

A. H. MERRILL.
WATER HEATER.
APPLICATION FILED NOV. 7, 1910.

994,084.

Patented May 30, 1911.

FIG. 1

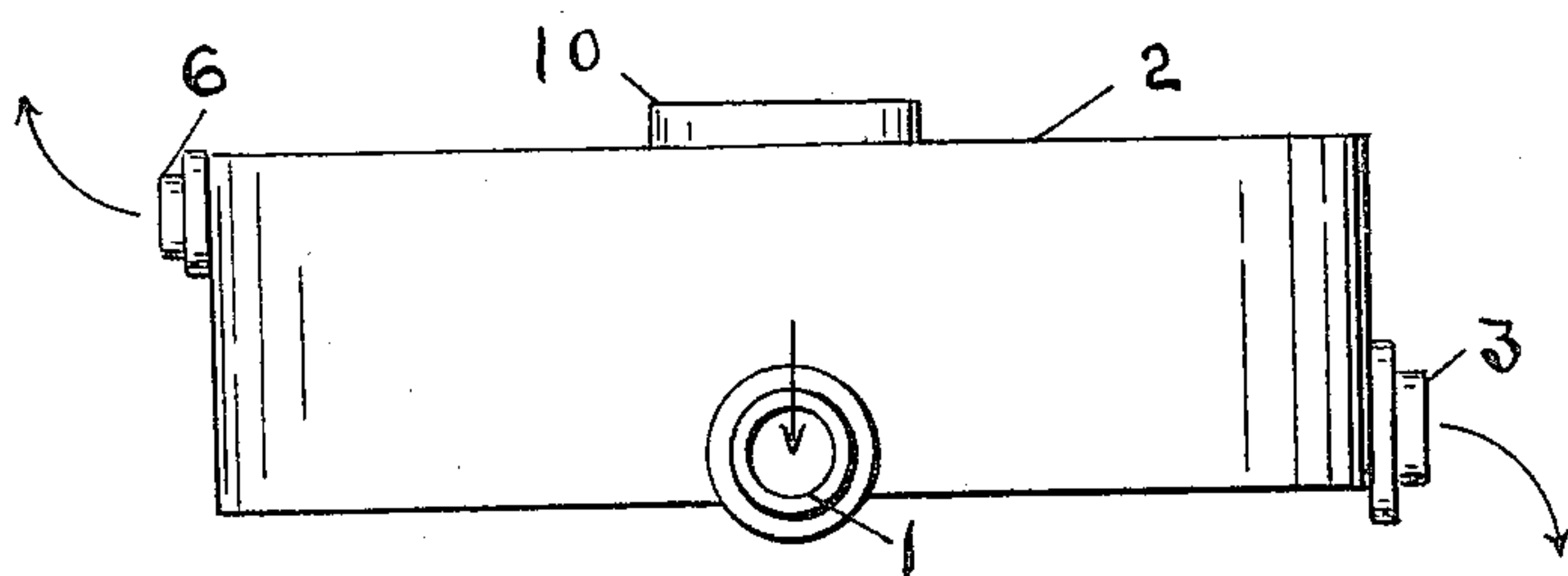
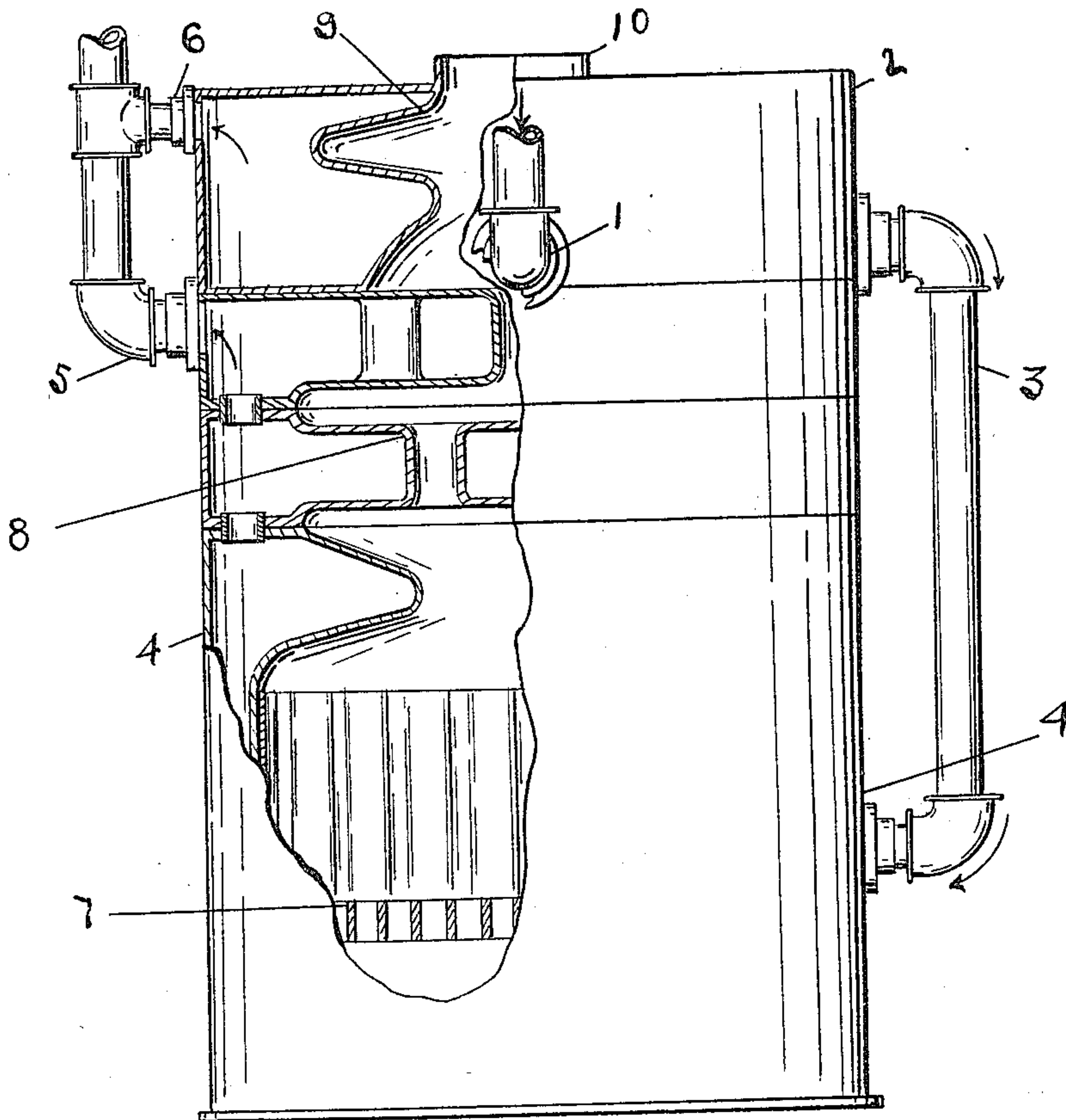


FIG. 2

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ALFRED H. MERRILL, OF TOLEDO, OHIO.

WATER-HEATER.

994,084.

Specification of Letters Patent.

Patented May 30, 1911.

Application filed November 7, 1910. Serial No. 590,962.

To all whom it may concern:

Be it known that I, ALFRED H. MERRILL, a citizen of the United States, residing at Toledo, Lucas county, Ohio, have invented
5 a new and useful Water-Heater, of which the following is a specification.

This invention relates to a heater for liquids.

This invention has utility when adapted
10 to a water heater, especially water heaters adapted for residence warming.

Referring to the drawings: Figure 1 is an elevation with parts broken away, showing an embodiment of the invention as
15 adapted to a water heater of the cast sectional vertical type; and Fig. 2 is an elevation of the heating or receiving chamber to be mounted between the heater and the flue.

The down pipe or return line 1 discharges
20 its cold water from the radiator heating system into the lower part of the chamber 2, which chamber 2 has in its lower portion a discharge passage 3 leading to the lower portion of the heater proper 4. This water
25 from the heater 4 as it is warmed rises and passes out through discharge passage 5 to the riser line in the heating circuit with the return line 1. From the upper part of the chamber 2 discharge passage 6 is in com-
30 munication with the riser line 5.

In the lower part of the heater 4 is the burner or fire-pot 7, the products of combustion of which pass upward through flues 8 in the sections of the heater, and from
35 thence into the flue portion 9 of the auxiliary or receiving chamber 2 in communication with the flue 10 for exhaust gases leading to the chimney or stack.

In normal operation the heater proper
40 warms the cold water received from passage 3, which water growing lighter as it is warmed rises and passes out through discharge passage 5. In series with its down line 1 and supply passage 3 to the heater
45 or first heating chamber 4 is the second heating or receiving chamber 2. Should there be any amount of heat in the exhaust gases after passing through the flues 8 of the heater proper, this receiving chamber
50 may take up such heat units and thus produce a rise in the temperature of the water from down line 1. The circulation in the heater 4 will draw this water through the line 3 to pass through the heater proper to

riser line 5. As heat units have been ex- 55
pended in chamber 2, there is accordingly less work for the heater proper and more efficient operation of the plant is thus possible. In the event considerable heat is in the exhaust gases, some of the water in
60 the chamber 2 may be sufficiently warmed to rise to the top of said chamber and have circulation momentum enough to go through the outlet passage 6 into the riser line 5 with the other hot water from the heater 4. 65
This receiving chamber 2 is accordingly when supplying passage 3 in series with the down return line, and when supplying riser line 5 through passage 6 in parallel with the heater 4. The heat available in flue 70
portion 9 from the exhaust gases, after passing the flues 8 of the heater 4, determines which of these selective functions of the chamber 2 shall predominate, and there is
75 accordingly an automatic control working toward a maximum of heat efficiency for the installation.

What is claimed and it is desired to secure by Letters Patent is:

1. The combination with a water heater 80
provided with a first heating chamber, a riser line therefrom, a flue, a return line, of a second heating chamber between the first heating chamber and flue, said second chamber provided with a discharge passage ex- 85
tending to the heater and with an inlet opening near its base connected to the return line, said discharge passage extending to supply the lower portion of the first heating chamber from the upper portion of which 90
first heating chamber the riser line extends.

2. The combination with a water heater provided with a first heating chamber, a riser line therefrom, a flue, of a second heating chamber between the first heating cham- 95
ber and flue, said second chamber provided with a pair of discharge passages one of which extends to the lower portion of the first heating chamber, and from the upper portion of which first heating chamber the 100
riser line extends.

3. The combination with a water heater provided with a first heating chamber having a return line, a riser line, and a flue, of a second heating chamber connected to the 105
riser line, said second heating chamber being between the first heating chamber and flue and in the return line.

4. The combination with a water heater having a return line, and a riser line, of a heating chamber in the return line and provided with a line connection therefrom to
5 the riser line from the heater.

5. The combination with a water heater having a flue, a return line and a riser line, of a heating chamber above the heater having a flue in communication with the
10 water heater flue, said chamber having a connection near its base from the return

line, a connection near its base extending to a lower portion of the heater, and a connection near its top extending to the riser line from the heater.

In testimony whereof I affix my signature in the presence of two witnesses.

ALFRED H. MERRILL.

Witnesses:

C. H. RAUCH,
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
