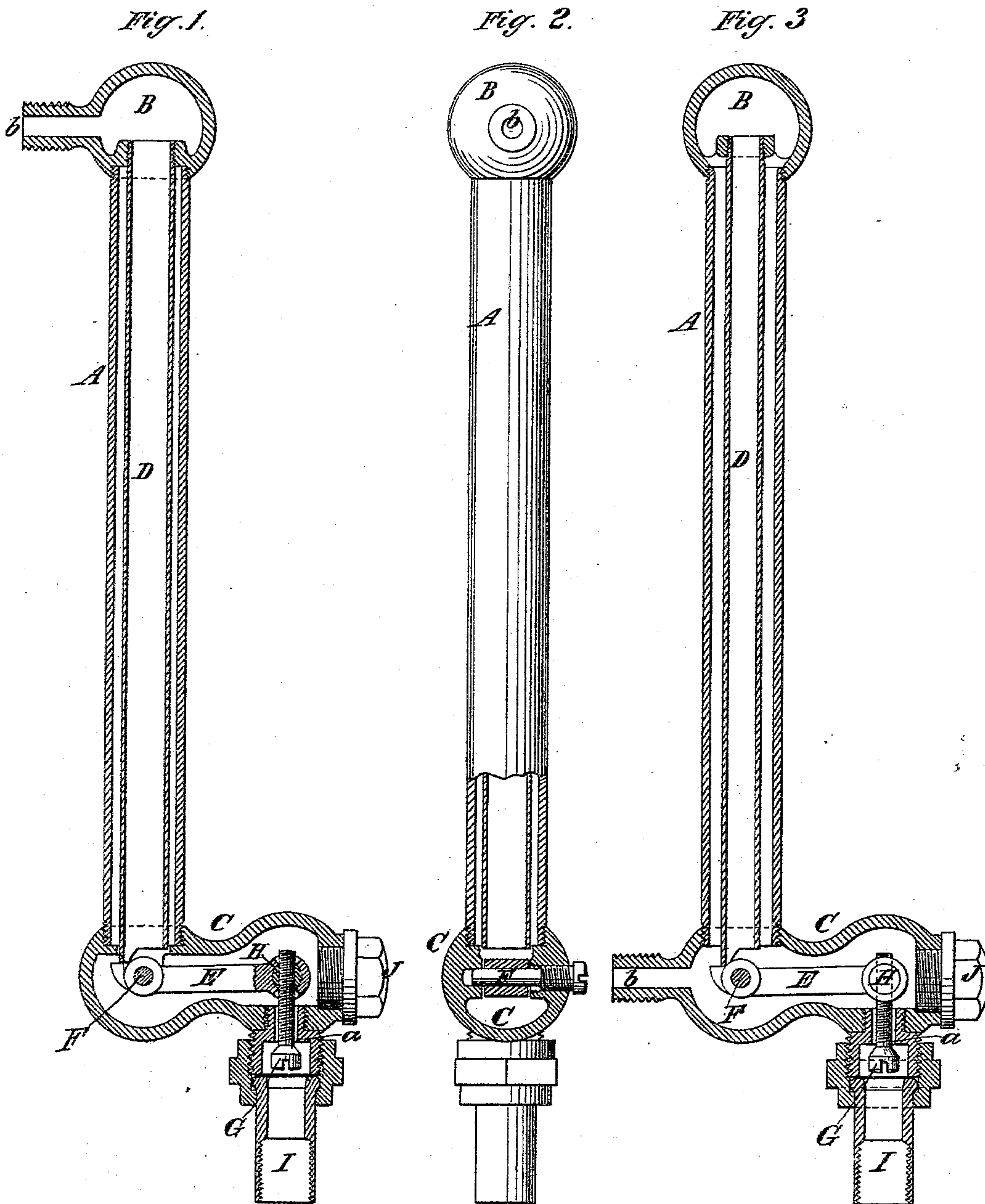


(No Model.)

J. T. KELLY.  
AIR AND STEAM TRAP.

No. 286,446.

Patented Oct. 9, 1883.



Witnesses:  
Geo. Maynes  
Ed. L. Moran

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# UNITED STATES PATENT OFFICE.

JOHN T. KELLY, OF BROOKLYN, NEW YORK, ASSIGNOR TO HIMSELF AND  
GEORGE M. JONES, OF SAME PLACE.

## AIR AND STEAM TRAP.

SPECIFICATION forming part of Letters Patent No. 286,446, dated October 9, 1883.

Application filed June 14, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN T. KELLY, of the city of Brooklyn, in the county of Kings and State of New York, have invented a certain  
5 new and useful Improvement in Air and Steam Traps; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked  
10 thereon, which form a part of this specification.

My invention has for its object to provide an air and steam trap very positive in its operation, easily adjusted, and not liable to get out of order, to be used more particularly as  
15 an air-trap for steam-heating apparatus; and it consists in certain improvements in the construction of such a trap, which will be hereinafter fully described, and particularly pointed out in the claims.

20 In the accompanying drawings, corresponding parts in the several figures are described by like figures of reference.

Figure 1 is a vertical section of the trap. Fig. 2 is a side elevation, partly in section.  
25 Fig. 3 is a vertical section, illustrating a modification of the trap.

A, Figs. 1 and 2, is a tube, of iron or other suitable metal, connected to an upper chamber or nozzle-head, B, and also to a lever-box, C.  
30 D is an inner tube, of brass or other suitable metal, which possesses a greater degree of expansion under heat than the outer tube, A. The tube D is attached to the upper nozzle-head, so as to communicate freely with the interior thereof, but its lower end is free for such  
35 vertical motion as may be due to expansion, and is arranged to act on the short arm of the lever E, which is contained within the box C, wherein it is pivoted on a fulcrum-pin, F. The  
40 extremity of the long arm of this lever is attached to the stem of the valve G by a peculiar-shaped joint, consisting of a rocking nut, H, inserted in a transverse bore in the end of the lever-arm E, and through which the threaded  
45 stem of the valve G passes. This arrangement allows the valve to properly seat itself in the seat *a*, which is provided in the bottom of the lever-box C, at the escape-opening, and also allows the proper adjustment of the valve by  
50 a screw-driver or other instrument inserted through the escape-opening.

I is a waste-pipe connected to the lever-box chamber C, at the escape-opening, by an ordinary inner coupling.

J is a screw-plug for closing the opening provided in the lever-box C for the insertion of the lever. The valve is inserted through the escape-opening.

The trap shown in Fig. 3 differs in no essential respect from that shown in Figs. 1 and 2,  
60 except that the nozzle *b*, by which it is to be attached to the radiator or other apparatus, is on the lower chamber or lever-box, C, instead of on the upper chamber or head, B. This requires an opening from the upper end of the  
65 inner tube, D, or chamber B, to the outer tube, A, to provide for free circulation within the inner tube, D. I, however, consider the construction shown in Figs. 1 and 2 preferable, as the air or water and steam cannot in that  
70 reach the outlet without passing through the tube D, which is thus fully exposed to the heating effect of the steam.

The operation is as follows: The air or water in the pipes or coils of the radiator or other  
75 apparatus passes freely from the inlet-nozzle *b* to and past the valve G, and to the waste-pipe, so long as the tube D remains cool and does not expand; but as soon as steam enters, the said tube becomes expanded by the heat,  
80 and, acting on the lever E, will close the valve G, thus preventing any escape of steam. The valve, it will be observed, closes inward, so that it cannot be closed by the pressure of steam in the trap, but must remain open until the  
85 tube D becomes heated and expanded by the steam.

The arrangement of the fulcrum F for the lever E immediately below the end of the tube D, and the end of said tube having a bearing  
90 at one side only on the short arm of the lever, enables me to get a comparatively great movement of the valve with a slight expansion of the tube, and still to preserve the compact arrangement of parts.

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

1. The combination of the tubes A D, having different degrees of expansion, the tube D being opened at both ends, so that the steam  
100 may have free access to its interior, the nozzle-head or chamber B and lever-box C at the ends



of said tubes, the lever E arranged in said box, and an outlet-valve carried by said lever, substantially as described.

2. The combination, with the tubes A and D, 5 having different degrees of expansion and both open at both ends, so that the steam may have access to both the interior and exterior of the tube D, the nozzle-head or chamber B, and lever-box C, a lever in said box against which 10 the tube D acts, and an outlet-valve carried by said lever, substantially as described.

3. The combination, with the tubes A D, having different degrees of expansion, of the head or chamber B and the lever-box C, connecting 15 the ends of said tubes, the lever E, fulcrumed immediately below the tube D, and having the edge at one side of said tube bearing on its

shorter arm, and an outlet-valve connected with the longer arm of the lever, substantially 20 as described.

4. The combination, with the tubes A and D, having different degrees of expansion, of the head or chamber B, the lever-box C, having the outlet I and a valve-seat therein, the lever 25 E, having the rocking nut H, fitting a cylindric box in its end, so as to be free to turn therein, and the outwardly-opening valve G, having its stem screwed into said rocking nut and accessible for adjustment through said outlet-opening I, substantially as described.

JNO. T. KELLY.

Witnesses:

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