

J. H. VAN ZANDT & W. E. THACHER.
FLUSHING CISTERN FOR CLOSET BOWLS.

APPLICATION FILED MAR. 7, 1907.

935,341.

Patented Sept. 28, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

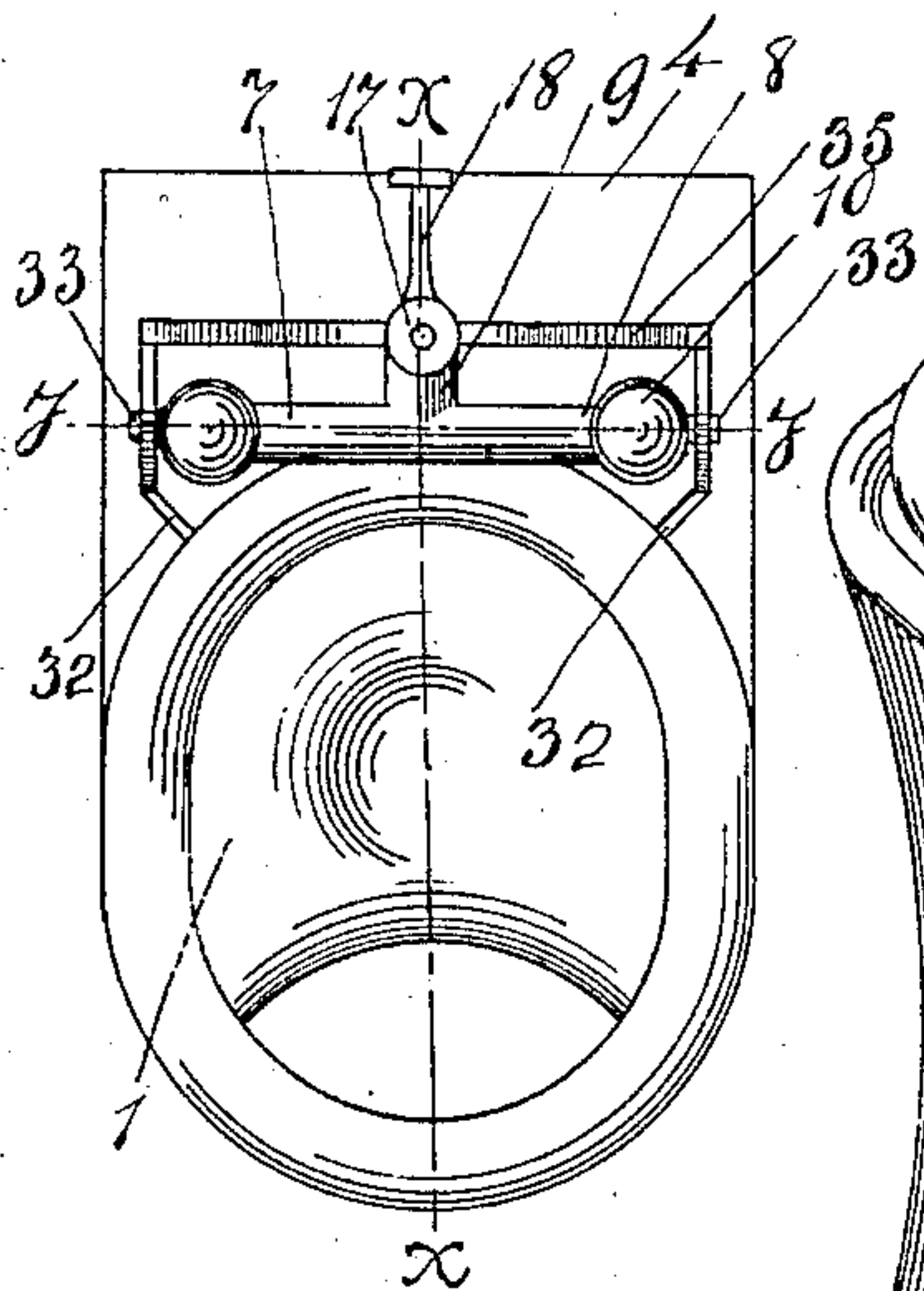


Fig. 2.

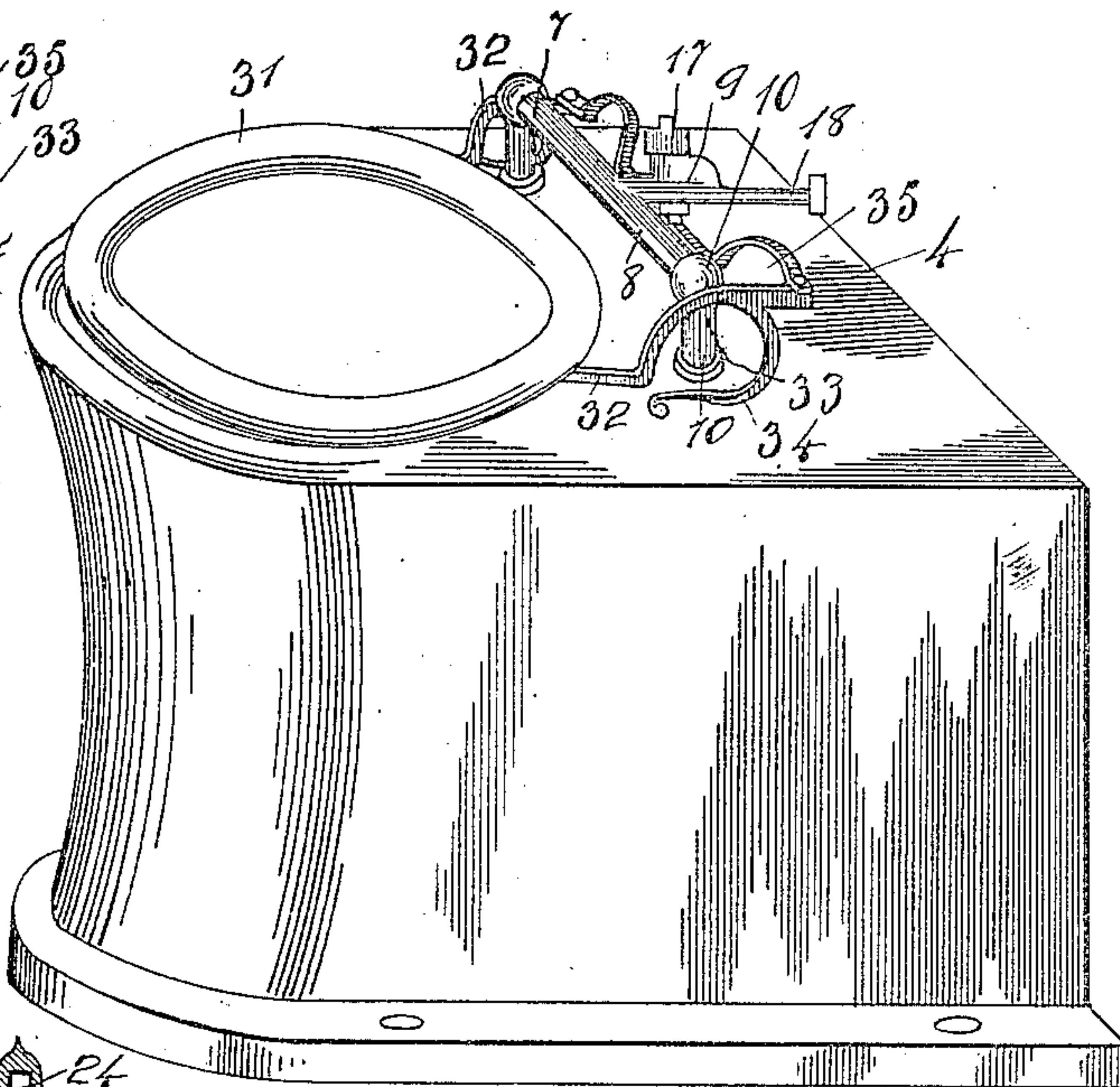


Fig. 3.

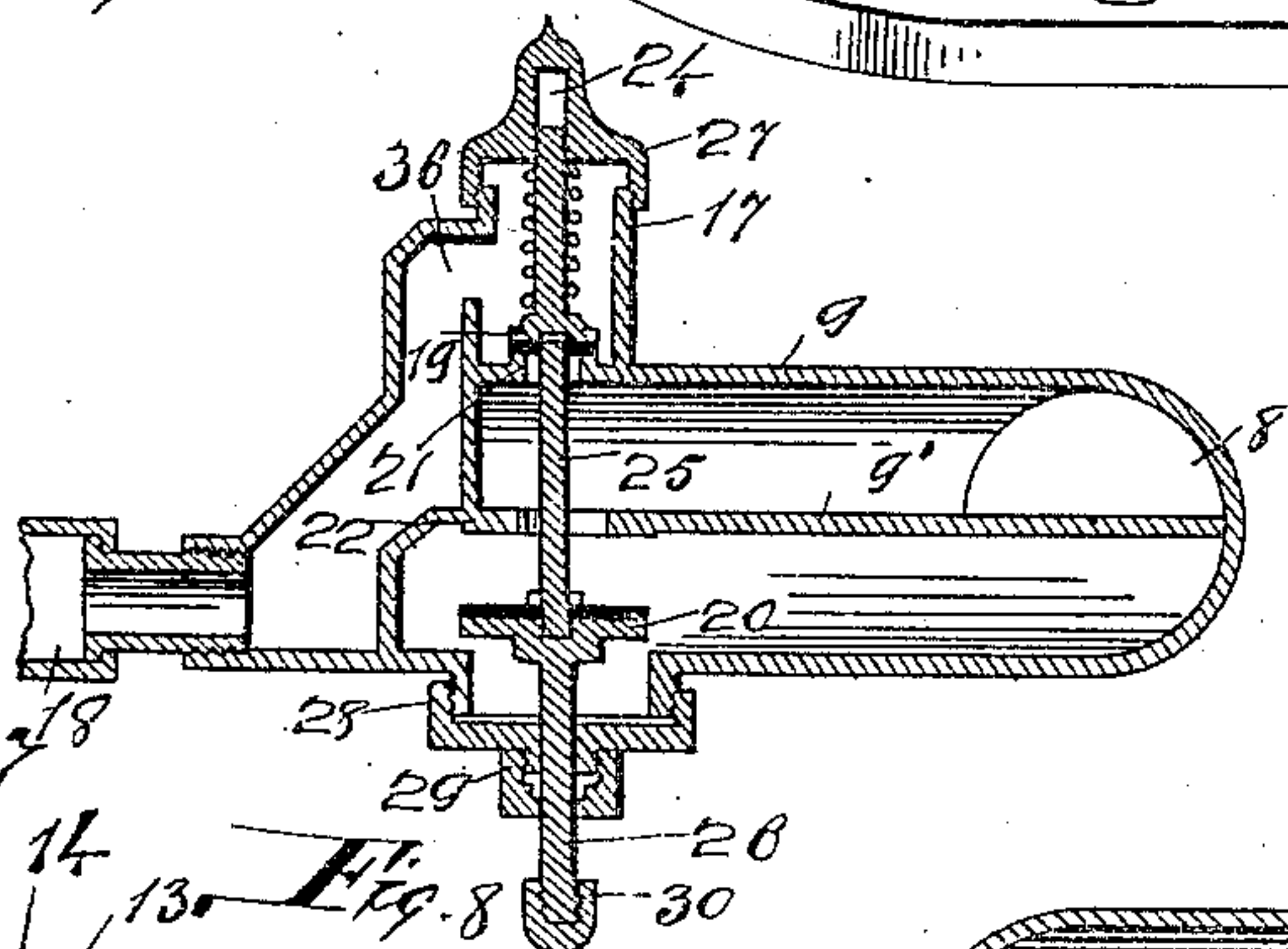


Fig. 4.

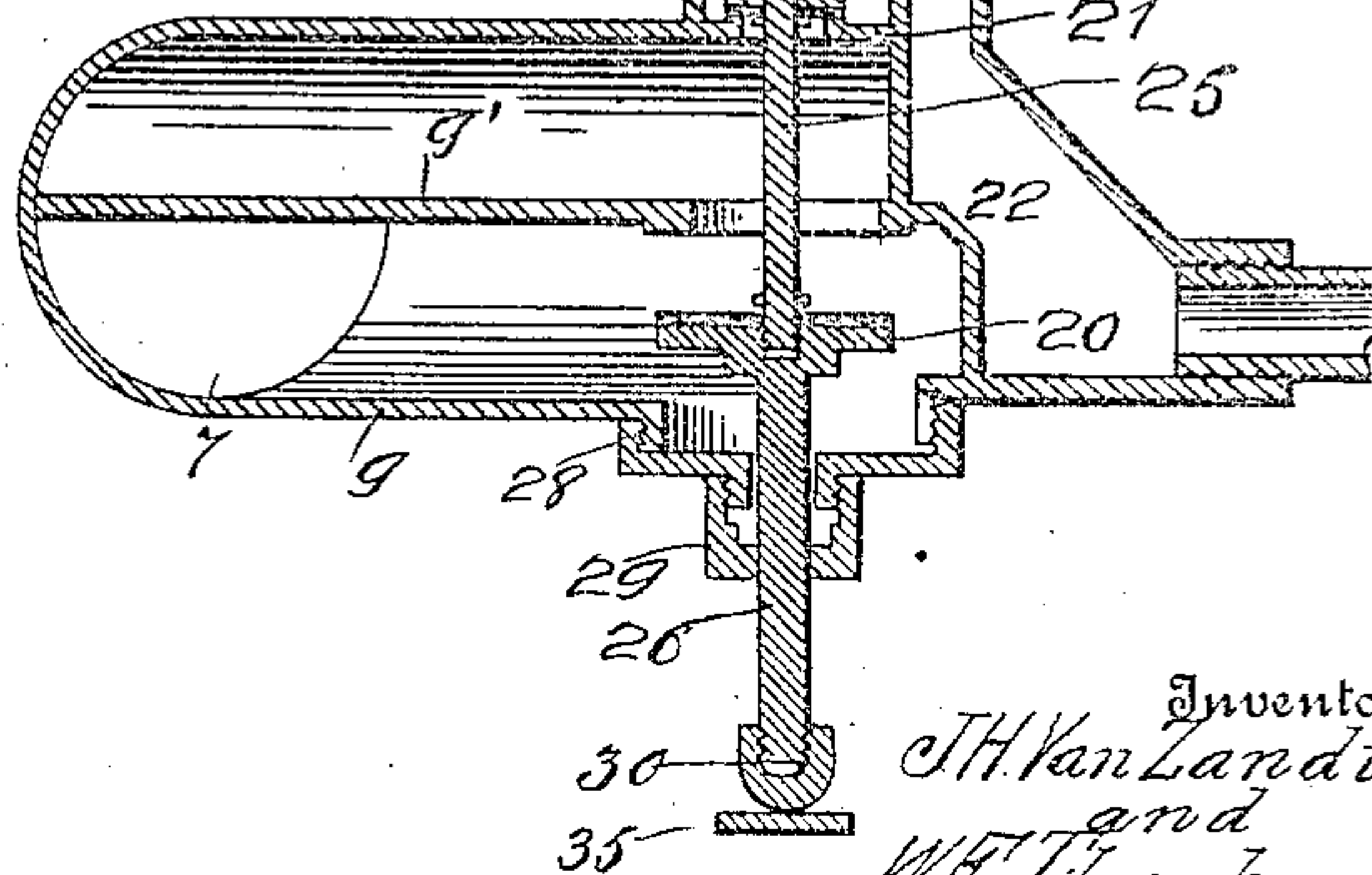
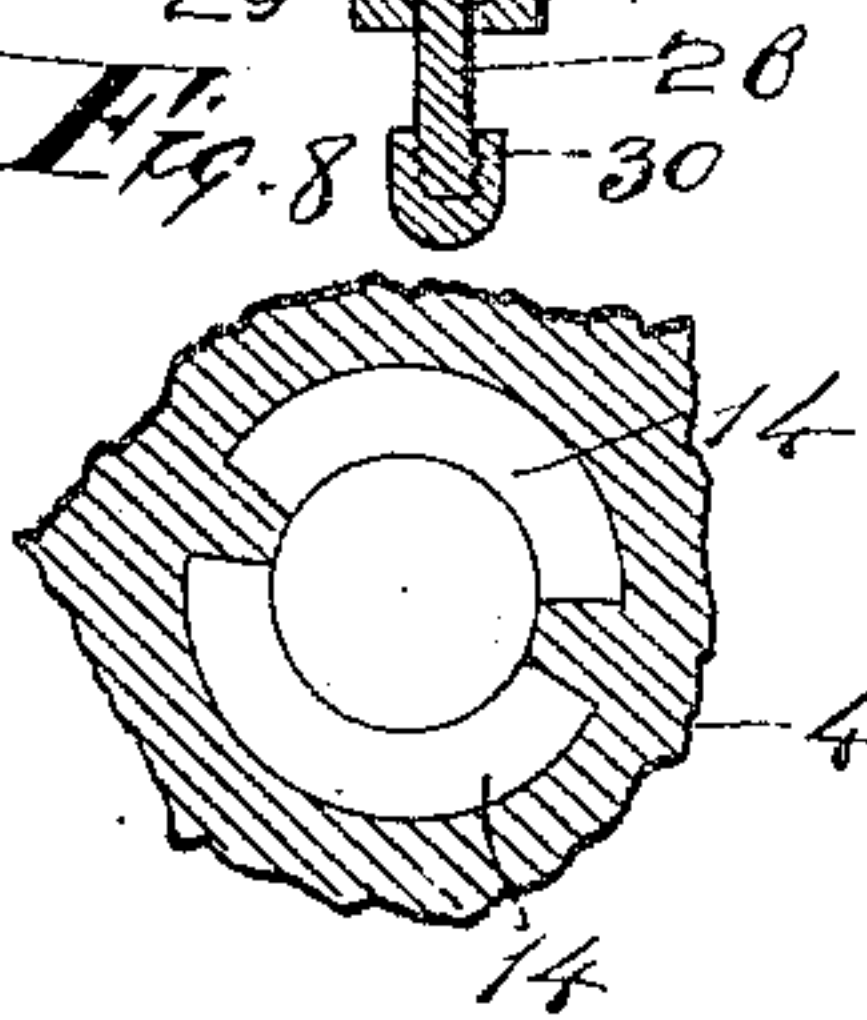
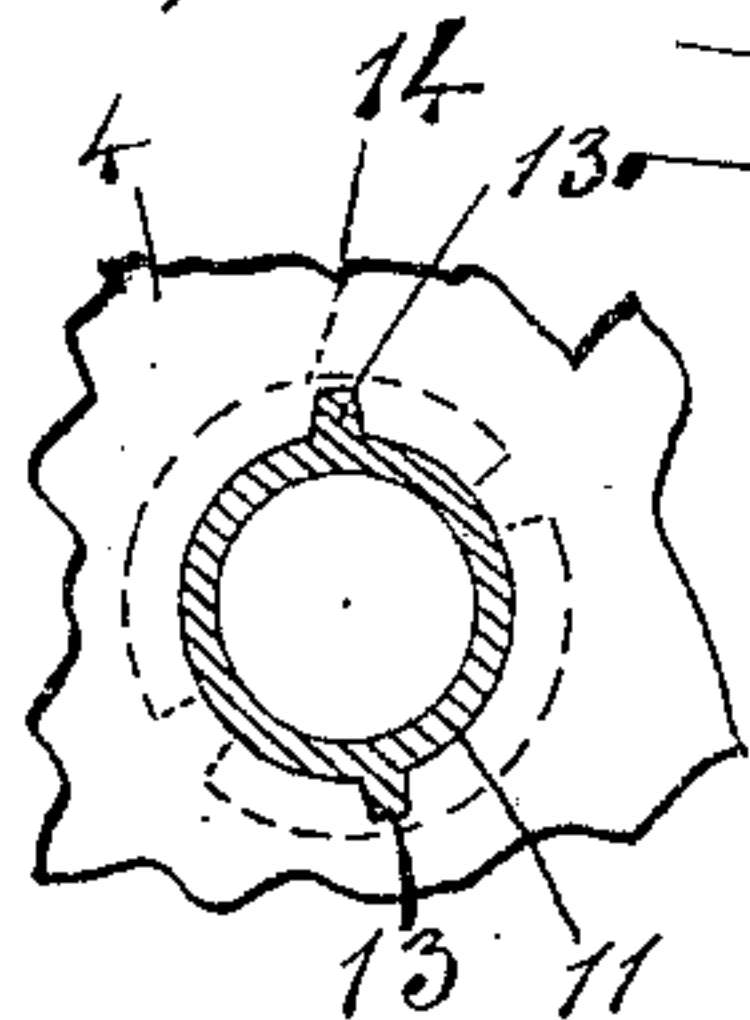
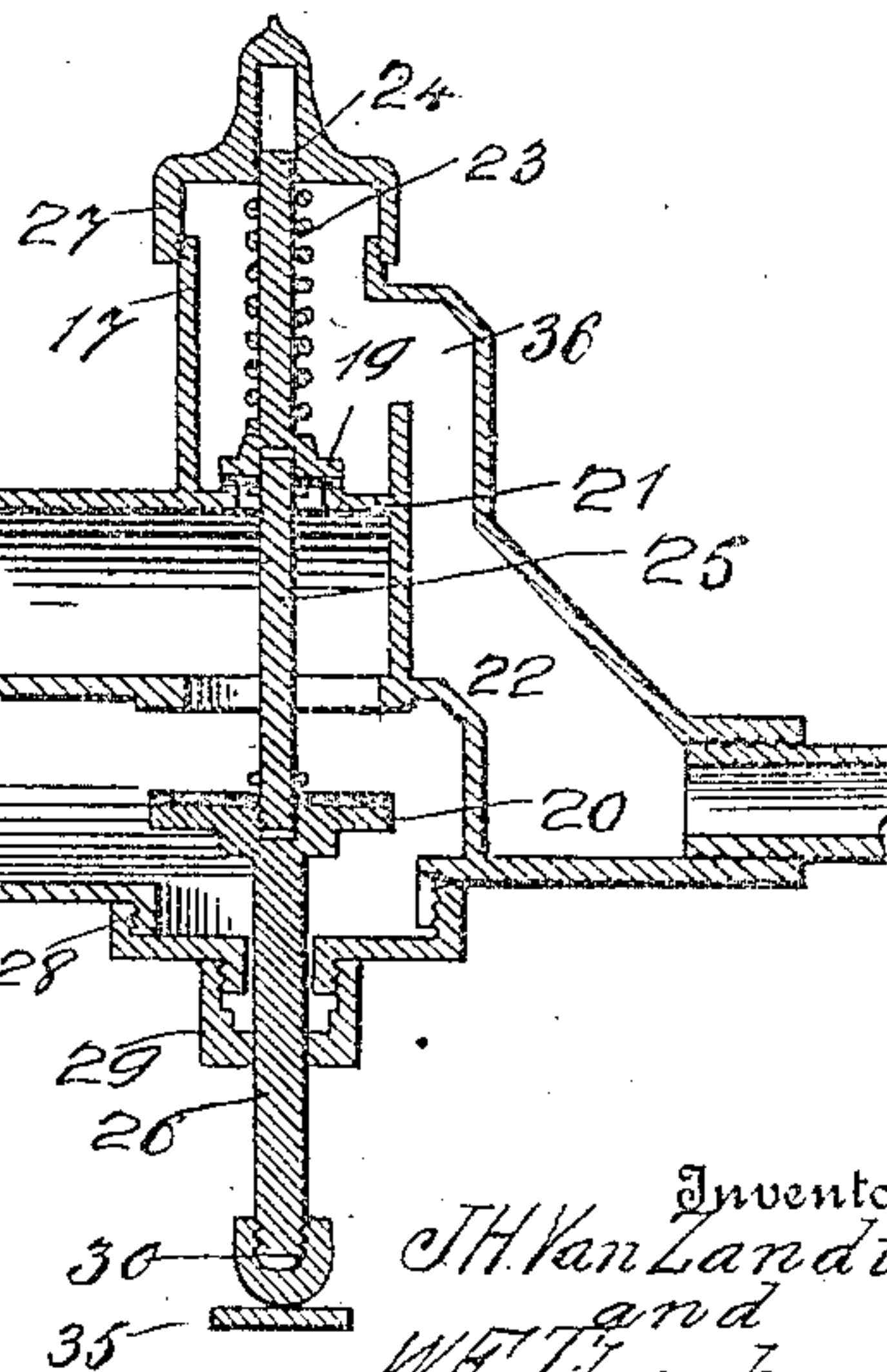


Fig. 7.



Witnesses

B. J. Lorkowski
J. M. Stitt

By

A. L. Jackson,

Attorney

Inventors,
J. H. Van Zandt
and
W. E. Thacher

J. H. VAN ZANDT & W. E. THACHER.

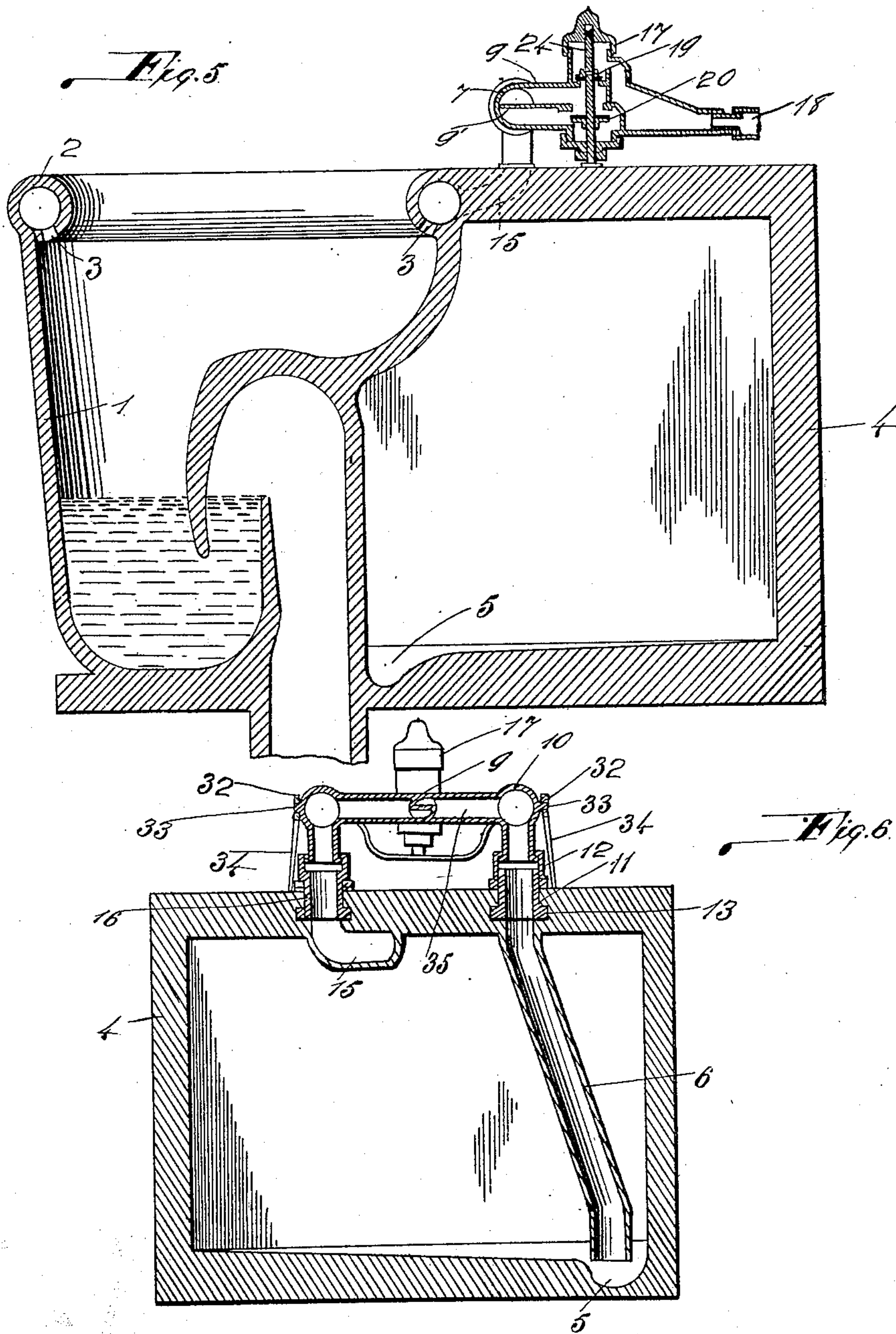
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B. J. Lorkowski
J. R. Stitt.

By

A. L. Jackson,

Attorney

Inventors,
J. H. Van Zandt,
and
W. E. Thacher,

UNITED STATES PATENT OFFICE.

JOHN H. VAN ZANDT AND WILLIAM E. THACHER, OF FORT WORTH, TEXAS.

FLUSHING-CISTERN FOR CLOSET-BOWLS.

935,341.

Specification of Letters Patent.

Patented Sept. 28, 1909.

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To all whom it may concern:

Be it known that we, JOHN H. VAN ZANDT and WILLIAM E. THACHER, citizens of the United States of America, residing at Fort Worth, in the county of Tarrant and State of Texas, have invented certain new and useful Improvements in Flushing-Cisterns for Closet-Bowls, of which the following is a specification.

10 This invention relates to flushing means for closet bowls and more particularly to a combined bowl and cistern and means for operating the same, and the object is to produce a closet bowl and cistern which are preferably formed integral so that the two can be made compact and the space about the closet bowl which is usually lost will be utilized and in which the cistern is specially adapted for the use of compressed air to aid in flushing the bowl and to provide a refill after the bowl is flushed. The cistern also makes a firm brace for the bowl and provides a rigid support to which the closet seat may be hinged.

25 One of the objects of this invention is to provide an automatic and quick action for obtaining the necessary quantity of water for flushing the bowl and our invention includes a large supply pipe provided with a compound valve and the cistern is constructed in such manner that practically all the water may be drawn out in flushing without losing the air which is necessary for flushing purposes.

35 Other objects and advantages will be fully explained in the following description and the invention will be particularly pointed out in the claims.

Reference is had to the accompanying drawings which form a part of this application and specification.

40 Figure 1 is a plan view of the bowl and cistern and the valve casing and supply pipe. Fig. 2 is a perspective view of the same. Fig. 3 is a vertical section of the valves and casing therefor, taken along the line *x x* of Fig. 1, showing the right half of the devices. Fig. 4 is a view of the left half of the same, Fig. 4 being slightly enlarged, as compared with Fig. 3 and both views being enlarged over the devices as shown in Fig. 1. Fig. 5 is a vertical section, taken along the line *x x* of Fig. 1. Fig. 6 is a vertical section taken along the line *y y* of Fig. 1. Fig. 7 is a broken portion of the upper part of the cistern, showing a section of the pipe which

enters the top of the cistern and showing in dotted outline the cavity under the surface for the movement of the lugs which are formed on the pipe. Fig. 8 shows the same portion of the top of the cistern in section through the cavity under the upper surface.

Similar characters of reference are used to indicate the same parts throughout the several views.

Our invention may be embodied in any suitable design of combined closet bowl and cistern. The drawings illustrate a bowl 1 of ordinary construction having a flushing rim 2 which has perforations 3 opening into the bowl. The cistern 4 is formed, preferably on the bowl 1 and integral therewith and extends back of the bowl and fills up the space which is usually found between the bowl and the wall of a house or other place. The cistern is formed with a depression 5 and the floor of the cistern inclines converg- ingly toward the depression so that when the cistern is discharging water the water will move by gravity to the depression. The cistern 4 is provided with a combined inlet and discharge or outlet pipe 6. The supply pipe is in the form of a T-pipe and has arms 7 and 8 which lead from the body portion 9. The trunk or body portion 9 is divided horizontally by a partition 9'. The arm 8 is a combined inlet and outlet pipe for the cistern. Pipe 8 has an elbow 10 through which communication is had with the pipe 6 by means of the joint 11 and a union 12. The joint 11 is secured to the cistern top by means of lugs 13 formed on the joint and curved cavities formed in the casing of the cistern, that is, formed below the upper surface of the cistern casing. See Figs. 6, 7, and 8. An opening is formed for the joint 11 and this opening has extensions for the passage of the lugs 13. After the lugs 13 pass down within the top of the cistern casing, the joint can be turned and the lugs 13 will move in the cavities 14 as far as the end of the cavities. The arm 7 is connected to the top of the cistern in the same manner as arm 8. A duct 15 connects the joint 16 with or completes the passage way for water from the arm 7 through the casing to the flushing rim 2.

A valve casing 17 may be formed integral with the pipe 9. This casing connects with a supply pipe 18. Valves 19 and 20 are provided and they operate as a compound valve. Valve seats 21 and 22 are provided respec-

tively for valves 19 and 20. The valve 19 is held normally closed by a spiral spring 23 which is mounted on the stem 24. The valve stem is made in sections 24, 25, and 26 for convenience in assembling the mechanism. The part 24 is formed integral with the body of valve 19. The part 25 is screwed into the valve body 19 and into the valve body 20 and the part 26 is formed integral with the valve body 20. A cap 27 is screwed on the casing 17 and forms a seat for the spring 23 and a guide for the stem 24. A cap 28 is screwed on the bottom of the casing to close the opening into the casing which opening is necessary for insertion of the valve 20. A packing gland 29 forms a seal about the stem section 26 and the packing cap is screwed on the cap 28. A bearing and adjusting cap 30 is screwed on the stem section 26. Means are provided for operating the valves 19 and 20 automatically. The seat rim 31 is mounted on and carried by bars 32 to which the rim is firmly attached. The bars 32 are pivoted on lugs 33 which are formed on the elbows 10 of the pipes 7 and 8. The bars 32 have curved springs 34 which may be formed integral therewith. The springs 34 rest normally on the top of the casing 4 and normally hold the seat rim raised. The bars 32 constitute levers and the short arms of the levers serve to operate the valves 19 and 20 by means of a bar 35. The bar 35 is attached to the levers 32 and is suitably curved or bent to come under the bearing cap 30. When the seat rim 31 is pressed down the bar 35 raises the valves for water to flow in from the supply pipe 18. The cap 30 may be screwed up or down on the stem 26 to regulate the amount of movement necessary for the bar 35.

The operation will be readily understood. When the seat rim is pressed down the bar 35 is pressed up and the valve 19 opened and valve 20 closed. The water will then flow in from pipe 18 through the passage 36 and through the pipe 9 and arm 8 down into the cistern 4 through the pipe 6. As the water flows into the cistern the air in the cistern will be compressed in the upper part of the cistern for the purpose of forcing the water out of the cistern when the valves are moved as hereinafter explained. While the valves are in position for water to flow into the cistern, the water will continue to flow into the cistern until the air has been compressed to 40 pounds or whatever pressure the water is subjected to in the supply pipe 18. When the seat rim is raised, valve 19 will be closed by the bar 35 being pressed down by the spring 23, the upward pressure on the valve stem having been relieved by the relieving of the pressure on the bar 35. Water will then be forced out of the cistern by the compressed air back through pipe 6, arm 8 and the upper part of pipe 9, then back through

the lower part of pipe 9, through arm 7 to the flushing rim. It is apparent that the water will be forced out with considerable pressure or speed at first, causing a thorough flushing of the bowl, and that the pressure will gradually decrease in the cistern so that the last water that is discharged into the flushing rim and bowl will come more slowly and thus refill the trap in the bowl. On account of the shape of the bottom of the cistern, very little water will be left in the cistern; and yet there will be no danger of the escape of the air because the pipe 6 will project into the water. The bottom of the cistern inclines toward the depression 5.

It is apparent that the location and form of the trap may be varied, as the water coming through the bowl will find its way to the trap.

Having fully described our invention, what we claim as new and desire to secure by Letters Patent, is,—

1. In a device of the character set forth, a casing containing therein a closet bowl and a pneumatic flushing cistern a horizontally disposed pipe having a horizontal partition therein and having two arms one arm in communication with the upper part of said partitioned portion and extending within and to the lower part of said cistern and another arm in communication with the lower part of said partitioned portion and said bowl, said partition having a flushing port therethrough and said pipe having an inlet port, and valves for simultaneously opening said inlet port and closing said flushing port for receiving a water supply and for simultaneously opening the flushing port and closing the inlet port.

2. In a device of the character set forth, a casing containing therein a closet bowl and a pneumatic flushing cistern, a pipe mounted on said casing and having a partition therein and one arm in communication with one side of said partitioned portion and with said cistern and extending to the lower part of said cistern and another arm in communication with the other side of said partitioned portion and with said bowl, said pipe having an inlet port and said partition having a flushing port, a valve for each port, and a closet seat pivotally mounted on said arms and operatively connected with said valves whereby when said seat is pressed down said valves are operated simultaneously to open said inlet port and to close said flushing port and when the seat is released to close said inlet port and to open said flushing port.

3. In a device of the character set forth, a casing containing therein a closet bowl and a pneumatic flushing cistern, a pipe mounted on said casing and having a partition therein and one arm in communication with said partitioned portion and with said cistern

and extending to the lower part of said cistern and another arm in communication with the other side of said partitioned portion and with said bowl, said pipe having an inlet port and said partition having a flushing port, a valve for each port, a spring actuated valve stem operating through said ports and normally closing the inlet port and opening the flushing port, and a closet seat pivotally mounted on said arms and operatively connected with said valve stem whereby when said seat is pressed down said valves are operated simultaneously to open said inlet port and to open said flushing port and when the seat is released to close said inlet port and to open said flushing port.

4. A combined closet bowl and cistern, a combined inlet and outlet pipe extending down within said cistern near the bottom thereof, a flushing pipe for said bowl, a horizontally disposed pipe having a partition therein, the upper part of said pipe forming a part of the intake passage and the lower half forming a part of the discharge passage to said flushing pipe, a valve for each half of said divided pipe, said valves acting to open the intake portion of said divided pipe to a supply source and to close simultaneously the discharge portion of said divided pipe whereby water is admitted to said cistern against the air pressure therein and when said valves are reversed to cut off the supply and simultaneously open said discharge portion whereby water is forced back by air-pressure through said inlet and outlet pipe and through the intake portion of said pipe and then through the discharge portion thereof to said flushing pipe, a spring normally holding the intake valve closed and pressing said valve in the direction of the flow of the intake, and a seat provided with means for actuating said valves.

5. A combined closet bowl and flushing cistern, a pipe connection for said cistern

having a projecting lug and a pipe connection for said bowl having a projecting lug, a valve normally closing the supply for said cistern and opening the discharge and when actuated opening the supply for said cistern and closing the discharge to said bowl, a seat for said bowl, arms carrying said seat and pivotally mounted on said lugs, said arms having springs holding said seat normally raised, and a bar carried by said arms for actuating said valve when said seat is pressed down.

6. A combined closet bowl and cistern, a pipe connection for said bowl and a pipe connection for said cistern each having a projecting lug, a seat for said cistern, bars carrying said seat and pivoted on said lugs, springs holding said seat normally raised, a compound valve normally closing the supply source for said cistern and opening the discharge through said bowl and when actuated opening the supply source and closing the discharge, and a bar carried by said first-named bars and serving when said seat is pressed down to actuate said valve.

7. A combined closet bowl and cistern, a pipe connection for said cistern and a pipe connection for said bowl, a seat for said bowl, arms attached to said seat and pivotally mounted on said connections, pipes for supplying water to said cistern and for discharging water from said cistern into said bowl, a compound valve normally closing the water supply source and opening the discharge into said bowl and when actuated opening the supply source and closing the discharge, and a bar operated by said arms for actuating said valve.

In testimony whereof, we set our hands in the presence of two witnesses, this 2nd day of March, 1907.

JOHN H. VAN ZANDT.
WILLIAM E. THACHER.

Witnesses:

A. L. JACKSON,
B. J. LORKOWSKY.