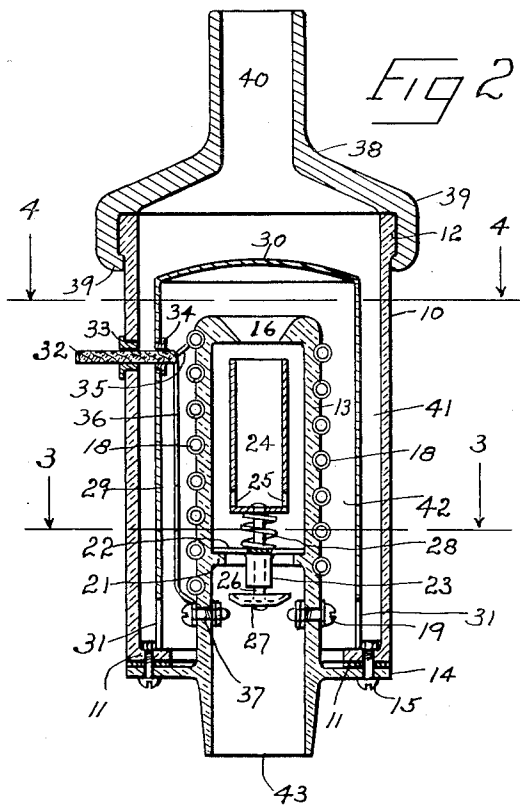
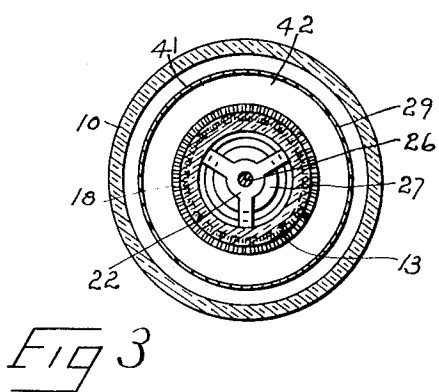
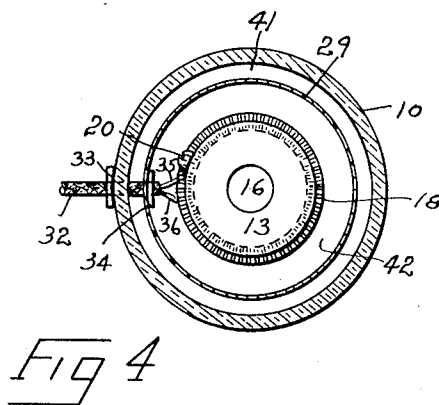
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INSTANTANEOUS ELECTRIC WATER HEATER WITH AUTOMATIC SWITCH

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INSTANTANEOUS ELECTRIC WATER
HEATER WITH AUTOMATIC SWITCH

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4 Claims. (Cl. 219—39)

The invention relates to electric water heaters of the type in which the water is heated as it passes through the device. It has for its main object to provide a device in which the flow of water will actuate a switch mechanism and close an electric circuit when the water is turned on and break the circuit when the water is turned off; thus eliminating all danger of over-heating the resistance element and causing it to burn out.

Another object is to so construct the device that no current can be caused to flow through its resistance element except when water is flowing through the heater. A further object is to provide an instantaneous heater which will impart the maximum amount of heat to the water for the amount of current consumed.

A still further object is to provide a heater of simple and inexpensive construction, and which may be either of the removable or of the stationary type, and which, when of the removable type may be attached in an instant to the faucet or outlet on which it is to be used. An additional object is to provide a heater which can be readily disassembled for cleaning or repairing.

These and various other objects and advantages will be readily understood from the following description and from the accompanying drawing of a preferred embodiment of the invention in which, however, modifications may be made without departing from the scope of the appended claims. In the drawing

Fig. 1 is a side elevation of the preferred embodiment,

Fig. 2 a cross-sectional side elevation of same,

Fig. 3 a cross-sectional top view taken on line 3—3 on Fig. 2, and

Fig. 4 a cross-sectional top view taken on line 4—4 on Fig. 2.

Referring now to all the views, simultaneously, the heater consists of a casing 10 which is preferably made of insulating and heat resisting material, such as for example porcelain. An inwardly extending flange 11 is provided at the bottom of the casing, and an outwardly extending collar 12 is provided at its upper end. A tubular core 13 is moulded with a flange 14 which is secured to the casing flange by a plurality of bolts 15. The core is provided with a conical-shaped opening 16 at its upper end and a helical groove on its periphery in which a coil-wound resistance element 18 is secured by means of screws 19 and 20. The lower end of the heating element is secured under the head of screw 19 and the upper end under the head of screw 20. The location of this last-mentioned screw is shown in Fig. 4. While

I prefer to employ a resistance element of the type just described, other elements may be employed.

The core, which is made of refractory material, is also provided with an internal shoulder 21 on which a spider-shaped member 22 is supported. This member is made with a relatively long, vertical bearing 23. A cylinder 24, which is open at its upper end and provided with a plurality of small openings 25 at its lower end, is mounted on a vertical rod 26 which is free to slide in the bearing 23. A circular metal disc 27 is riveted on the lower end of the rod 26, and a compression spring 28 is wound on the rod between the member 22 and the bottom of the cylinder 24. This spring tends to hold the cylinder in its upper position.

An inverted cylinder 29, having a domed roof 30 and a plurality of openings 31 at its lower end, is inserted in the casing so as to cover the core 13. An electric wire 32 is passed through bushings 33 and 34 inserted in the casing and the cylinder 29, respectively, and one of the conductors 35 contained in this wire is attached under the head of the screw 20, while the other conductor 36 is secured under the head of a screw 37 which is attached on the core.

When the heater is to be attached to a faucet or the like, I prefer to employ a cap such as shown at 38, so that the device may be readily attached or detached. This cap is preferably made of rubber and has a bead 39 which fits under the collar 12 on the casing, and a tube 40 which will fit the end of the nozzle.

The device works in the following manner: the hose 40 is attached to a faucet and the wire 32 to a source of electric current. As the faucet is turned on the water will flow through the cap 38 and, being interrupted by the domed-roof 30, through the space 41 formed between the cylinder 29 and the casing. From this passage the water flows through the opening 31 and raises in the space 42 formed between the cylinder 29 and the core 13. The water, as it rises above the top of the core, flows through the conical opening 16 and fills the cylinder 24. The weight of the water depresses the cylinder 24 until it is restrained by the disc 27 contacting with the ends of the screws 19 and 37.

While a small amount of water will flow through the openings 25 in the cylinder, there will always, while the faucet is turned on, be sufficient water in the cylinder to cause it to stay in its lower position. After the cylinder 24 is filled the water will flow through the central opening in the core and out through its

lower end 43. When the disc 27 contacts with the screws 19 and 37, the electric current is closed. The current then flows through conductors 36, screw 37, disc 27, screw 19, heating element 18, screw 20 and conductor 35, or vice versa. The water is heated, as it rises in the passage 42, by coming in contact with the heating element.

As soon as the faucet is closed and the water ceases to flow, the water in the cylinder 24 empties out through the openings 25, and the spring 28 lifts the cylinder and breaks the current by disconnecting the disc 27 from the screws 19 and 37. However, sufficient water is left in the passages 41 and 42 to keep the heating element immersed, thus eliminating any danger of its burning out by being exposed to the air, while hot.

From the foregoing it will be seen that the present invention overcomes one of the main defects in heaters of the type described, namely, that of the element burning out by being exposed to the air while the current is passing through it. It will also be seen that the means used for obtaining this result are simple in construction and completely automatic in operation. It is evident that while I have shown and described a device suitable for use on a faucet, the device, with a few minor changes, may be permanently installed in a water system.

Having described my invention and its advantages, what I claim as new and wish to protect by Letters Patent is:

1. In an electric water heater of the class described, a casing, a water inlet and a water outlet, a heating element located within said casing for heating the water passing through it, a receptacle located within said casing for intercepting a part of the water passing through the device, a switch for closing and breaking the current flowing through the heating element, said switch actuated by the weight of the water in said receptacle, self-emptying means associated with said receptacle, and means for retaining a sufficient quantity of water in the device at all times to keep the heating element immersed therein.

2. In an electric water heater of the class described, a casing, a water inlet, descending and ascending water passages formed within said casing, a tubular water-outlet member, a resistance element attached on said tubular member, a receptacle for intercepting a part of the water passing through the device located within said tubular member, a switch for closing and breaking the current passing through the resistance element, said switch actuated by the weight of the water in said receptacle, and automatic means for draining all the water from said receptacle when the current in the resistance element is broken.

3. In an electric water heater of the class described, a casing, a water inlet, descending and ascending water passages formed within said casing, a tubular water-outlet member, a resistance element attached on said tubular member, a receptacle for intercepting a part of the water passing through the device located within said tubular member, a switch for closing and breaking the current passing through the resistance element, said switch actuated by the weight of the water in said receptacle, automatic means for draining all the water from said receptacle when the current in the resistance element is broken, and means for attaching the device to a faucet.

4. In an electric water heater of the class described, a casing, a water inlet, descending and ascending water passages formed within said casing, a tubular water-outlet member, a resistance element attached on said tubular member, a receptacle for intercepting a part of the water passing through the device located within said tubular member, a switch for closing and breaking the current passing through the resistance element, said switch actuated by the weight of the water in said receptacle, automatic means for draining all the water from said receptacle when the current in the resistance element is broken, and means for permanently installing the heater in a water system.

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