No. 699,170. Patented May 6, 1902.

J. W. HODGES.

STEAM TRAP.

(No Model.) (Application filed Aug. 22, 1901.)

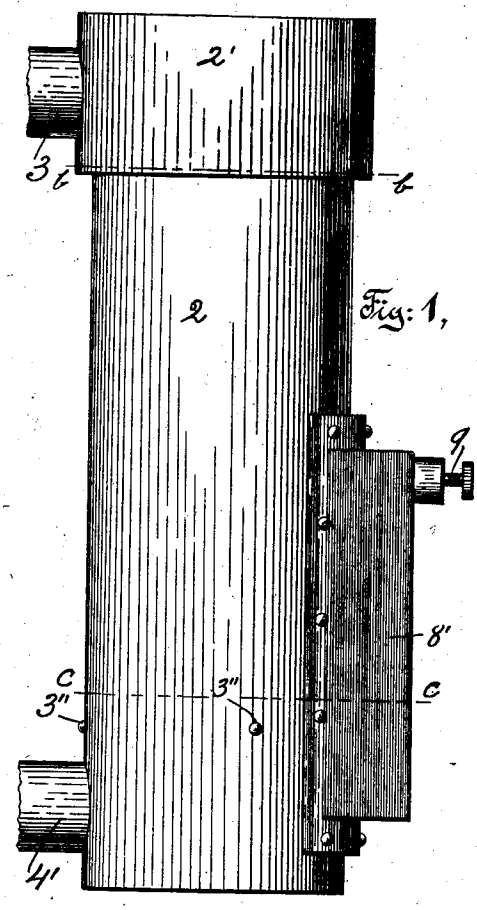

Fig: 1,

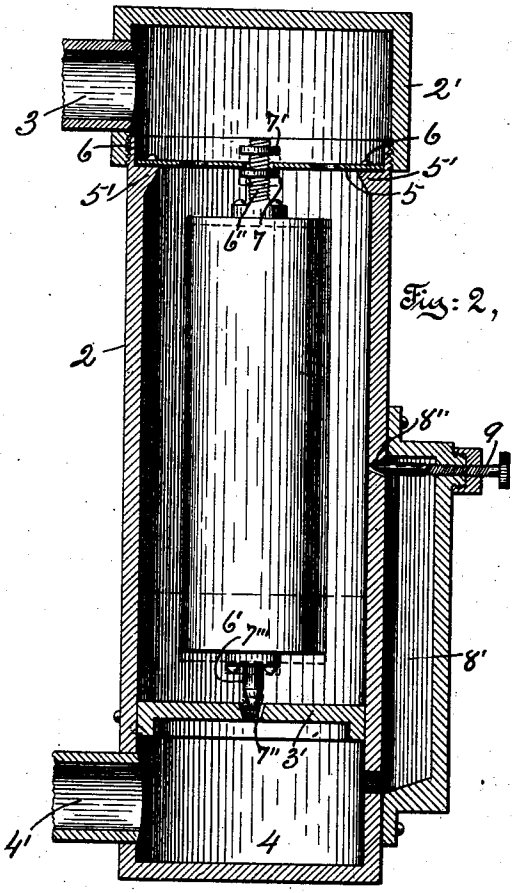

Fig: 2,

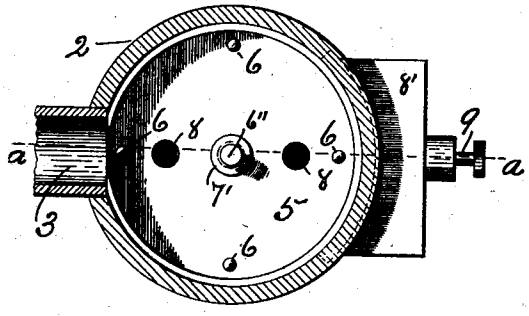

Fig: 3,

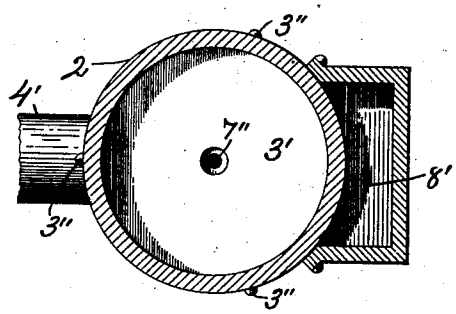

Fig: 4.

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UNITED STATES PATENT OFFICE.

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STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 699,170, dated May 6, 1902.

Application filed August 22, 1901. Serial No. 72,863. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. HODGES, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Steam-Traps, which improvements are fully set forth in the following specification and accompanying drawings, and in the latter—

Figure 1 is a side elevation view of a steam-trap constructed in accordance with my invention. Fig. 2 is a central longitudinal section of same as along the line *a a* of Fig. 3. Fig. 3 is a transverse section thereof as along the line *b b* of Fig. 1. Fig. 4 is a transverse section thereof as along the line *c c* of Fig. 1.

Similar reference-numerals denote like parts throughout the several views of the drawings.

This invention relates to improvements in devices of that class commonly known as "steam-traps," the same being utilized for the purpose of controlling the condensation-water which accumulates in steam pipes or conduits.

The object of this invention is to provide a steam-trap which shall be simple, inexpensive, and novel as regards construction, automatic, positive, and reliable in operation, which shall embody few, if any, features or elements liable to disarrangement in use, which shall be durable, and which shall possess certain well-defined advantages over prior analogous structures.

The invention consists in the employment of certain parts novel as to form, in the novel disposition and arrangement of the various parts, in certain combinations of the latter, and in certain details of construction, all of which will be specifically referred to hereinafter, and set forth in the appended claims.

Having reference to the accompanying drawings, 2 is the body member, fitted at one end with a removable cap 2′, communicating with the interior of which is the inlet-pipe 3. 3′ is a diaphragm or transverse horizontal partition situated within the body member 2 somewhat distant from the lower end thereof. This diaphragm may be formed integral with the body member 2, as in the process of casting, or formed as a separate part and secured in position for service, as by means of the fasteners 3″. The body member 2 is hollow or tubular in cross-section, so that when the diaphragm 3′ is located for service an outlet-chamber 4 at the lower end of the body member 2 is formed, which chamber has free communication with the outlet-pipe 4′. At the opposite end of the body member 2 there is located interiorly of said body member a removable brace or diaphragm 5. This diaphragm may be held in position for service in any well-known and approved manner, as by providing the body member 2 with an interior shoulder or rib 5′, on which said diaphragm may be seated and by means of fasteners, as 6, extending through said diaphragm and engaging said rib.

6′ is a float, solid or hollow, as preferred, and of material of sufficient specific gravity to insure the rising and falling thereof, according to the variations in the quantity of water of condensation that may accumulate within the body member 2 above and at the diaphragm 3′. The float 6′ is provided with a stem 6″, which projects upwardly therefrom through a central orifice formed in the brace or diaphragm 5. Stem 6″ carries adjustable stops 7 7′, the former engaging said stem below the diaphragm 5 and the latter engaging said stem above said diaphragm. Stop 7 serves to limit the rising action of the float 6′, and stop 7′ serves to limit the falling action thereof. Stops 7 7′ are here shown in the form of nuts working on threads with which the stem 6″ is provided, but other devices, admitting of adjustment along the stem 6″ and capable of limiting the rising and falling movements of the float 6′, may be substituted therefor.

Float 6′ is provided at its lower end with a depending needle-valve 7‴, alining with the orifice 7″, formed centrally in the diaphragm 3′, and in practice stop 7′ so limits the falling movement of the float 6′ that valve 7‴ shall not entirely close the orifice 7″, and stop 7 so limits the rising movement of float 6′ that the point of needle-valve 7‴ shall not sufficiently escape from the orifice 7″ to permit a free lateral movement of the float 6′.

Steam may be admitted to the interior of the body member 2 between the diaphragms

3′ and 5 in any desired manner, as by way of suitable openings, as 8, formed in the diaphragm 5.

8′ is a by-pass leading from the port 8″, controlled, as by valve 9, to and communicating with outlet-chamber 4.

It will be observed that by means of the stops 7 7′ the movements of float 6′ may be regulated in accordance with the quantity of condensation-water to be taken care of, which water escapes downward through the orifice 7″ and may be piped out of the chamber 4 or otherwise conducted away. The upward movement of float 6′ may be regulated to permit the escape by way of orifice 7″ of the maximum quantity of condensation-water, and the downward movement thereof may be accordingly regulated to permit due escape of the minimum quantity of such water. Therefore under these conditions all quantities of the water of condensation may be automatically taken care of.

In practice steam is permitted to pass through the trap as a whole by duly manipulating valve 9, and as the pressure of the steam at all points on the float 6′ is equal the movements of said float, in accordance with the quantity of water of condensation that may accumulate in the trap, are accordingly facilitated.

It will be observed that my improved steam-trap is well adapted for the purpose for which it is intended and that the same may be modified to some extent without departing from the spirit and principle of my invention.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A device of the class herein described comprising a hollow body member having a valve-controlled outlet-port, as 8″; a diaphragm within said body member below said port, and having an orifice, as 7″; a float within said body member above said diaphragm, the said float being provided with a valve adapted to control said orifice; and means for limiting the rising and the falling movements of said float, the said body member being provided with a suitable inlet-opening substantially as herein specified.

2. A device of the class herein described comprising a hollow body member having a valve-controlled outlet-port, as 8″; a diaphragm within said body member, below said port, and having an orifice, as 7″; a valve for controlling said orifice; a float within said body member, above said diaphragm, the said float being adapted to rise and fall and in its movements control the actions of the valve last named; and means for limiting the rising and falling movements, respectively, of said float, the said body member being provided with a suitable inlet-opening, substantially as herein specified.

3. A device of the class herein described comprising a hollow body member provided with a valve-controlled outlet-port, as 8″; a diaphragm within said body member, below said port, and provided with an orifice, as 7″; a brace fixed within said body member, above said port; a float within the body member, between said diaphragm and said brace and adapted to rise and fall, the said float being provided with a valve at its lower end for controlling the orifice in said diaphragm and with a stem at its upper end loosely engaging said brace; and stops, as 7 7′, engaging said stem one above and the other below said brace and adapted to limit the rising and falling movements, respectively, of said float, the said stops each permitting of adjustment along said stem, and said body member being provided with a suitable inlet-opening, substantially as herein specified.

4. A device of the class herein described comprising a hollow body member having a valve-controlled outlet-port, as 8″; a diaphragm within said body member, below said port, and having an orifice, as 7″; a brace fixed within said body member above said port and having a suitable central orifice; a float within said body member, between said diaphragm and said brace and adapted to rise and fall, the said float being provided with a needle-valve depending from the lower end thereof and adapted to control the orifice in said diaphragm, and with a threaded stem at its upper end projecting upwardly through the orifice in said brace; and nuts on said threaded stem, one above and the other below said brace, and whereby the rising and falling movements, respectively, of said float may be limited, the said body member being provided with a suitable inlet-opening, substantially as herein specified.

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