

(No Model.)

D. L. LONG.
STEAM TRAP AND FEEDER.

No. 522,020.

Patented June 26, 1894.

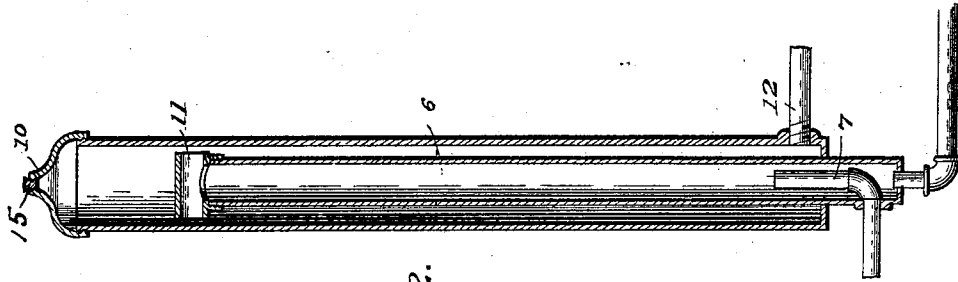


FIG. 2.

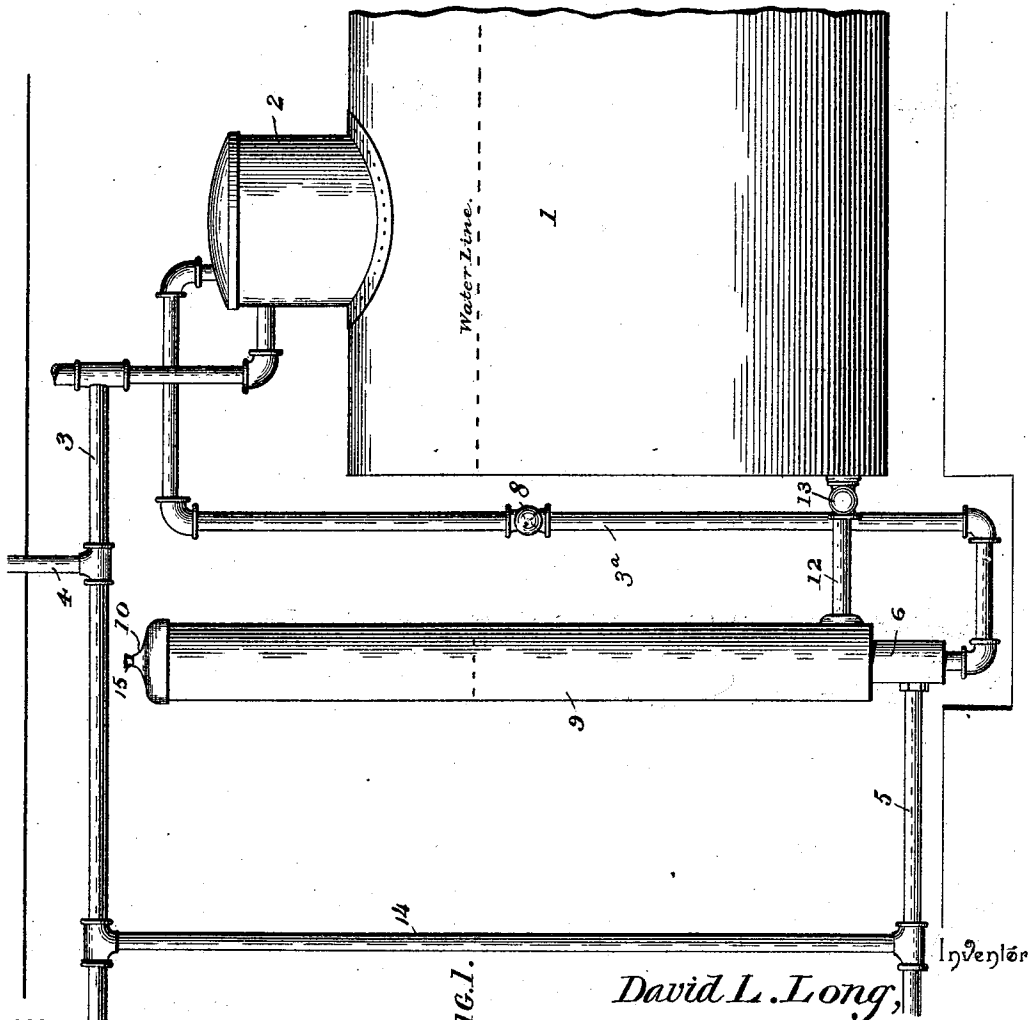


FIG. 1.

David L. Long,

Inventor

Witnesses

Julius Ulke, Jr.
[Signature]

By his Attorneys.

[Signature]

UNITED STATES PATENT OFFICE.

DAVID L. LONG, OF CRAWFORDSVILLE, INDIANA.

STEAM TRAP AND FEEDER.

SPECIFICATION forming part of Letters Patent No. 522,020, dated June 26, 1894.

Application filed February 13, 1894. Serial No. 500 084. (No model.)

To all whom it may concern:

Be it known that I, DAVID L. LONG, a citizen of the United States, residing at Crawfordsville, in the county of Montgomery and State of Indiana, have invented a new and useful Steam Trap and Feeder, of which the following is a specification.

My invention relates to an improvement in heating systems, and particularly to means for returning the water of condensation from the radiators to the boiler, and for increasing the circulation through the dry steam conductors.

Further objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the claims.

Referring to the drawings:—Figure 1 is a view of a heating system embodying my invention. Fig. 2 is a detail central section of the reservoir for water condensation and the inclosed stand-pipe with the connections.

Similar numerals of reference indicate corresponding parts in both figures of the drawings.

1 represents a boiler provided with the steam-dome 2, from which extend the dry steam-pipes or conveyers 3, which, as in other steam-heating systems, pass through the various portions of the building and are tapped at intervals, as shown at 4, for the connection of radiators, but as radiators form no part of my invention, they are not shown in detail in the drawings. The steam conveyers communicate with return pipes 5, which may be arranged in any suitable manner to agree with the distribution of the conveyers, and may be varied as desired without detracting from the efficiency of my invention. The end of the return pipe adjacent to the boiler is let into the side of a stand-pipe 6, and is turned up parallel with the axis of such pipe to form a nozzle 7, said nozzle, and preferably the return-pipe, being of less diameter than the stand-pipe so as to allow an annular space between the nozzle and the walls of the stand-pipe. Connected with the lower end of the stand-pipe beneath the point of attachment or entrance of the return-pipe 5, is a dry steam conveyer 3^a, which may form a part of the general dry-steam conveyer which is connected to the radiators, or made a separate

pipe extending directly from the steam-dome, the object being to admit live steam to the lower end of the stand-pipe at as near the pressure of the steam in the dome as possible. A globe-valve 8 is arranged in this portion 3^a of the dry-steam conveyer to control the flow of the steam therethrough.

Surrounding the stand-pipe and inclosing the same is a reservoir 9, which is of larger diameter than the stand-pipe and extends a short distance above the upper end of the same, where it is provided with an air-outlet or vent 10. The upper end of the stand-pipe is provided with an outlet 11, which preferably consists of a T-coupling, the lateral arms of which are open. A water-pipe 12 connects the lower end of the reservoir to the boiler below the water-line, whereby free communication is established between the reservoir and the boiler to preserve a common level in said receptacles. A check valve 13 is arranged in this water-pipe, whereby communication between the boiler and reservoir may be cut off.

With the parts constructed and arranged as described, the operation is as follows:—The steam which is admitted under pressure to the lower end of the stand-pipe rises around the nozzle 7 of the return-pipe and forces the water of condensation, which is brought by such pipe, upward in the stand-pipe and causes it to flow into the surrounding portion of the reservoir, and in addition to this action the partial condensation of the dry steam, brought by the pipe 3^a, produces a partial vacuum in the stand-pipe and thus draws the water of condensation to the nozzle of the return-pipe in position to be elevated by the blast of steam discharged into the reservoir. Thus the circulation of the steam in the conveyer is accelerated by the exposure of live steam in the stand-pipe to the water of condensation, which is obviously introduced into the stand-pipe at a lower temperature than the steam, and therefore the accumulation of water in the conveyers and radiators is prevented.

It will be understood that the arrangement of the conveyers and return-pipe may be varied to suit the extent of the system and the location of the boiler without affecting the operativeness of the device, for the reason

that my invention is designed especially to relieve from water of condensation those pipes and radiators which are located below the plane of the water-line in the boiler.

5 The vertical connecting-pipe 14, which is shown at the left of Fig. 1, is designed to show a means of communication between the pipe 3 and the pipe 5, and in practice said connecting-pipe will be removed from the stand-
10 pipe a greater distance than is indicated in the drawings, whereby the pipe through which the steam passes to the radiators exceeds in length the pipe 3^a, which connects the steam-dome with the lower end of the stand-pipe.

15 In operation the vent 10 is allowed to remain open until the stand-pipe and inclosed parts become heated by the steam introduced by the pipe 3^a, after which a plug 15 is fitted in said vent, as shown in Fig. 2, to insure the
20 necessary pressure in the stand-pipe to force the water therefrom into the boiler. Furthermore, with regard to the stand-pipe, reservoir, and connected parts various changes in the form, proportion and the minor details of construction may be resorted to without departing
25 from the principle or sacrificing any of the advantages of the invention.

Having described my invention, what I claim is—

30 1. The combination with the return-pipe of a steam conveyer, of a stand-pipe in communication with said return-pipe, and a live steam-pipe communicating with the stand-pipe at its lower end, whereby the partial
35 condensation of the dry steam increases the circulation in said conveyer, substantially as specified.

2. In a steam-heating system, the combina-

tion with a dry steam conveyer having a return-pipe, of a stand-pipe, a nozzle connected
40 with the said return-pipe and arranged axially in the stand-pipe, a cylindrical reservoir inclosing said stand-pipe, the latter being provided at its upper end with an outlet,
45 and a live steam pipe connected with the lower end of the stand-pipe, whereby the water of condensation discharged from the nozzle connected with the return-pipe is elevated
50 by the pressure of steam from the dry-steam pipe and is discharged into the surrounding reservoir, substantially as specified.

3. In a steam-heating system, the combination with a dry steam conveyer having a return-pipe which is arranged below the plane
55 of the water-line in a steam generating boiler, of a stand-pipe provided at its upper end with an outlet, a nozzle connected with the end of the return-pipe and arranged axially in the
60 stand-pipe near its lower end, a cylindrical reservoir surrounding the stand-pipe and provided at its upper end with a vent, a connecting pipe between the lower end of the reservoir and the steam generating boiler, and a
65 dry steam pipe communicating with the lower end of the stand-pipe and adapted to elevate the water of condensation discharged from the nozzle and force the same through the
outlet at the upper end of the stand-pipe, substantially as specified.

In testimony that I claim the foregoing as
70 my own I have hereto affixed my signature in the presence of two witnesses.

DAVID L. LONG.

Witnesses:

MICHAEL J. CARROLL,
MARTIN V. B. SMITH.