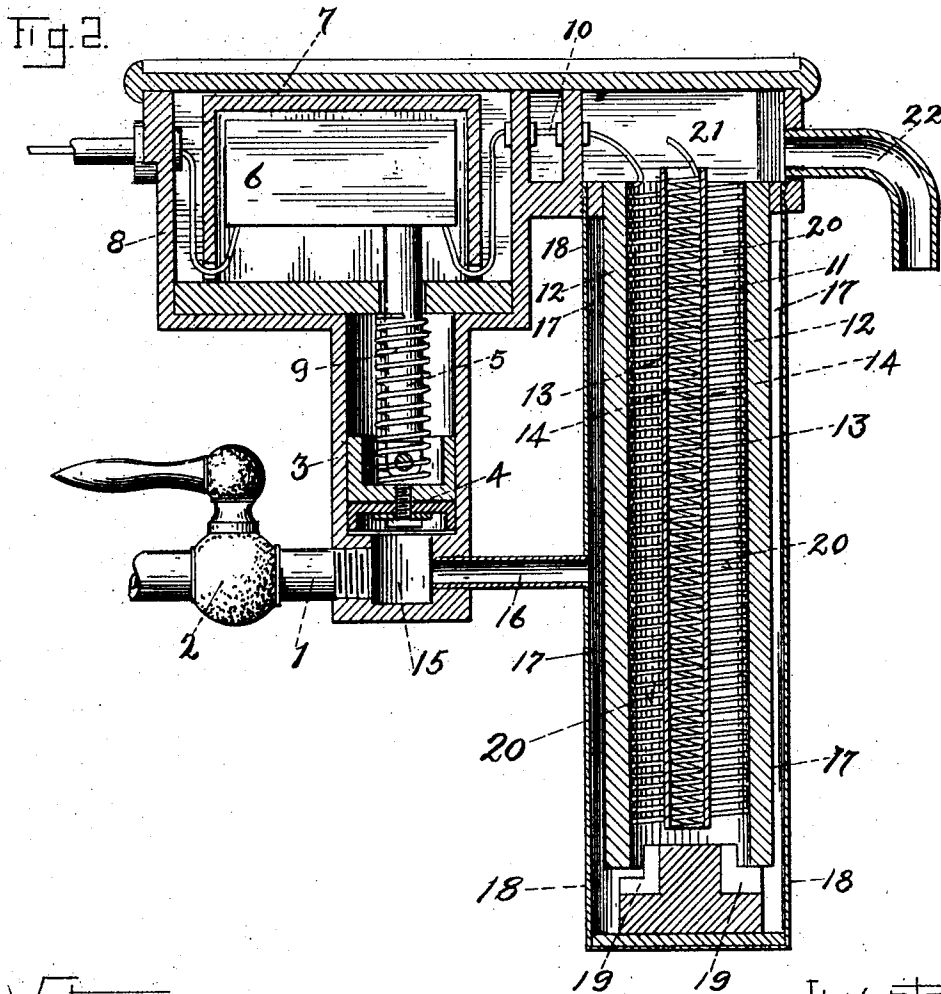
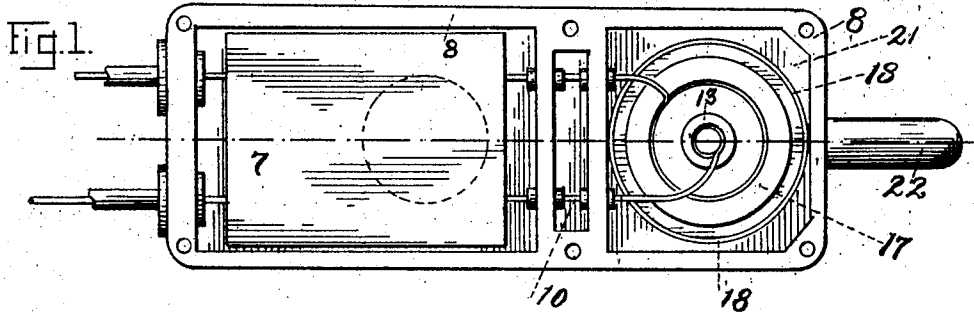


L. MILES.
 AUTOMATIC ELECTRIC WATER HEATER.
 APPLICATION FILED JAN. 29, 1912.

1,057,760.

Patented Apr. 1, 1913



Witnesses
 Arthur L. Slee
 Fred H. Smithson

Inventor
 Lewis Miles.

UNITED STATES PATENT OFFICE.

LEWIS MILES, OF SAN FRANCISCO, CALIFORNIA.

AUTOMATIC ELECTRIC WATER-HEATER.

1,057,760.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed January 29, 1912. Serial No. 674,108.

To all whom it may concern:

Be it known that I, LEWIS MILES, a citizen of the United States, residing in the city of San Francisco, in the county of San Francisco and State of California, have invented a new and useful Automatic Electric Water-Heater, of which the following is a specification.

My invention relates to a device for heating water by bringing it in heat absorbing relation to an electrical resistance medium, which is automatically subjected to the heating current by the flow of the water to be heated.

One object of my invention is to provide a device of this class in which an electric circuit closer is indirectly subjected to the rise and fall of the water pressure for opening and closing the circuit, so that a standard switch may be employed without subjecting the switch to the deteriorating influence of the water.

Another object is to subject the resistance medium to direct contact with the water under conditions which will keep the resistance conductor at all times submerged and, therefore, protected against fusing, so that the current can be utilized under more economical conditions.

Other objects of my invention relate to the production of a simple, cheap and reliable means for realizing the objects above mentioned.

These several objects are attained by a mechanism embodying the principles of construction and relations of parts disclosed in the accompanying drawing, in which—

Figure 1 is a plan view of the automatic electric water heater with the cover plate removed; and Fig. 2 is a vertical section on the line 2--2 of Fig. 1.

1 represents a water supply pipe having a controlling cock 2 and to the discharge end of which the automatically controlled electric heater is applied. In the embodiment selected for illustration, this consists of a cylinder 3 attached to and receiving the water supply from the pipe 1 and containing a piston 4 whose rod 5 acts as a push bar to close a standard type of electric switch 6, which may be conveniently located in the housing 7. 8. A spring 9 surrounding the piston rod 5 imparts return movement to the piston 4 which opens the switch 6.

10 represents wires forming part of the electric circuit of two heating coils 11 and

14, which are arranged within an insulating tube 12 and separated by a concentric insulating tube 13.

The cylinder 3 is provided with a lower pressure chamber 15, from which water flows by a restricted pipe 16 to an annular space 17 within the cylinder 18 containing the resistance coils, and within which the outer insulating tube 12 is supported in a manner to close the space 17 at top, so that the water entering said space has to flow downwardly through the passageways 19^a between the lower end of the insulating tube 12 and the spacing block 19 in order to gain access to the heating coils. Passing upwardly through the open-ended heating spaces 20 and 20^a, the water comes in direct contact with the greatly enlarged heating surfaces of the resistance coils 11 and 14, from which it escapes by the pressure behind it assisted by the increasing levity of the water, into the upper chamber 21, from which it flows through the spout 22. The water may gather some heat from the outer insulating tube 12, but it begins to collect its main heat units when it passes beneath the lower end of said tube and its temperature constantly increases until it reaches the top.

By having the water escape at top, the resistance coils are constantly submerged and are thereby prevented from fusing, so that coils of high resistance and great heating capacity can be safely employed.

When the cock 2 is opened, water entering the pressure chamber 15 will meet with sufficient resistance in escaping through the relatively smaller tube 16 to develop switch operating pressure beneath the piston 4, so that the latter will be forced upward to close the switch 6 and supply current to the coils 11 and 14. Being suitably protected, as for instance by the cup washer 4^a, the water cannot escape past the piston 4 to impair the switch 6. The water escaping through the pipe 16 is heated and delivered as already described. When the cock 2 is closed, the pressure in the chamber 15 is so far reduced as to permit the spring 19 to move the piston 4 downward and open the switch 6, thereby cutting off the current from the coils 11 and 14 and preventing the consumption of current when hot water is not needed.

I claim:—

1. In an electric water heater adapted to be connected to a water discharge pipe, a

110

suitably housed piston subjected to the pressure of water from said supply pipe but preventing the water passing the piston, a switch adapted to be closed by the said piston, means for opening the switch when pressure is relieved from the piston, means protecting the switch from the water which operates the piston, and a resistance body located in heating relation to water escaping from the piston housing and having a circuit controlled by said switch.

2. In an automatic electric heater, a water chamber adapted to receive water from a discharge pipe, a restricted outlet from said chamber adapted to develop pressure within the chamber, a suitably housed piston having its housing in communication with said water chamber whereby the piston is subjected to the water pressure, said piston being constructed to prevent the flow of water around it, a thrust switch adapted to be operated by said piston, means returning the switch and piston when the pressure is relieved, and a resistance coil in heating relation to water escaping through the restricted outlet from the chamber, said heating coil having a circuit controlled by said switch.

3. In an automatic electric water heater, the combination with a pressure chamber, a piston subjected to pressure of water introduced in said chamber, an electric switch controlled by said piston, and a resistance coil having a circuit controlled by said switch, said resistance coil having a housing constructed to receive and direct water from the pressure chamber through the resistance coil from the bottom of the resistance coil upward and said housing having a discharge outlet communicating with the upper end of the resistance coil housing, whereby the resistance coil is kept submerged.

4. In an automatic electric heater, the

combination with the water chamber, a piston subjected to pressure of water in said chamber, a switch controlled by said piston, a pair of open-ended concentric vertical heating chambers having an electrically non-conducting partition wall between them, resistance coils located in the respective chambers, a circuit for said coils controlled by the switch, a housing surrounding the heating chambers receiving water from the pressure chamber and delivering it to the bottom of the heating chambers, and a discharge outlet communicating with the top of the heating chambers.

5. In an automatic electric heater, the combination with the water chamber, a piston subjected to pressure of water in said chamber, a switch controlled by said piston, a pair of open-ended concentric vertical heating chambers having an electrically non-conducting partition wall between them, resistance coils located in the respective chambers, a circuit for said coils controlled by the switch, a housing surrounding the heating chambers receiving water from the pressure chamber and delivering it to the bottom of the heating chambers, and a discharge outlet communicating with the top of the heating chambers; the outer heating chamber having an outer wall spaced within the wall of the housing providing an annular water receiving space in communication with the pressure chamber, said water receiving space being closed at top and communicating with the heating chambers at bottom.

Dated and signed at the city and county of San Francisco, State of California, this twenty-fourth day of January, 1912.

LEWIS MILES.

Witnesses:

FRED H. SMITHSON,
WILLIAM ENGLIS.