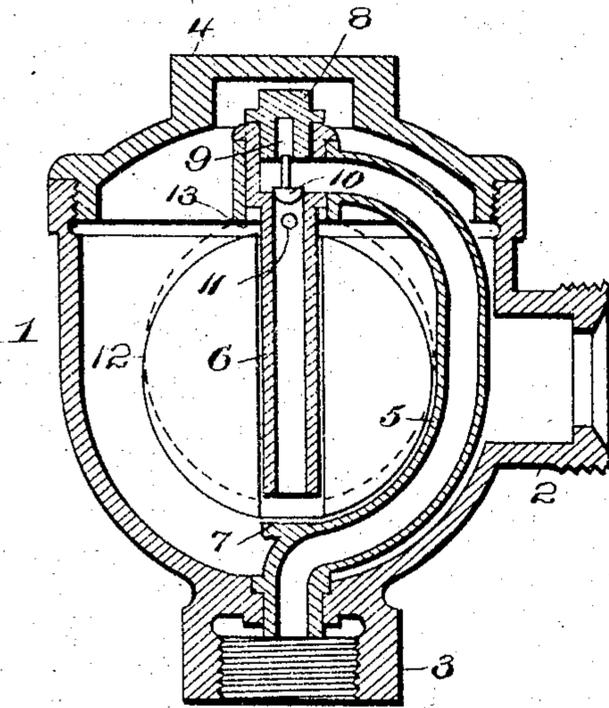


No. 772,859.

PATENTED OCT. 18, 1904.

C. A. BALL.
FITTING FOR STEAM HEATING SYSTEMS.
APPLICATION FILED MAY 8, 1903.

NO MODEL.



Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES A. BALL, OF WASHINGTON, DISTRICT OF COLUMBIA.

FITTING FOR STEAM-HEATING SYSTEMS.

SPECIFICATION forming part of Letters Patent No. 772,859, dated October 18, 1904.

Application filed May 8, 1903. Serial No. 156,193. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. BALL, a citizen of the United States, residing at Washington, in the District of Columbia, have invented
 5 new and useful Improvements in Fittings for Steam-Heating Systems, of which the following is a specification.

My invention relates to fittings for the return side of radiators, steam-coils, and other
 10 similar articles, and is more particularly designed for use in steam-heating systems wherein a circulation is created and maintained by means of an exhaust apparatus, such as a vacuum-pump, operating through the return-
 15 pipe of the system.

The object of my present invention is to provide an improved automatic means for the relief of air and water of condensation, the relief of air and water being alternative, the
 20 latter being accomplished by means of a tube shaped like a siphon, alternately opened and closed by means of a float, which at the same time alternately closes and opens an air-relief located in the short leg above the water-
 25 of-condensation level. This object I accomplish in the manner and by the means hereinafter described and claimed, reference being had to the accompanying drawing, in which the figure is a central vertical sectional view
 30 of a fitting embodying my improved construction.

In the said drawing the reference-numeral 1 denotes a casing apertured and exteriorly screw-threaded on one side at 2 for attachment to the base of the radiator and also apertured and interiorly screw-threaded on its under side at 3 for attachment to the exhaust-
 35 ing or return pipe of the system, the top of said casing being closed by a bonnet-piece 4. Located within said casing and having its lower end fitting in and closing the outlet-aperture 3 is one section, 5, of a tube corresponding to the long leg of a siphon-tube, the same curving upwardly within the casing and terminating at its upper end centrally within said
 45 casing. Fitted into and depending from said upper end of the leg 5 is another section, 6, corresponding to the short leg of the tube, the same terminating at its lower open end a

short distance above a flat seat 7 on the long
 leg 5, the latter for a purpose hereinafter to
 be described. The upper end of leg 6 is closed
 by a nut 8, centrally apertured at 9 to receive
 and guide the stem of an upwardly-opening
 check-valve 10, seated in the upper end of
 leg 6. Located in one side of said leg 6 near
 its upper end is an air-relief aperture 11, the
 same being well above the water-of-condensa-
 tion level and being substantially the same in
 function as the air-relief shown and broadly
 claimed in Letters Patent No. 641,179, grant-
 ed to me January 9, 1900. Surrounding the
 short leg 6 is a float 12, adapted to rest when
 in its lowermost position on the flat seat 7 on
 the long leg 5, thus closing the lower end of
 the short leg 6, and also adapted when lifted
 by the water of condensation to engage a de-
 pending ring 13, formed on the under side of
 the upper end of the long leg 5, thus cutting
 off the air-relief aperture 11.

From the above description the operation of my improved device will be understood to be as follows: When first operating the system, the action of the exhaust apparatus or vacuum-pump in the return side will extract
 75 the cold air from the fitting and its radiator or steam-coil through the air-relief aperture 11, thus inducing a circulation of steam in the radiator with consequent condensation. This air-relief through aperture 11 will continue
 80 until sufficient water of condensation has accumulated in the casing 1 to lift the float 12, which will then assume the position shown in dotted lines, contacting with the ring 13, thus shutting off access to aperture 11 and at the
 85 same time uncovering the lower end of short leg 6. The suction exerted on the long leg 5 of the tube will immediately cause said tube to function, thus withdrawing the bottom and cooler stratum of water in the casing 1, which
 90 action will continue until the float 12 begins to sink, when by again uncovering aperture 11 the siphon-like operation will be immediately broken and the discharge of water will cease. The alternate relief of air through
 95 aperture 11 and water through the tube will thus continue during the operation of the system.

I prefer to so constitute the float 12 that it will have very little buoyancy and will not rise until more than half submerged.

The function of the check-valve 10 is to prevent any possible back flow of water due to the cutting off of steam from the radiator and consequent back action from the vacuum thereby temporarily created in the radiator, as fully set forth in Letters Patent No. 702,336, granted to me June 10, 1902.

While I have described my invention as more particularly designed for use in systems employing an exhaust apparatus in the return side thereof and wherein exhaust-steam is utilized as the heating agent, still the fitting is equally well adapted for use in a pressure or live-steam system, the operation of the siphon-tube being insured in both instances by the difference in pressure on opposite sides of said tube, whether caused by suction or exhaust on the return side thereof or by live-steam pressure on the radiator side thereof.

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

1. A fitting for the return side of a steam-heating radiator or coil, comprising a closed chamber, means shaped like a siphon for removing therefrom into the return-piping the water of condensation and air, and means for breaking the water-removing action to maintain the water of condensation at a predetermined level in said fitting.

2. A fitting for the return side of a steam-heating radiator or coil, comprising a closed chamber, means shaped like a siphon for removing therefrom into the return-piping the water of condensation and air at different levels, and means whereby the establishing of

either of these means of discharge will cut off the other means of discharge.

3. A fitting for the return side of a steam-heating radiator or coil, comprising in combination a casing, means shaped like a siphon for removing the water of condensation and air from said casing, said means being provided with an aperture above the water-of-condensation level, and means governed by the water of condensation for opening and closing said aperture as the water-of-condensation level varies within said casing.

4. A fitting for the return side of a steam-heating radiator or coil, comprising a tube therein shaped like a siphon for discharging therefrom into the return-piping the water of condensation, an air-relief in said tube above the water-of-condensation level, and a float whose upward movement cuts off said air-relief and whose downward movement establishes said air-relief.

5. A fitting for the return side of a steam-heating radiator or coil, comprising a casing, a tube shaped like a siphon whose long leg affords the only means of communication with the return-piping and whose short leg depends in said casing, said short leg being provided with an air-relief aperture near its upper end, and a float encircling said short leg and adapted when lifted to cut off said air-relief aperture.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CHARLES A. BALL.

Witnesses:

JAS. A. HARD,

G. W. MANCHESTER.