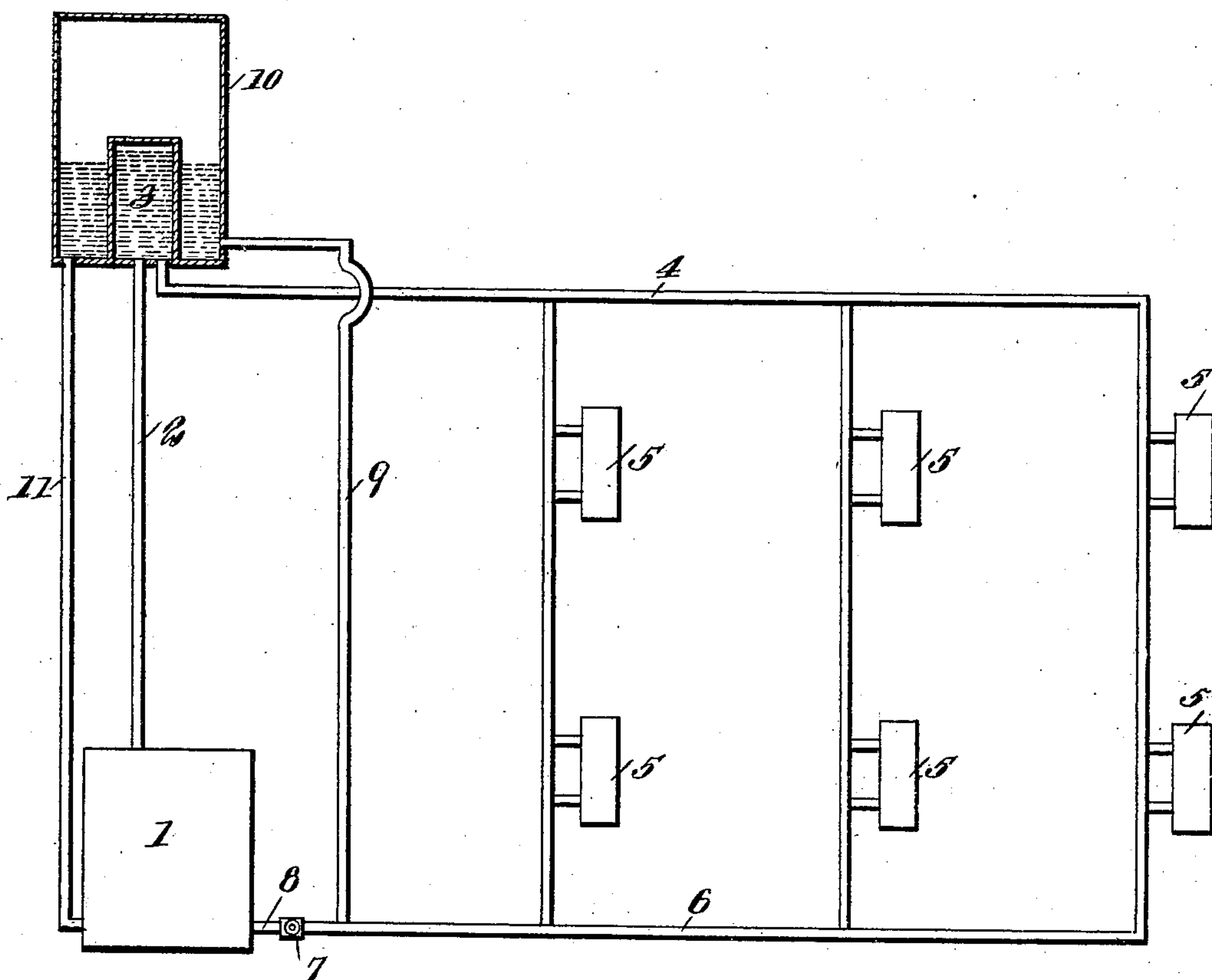


No. 862,642.

PATENTED AUG. 6, 1907.

H. V. JORGENSEN,
HOT WATER HEATING APPARATUS.
APPLICATION FILED JUNE 12, 1902.



WITNESSES
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HANS VALDEMAR JORGENSEN, OF AARHUS, DENMARK.

HOT-WATER HEATING APPARATUS.

No. 862,642.

Specification of Letters Patent.

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Application filed June 12, 1902. Serial No. 111,427.

To all whom it may concern:

Be it known that I, HANS VALDEMAR JORGENSEN, engineer, of the Kingdom of Denmark and Province of Jylland, in the city of Aarhus, Lille Torv Nr. 2, have invented certain new and useful Improvements in Hot-Water Heating Apparatus, of which the following is a clear and exact description.

My invention relates to a new means for improving the circulation in hot water heating systems. It is well known that the circulation in such systems is now improved by applying air or steam which is led to the main tube. This is however often an inconvenience which is remedied by my invention.

In my invention the increased circulation is obtained by producing a local development of steam within the main rising tube, the rising tube being connected at its top with an expansion chamber, the return water from the radiators being employed to slightly reduce the temperature of the water in the expansion chamber before passing to the boiler.

The invention is shown in the accompanying drawing in diagram.

1 is the hot water boiler from which the tube 2 leads the water to the expansion chamber 3. The water is then conducted through pipes 4 to the radiators 5. The cooled water is then conducted through pipe 6 to the tube 9 which is in connection with a cooling device or chamber 10. The chamber 3 is within the chamber 10, but not connected therewith. The water which passes this device is returned to the boiler through pipe 11.

It is to be understood that when the system is not in operation there is an equilibrium of pressure on the liquid in the chambers 3 and 10, said pressure being transmitted through all the communicating parts of the system. When the heater is in operation the fluid column extending from the boiler to the chamber 3 becomes less dense partly on account of its expansion and partly on account of the mixing with the water of the steam bubbles. The cooler and denser water in the column extending between the chamber 10 and the boiler forces the first mentioned column of water upward, raising the water level in the chamber 3 and causing a flow downward through the radiator pipes and upward through the pipe 9.

The water in boiler 1 is heated above 100 degrees centigrade and the heated water mixed with steam bubbles rises through tube 2 to chamber 3 where its temperature is slightly reduced by the cooled water in the cooling device 10. The steam bubbles in the water are thereby condensed and the water cooled down a few degrees but the boiling continues as there

is less pressure on account of the condensation. I may here mention that the water in the boiler need not be maintained above a temperature of 100 degrees C after the operation of the system has begun, as it may boil at less temperature if a corresponding vacuum is continually kept in the expansion chamber 3. Such a vacuum will always be formed as soon as the air passes out of the expansion chamber. If the temperature in the expansion chamber is then lowered below 100° centigrade a vacuum will be formed but the boiling will continue.

It may not always be necessary to let all the cooled water pass the cooling device 10 through pipes 9 and 11 as it usually only requires sufficient cooled water to diminish the temperature of the boiling water by a few degrees. The tube 6 is therefore connected directly with the boiler by a tube 8 provided with a valve 7. Through this valve more or less of the cooled water may pass directly to the boiler without passing the cooling device. The valve 7 is thus used to short-circuit a part of the return water if it shall not be necessary to send all of the return water through the cooling device.

The special feature of this invention is that heat is neither conducted to or led away from the system by external means.

Having now described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a hot water heating system the combination of a boiler, a main tube rising from the boiler, an expansion chamber connected with the main tube, a cooling device for cooling the water in the expansion chamber, radiators connected by piping with the expansion chamber, a return pipe which leads the water from the radiators to the cooling device, a pipe leading from the cooling device to the boiler, and a pipe connecting the return pipe with the boiler and provided with a valve whereby a part of the cooled water may pass directly from the return pipe to the boiler, substantially as described.

2. In a hot water heating system, the combination with a boiler, a main rising tube communicating with said boiler, an expansion chamber connected with the upper end of the main tube, radiators, a tube leading from the expansion chamber to the radiators, a return pipe, a second chamber with which said return pipe is connected and through which the cooled water passes, the said chamber surrounding the first mentioned chamber, a pipe leading from said second chamber to the boiler, and a pipe connecting the return pipe directly with the boiler and provided with a valve whereby a part of the cooled water may pass directly from the return pipe to the boiler.

In witness whereof I have hereunto set my hand. Copenhagen the twenty ninth day of May 1902.

HANS VALDEMAR JORGENSEN.

Witnesses:

CHARLES THRAE,
MARIUS ANDERSEN.