

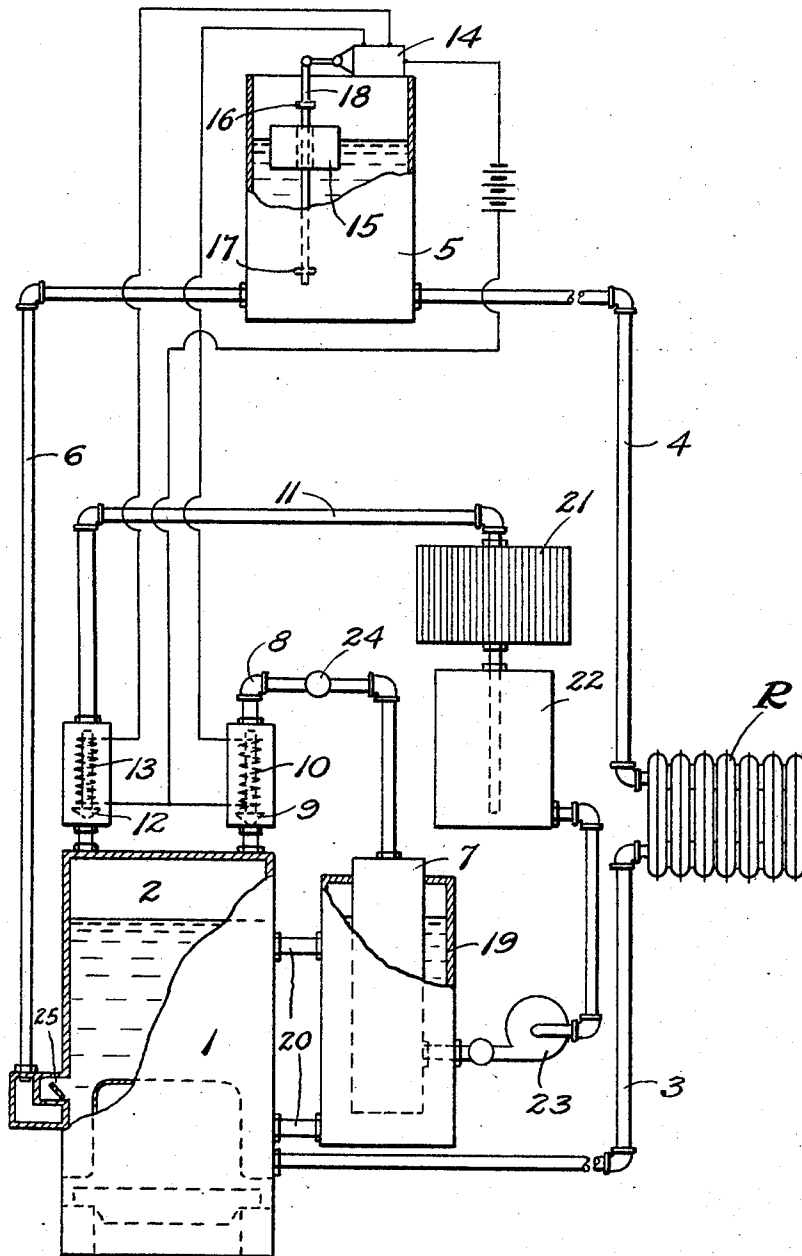
April 20, 1926.

1,581,591

H. MOREAU

WATER HEATING SYSTEM

Filed July 23, 1924



H. Moreau

INVENTOR.

BY

Marks & Clerk

ATTORNEYS

UNITED STATES PATENT OFFICE.

HENRI MOREAU, OF PARIS, FRANCE.

WATER-HEATING SYSTEM.

Application filed July 23, 1924. Serial No. 727,797.

To all whom it may concern:

Be it known that I, HENRI MOREAU, a citizen of the French Republic, residing at 37 Avenue Victor Emmanuel III, Paris, France, have invented new and useful Improvements in Water-Heating Systems, of which the following is the specification.

This invention relates to heating systems and more particularly to a hot water system in which the water is forced through the system by a gas under pressure, such as that shown and described in my French Patent 555,137, granted March 16, 1923.

It is an object of this invention to provide a pressure generator of novel construction in which the pressure is generated by the expansion of a volatile liquid adapted to be heated by the heated water in the boiler of the system. It is a further object to provide means for circulating and recovering the volatile liquid for further use in the pressure chamber.

Other objects will be apparent from the following description taken in connection with the accompanying drawing in which is disclosed a preferred form of the apparatus employed.

Referring to the drawing the boiler 1 heats the water for the heating system. At the top of the boiler is provided a space 2 into which a gas or vapor under pressure is introduced to force the water into the heating system, as will be explained hereinafter. Suitable pipe connections 3, 4, connect the radiator R with the boiler 2 and an expansion tank 5 respectively. A return pipe 6 permits water to flow back into the boiler from the expansion tank.

A vaporizing chamber 7 containing a volatile liquid adapted to vaporize at relatively low temperatures, e. g. between 60° and 80° C. is in communication with the space at the top of the boiler 2, a pipe 8, in which may be placed a reducing valve 24, being provided for this purpose. An outlet or discharge pipe 11 permits vapor to escape from the boiler. The inlet and discharge pipes 8 and 11 are controlled by valves 9 and 12 respectively, these valves being actuated by solenoids 10 and 13 controlled by a suitable switch mechanism on the expansion tank 5. Within the tank 5 is a float 15 adapted to rise and fall with the liquid in the tank and further adapted, by means of abutments 16 and 17 on the rod 18, to actuate the switch 14.

Surrounding the vaporizing chamber 7 is a jacket 19 in communication with the boiler through the connections 20. The vapor escaping through discharge pipe 11 flows through a condenser 21, thence into a reservoir 22 from which it is pumped into the chamber 7 by a pump 23.

The operation of the system is as follows: The water in the boiler 1 having been raised to the desired temperature, circulation of the water in the jacket 19 is established by a thermo-siphon action through the connections 20. The volatile liquid within the chamber 7 will vaporize at relatively low temperatures and, the valve 9 being adapted to open when the liquid in tank 5 falls, the vapor generated within chamber 7 will flow into the space 2 above the hot water in the boiler 1. At this time the valve 12 is closed so that, as the pressure within the space 2 increases, water from the boiler 1 will flow through the pipes 3, 4, and the radiator R to the expansion tank 5. So long as pressure greater than the head in the pipe 6 exists within the boiler, the check valve 25 in the pipe 6 remains closed and water is forced through the radiator into the tank 5. When the liquid in tank 5 has risen a sufficient amount the float 15 will strike the abutment 16 and actuate the switch 14 to energize solenoid 13, thus opening valve 12 and permitting the vapor in space 2 to escape. The liquid in tank 5 will now flow back to the boiler. This cycle of operations is repeated with each rise and fall of the liquid in tank 5.

When the valve 12 is opened the valve 9 is closed and at this time the vapor within the space 2 is permitted to escape through pipe 11 to the condenser 21. The vapor is thus condensed and the resultant liquid permitted to flow into the reservoir 22 from whence it may be pumped into the chamber 7 by means of a pump 23.

Although a specific apparatus has been described it is to be understood that it may be modified without departing from the spirit of the invention. While a single radiator is shown it is obvious that any number, limited only by the capacity of the pressure generator, may be used.

Having described my invention what I claim is:

1. In a hot-water heating system, a water chamber, means for heating the water in said chamber, heat exchange means in com-

munication with said chamber, a closed container in communication with said chamber, said container adapted to contain a liquid which will vaporize at a temperature substantially below the boiling temperature of water, a jacket surrounding said container, and conduit means connecting said jacket with said chamber, whereby when heat is applied to the water chamber said liquid will be vaporized and exert a pressure in said water chamber to force the water through said heat exchange means.

2. The apparatus as claimed in claim 1

in combination with a means adapted to be actuated upon a predetermined increase of pressure in the heat exchange means to cut off communication between the container and the water chamber.

3. The apparatus as claimed in claim 1 in combination with a means to condense said liquid and a means to return the liquid to the container.

In testimony whereof I have signed my name to this specification.

HENRI MOREAU.