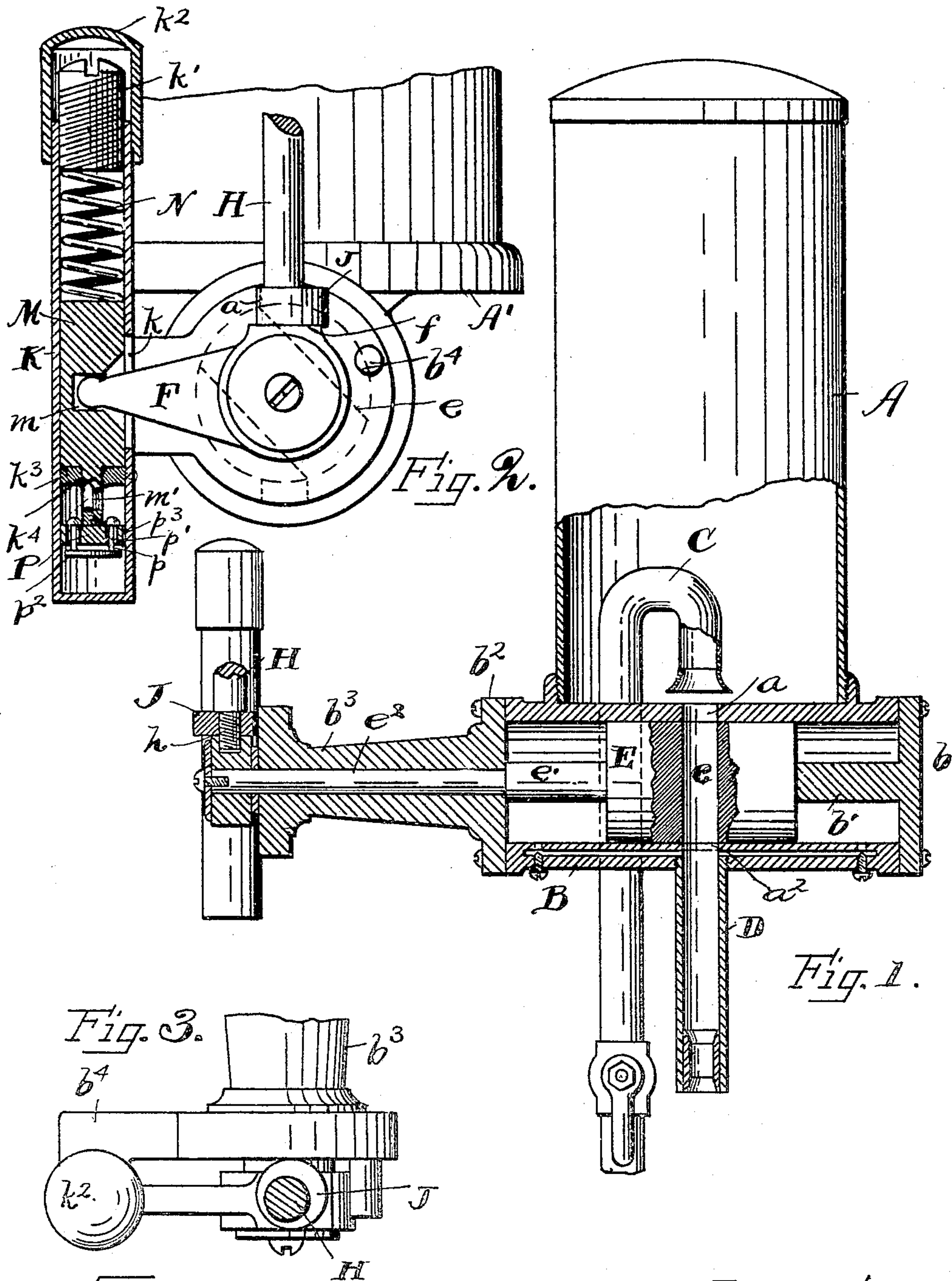


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P. F. KING.  
CLOSET FLUSHING APPARATUS.  
APPLICATION FILED APR. 18, 1904.



Witnesses  
M. H. Mc Mullin  
E. B. Gilchrist

Inventor  
Phineas F. King  
By Thurston & Bates  
his attorneys



# UNITED STATES PATENT OFFICE.

PHINEAS F. KING, OF CLEVELAND, OHIO.

## CLOSET-FLUSHING APPARATUS.

No. 801,018.

Specification of Letters Patent.

Patented Oct. 3, 1905.

Application filed April 18, 1904. Serial No. 203,607.

*To all whom it may concern:*

Be it known that I, PHINEAS F. KING, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Closet-Flushing Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to devices for controlling and operating the valve which governs the flow of water through the flush-pipe from the tank or other source of supply to the bowl of a water-closet.

The invention comprises a main valve for controlling the flow of water through the flush-pipe, a member connected with said valve and operating independently of the pressure of the water, but in such manner that when the valve is opened this member will be moved freely in one direction and will then have a tendency to slowly return to normal position, and thereby always give the desired time for the flushing operation.

The invention also includes mechanism in connection with the opening device for the main valve for varying the extent of manipulation thereof, and thus regulating the duration of time the valve is open.

Briefly summarized, the invention may be said to consist in the construction and combination of parts hereinafter more fully described.

Referring to the drawings, Figure 1 is a side elevation showing the main valve in vertical section. Fig. 2 is an end elevation showing the controlling mechanism in vertical section; and Fig. 3 is a top plan of a portion of the device located about the operating-handle, showing the same in cross-section.

In an apparatus arranged according to this invention a tank A is employed, having secured to its lower end a casting A', carrying a valve-casing B, which is cylindrical in form and is provided with a head  $b$ , having a stem  $b'$  extending within the same. At the other end the cylinder is provided with a head  $b^2$ , having a hollow extension  $b^3$ . The casting A' is further provided with a suitable opening for the entrance of a supply-pipe C, which extends up into the tank and is bent down with a flared mouthpiece. Directly below this mouthpiece is an opening  $a$  for the dis-

charge of the water from the tank. This opening  $a$  enters one side of the cylindrical valve-casing B, and diametrically opposite to this opening in said casing is another opening  $a^2$  for the discharge of the water into the flush-pipe D.

Within the cylindrical valve-casing is a valve E, having a port  $e$ , which extends from one side to the other and is arranged when in one position to register with the openings  $a$  and  $a^2$ , though somewhat larger in size, as shown, in order to permit of considerable movement thereof without effecting the closing of the opening. This valve E has a stem  $e'$ , which extends out and engages the head  $b^2$ , which, together with the stem  $b'$ , prevents any endwise movement of said valve. A reduced portion  $e^2$  of the stem  $e'$  extends through the opening in the extension  $b^3$  and projects out at the end thereof, where it is provided with an operating-arm F, rigidly secured thereto.

The operating-arm F has a flattened portion  $f$ , into which is secured a threaded shank  $h$  of an operating-handle H. Loosely around the shank  $h$  and between the handle and the flat portion  $f$  of the operating-arm F, is an eccentric J, arranged to engage a pin  $b^4$ , carried by the extension  $b^3$ . It will be seen that if the handle H were partially unscrewed from the operating-arm F the eccentric J might be turned upon the shank  $h$ , so as to regulate the extent of movement of the operating-handle H, and hence the throw of the arm F.

So far the description has been confined to the tank and the valve mechanism for controlling the discharge of water therefrom, and the operation of these parts is such that when the valve is turned, so that the opening there-through is closed to the tank, water from the main through the supply-pipe will partially fill the tank and compress the air in the upper part thereof. Should the valve be turned to bring the opening  $e$  therein to register with the openings  $a$  and  $a^2$ , then the pressure of the air in the tank will force the water through the flush-pipe D, and, with the ordinary siphon-bowl, furnish one, two, or more flushes, dependent upon the time this valve is held open. Means have been provided, therefore, for holding this valve open for a predetermined period of time and then closing it and for adjusting this means to change the amount



of time it is held open. This mechanism just mentioned for holding the valve open and then closing it is contained in a casing K, which is secured to the arm  $h^4$  on the extension  $h^3$ , before mentioned. This casing is cylindrical in form and is provided with an opening  $k$  for receiving the end of the operating-arm F. It is also provided with a screw-plug  $k'$  and a cap  $k^2$  for finishing off the upper end.

10 Within the casing is a plunger M, having an opening  $m$  therein for receiving the end of the operating-arm F in a manner such that when the plunger moves down it will rock the arm F upon its pivotal point, and when

15 the arm F is rocked upward by means of the handle H then the plunger will be raised.

The plunger M is given a downward tendency by means of a spring N, interposed between it and the plug  $k'$ . Below this plunger and within the casing K is an internal head  $k^3$ , which is provided with a central opening  $k^4$ , adapted to receive a stem  $m'$  of the plunger M. On the end of this stem is a piston P, which has suitable openings  $p$  for the passage of pins  $p'$ , secured in a valve-plate  $p^2$  below said piston P. Sufficient play is allowed about the pins  $p'$  to permit of a flush passing around the same, and the length thereof keeps the plate  $p^2$  away from the under

20 side of the piston P. A small vent  $p^3$  is provided in the periphery of the piston and furnishes communication between the chamber above and below the same. The lower part of the casing K is filled with a liquid, preferably glycerin, and the plunger is normally held down by the spring N against the internal head  $k^3$ .

Upon the operation of the handle H, or upon its movement to bring the eccentric J

40 against the stop  $h^4$ , the plunger will be raised against the tension of the spring N, and the glycerin will be passed from above the piston around the pins  $p'$  into the chamber below. This operation opens the valve F and permits

45 the water to flow from the tank through the flush-pipe D. Upon the release of the handle the spring N tends to force the plunger M downward; but upon the downward movement of the plunger, and consequently the piston

50 P, the valve-plate  $p^2$  moves up and closes the openings about the pins in the piston, thus preventing the flow of glycerin to the space above the piston at these points. The vent  $p^3$ , however, allows the glycerin to flow to

55 this space, but on account of its size limits the amount of such flow, and hence makes the movement of the piston very slow, permitting the valve F to remain open until the plunger nearly reaches the internal head  $k^3$ .

60 The tension upon the spring is primarily adjusted so that the plunger will move down and carry the piston through the glycerin at a predetermined rate of speed, or so as to occupy a certain number of seconds of time.

This adjustment is ordinarily sufficient for a single flush or for the minimum discharge from the tank for the minimum opening movement of the lever. Any further numbers of flushes or amount of discharge may be obtained by adjusting the eccentric, so as to increase the throw of the hand-lever H, and hence increase the height to which the plunger M is raised, the amount to which the plunger is raised necessarily determining its amount of travel, and hence the time that the main valve is held open.

One of the advantages of this invention is that the period of time the valve remains open is independent of the water-pressure. Hence the spring and eccentric being once adjusted to produce the most desirable results will continue to do so however the water conditions may vary.

Having described my invention, I claim—

1. In a flushing apparatus, the combination of a tank having for its floor a horizontal cylindrical valve-casing, a flushing-pipe connected with said valve-casing, there being holes in opposite walls of the casing leading to the tank and flushing-pipe respectively, with an oscillating cylindrical valve located in said casing and having a hole through it, a valve-stem secured to said valve and extending out of said casing, an arm secured to said valve-stem, a fluid dash-pot, a plunger whose movements in one direction are controlled by said dash-pot and which has a slot into which said arm projects, a spring acting to move said plunger in the direction which the dash-pot opposes, and an operating-arm secured to the valve-stem.

2. In a flushing apparatus, the combination of a tank having for its floor a horizontal cylindrical valve-casing, a flushing-pipe connected with said valve-casing, there being holes in opposite walls of the casing leading to the tank and flushing-pipe respectively, a supply-pipe entering said casing and having its end turned down over the hole in the bottom of said casing, a movable valve in the valve-casing having a hole through it adapted by the movement of the valve to be brought into registering relation with the holes in opposite walls of the casing, a head secured to one end of the valve-casing, a valve-stem secured to the valve and extending through said head, an operating-arm secured to said valve-stem, a dash-pot casing secured to said head, a dash-pot piston in said dash-pot, a plunger secured to said piston and movable in said dash-pot casing and having a slot which receives the operating-arm secured to the valve-stem, and a spring for moving said plunger.

3. The combination of a tank having for its floor a horizontal cylindrical valve-casing, a flushing-pipe connected with said valve-casing, there being holes in opposite walls of the

5 casing leading to the tank and flushing-pipe respectively, an oscillating cylindrical valve located in said casing and having a hole through it, a valve-stem secured to said valve and extended out of said casing, an arm secured to said valve-stem, a fluid dash-pot, its plunger which has a slot into which said arm projects, a spring acting to move said piston

down, and an operating-arm secured to said valve-stem.

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

PHINEAS F. KING.

Witnesses:

N. L. BRESNAU,

B. W. BROCKETT.