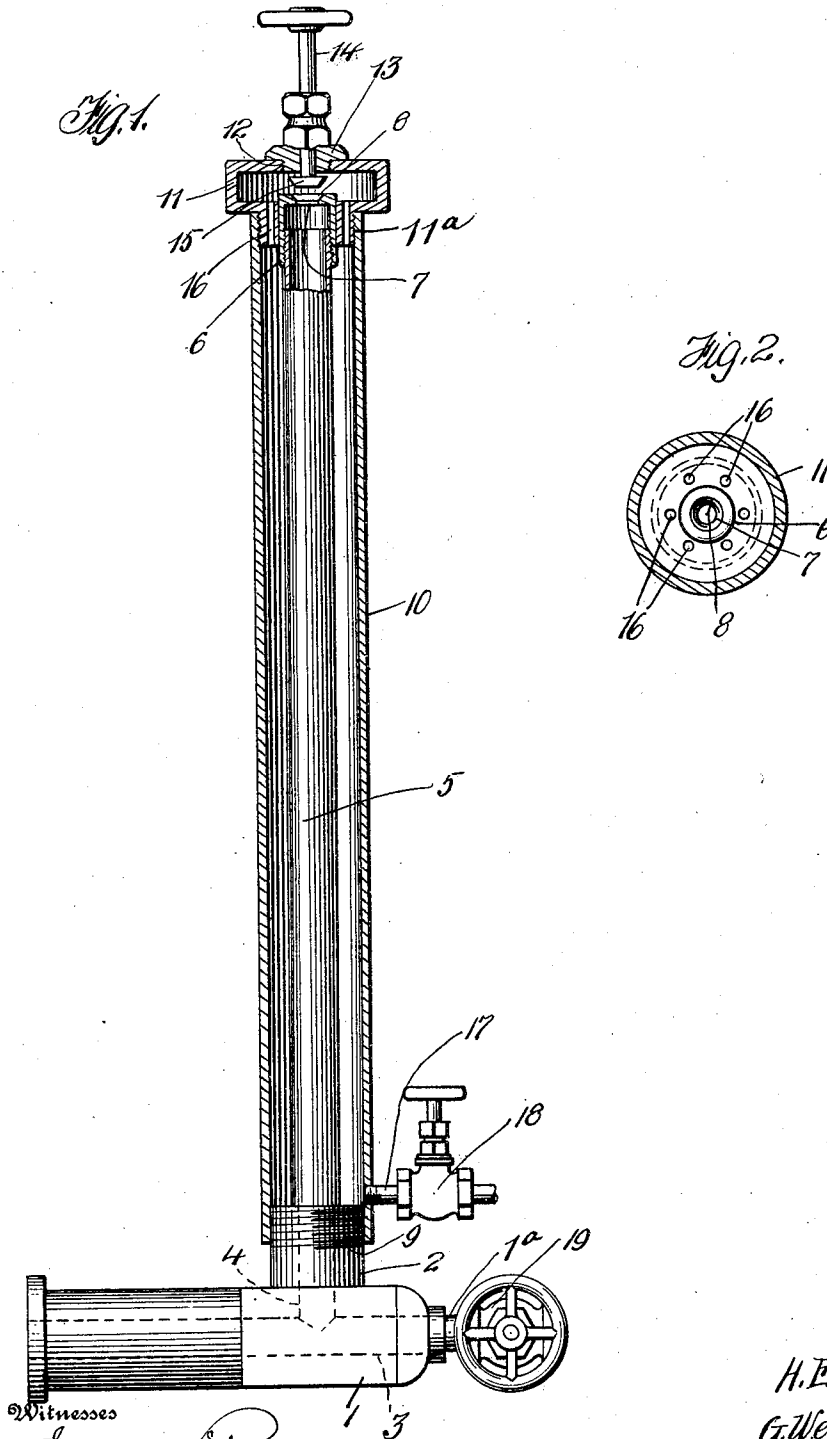


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STEAM TRAP.

APPLICATION FILED JUNE 25, 1909.

933,538.

Patented Sept. 7, 1909.



Witnesses

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# UNITED STATES PATENT OFFICE.

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## STEAM-TRAP.

933,538.

Specification of Letters Patent.

Patented Sept. 7, 1909.

Application filed June 25, 1909. Serial No. 504,319.

*To all whom it may concern:*

Be it known that we, HENRY ENZ and GUSTAVE WEINSCHENKER, citizens of the United States of America, residing at Allsworth, in the county of Westmoreland and State of Pennsylvania, have invented certain new and useful Improvements in Steam-Traps, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to steam traps, and the invention has for its object to provide simple and effective means for removing water from steam lines, cylinders and structures where water accumulates by condensation of steam, the condensate retarding the function of the steam, and in many instances impairing the structure in which the water accumulates.

Our invention aims to provide an automatic steam trap wherein an expansible tube is employed in connection with a valve and steam pressure for ejecting condensate from the trap.

With the above and other objects in view which will more readily appear as the invention is better understood, the same consists in a novel construction, combination and arrangement of parts to be hereinafter described in detail and claimed.

Reference will now be had to the drawing forming a part of this specification, wherein there is illustrated a convenient embodiment of our invention, and in which:—

Figure 1 is an elevation of the steam trap partly broken away and partly in section, and, Fig. 2 is a horizontal sectional view of the steam trap.

Referring to the drawings in detail, 1 denotes an annular cylindrical member provided with a bore 3 adapted to communicate with a boiler (not shown), the bore 3 extends from end to end of the member 1 and has opening therein a right-angularly disposed port 4. Formed integral with and projecting at right angles to the member 1 is a nipple 2 having exterior threads 9, the said nipple 2 communicating with the bore 3 through the medium of the port 4. The outer end of the member 1 is provided with a nipple 1<sup>a</sup> which opens into the bore 3 and also communicates with a blow-off valve mechanism 19.

Mounted in the nipple 2 and communicating with the port 4 is a vertically extend-

ing expansible tube 5 carrying on its upper end a shiftable cap 6 formed in its top with an opening 7, the wall of said opening 7 being beveled to constitute a valve seat 8. Connected to the threads of the nipple 9 is an elongated vertically extending tubular casing 10 which incloses the pipe 5 and has its upper end formed with interior threads to which is secured the depending extension 11<sup>a</sup> of a valve casing 11, the latter being mounted directly upon the top edge of the casing 10. The extension 11<sup>a</sup> has its inner diameter such as to provide a passage through which extends the cap 6 and the diameter of such passage is such as to allow of the shifting of the cap 6 when occasion so requires. The depending extension 11<sup>a</sup> of the valve casing 11 is formed with a plurality of circumferentially arranged vertically disposed ports 16 for establishing communication between the interior of the casing 10 below the extension 11<sup>a</sup> and the interior of the valve casing 11. The top wall of the valve casing 11 is provided with a centrally disposed opening 12 having the wall thereof screw-threaded and connected to the threads of the wall of said opening 12 is a plug 13 having a centrally disposed passage through which extends a valve stem 14 carrying on its lower end a beveled valve 15 adapted to engage the seat 8. The plug 13 has a portion of the wall of the passage thereof threaded (not shown), the stem 14 is also threaded, such arrangement provides for the adjustability of the stem 14. As this is such a well known construction, it is thought unnecessary to illustrate it.

Secured to and communicating with the interior of the casing 10 at a point in proximity to the top edge of the nipple 2 is an outlet pipe 17 which has attached thereto a globe valve 18.

The operation of the device is as follows: The steam passing through the member 1 and into the tube 5 will cause the said tube to expand and further shift the cap 6 upwardly so that the seat 8 will be engaged with the valve 15 whereby the opening at the upper end of the tube 5 will be closed so as to shut off communication between the valve casing 11 and the interior of the casing 10 through the ports 16. Should the steam condense and a quantity of water accumulate in the tube 5, a contraction of the tube immediately takes place, pressure being re-

lieved upon the cap 6, the latter moves downwardly so that the seat 8 will be shifted from the valve 15, the steam is then immediately blown into the valve casing 11 and from there passes through the ports 16 into the casing 10, and the steam accumulates if the valve 18 is closed, if the latter is open, the steam is discharged through the pipe 17. The operation of the steam trap can be controlled through the medium of the valves 15 and 18, as is evident, while the sediment and other foreign matter that might accumulate in the bore 3 can be blown off by the valve 19.

The tube may be made of any suitable material which is capable of expansion and contraction, while the other elements of the trap can be constructed of strong and durable metal, which is not readily susceptible to the action of heat and cold.

Having now described our invention, what we claim as new is:—

1. A steam trap comprising a member having a bore adapted to communicate with the boiler, an elongated tubular casing supported by said member, an expansible and contractible tube communicating with said bore and arranged within said casing, a valve casing mounted upon said tubular casing and provided with a depending extension projecting into said tubular casing, a shiftable cap mounted upon said tube and interposed between the extension and the tube and provided with a valve seat, said extension provided with ports for establishing communication between the valve casing and the tubular casing, and a valve supported by the valve casing and adapted to be engaged by said seat for shutting off communication be-

tween the valve casing and the tubular casing, and an outlet for the tubular casing.

2. A steam trap comprising an expansible and contractible tube adapted to communicate with the boiler, a tubular casing inclosing said tube, a shiftable cap mounted upon the upper end of said tube and provided in its top with a valve seat, a valve casing provided with means for establishing communication between it and said tubular casing, and a valve carried by the valve casing and adapted to be engaged by said seat when the cap is shifted in one direction for shutting off communication between the valve casing and the tubular casing.

3. A steam trap comprising an expansible and contractible tube adapted to communicate with a steam boiler, means for supporting the lower end of said tube, a tubular casing surrounding said tube and provided with an outlet, a valve casing provided with means to constitute a plurality of ports for establishing communication between the valve casing and the tubular casing, a shiftable cap mounted upon the tube and provided with a valve seat, and a valve carried by the casing and adapted to be engaged by said seat whereby communication is shut off between the tube and the valve casing and between the valve casing and the tubular casing.

In testimony whereof we affix our signatures in the presence of two witnesses.

HENRY ENZ.

GUSTAVE WEINSCHENKER.

Witnesses:

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