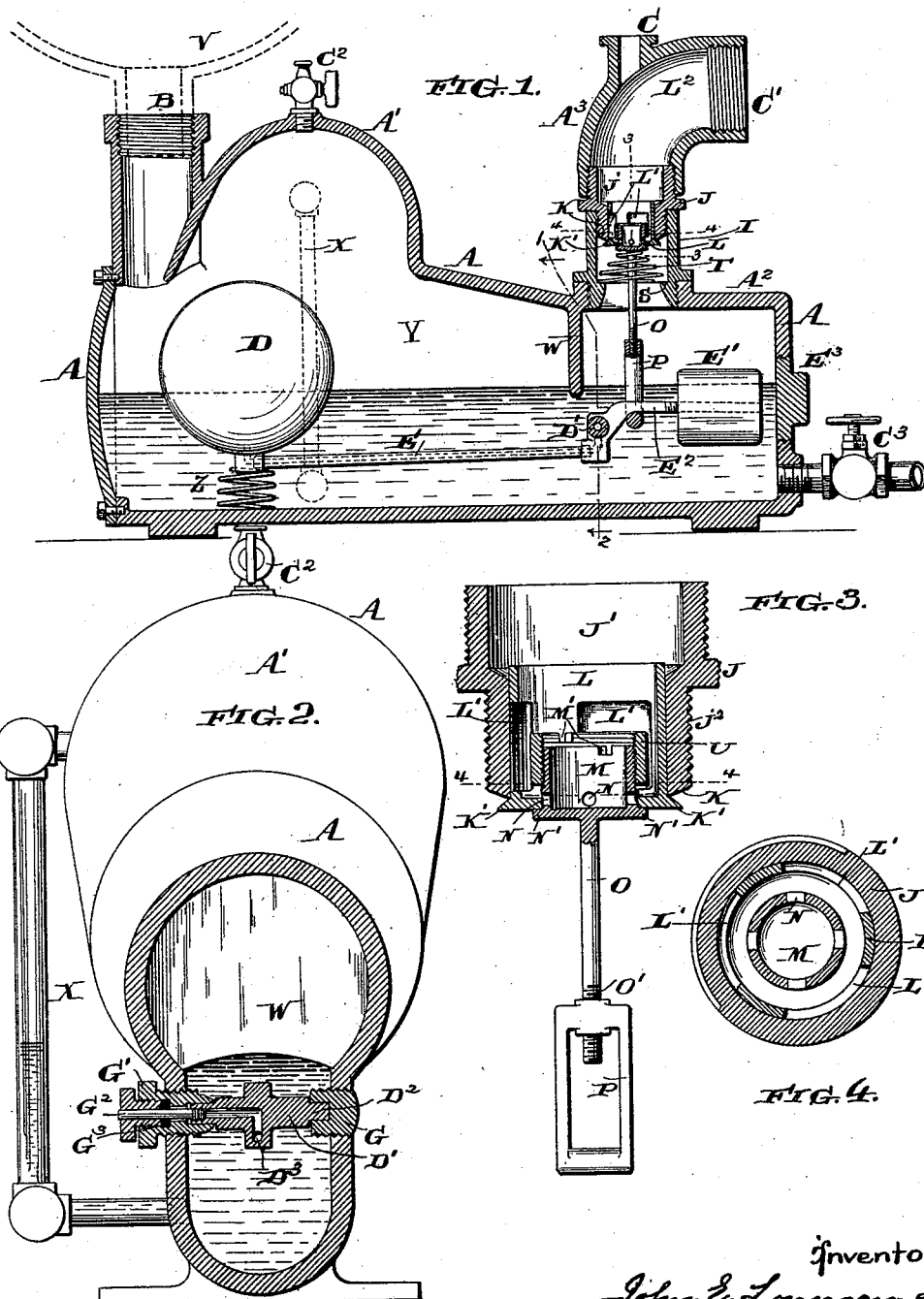


(No Model.)

J. E. LONERGAN & A FOGEL.
STEAM TRAP.

No. 455,002.

Patented June 30, 1891.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOHN E. LONERGAN AND ALEXANDER FOGEL, OF PHILADELPHIA,
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STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 455,002, dated June 30, 1891.

Application filed March 24, 1891. Serial No. 386,225. (No model.)

To all whom it may concern:

Be it known that we, JOHN E. LONERGAN and ALEXANDER FOGEL, both citizens of the United States, and residents of Philadelphia, Pennsylvania, have invented certain new and useful Improvements in Steam-Traps, of which the following is a description, reference being had to the annexed drawings, making part hereof.

The nature of our invention will fully appear from the following specification and claims.

In the drawings, Figure 1 is a vertical longitudinal sectional view of our device; Fig. 2, a vertical cross-sectional view on the line 1 2 of Fig. 1; Fig. 3, an elevation of the yoke and valve-stem and part sectional view of the parts on the line 3 3 of Fig. 1; Fig. 4, a cross-sectional view on the line 4 4 of Figs. 1 and 3.

A is the shell of the trap; B, the inlet; C, an opening-outlet adapted to receive a try-cock or plug; C', the outlet for water when under pressure; C'', a cock or valve to permit the escape of steam or air; C''', a cock or valve to drain the water of condensation from the trap and to blow out sediment.

D is a float set on one end of a tubular bar E, which opens into it, and is provided with pivot D', beyond which pivot this bar is solid, this portion being lettered E'', and supports at its end the weight E'. A removable screw-plug E''' is set by screw-threads in the end of shell A, which plug can be removed to permit the insertion or taking out of weight E', the latter being screwed upon the end of the float-bar. Pivot D is hollow, its interior space opening into the interior of tube E by hole D'''. It is closed at one end D'' and at the latter end is mounted in journal G. The hollow other end of the pivot is mounted in the hollow or pierced journal G'. This journal is provided with a tube G''. (Shown in full side view in Fig. 2, the hollowed pivot D' being shown in sectional view.) A stuffing-box G''' and its packing is shown, and is here used to make a close joint between the rocking tube G'' and the stationary journal-bearing G' to prevent the escape of steam or water from the interior space of the trap. The tube E and hollow pivot D' permit the escape of water of con-

densation from sweating or of vapors from the interior of the hollow float.

X is an ordinary water-gage.

A' is a swell in the shell A of the trap adapted to receive the float as it rises.

I is a hollow cylinder resting upon part A'' of shell A, rigidly connected to and practically integral therewith.

A''' is a curved tube provided with openings C and C', above described, and forming part of the outer shell A of the apparatus.

J is an interior hollow neck-piece engaging by parts J' above and J'' below, respectively, with tubes A''' and I. The lower edge K of this neck forms a seat for the annular flange K' of the large valve L, which flange sets up against said seat. This valve is provided with ports L', letting into space L'' in tube A'''. Small valve M (see Fig. 3) is set within large valve L, and is provided with ports N, which let into the latter, and has its annular bearing-flange N' seating up against the lower face of valve L. The lower face of small valve M is full. M' are notches in the upper edge of valve M. When both valves are seated, the upward flow of fluids is cut off.

O is a stem depending from small valve M and provided with a screw-thread O'. The female screw-threaded yoke P is set upon the lower end of this stem, as shown in Figs. 1 and 3. This yoke embraces the bar E at the part E''. (See Fig. 1.) Tube I is provided with a shelf or rest S upon which the spiral spring T sets. This spring impinges above against the lower face of small valve M, and tends in expanding to throw the latter upward to its seat against the lower face of valve L, and in sequence the latter to its seat against the lower edge K of part J'' of neck J.

U is a tubular collar screwed or shrunk around and forming part of small valve M to hold this valve from falling from place, but still to permit it to drop sufficiently to open its ports to the space below to allow water to pass upward to the interior of large valve L.

V (in dotted lines) represents the shell of the steam-chamber, the drip or condensation from which the trap is designed to dispose of.

W is a bridge spanning the inner space of shell A near the cylinder I.

Y is the interspace of shell A.

The operation is as follows: When from any cause the water rises above the lower edge of bridge W, the float D will be raised to such a height as to depress weight E' and
 5 also depress yoke P and stem O and open small valve M, when the steam-pressure in the space Y will drive the surplus water into valve L through ports N, and if these ports
 10 are not sufficient to carry off the water of rapid condensation float D will continue to rise and depress the weight E' and part E'' of the pivoted bar until the collar U strikes the bottom of large valve L and opens ports
 15 L' thereof to the space below, when the steam-pressure in space Y will force the surplus water out through tube A''' and exit C'. As the water escapes, float D will fall and spring I will expand and drive both valves back to their
 20 seats, thus preventing the escape of steam through their ports and preserving a mean water-level in the trap—that is, a level slightly above the lower edge of bridge W—which level will keep the valves closed. The resultant action of float D upon yoke P is regulated
 25 by raising or lowering the yoke upon stem O by means of the screw-thread. This is accomplished by removing the plug or try-cock from opening C and by means of a screw-driver or
 30 key therein inserted and engaging in notches M', turning the stem O, which latter by its screw-thread O' will raise or lower the yoke P.

Z is a spring set beneath the float and attached rigidly thereto to act as a cushion to
 35 prevent it from being indented by striking the bottom of the trap, upon which latter it sets loosely. It will be noted that the part E'' of the float-bar slants upward and backward from the pivot D', and is then continued
 40 horizontally to the weight. The yoke P sets below against the upper end of this slanted portion. Consequently the depression of part E'' of the bar first causes this slant to act against the yoke to tip its lower portion for-

ward as well as downward, thus gently starting the opening of small valve M, and after well starting the valve, which is thus rendered easy, the horizontal portion of the part E'' acts directly with the slanted portion to draw the yoke directly down, the latter being
 50 caught in the angle between the horizontal and slanted parts of E''.

What we claim as new is—

1. In a steam-trap, the combination of float D, pivoted bar E E'', weight E', bridge W,
 55 stem O, yoke P, double or large and small valves L and M, one set within the other and respectively provided with ports L' and N, and spring T, all combined and operating substantially as described. 60

2. In a steam-trap, the combination of float D, pivoted bar E E'', weight E', bridge W, stem O, yoke P, into which the stem is screwed, double or large and small valves L and M, one set within the other and respectively provided
 65 with ports L' and N, and spring T, the inner valve being provided with notches M' and the tube A''', provided with opening C, whereby an instrument may be inserted through opening C to turn valve M and change the distance of yoke P from the latter, all combined
 70 and operating substantially as described.

3. In a steam-trap, the combination of float D, bar E E'', bridge W, pivot D', and yoke P, the part E'' of the bar being slanted upward
 75 and backward from the pivot, and then continued about horizontally forward, the yoke being set below at the angle between the slanted and horizontal portions of part E'', substantially as and for the purposes described. 80

In witness that the above is our invention we have hereunto set our hands.

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