

No. 685,929.

Patented Nov. 5, 1901.

J. W. NETHERY.

VALVE.

(Application filed May 31, 1901.)

(No Model.)

Fig. 1.

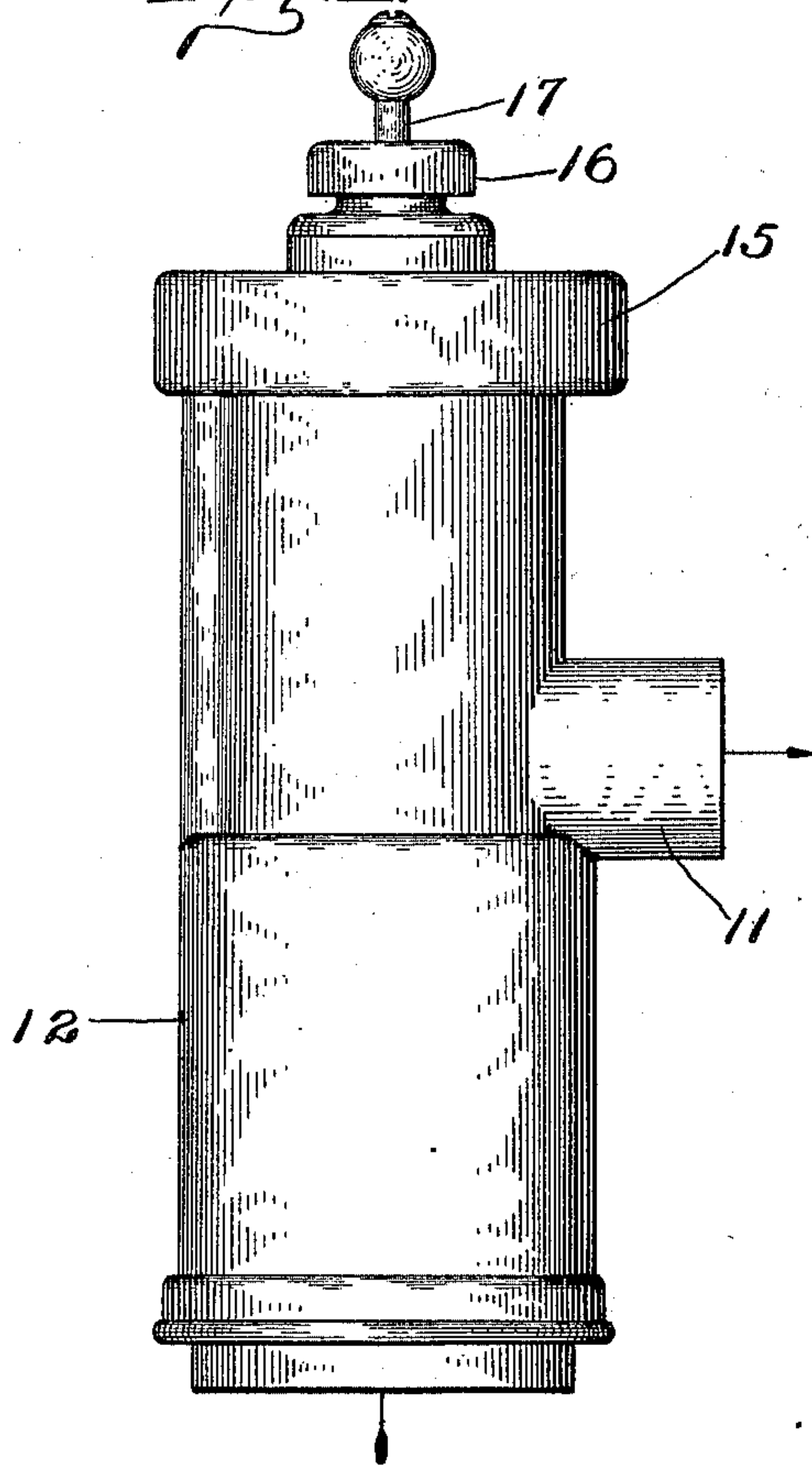


Fig. 2.

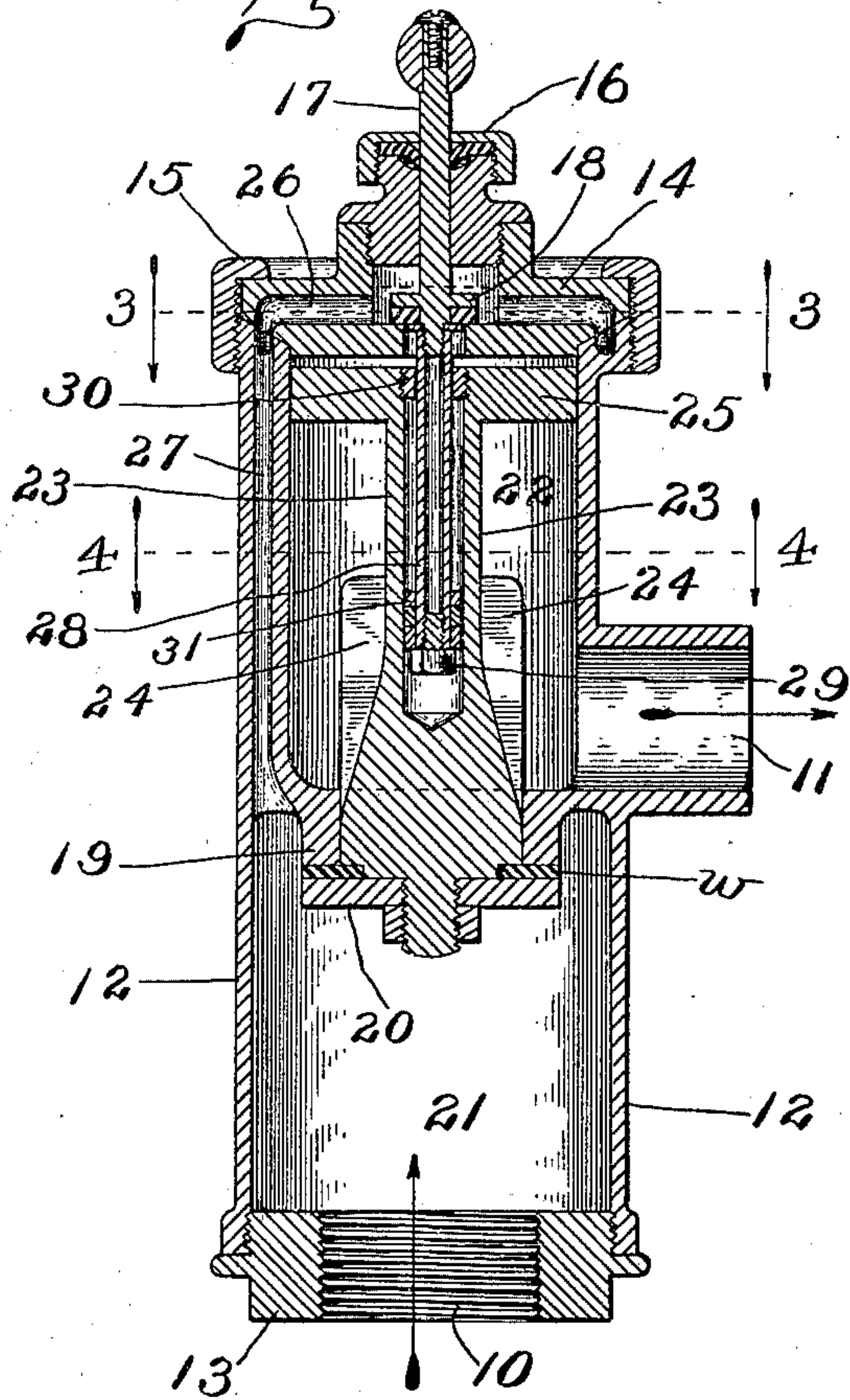


Fig. 3.

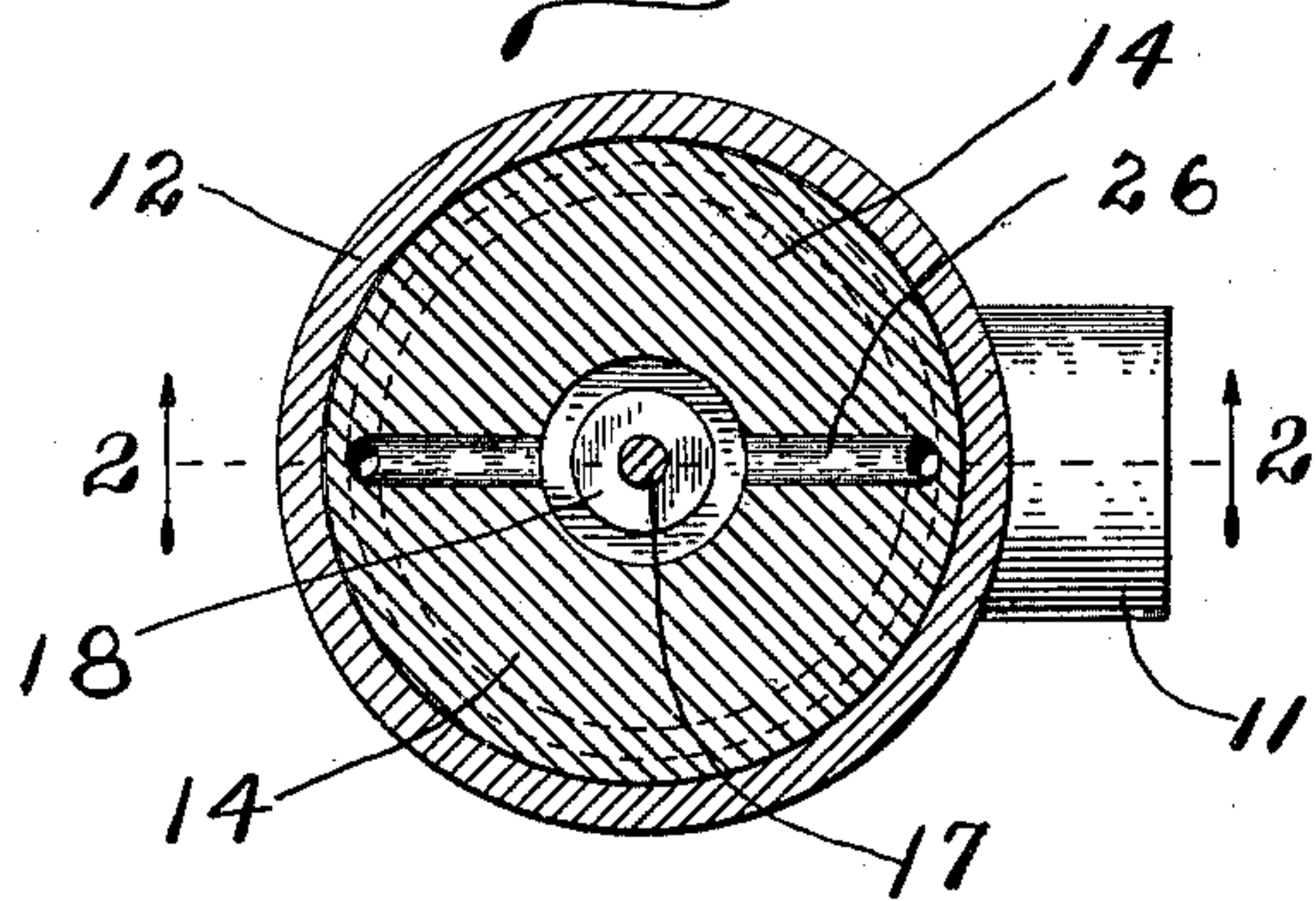
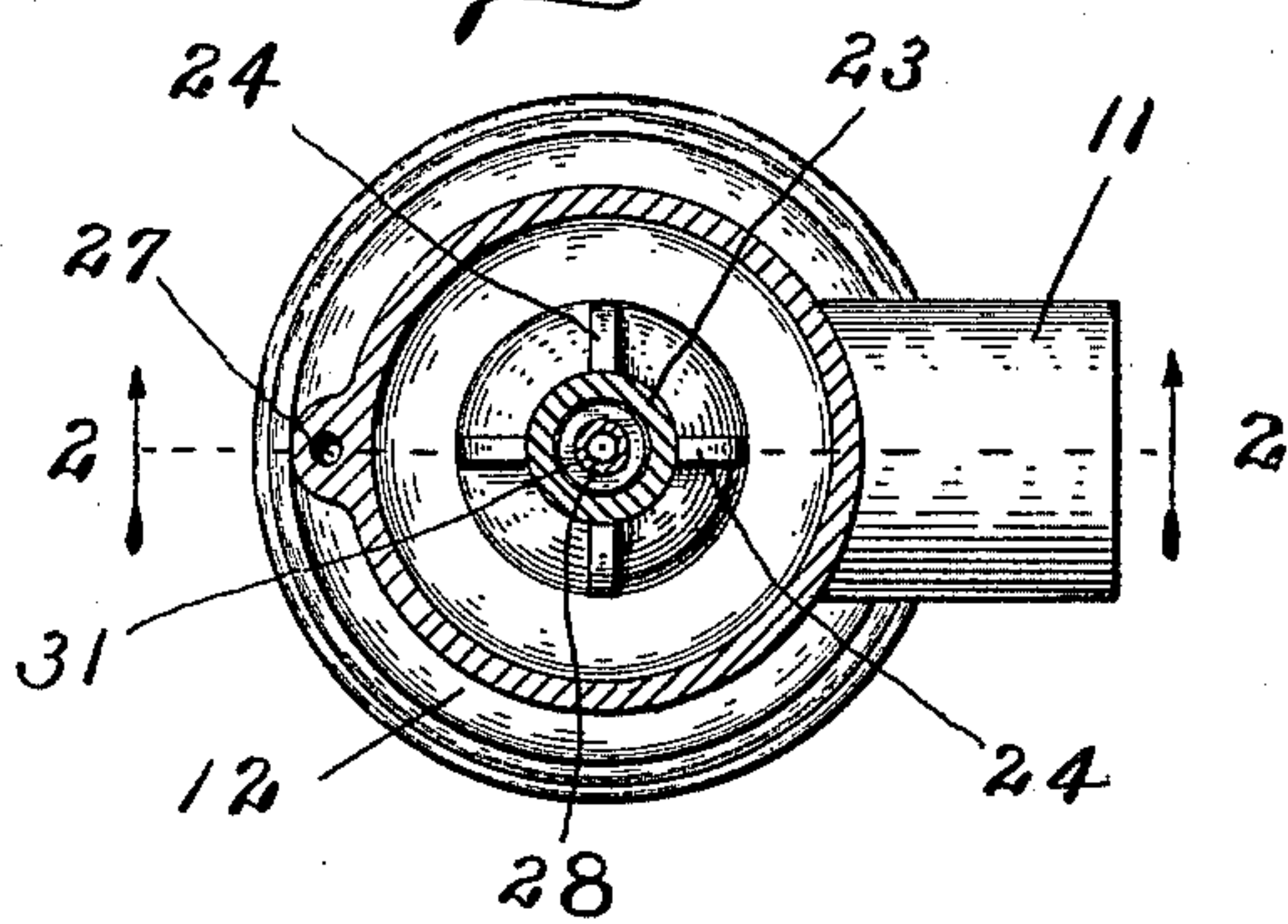


Fig. 4.



WITNESSES:

C. S. Frye
W. G. Goeve

INVENTOR

Joseph W. Nethery,
BY
Chester Bradford,
ATTORNEY

UNITED STATES PATENT OFFICE.

JOSEPH W. NETHERY, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO THE NETHERY HYDRAULIC VALVE COMPANY, OF INDIANAPOLIS, INDIANA; NEW YORK, N. Y., AND JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

VALVE.

SPECIFICATION forming part of Letters Patent No. 685,929, dated November 5, 1901.

Application filed May 31, 1901. Serial No. 62,594. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH W. NETHERY, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Valves, of which the following is a specification.

My present invention relates to that class or variety of valves by means of which after the valve is opened a predetermined amount of fluid may be drawn, whereupon the valve will automatically close. A valve embodying said invention will be first fully described and the novel features thereof then pointed out in the claims.

Referring to the accompanying drawings, which are made a part hereof and on which similar reference characters indicate similar parts, Figure 1 is a side elevation of a valve of suitable form for my purpose and embodying said invention; Fig. 2, a central vertical sectional view thereof on the dotted line 2 2 in Figs. 3 and 4; and Figs. 3 and 4, horizontal sectional views of the same as seen when looking downwardly from the dotted lines 3 3 and 4 4, respectively, in Fig. 2.

In use the fluid may be understood as entering through the inlet 10 (which is shown as threaded to receive a pipe) and after passing through the valve as emerging through the nozzle or outlet 11. The body of the valve is composed of a substantially cylindrical portion 12 and two heads or ends 13 and 14. The lower end 13 is shown as screw-threaded into a suitable rim on the lower end of the part 12, while the upper end (or head) 14 is shown as held on by means of a screw-cap 15; but these, as will be readily understood, are only mechanical details and may be varied in any desired manner. A stuffing-box 16 is also secured to the head 14 and the stem 17 of the starting-valve 18 passes through it.

The body 12 is divided by a diaphragm or partition which embodies the main-valve seat 19 and against this the main valve 20 is adapted to rest. Said valve is provided with a washer *w*, as is usual. As will be noticed, this main valve when closed is held seated by the pressure of the main body of fluid com-

ing upon it instead of being closed against said pressure, as is the more common way. The construction shown gives a chamber 21, into which the valve 20 enters as it descends, said chamber being of sufficient size to permit the fluid to pass up around the edges of the valve and thence on up through the opening in the main-valve seat into a chamber 22, above the diaphragm on which said valve-seat is formed. The valve 20 is secured to a valve-stem 23, the lower end of which is of substantially the same area in cross-section as the opening in the valve-seat, but tapers thence inwardly until it reaches a comparatively small size. This form provides for a gradual enlargement of the valve-opening as the valve moves downwardly and a gradual reduction in the opening as it moves upwardly toward its seat. The valve is kept in central relation to the valve-opening by means of the flanges or wings 24. The chamber 22 is cylindrical in form, and on the upper end of the valve-stem 23 is a head 25, which operates in said cylinder in the manner of a piston. The head 14 has a cavity 26 therein, which communicates with a by-pass 27 in one side of the body 12, which said by-pass leads from the chamber 21 to and communicates with the said cavity, as best shown in Fig. 2. There is an orifice in the under portion of the head 14, leading from the cavity 26 down through said portion to the chamber 22. There is also a cylindrical opening leading upwardly from said cavity through said head, which opening is closed when the parts are assembled by the stuffing-box 16. In the small chamber below said stuffing-box the starting or auxiliary valve 18 is situated, and the bottom of said small chamber constitutes the seat for said valve. As is obvious, when the small valve 18 is raised there is a free passage for the fluid from the chamber 21 up through the by-pass 27 into the cavity 26 and thence down into the upper portion of the chamber 22, above the piston-like head 25. Said head being larger in diameter than the valve 20 affords a greater area for the operation of the fluid-pressure, and the valve 20 is thus opened. There is a longitudinal per-

foration extending down a considerable distance into the main-valve stem 23, and a rod 28, (shown as a tubular rod for convenience of construction,) which is connected to the under side of the small valve 18, extends down into the said longitudinal perforation and has a head or nut 29 on its lower end. A bushing 30 is screwed into the upper end of the perforation in the main-valve stem, and when the main valve, its valve-stem, and the piston-like head thereon have descended the predetermined distance this bushing will come in contact with the head 29 or with washers 31, which may have been placed thereon. When this takes place, the valve 18, which has previously been opened by pulling upwardly on its valve-stem 17, is pulled down and closed, and the flow of fluid into the upper portion of the chamber 22 is thus shut off. The head 25 is either loosely fitted or it may have one or more small perforations through it, so that the fluid which is above the head may pass around or through to below said head, permitting the main valve to be raised by the pressure of fluid in the chamber 21 up against its seat, thus stopping the flow of fluid through the valve.

The operation is as follows: When it is desired to use this valve, the small valve 18 is raised by pulling up on its valve-stem 17. The fluid then immediately begins to open the main valve 20 by means of pressure upon the head 25. When the bushing 30 strikes the head 29 or the washers carried thereon, the small valve 18 is closed, and shortly thereafter the main valve is also automatically closed. The length of time the main valve shall remain open, and consequently the amount of fluid that shall pass through it at one opening, may be regulated by the number and thickness of the washers 31. When a greater aggregate thickness of these washers is used, the valve will be closed sooner, and when a less thickness of them is used it will remain open longer, as will be readily understood.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a valve shell or body containing two chambers divided by a partition or diaphragm upon the lower side of which is the main-valve seat, a main valve below said valve-seat, a valve-stem extending up through said partition or diaphragm up into the main upper chamber, a piston-head upon the upper end of said stem, a longitudinal perforation extending down into

said stem, a small chamber above the upper head of the main upper chamber and communicating with the said main upper chamber by means of a perforation through said upper head—the bottom of said small chamber constituting a valve-seat, a starting-valve positioned within said small upper chamber and adapted to rest upon said valve-seat, an extension from said valve extending down into an opening in the main-valve stem and provided with a head thereon, a shoulder at the upper end of said opening with which said head may come in contact, a valve-stem extending from said small valve to the outside where it can be reached by the operator, and a by-pass extending from the main lower chamber up around the main upper chamber to the small upper chamber.

2. The combination of a valve-body, a main valve carrying a piston-head upon the opposite end of its valve-stem and provided with a central perforation extending longitudinally thereof, and an auxiliary or starting valve having a projection extending into said longitudinal perforation and provided with means of engagement with the main-valve structure which as it descends will close said auxiliary valve at the termination of its movement.

3. The combination of a valve-body, a main valve mounted to open by a downward motion, an auxiliary or starting valve, and a slidable connection between the main valve and the starting-valve, whereby when the main valve reaches its limit of downward movement it will close said starting-valve.

4. The combination of a valve-body, a main valve having a valve-stem with a longitudinal perforation therein and an engaging shoulder at the upper end of said perforation, an auxiliary or starting valve above and in line with said perforation and having an arm or rod extending into said perforation and provided with a head adapted to come in contact with said shoulder, and means whereby said engaging head is rendered adjustable, whereby the starting-valve is adapted to be closed by the movement of said main valve at any predetermined point, substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 27th day of May, A. D. 1901.

JOSEPH W. NETHERY. [L. S.]

Witnesses:

CHESTER BRADFORD,
L. H. COLVIN.