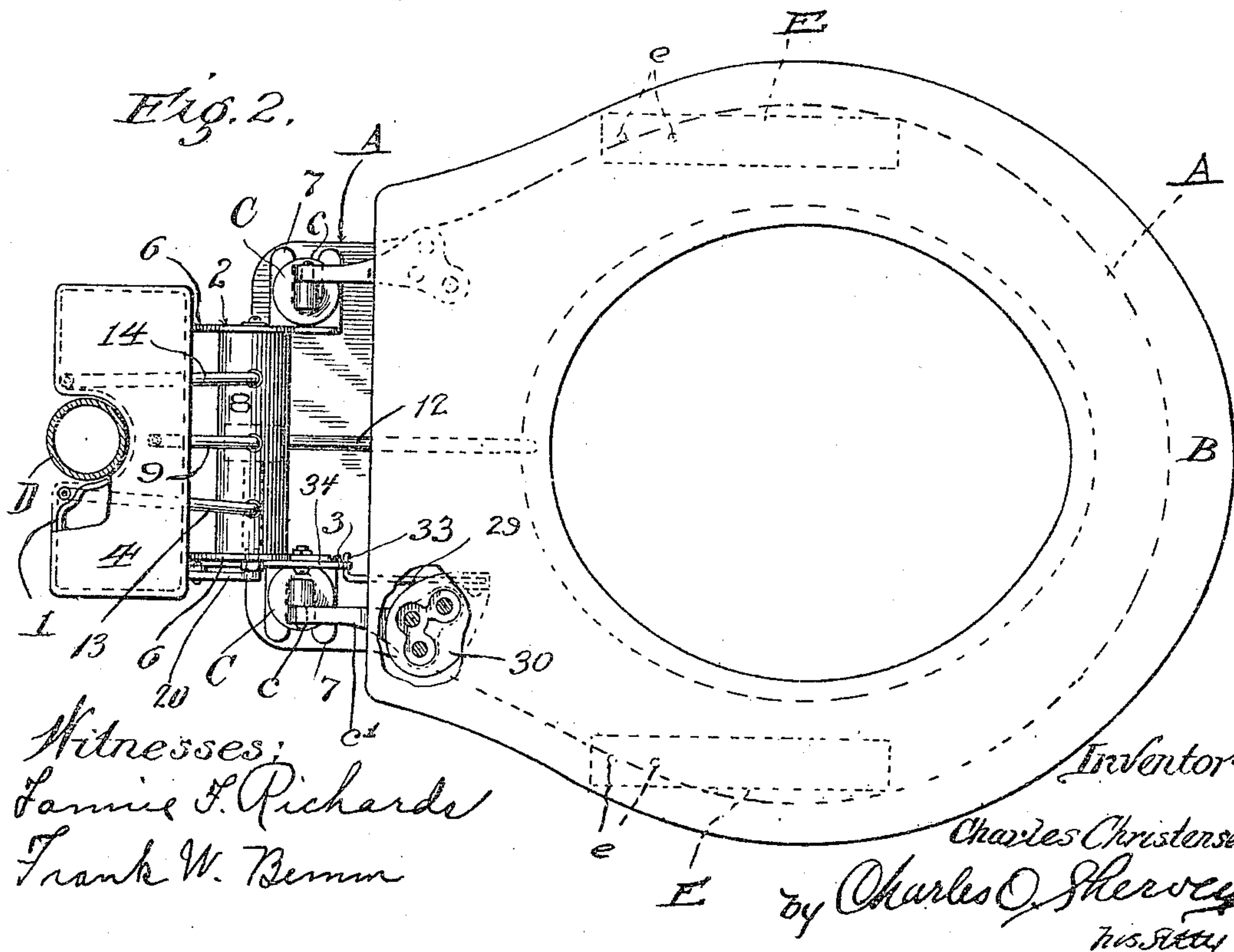
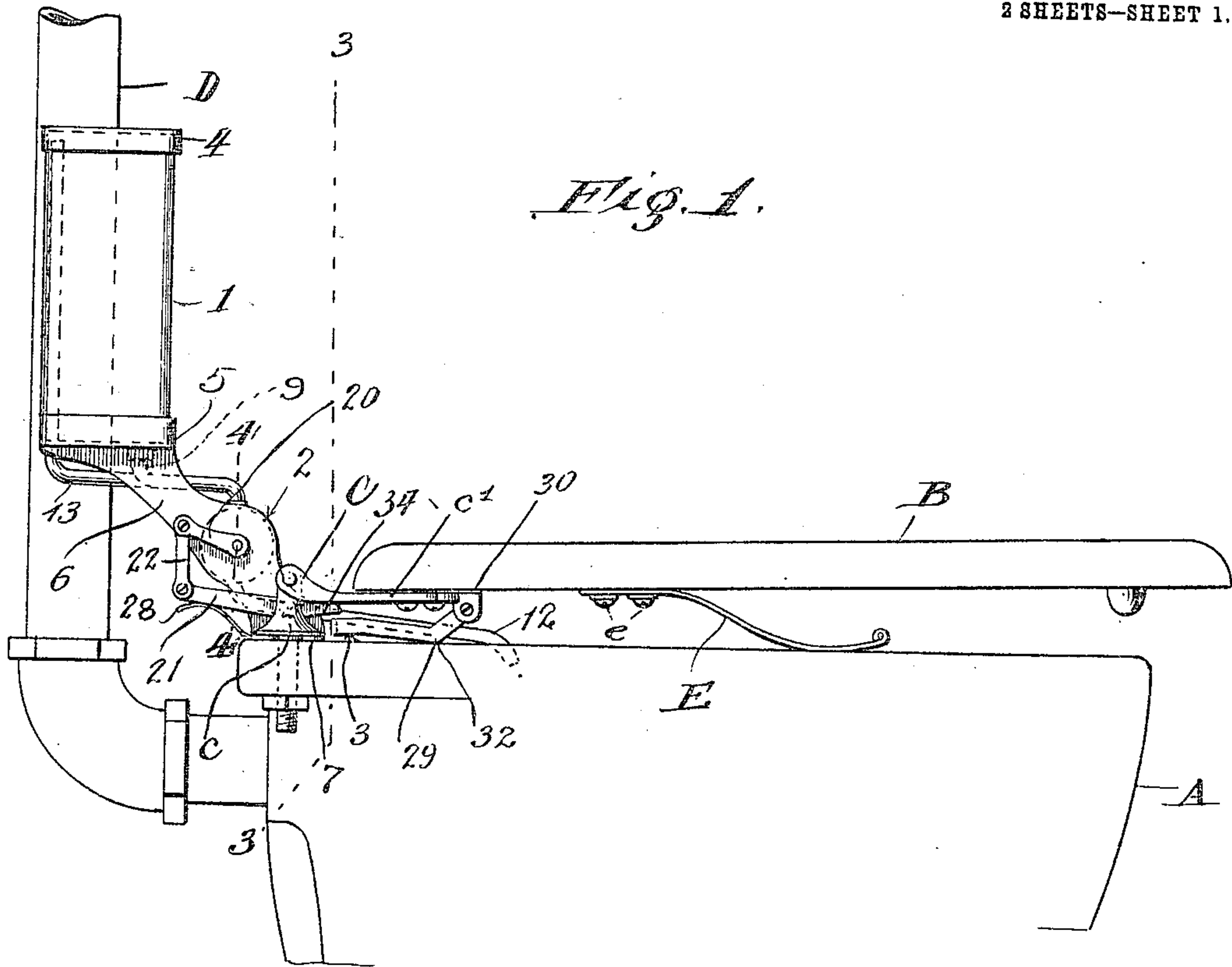


C. CHRISTENSEN.
 APPARATUS FOR DISPENSING MOBILE SUBSTANCES.
 APPLICATION FILED JUNE 26, 1908.

959,717.

Patented May 31, 1910.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 3.

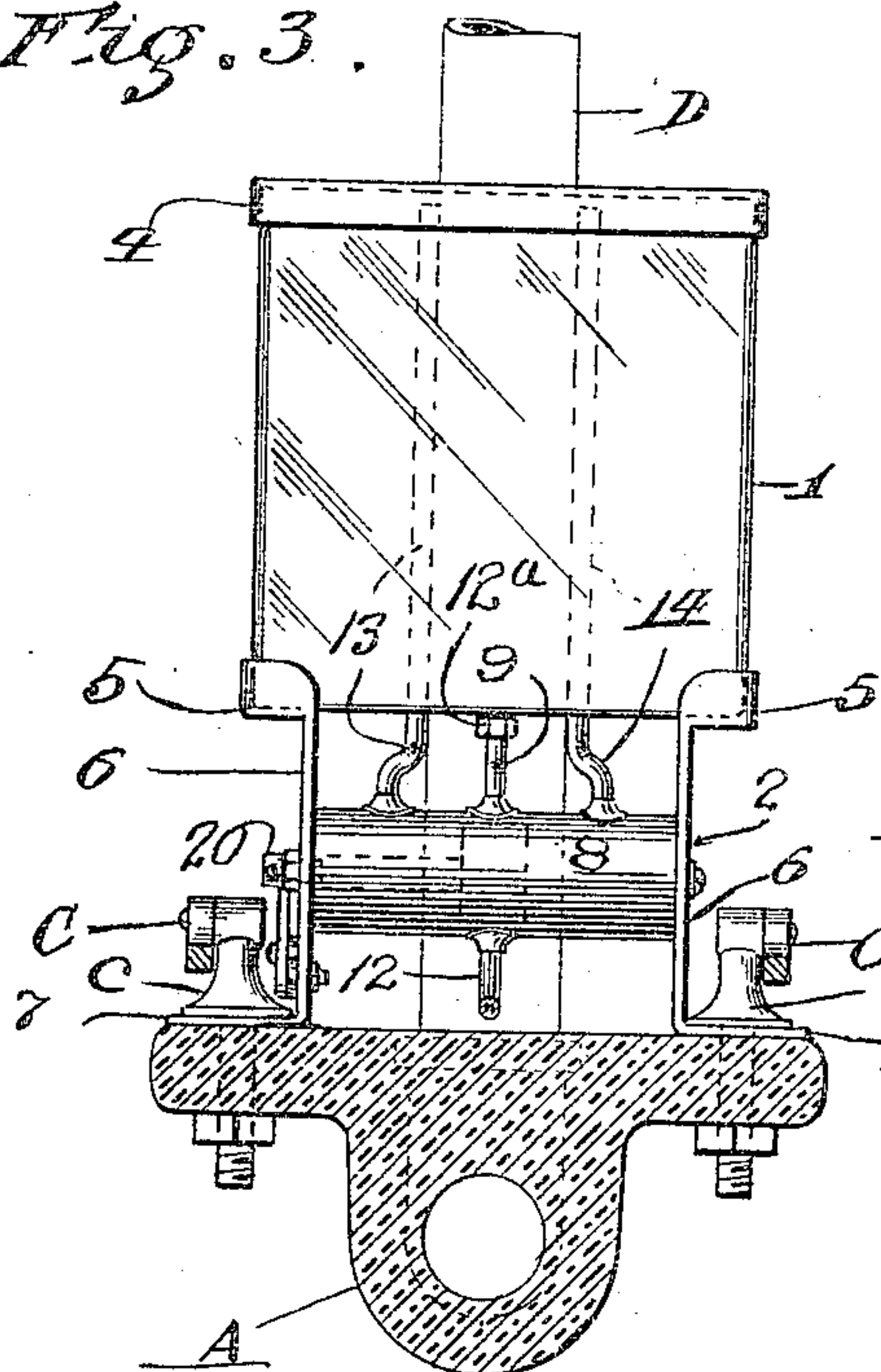


Fig. 4.

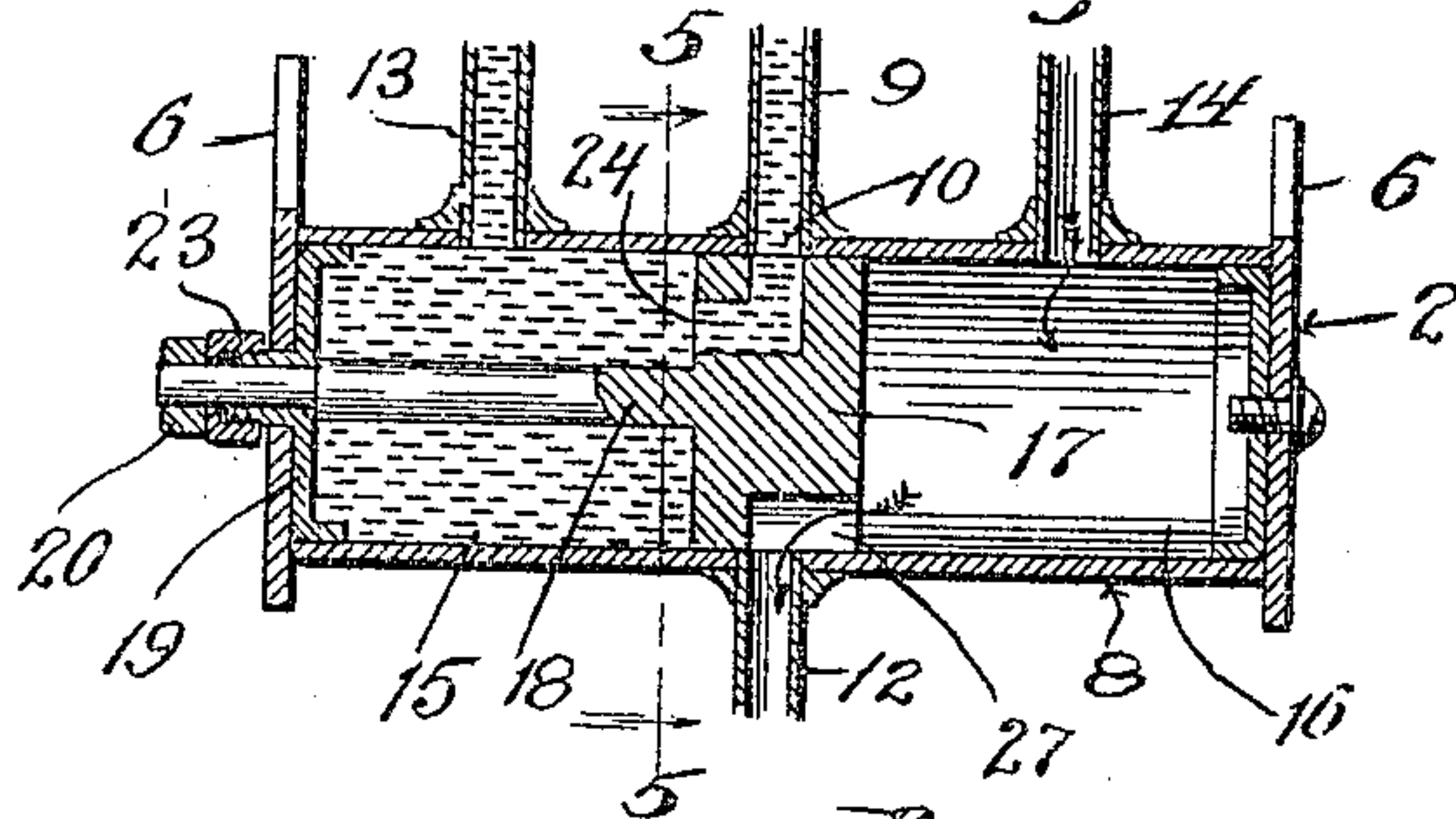


Fig. 5.

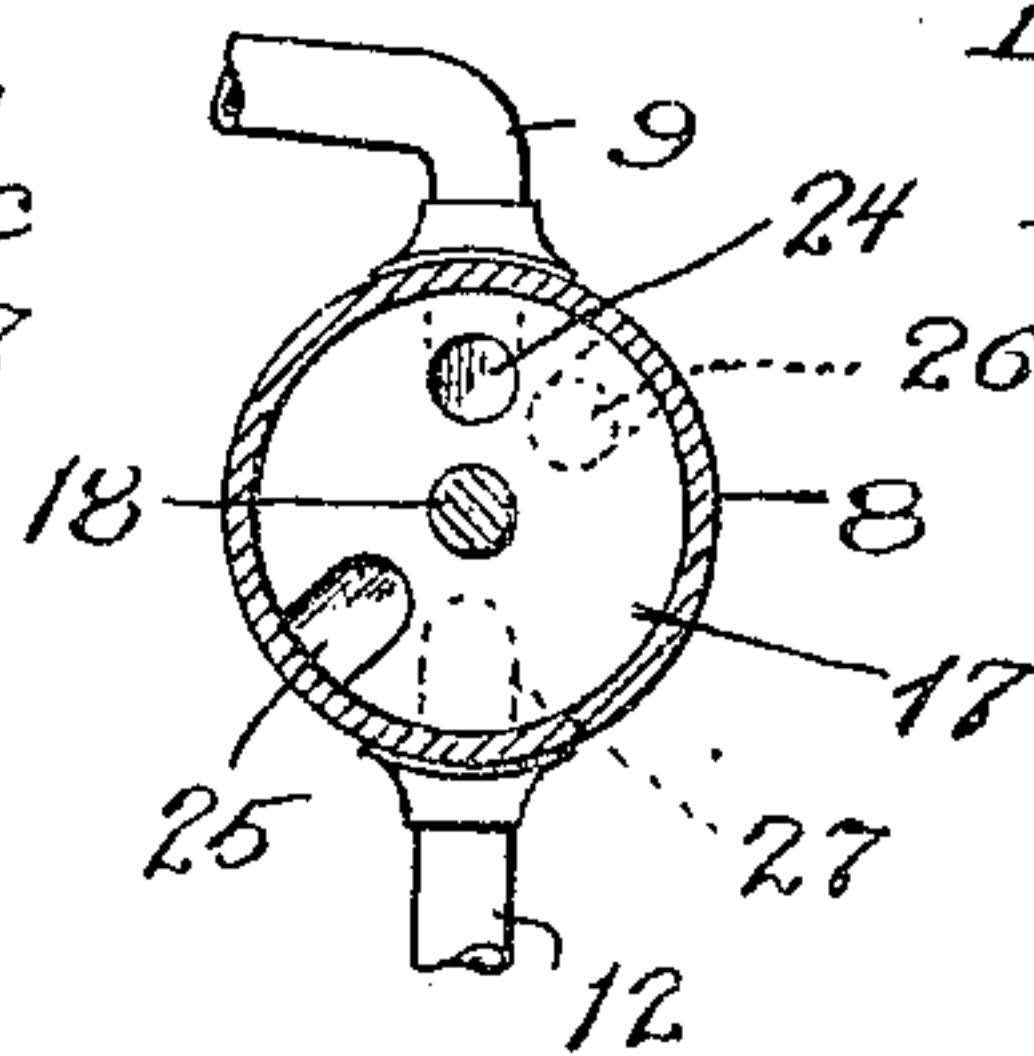


Fig. 6.

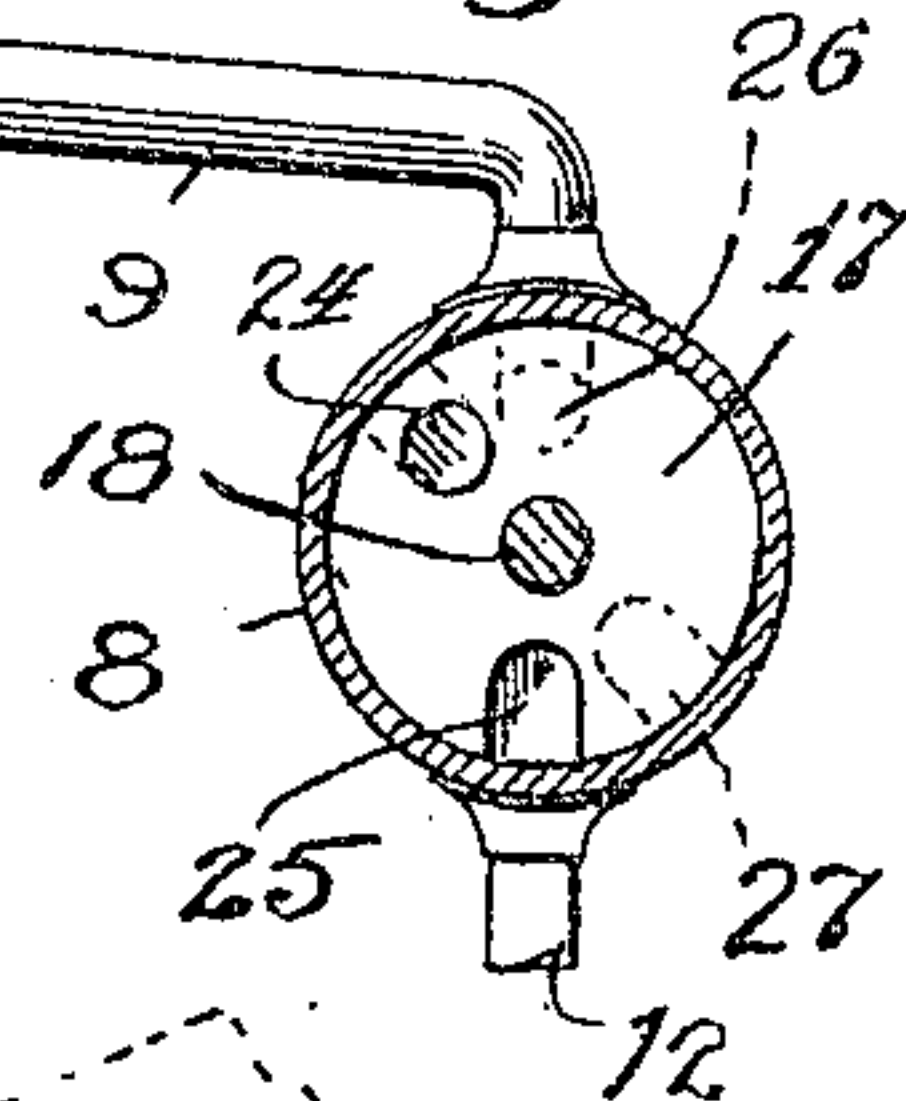


Fig. 7.

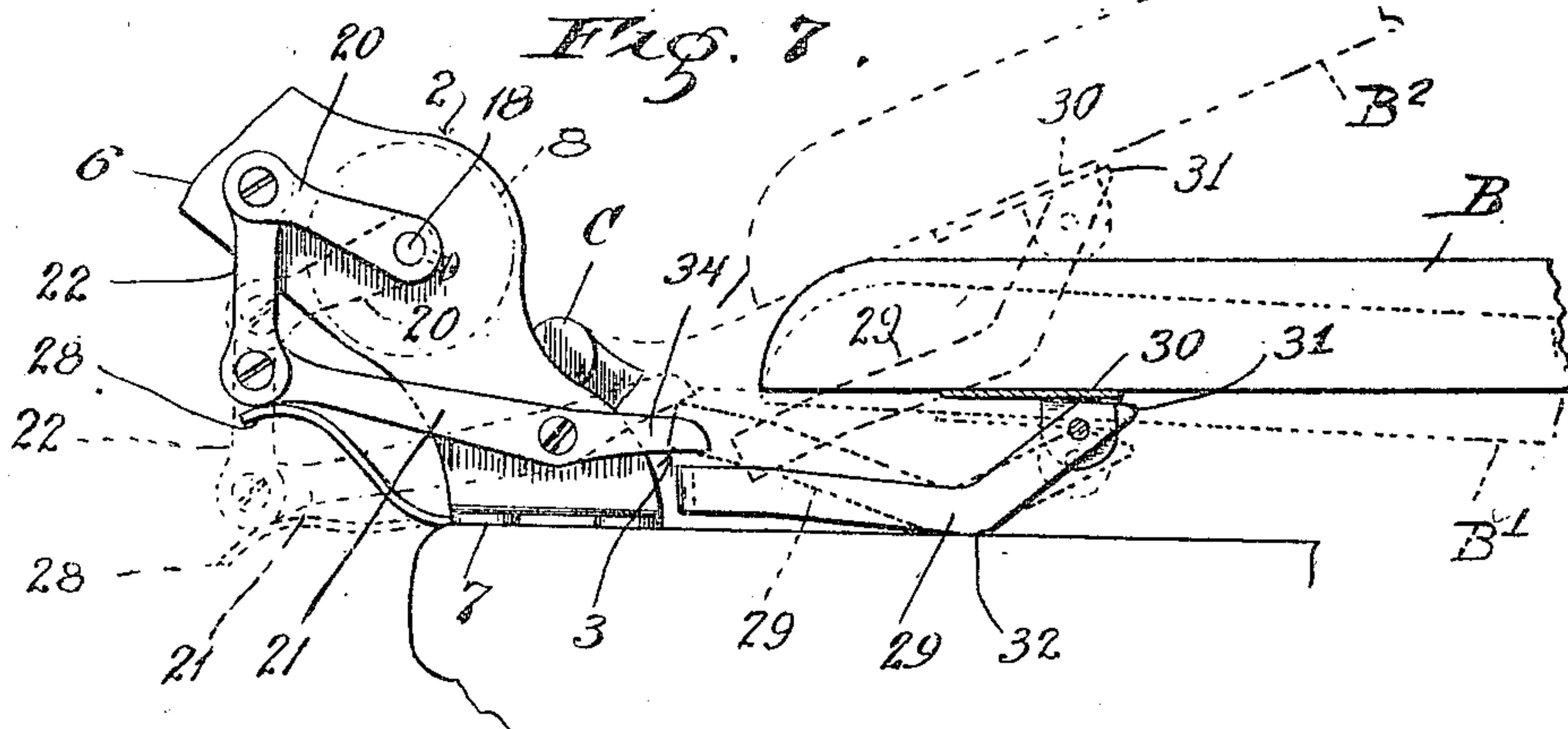
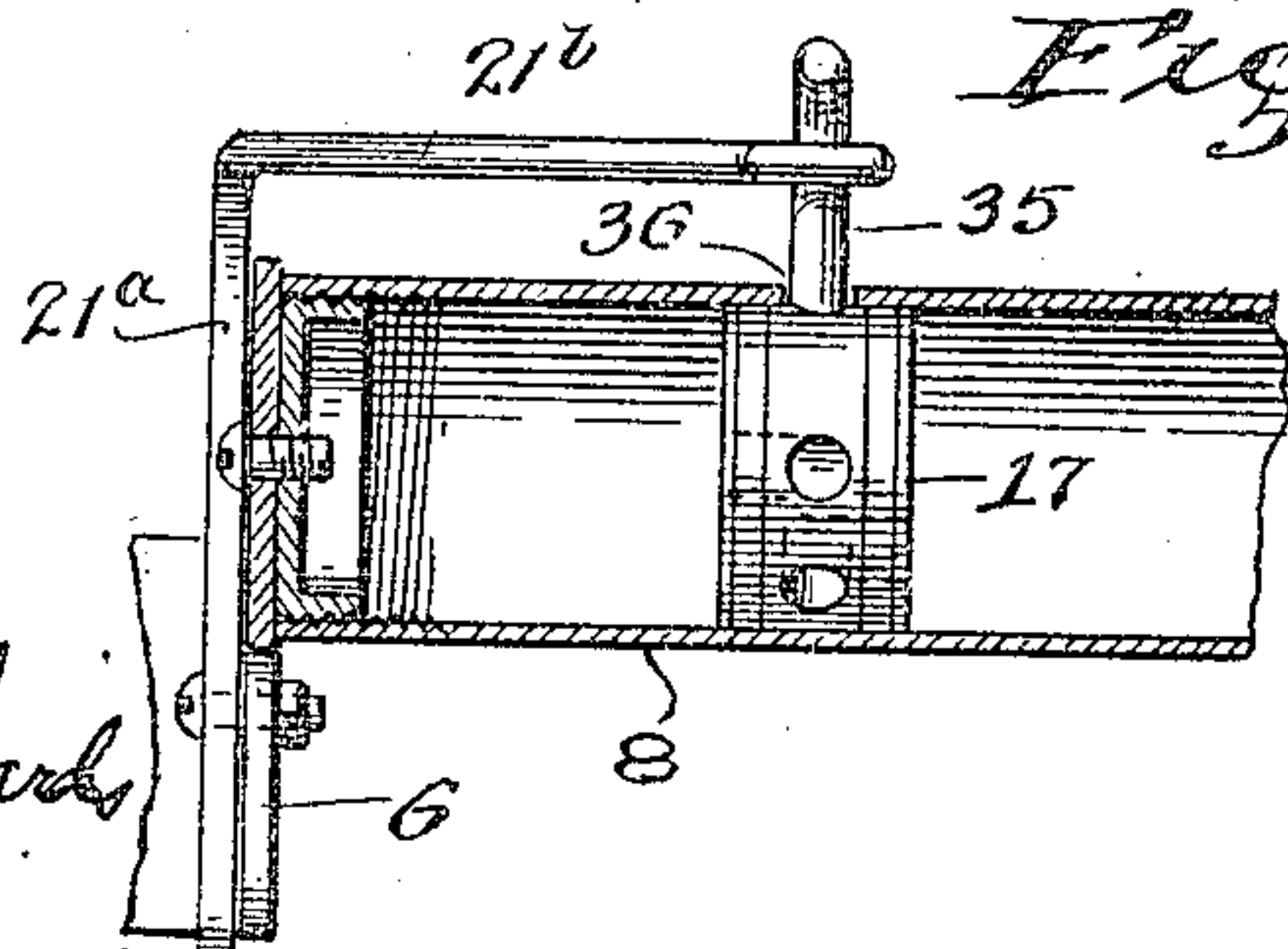


Fig. 8.



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UNITED STATES PATENT OFFICE.

CHARLES CHRISTENSEN, OF CHICAGO, ILLINOIS.

APPARATUS FOR DISPENSING MOBILE SUBSTANCES.

959,717.

Specification of Letters Patent.

Patented May 31, 1910.

Application filed June 26, 1908. Serial No. 440,512.

To all whom it may concern:

Be it known that I, CHARLES CHRISTENSEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Apparatus for Dispensing Mobile Substances, of which the following is a full, clear, and exact description.

This invention relates to improvements in apparatus for dispensing mobile substances and designs to provide an improved apparatus for measuring off a quantity of liquid or other mobile substance, and discharging it from a suitable reservoir or container. In the form shown in the drawings the apparatus has been designed especially for use in connection with water closets, and is adapted to be operated automatically to discharge a quantity of the liquid into the bowl whenever the seat is depressed or raised from such depressed condition.

One of the objects of this invention is to produce a simple, comparatively inexpensive and positively operating apparatus which may be easily and readily attached in place.

Another object is to provide a valveless device of this character, that is a device capable of operating without the use of valves which seat and unseat upon a seat, such as puppet or hinged valves, the use of valves being objectionable on account of the danger of clogging and from corrosion by the deodorizing and disinfecting substance usually employed.

Another object is to cheapen, simplify and otherwise improve upon devices of this character, and to such end this invention consists in the several novel features of construction and arrangement described in the following specification and particularly pointed out in the claims.

The invention is clearly illustrated in the accompanying drawings in which—

Figure 1 is a side view of an apparatus embodying my improvements, and showing the same as applied to an ordinary water closet. Fig. 2 is a plan view of the parts seen in Fig. 1. Fig. 3 is a view partly in front elevation and partly in vertical cross section, the line of section being taken at 3—3 Fig. 1. Fig. 4 is a vertical cross section taken on line 4—4 Fig. 1. Fig. 5 is a detail section taken on line 5—5 Fig. 4. Fig. 6 is a similar view showing the controlling plug in a different position. Fig. 7

is a side view of the trigger mechanism and Fig. 8 is a horizontal section through a slightly modified form of fluid releasing mechanism.

In these views A, is the bowl of an ordinary water closet, B, the seat, which is hinged to the bowl by the ordinary hinges C, and D, is the flush pipe. All of these parts are of well known construction, and require no especial description. The front end of the seat is normally raised about three fourths of an inch above the bowl by springs E, which are interposed between the seat and bowl and preferably attached to the seat by screws *e*.

The apparatus consists in general of a reservoir 1, a fluid measuring and releasing mechanism 2, and a trigger mechanism 3. The reservoir 1, is preferably constructed of glass or some like non-corrodible substance and if desired may be shaped to fit around the flush pipe D, as shown in Fig. 2. It is provided with a cover 4, of any suitable form. The reservoir is supported at a suitable point above the measuring apparatus as by two flanged shelves 5, that are formed upon brackets 6, which are secured upon the bowl B. The brackets have notched feet 7, which rest upon the bowl, and are secured in place by the members *c*, of the hinges C. The notches afford means for the attachment of the apparatus to closets of different forms and where the hinges are spaced at a greater or less distance apart than the ones shown in the drawings.

Between the brackets 6, is supported a measuring cylinder 8, which cylinder communicates with the reservoir 1, through a feed or supply pipe 9, which opens into the cylinder at 10. The connection between the upper end of the pipe 9 and the reservoir 1, is preferably made by a nipple 11, on the reservoir and a cap 12^a, screwed upon it, with a suitable packing between the nipple and cap, thereby providing a stuffing box for preventing leakage at this point. A discharge pipe 12, opens out from the bottom of the cylinder and is arranged to discharge the contents of the cylinder into the bowl. Two vent pipes 13, 14, are secured in the cylinder 8, and extend up to a point approximately on a level with the upper edge of the reservoir.

The cylinder 8, is divided into two separate chambers 15, 16, by means of a plug 17,

and said plug is connected to the trigger mechanism which is operated by the seat to give the plug a partial rotation upon its axis every time that the seat is depressed or raised from said depressed position. In the preferred form the plug has a spindle 18, which projects out through the end wall 19, of the cylinder, the end of said spindle having secured to it an arm 20, which is connected to a rocking lever 21, by means of a link 22. A stuffing box 23, is preferably provided at the point where the spindle 18, passes through the wall 19, to prevent leakage at this point. The plug 17, contains two sets of ports, one for each chamber, which ports are so arranged that when the plug is in one position the fluid from the reservoir will flow into an empty chamber and the contents of the opposite chamber will be discharged out through the discharge pipe 12. As shown in the drawings, the ports for the chamber 15, are shown at 24, 25, the port 24, being the inlet port and being arranged to be brought into or out of register with the discharge opening 10, in the filling pipe 9. The port 25 is so positioned that when the inlet port 24, is in register with the opening 10, the discharge pipe 12, will be closed to the chamber 15, by the plug, but when the latter is given a partial rotation the discharge port 25, will be brought into register with the discharge pipe 12, whereupon the inlet port 24, will be moved out of register with the opening 10, and the latter will be closed to the chamber 15, by the plug. The inlet and discharge ports 26, 27, for the chamber 16, are arranged to open out upon the opposite face of the plug, so as to establish communication between the chamber 16, and the supply pipe 9, or between the chamber and the discharge pipe 12, as the case may be. The ports of the plug are so arranged that when the inlet port 24, for the chamber 15, is in register with the supply pipe 9, the discharge port 27, of the opposite chamber 16, will be in register with the discharge pipe 12, and when the inlet port 26, is in register with the supply pipe 9, the discharge port 25, will be in register with the discharge pipe 12. It will thus be seen that whenever the inlet port 24, is brought into register with the supply pipe 9, a quantity of the liquid will run into the chamber 15, and rise in the vent pipe up to a level with the liquid in the reservoir and that simultaneously the contents of the chamber 16, will run out through the discharge pipe and be discharged into the bowl. If now the plug be turned to bring the port 26, into register with the supply pipe 9, and the discharge port 25, into register with the discharge pipe 12, the contents of the chamber 15, will run out and the chamber 16, will be re-filled with the liquid.

The mechanism for operating the plug is

best seen in Figs. 1, 2 and 7 and as shown, consists in a trigger mechanism 3, arranged to be actuated by a very slight movement of the seat. A trigger 29, is pivoted upon a plate 30, which as shown is secured between the hinge leaf c^1 and the seat and said trigger contains a shoulder 31, which is arranged to engage the plate 30 to limit the downward swing of the trigger when the seat is raised toward a vertical position. The trigger is provided with a heel 32, on its lower edge which rides upon the upper edge of the bowl and forms a fulcrum upon which it is rocked whenever the seat is depressed or raised from such depressed position, and the free end of said trigger has a finger 33, which engages with an arm 34, of the rocking lever 21. Fig. 7, shows the seat in full lines in its normal position, in the dotted lines B^1 in its depressed position and in the dotted lines B^2 in a partially raised position. The dotted lines B^1 show the trigger 29, in its working position, the same being a position where the rocking lever has been oscillated to draw the arm 20, of the controlling plug down to its lower limit of movement. The dotted lines B^2 show the position assumed by the trigger 29, when the seat is being raised from the position shown in full lines to a vertical position. In this case the free end of the trigger swings down until the shoulder 31, engages with the plate 30, and the end of the trigger then swings around the arm 34. A spring 28, yieldingly holds the lever 21, against the action of the trigger and returns the lever 21, and plug 17, to their original positions as soon as the trigger is disengaged from the lever 21.

It is evident that so long as the seat is raised, the port 24, will be in communication with the opening 10, and the chamber 15, will be filled with the liquid and that as soon as the seat is depressed the plug will be shifted by the action of the trigger mechanism to bring the ports 26, 25 into register with the inlet and outlet openings thereby allowing the liquid in the chamber 15, to be discharged into the bowl and permitting the chamber 16, to be re-filled. As soon as the seat is raised by the springs E, the reverse movement of the plug takes place, the ports 24, 27 are again brought into register with the inlet and outlet ports, and the liquid is discharged from the chamber 16, and the chamber 15, is recharged.

In the form shown in Fig. 8 the plug has an arm 35, which projects out through a slot 36, in the wall of the cylinder 8. The arm 35, is actuated by a rocking lever 21^a , which lever has an arm 21^b , that connects with the arm 29. The rocking lever 21^a is actuated by trigger mechanism as in the preferred form. The arm 35, travels in the slot 36, and keeps the plug in its position within the cylinder. If desired the end walls 19, of the

cylinders may be adjustable longitudinally thereof to afford a variation in the capacity of said chambers.

One of the most important advantages of this device is the fact that puppet or hinged valves, pumping apparatus and the like are done away with, and the liquid is allowed to flow by its own gravity from the reservoir through the measuring apparatus and into the bowl. Another feature is the peculiar trigger mechanism by means of which a large amount of movement is given to the controlling plug with a very limited movement of the seat. This is a decided advantage inasmuch as it is very undesirable to have a great amount of movement of the seat from its slightly raised position to its depressed position and this comparatively large amount of movement of the plug has been accomplished by the peculiar trigger mechanism above set forth. The free movement of the seat is in no wise interfered with, inasmuch as the shouldered connection between the trigger and the seat makes it possible to permit the trigger to swing out of the way of the rocking lever 21, as the seat is being raised or lowered from its intermediate position. The parts may be readily assembled and put in place with very little effort.

I am aware that various alterations and modifications of this device are possible without departing from the spirit of my invention, and I do not therefore desire to limit myself to the exact forms shown and described, except as may be necessitated by the state of the art.

I claim as new and desire to secure by Letters Patent:

1. In an apparatus of the class described, the combination with a reservoir, a measuring cylinder connected therewith and having a suitable discharge opening, said reservoir, measuring cylinder and discharge pipe being arranged so that liquid may flow solely by gravity from the reservoir out through the discharge pipe, a plug in said cylinder for establishing and cutting off communication with the reservoir, and trigger mechanism for actuating said plug, arranged to be operated by movement of a suitable seat.

2. In an apparatus of the class described, the combination of a reservoir, a measuring cylinder connected therewith and having a suitable discharge pipe, said reservoir, measuring cylinder and discharge pipe being arranged so that liquid may flow solely by gravity from the reservoir out through the discharge pipe, a plug in said cylinder for establishing and cutting off communication between the reservoir and cylinder, a rocking element for actuating said plug and a trigger carried by a suitable seat and arranged to actuate said rocking element through the movement of the seat.

3. In an apparatus of the class described, the combination of a reservoir, a cylinder connected thereto, and having a suitable discharge pipe, said reservoir, measuring cylinder and discharge pipe being arranged so that liquid may flow solely by gravity from the reservoir out through the discharge pipe, a plug in said cylinder for establishing and cutting off communication between said reservoir and the cylinder, an arm for said plug, a rocking lever, a link connecting the arm and rocking lever and a trigger carried by a suitable seat arranged to engage said rocking lever through the depression of the seat.

4. In an apparatus of the class described, the combination of a reservoir, a cylinder, a supply pipe between the reservoir and cylinder, a discharge pipe leading away from said cylinder, all arranged so that liquid may flow solely by gravity from said reservoir and out through the discharge pipe, a shiftable plug in said cylinder arranged to divide said cylinder into two chambers and containing a double set of alternately acting inlet and outlet ports for alternately establishing communication between the supply pipe and the chambers, and between the chambers and the discharge pipe, and suitably operated trigger mechanism for actuating said plug.

5. In an apparatus of the class described, the combination of a reservoir, a measuring cylinder, a supply pipe connecting said reservoir with the cylinder, a discharge pipe leading away from the cylinder, all arranged so that liquid may flow solely by gravity from said reservoir and out through the discharge pipe, a shiftable plug in said cylinder arranged to divide said cylinder into two chambers and having separate alternately acting inlet and outlet ports for each chamber, and suitably operated trigger mechanism for actuating said plug.

6. In an apparatus of the class described, the combination with a measuring cylinder connected with a suitable supply reservoir and having a suitable discharge pipe, all arranged so that liquid may flow solely by gravity from said reservoir and out through the discharge pipe, of a shiftable plug in said cylinder arranged to divide said cylinder into two chambers and having two sets of alternately acting inlet and outlet ports for establishing communication between the supply reservoir and one chamber and between the other chamber and discharge pipe at any one given time, and a suitably operated trigger mechanism for actuating said plug.

7. In an apparatus of the class described, the combination of a measuring cylinder having inlet and outlet openings and connected with a suitable supply reservoir which is located above the cylinder, whereby liq-

uid may flow solely by gravity out through the outlet opening, a plug in said cylinder arranged to divide the same into two chambers and having two sets of alternately acting inlet and outlet ports, one set being arranged to alternately establish communication between the chamber on one side of said plug and the inlet and outlet openings and the other set of ports being arranged to alternately establish communication between the other chamber and the inlet and outlet openings, and suitably operated trigger mechanism for actuating said plug.

8. In an apparatus of the class described, the combination of a measuring cylinder having suitable inlet and outlet openings and connected with a suitable supply reservoir which is located above the cylinder, whereby liquid may flow solely by gravity out through the outlet opening, a shiftable plug arranged to divide said cylinder into two chambers and having two sets of alternately acting inlet and outlet ports, one set being arranged to alternately establish communication between one chamber and the inlet and outlet opening and the other set being arranged to alternately establish communication between the opposite chamber and the inlet and outlet openings, said ports being so positioned that the chambers will be alternately filled and discharged by the partial rotation of the plug, and suitably operated trigger mechanism for actuating said plug.

9. In an apparatus of the class described, the combination of a measuring cylinder having oppositely arranged inlet and outlet openings, a shiftable plug in said cylinder arranged to divide said cylinder into two chambers and having two sets of diametrically arranged inlet and outlet ports for alternately establishing communication between the inlet opening and the two chambers and between the two chambers and the outlet opening and a suitably operated trigger mechanism arranged to actuate said plug.

10. In an apparatus of the class described, the combination of a measuring cylinder connected with a suitable supply reservoir which is located above the measuring cylinder, and from which liquid may flow out through said cylinder solely by gravity, a suitable liquid controlling plug in said cylinder, a rocking lever for actuating said plug, a seat hinged upon a bowl, a trigger hinged to said seat and arranged to rock upon the bowl and having an end adapted to engage and actuate the rocking lever.

11. In an apparatus of the class described, the combination of a pair of brackets having slotted supporting feet, a reservoir supported by said brackets, a measuring cylinder below said reservoir and having a supply pipe connected with said reservoir, a discharge pipe leading away from the cylinder,

a plug arranged to divide said cylinder into two chambers and having controlling ports between the supply pipe, and chambers and between the chambers and discharge pipe, and suitable trigger mechanism for actuating said plug.

12. In an apparatus of the class described, the combination of a reservoir, a measuring cylinder located below the same, an inlet tube between the reservoir and measuring cylinder, and opening into said cylinder approximately midway between its ends, a discharge pipe opening out from said cylinder, a rotary plug in said cylinder arranged to divide the same into two chambers and having two pairs of alternately operating by-passes, one pair arranged to simultaneously establish communication between the inlet tube and one chamber, and between the opposite chamber and discharge pipe, and the other pair being arranged to establish communication in the reverse order, and a trigger mechanism for operating said plug.

13. A measuring cylinder having an inlet opening and a discharge opening, and a plug in said cylinder for dividing the same into two independent chambers, said plug having two sets of alternately acting inlet and outlet ports, one set of which is arranged to simultaneously establish communication between the inlet opening and one chamber, and between the opposite chamber and outlet opening, and the other set of which is arranged to establish communication between the inlet opening and said opposite chamber, and between the first named chamber and the discharge opening.

14. A measuring cylinder having an inlet opening and a discharge opening, and a rotatory, reciprocatory plug in said cylinder for dividing the same into two independent chambers, said plug having two sets of alternately acting inlet and outlet ports, one set of which is arranged to simultaneously establish communication between the inlet opening and one chamber, and between the opposite chamber and outlet opening, and the other set of which is arranged to establish communication between the inlet opening and said opposite chamber, and between the first named chamber and the discharge opening.

15. A measuring cylinder having an inlet opening and a discharge opening, and a plug in said cylinder arranged to divide said cylinder into two chambers, said plug having two sets of inlet and outlet ports for alternately establishing communication between the inlet opening and the two chambers and between said chambers and the outlet opening.

16. A measuring cylinder having an inlet opening and a discharge opening, and a plug in said cylinder for dividing the same into two chambers, said plug having two

alternately acting sets of ports arranged to communicate with the inlet and discharge openings of the cylinder, whereby the opposite chambers may be alternately filled and
5 emptied.

In witness whereof, I have executed the above application this 20th day of June,

1908, at Chicago, county of Cook and State of Illinois.

CHARLES CHRISTENSEN.

Witnesses:

CHARLES O. SHERVEY,
FANNIE F. RICHARDS.