

(No Model.)

2 Sheets—Sheet 1.

F. J. HLADKY.

STEAM TRAP.

No. 377,305.

Patented Jan. 31, 1888.

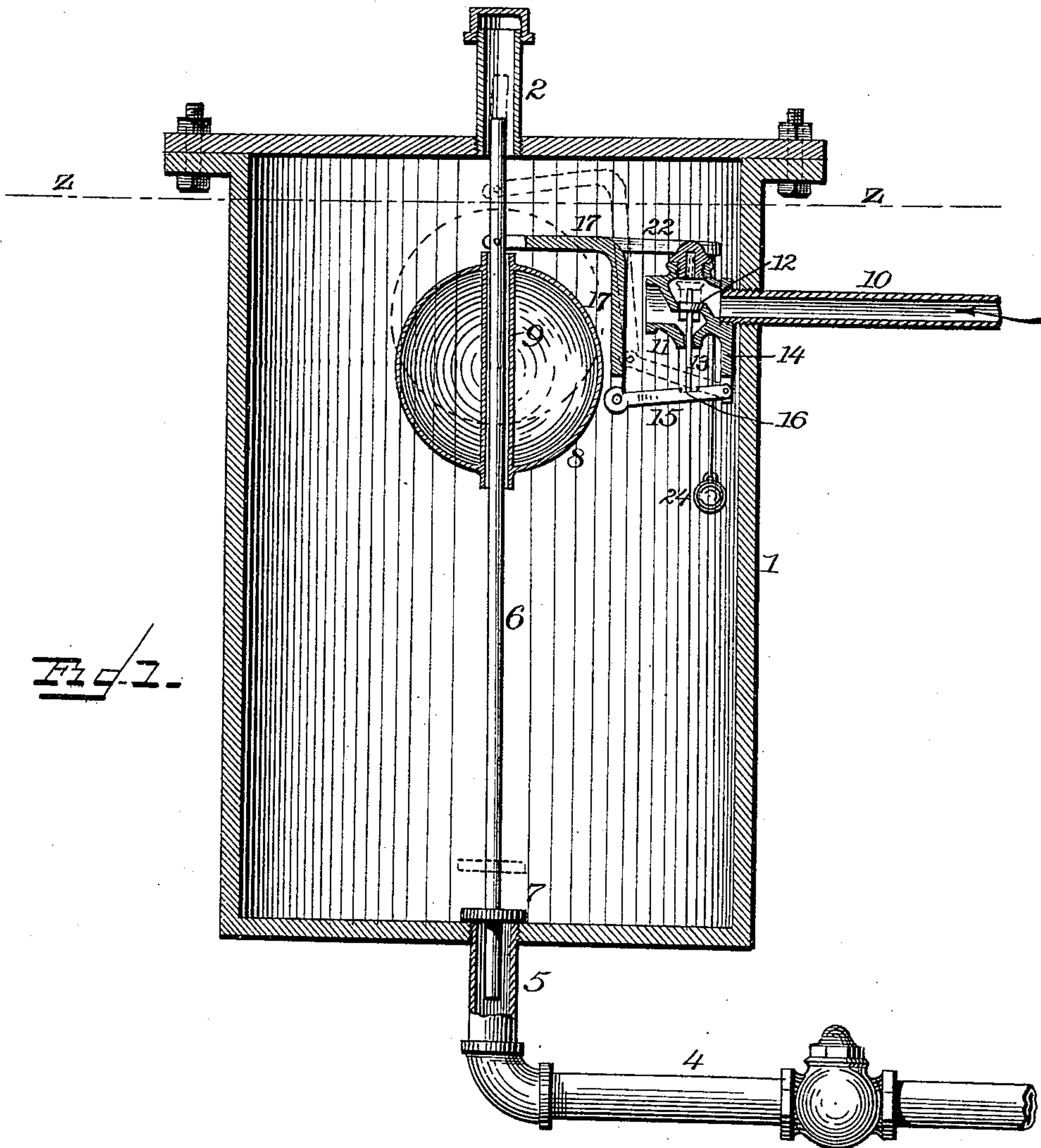
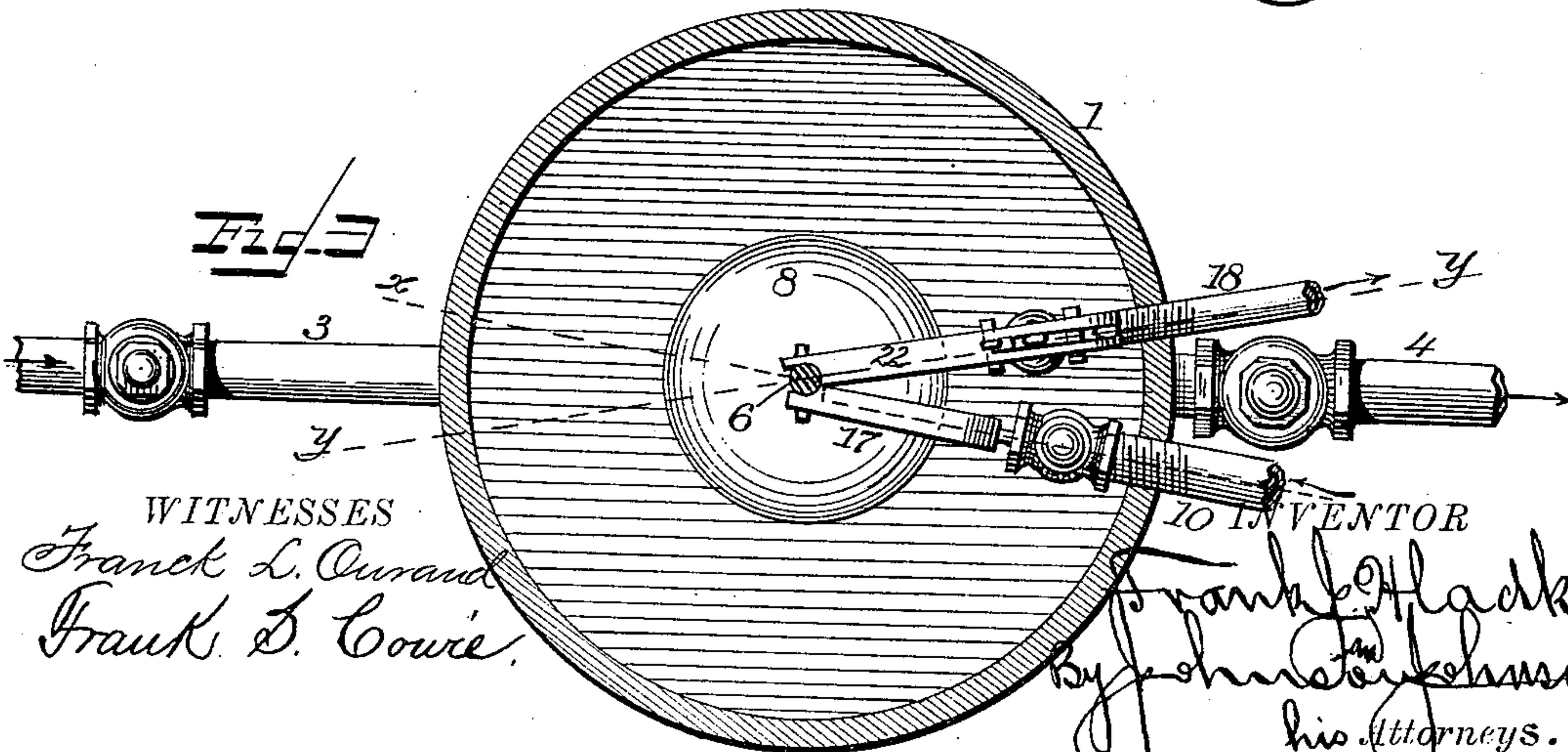


Fig. 1.



WITNESSES

Frank L. Ouraud
Frank D. Cowie.

TO INVENTOR

Frank J. Hladky
By John S. Johnson
his Attorneys.

(No Model.)

2 Sheets—Sheet 2.

F. J. HLADKY.

STEAM TRAP.

No. 377,305.

Patented Jan.-31, 1888.

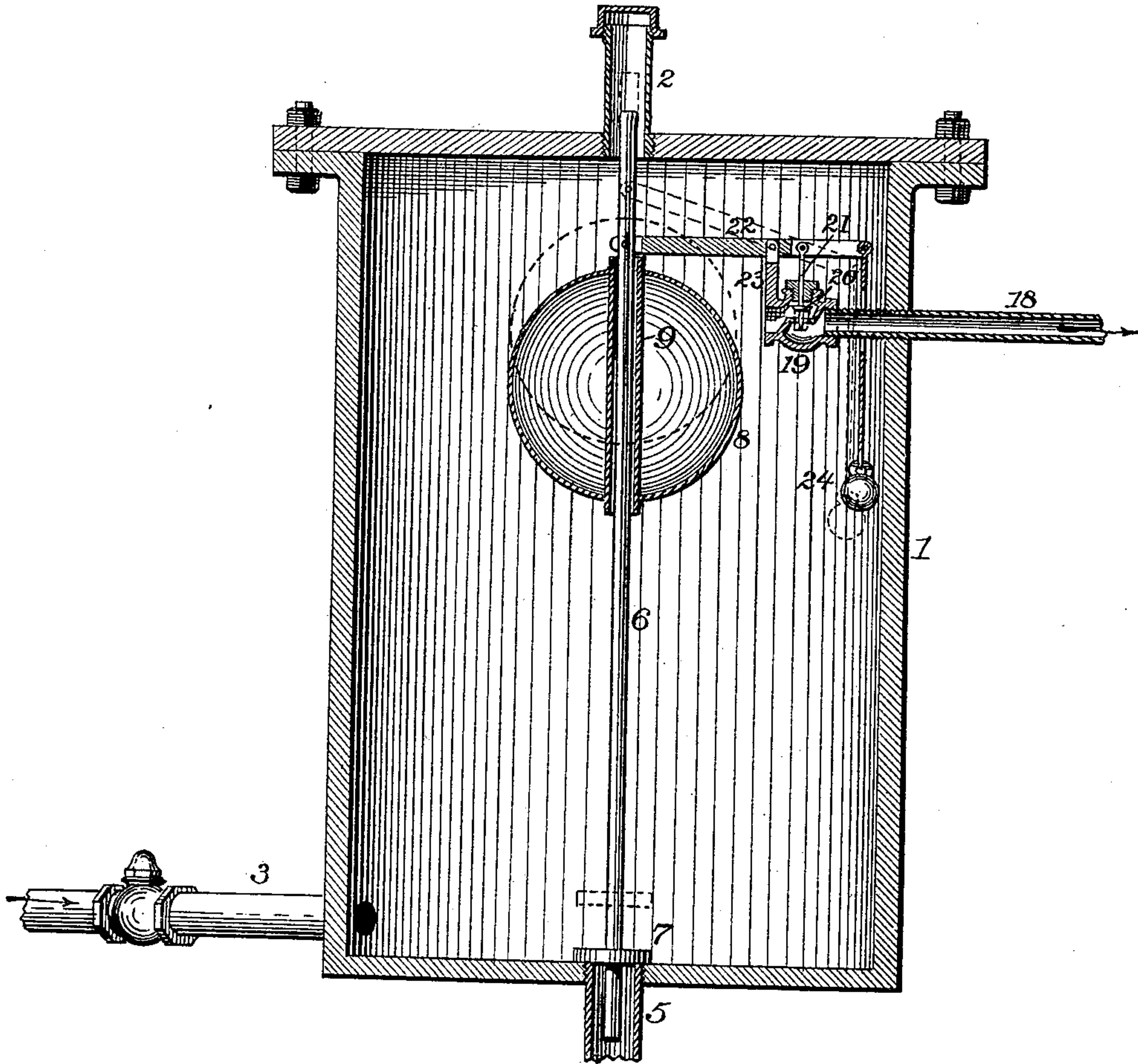


Fig. 2.

WITNESSES

F. L. Ourand.
F. D. Cowie.

INVENTOR

Frank J. Hladky
By Johnson and Johnson
his Attorneys.

UNITED STATES PATENT OFFICE.

FRANK J. HLADKY, OF TOPEKA, KANSAS.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 377,305, dated January 31, 1888.

Application filed July 26, 1886. Serial No. 209,155. (No model.)

To all whom it may concern:

Be it known that I, FRANK J. HLADKY, a citizen of the United States, residing in the city of Topeka, county of Shawnee, and State of Kansas, have invented a new and useful Return-Trap, of which the following is a specification.

My invention relates to return steam-traps, or steam-traps by means of which the condensed or waste water from a boiler, steam-engine of high or low pressure, steam heater, or any similar apparatus or machine may be returned and forced into the boiler; and it has for its object to provide such a trap, by means of which the said condensed or waste water may be automatically forced back into the boiler and supply the same with heated feed-water, effecting a saving in the fuel consumed in heating the water in the boiler and effecting a saving in the water consumed in the boiler and apparatus connected to the same.

To this end the invention consists in the improved construction and combination of parts of such a trap, as hereinafter more fully described and claimed, and illustrated in the accompanying drawings, which form a part of the specification, and in which—

Figure 1 is a vertical sectional view on line *x x*, Fig. 3. Fig. 2 is a similar view on line *y y*, Fig. 3; and Fig. 3 is a horizontal sectional view on line *z z*, Fig. 1.

The same numerals of reference indicate the same or corresponding parts in all the figures.

In the drawings, the numeral 1 indicates a casing, preferably cylindrical, and provided with a short central tube, 2, in its closed top, closed at its upper end, and with an inlet-pipe, 3, which may either enter the casing at the bottom or near the top. An outlet-pipe, 4, enters the casing at the center of the bottom, and has a vertical portion, 5, at the end, entering the same. A rod, 6, is supported in the casing axial to the same by having its ends fitting and sliding in the tube at the top of the casing and in the vertical portion of the outlet-pipe, the lower end of the rod in the vertical portion of the outlet-pipe being smaller in diameter than the said portion, and having a disk or valve, 7, near the end, which fits over the central aperture in the bottom of the casing, closing the same.

A hollow metallic ball, 8, has a diametrical tube, 9, with which it slides upon the rod, resting, when dropped to its lowermost position, upon the disk or valve 7, and this ball may rise within the casing and upon the rod when water enters the casing, floating upon the surface of the same.

A steam-inlet pipe, 10, enters the casing near the upper end, extending from the gage-cocks of the boiler, and having cocks at each branch extending to the gage-cocks, so that each branch may be cut off when not in use, and the inner end of this inlet-pipe, within the casing, is formed with a valve-casing, 11, having an upwardly-opening puppet-valve, 12, with its stem 13 extending down through the bottom of the valve-casing, sliding in the same.

A lug or hanger, 14, projects downward from the said valve-casing, and has a rod, 15, pivoted to its end, the said rod having a concave notch, 16, upon its upper side, in which the lower end of the valve-stem rests, and the free end of the pivoted rod is pivotally connected to the lower end of a rectangularly-bent arm, 17, which has the end of its horizontal portion pivotally connected to the vertically-sliding rod. An exhaust-pipe, 18, enters the upper end of the casing, and has a valve-casing, 19, at its inner end within the trap-casing, and this valve-casing is provided with an upwardly-opening puppet-valve, 20, having its stem extended up and sliding through the top of the valve-casing, the upper end of this stem being pivoted to a lever, 22, fulcrumed upon an upright lug, 23, upon the valve-casing, and having its longer arm pivotally connected to the vertically-sliding rod, and its shorter arm, to which the valve-stem is pivoted, provided with a pending weight, 24, which will assist in heating the valve when the longer arm is raised.

The operation is as follows: The vertical rod has its disk or valve normally closing the outlet-aperture in the bottom of the casing, and the steam-inlet valve is normally closed while the exhaust-valve is open, and the water-inlet is always open. When, now, sufficient water has entered the casing to raise the floating ball and to cause it to tilt the bent arm and the lever upward, the steam-inlet valve will be

opened and the exhaust closed, causing the pressure of the steam from the boiler to equalize the pressure against the water in the outlet or discharge pipe, and the water within the casing will run back into the boiler by its own gravity, the discharge-pipe entering near the bottom of the boiler. The disk or valve upon the vertically-sliding rod has also been raised by the floating ball, so that free discharge from the casing may take place. When, now, all the water has run out, the floating ball will drop with it, closing the disk or valve over the discharge-aperture, and, drawing the bent arm and the lever down with the vertically-sliding rod, it will again open the exhaust-valve and close the steam inlet valve, allowing water to again accumulate in the casing until the ball is again raised sufficiently high to tilt the arm and the lever, when discharge into the boiler will again take place. It will thus be seen that the condensed or waste water from the engine or apparatus connected with the boiler will automatically be forced back into the boiler, and as this water is more or less heated a saving will be effected in the fuel consumed in heating the boiler, as a part of the feed-water for the boiler will thus be heated before entering the same. When the steam-inlet valve is open, forcing water into the boiler, and the water should rise above the gage-cock, with which the steam-inlet is connected, the water will flow back through the inlet-pipe into the casing of the feeder, and will circulate from the casing to the boiler and back to the casing until sufficient water has been evaporated in generating steam to let the water fall below the gage-cock connected to the inlet, so that the water within the boiler can never rise above the level at which it is desired to have it kept.

In localities where water is scarce a saving in the consumption of the water will also be effected by the use of this return steam-trap, as the waste or condensed water will be returned automatically to the boiler, so that it will continually circulate from the boiler to the engine or other apparatus and back again into the boiler, the only water thus consumed being the water which will leak out

or otherwise escape in its circuit and the water which will be decomposed by continuous heating.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a return steam-trap, the combination of a casing having a water-inlet and a water-discharge in the bottom, a vertically-sliding rod having a floating ball sliding upon it, a steam-inlet having an upwardly-opening valve provided with a downwardly-extending stem, a pivoted rod bearing against the stem and having a rectangularly-curved arm pivoted to its free end and to the rod above the ball, a steam-exhaust having an upwardly-opening valve with an upwardly-projecting stem, and a lever fulcrumed over the valve and having its longer arm pivoted to the sliding rod, and having a weight upon its shorter arm and having the valve-stem pivoted to the short arm, as shown and set forth.

2. In a return steam-trap, the combination of a casing having a closed central tube in its top, and having a water-inlet pipe, 3, and a water-discharge pipe, 4, entering at the center of the bottom, with a vertical portion, 5, a vertically-sliding rod having its ends in the top tube and vertical portion of the discharge-pipe, and provided with a valve or disk, 7, near its lower end, a hollow floating ball sliding with a diametrical tube upon the rod, a steam-inlet pipe, 10, having a valve-casing, 11, and upwardly-opening valve 12, provided with downwardly-extending stem 13, a rod, 15, pivoted upon lug 14 and having notch 16, rectangularly-bent arm 17, pivoted to the rod 15 and to the vertically-sliding rod, exhaust-pipe 18, having valve-casing 19, and upwardly-opening valve 20, having upwardly-extending stem 21, and lever 22, fulcrumed upon lug 23 and pivoted to the rod 6 and to the valve-stem, and having a weight depending from the end of its short outer arm, as shown and set forth.

FRANK J. HLADKY.

Witnesses:

W. H. COPP,
C. W. GRAVES.