D. F. MORTON.

WATER SEALED TRAP FOR RADIATORS.

APPLICATION FILED MAY 28, 1918.

1,303,573.

Patented May 13, 1919.

Fig. 2.

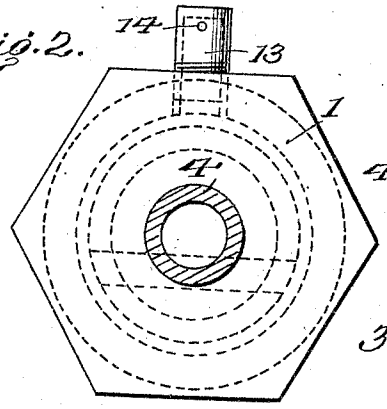
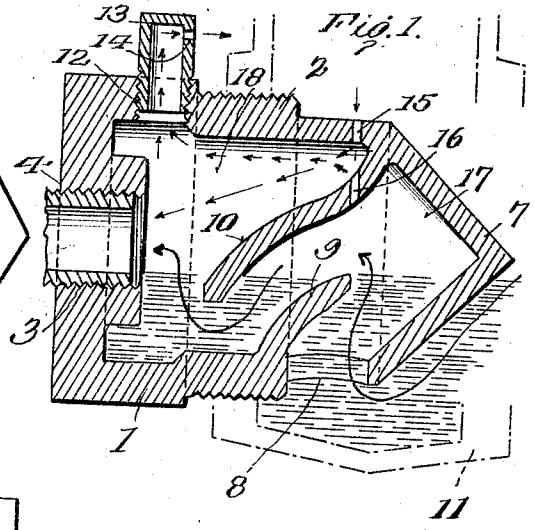


Fig. 1.



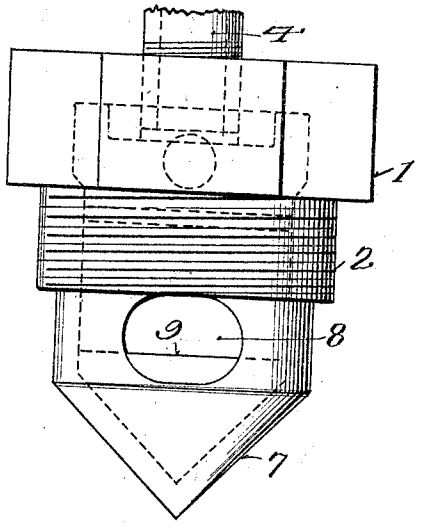


Fig. 3.

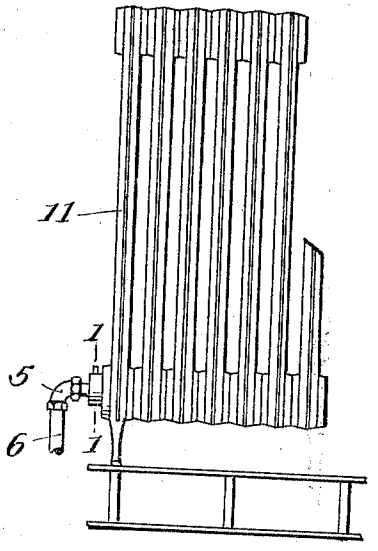


Fig. 4.

WITNESS:

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WATER-SEALED TRAP FOR RADIATORS.

1,303,573. Specification of Letters Patent. Patented May 13, 1919.

Application filed May 28, 1918. Serial No. 237,114.

To all whom it may concern:

Be it known that I, DAVID F. MORTON, a citizen of the United States, residing at Boston, in the county of Suffolk, State of Massachusetts, have invented certain new and useful Improvements in Water-Sealed Traps for Radiators, of which the following is a description, reference being had to the accompanying drawing and to the figures of reference marked thereon.

The invention relates to new and useful improvements in traps for radiators and more particularly to a water sealed trap located between the radiator and the return line pipe.

An object of the invention is to provide a radiator trap of the above character which is so constructed as to form a double water seal interposed between the steam space of the radiator and the return line pipe which more efficiently prevents the vapor or steam at very low pressure from passing through the radiator into the return line pipe and also which prevents the radiators from heating backward through the return pipes if they contain vapor or steam at low pressure while the valve for admitting live steam to the radiator is closed.

A further object of the invention is to provide a trap of the above character having a double water seal with means for venting the chamber associated with each water seal and also with means for venting the radiator so as to prevent the radiator and the chambers associated with the water seal in the trap from air binding and thereby prevent a free flow of the vapor to the radiator and a free flow of the water of condensation from the radiator through the trap to the return pipe.

These and other objects will in part be obvious and will in part be hereinafter more fully disclosed.

In the drawings which show by way of illustration one embodiment of the invention:

Figure 1 is a vertical sectional view through my improved trap showing in broken lines the radiator to which it is attached;

Fig. 2 is a front view of the trap;

Fig. 3 is a bottom plan view of the same; and

Fig. 4 is a view showing a section of a radiator with my improved trap attached thereto and connected to the return pipe.

In carrying out the invention I have provided a radiator trap which preferably is in the form of a bushing threaded into the radiator. The body portion of this trap is so constructed as to form a double water seal which is interposed between the steam space of the radiator and the return line pipe. This may be accomplished by closing the inner end of the body portion of the trap and providing an opening at the lower side thereof so that the water of condensation in the radiator may pass up through this opening in the trap. Extending downwardly from the upper part of the trap is a partition which extends below the outlet connection to the return pipe so as to form a double water seal. The water accumulating in the bottom portion of the radiator passes up through the opening into the trap then underneath the partition and then out through the outlet. The chamber associated with each water seal is vented so as to prevent any accumulation of air separating from the water of condensation of such an extent as to airbind the trap.

Referring more in detail to the drawings my improved radiator trap consists of a body portion 1 which is preferably in the form of a bushing threaded at 2 so that it may be screwed into the usual opening in the radiator for draining the water of condensation from the radiator. The outer end of the body portion is partly closed and is formed with an opening 3 into which is threaded a connection 4. This connection 4 is adapted to be attached to the usual elbow 5 which in turn is connected to the return line pipe 6, (see Fig. 4 of the drawings).

The inner end of the body portion 1 is closed as at 7.

The body portion is formed with an opening 8. Adjacent the opening 8 is an upwardly extending partition 9 which extends across the body portion of the trap and the extreme upper end of this partition is substantially on a line with the lower part of the connection 4. Extending downwardly from the upper part of the body portion 1 is a partition 10. The partition 10 is spaced from the partition 9 and also from the inner end of the connection 4. The extreme lower

edge of the partition 10 extends to a point slightly below the lower inner surface of the connection 4. The trap is threaded into the radiator which is indicated at 11 in the drawings. The trap is formed with an opening 12 into which is threaded a closed sleeve 13 having a vent opening 14. The trap has a vent hole 15 which connects directly with the radiator. The partition 10 has a vent hole 16. The water of condensation accumulating in the bottom of the radiator passes through the opening 8 into the trap over the top of the partition 9, thence downwardly underneath the partition 10, thence through the outlet pipe 4 into the return pipe 6. The water, of course in the radiator will stand at a level on a line with the extreme lower inner surface of the connection 4. The partition 10 extends beneath the surface of the water while the partition 9 reaches nearly to the upper level of the water. As a result my improved trap is formed into two chambers 17 and 18 which are separated by the partition 10 and the partitions 9 and 10 form a double water seal, so that the vapor or steam at low pressure in the radiators in order to escape through the outlet pipe 4 of the return line pipe must pass underneath the outer end of the trap up through the opening 8 into the chamber 17, thence down through the water again, underneath the partition 10 and up into the chamber 18 and thence through the outlet pipe.

It will be apparent, therefore, that my trap, as above noted, has a double water seal to prevent the vapor or steam at low pressure from passing through the radiator out into the return line pipe. The water seal also will operate to prevent the radiators from heating backward through the return pipe if they contain steam at low pressure while the valve for admitting steam at a higher pressure is closed. This, of course, is obvious from the construction above described. The air in the radiator may escape through the vent 15 either to the return pipe, as indicated by the arrows or to the sleeve 13 and thence through the vent openings 14. Air separating from the water of condensation in the chamber 17 may also escape through the vent opening 16 and either to the line pipe or out through the opening 14. This prevents the trap from airbinding and obstructing the free flow of the water of condensation to the return pipe. Any water or moisture escaping through the vent opening 14 into the room will be blown against the radiator and be vaporized thereby.

The vent opening 16, as will be apparent, provides an equilibrium or equal pressures in the chambers 10 and 11 at all times, thus, as above noted, permitting a continuous stream of water to flow from the radiator to the boiler through the return line pipe at a rate at which steam or vapor is condensed.

While the trap referred to above is especially adapted for vapor systems of heating it can, however, be used to advantage in hot water systems of heating in which instance the vent opening 14 would be closed.

It is also obvious that minor changes in the details of construction, shape and arrangement of parts may be made without departing from the spirit of the invention as set forth in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—.

1. A radiator trap adapted to connect the radiator and the return line pipe, said trap comprising a body portion having a connection to the return line pipe and having a connection to the radiator, said body portion having passages formed therein and fixed parts arranged so as to form an outlet passage for the water of condensation from the radiator through the trap to the return pipe, which outlet passage is formed with a double water seal for preventing vapor in the radiator from passing through the return line pipe and vapor in the return line pipe from passing to the radiator.

2. A radiator trap adapted to connect the radiator and the return line pipe, said trap comprising a body portion having a connection to the return line pipe and having a connection to the radiator, said body portion having passages formed therein and fixed parts arranged so as to form an outlet passage for the water of condensation from the radiator through the trap to the return pipe, which outlet passage is formed with a double water seal for preventing vapor in the radiator from passing through the return line pipe and vapor in the return line pipe from passing to the radiator, said body portion of the trap having air vents formed therein above the water level in the trap whereby the air in the radiator may escape into the trap.

3. A radiator trap adapted to connect the radiator and the return line pipe, said trap comprising a body portion having a connection to the return line pipe and a connection to the radiator, said trap being closed at its inner end and having an opening at the lower part thereof, through which the water of condensation passes from the radiator into said trap, said trap having a partition extending downwardly to a point below the connection of the return pipe, whereby a double water seal is formed to prevent the escape of the vapor in the radiator to the return line pipe and the vapor in the return line pipe from passing into the radiator, said trap having an air vent connection with the radiator above the water level in the trap, whereby air in the radiator may escape through the trap to the return line pipe.

4. A radiator trap adapted to connect the

radiator and the return line pipe, said trap comprising a body portion having a connection to the return line pipe and a connection to the radiator, said trap being closed at its inner end and having an opening at the lower part thereof through which the water of condensation passes from the radiator into the trap, said trap having a partition extending downwardly to a point below the connection to the return pipe, whereby a double water seal is formed to prevent the escape of the vapor in the radiator to the return line pipe and the vapor in the return line pipe from passing into the radiator, said partition dividing said trap into two chambers, said partition having a vent opening therethrough above the water level in the trap, whereby air separating from the water of condensation is prevented from air binding and stopping the free flow of water of condensation through the trap.

5. A radiator trap adapted to connect the radiator and the return line pipe, said trap comprising a body portion having a connection to the return line pipe and a connection to the radiator, said trap being closed at its inner end and having an opening at the lower part thereof through which the water of condensation passes from the radiator into the trap, said trap having a partition extending downwardly to a point below the connection to the return pipe, whereby a double water seal is formed to prevent the escape of the vapor in the radiator to the return line pipe and the vapor in the return line pipe from passing into the radiator, said partition dividing said trap into two chambers, said partition having a vent opening therethrough above the water level in the trap, whereby air separating from the water of condensation is prevented from air binding and stopping the free flow of water of condensation through the trap, said body portion of the trap having an air vent opening above the water level of the trap connecting the radiator with the trap, whereby air in the radiator may escape through the trap into the return line pipe.

6. A radiator trap for connecting the radiator and the return line pipe, said trap comprising a body portion threaded into the radiator and having its outer end connected to the return line pipe at a point above the bottom of the chamber in said body portion, said body portion having an opening at the lower side thereof adjacent the inner end, a partition at the outer edge of said opening and between the opening and the connection to the return pipe, said partition terminating substantially at the level of the lower inner surface of the return pipe connection, said body portion having a partition at the upper side thereof extending downwardly to a point below the level of the connection to the return pipe and located between the said first named partition and the return pipe, said downwardly projecting partition having a vent opening therein above the water level.

7. A radiator trap for connecting the radiator and the return line pipe, said trap comprising a body portion threadel into the radiator and having its outer end connected to the return line pipe at a point above the bottom of the chamber in said body portion, said body portion having an opening at the lower side thereof adjacent the inner end, a partition at the outer edge of said opening and between the opening and the connection to the return pipe, said partition terminating substantially at the level of the lower inner surface of the return pipe connection, said body portion having a partition at the upper side thereof extending downwardly to a point below the level of the connection to the return pipe and located between the said first named partition and the return pipe, said downwardly projecting partition having a vent opening therein, said body portion having a vent opening leading to the radiator at a point above the level of the water of condensation and a vent opening leading to the atmosphere independent of the return pipe.

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

DAVID FLOURNOY MORTON.

Witnesses:
JOSEPH W. CONREN,
JOSEPH E. ROBINSON.

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