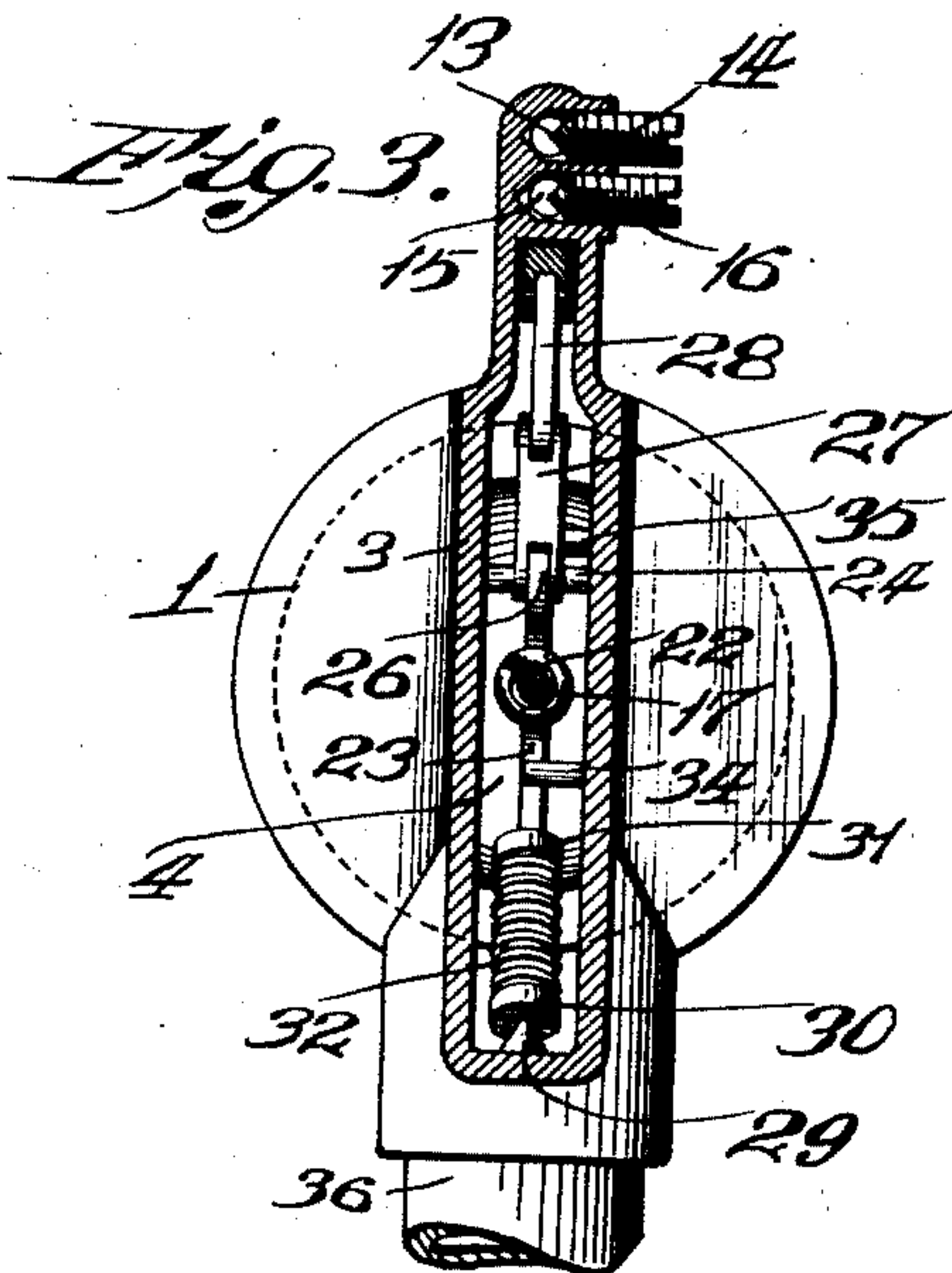
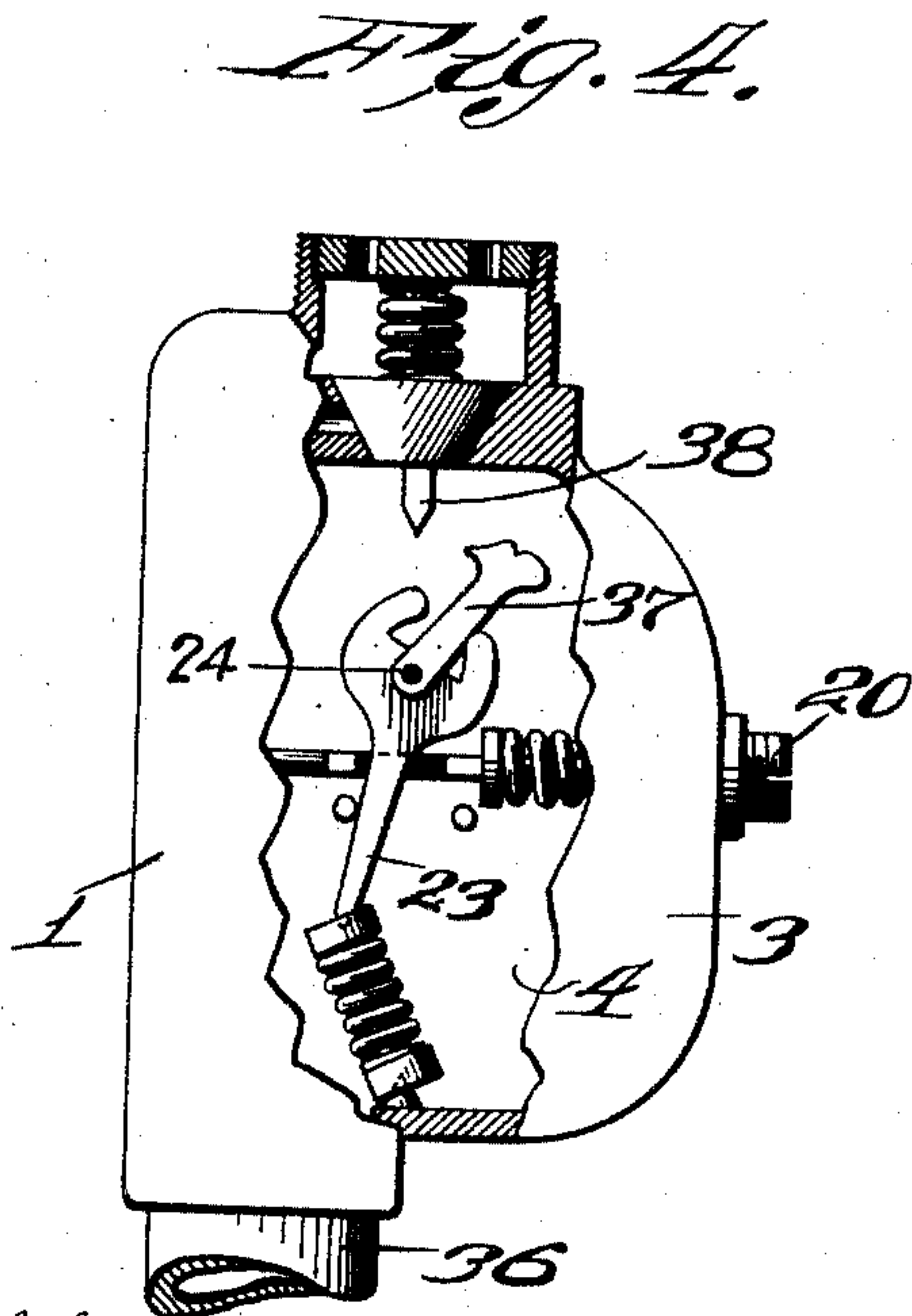
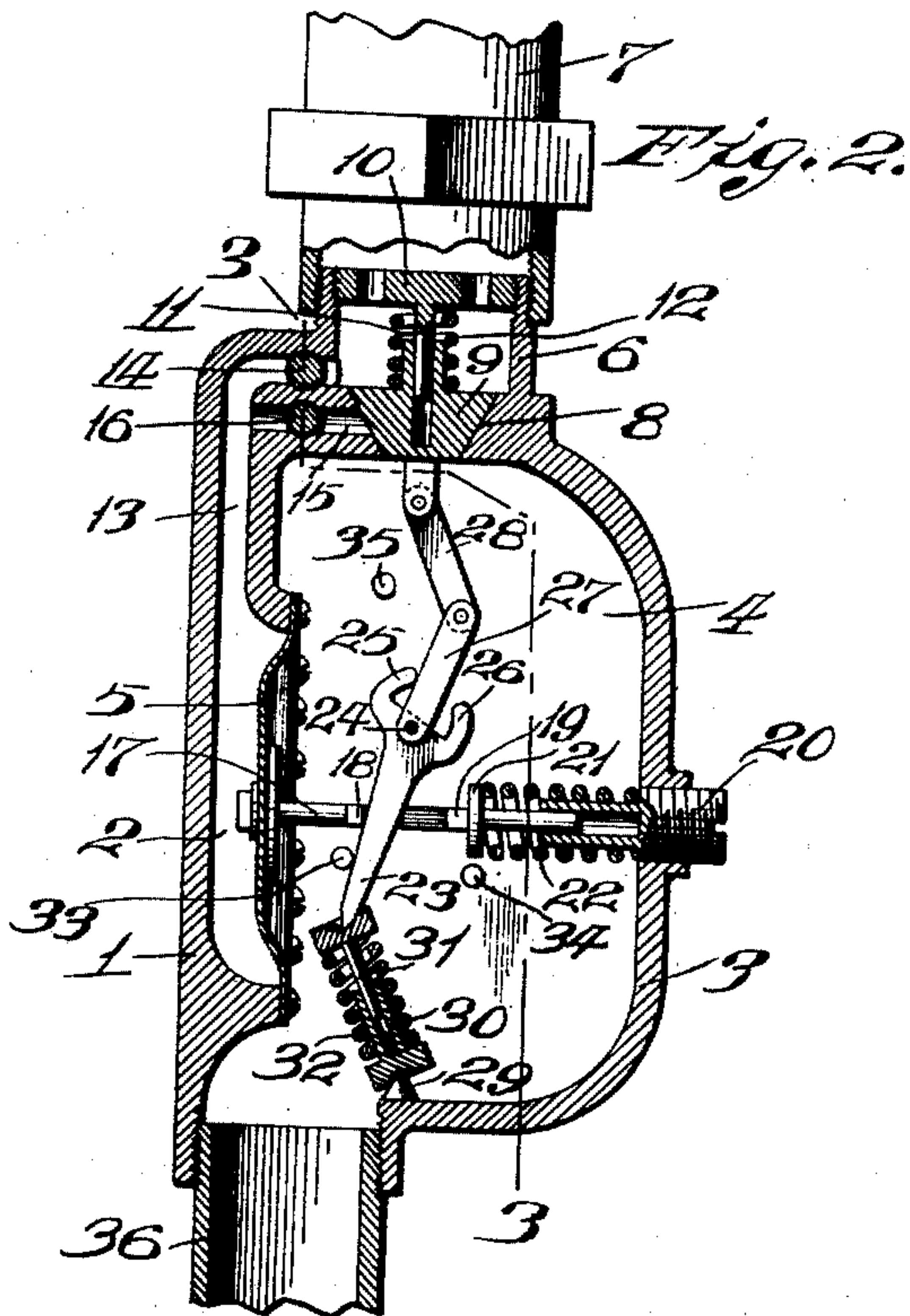
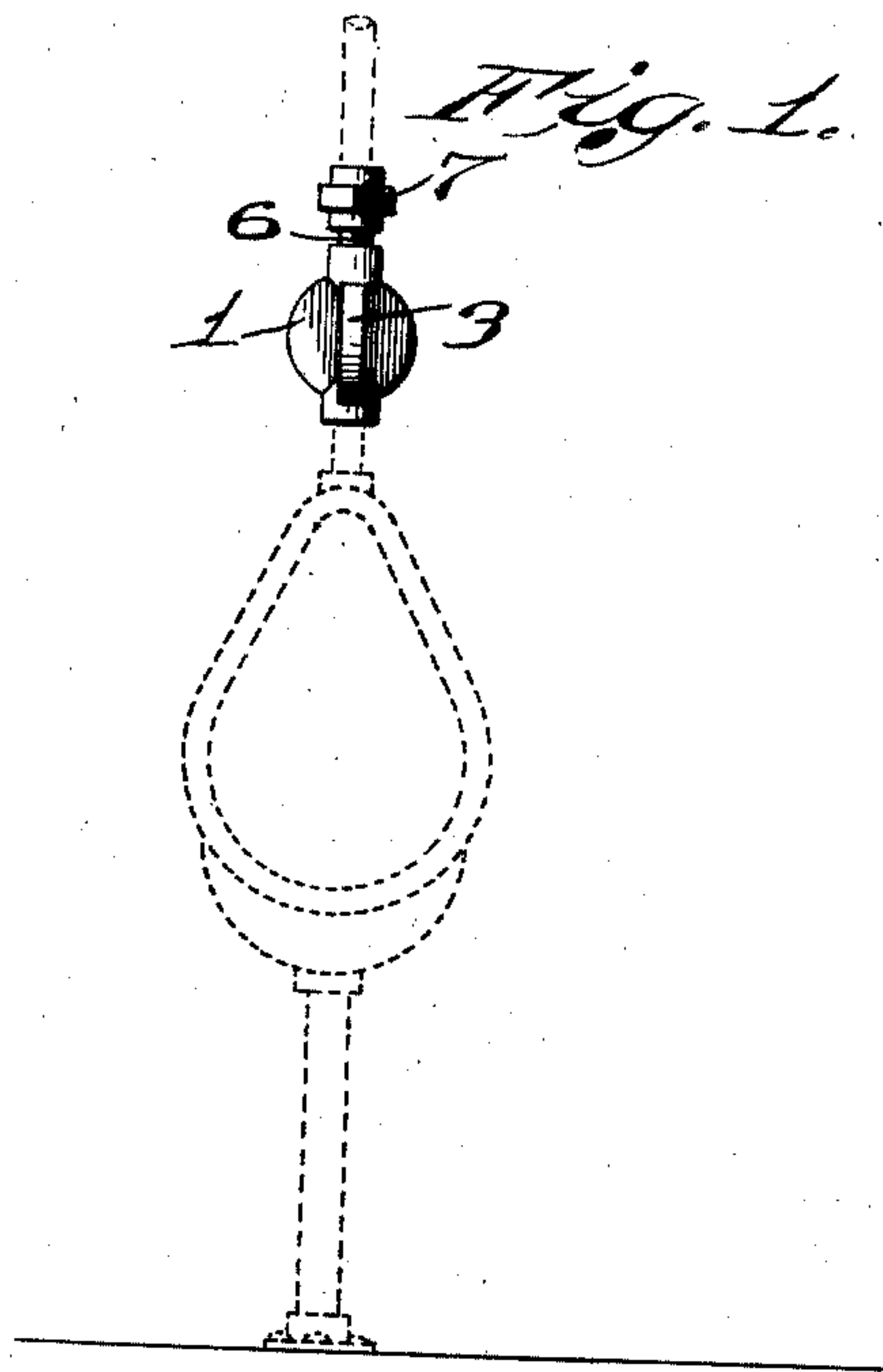


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AUTOMATIC INTERMITTENT FLUSHING VALVE.  
APPLICATION FILED SEPT. 26, 1908.

928,459.

Patented July 20, 1909.



attest.  
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# UNITED STATES PATENT OFFICE.

HENRY A. KIESELHORST, OF ST. LOUIS, MISSOURI.

## AUTOMATIC INTERMITTENT FLUSHING-VALVE.

No. 928,459.

Specification of Letters Patent.

Patented July 20, 1909.

Application filed September 26, 1908. Serial No. 454,871.

*To all whom it may concern:*

Be it known that I, HENRY A. KIESELHORST, a citizen of the United States, and resident of St. Louis, Missouri, have invented certain new and useful Improvements in Automatic Intermittent Flushing-Valves, of which the following is a specification containing a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates generally to a valve, and more particularly to an automatic intermittent flushing valve, particularly intended for use in connection with water supply pipes of closet bowls, and the object of my invention is to provide a simple inexpensive valve which will automatically and intermittently open to allow water to discharge through the supply pipe, and said valve being provided with simple means whereby the intermittent action can be accurately regulated, and the period of flushing accurately timed.

To the above purpose my invention consists in certain novel features of construction and arrangement of parts, which will hereinafter be more fully set forth, pointed out in the claims, and illustrated in the accompanying drawings in which:—

Figure 1 is a front elevation of a valve of my improved construction, the same being shown in position for use. Fig. 2 is an enlarged vertical section taken from the center of my improved valve. Fig. 3 is a vertical section taken on the line 3—3 of Fig. 2. Fig. 4 is a side elevation partly in section of a modified form of my improved valve.

The housing of my improved valve is constructed in two main portions, 1 designating the rear portion, and formed herein is a circular chamber 2, and formed integral with the front of this portion 1 is a narrow vertically disposed housing 3, in which is formed chamber 4, and fixed to the front wall of the portion 1, and separating the chambers 2 and 4, is a diaphragm 5. Formed integral with the upper end of the housing 3 is a tubular extension 6, which is adapted to be connected to the water supply pipe 7, and formed in the wall of the housing 3, immediately beneath this extension is a conical opening 8 which is normally closed by a conical valve 9. Detachably positioned in the upper end of the tubular extension 6, is a perforated plate or spider 10 provided with a depending pin 11, which enters a corre-

sponding aperture formed in the valve 9, for the purpose of guiding said valve during its vertical movement and arranged on said pin between the valve and the perforated plate 10 is an expansive coil spring. 12. A passage way 13 establishes communication between the chamber 2 and the chamber within the tubular extension 6; and seated in the wall of the housing 3 is a regulating screw 14 which is adapted to close this passage way. Formed through the wall in which the valve seat 8 is formed and establishing communication between said valve seat or opening 8 and the passage way 13 is a passage way 15 and screw seated in the wall in which this passage way is formed is a regulating screw 16 the forward end of which is adapted to close said passage way 15.

Fixed to the center of the diaphragm 5 is a horizontally disposed pin 17 on which is formed a pair of lugs 18 and 19, and the forward end of said pin is seated in an aperture formed in the rear end of a screw 20, which latter is seated in the front wall of the housing 3. Located upon the inner end of this screw 20 and bearing against a disk 21 carried by the pin 17 is an expansive coil spring 22. A vertically disposed lever 23 is fulcrumed upon a pin 24 which latter is fixed in the side walls of the housing 3 and the upper end of said lever is provided with a pair of lugs 25 and 26. A link 27 is pivotally arranged on the pin 24 which link passes between the lugs 25 and 26 and the upper end of this link is pivotally connected to the lower end of a corresponding link 28, the upper end of which latter is pivotally connected to the bottom of the valve 9.

29 designates a pivot point formed on the bottom of the housing 3 in direct vertical alinement with the pin 24, and the center of the valve 9; arranged to rock on the said pivot point is the lower end of a tube 30, in the upper portion of which is arranged to slide a pin 31, the upper end of which pivotally engages the lower end of the lever 23. Arranged on said tube 30 and pin 31 and bearing against shoulders formed thereon is an expansive coil spring 32. Lugs 33 and 34 are formed integral with one of the side walls of the housing 3 beneath the pin 17, which lugs form stops to limit the swing of the lever 23; formed integral with one of the side walls of the housing 3 is a lug 35 which forms a stop to limit the movement in one direction



of the link 28. Connected to the lower portion of the housing 3 and leading from the chamber 4 therein is an outlet pipe 36.

The automatic operation of the valve is as follows:—Assuming that the valve 9 is closed the various parts of the device are at rest and in the positions seen in Fig. 2, water from the supply pipe 7 passes through the perforated plate or spider 10 into the chamber within the tubular extension 6, and from thence the water passes through the passage way 13 into the chamber 2, it being understood that the regulating screw 14 is set so as to permit water to discharge through said passage way 13. The pressure of the water within chamber 2 acts upon diaphragm 5 and slowly moves the same toward the chamber 4 which action shifts the pin 17 toward the screw 20, thus compressing the spring 22, and at the same time causing the lug 18 to bear against one side of the lever 23, and as this movement continues said lever with its lower end bearing on the pin 31 is gradually moved into a vertical position, and as soon as the pivot point between the lower end of the said lever and pin 31 passes the center, the power stored in the coil spring 32 will instantly act to swing the lower portion of the lever 23 over against the stop lug 34, and as this movement takes place the lug 26 on the upper end of said lever will bear against the corresponding side of the link 27, thus moving the said link and link 28 into approximately vertical alinement, which action elevates and unseats the valve 9. The pivot point between the toggle links 27 and 28 during this action moves slightly past the center or until the link 28 rests against the stop lug 35 and thus the valve 9 is held in an unseated position, and the water from the supply pipe is now free to pass downward through the conical opening 8 into the chamber 4, whence it discharges through the outlet pipe 36. As soon as valve 9 is unseated the pressure in the chamber 2 is relieved and the water therein is forced upward through the passage way 13, owing to the return of the diaphragm 5 to its normal position, which action is brought about by the expansion of the spring 22, and as this movement takes place the lug 19, carried by pin 17, will engage against the corresponding side of the lever 23, and said lever will be gradually moved into a vertical position, and as the pivot point between said lever and pin 31 passes the center, the power stored in the spring 32 will act to throw said lever into the position shown in Fig. 2; and as this movement takes place the lug 25 will bear against the corresponding side of link 27, thus shifting the link, and in turn moving the pivot point between the links 27 and 28 past the center and as a result the power stored in spring 12 will act to reseat and close valve 9.

During the time the valve is elevated the

water discharge from the chamber 2 passes through the upper end of the passage way 13 and through the aperture 15 in which passage way and aperture are located the regulating valves 14 and 16; and thus by means of said regulating valves the time required for the filling and emptying of the chamber 2 may be accurately regulated, and in a like manner the period of time between the intermittent flushing actions may be regulated.

In a modified form of the device seen in Fig. 4 the toggle links 27 and 28 are dispensed with and a trigger 37 is pivotally carried by the upper end of the lever 23; and which trigger is adapted to engage pin 38 carried by the valve 9.

A device of my construction is simple, inexpensive, and can be advantageously employed in connection with any apparatus wherein an automatic and intermittent discharge of fluid is desired.

I claim:—

1. An intermittent flushing valve, comprising a housing adapted to be located in a fluid supply pipe, a normally closed spring held valve for controlling the passage of fluid through the housing, means whereby the valve is elevated to open the passage way through the housing, and a spring pressed diaphragm in position to be actuated by the pressure of the fluid in the supply pipe and adapted to actuate the valve opening means.

2. An intermittent flushing valve comprising a housing adapted to be located in a supply pipe in which housing is formed a pair of chambers, one of said chambers being in connection with the inlet portion of the pipe in which the valve is located, a diaphragm arranged between the chambers in the housing, a valve for controlling the passage of liquid through the valve housing, means within the valve housing for opening and closing the valve, which means is actuated by the movement of the diaphragm, and means for regulating the flow of fluid from the supply pipe to the chamber behind the diaphragm.

3. An intermittent flushing valve comprising a housing adapted to be located in a supply pipe, in which housing is formed a pair of chambers, one of said chambers being in connection with the inlet portion of the pipe in which the valve is located, a diaphragm arranged between the chambers in the housing, a valve for controlling the passage of liquid through the valve housing, means within the valve housing for opening and closing the valve, which means is actuated by the movement of the diaphragm, means for regulating the flow of fluid from the supply pipe to the chamber behind the diaphragm, and means whereby the discharge of fluid from the chamber behind the diaphragm is regulated.

4. An intermittent flushing valve compris-



ing a housing adapted to be connected to a fluid supply pipe in which housing is formed a pair of chambers, a diaphragm forming a partition between the said chambers, a spring  
5 held pin connected to the diaphragm, a spring held valve normally closing the main passage way through the valve housing, spring held means within the valve housing for opening and closing the valve, and which  
10 last mentioned means is actuated by the pin carried by the diaphragm, there being a passage way leading from the inlet end of the supply pipe to the chamber behind the diaphragm, and means whereby the area of the  
15 opening through said passage way is varied.

5. An intermittent flushing valve, comprising a housing adapted to be connected to a fluid supply pipe in which housing is formed  
20 a pair of chambers, a diaphragm forming a partition between said chambers, a spring

held pin connected to the diaphragm, a spring held valve normally closing the main passage way through the valve housing, spring held means within the valve housing for opening and closing the valve, and 25 which last mentioned means is actuated by the pin and carried by the diaphragm, there being a passage way leading from the inlet end of the supply pipe to the chamber behind the diaphragm, means whereby the area 30 of the opening through said passage way is varied, and means whereby the discharge of fluid from the passage way is regulated.

In testimony whereof, I have signed my name to this specification, in presence of two 35 subscribing witnesses.

HENRY A. KIESELHORST.

Witnesses:

M. P. SMITH,  
E. L. WALLACE.