

(No Model.)

J. W. PERTZ.
SEPARATOR AND TRAP.

No. 413,243.

Patented Oct. 22, 1889.

Fig. 1.

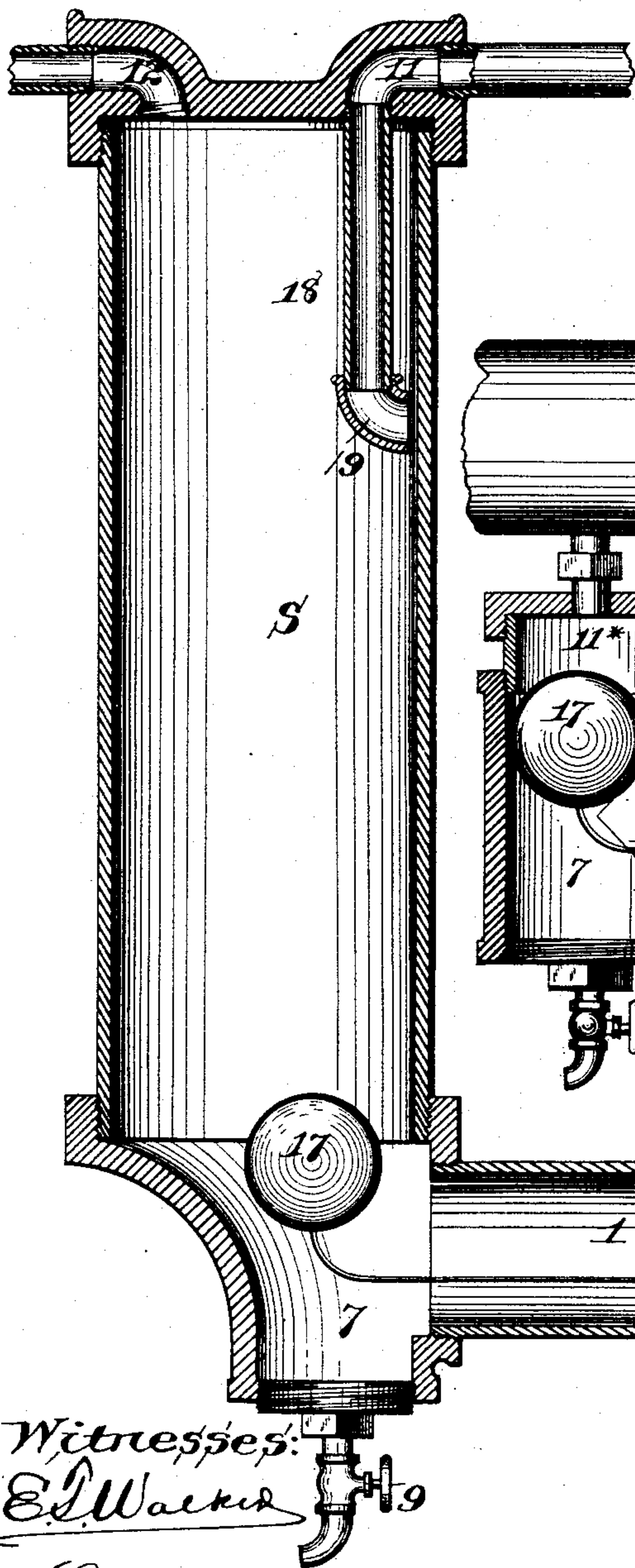


Fig. 2.

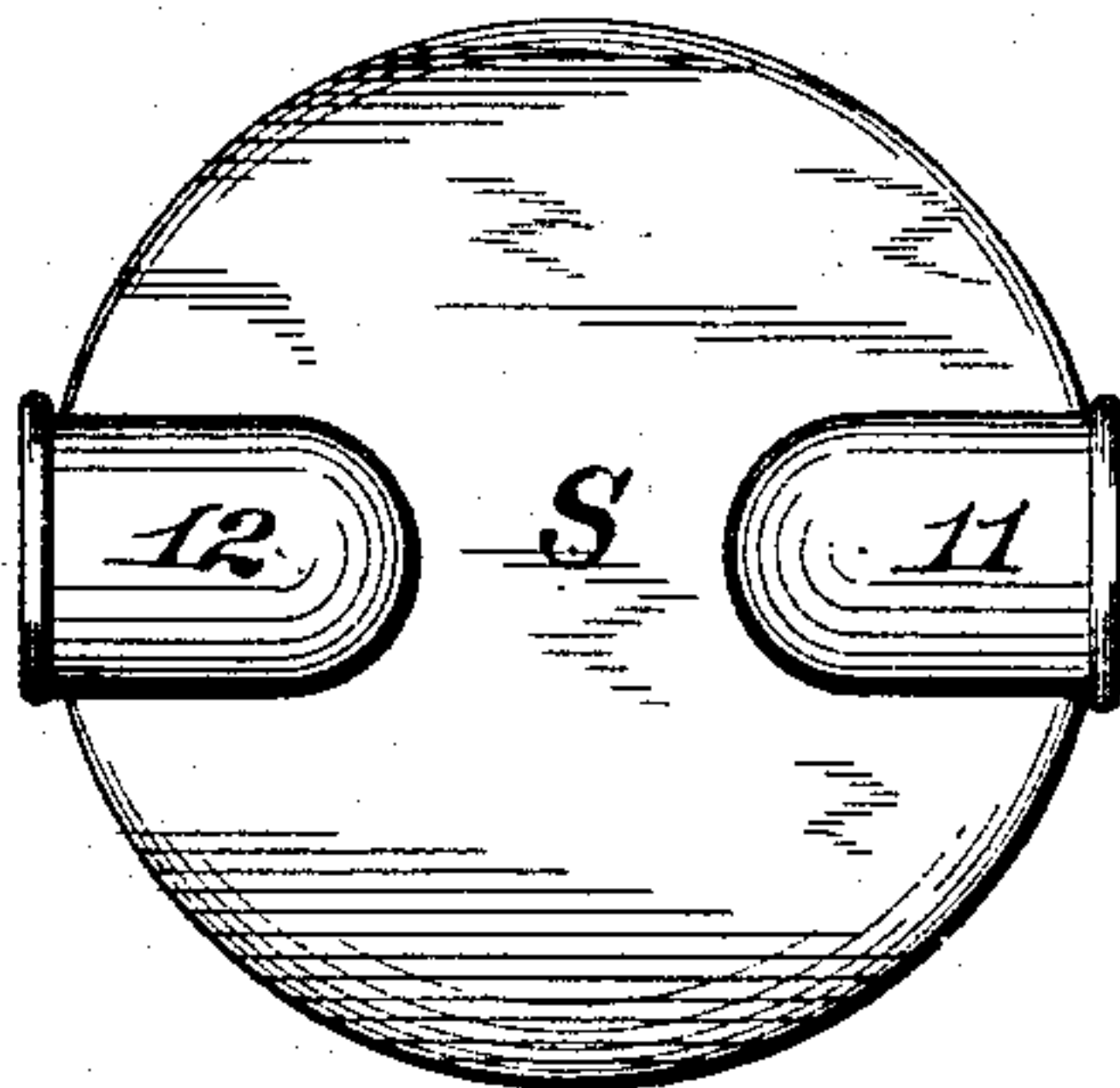
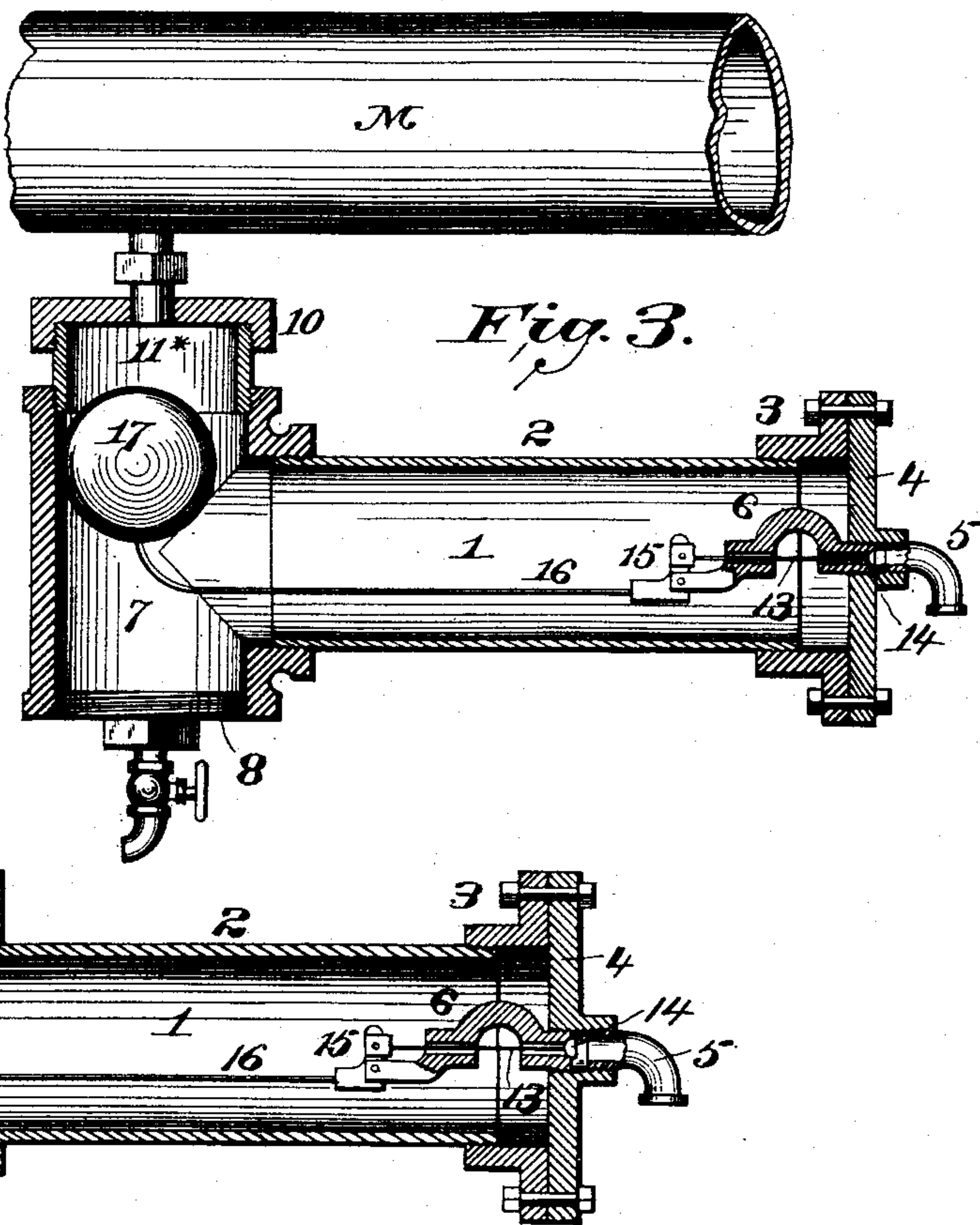


Fig. 3.



Witnesses:

E. J. Walker

H. B. Moulton

Inventor:

John W. Pertz
by F. W. Ritter Jr
att'y

UNITED STATES PATENT OFFICE.

JOHN WM. PERTZ, OF KOKOMO, INDIANA, ASSIGNOR OF ONE-HALF TO
GEORGE R. STEWART, OF SAME PLACE.

SEPARATOR AND TRAP.

SPECIFICATION forming part of Letters Patent No. 413,243, dated October 22, 1889.

Application filed February 11, 1889. Serial No. 299,446. (No model.)

To all whom it may concern:

Be it known that I, JOHN WILLIAM PERTZ, a citizen of the United States, residing at Kokomo, in the county of Howard and State of Indiana, have invented certain new and useful Improvements in Separators and Traps for Separating Gases, Steam, &c., from Fluids; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, wherein—

Figure 1 is a vertical longitudinal central section of devices embodying my invention. Fig. 2 is an end or top view of the same. Fig. 3 is a detached sectional view of the trap as applied directly to a main, the intermediate separator-chamber being omitted.

Like symbols refer to like parts wherever they occur.

The object of the present invention is to provide simple and efficient means for automatically separating fluids from steam, dry gases, &c., and for automatically trapping out or removing the fluids deposited from said gases, and said devices will be found of especial value in gas-works or on natural-gas mains leading from wet wells.

The apparatus as an entirety and in its preferred form consists, first, of a separator or chamber wherein the fluids and gases are caused to separate by the expansion of the gases and deposition of the fluids; secondly, in a fluid-chamber provided with a float-controlled valve, said fluid-chamber preferably arranged at right angles to the separator-chamber or in such manner as to obtain proper leverage on the float-controlled discharge-valve. It is evident that in case of pipe-lines for natural gas and in any equivalent position where it is desirable to drain a main or relieve it from accumulations of deposited fluids, the automatic trap may be used without the separator. Therefore the trap may be considered as one feature of the invention, and the combined separator and trap, which constitutes the entire apparatus, as a second feature.

There are minor features of invention which pertain to the particular form or construction adopted, all as will hereinafter more fully appear.

In the drawings, 1 indicates the fluid or trap chamber, which is preferably so constructed as to stand at right angles or in substantially a horizontal position to obtain leverage on the valve, for reasons which will hereinafter appear. A convenient method of constructing said trap-chamber 1 is to employ a section of pipe 2, closed at one end by a threaded sleeve 3, with a cap or head 4, bolted or otherwise secured thereto, which head 4 is tapped for a discharge-spout 5, and to receive the end of the valve-seat or valve-casting 6. To the opposite end of pipe-section 2 is secured a T-fitting 7, the lower end of which is closed by a plug 8, in which, if desired, may be placed a blow-off cock 9, and the opposite end of said T-fitting 7 may be either closed by a cap 10 and directly connected with a main M by a passage 11*; or, as I prefer, an enlarged expansion and separator chamber S, which may be a section of pipe, may be interposed, as shown at Fig. 1, and, in addition to the inlet-passage 11, an independent outlet 12 may be provided.

6 indicates the valve-casting of the trap-chamber 1, which is preferably of yoke shape to give a long bearing for the valve-stem without obstructing the flow of liquid. Through said valve-casting is the port or passage for the stem 13 of button-valve 14, and either the valve-stem 13 may be fluted or the passage for the valve-stem made of greater diameter than stem 13, as preferred. The seat of button-valve 14 is formed on the end of the valve-casting 6 at the termination of the passage formed therein for valve-stem 13, and is therefore on the exterior of the trap-chamber 1, which tends to prevent clogging of the valve by any deposit of sediment thereon and also affords ready access to the valve when desired.

On the free or inner end of valve-casting 6 is pivoted by its angle a bell-crank or elbow-lever 15, to one arm of which is attached the stem 13 of valve 14 and to the other arm a float-lever 16, provided at its end with a float 17. The float 17 is preferably solid, the better to avoid injury as well as to measurably weight the lever 16, the more effectively to close the valve 14 when the fluid is low or absent.

The L-form or horizontally-extended position of the trap-chamber 1 enables me to obtain considerable leverage on the stem of valve 14 without the necessity of employing a large trap-tank or separator-chamber. The gas and fluid pressure will act against the valve-stem to assist float 17, so that it will work effectually under the highest pressure of gas or of fluid.

In order to increase the efficiency of separator S and insure the deposit of any solid matters within the separator, where they can not reach and clog the automatic discharge-valve of the fluid-chamber, I prefer to prolong the inlet-passage 11 by means of a tube or pipe 18, extending into the separator and terminating in an elbow or nozzle 19, which directs the incoming gas, &c., against the walls or sides of the separator, whereby a species of condensation of fluids by contact of the gases with the walls is added to the precipitation due to the expansion of the gases.

The operation of the devices hereinbefore described, or their equivalents, is as follows: Any condensation taking place in the main M will find its way by passage 11 (or 11*) into the trap-chamber 1; also, any gases (or steam) conveying fluids in suspension will pass by passage 11 and prolongation 18 into the separator S, (when used,) and first by impingement on the separator-walls, and, secondly, by expansion of the gases within the separator-chamber, will deposit any contained fluids and solids, the dry gases (or steam) escaping from the separator by passage 12 back into the main or conduit therefor. When there is no fluid in the trap-chamber, or insufficient to raise the float and operate the automatic discharge-valve, the gaseous pressure on the float and the weight of the float, owing to the leverage exerted on the elbow-lever 15 and stem 13, will hold button-valve 14 on its seat or closed against the highest gaseous or fluid pressure in the main or the separator; but when the fluid has accumulated sufficiently to elevate the float the leverage will then assist the float in operating the valve.

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

1. In a fluid-trap, the combination, with the trap-chamber, of an elbow-lever pivoted by its angle within said chamber, an outwardly-opening discharge-valve connected by its stem with one arm of said elbow-lever, and a float connected with the opposite arm of said elbow-lever, substantially as and for the purposes specified.

2. In a fluid-trap, the combination, with a trap-chamber, of a U-shaped valve-casting having a discharge-port therethrough and a valve-seat on its outer end, an outwardly-opening valve having a stem which extends through the port or passage of said valve-casting, an elbow-lever pivoted at its angle and connected by one arm with the valve-stem, and a float connected with the other arm of said elbow-lever, substantially as and for the purposes specified.

3. In a combined separator and fluid-trap, the combination, with an L-shaped chamber the vertical arm of which forms an expansion or separator chamber and the horizontal arm a fluid chamber or trap, of an inlet-pipe arranged in said vertical arm to deliver against the walls thereof, and an outlet-pipe, a trap-valve at the distant end of the horizontal arm of the L-shaped chamber, a valve-lever arranged longitudinally in said arm to actuate the valve, and a float arranged in the vertical arm and connected with the valve-lever, substantially as and for the purposes specified.

4. In a separator and fluid-trap, the chamber S, having the horizontal extension 1, the inlet-pipe 18 19, outlet 12, trap-valve 13 14, bell-crank lever 15, float-lever 16, and float 17, said parts arranged and combined substantially as and for the purposes specified.

In testimony whereof I affix my signature, in presence of two witnesses, this 8th day of February, 1889.

JOHN WM. PERTZ.

Witnesses:

GEO. W. DUKE,
H. C. MIX.