No. 726,155. PATENTED APR. 21, 1903.

L. B. FULTON.

STEAM TRAP.

APPLICATION FILED DEC. 9, 1902.

NO MODEL.

Fig. 1.

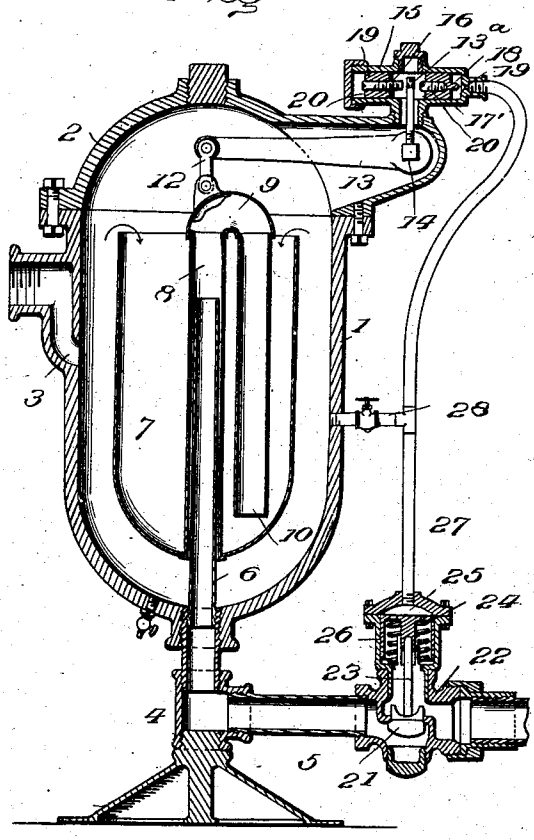


Fig. 3.

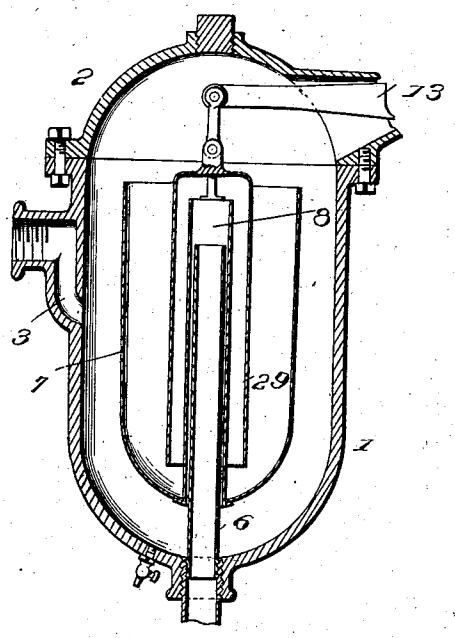


Fig. 2.

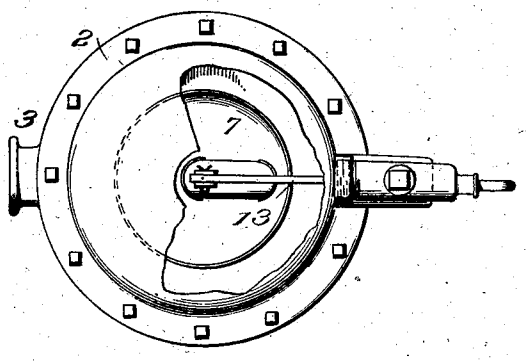
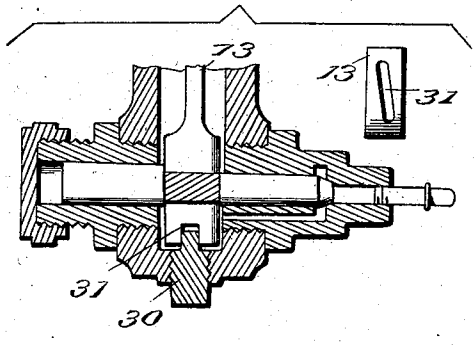


Fig. 4.



Witnesses

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By

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UNITED STATES PATENT OFFICE.

LOUIS B. FULTON, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO THE CHAPLIN-FULTON MANUFACTURING COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 726,155, dated April 21, 1903.

Application filed December 9, 1902. Serial No. 134,503. (No model.)

To all whom it may concern:

Be it known that I, LOUIS B. FULTON, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Steam-Traps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The primary object of this invention is to provide an improved, simple, and highly-efficient water-trap the outlet from which is controlled by a valve which is automatically periodically unseated by pressure taken from within the trap itself, such pressure unseating the valve as against the pressure of the discharge water, by which the valve is normally held to its seat.

A further object is to provide a trap of this character composed of but few parts and which will be automatic and positive in operation.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical longitudinal sectional view. Fig. 2 is a transverse sectional view through the valve-casing with portions of the trap-casing broken away. Fig. 3 shows a slight modification. Fig. 4 shows a modified form of pressure-controlling valve.

Referring to the drawings, 1 designates the trap-casing, having a removable top 2 and a side inlet-opening 3. The outlet-opening is connected by an elbow 4 to a discharge-pipe 5, and from this outlet-opening extends a perpendicular pipe 6, arranged centrally within casing 1, such pipe being open at its upper end.

7 is a bucket located within casing 1 and having a central tube 8, extending longitudinally therethrough and to which is connected at the top of the bucket by a U-piece 9 a downwardly-extended pipe 10, opening at its lower end near the bottom of the bucket. The bucket 7 is movable up and down within the casing, being guided in its movements by the pipe 6, which is telescoped by the tube 8. This pipe 6, together with the tube 8 and pipe 10, constitutes the water passage-way between the bucket and the discharge-pipe. The bucket is pivotally suspended by a link 12 from an arm 13, mounted on a cross-shaft 14, journaled in the sides of an extension of the top 2. This arm carries a tappet 13^a, shown in the form of a screw, extended through an opening in top 2 into a valve-casing 15. Within this casing is a longitudinally-movable pressure-controlling valve 16, having two guiding portions 17 at each side of its open center, one of these guiding portions being grooved longitudinally and formed with a reduced extension 18, designed to be seated over an outlet-port 19 in the end of the valve-casing. The valve carries two adjustable screws 20, with which the tappet is designed to engage, such tappet effecting the seating and unseating of the valve—that is, the closing and opening of the outlet-port—according as the bucket is in its raised or lowered position.

21 designates the discharge-controlling valve mounted in a casing 22 within the discharge-pipe 5. This valve is constructed after the form and has all of the characteristics of a valve of the kind pointed out in Letters Patent of the United States No. 662,488, issued to me November 27, 1900—that is to say, the valve is normally seated by pressure against its under side and is held away from its seat in emptying the trap by pressure acting downwardly thereon in opposition to the discharge-pressure. The valve-stem 23 engages a piston-like head 24, movable within a chamber 25 on the valve-casing and normally held at the upper limit of its movement by a spring 26, such spring aiding in holding the valve to its seat. Into this chamber opens a pressure-pipe 27, leading from the outlet-port 19 of the pressure-controlling valve 16. This pressure-pipe is connected at an intermediate point to the trap-casing by a valved by-pass 28.

In operation the bucket is normally held elevated, as shown in Fig. 1, under the buoyancy of water within the trap-casing, the valves 16 and 21 being seated. The water in rising in the trap-casing will overflow into the bucket and its weight will cause the lat-

ter to sink, pulling downwardly on the arm 13, and thereby through the action of the tappet effect the unseating of valve 16. This allows the pressure within the trap-casing to pass through the grooved head 17 and out through port 19 into the pressure-pipe and acting upon the piston of the discharge-controlling valve 21 effect the unseating thereof as against spring 26 and the pressure against the under side of the valve. The water within the bucket will be forced through the passage-way into the discharge-pipe 5. As soon as the bucket is sufficiently empty to allow it to rise under the buoyancy of the water within the trap-casing the tappet will effect the seating of the pressure-controlling valve, cutting off pressure against the top of the piston-like head 24 and allow of the immediate reseating of the discharge-controlling valve. Thus it will be seen that this latter valve is, as pointed out in my before-noted patent, automatically seated and unseated by pressures acting in opposite directions, one of such pressures being controlled by means operated by the water in the trap-casing.

In the event of the bucket or the pressure-controlling valve or any of the connecting parts becoming impaired or inoperative pressure may be admitted to the pressure-pipe through the by-pass 28.

The advantages of my invention are apparent. It will be noted that the parts are exceedingly simple and few in number, and hence are not liable to readily become deranged.

It is obvious that modifications may be made without departing from the scope of my invention. As shown in Fig. 3, instead of having the inlet to the passage-way for the water in the form of a pipe depending at one side of the center of the bucket the central tubular portion of the latter, which telescopes the pipe 6, may itself be telescoped by an outer pipe 29, between which and the said tubular portion 8 the water rises in passing to the outlet-pipe. This pipe 29 is shown as connected at its upper closed end to the arm controlling the tappet of the pressure-controlling valve.

Various forms of valves may be used for controlling admission of pressure to the pressure-pipe. For instance, in Fig. 4 I have shown this valve as itself forming the shaft for the bucket-arm, its seating and unseating being effected by a longitudinal motion imparted thereto by a screw 30, engaging a diagonal slot 31 in the end of the bucket-arm. It is obvious that as the bucket is lowered the valve will under the engagement between the screw and the slotted end of the arm be moved from its seat, while in the rising of the bucket such valve will be moved in the opposite direction to cut off further communication with the pressure-pipe.

I claim as my invention—

1. A trap having its casing formed with inlet and outlet openings, a discharge-pipe leading from the latter, a discharge-controlling valve within such discharge-pipe, designed to be positively seated and unseated by pressures acting in opposite directions, a valve for controlling one pressure medium, a bucket within the trap-casing, a water passage-way between the interior of the bucket and the discharge-outlet, such passage-way being movable with the bucket, and means actuated by the bucket for operating the said pressure-controlling valve, as set forth.

2. A trap having its casing formed with inlet and outlet openings, a discharge-pipe leading from the latter, a discharge-controlling valve within such discharge-pipe, the seating of such valve being effected by pressure against its under side, a movable body to which such valve is connected, a pressure-pipe leading from the trap-casing and opening at its other end adjacent to said movable body, a valve controlling admission to such pressure-pipe, a bucket within the trap-casing, a water passage-way between the interior of the bucket and the discharge-outlet, such passage-way being movable with the bucket, and means actuated by the bucket for operating the said pressure-controlling valve, as set forth.

3. A trap having its casing formed with inlet and outlet openings, a discharge-pipe leading from the latter, a discharge-controlling valve within such discharge-pipe, designed to be positively seated and unseated by pressures acting in opposite directions, a valve for controlling one pressure medium, a pipe extending perpendicularly from such outlet-opening, a bucket having a central tubular portion telescoping such latter pipe, a pipe forming in conjunction with the said perpendicular pipe and the said tubular portion a water passage-way between the bucket and the discharge-outlet, and means actuated by the bucket for operating said pressure-controlling valve, as set forth.

4. The combination with the trap-casing having inlet and outlet openings, and the valve in the discharge-pipe, of the perpendicular pipe extending from the discharge-outlet, the bucket having a central tubular portion telescoping said latter pipe, a second pipe within the bucket open at its lower end and at its upper end communicating with said tubular portion, a pressure-pipe leading from the trap-casing to the discharge-controlling valve to effect the unseating thereof, a pressure-controlling valve, a pivoted arm from which said bucket is suspended, and means for actuating the pressure-controlling valve, as the bucket is raised and lowered, as set forth.

5. The combination with the trap-casing having inlet and outlet openings, and the valve in the discharge-pipe, of the perpendicular pipe extending from the discharge-outlet, the bucket having a central tubular portion telescoping said latter pipe, a second

pipe within the bucket open at its lower end and at its upper end communicating with said tubular portion, a pressure-pipe leading from the trap-casing to the discharge-controlling valve to effect the unseating thereof, a pressure-controlling valve, a pivoted arm from which said bucket is suspended, said pressure-controlling valve having an open portion, and a tappet carried by said arm extended into said open portion for effecting the longitudinal movements of such valve, as set forth.

6. The combination with the trap-casing, the vertically-movable bucket, and the water passage-way movable with the bucket leading from the latter to the discharge-pipe, of a valve in such pipe normally held seated by pressure against its under side, a pressure-pipe leading from the upper portion of said casing to the discharge-controlling valve, a valve at the inlet end of such pressure-pipe, means actuated by the bucket for actuating such pressure-controlling valve, and a valved by-pass leading from such casing and opening into such pressure-pipe at a point intermediate the pressure-controlling valve and the discharge-pipe valve, as set forth.

7. The combination with the trap-casing, the vertically-movable bucket, and the water passage-way leading from said bucket to the discharge-pipe, of a valve in such pipe, a spring-pressed movable body to which such valve is connected, a chambered casing for such body, a pressure-pipe opening into such chambered casing above the said body, a pressure-controlling valve, a casing therefor in communication with the trap-casing, said pressure-pipe leading from such valve-casing, a rocking arm, a link suspending said bucket from said arm, and means for effecting the seating and unseating of such pressure-controlling valve in the rising and falling of the bucket, substantially as set forth.

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

LOUIS B. FULTON.

Witnesses:
M. B. CHAPLIN,
CHAS. W. TOWNSEND.