No. 612,430. Patented Oct 18, 1898.

H. C. MOOERS.

STEAM TRAP.

(Application filed July 8, 1897.)

(No Model.)

FIG. 1.

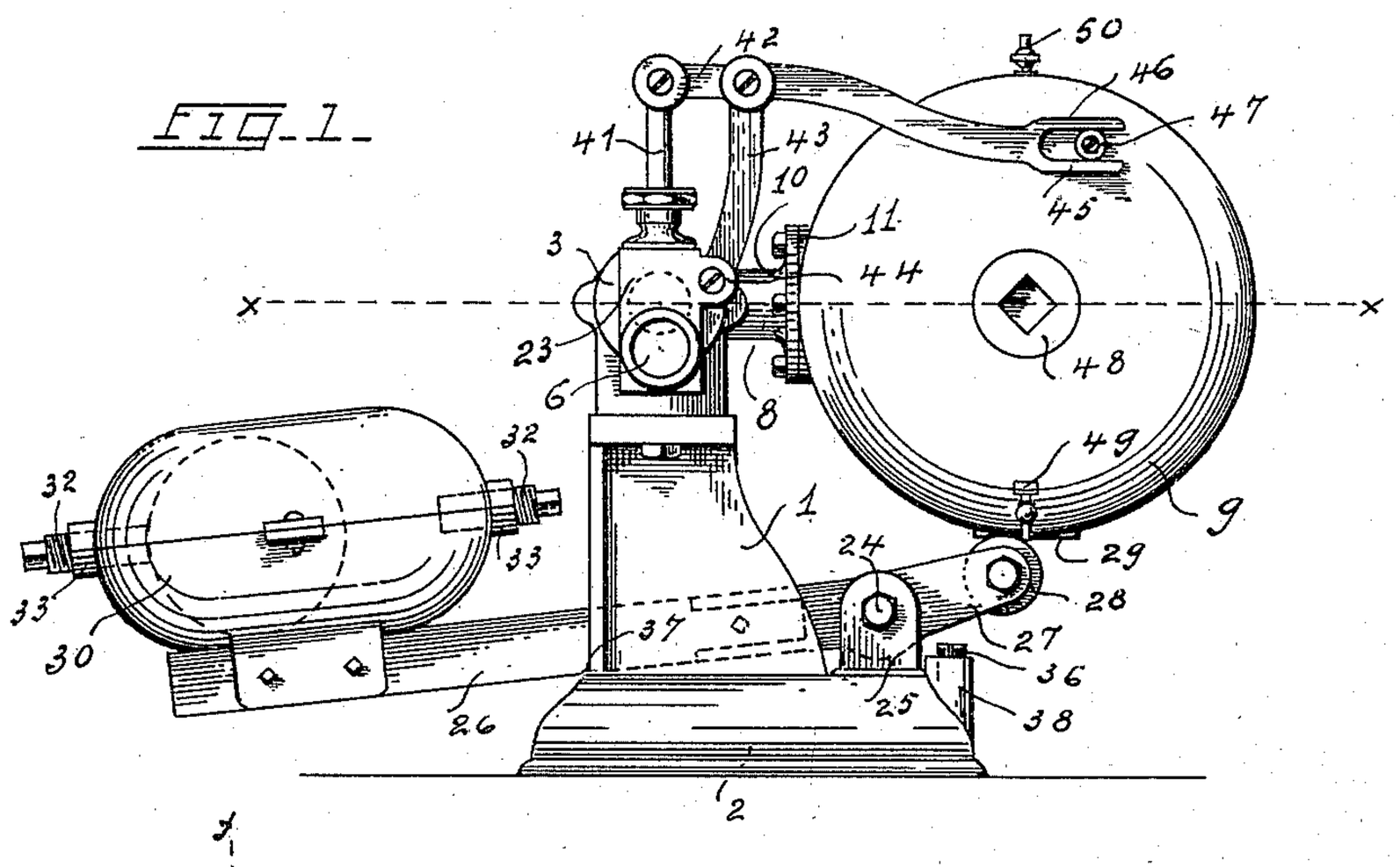


FIG. 3.

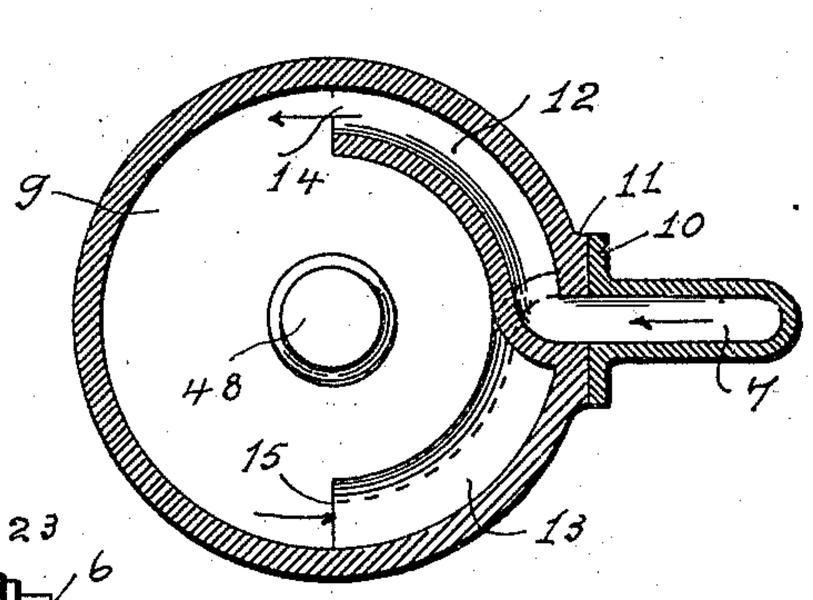


FIG. 2.

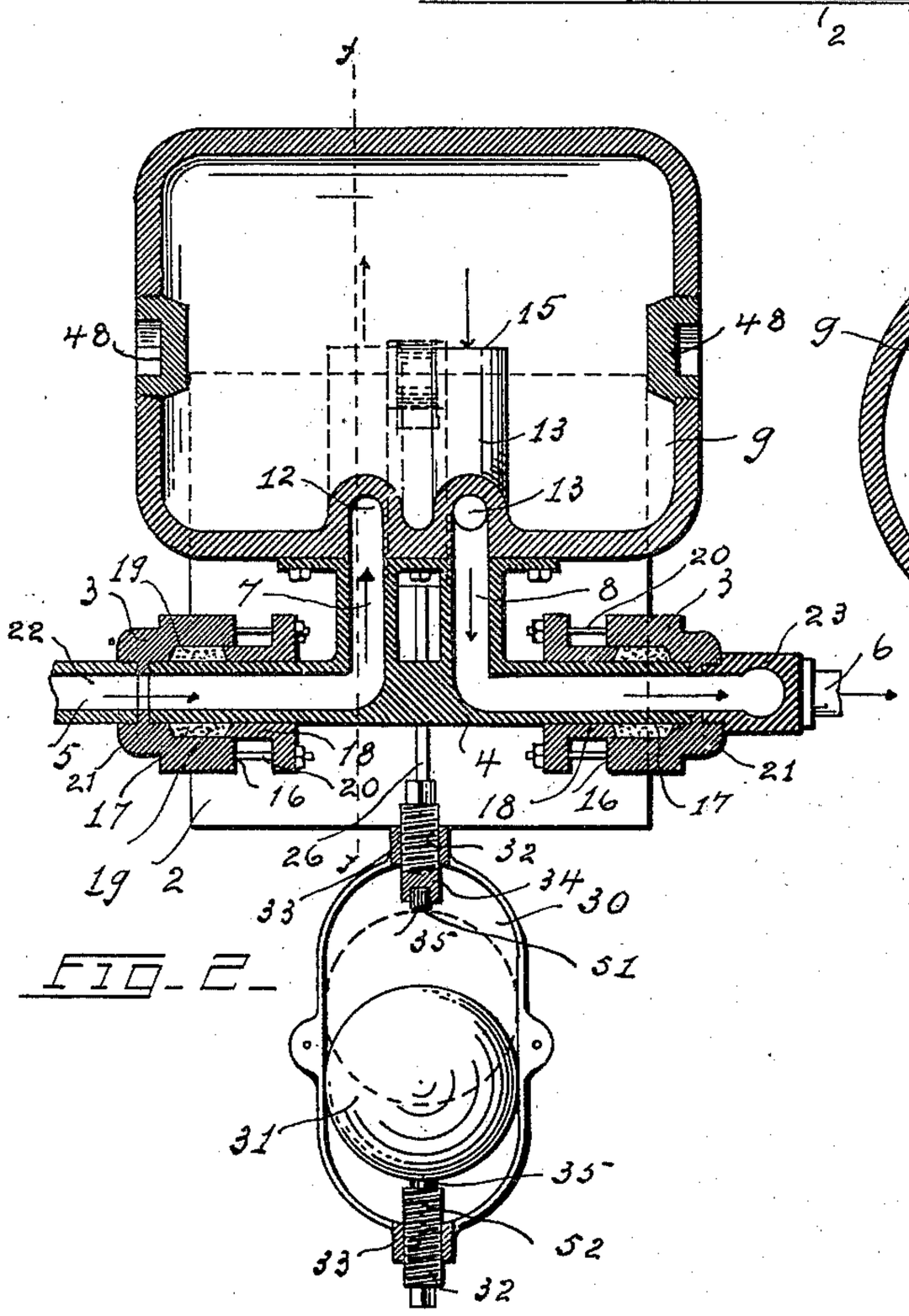
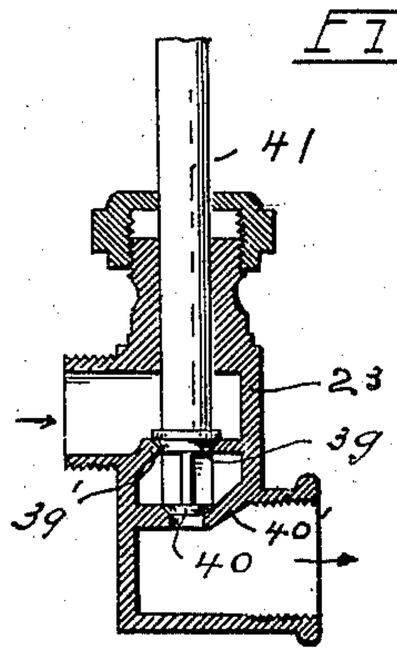


FIG. 4.



WITNESSES.

H. H. Martin

Maud Schumacher.

INVENTOR.

Henry C. Mooers

By William Webster

Atty

UNITED STATES PATENT OFFICE.

HENRY C. MOOERS, OF TOLEDO, OHIO, ASSIGNOR OF ONE-HALF TO ALBERT COOKE, OF SAME PLACE.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 612,430, dated October 18, 1898.

Application filed July 8, 1897. Serial No. 643,877. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. MOOERS, of Toledo, county of Lucas, and State of Ohio, have invented certain new and useful Improvements in Steam-Traps; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form part of this specification.

My invention relates to a steam-trap, and has for its object to provide adjustable mechanism for automatically discharging at intervals a certain volume of accumulated liquid or water and to effect a scouring action in the reservoir and ports during the period of discharge or evacuation.

A further object is to provide a reservoir whereby the discharging liquid can be measured.

The trap can be used with high or low pressure and for any liquid.

There are no floats exposed to the pressure, and all the operating mechanism is visible, thereby insuring easy access for repair or adjustment.

I have found that with my trap no steam is wasted during the discharge of the liquid from the reservoir and that by the actuating balance-lever and the movable weight the discharge can be arrested at any time, leaving the desired amount of liquid in the reservoir, thereby preventing the discharge of steam.

In the drawings, Figure 1 is a side elevation of the invention. Fig. 2 is a horizontal section on line $x\,x$. Fig. 3 is a vertical section through the reservoir inlet and discharge ports on line $y\,y$. Fig. 4 is a vertical section through the outlet-valve.

In carrying out the invention I mount upon the standard 1, integral with the base-plate 2, journals 3, and held in these journals is an oscillating shaft 4, having located therein an inlet-port 5 and a discharge-port 6, communicating, through the connections 7 and 8, with the reservoir 9. Ports 7 and 8 are integral with the ported shaft 4 and terminate upon their outer ends in a face-plate 10, adapted to be secured with bolts to a coincident shoulder 11 upon the periphery of the reservoir, having suitable packing material interposed between the surfaces. Upon the inner side of the reservoir and integral with the walls is an inlet-port 12 and an outlet-port 13, conforming to the curvature of the walls of the reservoir. The inlet-port 12 is curved upwardly, communicating with the interior of the reservoir at 14. The discharge-port is curved downwardly and opens at 15, thereby bringing the mouths of the ports in the same direction and vertically above and under each other. The inner face 16 of the journals 3 contains an annular chamber 17, adapted to receive the annular packing-glands 18 and suitable packing material 19. The glands are secured to the journals by stud-bolts 20. The outer faces 21 of the journals are adapted to be connected by threaded couplings to the drain and steam connections 22 and to the double-seated discharge-valve 23. Pivoted in an antifriction-bearing 24, supported in vertical standards 25, is an equalizing-lever 26, which is bifurcated upon the short portions 27 and has journaled in the bifurcation in antifriction-bearings a roller 28, which is in contact with the flat face 29, formed upon the periphery of the reservoir. To the long end of the lever there is adjustably secured a housing 30, adapted to contain a movable weight 31. To adjust the travel of the movable weight, adjustable plugs 32 are provided, engaging bosses 33, integral with the housing. The inner end 34 of the plugs is adapted to contain some resilient material 35 to eliminate the noise of the weight striking the ends of the housing. Provision is also made to prevent the noise of the lever striking the base by interposing resilient material 36 at the point 37 and at the top of the boss 38, integral with the base.

The discharge-valve 23 is provided with valves 39 and 40, adapted to be in coincidence with seats 39′ and 40′, formed within the body portion of the valves. The stem 41 is elongated and connected with a lever 42, pivoted in a standard 43, which is held between lugs 44, integral with the body of the discharge-valve. The outer end of the lever is bifurcated, and located between the bifurcations 45 and 46, movably secured to the end of the

reservoir, is a roller 47, adapted to move in the bifurcations as the reservoir is depressed and the discharge-valve is raised or lowered by the lever.

48 designates plugs in the ends of the reservoir, and 49 and 50 designate vents upon the reservoir.

In operation the relative position of the weighted lever, reservoir, and discharge-valve-operating lever is as shown in Fig. 1. The condensation flows into the reservoir through ports 5 and 7 until the accumulated liquid fluid overbalances the weighted lever, causing the reservoir to descend and, depressing the discharge-valve lever, opening the valve, thereby allowing the fluid to escape through ports 6 and 8. As the reservoir descends the weighted lever ascends and causes the weight within the housing to move downwardly and inwardly until it rests against the adjustable plug 51, where it will remain until the weight overbalances the reservoir and partly-discharged contents. Then the weighted lever descends, causing the reservoir to assume its original position, thereby closing the discharge-valve, the weight within the housing having moved in the descending against the outer and lower plug 52, remaining there until sufficient accumulation in the reservoir causes the above operation to be repeated. In limiting the travel of the weight within the housing by the plugs 51 and 52 the time of the intermittent discharge and volume thereof can be adjusted. By adjusting the plug 52 the time of the intermittent discharge may be increased or diminished, and by adjusting the plug 51 the volume of fluid to be discharged or retained in the reservoir can be increased or diminished. A scouring action is established by the rushing of the liquid contained in the reservoir to escape through the port 13, located at the lowest portion of the interior of the reservoir.

Arrows shown in the drawings indicate the direction of the flow. I may also interpose the discharge-valve-operating mechanism and locate the same diametrically under the position shown in Fig. 1.

What I claim is—

1. In a steam-trap, a base-plate, standards formed integral therewith, journal-bearings carried by the standards, within which an oscillatory shaft has its bearings, said shaft being hollow and provided with a right-angular projection having an inlet and a discharge port, the projection terminating in a face-plate, a reservoir provided with a shoulder upon one side, by which means the reservoir is secured to the face-plate of the right-angular projection, said inlet and discharge port of the projection communicating with the interior of the reservoir, inlet and outlet ports formed integral with the reservoir-wall, annular chambers formed in the journal-bearings, annular locking-glands and packing material located in the annular chamber, drain and steam connections, a discharge-valve, a bifurcated equalizing-lever, antifriction-bearings located in the lever, housing secured to the lever, a weight secured in the housing, and adjustable plugs and bosses for determining the travel of the weight.

2. In a steam-trap, a lever journaled in antifriction-bearings upon standards secured to the base, a housing adjustably secured to the lower end of the lever, containing a movable weight, plugs adapted to limit the travel of the movable weight within the housing, having resilient inner end portions, a roller journaled in antifriction-bearings in the bifurcated short end portion of the lever, being in contact with a flat face upon the periphery of the reservoir, a reservoir secured to an oscillating shaft journaled upon standards secured to the base, inlet and outlet ports within the shaft communicating through cross-connections with the interior of the reservoir, a discharge-valve secured to one end of the journal, adapted to be opened and closed by a lever engaging a roller journaled to the end of the reservoir, packing-glands upon the inner face of the journals, adapted to be inserted in annular chambers formed by the journal and oscillating shaft, and resilient material secured to the base at the contact-point of the lever.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

HENRY C. MOOERS.

Witnesses:
HERMAN H. MARTIN,
MAUD SCHUMACHER.