

No. 748,492.

PATENTED DEC. 29, 1903.

W. O. FOSS.

BALL COCK FOR FLUSH TANKS FOR WATER CLOSETS.

APPLICATION FILED MAY 2, 1903.

NO MODEL.

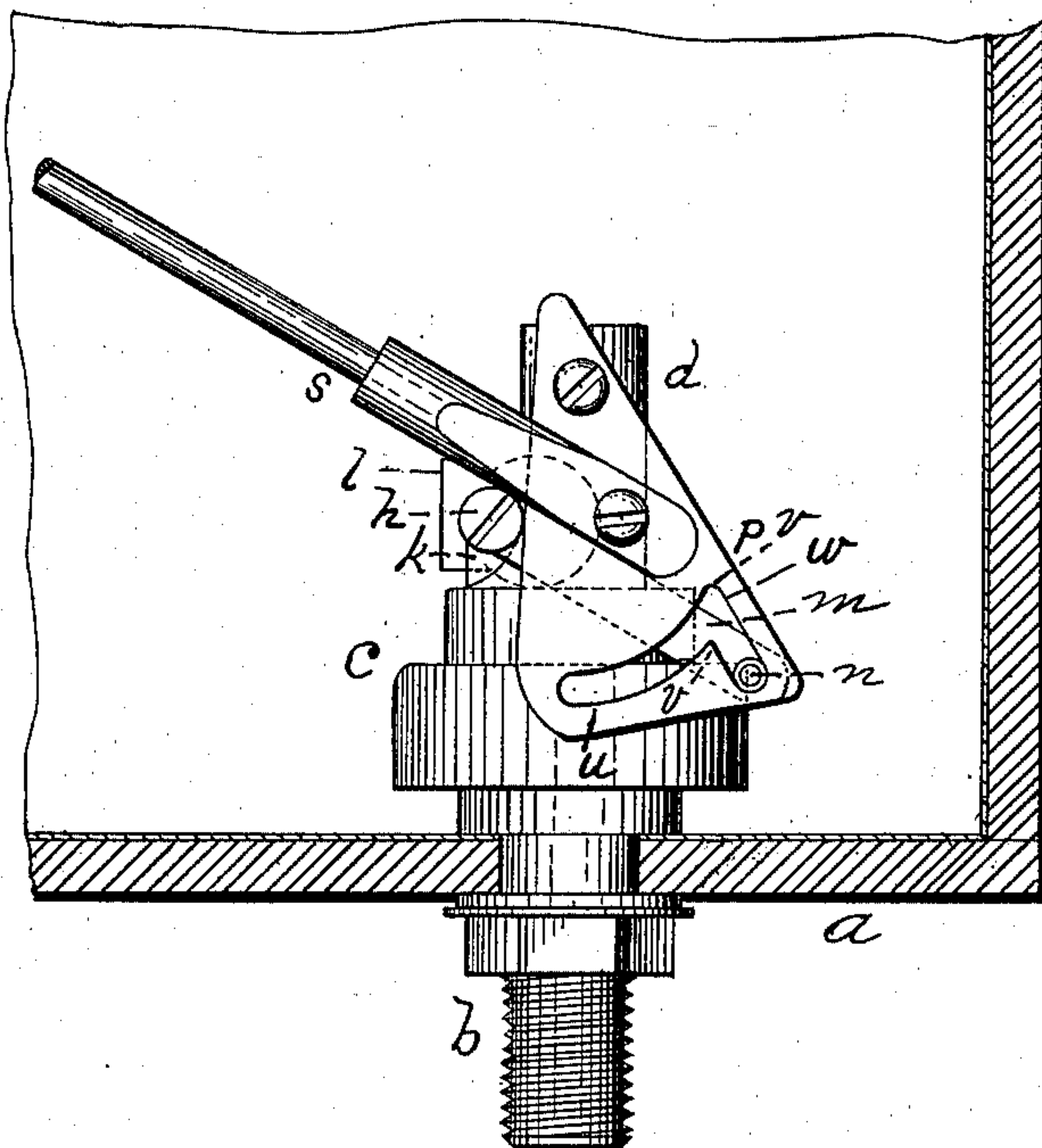


Fig. 1.

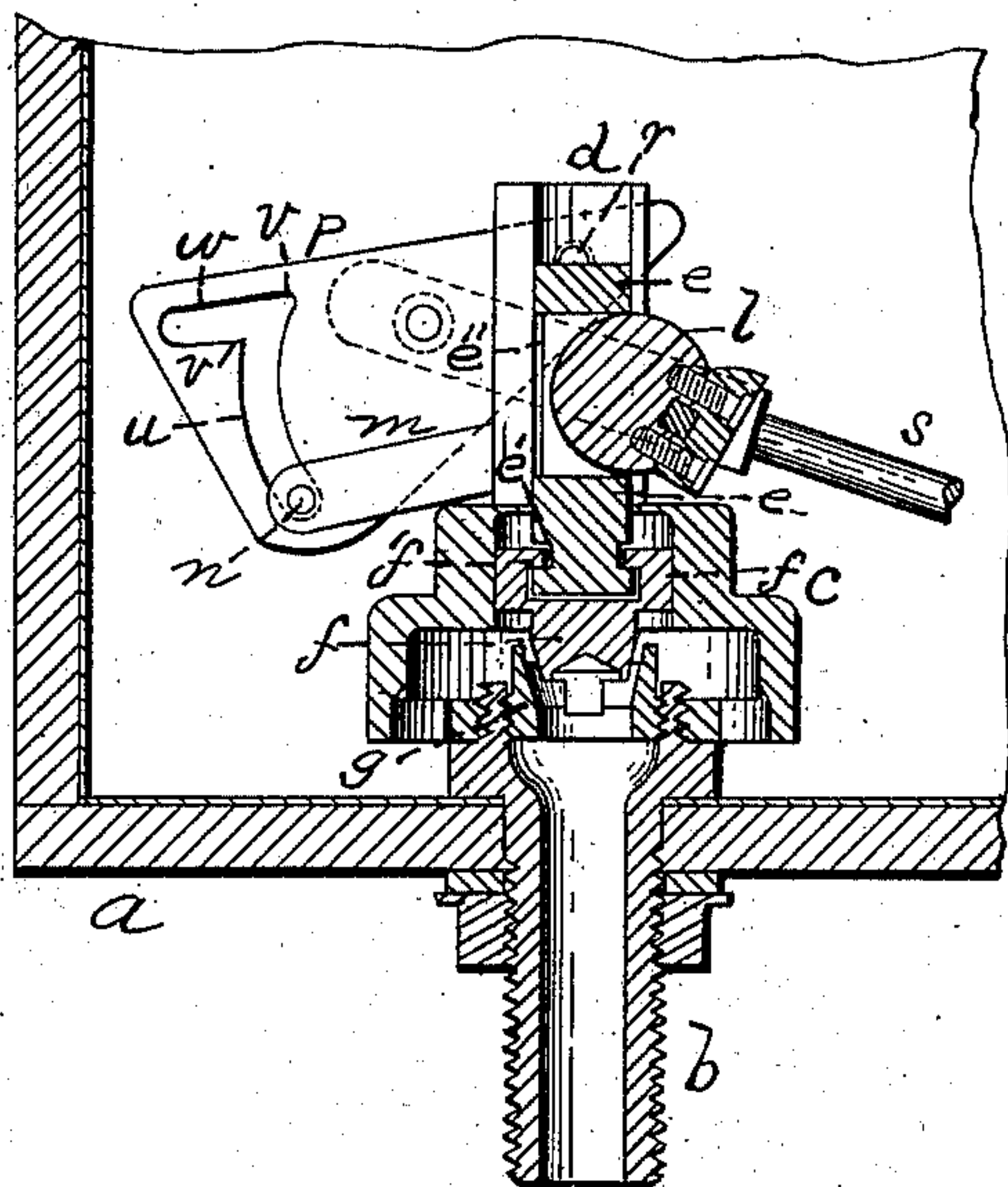


Fig. 2.

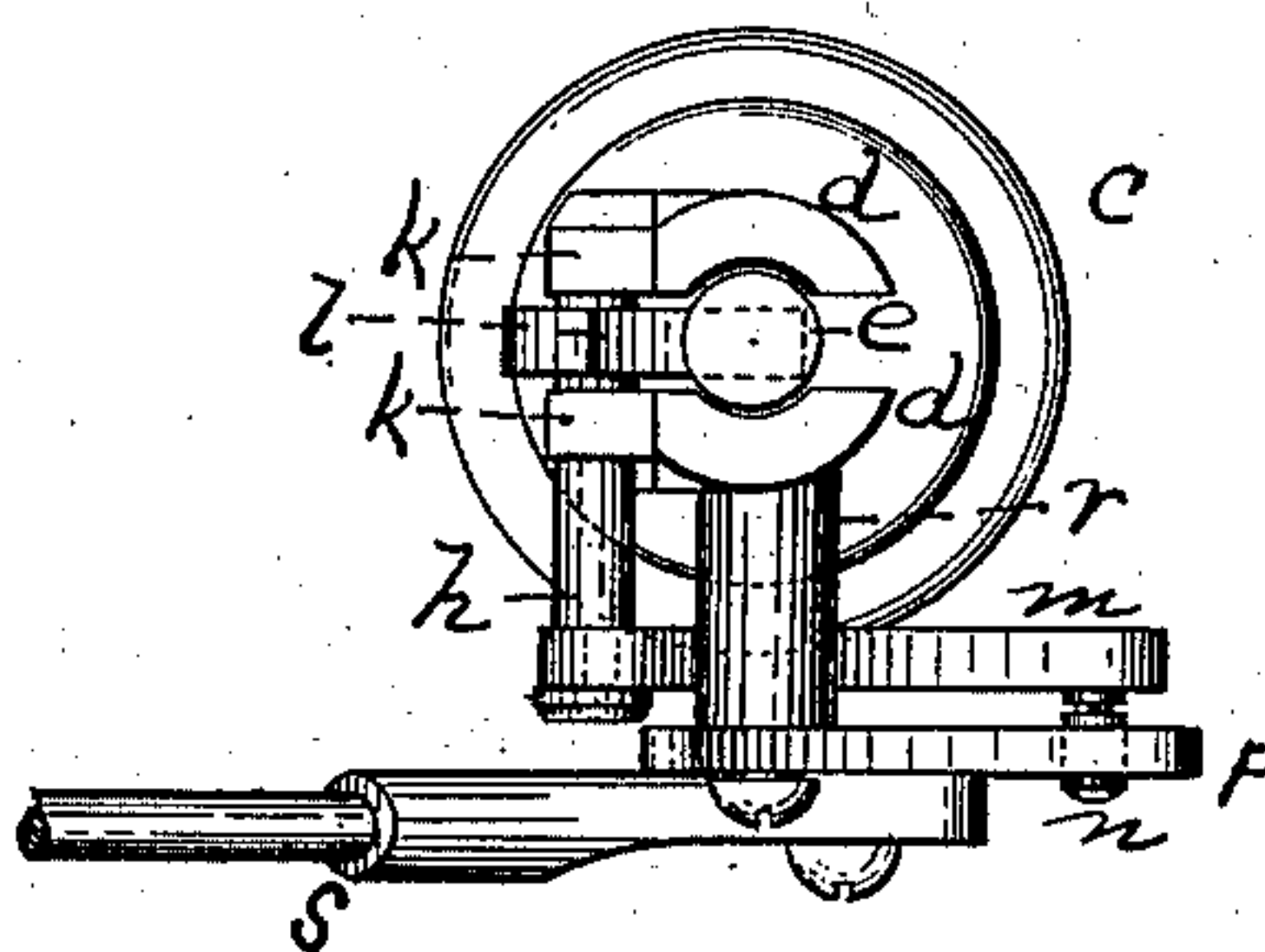


Fig. 3.

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# UNITED STATES PATENT OFFICE.

WALTER O. FOSS, OF BROCKTON, MASSACHUSETTS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO CHARLES H. TAPPAN AND WILLIAM C TAPPAN, OF ATTLEBORO, MASSACHUSETTS.

## BALL-COCK FOR FLUSH-TANKS FOR WATER-CLOSETS.

SPECIFICATION forming part of Letters Patent No. 748,492, dated December 29, 1903.

Application filed May 2, 1903. Serial No. 155,379. (No model.)

*To all whom it may concern:*

Be it known that I, WALTER O. FOSS, a citizen of the United States, residing in Brockton, in the county of Plymouth and State of Massachusetts, have invented a new and useful Improvement in Ball-Cocks for Flush-Tanks for Water-Closets, of which the following is a specification.

In operating ball-cocks for water-closet tanks as ordinarily constructed there is much complaint on account of the noise which accompanies or is occasioned by the shutting off of the water. This noise is produced by the gradual shutting off in the tank of the water until during the shutting-off process a small and gradually-diminishing space is provided for the flow of the water, thus necessitating a great and increasing velocity, with the result that the unpleasant noise referred to is created.

In this invention I so construct the mechanism that there is at a certain point in the operation a quick and sudden movement of the valve from a wide-open position to a closed one, thus effectually preventing a gradually-diminishing space for the flow and a correspondingly-accelerating speed thereof. Moreover, as the wear on the valve-seat occurs when the valve is first slightly opened such wear is practically done away with in my invention, and no washers or packing are required.

The nature of the invention is fully described below and illustrated in the accompanying drawings, in which—

Figure 1 represents a vertical section of a sufficient portion of a flush-tank to illustrate my invention in elevation applied thereto, the float-rod being shown as raised and the valve closed. Fig. 2 is a central vertical section of the same looking from the opposite direction, the float-rod being down and the valve open. Fig. 3 is a plan view of the device with the parts in the position indicated in Fig. 1.

Similar letters of reference indicate corresponding parts.

*a* represents a portion of an ordinary flush-tank. *b* is the inlet-pipe screwed into the case *c* and extending down therefrom through the bottom of the tank. Parallel posts or up-

rights *d* extend up from the case and constitute a barrel-guide for the lifting-stem *e* of the valve *f*, said case being provided with an opening at its upper end for the reception and play of said valve-stem. The stem engages with the valve by means of an annular groove *e'*, into which a ring *f'* extends, said ring being integral with the valve, and by this means the valve is lifted off its seat *g* and returned thereto by the lifting-stem.

A horizontal rod or cam-shaft *h* has its bearings in ears *k*, and fast on one end of this shaft is the cam *l*, which engages with the lifting-stem *e* by means of an opening *e''* therein. Fast on the other end of the cam-shaft is a lever *m*, provided with a pin *n*, which extends into a slot in the broad end of the plate *p*, which is substantially triangular in shape and whose small end is pivoted to a horizontal stud *r* on one of the posts *d*. Secured to this swinging plate *p* is one end of the float-rod *s*.

The plate *p* is provided with a slot which consists of two connecting parts *u* and *w*. The part *u* is curved and describes approximately an arc of a circle, of which the center would be at the stud *r* or at a point near the stud and between it and the shaft *h*. The part *w* makes a very sharp bend from the part *u*, leaving a sharp and somewhat pointed corner *v* for the pin *n* to round as it travels from the part *u* to the part *w*. The device being in the position indicated in Figs. 1 and 3—that is, with the float-rod *s* raised and the valve *f* closed—when the rod *s* is pulled down the plate *p* is swung up, and the pin *n* passes from the slot *w* into the slot *u*, lifting the valve-stem and valve. When the float-rod is released, as the surface of the water rises the pin *n* travels along the curved slot *u* until it reaches the sharp corner *v*. At this point the pin drops quickly into and to the end of the slot *w*, with the effect of quickly swinging down the outer end of the lever *m* and at the same time rotating the cam *l* and quickly closing the valve *f*. This quick and sudden closing of the valve and shutting off of the water prevents any noise, such as is created by a slow closing of the valve, producing accelerating velocity to the water in a gradually-diminishing space, and also pre-



vents wear on the valve-seat, as mentioned above.

The above-described invention can be applied, of course, to any kind of flush-tank—  
5 such as, for example, a flush-tank for hot-water boilers—without departing from the invention.

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

1. In a ball-cock for flush-tanks of the character described, a case; a valve and valve-stem adapted to move therein; a cam mounted on the case and in engagement with the  
15 valve-stem; a plate or segment pivotally connected with the case and provided with two slots connected together at a sharp bend or angle with relation to each other; a pin moving in said slots; mechanism connecting the  
20 cam with the pin; and a float-rod connected with said plate, substantially as set forth.

2. In a ball-cock for flush-tanks of the character described, a valve and valve-stem adapted to move therein; a plate or segment pivotally  
25 otally connected with the case and provided with two slots connected together at a sharp angle or bend with relation to each other; a float-rod connected with said plate; and mech-

anism intermediate of the plate and the valve-stem and in engagement with the slots whereby at a point in the rise of the float said engaging mechanism in passing around the bend from one slot to the other causes the valve to drop quickly to its seat, substantially as described. 30

3. In a ball-cock for flush-tanks of the character described, the case provided with the barrel-guide *d*; the valve-stem moving in said guide; the cam-shaft *h* mounted on the case and provided with the cam *l* in engagement  
40 with the valve-stem; the plate *p* pivotally supported by the case and provided with the slots *u* and *w* connecting with each other at the sharp bend or angle *v*; the lever *m* fast on the cam-shaft and provided with a pin *n*;  
45 which extends into the slots; and the float-rod extending from said plate, substantially as set forth.

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

WALTER O. FOSS.

Witnesses:

HENRY W. WILLIAMS,  
A. N. B. EMERY.