

(No Model.)

E. E. GOLD.
GRAVITY STEAM TRAP.

No. 551,858.

Patented Dec. 24, 1895.

FIG. 1.

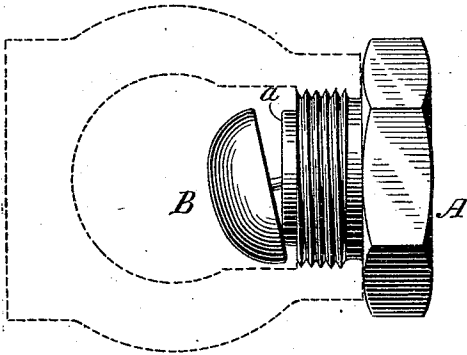


FIG. 2.

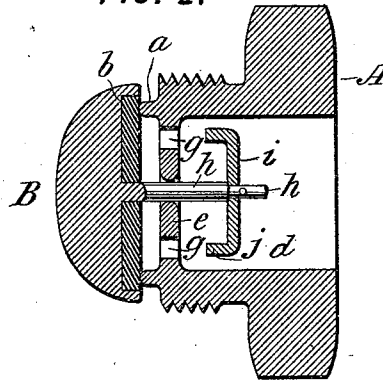


FIG. 3.

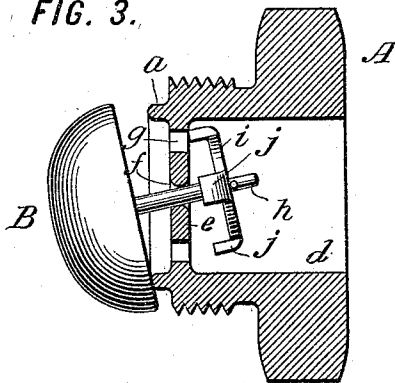


FIG. 4.

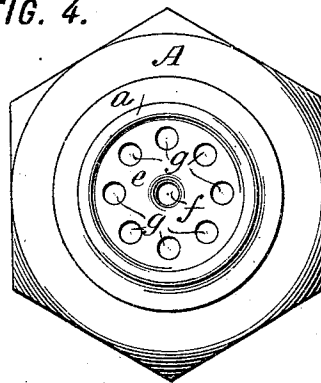
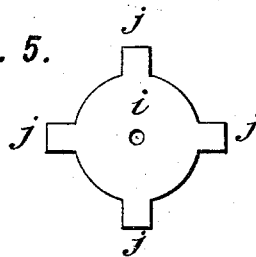


FIG. 5.



WITNESSES:

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GRAVITY STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 551,858, dated December 24, 1895.

Application filed June 1, 1894. Serial No. 513,190. (No model.)

To all whom it may concern:

Be it known that I, EDWARD E. GOLD, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Gravity Steam-Traps, of which the following is a specification.

This invention relates to dynamic traps or drainage-valves for draining off water of condensation from steam-pipes or vessels. The trap-valve is constructed to open outwardly, so that it is closed and held to its seat by internal pressure, but when the steam is turned off or the pressure ceases the valve opens automatically and drains out the accumulated water. Heretofore such dynamic traps have been constructed to be opened either by the tension of a spring acting to lift the valve bodily from its seat or by means of a counterweighted stem acting to tilt the valve on its seat and thereby open it. An example of the former construction is found in my Patent No. 472,116, dated April 5, 1892, and of the latter construction in my Patent No. 481,727, dated August 30, 1892.

My present invention has the same advantage as that in my last-mentioned patent, in that it avoids the use of a spring, but has the further improvement of avoiding the use of a heavy stem with a counterweight hung on its end to overcome the weight of the valve. Instead thereof the weight of the valve is used to open it, and a light stem may be employed having only sufficient strength to guide the valve.

According to my invention the trap consists of a body having an outlet-opening through it and formed with a seat on its inner side, and the valve is mounted on the inner side of the body to close outwardly against this seat, being supported in any suitable manner which will admit of its falling inwardly in opening, and being constructed with its center of gravity located inwardly from its support, so that its weight is utilized to impart to it a tendency to fall open.

Figure 1 of the accompanying drawings is a side elevation of my improved trap. Fig. 2 is a mid-section thereof showing it closed. Fig. 3 is a similar section showing it open. Fig. 4 is an end view from the inner side of

the trap-body. Fig. 5 shows the blank from which the baffle-disk is formed.

Referring to the drawings, let A designate the body or shell of the trap, which is constructed with an outlet-passage through it, and with a seat *a* on its inner side. The body A is preferably constructed with a screw-plug having a threaded neck to screw into a tapped hole in a steam-pipe or other vessel, as shown in dotted lines in Fig. 1, and a hexagonal head to facilitate screwing in the plug. It may, however, be constructed for attachment in any other way.

In the several figures, B is the valve-trap, which is located on the inner side and adapted to close outwardly against the seat *a*. It is preferably formed with a yielding face or gasket *b*, in order to facilitate the formation of a tight joint against the seat. The valve may be supported in any suitable manner from the body A, either by a support in the same plane as the seating face or by a support in a plane located farther outwardly than the seating face, or in a plane farther inwardly than the seating face. In either case the center of gravity of the valve B is located inwardly of the plane of the support, in order that the weight of the valve may cause it to fall away from the seat and thereby open itself inwardly.

In the preferred construction shown the valve-body A is formed with a large opening *d* through it, intercepted by a transverse partition or diaphragm *e*, having a central hole *f*, and a plurality of perforations *g g* around this hole. The valve B is formed with a valve-stem *h*, which passes loosely through the central hole *f*, so that by the combination of its hole and stem the valve is supported and guided. To keep the valve when it opens, as shown in Fig. 3, from falling by the sliding of the stem *h* through the hole *f*, a disk or plate *i* is attached to the stem, which when the valve opens strikes the inner face of the diaphragm *e* and serves as a stop. This disk or plate serves also the important purpose of a baffle-plate to facilitate the closing of the valve. Trap-valves of this character are expected to close automatically whenever a sufficient pressure of steam exists in the pipe or vessel to which they are

applied, the blowing out of the steam through the trap serving to quickly close it, and in order that a lower pressure of steam may thus suffice to close the trap than would be required if the action of the steam against the valve B was alone relied upon the baffle-plate *i* is provided, extending within the passage *d*, so as to stand somewhat in the path of the outflowing stream, and, by receiving the impulse thereof, to be blown outwardly and through the valve-stem to exert an outward impulse against the valve B. A baffle plate or disk having this function is illustrated in each of my two patents hereinbefore referred to, although in both cases the construction was different from that here illustrated. The disk *i* must be considerably smaller than the passage *d*, in order not to obstruct the outflow of water of condensation through the trap. When the valve is open, the outflow-passage should be sufficiently unobstructed to prevent a free flow, and for that purpose the body of the disk *i* should not be permitted to come close against the partition *e*, as thereby it would partially close some of the holes *g*, and to avoid this the disk is formed with four arms or projections *j*, stamped out originally as shown in Fig. 5, and then bent at right angles, as shown in Figs. 2 and 3, so that these arms will themselves strike the partition *e* and serve as the stops.

My invention may be considerably modified in construction without departing from its essential features, which are hereinafter defined in the claims.

I claim as my invention the following-defined novel features, substantially as hereinbefore specified, namely:

1. A gravity steam trap comprising a fixed body having a discharge-opening through it and a valve-seat on its inner side, and a movable valve closing outwardly against said seat, supported on said body and having its mass extended inwardly from said seat sufficiently to impart to it a tendency to fall open by its own weight a stem fixed to and projecting rigidly from said valve through said seat, and a baffle-disk fixed on said stem.

2. The combination to form a gravity steam trap, of a body A having a discharge opening *d* through it, and a seat *a* on its inner side, with a weighted valve B adapted to close out-

wardly against said seat and supported outwardly of its center of gravity so that it tends to fall open, a stem projecting from said valve, and a baffle-disk mounted on said stem and adapted to strike the body A when the valve is fully open to serve thereby as a stop for limiting the movement of the valve.

3. The combination to form a gravity steam trap, of a body A having a discharge opening *d* through it, and a seat *a* on its inner side, with a weighted valve B adapted to close outwardly against said seat and supported outwardly of its center of gravity so that it tends to fall open, a stem projecting from said valve, and a baffle-disk *i* mounted on said stem and formed with projections *j* adapted to strike the body A when the valve is fully open to serve thereby as a stop for limiting the movement of the valve, and to leave an outlet passage between the body and disk.

4. The combination to form a gravity steam trap, of a body A having a discharge opening *d* through it, a seat *a* on its inner side, a diaphragm *e* dividing said discharge opening, a central hole in said diaphragm, and perforations through it around said hole, with a weighted valve B arranged to close outwardly against said seat, and supported outwardly of its center of gravity so that it tends to fall open, and having a stem *h* projecting rigidly from it and passing loosely through said hole, whereby the valve is supported by the bearing of its stem in said hole.

5. The combination to form a gravity steam trap, of a body A having a discharge opening *d* through it, a seat *a* on its inner side, a diaphragm *e* dividing said discharge opening, a central hole in said diaphragm, and perforations through it around said hole, with a weighted valve B arranged to close outwardly against said seat, and having a stem *h* projecting rigidly from it and passing loosely through said hole to support the valve, and a baffle and stop disk *i* mounted on said stem.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

EDWARD E. GOLD.

Witnesses:

CHARLES K. FRASER,
GEORGE H. FRASER.