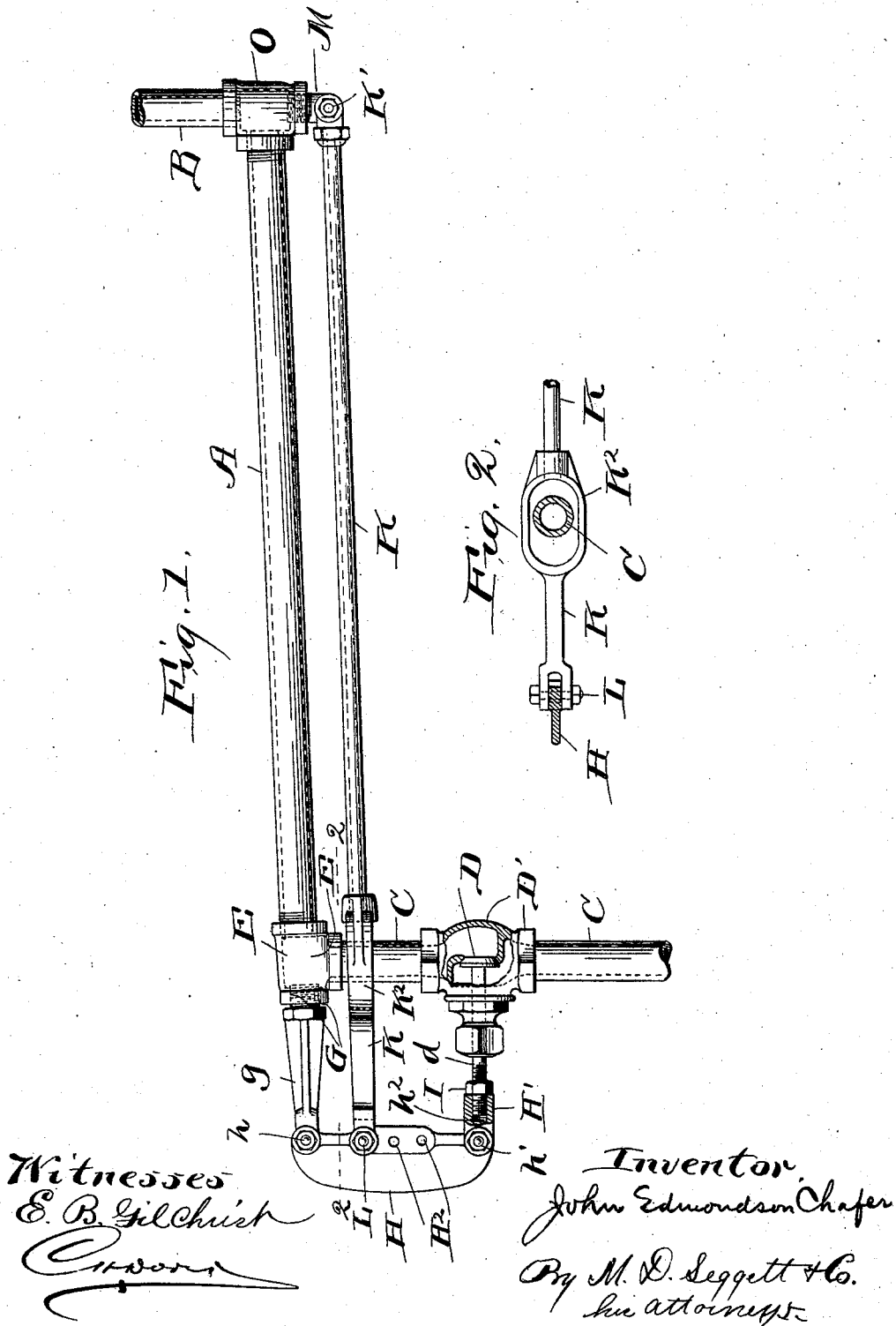


(No Model.)

J. E. CHAFER.
EXPANSION STEAM TRAP.

No. 575,920.

Patented Jan. 26, 1897.



UNITED STATES PATENT OFFICE.

JOHN EDMONDSON CHAFER, OF CLEVELAND, OHIO.

EXPANSION STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 575,920, dated January 26, 1897.

Application filed May 13, 1895. Serial No. 549,038, (No model.)

To all whom it may concern:

Be it known that I, JOHN EDMONDSON CHAFER, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain
5 new and useful Improvements in Expansion 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 pertains to
10 make and use the same.

My invention relates to expansion steam-traps; and it consists in certain features of construction and combinations of parts hereinafter described, and pointed out in the
15 claims.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of a steam-trap embodying my invention. Fig. 2 is a plan in section on line 2 2, Fig. 1.

20 The steam-trap comprises an almost horizontally-arranged but inclined expansible and contractible pipe A. B designates a steam-pipe leading downwardly from a system (not shown) of steam-pipes and connected at
25 its lower end with the upper end of inclined pipe A, and a depending drain-pipe C conducts away the water resulting from condensation of steam and accumulating in said inclined pipe. A valve D is arranged in the
30 line of pipe C, and D' designates the valve-casing that is suitably interposed in the line of said pipe, said valve D being adapted to control communication through pipe C. The lower and discharging end of pipe A is connected with the receiving end of pipe C, preferably by means of a T E, the central opening whereof is engaged by pipe C, and pipe A engages one of the oppositely-located openings in the T. The other opening of said
40 oppositely-located openings is closed by a plug G, that bears an outwardly-projecting bracket g, arranged approximately in line with pipe A. A tilting lever H is fulcrumed at its upper end, as at h, to the outer end of bracket g. Lever H at its lower end is operatively connected with the horizontally-arranged stem d of valve D, that is adapted to move horizontally in interrupting and establishing communication through pipe C.
50 The valve-stem extends through the valve-casing in any approved manner and is pref-

erably secured at its outer end to lever H in the following manner: The lever at its lower end is provided with a laterally and inwardly extending arm H', that is pivotally secured
55 at its inner end, as at h', to the body portion of the lever and is provided with a screw-threaded hole h², engaged by the correspondingly-threaded outer end of the valve-stem, and a nut I, mounted upon said portion of the
60 valve-stem at the free end of arm H', locks the valve-stem to arm H' in the desired adjustment of the parts. Lever H is therefore, it will be observed, adjustably connected with the valve-stem, which is desirable, because it
65 accommodates the accurate setting of the valve to deliver at any desired temperature. Lever H is shown provided with several holes H² between its fulcrum and arm H', and a rod K is operatively connected with said lever at
70 any one of said holes. Rod K is shown arranged parallel with and in close proximity to pipe A, and the connection of said rod with lever H is preferably by means of a pin or bolt L, that engages a hole H² in lever H.
75 Rod K at its opposite end is pivoted, as at K', to a plug M, that closes the lower opening of the oppositely-located openings in the T O, employed in connecting together pipes A and B.

By the construction hereinbefore described it will be observed that expansible and contractible pipe A will, when the temperature decreases from condensation of steam and accumulation of water in said pipe, contract
85 and thereby cause rod K to be moved in the direction required to swing lever H outwardly and open valve D, so as to accommodate the escape or delivery of the water from pipe A through pipe C, and pipe A will again
90 expand and close the valve when the water has been discharged and the temperature of said pipe again risen.

It will be observed that lever K is located in comparatively close proximity to the valve,
95 and that therefore no long connecting-rod liable to be bent or buckled is required between the valve and valve-actuating lever, and hence positive action of the valve is always assured. By the provision of a number
100 of holes H² in lever H the capacity of the valve can be varied. Rod K is shown con-

nected with lever H at the uppermost hole H² in said lever, and hence in the adjustment shown the maximum throw or movement is given to the valve in the operation of the trap. Hence if it is desired to decrease the movement of the valve it is merely necessary to remove pin or bolt L and connect rod K to the lever at a hole H² that is located farther from the fulcrum of the lever. I would also remark that rod K at pipe C is preferably provided with a loop K², that embraces said pipe and prevents buckling of the rod.

What I claim is—

1. In an expansion steam-trap, the combination of the almost horizontally-arranged but inclined pipe A; the steam-pipe communicating with the upper end of said inclined pipe; the drain-pipe leading downwardly from the lower end of said inclined pipe; the bracket *g* rigid with the drain-pipe and inclined pipe at the junction of said pipes and arranged in line, or approximately in line, with the inclined pipe; the valve for controlling communication through the drain-pipe and provided with a stem arranged parallel or approximately parallel with the aforesaid bracket; the lever H depending from and fulcrumed to the outer end of the bracket and operatively connected, at its lower end, with the valve-stem, and the rod K operatively connected with said lever between the latter's fulcrum and lower end, and suitably connected with the upper end of the inclined pipe, and said rod being provided with a loop

embracing the drain-pipe, substantially as shown, for the purpose specified.

2. In an expansion steam-trap, the combination of the almost horizontally-arranged but inclined pipe A; the steam-pipe communicating with the upper end of said inclined pipe; the drain-pipe leading downwardly from the lower end of said inclined pipe; the bracket *g* rigid with the drain-pipe and inclined pipe at the junction of said pipes and arranged in line, or approximately in line, with the inclined pipe; the valve for controlling communication through the drain-pipe and provided with a stem arranged parallel or approximately parallel with the aforesaid bracket; the lever H depending from and horizontally fulcrumed to the outer end of the bracket, said lever being operatively connected, at its lower end, with the valve-stem, and having the series of lateral holes H² between its fulcrum and lower end; the rod K pivoted horizontally to the upper end of the inclined pipe and arranged below and longitudinally of the inclined pipe, and a bolt or pin connecting said rod with the lever at one of the aforesaid holes, substantially as shown, for the purpose specified.

In testimony whereof I sign this specification, in the presence of two witnesses, this 10th day of May, 1895.

JOHN EDMONDSON CHAFER.

Witnesses:

C. H. DORER,

L. WARD HOOVER.