March 21, 1933. H. B. McGINNIS 1,902,288

STEAM HEATING SYSTEM

Filed March 17, 1930

Fig. 1.

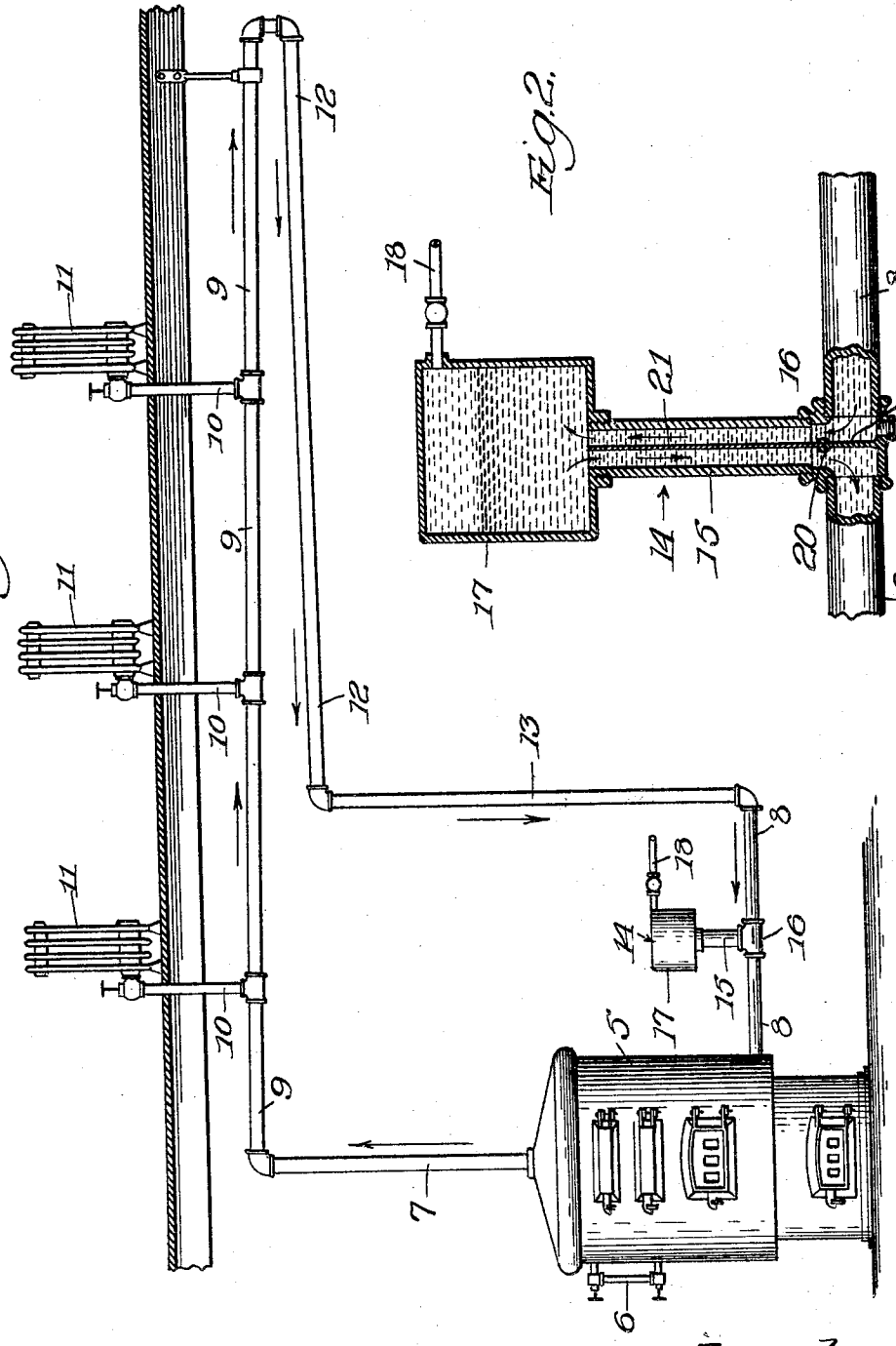


Fig. 2.

Inventor:
Harry B. McGinnis,
By Dyrenforth, Lee, Chritton & Wiles,
Attys.

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HARRY B. McGINNIS, OF CHICAGO, ILLINOIS

STEAM HEATING SYSTEM

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The present invention relates to oil traps for steam heating systems, and is more particularly adapted to be used in connection with those steam heating systems which employ a gravity return line to the boiler.

Considerable difficulty is experienced in the operation of steam heating systems because of oil which becomes admixed with the water. This oil causes foam to be formed within the system with a consequent impairment of the efficiency of the system.

It is believed that this oil is that oil which remains in the various fittings of the boiler, pipes and radiators after machining operations. Also, it is believed that some core-oil remains within the interior of the radiators and boiler after the molding or casting of such parts. At any rate, such oil is present in newly installed systems, and it is therefore an object of the present invention to provide a simple and effective means for effecting its removal.

The invention will be more fully understood from the following description in conjunction with the accompanying drawing, in which—

Figure 1 is a somewhat diagrammatic view of a steam heating system of the gravity return line type, embodying the device of the present invention; and

Fig. 2 is an enlarged vertical sectional view of the oil trap of the present invention.

Referring more in detail to the drawing, the numeral 5 designates a conventional type of steam boiler heating system. The boiler 5 is provided with a water level gage 6, a steam outlet line 7 and a gravity water return line 8. The steam line 7 is connected to a main 9 provided with a plurality of risers 10, each of which leads to one of a plurality of radiators 11. The main 9 is inclined downwardly in a direction leading away from the line 7 so that condensed steam from the radiators 11 will not flow back through line 7 into the upper portion of the boiler 5. The lowermost end of the main 9 is connected to the higher end of an inclined line 12. The lower end of the line 12 is connected to a riser 13 leading to the line 8 which is connected to the boiler 5.

The foregoing is a conventional type of steam heating plant structure, and it is thought that a more detailed description of the same is unnecessary.

The device of the present invention is designated as a whole at 14, and comprises a vertical conduit member 15, the lower end of which is connected to the line 8 by means of a T 16. The upper end of the conduit member 15 carries and communicates with a closed chamber or box 17. The upper portion of the chamber 17 is provided with a valved drawoff line 18.

The interior of the T 16 is provided with a transversely disposed baffle, or partition 19. The upper edge of the partition 19 is provided with a slot 20 which receives the lower end of a sheet metal partition member 21 which has a close sliding fit within the upright conduit or pipe 15. The partition 21 preferably extends at least to the upper end of the pipe 15. The lower portion of the T 16 may be provided with a small drain cock 22 for drawing water from the system.

The length of the conduit 15 is preferably such that the top end of the chamber 17 and the drawoff line 18 will be considerably below the horizontal plane of the water within the boiler during operation of the system.

The operation should be readily apparent. The boiler is filled to the proper level with water and the valved line 18 is opened to permit any air within the chamber 17 and conduit 15 to be displaced by water. The line 8 is full of water and a column of water extends into the riser 13 to a point substantially in the same plane as the level of the water in the boiler. Steam passes from the boiler 5 through line 7 and into the main 9 from which it passes through risers 10 and into the radiators 11. The steam condensed in the radiators 11 flows down through the risers 11 into the main 9, from which it flows through the line 12 and into the riser 13. The condensate flows through the line 8 and as it enters the T 16 it is caused to flow upwardly through the conduit 15 by the baffles 19 and 21. As the water enters the comparatively quiescent body of water within the chamber 17 any oil admixed therewith will rise to the

top of the chamber 17 and accumulate in the form of a layer. The water will then flow down the conduit 15 on the other side of the baffle 21 and back into the line 8 from which it is discharged into the boiler 5.

When a substantial quantity of oil has accumulated in the chamber 17 it may be removed by simply opening the valved line 18. The oil will be forced out through the line 18 by the pressure of the water, as the level of the water in the boiler is ordinarily at least as high as the top of the chamber 17.

While a preferred form of the invention has been described, it must be understood that it is not intended that the invention should be limited thereto, since the same is capable of many modifications within the scope of the appended claims.

I claim:

1. In a steam heating system having a steam boiler and one or more radiators, the combination of a conduit leading from the boiler to the radiators for supplying steam thereto, a second conduit connected to said conduit and to the steam boiler at a point substantially below the normal water level within said boiler for returning condensed steam from the radiators and from said first-named conduit to the boiler, a chamber mounted in a plane above the point of connection between said second-named conduit and the boiler and in a plane substantially below the normal level of the water within the boiler during operation of the system, downwardly extending conduit means having its upper end connected to the lower end of said chamber and its lower end connected to said second-named conduit a baffle in said downwardly extending conduit, and a drain conduit communicating with the upper end of said chamber.

2. In a steam heating system having a steam boiler and one or more radiators, the combination of a conduit leading from the boiler to the radiators for supplying steam thereto, a conduit connected to the steam boiler at a point substantially below the normal water level within said boiler for returning condensed steam from the radiators to the boiler, a closed chamber disposed above said second-named conduit in a plane substantially below the normal level of water within the boiler during operation of the system, said chamber being independent of said boiler and having no direct communication with the steam zone thereof a transversely partitioned T-fitting adapted to divert water from said second-named conduit, conduit means leading from said second named conduit to the lower end of said chamber, said conduit means being adapted to pass any water flowing through said second-named conduit from the radiators into the lower end of said chamber in an upward direction and to withdraw water from the lower end of said chamber and return it to the said second-named conduit, and a drain-conduit leading from the upper portion of said chamber and from the heating system.

3. In a heating system having a boiler, one or more radiators, and a conduit returning condensed steam to said boiler, means for separating oil from said condensed steam comprising a closed chamber disposed above said conduit, a drain in the upper end of said chamber, a pipe connecting the lower part of the chamber and said conduit, and a baffle in said pipe.

4. In a heating system having a boiler, one or more radiators, and a conduit returning condensed steam to said boiler below the water line of said boiler, means for separating oil from said condensed steam comprising a closed chamber associated with said return conduit in a plane below the water line of said boiler, a riser provided with a baffle connecting said chamber and the return conduit and a valve-controlled drain in the upper end of said chamber.

5. In a heating system having a boiler, one or more radiators, a main supplying said radiators with steam and a conduit returning condensed steam to said boiler below the water line of said boiler, means for separating oil from condensed steam comprising a chamber disposed above said conduit and in a plane below the water level of the boiler, a valved drain in the upper end of said chamber, a pipe connecting the lower part of the chamber and the return conduit adapted to supply the chamber with condensed steam and to return it to the conduit, and a transversely partitioned T-fitting connecting said pipe and said return conduit.

In testimony whereof, I hereunto affix my signature, this 21st day of February, 1930.

HARRY B. McGINNIS.