No. 754,747. PATENTED MAR. 15, 1904.

C. W. CLEWELL.

TRAP VALVE.

APPLICATION FILED DEC. 5, 1903.

NO MODEL.

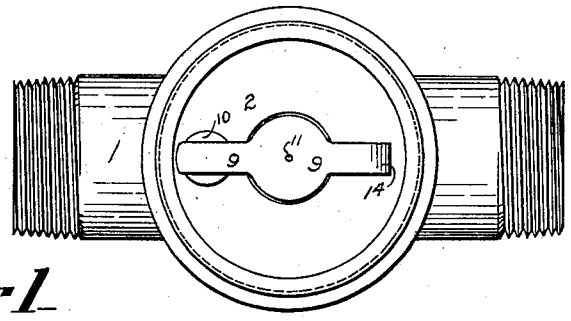


Fig 1.

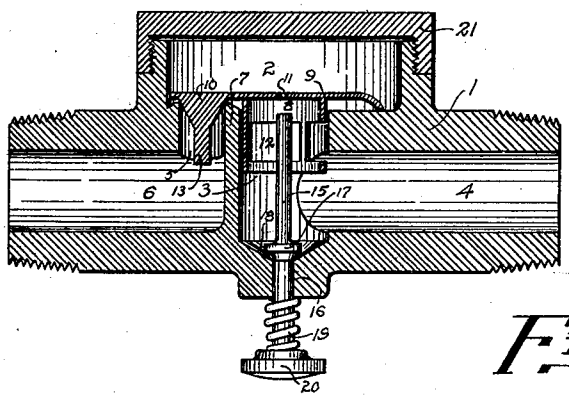


Fig 2.

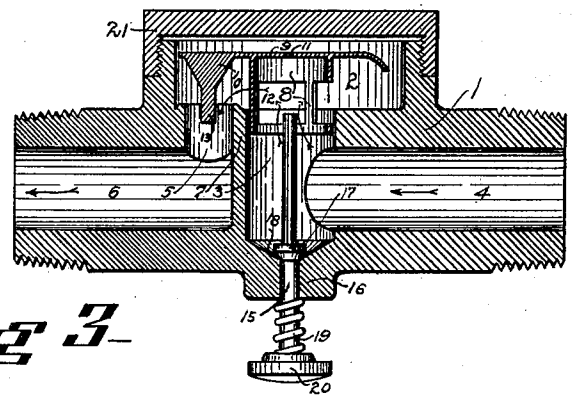


Fig 3.

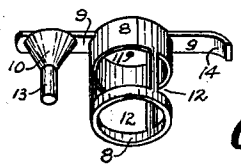


Fig 4.

WITNESSES

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No. 754,747. Patented March 15, 1904.

UNITED STATES PATENT OFFICE.

CHARLES WALTER CLEWELL, OF CANTON, OHIO.

TRAP-VALVE.

SPECIFICATION forming part of Letters Patent No. 754,747, dated March 15, 1904.

Application filed December 5, 1903. Serial No. 183,899. (No model.)

To all whom it may concern:

Be it known that I, CHARLES WALTER CLEWELL, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented a new and useful Trap-Valve, of which the following is a specification.

The invention relates to a trap-valve for use more particularly in connection with natural or other gases the flow of which is subject to be stopped without warning; and the object of the device is to prevent a resumption of the flow thus stopped by an automatic closing of the valve when the stoppage occurs and by utilizing a renewed pressure of the gas to hold the valve tightly shut until it is opened by an external manipulation or agency. I attain this object by the construction and mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of the valve-case with the cap removed, showing the trap; Fig. 2, a longitudinal section showing the valve closed; Fig. 3, a similar section showing the valve opened, and Fig. 4 a detached perspective view of the trap.

Similar numerals refer to similar parts throughout the drawings.

The case 1 is preferably formed as a tube or short section of pipe, with the trap-chamber 2 formed on the upper side. The preferably round and vertical trap-port 3 extends from the inlet-channel 4 to the bottom of the chamber, preferably near the middle, and the preferably round and vertical valve-port 5 extends from the outlet-channel 6 to the bottom of the chamber adjacent to the trap-port, with the partition 7 separating the inlet-channel and trap-port from the valve-port and outlet-channel.

The trap is composed of the vertical stem 8, the horizontal plate 9, and the valve proper, 10. The stem is preferably tubular in form and depends from the middle part of the plate, which extends across and closes its upper end, except for the small aperture 11, which is preferably provided in the plate. The stem is made slightly smaller than the trap-port, in which it is adapted to operate endwise and be guided, so that the gas can at all times leak around it from the inlet-channel into the trap-chamber. In the lower part of the sides of the stem are provided apertures or vents 12, which vents are located to be entirely below the bottom of the chamber when the valve is closed, but to provide a free opening or channel from the trap-port into the chamber when the valve is opened.

The valve proper, 10, depends from one end of the trap-plate and is preferably shaped as an inverted cone, with a guide-pin 13 depending from its apex. The valve is adapted to be closed or seated by entering as a wedge in the upper opening of the valve-port. The parts are preferably so arranged and proportioned that when the valve is closed the trap-plate is located a short distance above the bottom of the chamber, and the free end 14 of the plate is bent or curved downward to rest on the bottom of the chamber and hold the plate in a horizontal position when the valve is closed, thus insuring a true resting of the valve in its seat and at the same time giving free entrance into the chamber for the gas which leaks around the stem.

The lift-bar 15 is provided to operate vertically in the aperture 16 in the bottom of the case and is preferably provided with the inverted-cone-shaped collar 17, adapted to enter in the corresponding socket 18 to form a tight joint, and the coil-spring 19 is provided to act between the bottom of the case and the knob 20 on the lower end of the bar to hold the same down in its normal position.

The valve being closed, as shown in Fig. 2, a flow of gas through the inlet-channel will leak around the stem of the trap into the chamber, and the pressure therein operating against the plate over the valve acts to force the cone-shaped valve more tightly into its seat, and thereby to completely stop any passage of gas through the valve-port. To make sure the gas will pass from the inlet-channel into the trap-chamber when the valve is shut, I prefer to provide the small aperture in the plate, so as not to depend entirely upon the leakage around the stem.

There being a pressure of gas in the inlet-channel and permeating into the trap-chamber to open the valve, the lift-bar is pushed up

from below, and the upper end striking against the plate lifts the trap upward and opens the valve. The trap is raised until the vents in the side of the stem are brought partly or wholly above the bottom of the chamber, thus permitting a free flow of gas through these vents into the trap-chamber, thence through the open valve-port, and into the outlet-channel, as shown by arrows in Fig. 3. The flow of gas upward against the plate or against the gas caught inside of the stem above the vents keeps the trap suspended in the air, as it were, like a balloon, as long as there is any perceptible flow through the valve; but in event there is a stoppage of the flow the trap instantaneously drops by its own weight and the valve is closed only to be opened again by the lift-bar, as described.

For the purpose of making the action of the trap quite sensitive, so that a very slight flow of gas will keep the valve open, it is preferred to make the parts or trap out of very thin brass or other light metal to reduce its weight to a minimum, and for convenience it is preferred to close the top of the trap-chamber by the screw-cap 21, so that the trap can readily be removed for cleaning or other attention, and in use it is preferable to locate the trap-valve near the ordinary valve or stop-cock, so that whenever the gas has been turned off by the latter the trap-valve can be readily manipulated immediately after the ordinary valve is again opened.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A trap-valve comprising a case having an inlet-channel and an outlet-channel, a chamber above these channels, a trap-port between the inlet-channel and the chamber and an adjacent valve-port between the chamber and the outlet-channel; a trap in the chamber composed of a tubular stem adapted to operate freely in the trap-port, there being vents in the sides of the stem, a plate across the upper end of the stem, and a valve depending from the plate adapted to close the valve-port when the trap is down; and a spring-held lift-bar extended through the bottom of the case and adapted to raise the trap when it is down.

2. A trap-valve comprising a chamber, a trap-port entering and an adjacent valve-port leaving the bottom of the chamber, and a trap in the chamber composed of a tubular stem adapted to operate loosely in the trap-port, there being vents in the sides of the stem, a plate across the top of the stem, a valve depending from one end of the plate adapted to close the valve-port when the trap is down, the other end of the plate being bent down to rest on the bottom of the chamber when the valve is closed.

3. A trap-valve comprising a chamber, a trap-port entering and an adjacent valve-port leaving the bottom of the chamber, and a trap in the chamber composed of a tubular stem adapted to operate loosely in the trap-port, there being vents in the sides of the stem, a plate across the top of the stem, and a valve depending from the plate adapted to close the valve-port when the trap is down.

4. A trap-valve comprising a chamber, a trap-port entering and an adjacent valve-port leaving the bottom of the chamber, and a trap in the chamber composed of a tubular stem adapted to operate in the trap-port, there being vents in the sides of the stem, a plate across the top of the stem, means for constant constricted communication between the trap-port and the chamber, and a valve depending from the plate adapted to close the valve-port when the trap is down.

5. A gas-trap valve comprising a chamber, a trap-port entering and a valve-port leaving the chamber, a trap in the chamber adapted to be held up by the flow of gas into the chamber, there being a valve on the trap adapted to close the valve-port when the trap is down and to be held shut by the pressure of gas in the chamber, and means for constant constricted communication between the trap-port and the chamber.

6. A gas-trap valve comprising a chamber, a trap-port entering and a valve-port leaving the chamber, a trap in the chamber adapted to be held up by the flow of gas into the chamber, there being a valve on the trap adapted to close the valve-port when the trap is down, and means for constant constricted communication between the trap-port and the chamber.

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

CHARLES WALTER CLEWELL.

Witnesses:
P. G. WILLIAMS,
HARRY FREASE.