

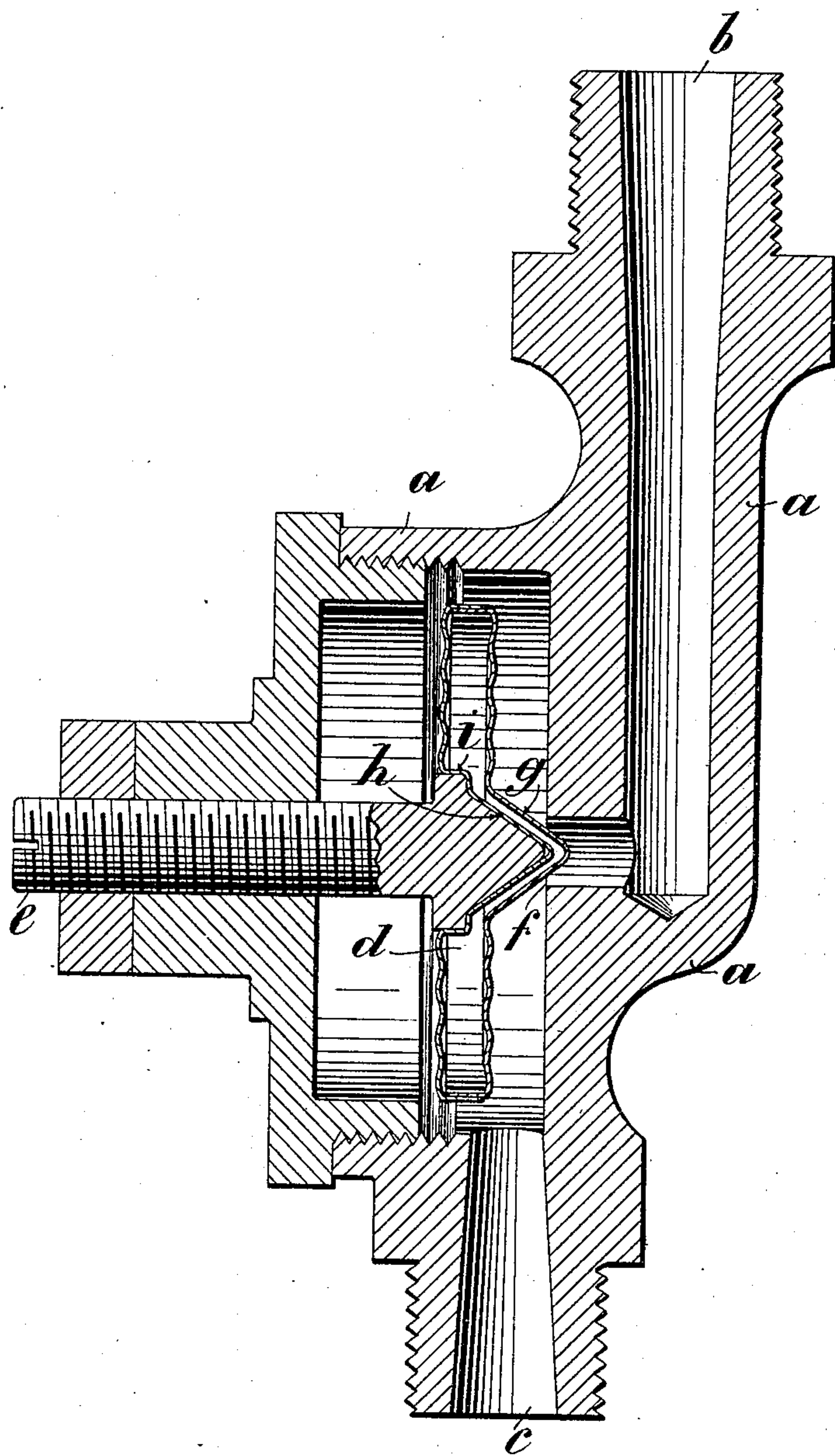
No. 773,688.

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W. M. STILL.
STEAM TRAP.

APPLICATION FILED APR. 26, 1904.

NO MODEL.



Witnesses:

Wm. Bingham
J. Edwards

Inventor:
William Mudd Still
per W. Lloyd Wise
Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM MUDD STILL, OF LONDON, ENGLAND.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 773,688, dated November 1, 1904.

Application filed April 26, 1904. Serial No. 204,952. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM MUDD STILL, a subject of the King of Great Britain and Ireland, residing at London, England, have invented Improvements in Steam-Traps, of which the following is a specification.

Steam-traps of the kind in which the discharge of water of condensation and steam is controlled by the contraction and expansion of fluid inclosed in a chamber one of whose walls is formed as a flexible diaphragm, with a hollow projection that serves as a valve to enter and control the discharge-orifice, are liable to become damaged owing to the adjusting-screw which regulates the position of the fluid-containing chamber being carelessly screwed so far in as to force the hollow valve against the seat around the orifice with such pressure as to permanently set back or distort the hollow valve or the diaphragm, or both. To obviate this, the opposite wall of the chamber to that formed with the hollow valve is formed with a depression or inwardly-extending projection of a form corresponding to the internal form of the hollow valve and the end of the adjusting-screw is made to fit into this depression or inward projection, the arrangement being such that should the screw be screwed too far in it will cause the hollow valve to abut against its seat and the depression or inward projection in the opposite wall to fit into the hollow valve, so that instead of the valve and diaphragm having to transmit the thrust it will be taken directly by the adjusting-screw, which will nip the walls of the hollow valve and the depression or inward projection between it and the valve-seat without distorting them. It is sometimes necessary that the fluid-containing chamber should be arranged on edge, the hollow valve moving toward and from its seat in an approximately horizontal direction, and in such cases it has been necessary to secure the fluid-containing chamber to the adjusting-screw by solder, because the clearance between the fluid-containing chamber and the casing or guiding-webs of the trap must be sufficient to provide for the diametrical expansion of the chamber, and this clearance is so great that if the chamber is loose and rest-

ing on its lower edge its hollow valve would not be coaxial with its seat during working. Moreover, by securing the fluid-containing chamber to the adjusting-screw as described it is prevented from adapting itself to its seat, and the heat required to effect the soldering tends to soften and take the spring out of the diaphragm. These disadvantages are also obviated by adapting the adjusting-screw to enter the depression or inward projection in the opposite wall of the chamber to that in which the valve is formed, and to thus support the fluid-containing chamber in such a position that its valve is always coaxial with its seat. The depression or inward projection and the end of the adjusting-screw may conveniently be conical, the outer part of the depression or inward projection being of enlarged diameter and cylindrical and the adjusting-screw being formed with a flange at the base of the cone that approximately fits the enlarged portion of the depression. With this arrangement the fluid-containing chamber is supported by the adjusting-screw with sufficient play to enable the valve to adjust itself into the seating, its proper position in relation thereto being also maintained even when the valve is not on its seat.

Steam-traps with the back walls of their fluid-containing chambers either rigid or in the form of flexible diaphragms may be constructed as hereinbefore described, and such a trap may be arranged so that the valve moves toward and from its seat either vertically or horizontally.

The accompanying drawing illustrates in central vertical section a steam-trap according to this invention.

a is the casing of the trap; *b*, the inlet thereto; *c*, the outlet therefrom; *d*, the fluid-containing chamber; *e*, the adjusting-screw, and *f* the valve-seat around the orifice to be closed.

The chamber *d* comprises front and rear walls each in the form of a flexible corrugated diaphragm. The front wall is fashioned with a hollow valve-cone *g*, to which the expansible fluid has access, and the rear wall is fashioned with a similar but inward projection or depression *h*, which is shown as having an enlarged outer part *i*. The inner end of the

adjusting-screw *e* is correspondingly formed and fits loosely into the depression *h* and its enlargement *i*.

The parts are shown in the position they occupy when the adjusting-screw has been set in approximately the correct position, and it will be seen from the drawing that if the screw be screwed farther in it will seat the valve *g* and push forward the inward projection *h* until it comes in contact with the inner surface of the hollow valve, any further movement then causing the walls of the projection *g* and *h* to be nipped between the seat *i* and the screw *e*, so that distortion of the valve *g* or its diaphragm will be prevented.

What I claim is—

1. In a steam-trap, the combination with a casing having an inlet and an outlet, of an expansible fluid-containing chamber one of whose walls is formed with a valve adapted to control the passage through the trap and whose opposite wall is formed with an external depression, and an adjusting-screw extending through the casing and whose inner end is adapted to loosely fit said depression, and hold said chamber in position, as set forth.

2. In a steam-trap, the combination with a casing having an inlet and an outlet, of an expansible fluid-containing chamber one of whose walls is fashioned with a hollow outwardly-projecting valve adapted to control the passage through the trap and whose opposite wall is provided with a correspondingly shaped and disposed inward projection and means for adjusting the relative positions of the valve and its seat, as set forth.

3. In a steam-trap, the combination with a casing having an inlet and an outlet, of an expansible fluid-containing chamber one of whose walls is fashioned as a hollow outwardly-extending valve adapted to control the passage through the trap and whose opposite wall is formed with a correspondingly shaped and disposed inward projection and an outer depression, and an adjusting-screw extending through the casing and whose inner end is adapted to loosely fit said depression and hold said chamber in position, as set forth.

4. In a steam-trap, the combination with a casing having an inlet and an outlet, of an expansible fluid-containing chamber arranged within said casing and having its opposite walls formed as flexible diaphragms with hollow projections correspondingly shaped and disposed and extending in the same direction, the outwardly-extending projection being adapted to act as a valve and control the passage through the trap, and an adjusting-screw which extends through the casing and whose inner end is adapted to loosely fit into the hollow inwardly-extending projection and hold said chamber in position, as set forth.

5. A steam-trap comprising a casing of shallow drum-like form, a central opening at one

end of the drum-like casing, an adjusting-screw extending through the opposite end of the drum-like casing, a shallow fluid-containing chamber one of whose walls has a valve adapted to control the passage through said opening and whose opposite wall is formed with an external depression into which the end of the adjusting-screw loosely fits so as to support the chamber in position, as set forth.

6. A steam-trap comprising a casing of shallow drum-like form, a central opening at one end of the drum-like casing, an adjusting-screw extending through the opposite end of the drum-like casing, a shallow fluid-containing chamber one of whose walls is fashioned with a hollow outwardly-projecting valve adapted to control the passage through said opening and whose opposite wall is fashioned with a correspondingly shaped and disposed inward projection and with an external depression into which the end of the adjusting-screw loosely fits so as to support the chamber in position, as set forth.

7. A steam-trap comprising a casing of shallow drum-like form, a central opening at one end of the drum-like casing, an adjusting-screw extending through the opposite end of the drum-like casing, a shallow fluid-containing chamber having its opposite walls formed as flexible diaphragms with hollow projections correspondingly shaped and disposed and extending in the same direction, the outwardly-extending projection being adapted to act as a valve and control the passage through the trap and the inner end of the adjusting-screw loosely fitting into the hollow inwardly-extending projection and thus holding the said chamber in position, as set forth.

8. A steam-trap comprising a casing of shallow drum-like form, a central opening at one end of the drum-like casing, an upwardly-extending inlet-passage leading thereto, an adjusting-screw extending through the opposite end of the drum-like casing, a shallow fluid-containing chamber arranged on edge and having its opposite walls formed as flexible diaphragms with hollow projections correspondingly shaped and disposed and extending in the same direction, the outwardly-extending projection being adapted to act as a valve and control the passage through the inlet-opening and the inner end of the adjusting-screw loosely fitting into the hollow inwardly-extending projection and thus holding the said chamber in position, as set forth.

9. A steam-trap comprising a casing of shallow drum-like form, a central opening at one end of the drum-like casing, a shallow fluid-containing chamber having its opposite walls formed as flexible diaphragms with hollow projections correspondingly shaped and disposed and extending in the same direction, the outwardly-extending projection being adapted to act as a valve and control the passage through the trap, and an adjusting-screw

which extends through the casing and whose inner end is adapted to loosely fit into the hollow inwardly-extending projection and hold said chamber in position, said inward
5 projection being of enlarged diameter at its outer part and said adjusting-screw being formed with a flange adapted to occupy said enlarged part, as set forth.

10 10. A steam-trap comprising a casing of shallow drum-like form, a central opening at one end of the drum-like casing, a shallow fluid-containing chamber having its opposite walls formed as flexible diaphragms with hol-
15 low projections correspondingly shaped and disposed and extending in the same direction, the outwardly-extending projection being adapted to act as a valve and control the pas-

sage through the trap, and an adjusting-screw which extends through the casing and whose inner end is adapted to loosely fit into the
20 hollow inwardly-extending projection and hold said chamber in position, said hollow projections both being of conical form and said inward projection being of enlarged di-
25 ameter at its outer part and said adjusting-screw being formed with a flange adapted to occupy said enlarged part, as set forth.

Signed at London, England, this 13th day of April, A. D. 1904.

WILLIAM MUDD STILL.

Witnesses:

ALFRED NUTTING,
H. D. JAMESON.