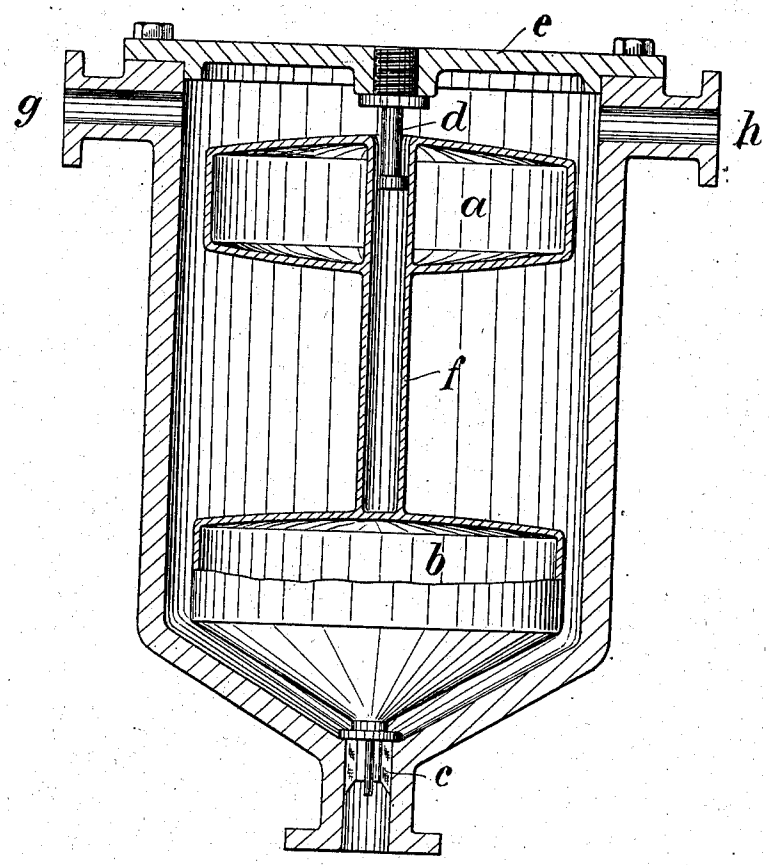
No. 729,679. PATENTED JUNE 2, 1903.

V. SCHWANINGER.

STEAM TRAP.

APPLICATION FILED DEC. 23, 1901.

NO MODEL.



Witnesses
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 729,679. Patented June 2, 1903.

UNITED STATES PATENT OFFICE.

VITUS SCHWANINGER, OF OGGERSHEIM, GERMANY.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 729,679, dated June 2, 1903.

Application filed December 23, 1901. Serial No. 87,017. (No model.)

To all whom it may concern:

Be it known that I, VITUS SCHWANINGER, a subject of the King of Bavaria, residing and having my post-office address at Oggersheim, in the Palatinate, Germany, have invented certain new and useful Improvements in Steam-Traps, of which the following is a specification.

This invention has for its object to provide a steam-trap which without the aid of lever connections or compound mechanism of any sort opens and closes the outlet-valve at the required moment solely by means of the lift of a twin float.

The accompanying drawing illustrates a trap constructed according to this invention in vertical section.

Two floats *a* and *b* are arranged one above the other and are rigidly connected together to form a whole element. The sizes of the floats are so calculated that the upward lift of the lower one, *b*, just suffices to support the dead-weight of the twin float plus the weight of the valve-cone *c*, attached to the bottom of the same, when the lower float alone is in the water, or, in other words, when the level of the fluid-surface is not high enough in the trap to also impart a lifting action to the upper float *a*. However, the lifting power of the lower float alone is not sufficient to overcome the force of the steam-pressure in the trap tending to keep the valve of the same closed. To overbalance this downward force, the additional lifting force of the upper float *a* is required. The guiding of the float in a vertical direction may be accomplished in any suitable manner. In the example of construction shown in the drawing a vertical pin *d* is screwed firmly into the cover *e* of the trap and projects down into the tube *f*, this latter serving at the same time as a connection between the two floats *a* and *b*. The guiding of the lower end of the twin float is effected by the ribs of the water-outlet valve *c*.

The action of the above-described apparatus is as follows: The steam flowing from *g* to *h*, or vice versa, conveys its products of condensation to the trap until this latter is nearly full—*i. e.*, until both float-bodies are immersed in fluid. Their combined upward force causes the valve *c* to open. Although as the water now escapes its surface sinks below the upper float-body *a*, the valve *c* nevertheless still remains open and can only close when the water-level has sunk low enough to cause the lifting power of the lower float-body to be reduced to a minimum. An example will best serve to support this statement of facts. Let the dead-weight of the twin float *a b* be two kilograms, the steam-pressure on the valve at *c* six kilograms, and the lifting force of the lower float-body *b* alone five kilograms. In this case the carrying power of the float-body *b* is greater than the float-weight tending to keep the valve closed by three kilograms, but is, however, not great enough to overcome the steam-pressure acting on the valve as well. It is therefore necessary that a further lifting force, supplied through the intermediary of the upper float-body, of at least three kilograms come into play in order to effect the opening of the valve. As the water escapes at *c* the twin float with the valve-cone remain in a raised position, even when the water has sunk below the upper float-body, for the lifting force of five kilograms of the lower float-body alone is quite sufficient for this, as the float-weight was assumed to be only two kilograms, and only when the trap is nearly entirely emptied and the lifting force has sunk below two kilograms does the valve-cone fall back onto its seat, and the operation repeats itself afresh.

Although the general arrangement of the above-described steam-trap is in itself extraordinarily simple, rendering the apparatus cheap to manufacture and obviating, apart from an occasional regrinding of the valve, all necessity of repairs, still further advantages of working are obtained by its employment. The trap can be coupled in direct into the steam-pipe, its condensed water running away at the bottom. The accumulation of mud, which, as is well known, often interferes with the working of apparatus of this description, is rendered a matter of impossibility. At the same time this trap can force the precipitated water to any height corresponding to the pressure of the steam.

I declare that what I claim is—

In a steam-trap the combination with a chamber having an inlet and outlet for vapor and an outlet for water at the bottom thereof closed by a valve, of a twin float in said

chamber connected to and adapted to open and close the valve by its rise and fall, said twin float consisting of two floats arranged one above the other, and rigidly connected together by means of a tube and means for vertically guiding the float in the chamber consisting of a vertical pin attached to the cover of the chamber and extending into said tube and ribs on said valve, substantially as described.

In witness whereof I have signed this specification in the presence of two witnesses.

VITUS SCHWANINGER.

Witnesses:

JACOB ADRIAN,

H. W. HARRIS.