

No. 837,741.

PATENTED DEC. 4, 1906.

R. C. SIMPSON.
WATER HEATER.

APPLICATION FILED JUNE 19, 1905.

3 SHEETS—SHEET 1.

Fig. 1.

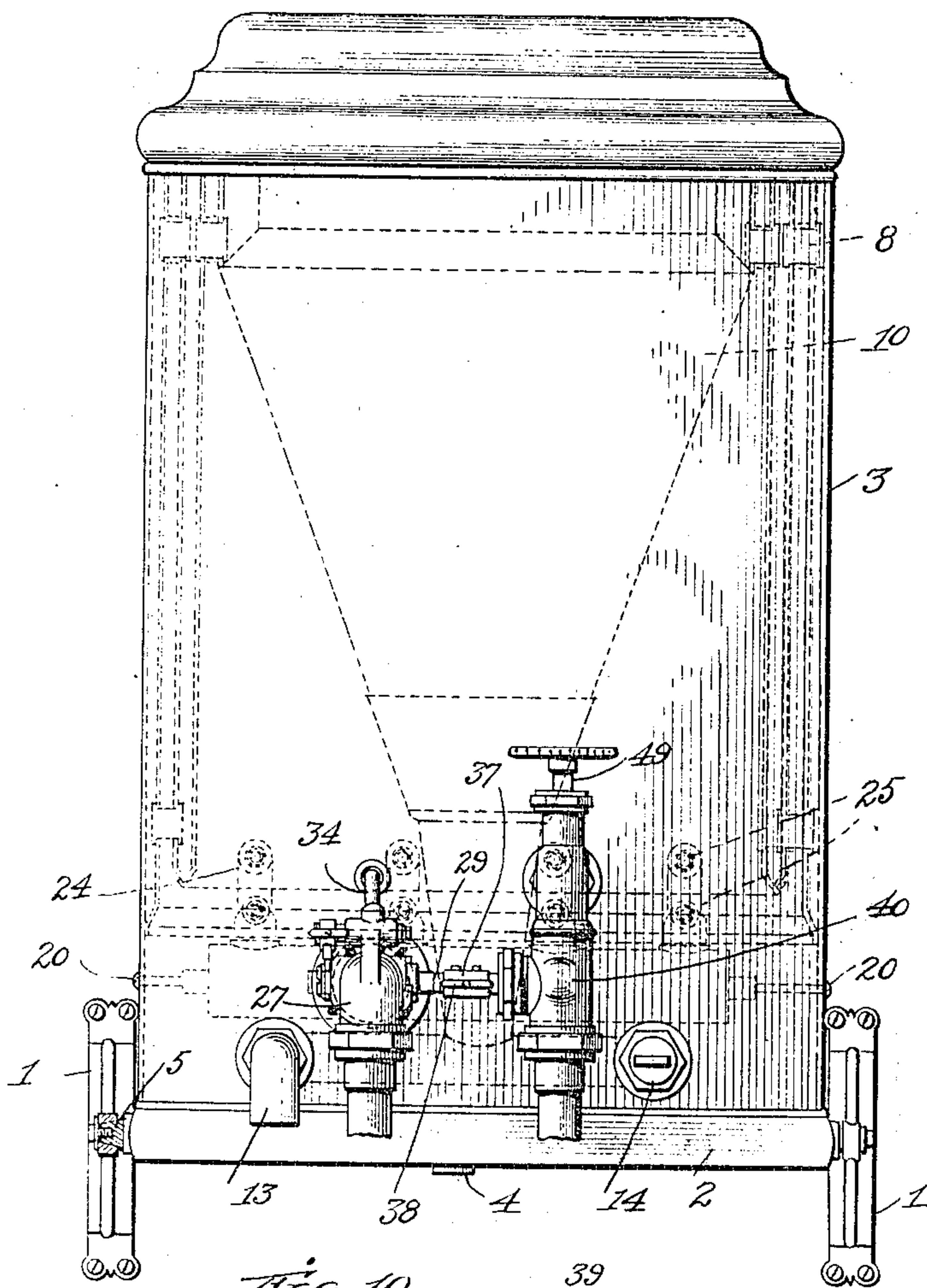
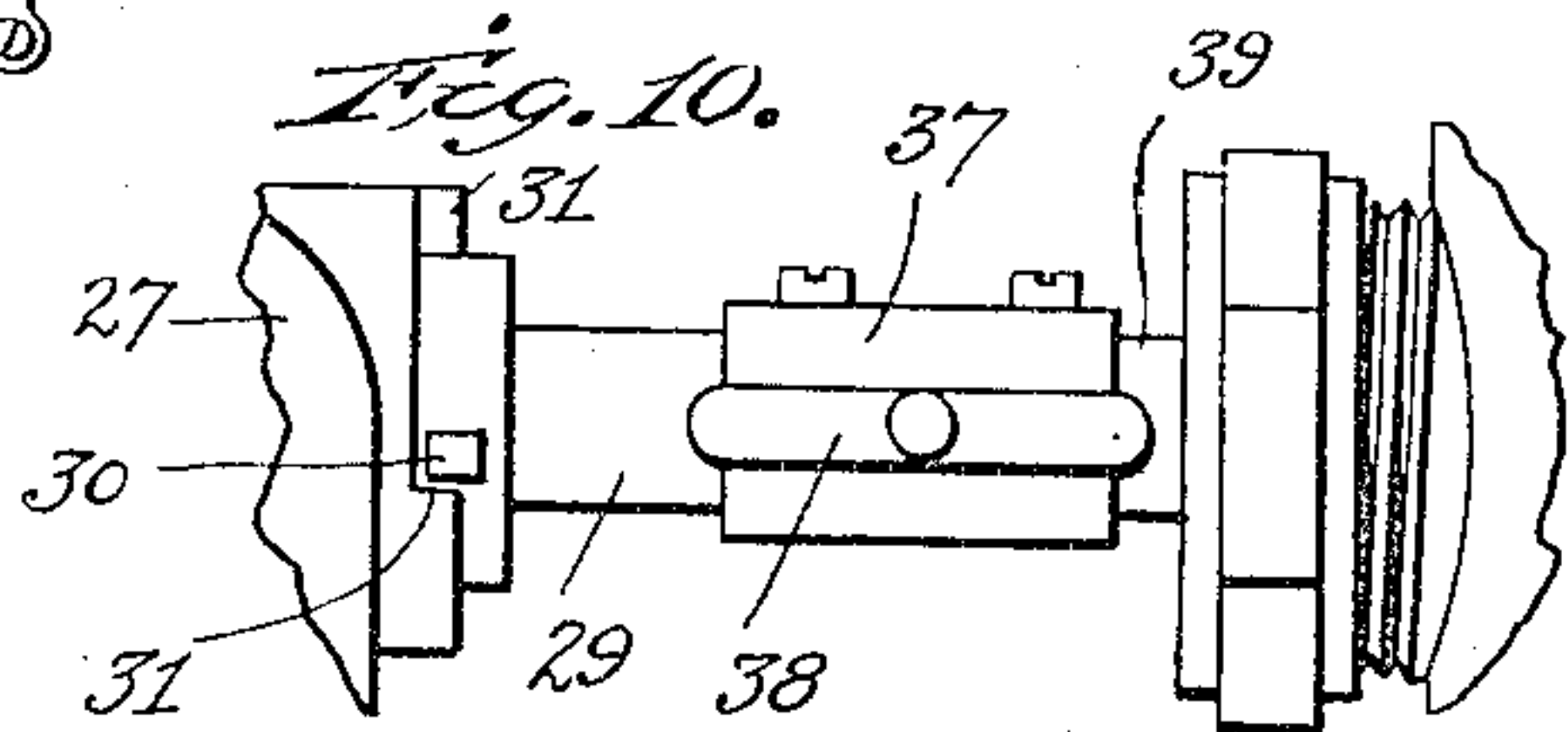


Fig. 10.



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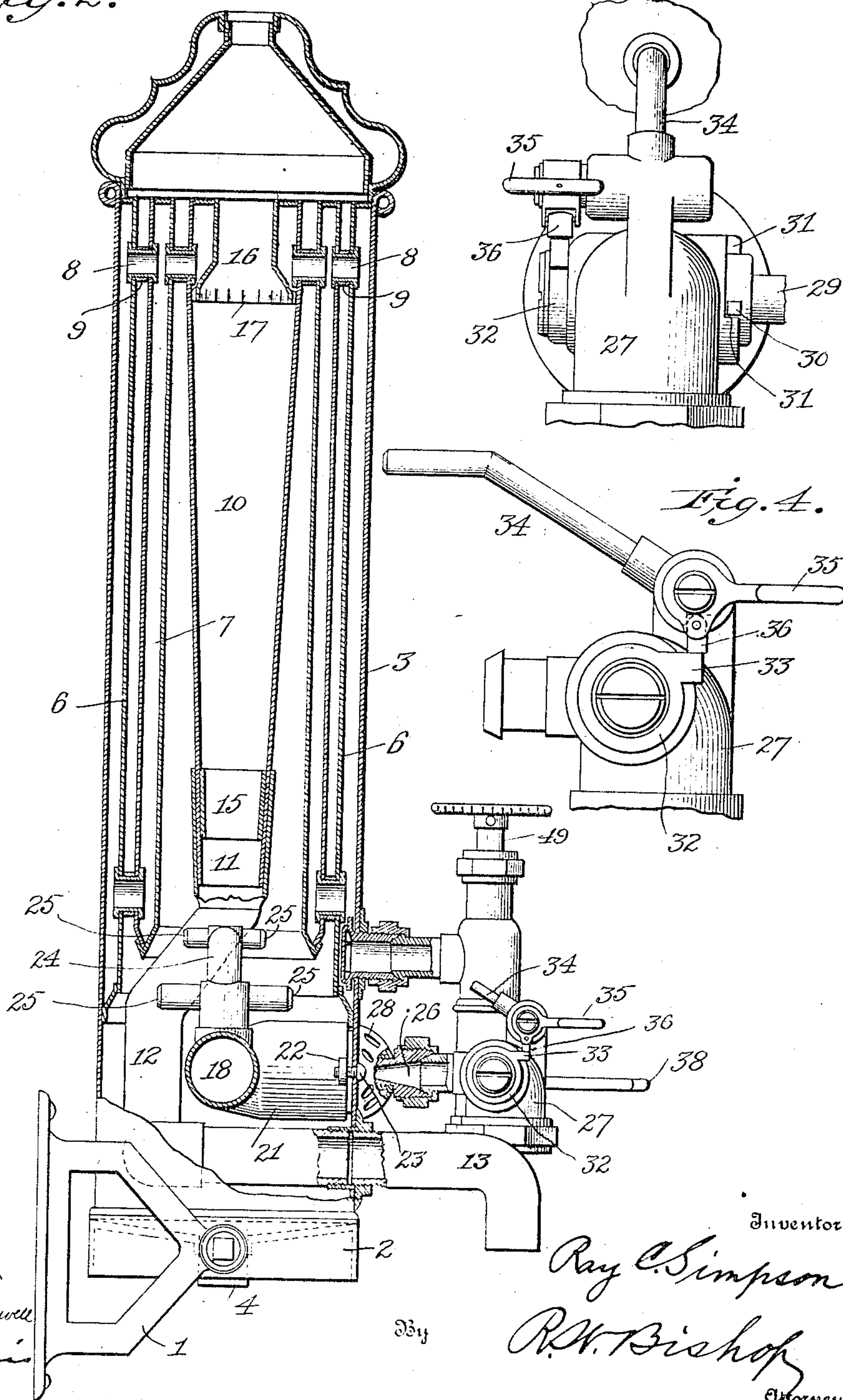
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3 SHEETS—SHEET 2.

Fig. 2.

Fig. 3.



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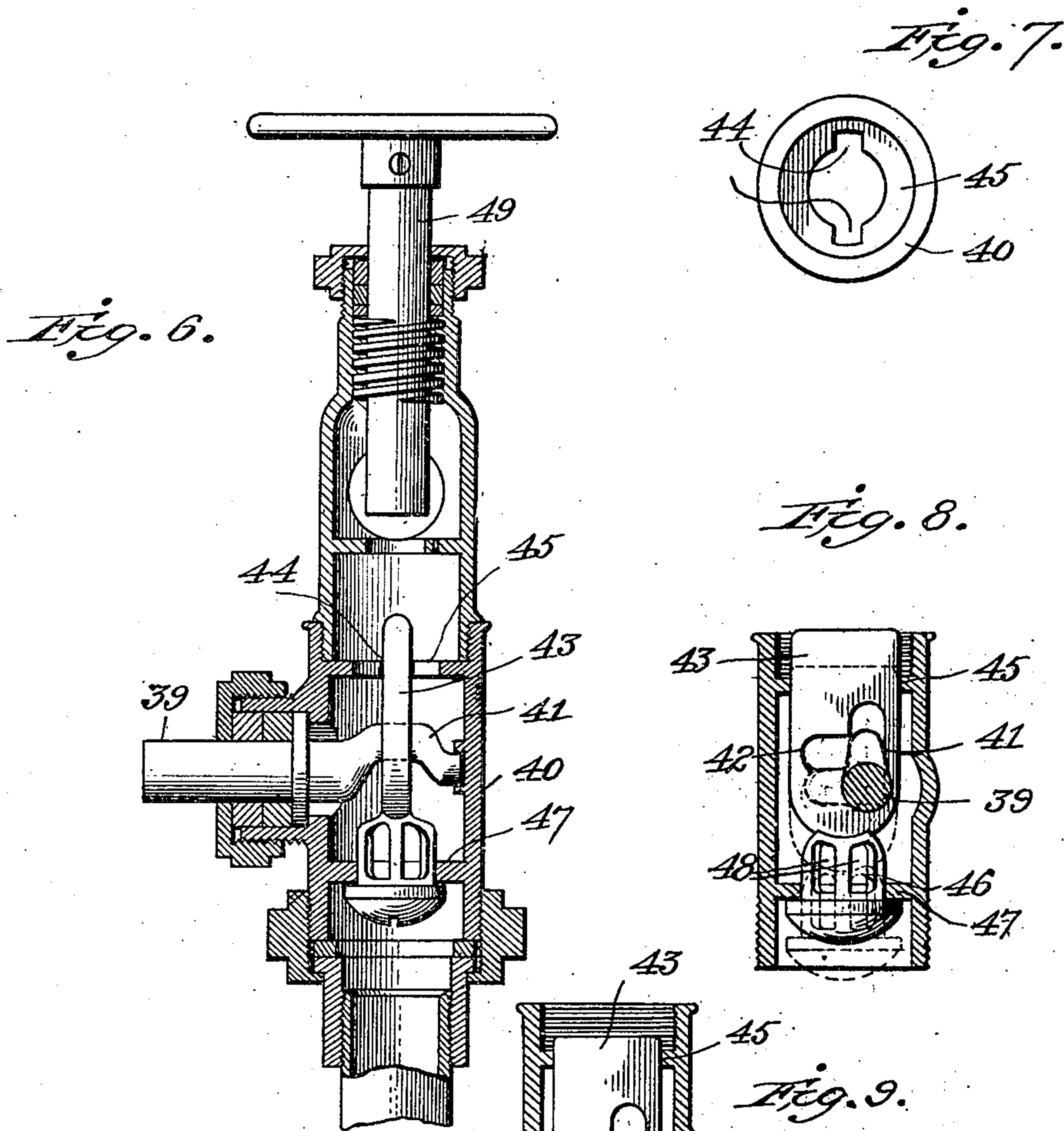
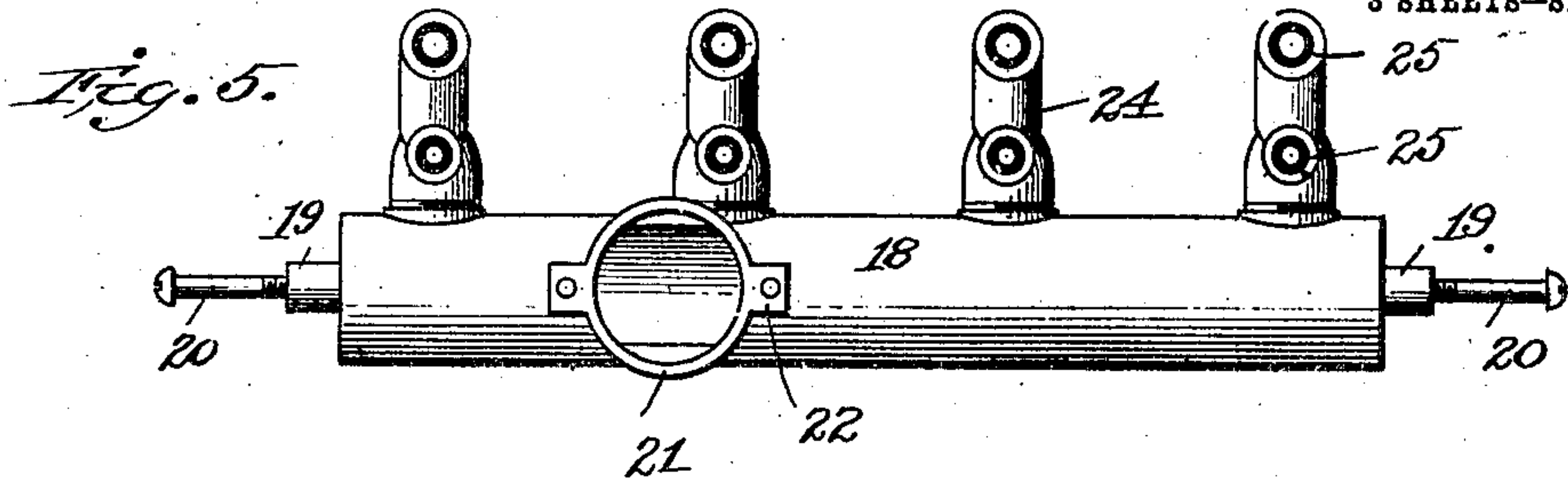
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

RAY C. SIMPSON, OF DALLAS, TEXAS.

WATER-HEATER.

No. 837,741.

Specification of Letters Patent.

Patented Dec. 4, 1906.

Application filed June 19, 1905. Serial No. 266,020.

To all whom it may concern:

Be it known that I, RAY C. SIMPSON, a citizen of the United States of America, residing at Dallas, in the county of Dallas and State of Texas, have invented certain new and useful Improvements in Water-Heaters, of which the following is such a full, clear, and exact description as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming a part hereof.

This invention relates to improvements in water-heaters which employ natural or artificial gas as fuel; and the objects of the invention are to provide means whereby the apparatus will be automatically drained of water when the water-supply is cut off at the main or house supply-pipe and to provide means which will prevent either the gas or water supply to the heater being opened without opening the other.

A further object of the invention is to provide means which will prevent the opening of the gas-supply unless the pilot-burner is first opened.

These objects and other incidental objects, which will hereinafter appear, are all attained by the use of the apparatus illustrated in the accompanying drawings; and the invention consists in certain novel features of the same, as will be hereinafter first fully described and then particularly pointed out in the claims.

In the drawings, Figure 1 is a front elevation of an apparatus embodying the invention. Fig. 2 is a view of the same, partly in end elevation and partly in vertical section. Fig. 3 is a detail front elevation of the gas-cock and pilot-burner. Fig. 4 is a detail end view of the same. Fig. 5 is a detail elevation of the burner. Fig. 6 is a vertical section of the water-cock. Fig. 7 is a detail plan view of the plunger-guide in the water-cock. Fig. 8 is a detail view of the plunger or valve of the water-cock, showing the position when the cock is closed and the water-supply from the house open in full lines and in dotted lines showing the position assumed when the house-supply is cut off. Fig. 9 is a similar view showing the position of the valve or plunger when the cock is opened, and Fig. 10 is a detail front elevation of the operating-handle for the gas and water cocks.

In carrying out the invention I employ two brackets 1, between which is supported a

shelf 2, upon which the heater 3 is placed. The upper surface of the shelf is approximately concave, so that water of condensation collecting thereon will be drained toward the center and carried off through a discharge-port 4, as will be readily understood. At the ends of the shelf are bosses 5, which engage and are secured in suitable openings in the brackets 1 to rigidly secure the shelf in a horizontal position.

The body of the heater is of sheet metal, and secured upon the inner sides of the same (preferably by brazing) is a concentric or parallel wall 6, which, in conjunction with the outer wall, forms a water-space, as clearly shown. A water box or chamber 7 is arranged concentrically within the space defined by the wall 6 and is connected with the said wall by short sleeves 8 at its upper and lower ends, whereby the water may pass into the said water-chamber. The ends of these sleeves 8 are turned over against the respective walls, so as to securely engage the same, and collars 9 are fitted on the sleeves between the walls, so as to force the walls against the flanged ends of the sleeves, and consequently form tight joints.

Arranged centrally within the space defined by the water-chamber 7 is a reservoir 10, which is connected to the said water-chamber at its upper end by sleeves and collars similar in all respects to the sleeves 8 and collars 9. This reservoir is approximately funnel-shaped, being tapered toward its lower end and having said lower end 11 fitted in the upper end of a branched coupling 12, which leads to the discharge pipe or spout 13 at either side of the heater. The spout 13 may be provided with a suitable valve to permit the water to be drawn off as needed for use, or it may form the end of a pipe to carry the water to any point. A spout may be provided at each side of the device; but in the drawings I have shown a plug 14 closing one of the discharge-ports.

In order to obtain a tight and smooth joint between the reservoir and the coupling, I insert a tapered ring 15 therein, which by being pushed down in the reservoir clamps the same tightly and smoothly against the wall of the coupling, as will be readily understood. In the upper end of the reservoir I provide a water-distributor 16, which is in the form of a tubular partition having a fan-shaped or divergent lower end, the edge of which is corrugated, as shown at 17, so

that when the distributor is in position within the reservoir small openings will be provided through which the water will pass down into the reservoir.

5 The burner 18 is situated in the lower end of the heater just below the bottom of the reservoir, and the coupling 12 is turned rearwardly to clear the burner, as clearly shown in Fig. 2. The burner-body consists
10 of a tube or cylinder having bosses 19 at its ends to receive screws 20, inserted through the end walls of the heater-body to secure the burner in position. A branch 21 leads from the burner-body to the front of the
15 heater and is there provided with lateral lugs 22, which receive securing-screws 23, inserted through the heater-body. A plurality of burner-tips 24 rise from the upper side of the burner-body, each of the tips being in the form of a double T, whereby four
20 flame-orifices 25 are provided in each tip, and the several parts are so arranged that the jets of flame are directed against the lower ends of the several water-compartments, while the heat from all the flames will rise
25 along the walls of the said compartments and escape through the top of the apparatus. A thorough and rapid heating of the water is thus accomplished. The branch or elbow 21 of the burner is arranged directly in line with
30 the exit 26 of the gas-cock 27, but is of greater diameter than said exit, a mixing-chamber or damper 28 being arranged around said exit at the junction of the same with the body of the heater, as shown most clearly in
35 Fig. 2. The stem 29 of the gas-cock extends laterally from the same toward the central line of the heater and is formed with a lug or stop 30, which plays between
40 shoulders 31 on the body of the cock, and thereby limits the play of the cock to an arc of ninety degrees, or one-quarter of a revolution. At the opposite or what may, for convenience, be termed the "outer" side of the
45 body or casing of the cock a washer 32 is secured rigidly to or formed integral with the stem, and said washer is provided with a lip 33, which when the cock is closed stands in a horizontal position, as shown in Figs. 2 and 4.
50 The pilot-burner 34 is arranged directly over the gas-cock, and its body is preferably cast integral with the body of the gas-cock. The stem of the pilot-burner valve projects to one side of the body or casing and is provided with an operating-handle 35 directly
55 over or in the same vertical plane with the washer 32, and a trip or dog 36 is pivotally secured to the handle portion of the stem in such position that when the several valves
60 are closed the said dog will rest directly upon the lip 33, as shown in Figs. 2 and 4. If when the parts are in the position shown it be desired to use the apparatus, the pilot-burner must first be opened, because all effort to raise and open the gas-cock valve will

be nullified by the engagement of the dog 36 and the lip 33. If the pilot-burner be opened, however, the gas-cock may then be opened and the gas at the burner-tips 24 ignited from the pilot-burner, after which
70 the pilot-burner will be extinguished by returning its valve to its initial position. Then when the gas-cock is closed the lip 33 will strike the dog 36 and swing it forward sufficiently to clear the same, after which
75 the dog will drop back into the initial position illustrated. The stem of the gas-cock valve is secured in a coupling-sleeve 37, provided with a forwardly-projecting handle or lever 38, and in the opposite end of said
80 coupling is secured the end of the stem of the water-cock. The stem 39 of the water-cock is provided within the casing 40 with a crank or eccentric portion 41, which passes through a slot 42 in a plunger or valve-stem
85 43. This stem or plunger, it will be noticed, is flat and plays in guideways 44, formed in an internal flange or shoulder 45 within the casing. The lower end of the stem or plunger carries a valve 46, which plays in a horizontal
90 partition or valve-seat 47, and consists of a disk-like head connected with the flat stem by a cylindrical body, which is provided with suitable openings or grooves 48 for the passage of the water, the lower end
95 of the valve-casing being coupled to the main water-pipe which supplies the house. The slot 42 in the plunger, it will be noticed, is angular, having two branches, one arranged vertically and the other horizontally.
100

In Fig. 8 the full lines show the position of the valve when the cocks are closed and the water turned on at the house supply-pipe. In this condition the pressure of the water against the disk-head of the valve will hold
105 the same up against the valve-seat, and the eccentric portion 41 of the stem 39 will be in its upturned position at the corner of the angular slot 42, the flow of water into the heater being prevented by the engagement of the
110 valve against its seat. Should the water be cut off from the house supply-pipe, the valve will at once drop owing to the removal of the water-pressure and the vertical portion of the slot will engage over the eccentric 41, as
115 shown in dotted lines in Fig. 8. The water in the heater will then flow backward through the valve-casing 40 and past the valve 46 into the main water-pipe, so that the heater will be automatically drained. When the
120 parts are in this position, the gas-cock cannot be opened because the stem of the same, is coupled to the stem of the water-cock, and rotation of the said stem is prevented by reason of the vertical portion of the slot engaging the eccentric 41, so that the valve or
125 plunger will bind against the side walls of its seat upon any attempt being made to rotate the eccentric. It will thus be seen that when the water is cut off at the house-supply the
130

heater will be automatically drained and that the gas cannot be again admitted to the burner until the water is again admitted through the house-supply. When the parts
 5 are in the position shown in solid lines in Fig. 8 and it is desired to admit the water to the heater, the stem is rotated so as to swing the eccentric 41 forward, and the plunger will then be pushed downward to the position
 10 shown in Fig. 9, so as to admit the water by reason of the eccentric riding upon the lower wall of the horizontal portion of the slot. When it is desired to stop the operation of the heater, the eccentric is rotated in the re-
 15 verse direction, and the valve is forced against its seat by the water-pressure. The flow of gas will of course be cut off or permitted positively and simultaneously with the stopping or starting of the water as the
 20 two cocks are coupled together.

49 denotes an ordinary hand-operated pressure-regulating device in the upper end of the water-cock.

It will be readily seen from the foregoing
 25 description, taken in connection with the accompanying drawings, that I have provided a simple device particularly adapted for household use by which water may be quickly and thoroughly heated, the body of the
 30 heater and the water-confining walls being of sheet metal, so that the heat will quickly reach the water. The water-distributor in the upper end of the reservoir directs the water against the walls of the reservoir in a
 35 thin sheet, so that the heat rising along the outer sides of the reservoir-walls will raise the temperature of the water. Accumulation of the gas within the heater is prevented by the pilot-burner locking the gas-cock closed,
 40 so that it is necessary to open the pilot-burner before the gas-cock can be opened. The necessity of first opening the valve of the pilot-burner of course insures the lighting of the gas at the tip of the said burner, so that
 45 when the gas-cock is opened the flame from the pilot-burner will at once and automatically ignite the gas at the flame-orifices of the main burner 18. When the pilot-burner valve is opened, the handle 35 is swung up-
 50 ward and carries the dog 36 away from the lip 33, so that the gas-cock can then be opened by turning the stem and said lip upward and backward. After the main burner is lighted the pilot-burner stem is returned to its initial
 55 position. Then when the gas-cock is closed the lip 33 will strike the rear side of the dog 36 and push the dog forward sufficiently to clear the same, after which the dog will drop back to and rest upon the lip, so as to again
 60 lock the gas-cock in its closed position.

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

1. A water-heater comprising a body, a

burner in the lower portion of the same, a 55 reservoir within the body, a discharge leading from the lower end of the reservoir over and around the burner, and a water-supply communicating with the reservoir.

2. A water-heater comprising a body, a 70 burner in the lower portion thereof, a series of communicating water-chambers arranged concentrically within the body the lower ends of said chambers surrounding the burner, a reservoir arranged centrally within the body 75 and communicating at its upper end with the innermost water-chamber, a water-discharge leading from the lower end of the reservoir, and a water-supply leading into the outer-
 80 most water-chamber.

3. A water-heater comprising a body, a burner arranged in the lower portion thereof, a series of communicating water-chambers arranged concentrically within the body the lower ends of said chambers surrounding the 85 burner, a reservoir arranged centrally within the body, water-passages leading from the sides of the innermost water-chamber through the sides of the reservoir near the upper end of the same, a frusto-conical 90 water-distributor in the upper portion of the reservoir and extending to the sides of the same below said passages, a water-discharge leading from the lower end of the reservoir, and a water-inlet leading into the outermost 95 water-chamber at the lower edge of the same.

4. A water-heater comprising a body, a burner in the lower portion of the same, a downwardly-tapered reservoir arranged centrally over the burner, a discharge-pipe hav- 100 ing a flared upper end fitting over the lower end of the reservoir, a tapered ring fitted in the reservoir below the upper extremity of the water-discharge pipe, and a water-inlet opening into reservoir. 105

5. The combination with a water-heater of the gas-cock mounted thereon and having a lip projecting laterally from its stem, a pilot-burner arranged above the gas-cock, and a dog pivotally hung on the stem of the pilot- 110 burner stem and arranged to normally rest on the lateral lip of the gas-cock stem.

6. The combination with a water-heater of the gas-cock mounted thereon and having a stem provided with a normally horizontal 115 forwardly-projecting lip, a pilot-burner arranged above the gas-cock, and a dog or stop pivoted on the stem of the pilot-burner and normally depending to rest upon the said horizontal lip. 120

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

RAY C. SIMPSON

Witnesses:

H. P. MOLINEU,

J. S. LEE.