(No Model.)

R. W. CLARK.

STEAM TRAP AND BOILER FEEDER.

No. 289,388. Patented Dec. 4, 1883.

Fig. 1.

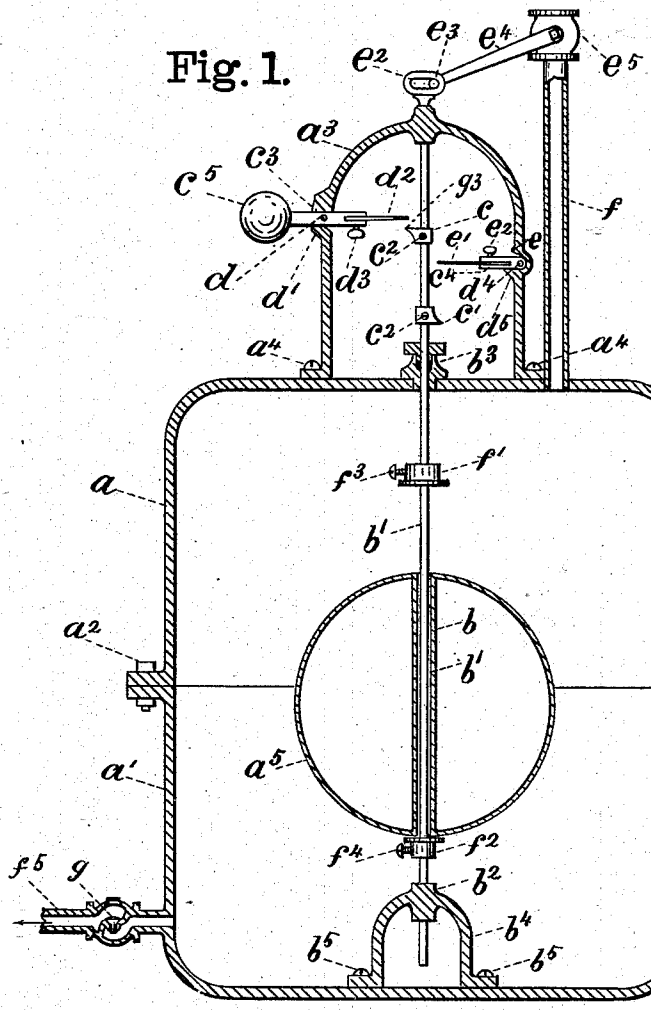


Fig. 3.

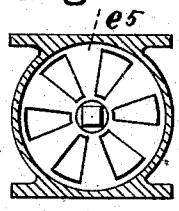


Fig. 2.

Witnesses.

James H. Gates.

T. W. Brann

Inventor.

Robt. W. Clark.

By James Sangster

Atty.

N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

ROBERT W. CLARK, OF BUFFALO, NEW YORK.

STEAM-TRAP AND BOILER-FEEDER.

SPECIFICATION forming part of Letters Patent No. 289,388, dated December 4, 1883.

Application filed June 13, 1883. (No model.)

To all whom it may concern:

Be it known that I, ROBERT W. CLARK, a citizen of the United States, residing in Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Return Steam Traps and Boiler-Feeders, of which the following is a specification.

The object of this invention is to provide the means for taking the condensed water into the trap from the coils of pipes for heating buildings, or from other sources, and returning it or feeding it to the boiler by means of a float and its connecting parts operated by the rise and fall of the condensed water, the operation of the float being such that the water rises within the trap faster than the float until it passes a given point, when it fully opens the valve by a sudden upward movement, and on the return movement the level of the water, as it passes into the boiler, falls faster than the float until after the float has moved down past a given point, when, by a quick movement downward, it opens the valve to its fullest extent, by means which will be fully and clearly hereinafter shown and described by reference to the accompanying drawings, in which—

Figure 1 is a vertical section in or about line X X, Fig. 2. Fig. 2 represents a plan or top view of the trap complete; and Fig. 3 is a section through valve e^5.

The casing or shell of the trap is composed of two parts, a a', bolted together by bolts a^2. A smaller casing, a^3, is secured to the upper part of the case a by bolts a^4. The float a^5 is a hollow metallic ball having a tube, b, adapted to slide up and down on the rod b'. This rod b' is secured in bearings b^2 b^3, and is adapted to slide easily up and down. The lower bearing is on the curved frame b^4, and is secured in place by bolts b^5, or in any other well-known or equivalent way, and the upper bearing, b^3, is secured in position at the top of the case within the casing a^3. On the rod b', within the casing a^3, are two projecting pieces, c c', secured in place by screws c^2, and may be made adjustable up and down the rod, if desired. The upper portion of the case a^3 is provided with two jointed arms, c^3 c^4. The arm c^3 is provided with a counter-weight, c^5, to keep it down in position; but a spiral or other equivalent spring may be used in its place, if desired. It is jointed to the case a^3 by a pin, d. On the outside of the case is a small projection, d', to stop the arm from swinging down too far. The end of the arm inside of the casing is provided with a thin elastic slip or spring, d^2. (Spring-steel answers a good purpose; but any other material adapted for the purpose will do.) This spring is kept in place by a thumb-screw, d^3, so that it may be easily replaced, if broken. The arm c^4 is jointed to the opposite side of the case a^3 by a pin, d^4, and falls down by its own gravity against the inward projection d^5, which limits its motion in that direction. Its upward motion is limited by the inward projection e. It is also provided with a spring, e', secured in place by a thumb-screw, e^2. The rod b' passes through the top of the casing a^3, and is provided with a slotted end, e^3, through which the pin e^3 on the arm e^4 passes. The arm e^4 is connected to a valve, e^5, which it operates. I have shown a suitable valve; but any other valve adapted for the purpose will answer.

f is a steam-pipe leading from the boiler to the trap, and is connected in any suitable way to the casing a. The rod b' is provided with stops f' f^2, held in place by set-screws f^3 f^4, to limit the movement of the float a^5 up and down before it operates or moves the rod b'. The outlet-pipe f^5, leading into the boiler, is provided with a valve, g, constructed in the usual manner. At the opposite side of the the lower part of the case is the inlet-pipe g', provided with a valve, g^2, constructed in the usual way.

The operation of the invention is as follows: As the condensed water from the heating-coils, or from any other source, passes through the pipe g', it lifts the valve g^2, and, passing into the trap, continues to rise and lifts the float. It moves up at first without moving the rod b' until it reaches the stop f', when it moves the rod up until the point g^3 of the stop or piece c comes in contact with the spring d^2, which prevents the float from moving farther up until the water rises sufficiently high in the trap to overcome the resistance, when the point g^3 suddenly passes the end of the spring, thereby allowing the float to move quickly up and open the valve e^5 to its fullest extent. This

operation allows the steam from the boiler to pass into the trap with sufficient pressure to hold the valve g^2 down and stop the condensed water from coming in, and opens the valve g, so that the water within the trap is forced through the opening around the valve g into the boiler until the lowering of the float brings the point of the part c' past the spring e' and closes the valve e^5, when the trap is relieved from the steam-pressure, and the pressure from the condensed-water pipe g' lifts the valve, and it passes in again and repeats the process. By this operation the motion of the float is retarded to a certain point, after which it is instantly released, and with the accumulated force, caused by the rise of the water, it moves quickly up and opens the valve at once, and it operates in a similar way in its downward movement to close the valve quickly.

I do not claim a pivoted lever having a lug or cam at its end in combination with a float, as that has been done before; but

What I do claim as my invention is—

1. A steam-trap provided with inlet and outlet valves, a float adapted to move up and down on a vertical rod provided with stops for limiting its movement before moving the rod, in combination with the projections $c\ c'$, the pivoted springs $d^2\ e'$, and arm e^4, connecting with a valve leading from the boiler to the trap, for the purposes specified.

2. In a steam-trap, the combination of a float operated by the rise and fall of the water within the trap, with the vertical rod, provided with the projecting piece c and spring d^2, for resisting the upward movement of the float until the water has risen sufficiently to move it by the spring and open the valve, as described.

3. In a steam-trap, a float adapted to move up and down against stops on a vertical rod, in combination with the projection c' and spring e', and their several connections, substantially as specified, for the purpose of suddenly closing the valve e^5, as described.

ROBERT W. CLARK.

Witnesses:
JAMES SANGSTER,
F. W. BRAUN.