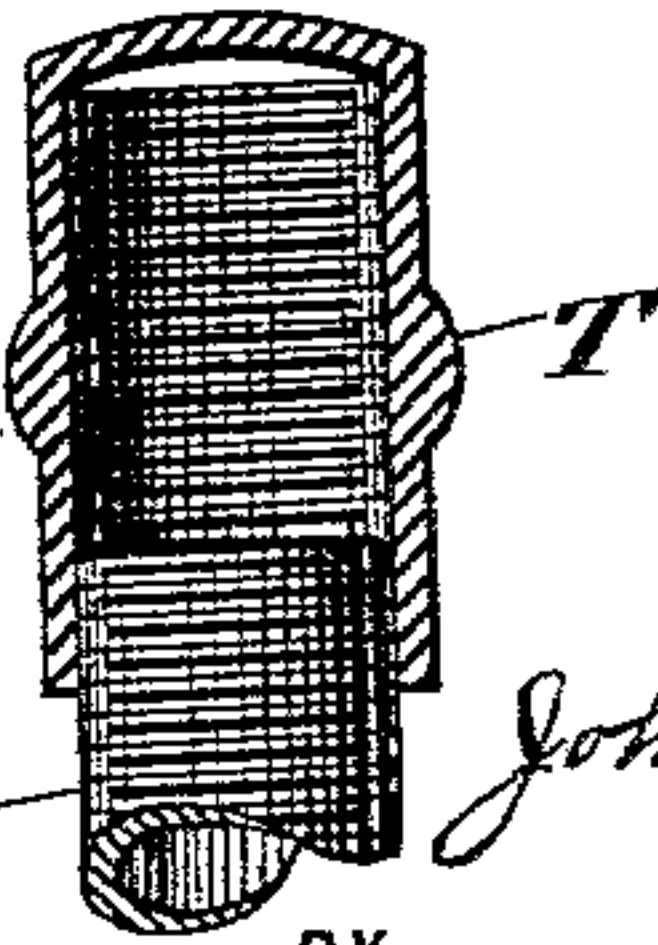
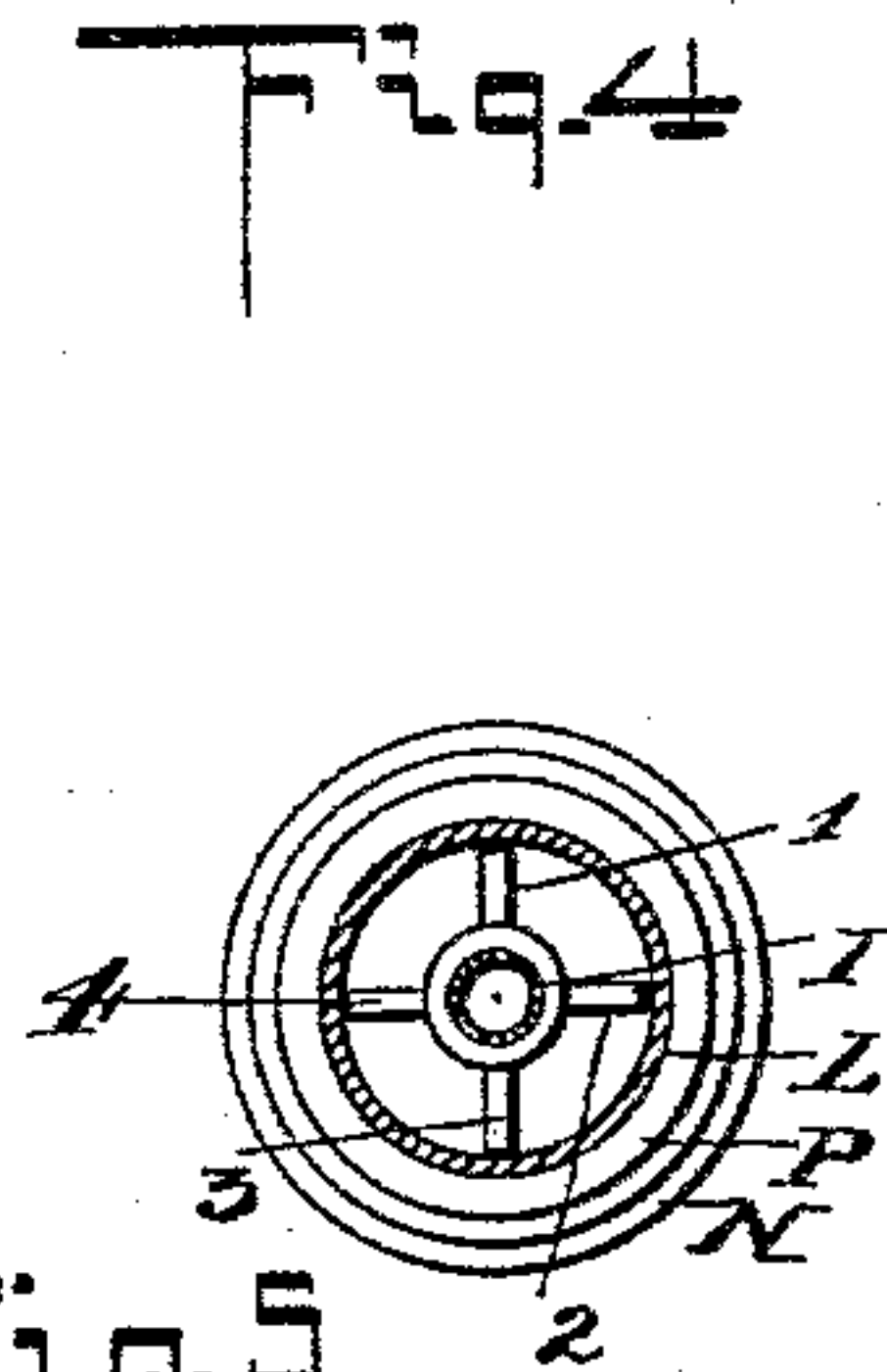
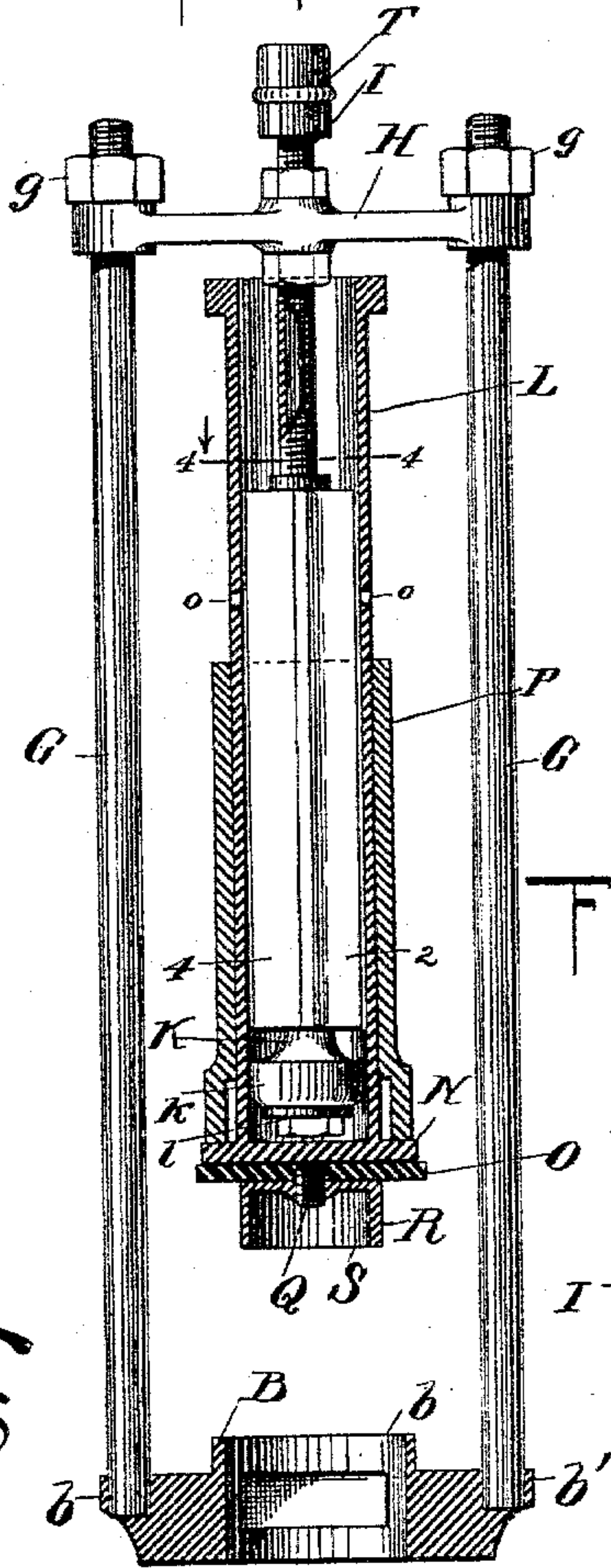
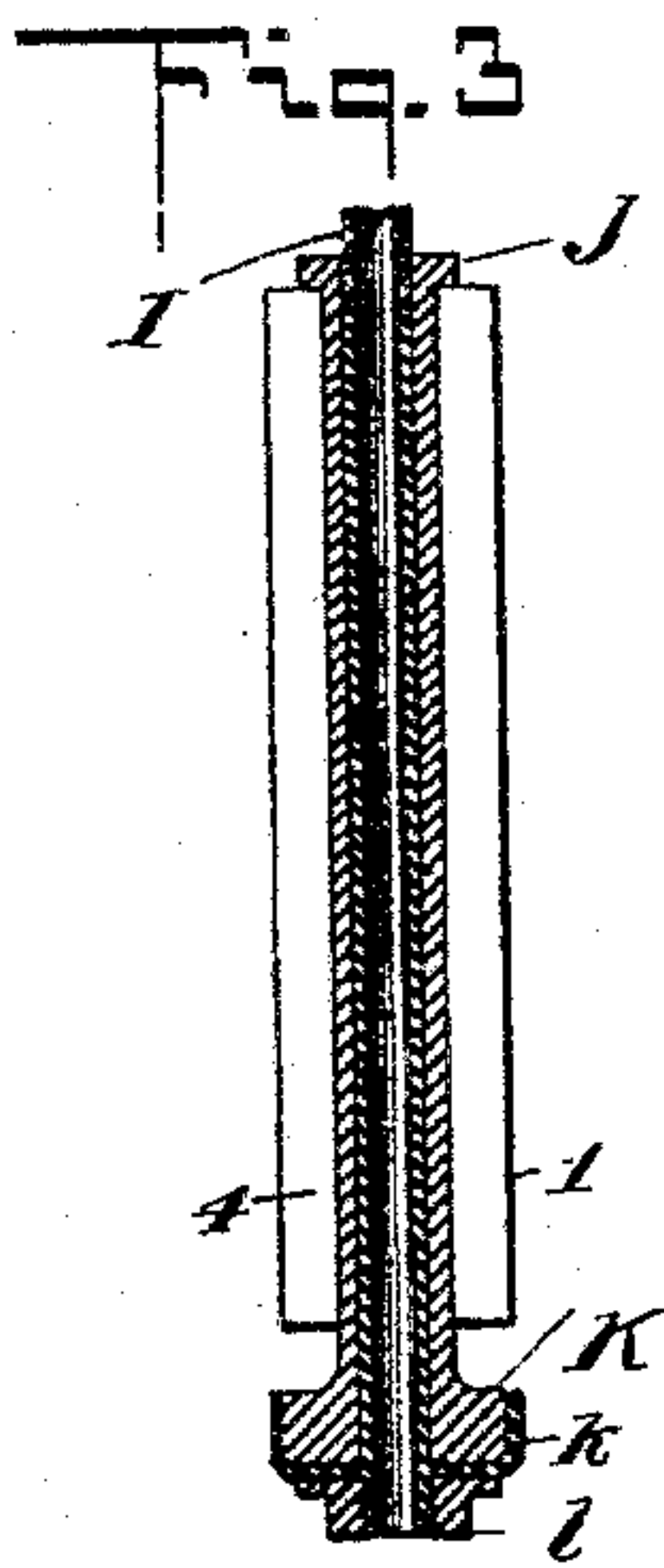
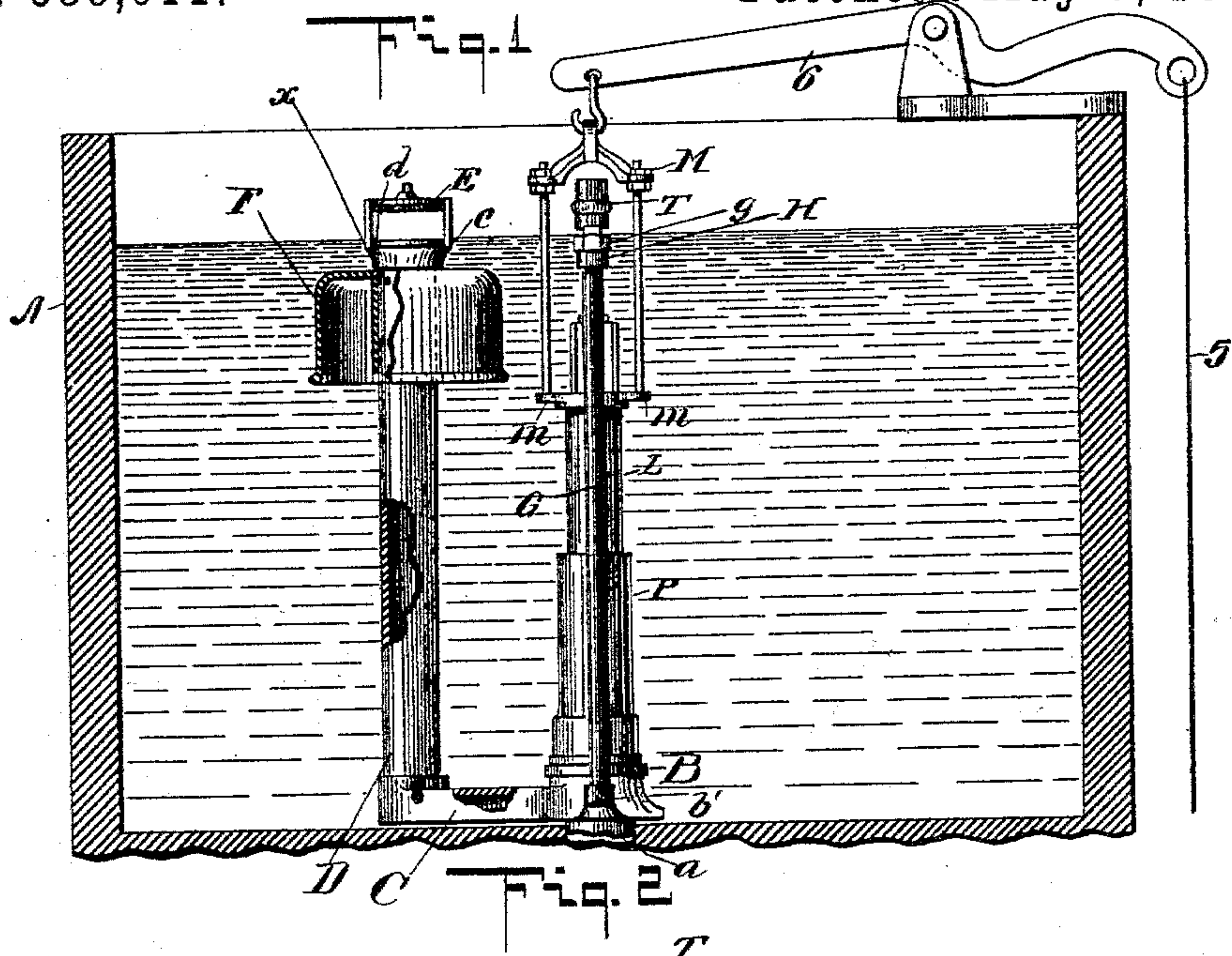


(No Model.)

J. N. SANGER.  
VALVE APPARATUS.

No. 559,611.

Patented May 5, 1896.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

JOHN N. SANGER, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE FRED ADEE & COMPANY, OF NEW YORK, N. Y.

## VALVE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 559,611, dated May 5, 1896.

Application filed September 28, 1895. Serial No. 563,949. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN N. SANGER, a resident of Brooklyn Hills, county of Queens, and State of New York, have invented certain new and useful Improvements in Valve Apparatus, of which the following is a specification.

My invention relates to valve apparatus, and has for its object to produce a slow-closing tank-valve and an efficient overflow apparatus with means for refilling the bowl.

My invention will be understood by reference to the accompanying drawings, in which—

Figure 1 is an elevation, partly broken away and in section, of an apparatus embodying my invention. Fig. 2 is an enlarged sectional view of a part thereof hereinafter described. Fig. 3 is a section of the valve and stem shown in Fig. 2. Fig. 4 is a section on line 4 4 of Fig. 2, showing the wing-guides for the valve-stem; and Fig. 5 is an enlarged sectional detail view of the air-inlet-regulating cap.

In the drawings, A represents a water-closet flush-tank adapted for use with my improved valve apparatus. This tank is apertured at *a* for the passage of the flushing-pipe of the closet.

B is a pipe communicating with the flushing-pipe and terminating in a valve-seat *b*. Branching from the pipe B is a pipe C, which is in communication with an upright stand-pipe D, apertured, as at *x*, with a small aperture or pin-hole. Mounted upon the stand-pipe D and embracing the same by its lower ring *e* is a valve E, which is adapted to rest upon the upper edge *d* of the stand-pipe. Sliding upon the stand-pipe D is a float F, which embraces the stand-pipe and is operated by the rise and fall of the water in the tank. This float contacts with the lower ring *e* of the valve E, so as to raise the valve to permit the water in the flush-tank to overflow into the stand-pipe D and thence by means of pipes C and B into the flushing-pipe. This overflow will take place only when the level of the water in the flush-tank rises above the upper end of the stand-pipe. The rising water carries with it the float F,

which raises the valve E to permit the water to enter the stand-pipe. When the water-level has fallen sufficiently, the float falling with it will reseal the valve E and the water in the pipes intervening between the tank and the bowl will run into the bowl to refill the same. The flow of this refill water will be slow, being regulated by the small amount of air entering the stand-pipe D through the aperture *x*. Rising from the pipe V and seated in lugs *b'* are upright rods G. These rods are connected at their upper ends by a yoke H, which is pierced at or about the middle thereof for the passage of a screw-threaded stem I. Suitable nuts *g* or other fastening devices serve to hold the yoke H upon the rods G.

Mounted upon the stem I (see Figs. 2, 3, and 4) is a sleeve J, carrying wing-guides 1 2 3 4 and terminating in a piston K, which is provided with any usual packing *k* and held by a suitable nut or other fastening device *l*. The stem, wing-guides, and piston just described constitute one member of my slow-closing valve. The other member consists of a sleeve L, which moves freely upon the wing-guides and is suspended by a yoke-hanger M, which engages lugs *m* on the movable sleeve and stands at an angle to the yoke H. The sleeve L is closed at the bottom by a plate N, which carries a disk, washer, or packing O, which, when the sleeve is in its lowermost position, rests upon the valve-seat *b* of the pipe B. The piston K fits closely in the movable sleeve L, which is provided with apertures *o* to allow ingress of water into the sleeve above the piston, in order to keep the packing thereof moist, so that the piston will fit tightly. The movable sleeve L is also surrounded by the usual loose cast-metal weight P, which serves to restore the sleeve to its position resting on the valve-seat *b*.

Projecting from the plate N of the sleeve is a screw Q, upon which is mounted a cup R. This cup is of less diameter than the valve-seat *b* and enters the said valve-seat, the interior of the cup forming a cushioning-chamber S for cushioning the valve. Carried upon the upper end of the stem *i* is an internally-



threaded cap T. The purpose of this cap is to regulate the ingress of air to the hollow stem I. This is accomplished as follows: It will be obvious that there is a slight leakage of air through the grooves of the screw-threads between the cap and the stem. It is also obvious that when the cap is screwed down a considerable distance little or no air will enter; but as the cap is screwed off the stem the number of screw-threads of the stem which enter the cup will be less, and consequently the air will have more opportunity to enter the stem. The amount of air entering the stem at any given time can be thus efficiently regulated by adjusting the position of the cap T.

The operation of my slow-closing valve is as follows: The stem and piston are stationary and the sleeve L movable. When it is desired to flush the water-closet, the cord 5 is pulled, which lifts the sleeve through the medium of lever 6, which is connected to the hanger M of the sleeve L. When the sleeve L has been raised, the cord 5 may be released. This raising may be to various heights, but is preferably to the height shown in Fig. 2. The water in the tank A will rush into the pipe B and thence to the flushing-pipe of the closet, and will continue so to run until the sleeve has been reseated upon the valve-seat b. This reseating will be accomplished by gravity; but it being remembered that there is a partial vacuum below the piston K the sleeve can descend only as air is admitted to this space. Air can come to this space only through the stem I, the ingress of air being regulated, as explained, by previously setting the cap T. As the air enters the space below the piston the sleeve L will descend. As the cup R enters the valve-seat the sleeve is brought to rest slowly and the closing off of

the water from the pipe B will be gradual instead of being closed off with a shock.

It will be obvious that the construction of the various parts may be varied without departing from the spirit of my invention.

What I claim, and desire to secure by Letters Patent, is—

1. The following instrumentalities in operative combination, to wit: the rods G G, the yoke H connecting the rods, the stem I, sleeve J and piston K suspended from the yoke, the sleeve L surrounding the stem, sleeve and piston, the yoke-hanger suspending the sleeve L, and the operating-lever 6, substantially as described and for the purposes set forth.

2. In a water-closet-flushing apparatus, the combination of the following instrumentalities, to wit: a tank, an overflow thereto, an outlet-pipe B for the tank communicating with the flushing-pipe, a valve-seat, a movable sleeve L, coöperating with the valve-seat to control the flow of the water therethrough, a stationary piston entered into the sleeve and having a hollow stem and wing-guides to guide it in its movement in the sleeve, the said stem being externally screw-threaded and having a screw-threaded cap carried thereupon for regulating the inlet of air to the stem; combined with means for supporting and operating the herein-mentioned operating parts comprising the rods G G, the yoke H connecting the rods and supporting the hollow-stem wing-guides and piston, the yoke-hanger suspending the sleeve L, and the operating-lever 6, substantially as described and for the purposes set forth.

JOHN N. SANGER.

Witnesses:

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