

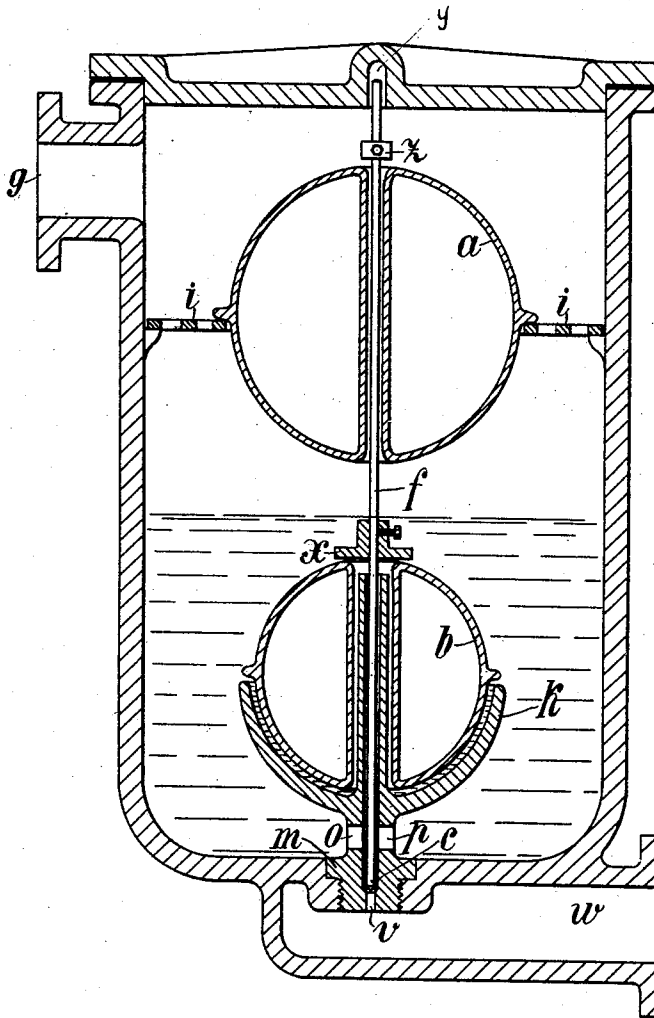
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V. SCHWANINGER.
STEAM TRAP.

APPLICATION FILED DEO. 9, 1903.

NO MODEL.



Witnesses.

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UNITED STATES PATENT OFFICE.

VITUS SCHWANINGER, OF OGGERSHEIM, NEAR MANNHEIM, GERMANY.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 771,398, dated October 4, 1904.

Application filed December 9, 1903. Serial No. 184,431. (No model.)

To all whom it may concern:

Be it known that I, VITUS SCHWANINGER, a subject of the German Emperor, residing at Oggersheim, near Mannheim, in the Palatinate, Empire of Germany, have invented certain new and useful Improvements in Steam-Traps, of which the following is a specification.

This invention relates to steam-traps.

In former steam-traps the discharge-valve for condensed-steam water only opens when the float acting upon it is partly surrounded by water—to wit, possesses a correspondingly large buoyancy. When working is stopped, as is the case at night, the condensed steam contained in the steam-conduit will collect in the steam-trap. However, the discharge-valve of the latter will, as stated above, not be opened till the float is correspondingly encircled by water. As the condensed-steam water flows very slowly and in very small quantities into the trap, the level of liquid contained therein also will rise very slowly and probably not reach the upper float part at all or only after several hours. Consequently in winter the water may freeze up in the trap. This drawback is effectively avoided by the present improvement, inasmuch as during the time when steam is shut off from the steam-conduit—*i. e.*, as soon as overpressure ceases in the steam-trap in consequence of the steam condensing—the discharge-valve is opened and caused to remain so for the purpose of completely discharging the condensed steam.

The accompanying drawing illustrates a trap constructed according to this invention in vertical section. The principal feature of same consists of a cup *k*, partly surrounding the lower float part *b*, said cup *k* being rigidly connected to the valve-seat *m* or integral with the latter. This cup *k*, which always remains filled with water to a certain level, causes the lower float part *b* to rise as long as there is no considerable pressure in the trap on account of the buoyancy or upward movement imparted to it by the water contained in the cup *k*. Thereby the discharge-pipe *v* is opened, so that all the water contained in the trap may escape through valveway *v*, apertures *o* *p*, and pipe *w*. The top of the rod *f* is in-

closed and guided in a recess *y* in the top plate. When there is an increase of pressure in the trap, the pressure of the steam in the recess *y* upon the upper end of the spindle *f* tends to force the spindle down against the atmospheric pressure below said spindle in the pipe *w*, and in consequence the valve *y* will only be open when the upper part *a* is also partly surrounded by condensed water. In most cases it will be preferable not to fix the lower float part *b* to the float-spindle either, but to let it have a certain amount of play with regard to the latter. The part *b* then can operate the spindle *f* by means of a collar *x* on the latter, so that it influences the spindle *f* only during its upward movement.

For the purpose of really effectively attaining the operation of the trap, as described above, it will be preferable to discharge the valve-spindle *c* and the float-rod *f* from the weight of the upper float part *a*. For this purpose the latter is not fastened to the float-rod *f*, but rests upon a special seat *i* when the float is in its lower position. Thus the upper float part *a* will only be able to act upon the float-rod during its upward movement by abutting against the collar *z*, arranged on the latter. As the float-rod *f* now is not loaded by the upper part *a*, the buoyancy of the lower part *b*, imparted to the latter by the condensing-water contained in the cup *k*, will suffice the more for lifting the rod *f*, valve-spindle *c*, and for opening the valve *v* if the overpressure in the trap has ceased.

Having now fully described my invention, I declare that what I claim is—

1. In a steam-trap the combination with a chamber having inlet for vapor and an outlet for water closed by a valve, of a float arranged in said chamber consisting of an upper and lower part, a rod to which said float parts are loosely connected, with means for retaining the valve open by the lower float part on steam being shut off from the chamber, substantially as set forth.

2. In a steam-trap the combination with a chamber having inlet for vapor and an outlet for water closed by a valve, of a float arranged in said chamber consisting of an upper

and lower part, a rod to which said float parts are loosely connected, of a cup partially surrounding said lower float part containing condensed steam and adapted to retain the valve open on steam being shut off from the chamber, substantially as set forth.

3. In a steam-trap the combination with a chamber having inlet for vapor and an outlet for water closed by a valve, of a float arranged in said chamber, consisting of an upper and lower part, a rod to which said float parts are loosely connected, of a cup partially surrounding said lower float part containing condensed steam, with means for supporting the upper float when free of water.

4. In a steam-trap the combination with a chamber having inlet for vapor and an outlet for water closed by a valve, of a float arranged in said chamber consisting of an upper and lower part, a rod to which said float parts are loosely connected of a cup partially surrounding said lower float part containing con-

densed steam and a seat for receiving the upper float part when free of water.

5. In a steam-trap the combination with a chamber having inlet for vapor and an outlet for water closed by a valve, of a float arranged in said chamber consisting of an upper and lower part, a rod to which said float parts are loosely connected of a cup partially surrounding said lower float part containing condensed water and a seat for receiving the upper float part when free of water, of a collar fixed to the rod above the upper float part and a second collar arranged on the rod above the lower float part, both adapted to come up against said collars respectively when immersed in liquid.

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

VITUS SCHWANINGER.

Witnesses:

JACOB ADRIAN,
H. W. HARRIS.