No. 638,537. Patented Dec. 5, 1899.

C. H. WHITAKER.

STEAM TRAP.

(Application filed Aug. 9, 1899.)

(No Model.)

Fig. 1.

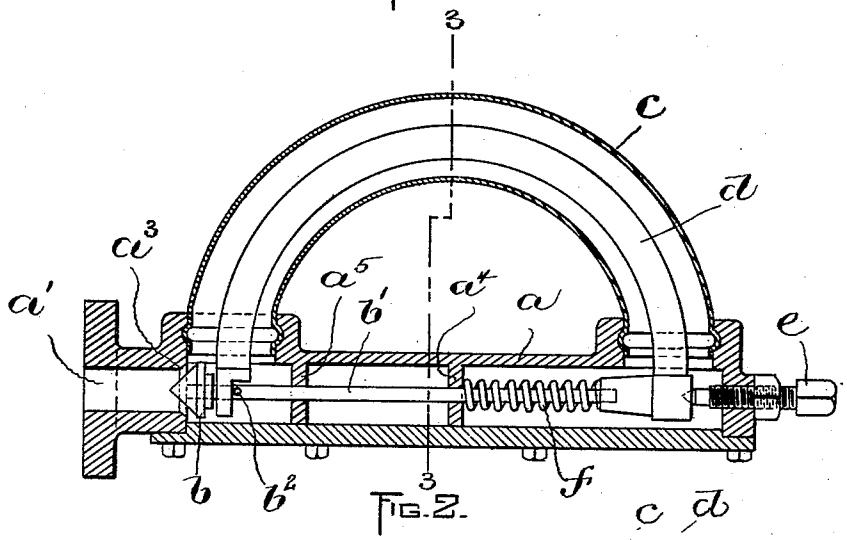
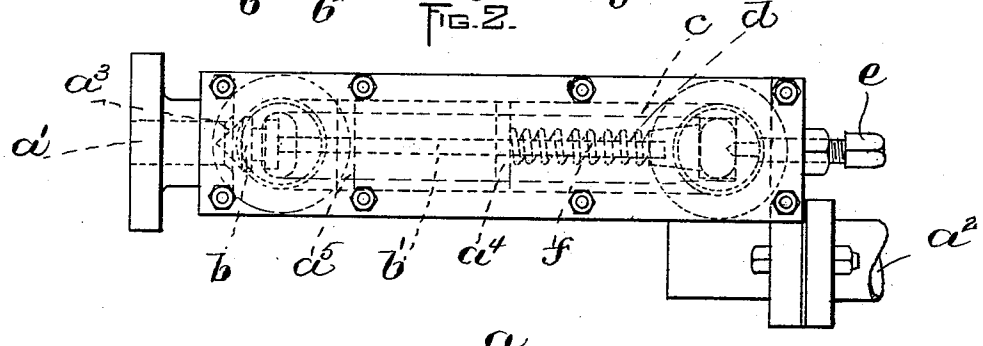


Fig. 2.



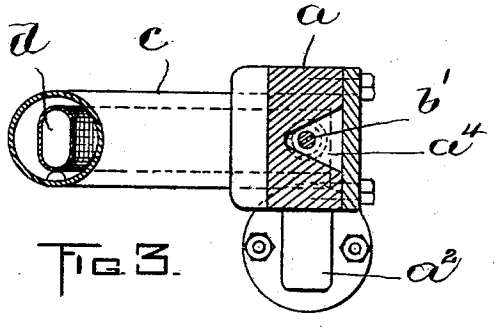


Fig. 3.

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UNITED STATES PATENT OFFICE.

CHARLES H. WHITAKER, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO ALFRED C. WHITING, OF BURLINGTON, VERMONT.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 638,537, dated December 5, 1899.

Application filed August 9, 1899. Serial No. 726,684. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. WHITAKER, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Steam-Traps, of which the following is a specification.

This invention relates to steam-traps of the kind which employ a thermostatic device for operating the valve; and it has for its object to improve traps of the kind specified by rendering them more delicate and sensitive in operation than heretofore.

The invention consists in the improvements which I shall now proceed to describe and claim.

Of the accompanying drawings, Figure 1 represents a horizontal sectional view of a steam-trap constructed in accordance with my invention. Fig. 2 represents a side elevation thereof. Fig. 3 represents a transverse section on the line 3 3 of Fig. 1.

The same reference characters indicate the same parts in all of the figures.

Referring to the drawings, *a* designates an elongated hollow casing composed of cast-iron or other suitable material and having at one end an inlet a' and at the other end an outlet a^2 for the steam and water of condensation. A valve-seat a^3 surrounds the inlet a', and a valve *b*, located in the casing *a*, near one end of the latter, opens and closes against said valve-seat.

c represents a substantially semicircular shell of annular cross-section jointed into the casing *a*, near the ends of the latter, and containing a thermostat *d* of corresponding semicircular shape, the ends of which enter the casing *a*, as shown. The valve *b* is attached to the end of a valve-stem b', which is stepped loosely at its rear end in a socket at that end of the thermostat *d* which is nearest the outlet a^2. A suitable adjusting device, such as the screw *e*, bearing against the said end of the thermostat, is provided, and a spring *f*, surrounding the valve-stem b' and interposed between an abutment a^4 on the interior of the casing *a* and the end of the thermostat *d*, presses the latter against the adjusting-screw *e*. The end of the thermostat *d* nearest the inlet a' is engaged with the valve-stem b' between the valve *b* and a pin b^2 on said stem, so that movements of the said end of the thermostat longitudinally of the casing *a* will operate to open and close the valve with respect to the valve-seat a^3. I prefer to employ as a thermostat the well-known Bourdon tube, consisting of a closed metallic tube of oval shape in cross-section, as shown in Fig. 3, containing a liquid, this being a particularly sensitive and durable form of thermostat. a^5 designates a partition extending across the casing *a* and practically closing the same against the passage of steam or water of condensation, the said partition having an aperture formed in it large enough to admit the valve-stem b' loosely without permitting the passage of any appreciable amount of fluid. By means of this construction I cause the steam and water of condensation passing through the trap to follow the course of the shell *c*, so that the whole amount of fluid passing through is carried into contact with the Bourdon tube *d*.

The operation of the described form of steam-trap is as follows: The action of the Bourdon tube *d* normally holds the valve *b* open. The advancing steam, upon entering the casing *a* and shell *b*, heats the Bourdon tube and causes its ends to spread and close the valve, thereby preventing the further entrance of steam into the trap. As soon as this occurs the heat from the steam which is already in the trap begins to radiate from the walls of the shell *c* and causes the steam to condense. The consequent cooling of the Bourdon tube causes the latter to contract and open the valve *b*, permitting the water of condensation which has accumulated in the system with which the trap is connected to escape through the trap. The reëntering steam then closes the valve, as before. In order to obtain the best radiating efficiency from the shell *c*, the latter should be composed of thin metal, preferably brass, which will readily conduct the heat from the interior of said shell and dissipate it in the surrounding atmosphere, and it will be noted that by employing a shell constructed and arranged as described with relation to the thermostat and the casing *a* I reduce to a minimum the dead space surrounding the thermostat and obtain a maximum radiating-surface for the shell.

At the same time by causing both the steam and water of condensation to pass directly around the Bourdon spring the latter is caused to respond more quickly to changes in temperature.

I claim—

1. A steam-trap comprising an elongated casing having an inlet at one end, an outlet at the other end, a valve-seat surrounding said inlet, and a transverse partition substantially closing said casing as a fluid-passage, a valve adapted to open and close against said seat and having a stem extending longitudinally of said casing and traversing the partition, a substantially semicircular shell jointed at its ends to said casing and composed of thin metal adapted to quickly dissipate heat from the interior of the shell, and a thermostat of substantially semicircular shape inclosed in said shell and having its ends in the casing, one end being connected with and adapted by its movements to operate the valve.

2. A steam-trap comprising an elongated casing having an inlet at one end, an outlet at the other end, and a valve-seat surrounding the inlet, a valve adapted to close against said valve-seat, a substantially semicircular shell jointed at its ends to said casing and composed of thin metal adapted to quickly dissipate heat from the interior of the shell, and a thermostat of substantially semicular shape inclosed in said shell and having its ends in the casing, one end being connected with and adapted by its movements to operate the valve.

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

CHARLES H. WHITAKER.

Witnesses:

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