

F. W. WANDLESS.
STEAM TRAP.
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1,407,009.

Patented Feb. 21, 1922.

Fig. 1.

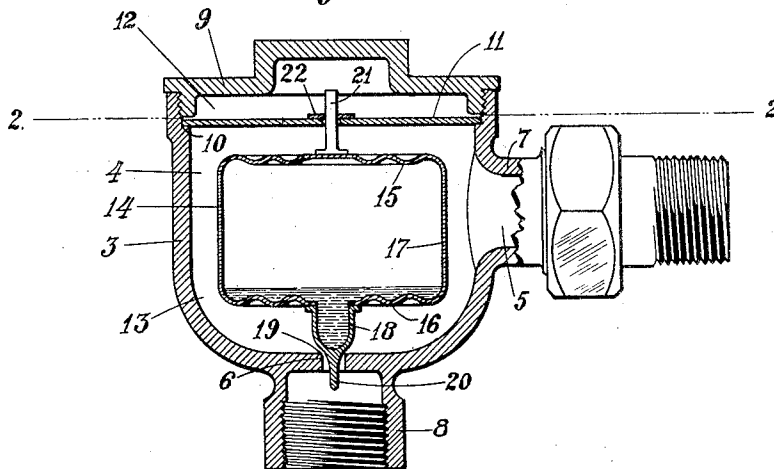
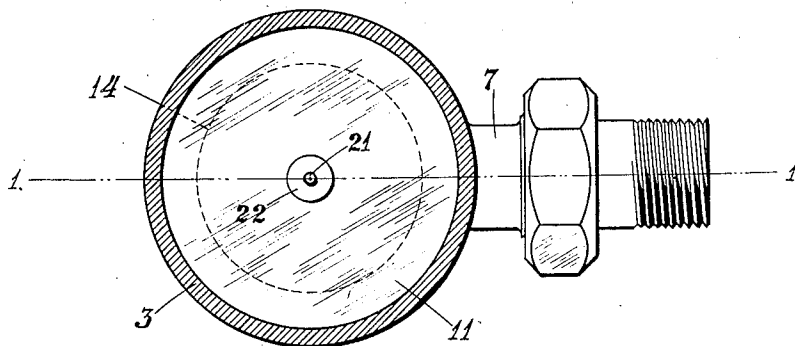


Fig. 2.



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1,407,009.

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To all whom it may concern:

Be it known that I, FRANKLIN W. WANDLESS, a citizen of the United States, residing at Berwyn, in the county of Chester and State of Pennsylvania, have invented certain new and useful Improvements in Steam Traps, of which the following is a specification.

This invention relates to improvements in steam traps particularly adapted for use in steam heating systems.

The object of the invention is to provide a combined thermal and float trap of novel, simple, efficient and sensitive construction which will permit air and water of condensation to pass from a radiator and prevent steam from passing therefrom.

With the above and related objects in view, the invention consists in the novel construction, combination and arrangement of parts hereinafter described and claimed.

In the accompanying drawings, illustrating the invention,

Figure 1 is a vertical section through my improved trap, on line 1—1 of Fig. 2.

Figure 2 is a horizontal section through the trap on line 2—2 of Fig. 1.

Referring to the drawings, 3 designates the body portion of the trap, which is formed of a hollow casting enclosing a chamber 4 having an inlet opening 5 in one side thereof and an outlet opening 6 in the bottom thereof. The inlet and outlet openings 5 and 6 extend through suitable projections 7 and 8 on the casting 3, which are adapted to be connected to inlet and outlet pipes leading to and from the trap, respectively.

The upper end portion of the casting forming the body 3 of the trap is interiorly threaded for the reception of the screw thread of a cap or cover 9 which is screwed on to the top of the body 3 to close the upper end thereof.

The body portion 3 has an annular ledge 10 formed therein near the top thereof to receive a horizontal partition plate 11 which is located above the inlet opening 5 and divides the chamber 4 into upper and lower compartments 12 and 13, respectively, and the plate 11 is held in place by and between the cap 9 and ledge 10.

Within the chamber 4 below the plate 11 is a hollow float 14 comprising top and bottom walls 15 and 16, respectively, connected by a cylindrical wall 17. The float 14 is

made air tight and air is exhausted therefrom before the sealing thereof to create a partial vacuum therein for a purpose hereinafter explained. The top and bottom walls 15 and 16 are provided with annular corrugations which permit the central portions thereof to separate under the influence of pressure within the float, and which permit the central portions thereof to move toward each other after the expansion of the float and the reduction of the pressure therein which caused the expansion thereof.

Secured to the central portion of the bottom wall 16 of the float 14 is a hollow valve 18 which is adapted to rest upon a seat 19 formed in the body 3 and surrounding the outlet opening 6 and thereby close the outlet opening. The valve 18 is provided with a downwardly-extending stem 20 which is loosely fitted within the outlet opening for guiding the valve 18 to its seat 19. The space between the stem 20 and the wall of the outlet opening 6 is sufficient to permit air and water to pass therethrough. The interior of the valve 18 communicates with the interior of the float 14, and the valve 18 and float 14 are provided with a suitable volatile liquid, such as water, which rests in the lower portion of the float 14 and fills the hollow valve 18 and which is very sensitive to heat and expands quickly under the influence thereof, by reason of the partial vacuum within the float 14.

Secured to the central portion of the top wall 15 of the float 14 is a vertical stem 21 which extends upwardly therefrom in axial alinement with the stem 20, valve 18 and float 14, and which is slidably fitted within a central aperture in the plate 11. The stem 21 is provided with a collar 22, which, when the float 14 is in its normal or unexpanded condition, rests upon the plate 11 and supports the float 14 and its valve 18 with the valve 18 in the position shown in Fig. 1, a slight distance above its seat 19. When the float 14 expands thereby separating its top and bottom walls 15 and 16, the valve 18 moves down until it engages and rests upon its seat 19, and, thereafter, as the float 14 continues to expand, the stem 21 rises and slides through the aperture in the plate 11.

The operation of the trap is as follows:

When the valve of the radiator, to which the trap inlet opening 5 is connected, is opened, the trap is in the normal condition

shown in the drawings and the incoming steam or vapor expels the air within the radiator through the slight opening between the valve 18 and its seat 19 and through the trap outlet opening 6. As the steam or vapor condenses, the condensation will flow from the bottom of the radiator to the trap and be discharged through the opening 6 until there is more condensation than the slight opening between the valve 18 and its seat 19 will take care of in the normal condition of the float 14. Then the water will rise in the trap and cause the float 14 to rise so that the discharge from the trap will be the full area of the space between the stem 20 and the wall of the opening 6, and this condition will continue until the radiator is full of steam, and steam enters the trap and acts upon the float 14 and the contents thereof and expands the same and thereby moves the valve 18 down against its seat 19 and prevents the discharge of steam or vapor from the radiator or trap. Thereafter, in the event of condensation coming to the trap from the radiator, the float will be immediately raised, thereby raising the valve 18 from its seat until the condensation is discharged through the opening 6, whereupon the gravity action of the float 14 will return the valve 18 to its seat 19 and again close the trap.

If steam should return to the trap through the opening 6 from any part of the heating system below the trap while the float 14 is contracted and the valve 18 is open, the steam will come into close contact with the hollow valve 18 and will act upon the volatile liquid therein very quickly and close the valve 18 immediately and thereby prevent any more steam from entering the trap from any part of the heating system below the same.

I claim as my invention:—

1. In a trap, a body portion enclosing a chamber and having an outlet opening in the bottom thereof provided with a valve seat and having an inlet opening therein above said outlet opening, an expansible and contractible float in said chamber, a valve carried by said float and adapted to close said outlet opening, a part carried by the casing above the float and having an aperture therein, a stem connected to the float and extending upwardly therefrom and through said aperture, and a collar on said stem adapted to engage said part and support said float and said valve in a position with said valve out of contact with said seat when said float is in normal condition.

2. In a trap, a body portion enclosing a chamber and having an outlet opening in the bottom thereof provided with a valve seat and having an inlet opening therein above said outlet opening and having a ledge formed therein above said inlet opening, a plate resting on said ledge and having a central aperture therein, a cap screwed on to the top of the body portion and closing the top of the chamber and maintaining said plate in place between it and said ledge, an expansible and contractible float in said chamber beneath said plate, a valve carried by said float and adapted to close said outlet opening, a stem connected to the float and extending upwardly therefrom through and slidably fitted to said aperture, and a collar on said stem above and adapted to rest upon said plate and support said float and said valve in a position with said valve out of contact with said seat when said float is in normal condition.

In testimony whereof I affix my signature hereto.

FRANKLIN W. WANDLESS.