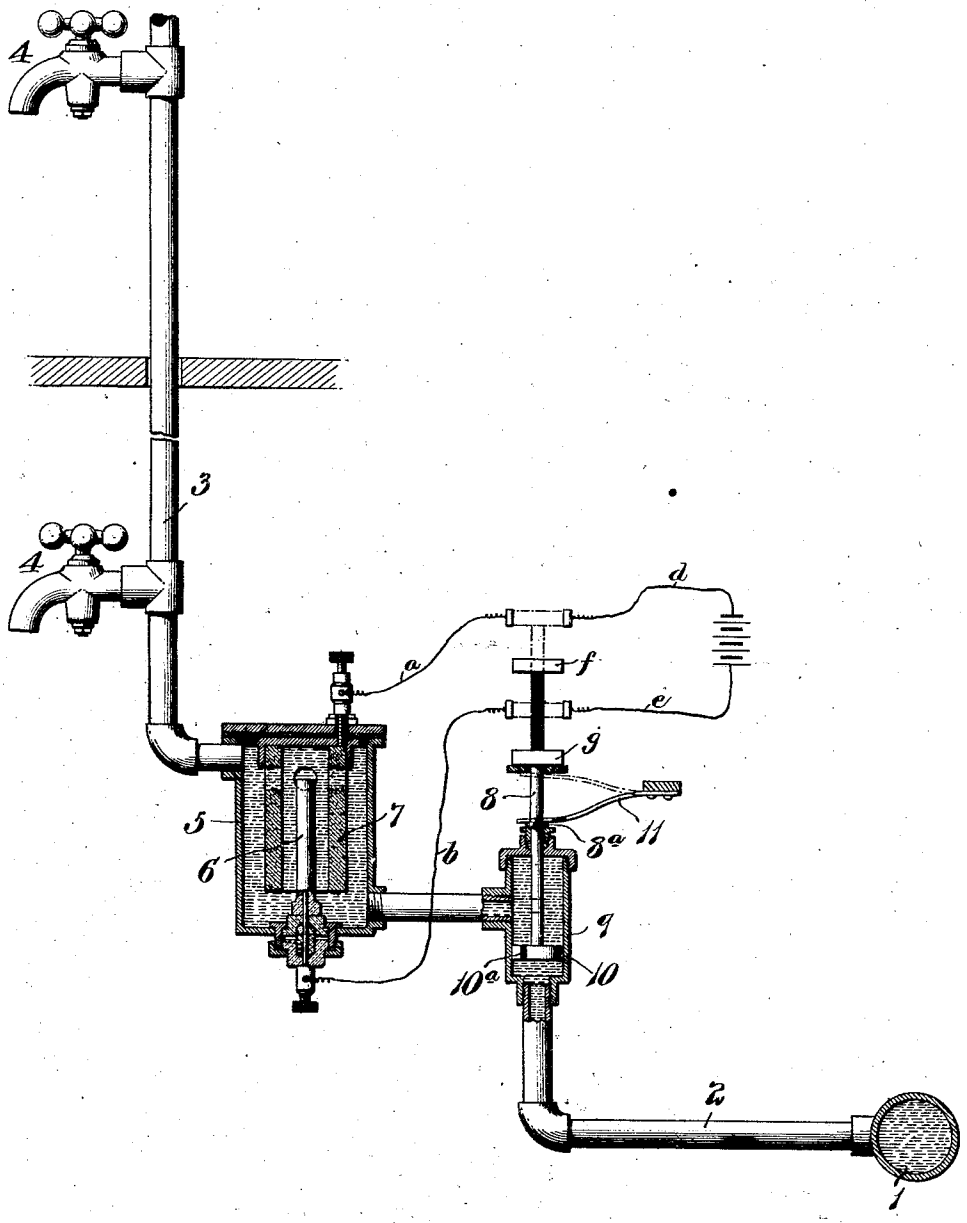
No. 895,638. PATENTED AUG. 11, 1908.

H. M. HILL.

WATER HEATING SYSTEM.

APPLICATION FILED MAY 13, 1907.



Witnesses:
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UNITED STATES PATENT OFFICE.

HARRY M. HILL, OF ST. LOUIS, MISSOURI, ASSIGNOR TO HILL ELECTRICAL MANUFACTURING COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

WATER-HEATING SYSTEM.

No. 895,638. Specification of Letters Patent. Patented Aug. 11, 1908.

Application filed May 13, 1907. Serial No. 373,405.

To all whom it may concern:

Be it known that I, HARRY M. HILL, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Water-Heating Systems, of which the following is a full, clear, and exact description, 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, forming part of this specification, in which—

Figure 1 is an elevational view, partly in section, of my improved water heating system.

This invention relates to a new and useful improvement in water heating systems, the object being to provide a heating medium, preferably an electric water heater, and also to provide improved means for automatically breaking the circuit to the heater when the heater is not in use.

Where water heaters of the character indicated are introduced in a pipe system it is desirable at times to locate the heater and its connections at selected points, say, for instance, in the basement of a building, where it is accessible but out of the way. It is also desirable to eliminate all wiring from the spigots or cocks through which water is drawn from the system, and it is of great advantage to provide a cut-out which will automatically break the circuit when the heater is not in use, said cut-out operating to cut in or complete the circuit through the heater when it is desired to obtain hot water from any of the spigots connected to the system.

It is usual, where buildings are piped for water, to have practically two branches to the system, one for cold water and the other for hot water. Various means may be provided for heating the water in the hot water pipes, a common means being a water back arranged in the fire box of a cooking stove or range. This water back will heat the water which is stored in a tank or reservoir in readiness for use. It frequently happens in warm weather that it is not convenient to keep the fire in the cooking range for any considerable period of time, and consequently as the supply of hot water is derived from the tank in the range it is obvious that when the range is not fired up there will be no hot water in the tank. Gas heaters have been employed to heat the water in the hot water pipes in the system just described, and my present invention contemplates the use of an electric water heater which is useful for the same purpose.

It will be seen from the above that it is possible to arrange in the existing hot water pipes of a building an electric water heater, it being only necessary to introduce said heater at some convenient point in said system.

In the drawings, 1 indicates a water supply pipe as, for instance, a main, from which leads a pipe 2 to the building. 3 is a distributing pipe from which lead the spigots 4, the pipe 3 being appropriately connected to the pipe 2.

5 is a shell or casing of an electric water heater, in which shell or casing are located the electrodes 6 and 7.

The type of water heater shown in the accompanying drawing is similar to that described and claimed in United States Letters Patent No. 788,905, granted to me May 2, 1905, and I therefore do not specifically claim the construction of this electric water heater in this application; nor do I wish to be understood as limiting my invention to the use of this particular electric water heater as there are other types of electric water heaters which could be used without in the least departing from the nature and spirit of my invention.

a and *b* are wires connecting the terminals of the heater electrodes with switch posts.

d and *e* are other wires leading from a suitable source of supply to companion switch posts.

8 is a rod carrying switch blades *f* and *g*, which blades are insulated from each other and which coöperate with the switch posts. The special construction of two-pole switch shown and described is not at all essential in carrying out my invention as a single-pole switch could be used. It will also be understood that there are various forms and types of switches capable of use in connection with my invention. The rod 8 referred to, which is the switch-operating rod, passes through a stuffing box arranged at one end of a shell or casing 9, in the lower end of which there is arranged a water inlet opening, and in the upper end of which is the water discharge opening. Between these two openings on the rod 8 is a piston head 10, said piston head being on the lower end of rod 8. The piston head 10 is preferably provided with a groove 10^a in its periphery constituting a

leakage port. Rod 8 is provided with a collar 8^a against which bears a spring 11, said spring tending at all times to force the piston head 10 between the inlet and discharge openings.

In operation, when any spigot 4 is opened for the purpose of drawing water from the pipe 3, the pressure in the water main forces the piston head 10 upwardly, which causes the switch-operating rod 8 to close the switch, that is, complete the circuit through the electric water heater; thus as long as the spigot 4 is open the circuit through the electric water heater will be completed and the water will be heated in the heater to the proper temperature and flow out through the open spigot.

The temperature to which the water is heated in the heater may be regulated in several well known ways, as, for instance, controlling the rapidity with which the water passes through the heater, adjusting the electrodes with relation to each other, using different voltages, etc. Of course, when a spigot 4 is opened, if the water in pipe 3 is cold, this water will have to be displaced by the hot water before the hot water will flow through the spigot, but ordinarily this requires a brief space of time.

When the spigot 4 is closed and water no longer flows through the pipes 2—3, the spring 11 operates to force the rod 8 and its connected piston head to a position between the inlet and discharge openings of casing 9. The leakage port 10^a permits this to be done, and when the rod 8 and its connected piston head are moved to this normal position, the cut-out or switch is operated so as to break the circuit to the electric water heater. The parts are shown in this normal position in the drawing.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. An apparatus for heating the water which flows through the distributing pipes of a water supply system, comprising an electric water heating device, of a manually-operated spigot on one of the distributing pipes, a cylinder provided with a piston that is operated by flowing water, a rod connected to said piston and provided with a switch member that engages a coöperating switch member for rendering said electric water heating device effective, and a spring coöperating with said piston to restore the same to normal position and render said electric water heating device ineffective when the spigot is turned to cut off the flow of water in the system; substantially as described.

2. An apparatus for heating the water which is used in a building or other structure for washing and other domestic purposes, comprising water distributing pipes, an electric water heater, a device on one of the distributing pipes for cutting off the flow of water therethrough, a cylinder through which the water in said system flows, a piston mounted in said cylinder and provided with a rod that passes through one end of said cylinder, said piston being operated by the flowing water in said cylinder and a switch member on said rod that engages a coöperating switch member for rendering said electric heating device effective; substantially as described.

3. An apparatus for heating the water which flows through the distributing pipes of a water supply system comprising an electric water heating device for heating flowing water, a manually operated spigot on one of the distributing pipes, a cylinder through which the water in the system passes, a branch pipe projecting laterally from the side wall of said cylinder for conducting the water to the heating device, and a piston arranged inside of said cylinder and adapted to be operated by the flowing water therein for rendering said electric heating device effective; substantially as described.

4. In a water heating system, the combination with an electric water heater, of a switch in the circuit of said water heater, a switch-operating rod, a piston coöperating with said switch-operating rod, the said piston being acted upon by the flowing water in the system to close said switch, and a spring coöperating with said switch-operating rod to open said switch when the water in the system ceases to flow; substantially as described.

5. In a water heating system, the combination with an electric water heating device, a piston operated on by the flowing water in the system for rendering said electric water heating device effective, and a leakage port in said piston for permitting the piston to move in a direction opposite to that of the flowing water; substantially as described.

6. In a water heating system, the combination with a distributing pipe having one or more spigots, of an electric water heating device for heating the water delivered to said pipe, a piston operated by flowing water in the system for rendering said electric water heating device effective, and a leakage port in said piston which will permit the leakage of water past the piston without operating said piston; substantially as described.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this ninth day of May 1907.

HARRY M. HILL.

Witnesses:
F. R. CORNWALL,
GEORGE BAKEWELL.