

No. 831,017.

PATENTED SEPT. 11, 1906.

A. G. PAUL.
HEATING SYSTEM.
APPLICATION FILED MAY 15, 1900.

Fig. 1,

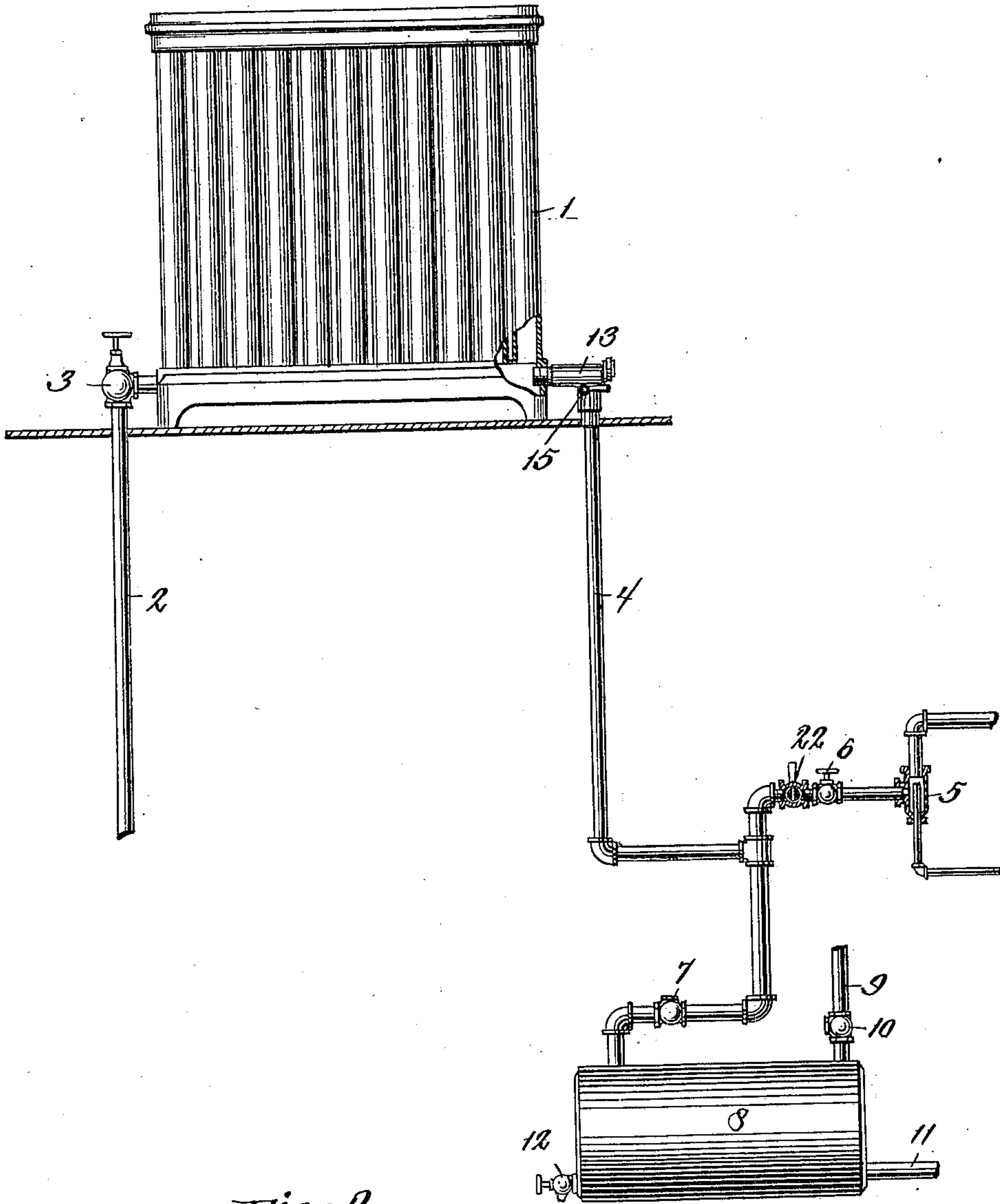
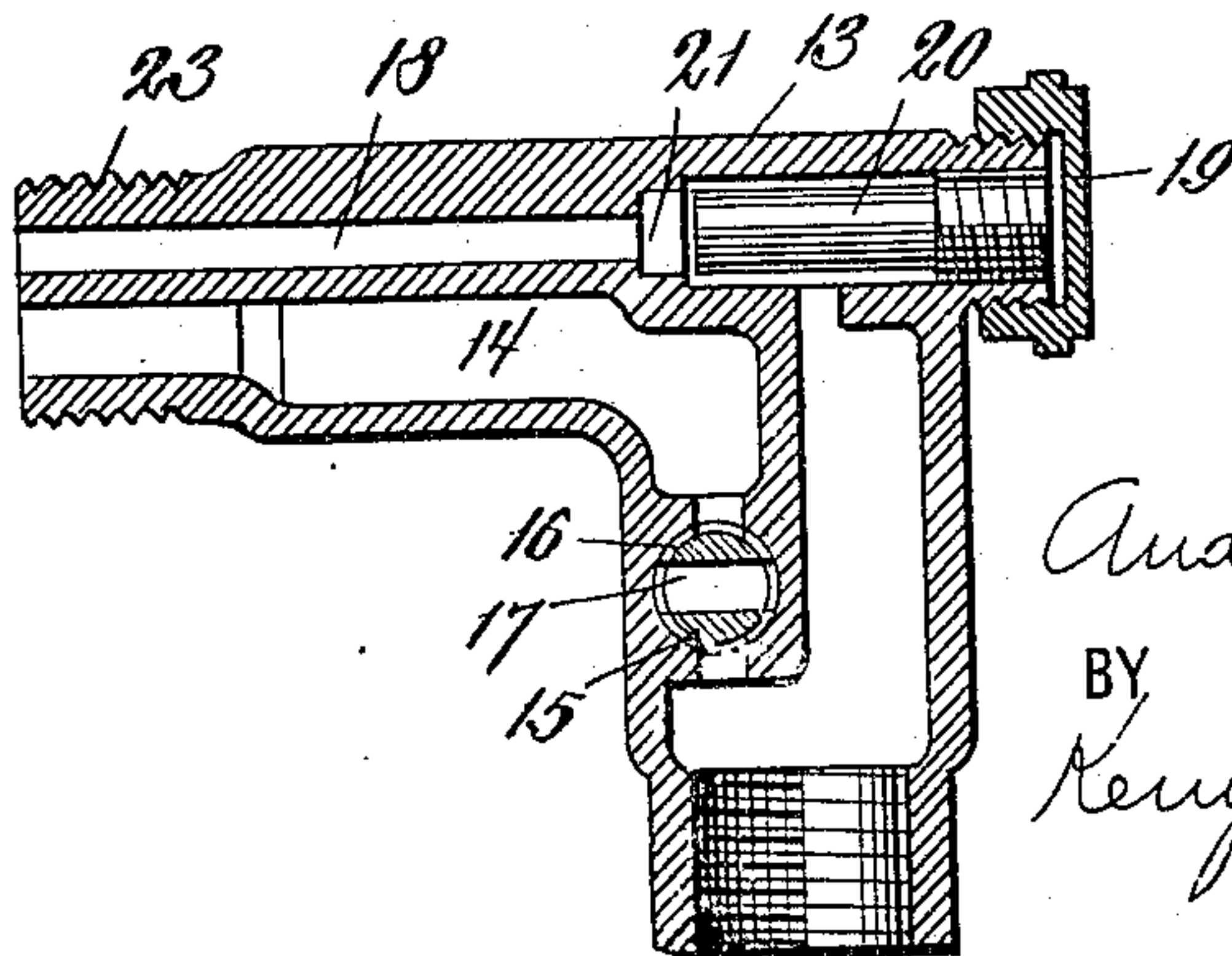


Fig. 2,



WITNESSES:

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HEATING SYSTEM.

No. 831,017.

Specification of Letters Patent.

Patented Sept. 11, 1906.

Application filed May 15, 1900. Serial No. 16,816.

To all whom it may concern:

Be it known that I, ANDREW G. PAUL, a citizen of the United States, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Heating System, of which the following is a full, clear, and exact specification, reference being had to the accompanying drawings, which form a part hereof.

This invention relates to a heating system wherein steam or other suitable heating agent is circulated for the purpose of conveying and imparting heat to the places desired; and it consists in an improved construction and arrangement of the parts of such a system, and especially in an improved fitting for use on the discharge-pipe of such a system.

The object of my invention is to automatically control the removal of the water and air from the heating system and at the same time to prevent the escape of the heating-vehicle.

My invention consists, first, in a fitting for use on the discharge-pipe of a heating system provided with a passage for the water of condensation and a plug in said passage having a capillary duct therein and a second passage for air above the water-passage and a thermostatic air-valve in said air-passage.

My invention also consists in certain other features and combinations of parts in a fitting and a heating system, hereinafter set forth.

My invention is shown in the accompanying drawings, in which—

Figure 1 shows a radiator having my invention applied thereto. Fig. 2 shows a sectional view of my improved fitting.

Similar numbers denote similar parts in the two figures.

1 is a radiator of any suitable form.

2 is a supply-pipe.

3 is a supply-valve.

4 is a discharge-pipe.

5 is an exhauster of any suitable kind, preferably in the form of a jet.

6 is a hand-valve for cutting the exhauster out of operation.

7 is a check-valve in the discharge-pipe.

8 is a tank to receive the water of condensation.

9 is a relief-pipe provided with any suitable kind of valve 10.

11 is a pipe through which the water of

condensation can be pumped from the tank 8 to the boiler or to any other point desired.

12 is a cock for drawing off the water of condensation from the tank.

13 is my improved fitting. (Shown in cross-section in Fig. 2.) It is provided with a lower passage 14, through which the water of condensation escapes from the radiator, and in this passage is inserted a cock or plug 15. This plug is provided with a restricted passage or groove 16 encircling the plug, as shown in Fig. 2. It is also provided with a wider passage 17. When the cock is turned in the position shown in Fig. 2, the water of condensation can only escape through the restricted passage 16. When the cock is turned at right angles to this position, the wider passage 17 is brought in line with the passage 14, giving a much larger outlet for the escape of the water of condensation.

18 is a second passage in the fitting, placed above the water-passage through which the air is drawn out from the radiator. The passage 18 is provided with an automatic steam-trap 19. In the form shown this steam-trap is a thermostatic air-valve, having the expanding member 20 supported in position in any suitable manner and adapted to expand into the recess 21, and thereby to close the air-passage 18. The expanding member is preferably provided at its outer end with a screw-thread adapted to take into a screw-thread in the fitting. The outer end of the expanding member is protected by a screw-cap, as shown in Fig. 2. By this means the expanding member can be adjusted or replaced without removing the fitting.

22 is a restricted passage in the branch pipe leading from the discharge-pipe to the exhauster. This restricted passage is preferably formed by an automatic valve, such as is described in my prior patent, Serial No. 563,879. The fitting 13 is provided at its inner end with a screw-threaded portion 23, which is adapted to be screwed into the base of the radiator, as shown in Fig. 1, as a result of which the passage for the water and the passage for the air open independently into the radiator.

The operation of my improvement is as follows: When the system is started, the cock 15 in the water-passage 14 is turned so as to form a wide opening or passage for the water of condensation. The air is drawn out

from the radiator at first both through the passage 14 and the passage 18, the radiator being thus quickly freed of all air. As soon as the water rises in the radiator to the level of the passage 14 it is drawn out through that passage and through the discharge-pipe 4 and escapes into the tank 8. As soon as the system is in operation the valve 15 is turned to the position shown in Fig. 2, so as to form a restricted passage in the pipe 14. This restricted passage is made of such a size as to permit the removal from the radiator of the water of condensation as rapidly as it collects in the ordinary operation of the system. At the same time the restricted passage operates to prevent the escape or loss of any substantial quantity of steam. The air in the radiator is drawn out through the passage 18 and the discharge-pipe 4 and passes out through the cock 22 and the exhauster. When the air has been entirely removed and steam enters the passage 18, the thermostat is expanded and passage 18 is closed, thus preventing the loss or waste of any substantial quantity of steam. By employing the cock 22 with the restricted passage between the exhauster and the discharge-pipe the velocity of the current passing from the discharge-pipe to the exhauster is diminished, and consequently there is less chance of water being drawn out through the exhauster. The water in this arrangement passes down through the discharge-pipe into the tank 8.

Some of the advantages of the invention are as follows: The water and air are successfully removed from the radiator whenever they collect therein, and this is done without any substantial loss or waste of the heating-vehicle. The water and air pass out from the radiator through separate channels, and the removal of the one is therefore not interfered with by the removal of the other. The improved fitting is very simple in construction and can be made at comparatively

small cost, and yet provides in one simple device an efficient means for the removal of both air and water.

What I claim as new, and desire to secure by Letters Patent, is—

1. A fitting for use on the discharge-pipe of a heating system provided with a passage for the water of condensation, a plug in said passage provided with a capillary duct, a second passage for air above the water-passage, and a thermostatic air-valve in the air-passage, substantially as set forth.

2. A fitting for use on the discharge-pipe of a heating system, provided with a passage for the water of condensation, a valve in said passage having a restricted opening and having a larger opening which latter may be brought into register with the said passage, the said fitting being also provided with an air-passage having an enlarged portion or recess, an expanding member adapted to expand into said recess and close the passage, and means for adjusting or replacing the expanding member, substantially as set forth.

3. In a heating system the combination of a radiator, a supply-pipe, a discharge-pipe, a fitting in said discharge-pipe, provided with a passage for the water of condensation, a valve in said passage having a restricted opening and having a larger opening which latter may be brought into register with the said passage, the said fitting being also provided with an air-passage, an automatic air-valve in said passage provided with an expanding member adapted to close the said passage, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ANDREW G. PAUL.

Witnesses:

THOMAS K. PETERS,
NANNIE FINLEY.