

No. 630,399.

Patented Aug. 8, 1899.

J. E. L. OGDEN.

STEAM TRAP.

(Application filed Feb. 28, 1899.)

(No Model.)

2 Sheets—Sheet 1.

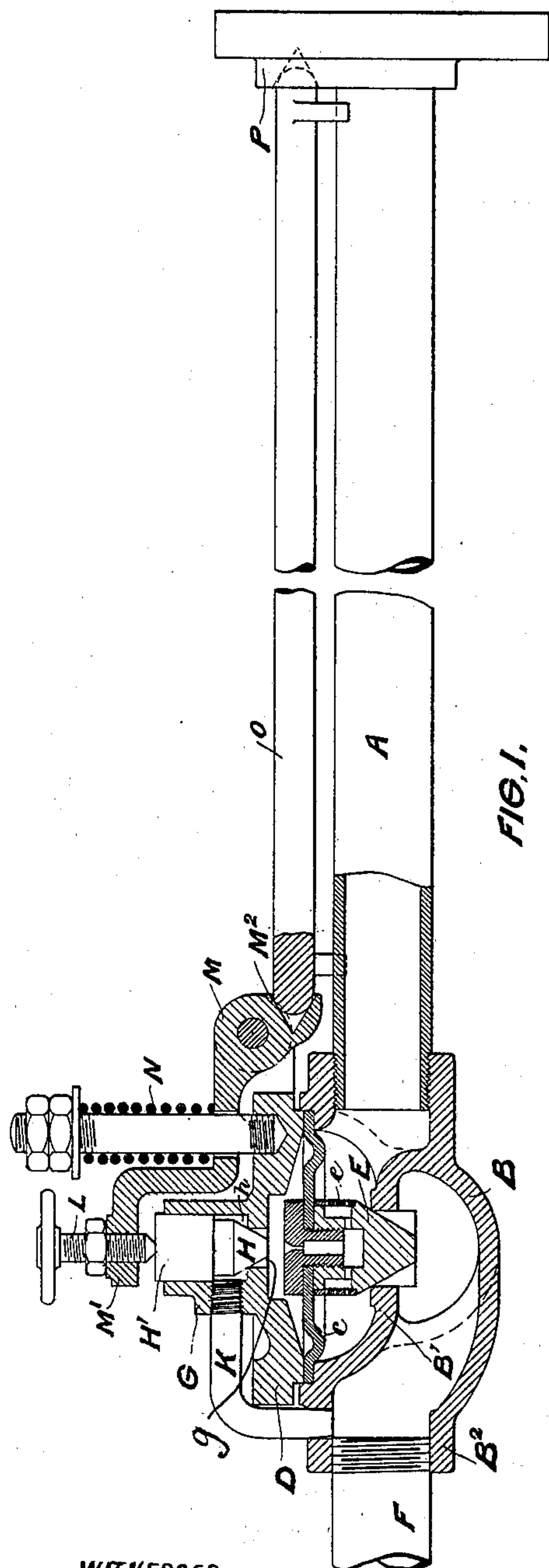


FIG. 1.

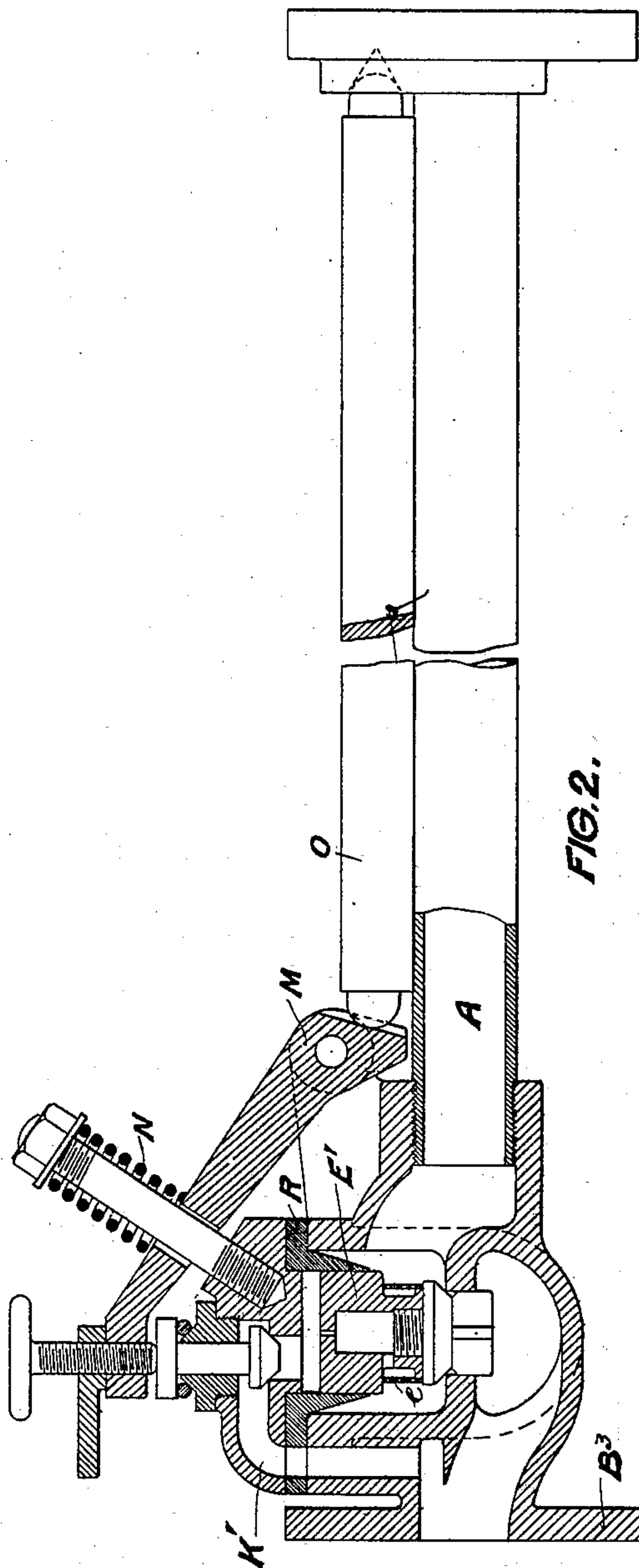


FIG. 2.

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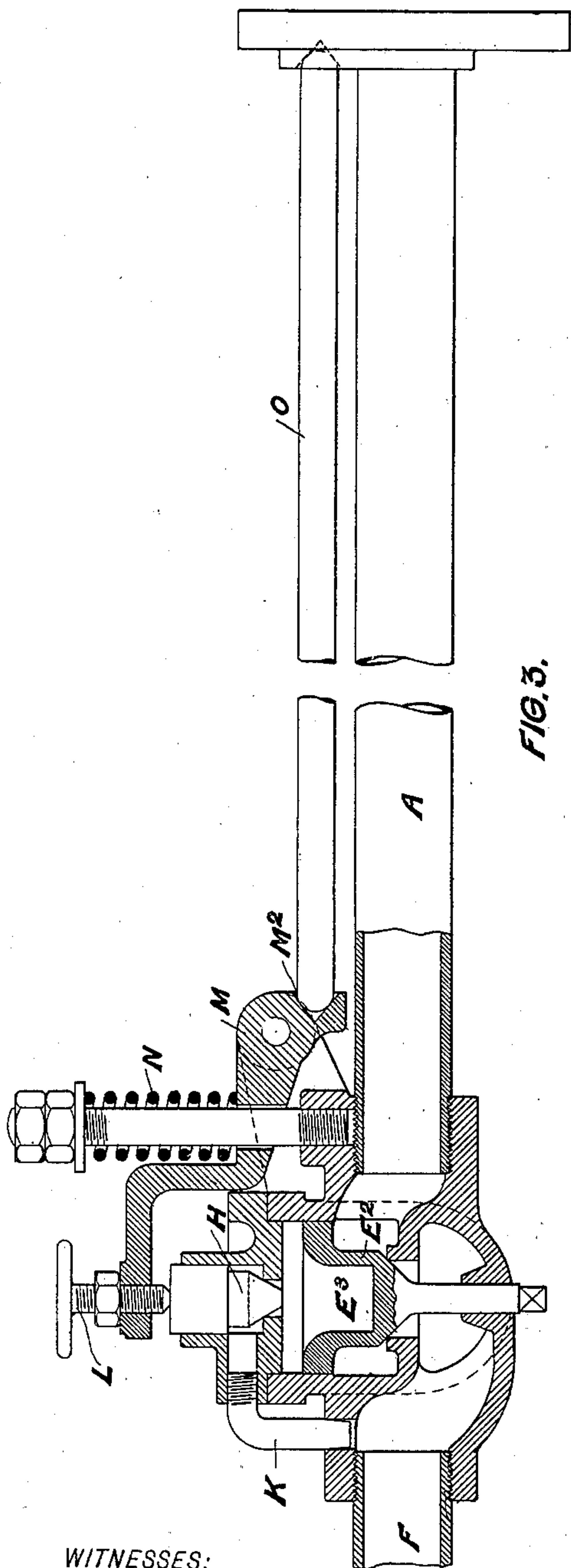
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JOHN EDWARD LEWIS OGDEN, OF LONDON, ENGLAND.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 630,399, dated August 8, 1899.

Application filed February 28, 1899. Serial No. 707,173. (No model.)

To all whom it may concern:

Be it known that I, JOHN EDWARD LEWIS OGDEN, engineer, a subject of the Queen of Great Britain and Ireland, residing at Penshurst, Vernon road, Leytonstone, London, in the county of Essex, England, have invented certain new and useful Improvements Relating to Steam-Traps, of which the following is a specification.

My invention relates to steam-traps, and has for its object to provide a steam-trap that shall be simple in design and that shall be positive, rapid, and certain in operation.

In the accompanying sheets of explanatory drawings, Figure 1 is a sectional elevation of one form of pilot-valve-arrangement steam-trap I construct, and Figs. 2 and 3 are similar views of modified forms of such traps.

In carrying my invention into effect in the provision of a steam-trap I employ a tube A, of brass, copper, or other such suitable metal or material, depending from or secured to the circuit of pipes required to be drained, the lower end of such tube being secured to a valve-casing B, in which a diaphragm c or piston is provided, the peripheral edge of the diaphragm being retained and held by means of a flange-cover D, suitably bolted or otherwise secured to the casing, the cover being in such close proximity to the diaphragm that when the diaphragm c is sprung out of its normal position it shall preferably rest and be supported by the interior face of the cover. The diaphragm is preferably corrugated and provided of thin, flexible, and elastic metal or other suitable material and has provided centrally thereon the main escape-valve E, which is maintained upon a seating B', provided upon the exit to which the waste-pipe F is connected. A perforation is formed in the diaphragm, or holes e are bored in the main valve E, so that water accumulating upon one side of the diaphragm may slowly pass through to the other side and so maintain an equal pressure upon that side.

Upon the flange or cover a pilot-valve casing G is centrally provided, having a passage or port g leading from the space between the cover and the diaphragm, which is normally closed by means of a pilot-valve H, which has its upper part preferably of cylindrical form

H' for the purpose of guiding the valve in the casing upon operation by internal pressure, as hereinafter described. An annular space h is provided in the pilot-valve casing, which communicates by means of a by-pass pipe K, passing around the steam-trap casing, to the waste-pipe or its branch B². The pilot-valve H is maintained upon its seat by means of a stop L, formed as an adjustable stud upon the extremity of the longer arm M' of an operating-lever M, which in turn is maintained to close the valve by means a spring N, suitably disposed. The smaller arm M² of this lever is diverted so as to receive the extremity of an iron thrust-rod O or rods of some other metal having relative to that of the tube A a small ratio of expansion, the opposite end of the rod being held by means of a stop or flange P, provided upon the upper extremity of the tube A, such rod lying for convenience upon or in close proximity to such tube.

In Fig. 2 I illustrate a modification of my improved trap in which the thrust-rod O rests upon the surface of the collecting-tube A, the lever M being also modified in its position and the valve H carried in a somewhat different manner. Instead of employing a diaphragm, as at c, Fig. 1, I may use a piston-headed valve E', having holes e for the steam to pass through its upper head, so as to act in a partially-balanced manner upon its upper surface, the valve-head working up and down in a gland R of woodite or other suitable material. The pilot-valve relief or waste passes by the passage K' to the exhaust side of the valve B³ of the valve-casing.

In operation the water of condensation which accumulates in the tube A causes the tube to contract and in the contraction causes the smaller end M² of the lever M to be forced forward, thereby relieving the pilot-valve H from the pressure of the spring N, and thereby in course permitting the water that has previously percolated or passed from the opposite side of the diaphragm c or piston E' to flow through the by-pass K or K' to the waste-pipe, thereby relieving the pressure behind the diaphragm or piston and permitting the pressure of the steam and the weight of the accumulated water to force up the main valve E from its seat and so permit the whole of

the accumulated water in the tube A to rapidly pass through to the waste-pipe, which done the tube A immediately expands, and an expansion relieves the pressure at the smaller end M² of the pilot-valve-operating lever, thereby permitting the pilot-valve to be again closed by means of the spring N, before referred to, the pressure becoming equal upon each side of the diaphragm or piston, so that the main valve closes upon its seat.

Fig. 3 is a sectional elevation of one form of my improved steam-trap in which the pilot-valve H is employed with the spring-loaded lever M and adjustable stop L, as before described, but in which the main valve E² is provided with a loose-fitting piston-head E³, under and above which the steam acts to keep the valve E² on its seat until the thermostatic pipe A is contracted and the lever M and its stop L caused to be raised slightly from the head of the pilot-valve H. When this movement arises, the steam above the piston-head E³ escapes through the pilot-valve and its port K, and thereby reduces or alters the balancing effect upon the main valve E, thus causing the pressure below to lift that valve, so as to readily draw off the accumulated water of condensation from the tube A into the exhaust-pipe F.

I modify the shape and size of my thrust-bars and the form and proportions of my tubes or collecting-chamber, also the arrangement of my pivoted spring-loaded lever to act upon the valve, to suit the capacity and conditions

of working of my improved steam-trap for any particular requirement.

My improved valve possesses the advantage of being uniformly reliable without readjustment when working with varying pressure of steam, so that when once the valve is set to work at any determined pressure it will remain equally effective when the pressure is considerably reduced or temporarily increased beyond the maximum working pressure.

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

In combination, the valve-casing B, the main valve the steam-supply and steam-pipe A, the thrust-rod O, the waste-pipe connection F, the pilot-valve H controlling the space above the main valve, the by-pass leading to the waste-pipe, said by-pass being controlled by the said pilot-valve and the spring-actuated lever M having one end to operate the pilot-valve while the other end is controlled by the thrust-rod O acting under the influence of the expansion and contraction of the steam-pipe A, the end flange of which engages with the end of the controlling thrust-rod O, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

JOHN EDWARD LEWIS OGDEN.

Witnesses:

ALBERT E. PARKER,
E. W. BARMARSH.