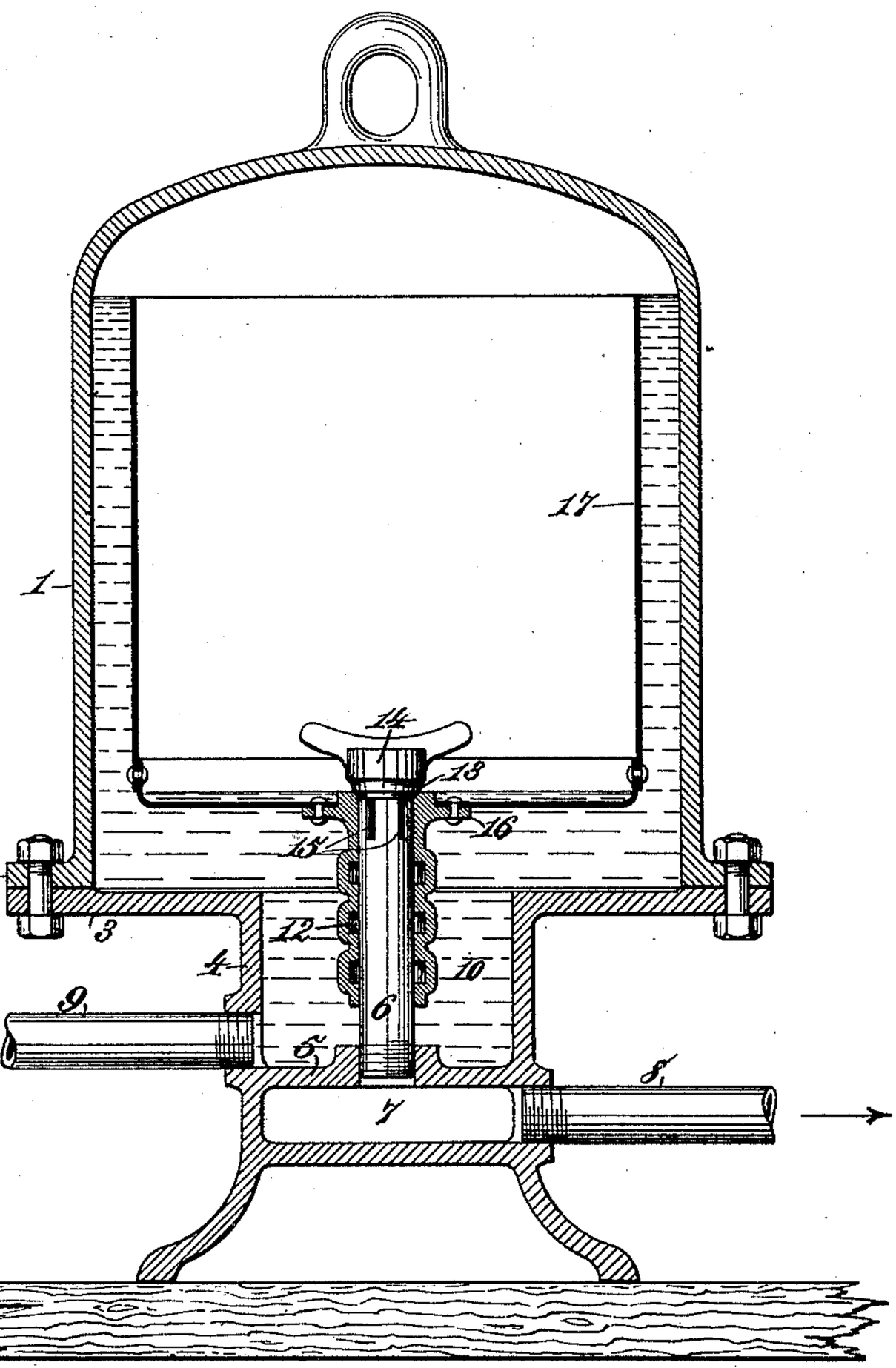
(No Model.)

B. THOENS.

STEAM TRAP.

No. 413,109. Patented Oct. 15, 1889.



WITNESSES

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BURCHARD THOENS, OF NEW ORLEANS, LOUISIANA.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 413,109, dated October 15, 1889.

Application filed May 13, 1889. Serial No. 310,531. (No model.)

To all whom it may concern:

Be it known that I, BURCHARD THOENS, a subject of the Emperor of Germany, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented new and useful Improvements in Steam-Traps, of which the following is a specification.

This invention has for its object to provide a novel steam-trap for discharging the water of condensation from radiators, steam-heating coils, and other steam apparatus; and the invention consists in the features of construction and arrangement of parts hereinafter described and claimed, reference being made to the accompanying drawing, in which the figure is a central vertical sectional view of a steam-trap embodying my invention.

In the said drawing the numeral 1 designates a closed casing or cap having substantially the form of a bell-glass and provided with a flange 2 upon its edge, by which it is bolted to a horizontal plate 3, formed with a central pendent chamber or well 4, having a bottom wall 5 in its lower portion and a chamber 7 below such wall. From the closed bottom 5 of this chamber rises a pipe 6, tapped through said bottom and communicating with a chamber 7, from which emerges an exit-pipe 8. An inlet-pipe 9 enters the well or chamber 4, and the pipe 6 rises to a point above the level of the seat 3, from which the well or chamber 4 depends. Surrounding the pipe 6 is a sleeve 10, having interior channels 12 to remove or diminish friction and to receive packing should the latter be necessary. This sleeve moves vertically upon the upright pipe 6, and is provided at its upper end with a valve-seat 13, which, as the sleeve rises, engages with a valve-plug 14, mounted on the end of said pipe. Immediately beneath this valve-plug openings 15 are cut in the end of the pipe, whereby water may flow into the chamber 7 below. Upon the upper end of the sleeve 10 is a flange 16, upon which is mounted a float 17, having an open mouth at its upper end, which in the elevated position of the sleeve lies nearly at the top of the casing 1. The float is composed of a cylindrical vessel, of sheet metal or other suitable material, of such size as to leave a small annular space between its circular wall and the wall of the casing.

The operation is as follows: The trap being empty, the float, with its sleeve 10, sinks down by gravity, leaving the passages 15 open or exposed. As steam enters by the inlet-pipe 9, the air is driven out of the trap, and the incoming water accompanying the steam gradually fills the well or chamber 4 and rises in the cap 1, thereby lifting the float until the openings 15 are closed by the sleeve 10, as shown in the drawing. As the water continues to enter, it rises around the float and enters the same by flowing over its top until the weight of water therein becomes sufficient to depress the float, whereupon the water passes through the openings 15, and thence through the chamber 7 into the outlet-pipe 8. If the water ceases to flow in, the steam will blow what remains in the float out through the pipe 6 until the float becomes light enough to rise and close the openings 15, after which the parts remain in that position until more water accumulates, when the operation is repeated. The well or chamber 4 serves to check the velocity or force of the inflowing water to some extent, thereby preventing it from exerting a violent upward movement upon the float. It is evident that the chamber 7 may be omitted and the exit-pipe 8 connected directly to the lower end of the upright pipe 6. The sleeve 10 is loosely fitted on the pipe 6, so that the trap empties itself after it is out of use, the remaining water leaking out between the sleeve 10 and the pipe 6. I also provide the trap with an ordinary form of air-cock on its highest part, so as to discharge any air which may accumulate during operation.

My improved construction of steam-trap differs from the prior apparatus having a pendent well and an open float in that the stationary vertical pipe rising from the bottom wall of the well extends above the plate which carries the bell-shaped casing, and is provided at its upper end with a stationary valve, while the sleeve, which slides up and down on the vertical tube, opens through the bottom wall of the float and is furnished inside the float with a valve-seat. This specific construction provides a novel and useful apparatus wherein the valve is balanced, while the float is not collapsible. There are no stuffing-boxes. A large discharge is provided. It is simple, re-

liable, and inexpensive. The outlet is water-sealed immediately when the device is worked. It operates equally well at any pressure. It blows the air out when starting and empties itself when stopping.

What I claim is—

A steam-trap consisting of a horizontal plate formed with a central pendent well having a bottom wall, a closed bell-shaped casing surmounting the horizontal plate, a float located in the bell-shaped casing and open at its top for the water to overflow thereinto, a vertical pipe secured to the bottom wall of the well, rising in the latter above its horizontal top plate and having its upper end provided with a fixed valve, and lateral orifices beneath the latter, a sleeve extending downward into the well from the bottom wall of the float, sliding up and down on the valved pipe and having its upper end opening through the said bottom wall of the float and there provided with a valve-seat, an inlet-pipe communicating with the well, and an outlet-pipe connected with the vertical pipe, substantially as shown and described.

In testimony whereof I have affixed my signature in presence of two witnesses.

BURCHARD THOENS.

Witnesses:
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SAMUEL GRIFFIN.