No. 668,837. Patented Feb. 26, 1901.

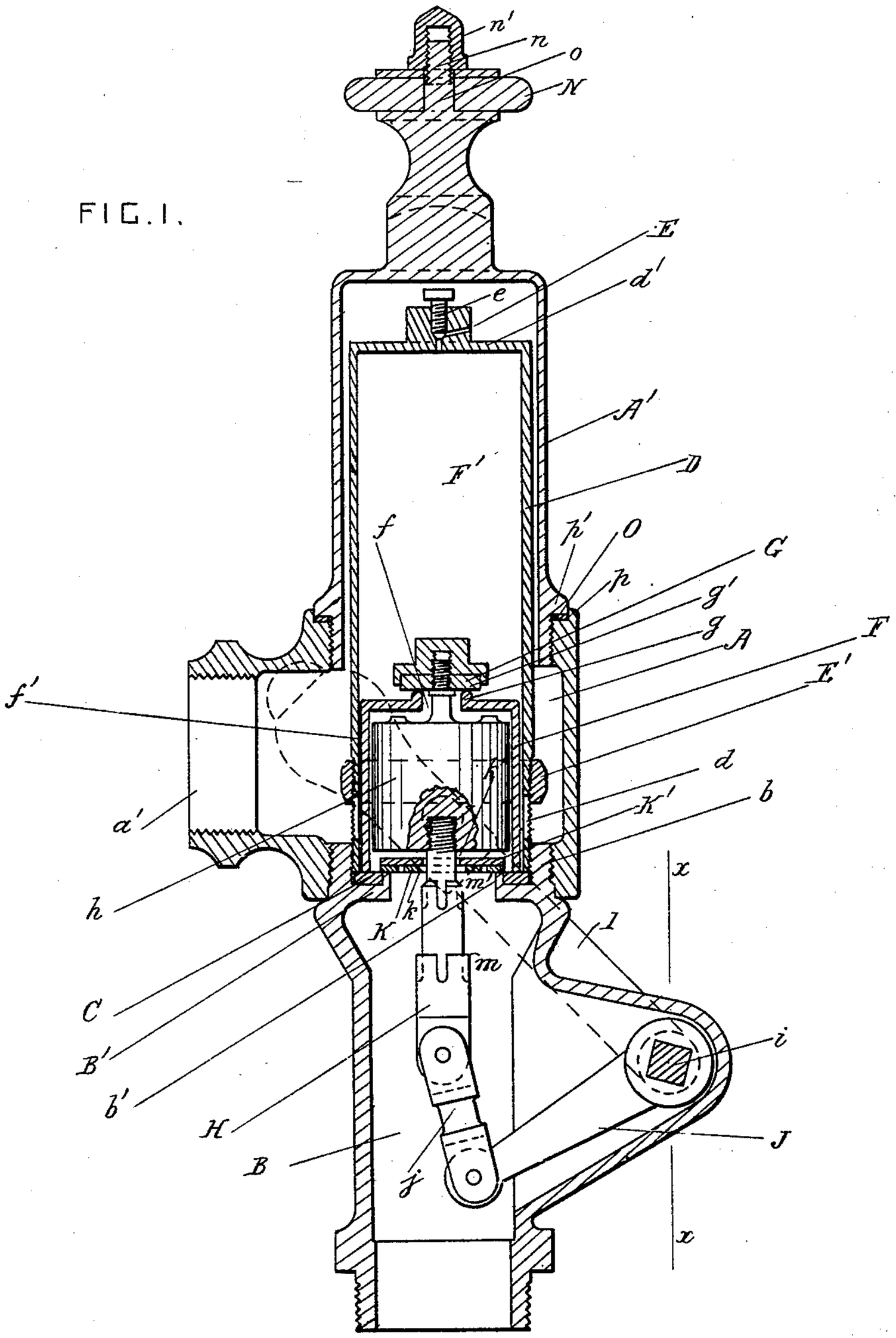
# D. T. KENNEY.

## VALVE FOR WATER CLOSETS.

(Application filed Apr. 24, 1900.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1.




Witnesses
Wm. H. Bates
James M Spear

Inventor
David T. Kenney
By Attorney Herbert W. Jenner.

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FIG. 2.

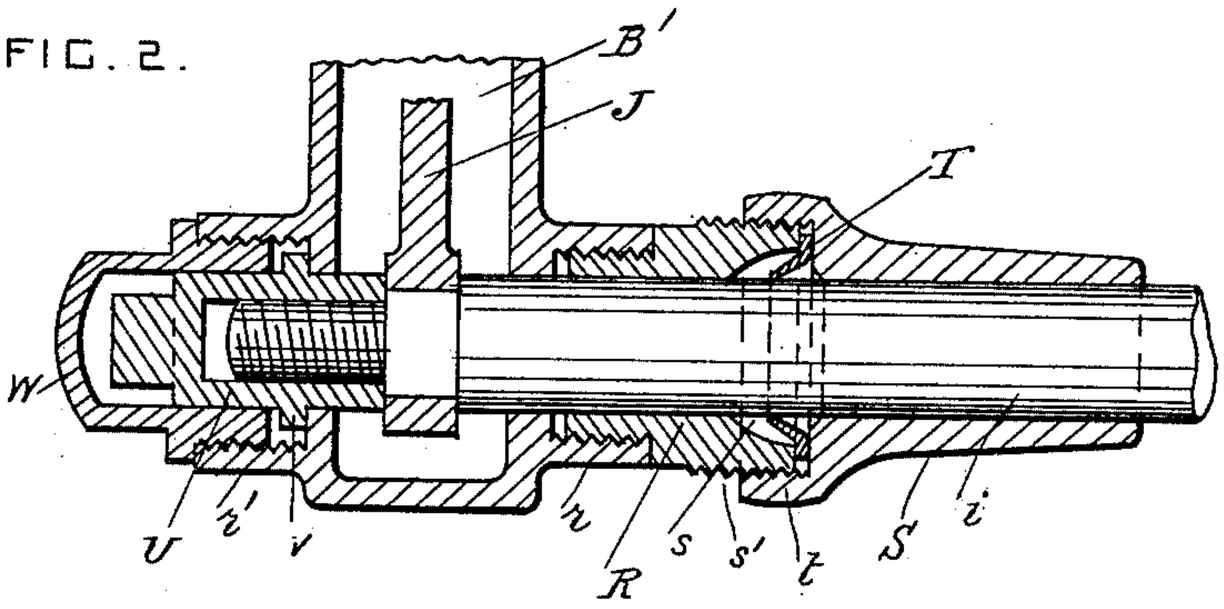



FIG. 3.

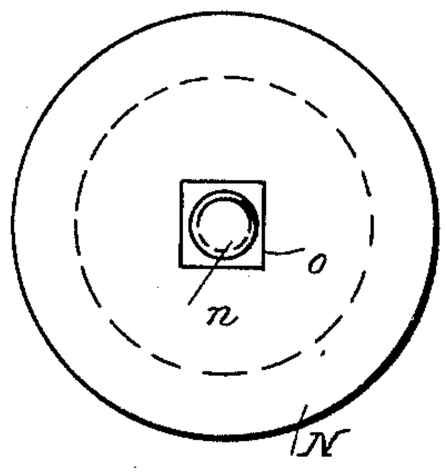
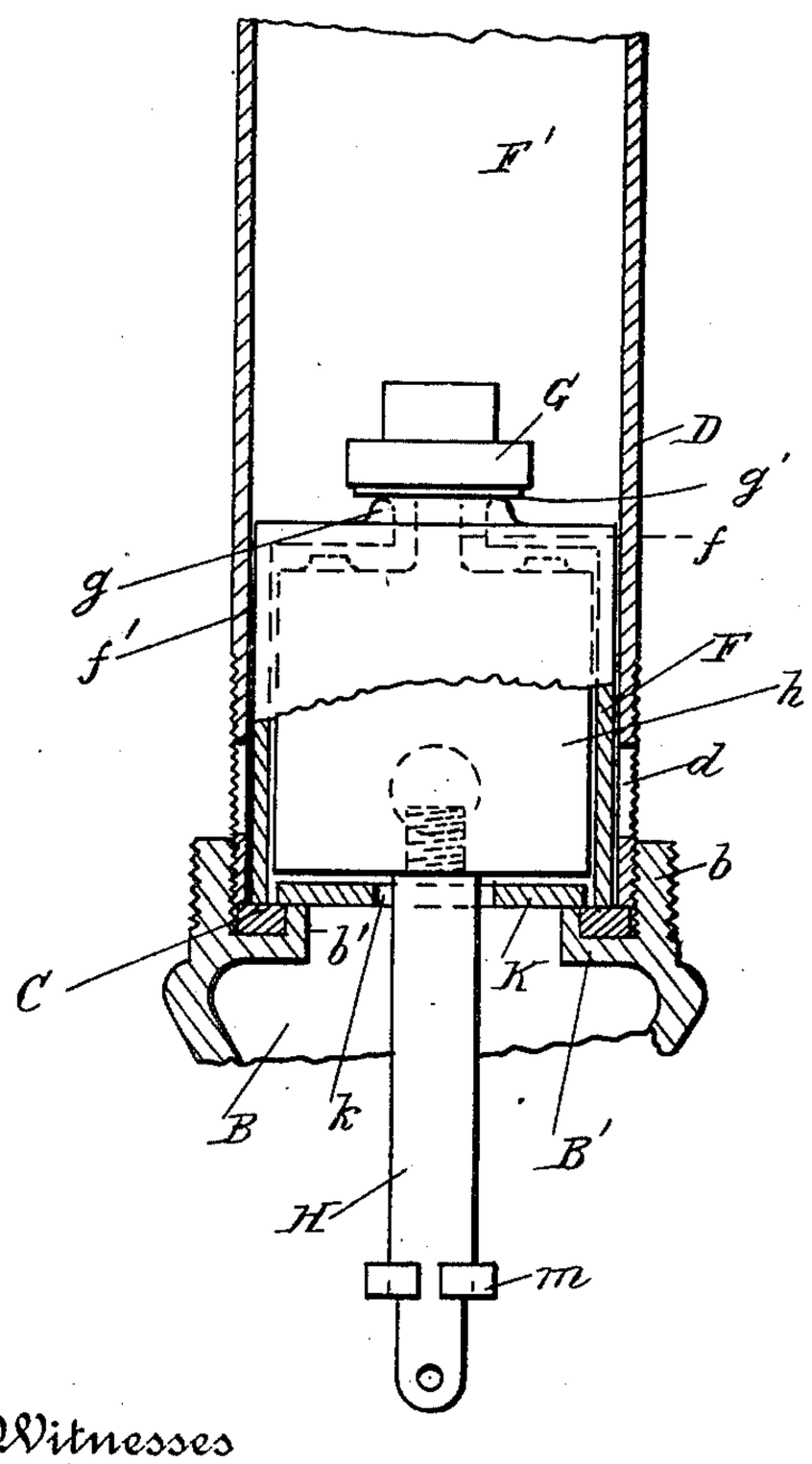



FIG. 4




Witnesses
Wm. H. Bates
James M. Shear

Inventor
David T. Kenney
By Attorney Herbert W. Jenner.

# UNITED STATES PATENT OFFICE.

DAVID T. KENNEY, OF NORTH PLAINFIELD, NEW JERSEY.

## VALVE FOR WATER-CLOSETS.

SPECIFICATION forming part of Letters Patent No. 668,837, dated February 26, 1901.

Application filed April 24, 1900. Serial No. 14,119. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID T. KENNEY, a citizen of the United States, residing at North Plainfield, in the county of Somerset and State of New Jersey, have invented certain new and useful Improvements in Valves for Water-Closets; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to flushing-valves for water-closets; and it consists in the novel construction and combination of the parts hereinafter fully described and claimed.

In the drawings, Figure 1 is a vertical section through the flushing-valve. Fig. 2 is a longitudinal section through the packing-chamber, taken on the line *x x* in Fig. 1. Fig. 3 is a detail plan view of the buffer. Fig. 4 is a vertical section showing a modification of the controller.

A is the inlet-chamber of the valve, provided with a branch *a'* for the water-inlet pipe.

A' is a cap which is screwed into the inlet-chamber and which forms the top part of it.

B is the outlet-chamber, provided with a nozzle *b*, which is screwed into the lower part of the inlet-chamber.

B' is a support for the main-valve seat at the top of the outlet-chamber, and C is the annular valve-seat of soft material, which rests on the said support inside the nozzle *b*. The support is provided with a lip *b'*, which projects upwardly inside the valve-seat. This lip prevents the valve-seat from being pressed into the outlet-opening, and it also forms a support for the controller, as hereinafter more fully described.

D is a cylindrical casing screwed into the nozzle *b* and holding the valve-seat in position. The casing is provided with one or more inlet holes or passages *d* and has a top *d'*, which closes its upper end. The casing D is arranged inside the inlet-chamber A and is provided with a small inlet-hole E at its top, which has a screw *e* for regulating the passage of water through it.

E' is a ring screwed on the lower part of the casing for regulating the passage of water through its inlet-holes *d*.

F is the main valve, which normally rests on the main-valve seat C and closes the outlet-passage through it.

G is the relief-valve, provided with a facing of soft material *g'*, which rests on a seat *g* at the top of the main valve F and controls the outlet-passage *f* from the chamber F' in the upper part of the casing D to the outlet-chamber B.

H is the stem for operating the main valve and the relief-valve. This stem is provided with a guide *h*, which slides freely in the main valve and preserves the alinement of the relief-valve. The weight of the guide is also serviceable in lowering the valves onto their seats, and it affords a means for raising the main valve when it bears against the top of it. The guide *h* does not obstruct the passage of water from the relief-valve through the interior of the main valve. A small inlet-passage *f'* is provided around the main valve, between it and the casing, in which it slides like a loose piston. This inlet-passage constantly connects the inlet *a'* with the chamber F' in the upper part of the casing above the main valve. The valve-stem H is operated by means of a lever I, which projects from the end of a spindle *i*, which passes laterally through the outlet-chamber.

J is an arm on the spindle *i* inside the outlet-chamber, and *j* is a connecting-rod pivoted to the outer end of the arm J and to the lower end of the stem H.

K is a controller which is slidable upon the valve-stem H and which is provided with a water-passage *k*. The water-passage *k* may be one or more holes, slots, or notches formed in the controller, which is, preferably, a flat disk, or it may be an annular passage between the controller and the stem on which it slides, or both holes and annular passage may be provided. The stem H is provided with a projection *m* for raising the controller, and the projection is grooved or otherwise constructed so that it does not act as a valve or close or obstruct the water-passage through the controller when the controller is resting on it.

K' is a second controller, which is slidable upon the stem H above the controller K. The controller K' also preferably consists of a flat plate, and it is provided with a water-passage *k'*, which is of smaller area than the passage *k* through the controller K. The stem H is

provided with a projection $m'$ for raising the controller K', and this projection is also arranged so that it will not obstruct the water-passage through the controller. The projection $m'$ is made so that it will pass through the central hole of the controller K and is preferably beveled, so that it will pass through freely.

The operation of the valve is as follows: When the stem is raised, the relief-valve opens first and relieves the pressure above the main valve, so that said main valve can easily be lifted from its seat and pushed up into the upper part of its casing. The controllers K' and K are raised one after the other as the valve-stem is pushed up, and the water flows from the inlet-chamber into the outlet-chamber when the main valve finally is raised. When the stem is let go, the valves descend by gravity. The relief-valve closes first. The controller K descends next onto its support and cuts off the main flow of water to a great extent and forms a water buffer under the valve, but permits sufficient water to pass to fill the bowl. The controller K' comes down next onto the controller K and still further cuts off the flow of water. The main valve closes last, and as the water flowing past the two controllers is a very small stream and as the main valve is retarded by the buffer of water between it and the controllers it comes down onto its seat very gently and silently. In this manner the valve can be used with very high-pressure water and will work noiselessly.

By making the controller seat itself in substantially the same plane as the main valve a very important advantage is gained. When the support for the controller is in the outlet-passage below the valve-seat, the controller is subjected to a heavy pressure and the full force of the rush of the water as soon as it enters the outlet-passage, and this causes it to drag down the valve-stem and everything connected to it until the controller is seated on its support. According to the present arrangement the controller is substantially free of the pressure of the water until it is close to the lip $b'$, which is its support, and the controller does not drag down the valve-stem to an objectionable extent.

A buffer N is secured to the upper part of the inlet-chamber, so that the seat or lid of the water-closet bowl may strike against it. The buffer N consists of a plate of elastic or soft material, such as india-rubber, and it is placed on a stem $n$ at the top of the inlet-chamber and is retained by a nut $n'$. In order to prevent the buffer from being removed by turning it by hand so as to unscrew the nut by frictional contact, the stem $n$ has a rectangular portion $o$, which engages with a rectangular hole in the buffer, so that the buffer cannot be revolved, and the nut has to be removed by proper means before the buffer can be taken off.

O is a washer of soft material, which is placed in a circular recess $p$ in the top of the inlet-chamber, and $p'$ is a collar on the cap, which bears against the said washer and fits the said recess, so that the recess is closed when the cap is screwed up, and a tight joint is assured without the washer of soft material being seen.

In order to keep the spindle $i$ water-tight in the outlet-chamber, bosses $r$ and $r'$ are formed on the opposite sides of the said chamber.

R is a bearing for the spindle, which is screwed into the boss $r$ and provided with a cup-shaped chamber $s$ in its projecting portion $s'$.

S is a bearing-sleeve for the spindle, having a screw-threaded socket $t$, which is screwed onto the portion $s'$, and T is a packing-leather arranged in the chamber $s$ around the spindle. The pressure of the water in the chamber $s$ presses the packing-leather against the spindle and forms a water-tight joint.

A thimble U is screwed on the end of the spindle and is placed in the boss $r'$. The thimble is provided with a collar $v$, which prevents the spindle from moving endwise, and W is a cap screwed into the boss $r'$ to close it and to form a bearing for the thimble to turn in.

In the modification shown in Fig. 4 a single controller K is used, the upper controller K' being omitted. This arrangement is intended for use when the water-pressure is not so high as to require two controllers. With extremely high pressures the number of controllers can be more than two, so that the water is cut off step by step as the controllers descend one after the other.

What I claim is—

1. The combination, with a chamber having a valve-seat and a support for the controller arranged in substantially the same plane; of a valve which normally rests on the said seat, a controller normally resting on the said support, and means for lowering the controller onto the said support before the valve is seated, substantially as set forth.

2. The combination, with an outlet-chamber having an upwardly-projecting lip and an upwardly-projecting nozzle, said nozzle being screw-threaded both externally and internally; of an inlet-chamber screwed onto the said nozzle, a valve-casing screwed into the said nozzle, a valve slidable in the said casing, and a controller which normally rests on the top of the said lip, substantially as set forth.

3. The combination, with a chamber having a valve-seat and a support for a controller; of a valve which normally rests on the said seat, two controllers arranged one above the other on the discharge side of the said valve, and means for lowering the said controllers onto their support one after the other before the said valve is seated, substantially as set forth.

4. The combination, with a chamber having a valve-seat and a support for a control-

ler; of a valve which normally rests on the said seat, a lower controller provided with a water-passage, an upper controller provided with a water-passage which is smaller than that of the lower controllor, said controllers being arranged on the discharge side of the said valve, and means for lowering first the lower controller and then the upper controller onto their support before the valve is seated, substantially as set forth.

5. The combination, with a chamber provided with a valve-seat, and a valve which normally rests on the said seat; of two controllers arranged on the discharge side of the valve one above the other and operating successively to diminish the flow of water through the valve-seat, said controllers being movable independent of each other and of the said valve, and means for lowering the controllers into an operative position one after the other before the valve is seated, substantially as set forth.

6. The combination, with a chamber having a valve-seat and an annular support for a controller arranged in substantially the same plane; of a valve which normally rests on the said seat, a stem for raising the valve, and a controller arranged on the discharge side of the valve and provided with an annular water-passage between it and the said stem, the said stem being provided with a projection which operates the said controller without closing the said annular water-passage, substantially as set forth.

7. The combination, with a chamber having a support for a valve-seat, and having also a nozzle and a lip which project upwardly from the said support; of a valve-seat carried by the said support between the said nozzle and lip in substantially the same plane as the said lip, a valve which normally rests on the said seat, a controller normally resting on the said lip, and means for lowering the controller onto the said lip before the valve is seated, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

DAVID T. KENNEY.

Witnesses:
A. E. KENNEY,
JULIUS J. STAHL.