

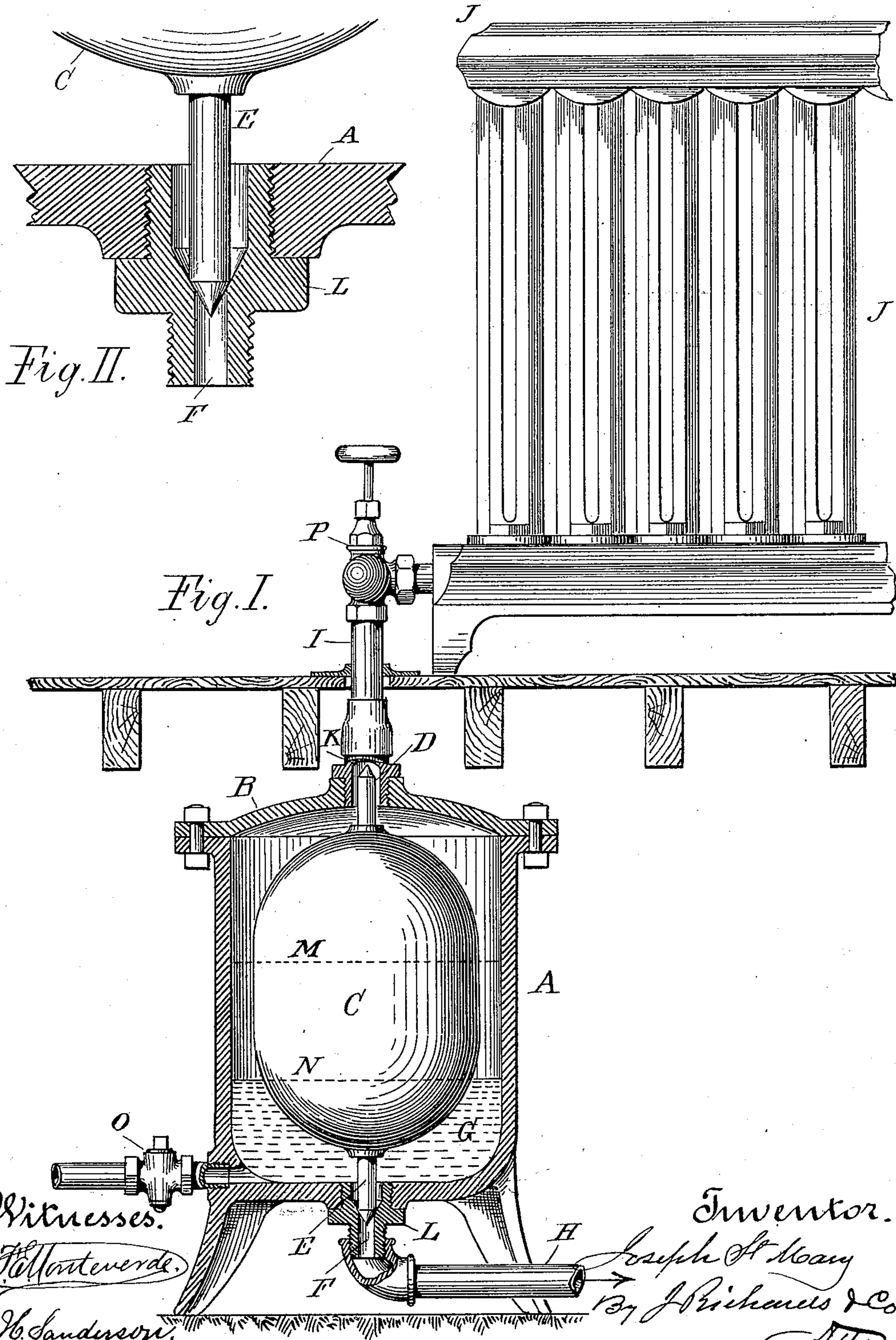
No. 635,703.

Patented Oct. 24, 1899.

J. ST. MARY.
STEAM TRAP.

(Application filed Nov. 1, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

JOSEPH ST. MARY, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE EUREKA IRON COMPANY, OF SAME PLACE.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 635,703, dated October 24, 1899.

Application filed November 1, 1898. Serial No. 695,205. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH ST. MARY, a citizen of the United States, residing at San Francisco, county of San Francisco, and State of California, have invented certain new and useful Improvements in Steam-Traps; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to what are called "traps" for collecting and discharging the water of condensation that accumulates in steam heating and other apparatus, and is an improvement and modification of my invention described in an application for Letters Patent, Serial No. 663,602, filed on the 27th day of December, 1897, for an improvement in steam-traps, relating to return steam-traps for discharging the water of condensation against pressure, and in which invention the valves are employed for the admission and escape of steam. In my present invention a single valve is employed for the release and discharge of the collected water, which escapes by its gravity, also by means of pressure, if any, in the pipes or source from which the water of condensation is collected.

My improved devices consist of a float therein, preferably of an ovaloid form, provided at each end with stems permanently attached to or integrally formed with the float set in the axis thereof, so as to laterally sustain and guide the float, one stem acting as an education-valve to permit the escape of water from the main chamber.

The objects of my invention are to dispense with all moving parts except the float and its stems, constituting a single member, and to permit the float to rise and fall by the action of its buoyancy and gravity, opening and closing the discharge-valve without appreciable friction or resistance, so the float will be free to revolve by the effect of the whirling motion of the escaping water, and thus attain certain results hereinafter explained.

To these ends I construct my improved steam-traps as shown in the drawings herewith, forming a part of this specification, in which—

Figure I is a vertical section through a

steam-trap constructed according to my invention, and Fig. II is an enlarged detail of the escape-valve and its seat also shown in section.

Referring to the drawings and the letters of reference marked thereon, the main vessel A is made open at the top, with a removable cover B, that permits the insertion and removal of the float C and for access within the main vessel. The float C is made of metal or other suitable material, preferably ovaloid in form, and is provided with stems D and E, set in its axis and made integral therewith or permanently attached thereto. These stems D and E, which can be made reversible as to position, have conical points, as shown in Fig. II, and are adapted to fit and close the aperture F, through which water escapes from the chamber G into the waste-pipe H. The inlet-pipe I leads from any source where steam is condensed—as, for example, from a heater J—and forms a conduit for the water of condensation which enters the chamber G through the passage K around the stem D. The float C being guided vertically by the stems E and D leaning or touching lightly against the guideways at the top and bottom is practically without friction and is free to be set in revolution by the whirling motion of the escaping water. The nipple L, screwed into the bottom of the vessel A, is provided with a seat for the conical pointed stem E and above the aperture F forms a guide for the stem E and has at this point a bore large enough to form a passage-way around the stem for the escaping water.

The operation of the trap is as follows: When the float C is at the bottom position, as shown in the drawings, and the valve at F is closed, water enters the chamber G from the pipe I and gradually fills this chamber up to some predetermined level—to the line M, for example—at which point the buoyancy of the float overcomes its gravity and any pressure tending to hold the valve at F closed. The float C then rises, opening the passage F, permitting the accumulated water to escape through the pipe H. When the water in the chamber G has been discharged down to some predetermined level—the line N, for example—then the float C will have sunk so the

stem E will close the aperture F, and the chamber G begins to fill again. When the float C rises and the stem E is out of contact with the valve-seat F, the escaping water is set in
5 revolution by some cause not well understood, but common in all such cases, and the float C being in suspension and without appreciable resistance is also set in revolution by the whirling water, so that when the stem
10 E comes in contact with its seat there is a slight twisting and grinding action that maintains a perfect fit and avoids the leaking common to such valves.

The stems E and D are preferably made
15 uniform, so that in case either of them is worn or injured the other can be put into use by inverting the float C.

O is a cock for drawing off the contents of the vessel A and for any purpose required,
20 and P a valve to shut off the entering water or steam in case the trap-chamber has to be opened.

It will be understood that the water escaping through the pipe H can be discharged
25 against any pressure less than that in the chamber G, such difference being sufficient to cause a flow of the water in that direction. It will also be understood that the trap will operate, collect, and discharge liquid of any
30 kind under conditions analogous to those that have been described.

Having thus explained the nature and objects of my invention and the manner of applying the same, what I claim as new, and desire to secure by Letters Patent, is—

1. In a steam-trap, a main chamber having central inlet and outlet apertures at top and bottom respectively, with a valve-seat formed within the lower aperture and below the top thereof, in combination with a float having integral cylindrical stems D, E, in axial alignment, revolubly supported in said inlet and outlet apertures, the lower stem being conically pointed at its lower end, to fit said valve-seat formed in the outlet-aperture, and close
45 the same at low-water level in said trap, substantially as specified.

2. In a steam-trap, a main chamber having central inlet and outlet apertures at top and bottom respectively, with a valve-seat in the lower aperture, in combination with a float C having integral cylindrical stems D, E, in axial alignment, revolubly supported in said inlet and outlet apertures, said stems being alike, and conically pointed at the ends,
55 whereby the said float is made reversible, substantially as specified.

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Witnesses:

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