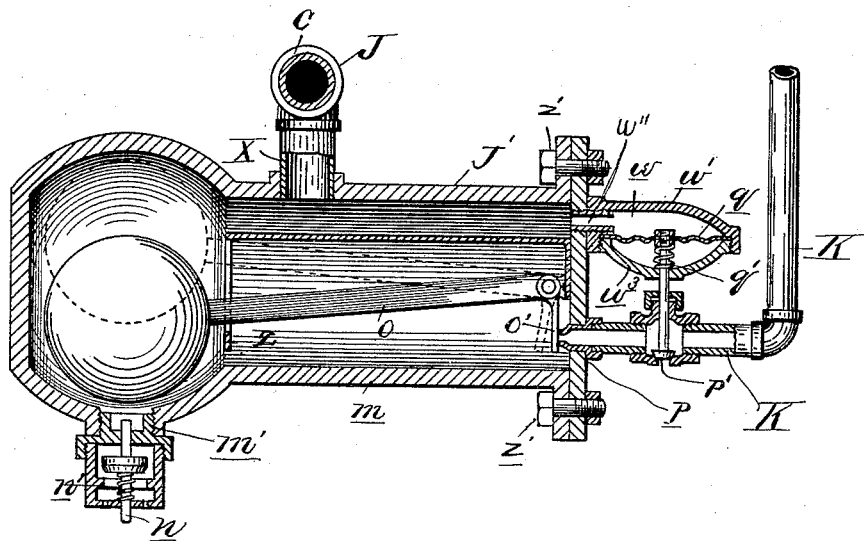


(No Model.)

J. F. McELROY.
STEAM TRAP.

No. 458,792.

Patented Sept. 1, 1891.



Witnesses.
Fred. H. Cornwall,
L. S. Bacon

Inventor,
James F. McElroy
by James Whittemore
att'y

UNITED STATES PATENT OFFICE.

JAMES F. MCELROY, OF ALBANY, NEW YORK, ASSIGNOR TO THE CONSOLIDATED CAR HEATING COMPANY, OF WHEELING, WEST VIRGINIA.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 458,792, dated September 1, 1891.

Application filed September 9, 1889. Serial No. 323,483. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. MCELROY, a citizen of the United States, residing at Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Steam-Traps, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to new and useful improvements in steam-traps; and the invention consists in the peculiar construction, arrangement, and operation of a steam-trap applied to a heating apparatus of that type known as a "return system," wherein the water of condensation returns from the pipe back to the point of starting.

The invention is especially adapted to be used in connection with the heating of railway-cars, and is intended to form a part of a car-heating system, as set forth and claimed in an application filed concurrently herewith, and in this application my improvement is shown as applied to railway-car heating.

25 In the drawings which accompany this specification is represented a vertical central section through the trap, showing the piping partly in elevation.

This trap is of the following construction: 30 *m* is a suitable casing having an aperture at the top to connect with the pipe *X* (which in turn connects into the *T J*) on the train-pipe *C*. An exit-opening *m'* is provided at the lowest point of the trap, in which is secured the valve *n*, which is held normally open by means of the spring *n'*.

40 *o* is a float-valve pivoted to the inside of the casing and having an offset *o'*, arranged to open and close the exit-opening *p* as the float rises and lowers.

K is an exit-pipe connecting into a tender or other suitable receptacle for the water of condensation, and secured in the exit-aperture *p*.

45 *p'* is a drip-valve located in the pipe *K*. This drip-valve is operated by means of a diaphragm *q* in the chamber *w* near the top of the trap, the valve *p'* being held normally open by means of the spring *q'*, and adapted

to be closed as soon as steam is admitted into the trap.

Z is a guide-arm, in which the float-valve *o* operates. The chamber *w* preferably consists of the top piece *w'*, having an aperture at the forward end adapted to engage with the nipple *w''*, secured in the aperture in the upper side of the trap. The lower side of the top piece is provided with a screw-threaded aperture, in which is secured the bottom piece *w³*, the diaphragm *q* being held between the two. 60 The rod of the valve *p'* passes through the bottom piece *w³* and engages centrally with the diaphragm, the spring *q'* being arranged between the diaphragm and the bottom piece and its tension acting to normally open the valve in the pipe *K*.

The end of the casing of the trap I preferably make detachable by means of suitable bolts *z'*, so that the interior of the trap may be readily reached. 70

The parts being thus constructed and arranged, they are intended to operate as follows: The water of condensation returns through suitable pipes together with the wet steam, which may not have been condensed. 75 The suction of the injector will carry the contents of the pipe *H* into the pipe *C*. The water being heavier than the steam, it will seek the lower part of the pipe *C*, and on reaching the *T J* will fall by gravity into the trap. When the steam is turned on, as soon as the steam-pressure enters the trap the valve *n* and the valve *p'* will be closed. As the water accumulates in the trap, the float *o* will rise, opening the aperture *p*, and the pressure of the steam upon the water will force it through the pipe *K*, which may be connected with the tender, or discharge it upon the ground, as may be desired. As soon as the water lowers, the trap will automatically close and the process will be kept up as long as the device is in operation. When steam is turned off, the pressure within the trap having diminished sufficiently the spring *n'* will open the valve *n* thereby allowing all the water in the trap to drain out, and the pressure in the chamber *w* being withdrawn the spring *q'* will lift the valve *p'*, thereby allow- 95

ing any water which may be in the pipe K to drain out, thus preventing the danger of freezing in cold weather, as the device is intended to be used in an exposed place upon the
5 tender.

It is obvious that my device presents the advantage of being entirely automatic in its action and that the steam-pressure in the trap operates the valve to drain the trap and connections, and also to force the water out and
10 to the desired point where it may be discharged.

What I claim as my invention is—

In a steam-trap, the combination, with a
15 casing, of an inlet-pipe opening into the top of the same, an outlet-pipe communicating with the casing near the bottom thereof, a float-valve for closing the outlet-pipe, a discharge-

opening in the lowest point of the outlet-pipe, a valve for closing the discharge-opening, a
20 spring for normally holding said valve open, a steam-chamber communicating with the top of the interior of the casing, a diaphragm in the chamber, a connection between the same and the valve of the discharge-opening
25 in the outlet-pipe, a valve in the lowest point of the casing, and a spring for normally holding the same open, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 9th day of
30 August, 1889.

JAMES F. MCELROY.

Witnesses.

EDWIN A. SMITH,
THOS. C. MURRAY.