

(No Model.)

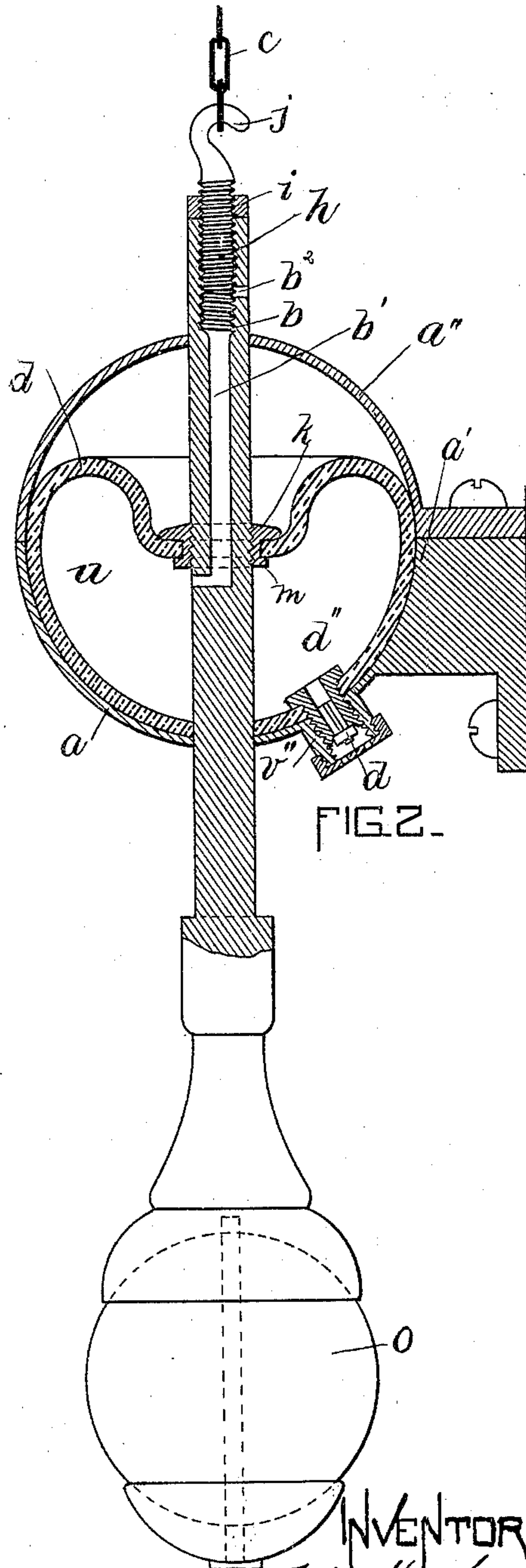
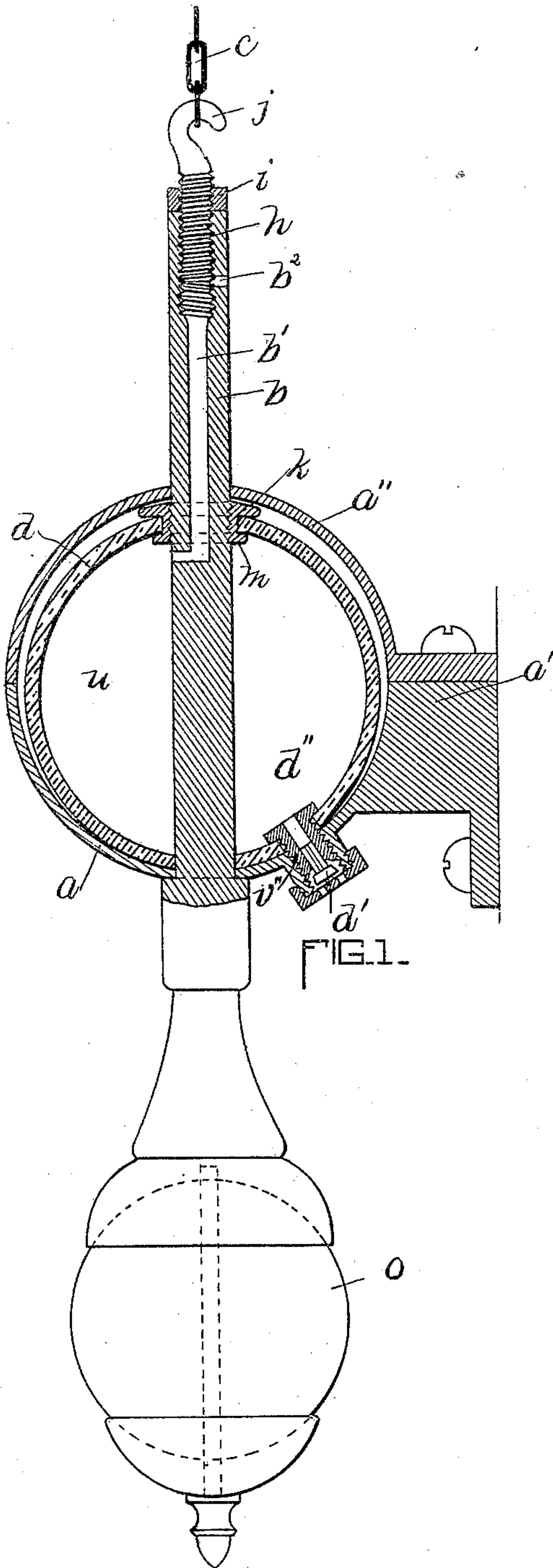
2 Sheets—Sheet 1.

T. McHUGH.

RETARDING DEVICE FOR WATER CLOSET VALVES.

No. 431,387.

Patented July 1, 1890.



WITNESSES
H. Brown
W. C. Ramsay.

INVENTOR
T. McHugh
By Wright, Brown & Co. Attys

(No Model.)

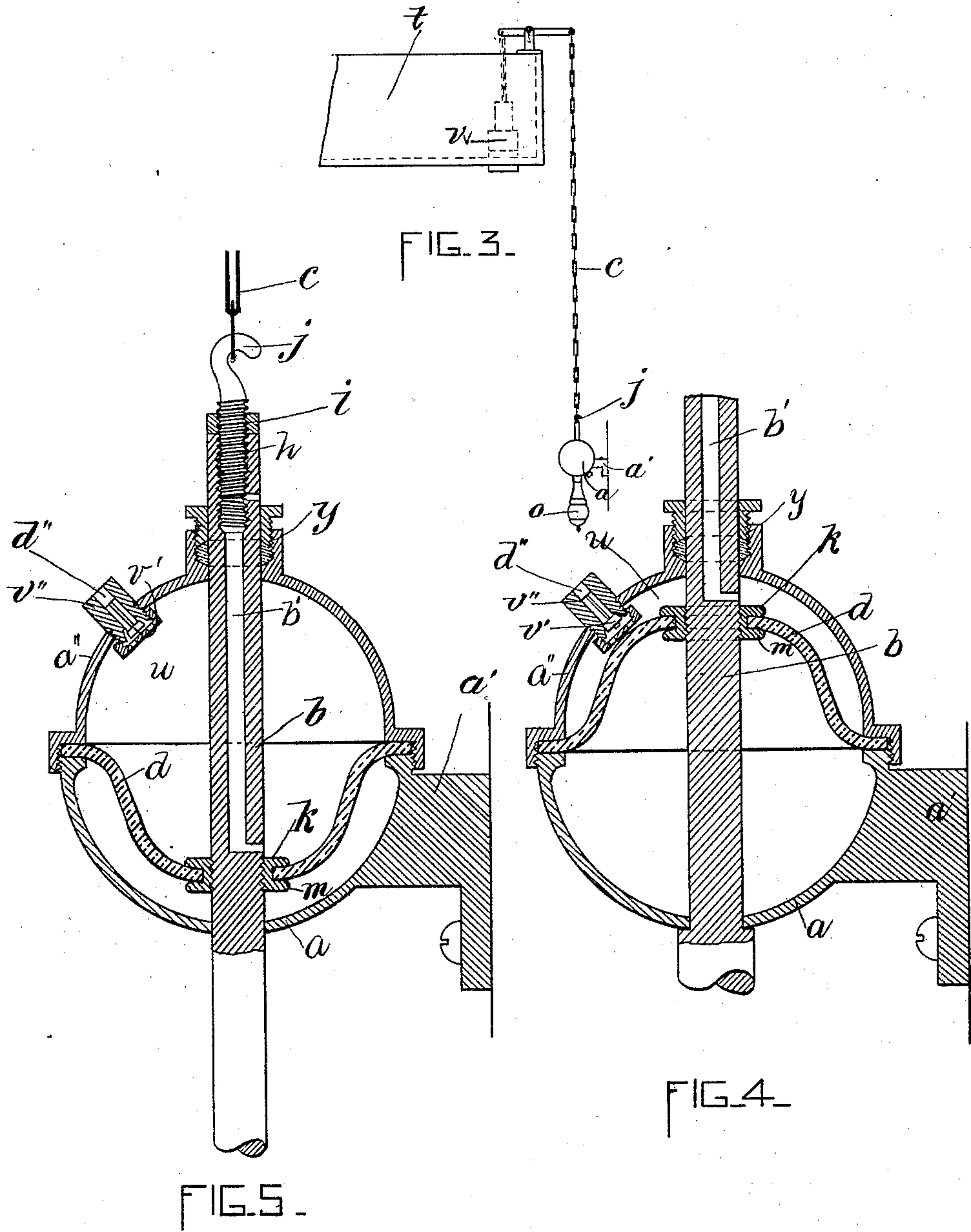
2 Sheets—Sheet 2.

T. Mc HUGH.

RETARDING DEVICE FOR WATER CLOSET VALVES.

No. 431,387.

Patented July 1, 1890.



WITNESSES.
H. Brown,
W. L. Ramsay.

INVENTOR
J. McHugh
By night & day
Attys

UNITED STATES PATENT OFFICE.

TIMOTHY MCHUGH, OF WAKEFIELD, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO THE SMITH & ANTHONY STOVE COMPANY, OF SAME PLACE.

RETARDING DEVICE FOR WATER-CLOSET VALVES.

SPECIFICATION forming part of Letters Patent No. 431,387, dated July 1, 1890.

Application filed June 17, 1889. Serial No. 314,530. (No model.)

To all whom it may concern:

Be it known that I, TIMOTHY MCHUGH, of Wakefield, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Retarding Devices for Water-Closet Valves, of which the following is a specification.

This invention relates to valves for water-closet supply-tanks, and has for its object to provide a simple, effective, and easily-applied attachment whereby the closing movement of such valves may be made as slow as may be desired, so that the wash may be of any desired duration.

The invention consists in a valve retarding or regulating apparatus comprising a holder adapted for attachment to a wall or other suitable support, a longitudinally-movable rod passing through and guided by said holder and connected with the valve by a chain or cord, so that a movement of said rod in one direction will raise the valve, an elastic diaphragm secured to the rod and supported by the holder and arranged to be displaced from its normal position by the movement of the rod which opens the valve, the displacement of the diaphragm causing a displacement of air, which must be replaced before the diaphragm can resume its normal position, and an air-passage having an adjusting device whereby the movement of air required to permit the return of the diaphragm to its normal position may be made as slow or rapid as may be desired, the closing movement of the valve corresponding to the movement of the diaphragm in resuming its normal position.

In the accompanying drawings, forming a part of this specification, Figures 1 and 2 represent vertical sections of my improved retarding device, Fig. 1 showing the diaphragm in its normal position, as when the valve is closed, while Fig. 2 shows the diaphragm displaced, as when the valve is open. Fig. 3 represents a side elevation of a supply-tank and my improved device connected with the valve thereof. Figs. 4 and 5 represent a modification.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a* represents a metallic holder, which is preferably cup-shaped or

hemispherical and attached to or formed on a bracket *a'*, which is adapted to be attached to a wall or other support.

b represents a rod, which passes through and is adapted to slide longitudinally in a guiding-orifice formed for it in the holder *a*. Said rod is provided at one end with a handle *o* and at its other end with a hook *j* or other means for engagement with a chain *c*, which connects the rod with a valve *v* in a supply-tank *t*, said valve and tank and the means for guiding the chain to the valve, so that a downward movement of the rod will raise the valve, being too well known to require detailed description and illustration here.

d represents a diaphragm, made of yielding rubber or other suitably-elastic material and secured to the rod *b*, preferably, by collars or shoulders *k m* on the rod, between which the margin of an orifice formed in the diaphragm is sprung to make an air-tight connection. The diaphragm is suitably supported by the holder *a*, so that movement of the rod *b* in the direction required to open the valve *v* will displace the diaphragm from its normal position, the valve being closed only when the diaphragm is in its normal position. An air-chamber *u* is provided at one side of the diaphragm, and said chamber communicates with the external air when the diaphragm is returning to its normal position and the valve *v* is closing through a passage *b'*, which is here shown as formed in the rod *b*. Said passage is provided with an adjusting device, here shown as a screw *h*, to regulate the rapidity of the flow of air through said passage. The diaphragm can only return to its normal position as fast as it is permitted by the flow of air through the passage *b'*; hence the closing movement of the valve may be made more or less rapid by adjusting the screw *h* to permit a more or less rapid flow of air through the passage.

In Figs. 1 and 2 the diaphragm is shown as made in the form of a hollow ball, the lower portion of which bears on the holder, the rod *b* being engaged with the upper portion of said ball. The air-chamber *u* is in this case the interior of the ball. When the rod *b* is moved to open the valve, as shown in Fig. 2, air is expelled from said air-chamber by the displacement of the diaphragm, and when the

rod *b* is released the diaphragm returns to place as fast as the inflow of air into the ball or air-chamber through the passage *b'* will permit. I prefer to provide the air-chamber with an air-tube *d''*, having a valve *d'*, which is arranged to open and permit a rapid escape of air from the chamber when the diaphragm is being displaced, but closes and prevents the admission of air through the tube *d''* when the diaphragm is returning to its normal position. Said tube *d''* also serves to clamp the ball which constitutes the diaphragm against the holder *a*, the tube having a flange at its inner end bearing on the inner surface of the ball, while its body is threaded and engaged with an internally-threaded nipple *v''* on the holder. The lower portion of the ball-shaped diaphragm is provided with an orifice, through which the rod *b* passes, and the margin of said orifice hugs the rod so closely as to prevent the passage of air around the rod, so that no stuffing-box is required around the rod. The holder *a* is shown as provided with a cover *a''*, which gives the holder a spherical shape. Said cover is not absolutely essential, however, as the device, as shown in Figs. 1 and 2, will operate as well without it. The screw *h*, which regulates the flow of air through the passage *b'*, is provided with a jam-nut *i*, which is turned against the end of the rod *b* after the screw has been adjusted and prevents accidental adjustment of the screw.

In Figs. 4 and 5 the diaphragm *d* is a disk, which is engaged at its center with the rod *b* and is clamped at its margin to the holder *a*. Said holder has a cap or cover *a''* arranged over the diaphragm, and the air-chamber *u* is between said cap or cover and the diaphragm. Air is therefore drawn into the air-chamber when the rod *b* is moved to open the valve and displace the diaphragm, and when the diaphragm is returning to place its movement is governed by the rapidity of the escape of air from the air-chamber through the passage *b'*. The cover *a''* may be provided with an inwardly-opening valve *v'* to permit the rapid entrance of air into the air-chamber when the diaphragm is being displaced, said valve being arranged to close when the diaphragm is returning to place, so that air can escape only through the passage *b'*. The cover should have a stuffing-box *y* to prevent the escape of air around the rod *b* when the diaphragm is returning to its normal position. It will be seen that by a slight movement of the screw *h* the rate of the closing movement of the valve can be varied, and that said movement may be made as fast or as slow as circumstances may require.

I claim—

1. The herein-described improved retarding device for a water-closet valve, comprising a fixed holder, an operating-rod passed through

said holder and connected to the water-closet valve, a diaphragm located in said holder and connected to said rod, and a passage-way in said rod connecting the external air with an inner chamber at one side of said diaphragm, substantially as set forth.

2. The herein-described improved retarding device for a water-closet valve, comprising a fixed holder, a diaphragm located in and secured to said holder, the operating-rod passed through said holder, having a passage-way formed therein and opening on one side of said diaphragm, which is connected to said rod, and the adjustable screw working in the upper end of said rod for controlling the flow of air through said passage, substantially as set forth.

3. The combination, substantially as set forth, of a holder adapted for attachment to a fixed support, a rod adapted to slide in said holder, an elastic diaphragm composed of a hollow ball secured at a given point to the rod (which passes through the ball) and at another point to the holder, the air-passage in the rod connecting the interior of the ball with the external air, and the adjusting device whereby the flow of air through said passage may be regulated.

4. The combination, substantially as set forth, of a holder adapted for attachment to a fixed support, a rod adapted to slide in said holder, an elastic diaphragm composed of a hollow ball secured at a given point to the rod (which passes through the ball) and at another point to the holder, the air-passage in the rod connecting the interior of the ball with the external air, the adjusting-screw engaged with the rod and adapted to regulate the flow of air through said passage, and the lock-nut *i* on said screw, whereby the latter may be secured at any position to which it may be adjusted.

5. The combination, substantially as set forth, of a fixed holder, a rod adapted to slide in said holder, an elastic diaphragm composed of a hollow ball secured at a given point to the rod which passes through said ball, the lower air-tube connecting said diaphragm to the holder, the valve located in said tube, the air-passage in the rod connecting the interior of the ball with the external air, and the adjusting-screw for regulating the flow of air through said passage, substantially as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 12th day of June, A. D. 1889.

TIMOTHY MCHUGH.

Witnesses:

C. F. BROWN,
A. D. HARRISON.