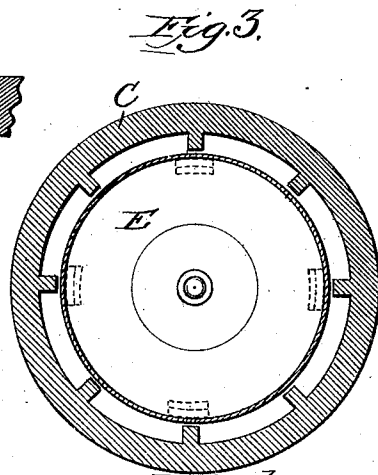
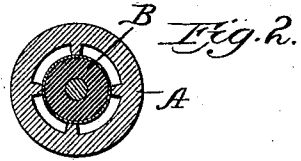
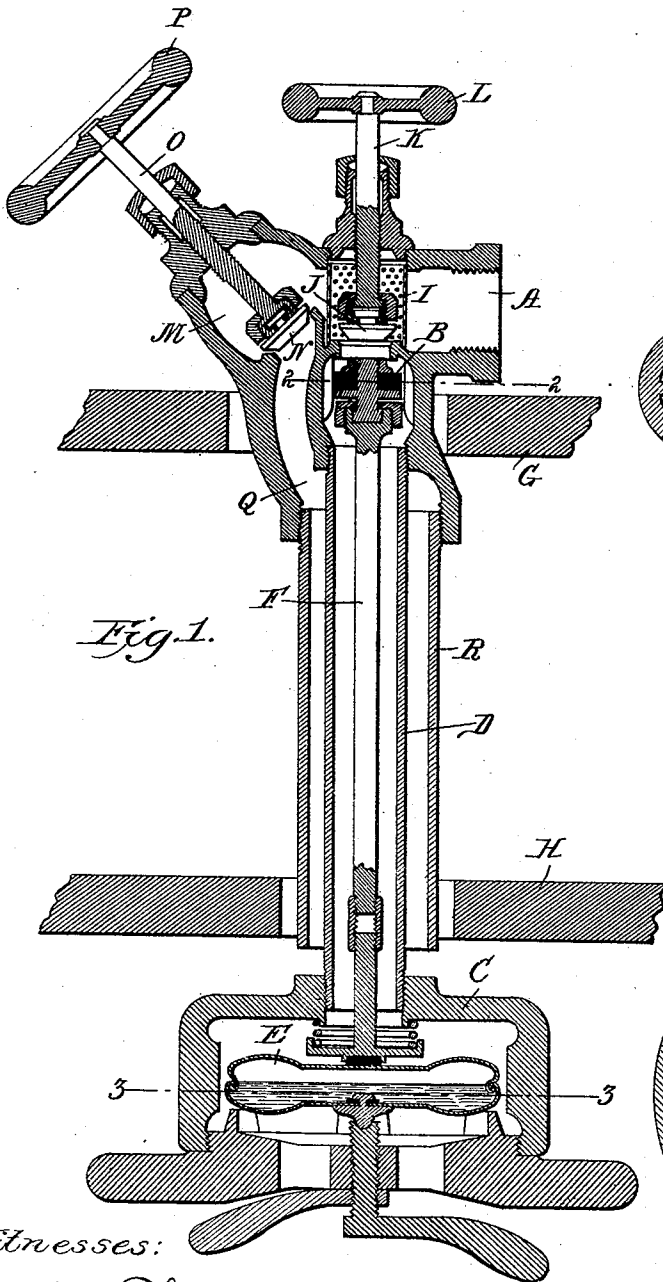


(No Model.)

E. H. GOLD.
STEAM TRAP.

No. 511,943.

Patented Jan. 2, 1894.



Witnesses:

Wm. M. Rheems.
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UNITED STATES PATENT OFFICE.

EGBERT H. GOLD, OF CHICAGO, ILLINOIS.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 511,943, dated January 2, 1894.

Application filed March 27, 1893. Serial No. 467,696. (No model.)

To all whom it may concern:

Be it known that I, EGBERT H. GOLD, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Steam Traps, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to improvements in steam traps for use in connection with that class of car heating systems in which the water of condensation is automatically discharged from the system as rapidly as it is formed, but is more especially designed as an improvement upon the invention set forth in Letters Patent of the United States No. 492,495, granted me on the 28th day of February, 1893. In the said patent a main valve for controlling the exhaust from the steam radiator is located within the space to be heated and an expansion device is located wholly without the space to be heated but connected with the main valve so that the latter will be operated by the expansion device under the influence of the differing temperatures of the exhaust and outside air so as to seat and unseat the valve and thereby open or shut off the exhaust. A hand-operated valve is also provided controlling a passage leading from the chamber in which the main or automatic valve is located, to the chamber in which the expansion device is located for the purpose of enabling the direct exhaust of steam into the chamber containing the expansion device and the passages connected therewith, for the purpose of blowing out or thawing out the trap in the event of its becoming frozen up as a result of the accumulation of the water of condensation.

The prime object of this invention is to have a hand-operated valve controlling the passage in which the main automatic valve is located, whereby the exhaust may be positively closed at any time desired; and a further object is to combine with such a trap a hand-operated valve controlling a chamber or passage surrounding the passage connecting the expansion device chamber with the main valve chamber, and opening directly into the open air in proximity to the expansion device chamber, whereby either live or exhaust steam may be discharged directly onto the expansion de-

vice chamber after enveloping the passages connecting the same with the main valve chamber, whereby the thawing out of a frozen trap is rendered certain and easy of attainment. These and other objects hereinafter referred to, are attained by the devices illustrated in the accompanying drawings, in which—

Figure 1 represents a central vertical section through a steam trap embodying my invention; Fig. 2 a horizontal section on the line 2—2 of Fig. 1; and Fig. 3 a horizontal section on the line 3—3 of Fig. 1.

Similar letters of reference indicate the same parts in the several figures of the drawings.

Referring by letter to the accompanying drawings A indicates the valve casing which is provided with a screw-threaded connection for attachment to the exhaust pipe of the car heater or radiator, B, the main valve located within the casing, C, the casing constituting a chamber for the expansion device operating the valve B, and D, a tube connecting the main valve chamber with the chamber of the expansion device E, which latter is connected by the rod F, extending through the tube D, with the main valve B, which latter is operated thereby in the manner which will be described farther on.

The casing A in which the main valve is located extends through an opening in the car floor G so that the main valve will be located wholly within the space to be heated, while the tube D extends through the underneath sheathing H of the car body so that the casing C and the expansion device contained therein are located wholly outside the space to be heated. The expansion device may be of any desired character, but preferably one comprising a flexible hollow diaphragm partially filled with an expansible fluid, such being a common and satisfactory form of thermostatic valve. This much of the trap is almost identical with that contained in the aforesaid Patent No. 492,495 and the operation thereof is the same, the water of condensation and steam passing from the car heater or radiator into the valve casing A, past the main valve B, down through the tube D and the chamber C of the expansion device from whence it is discharged into the air,

until the heat of the steam thus escaping is sufficient to cause the expansion device to lift the rod F and close the main valve; and the main valve will remain so closed until the lower temperature of the outer air causes the expansion device to contract sufficiently to open or unseat the main valve, when the operation above described will be repeated, and so on indefinitely, the opening and closing of the main valve for the discharge of the water of condensation as rapidly as it is formed, being thus automatically controlled.

The seat of the main valve is guarded by a perforated cage I located in the chamber in the casing A above the main valve seat, so as to keep the seat clear of dirt and sediment which might otherwise lodge therein. This cage also surrounds another valve seat for the hand-operated valve J, the stem K of which works through a stuffing box in the casing A and is provided with a hand-wheel L on the outer end thereof for convenience of manipulation. This valve J seats on the same diaphragm that constitutes a seat for the main valve B, but on the opposite side thereof, so as to close the chamber of the casing A and the chamber of the main valve and consequently of the tube D and expansion device chamber C, thus shutting off the automatic valve from action in connection with the heating apparatus. This operation is sometimes very desirable especially if the expansion device should get out of order and refuse to work, as well as to prevent a too rapid and direct discharge of steam from the heater or radiator.

The chamber in which the valve J is located is enlarged at one side so as to form a supplemental chamber M in which is located a second hand-operated valve N, the stem O of which extends obliquely through the casing A and is provided with a hand-wheel P on the outer end thereof for convenience of manipulation. This valve N controls a port leading to a passage Q, surrounding the chamber of the main valve B, which chamber is extended by a length of pipe R of somewhat greater diameter but less length, than the tube D, which it surrounds, the pipe being screwed into or otherwise rigidly secured to the lower extremity of the casing A. The pipe R terminates with the open end just above the casing C of the expansion device, so that steam passing through the port controlled by the valve N will not only surround the chamber of the valve B and the tube D, but will also be directed and discharged onto the top of the casing C and thus serve to thaw out any possible accumulation of ice in the casing C or tube D resulting from the freezing of water of condensation, which might accumulate therein through the defective working of some of the parts, or in excessively cold weather when there is likely to be an almost constant but small flow of water of condensation through the said tube and casing.

Having described my invention, what I

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

1. In a steam trap the combination of an automatically operated valve located within the space to be heated, an expansion device situated outside the space to be heated, and connections between said valve and expansion device, of a hand-operated valve for closing the port normally controlled by said automatic valve, substantially as described.

2. In a steam trap the combination with an automatically operated valve located within the space to be heated, an expansion device situated outside the space to be heated and connections between said valve and expansion device of a hand-operated valve for closing the port normally controlled by said automatic valve, and a second hand-operated valve controlling a by-pass around the automatic valve, substantially as described.

3. In a steam trap, the combination with a valve casing having a perforated diaphragm provided with valve seats on opposite sides thereof, and a hand-operated valve seating upon one side of said diaphragm, of an automatically operated valve seating on the opposite side of said diaphragm and located within the space to be heated, an expansion device located outside of the space to be heated, and a connection between said valve and expansion device, substantially as described.

4. In a steam trap the combination with a valve casing having a perforated diaphragm provided with valve seats on opposite sides thereof, a discharge tube connected to said casing and adapted to extend from within the space to be heated to the outside air, and a casing attached to the outer end of said tube wholly without the space to be heated, of a hand-operated valve adapted to seat upon one side of said diaphragm, an automatically operated valve seating on the opposite side of said diaphragm and within the space to be heated, an expansion device located in the casing outside of the space to be heated, and a rod connecting said expansion device with the automatically operated valve, substantially as described.

5. In a steam trap the combination with an automatically operated valve, an expansion device, a connection between said valve and expansion device, a passage connecting the chamber of the automatic valve with the chamber of the expansion device, of a hand-operated valve controlling a passage surrounding the main valve chamber and the connecting passage between said chamber and the expansion device chamber and opening to the outer air, substantially as described.

6. In a steam trap the combination with an automatically operated valve, an expansion device, a connection between said valve and expansion device, a passage connecting the chamber of the automatic valve with the chamber of the expansion device, of a hand-operated valve controlling a passage surrounding the main valve chamber and the connecting

passage between said chamber and the expansion device chamber, and terminating with an open end above said casing, substantially as described.

- 5 7. In a steam trap the combination with a valve casing containing separate valve seats, an automatically operated valve fitted to one of said seats, and an expansion device contained in a chamber communicating with said
10 valve orifice, of a hand-operated valve fitted to the other seat and controlling a passage surrounding the automatic valve chamber and the passage connecting said chamber with the chamber containing the expansion device,
15 substantially as described.

8. In a steam trap the combination with an automatically operated valve located within

the space to be heated, an expansion device located outside the space to be heated in a chamber communicating with the automatic
20 valve chamber and a connection between said valve and expansion device, of a hand-operated valve adapted to close the port normally controlled by the automatic valve and a second hand-operated valve controlling a pas-
25 sage opening to the air and surrounding the automatic valve chamber and the passage connecting said chamber with the expansion device chamber, substantially as described.

EGBERT H. GOLD.

Witnesses:

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