(No Model.)

P. HARVEY.

TANK OPERATING DEVICE FOR WATER CLOSETS.

No. 354,701. Patented Dec. 21, 1886.

Fig. 1.

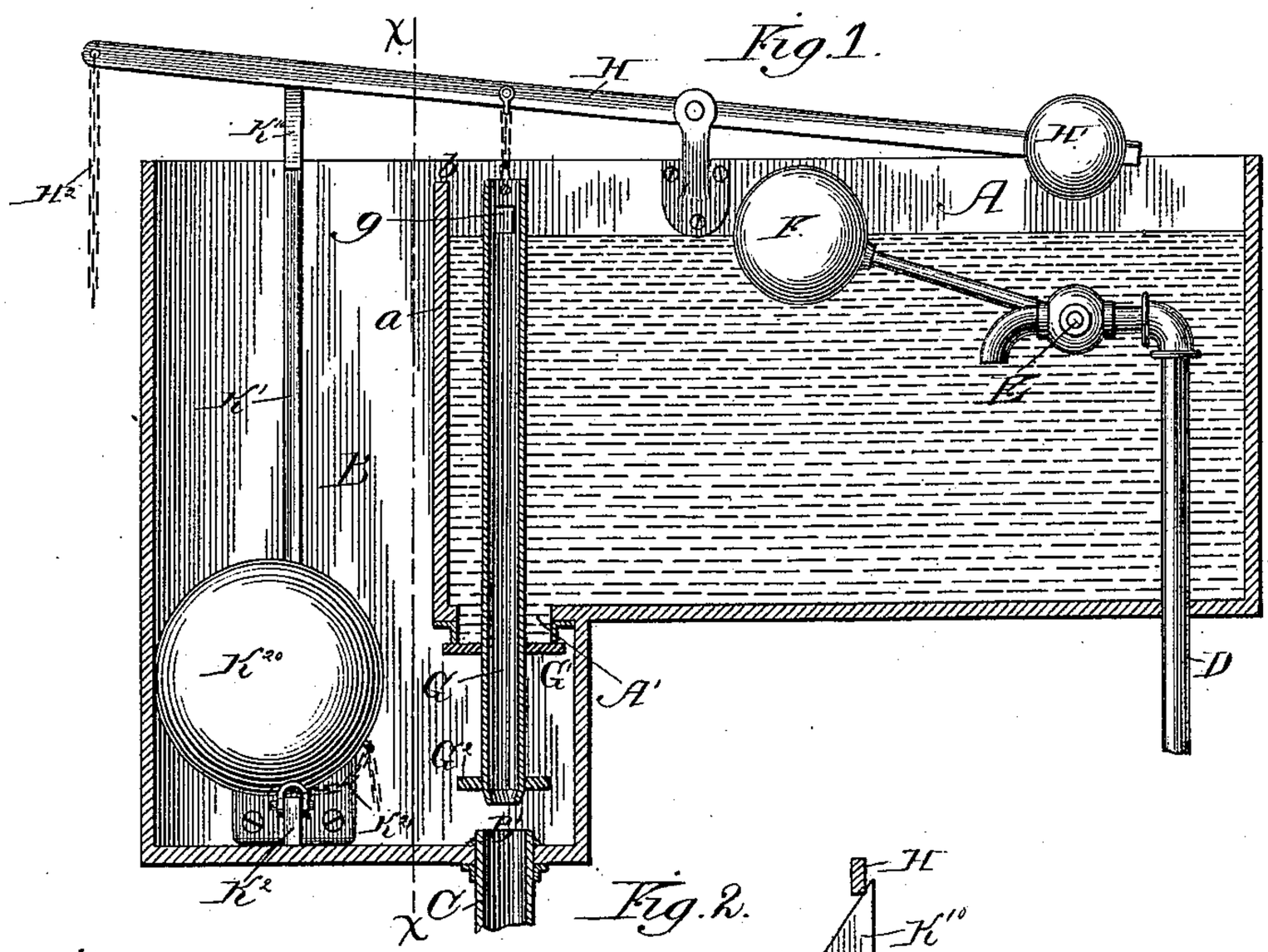


Fig. 2.

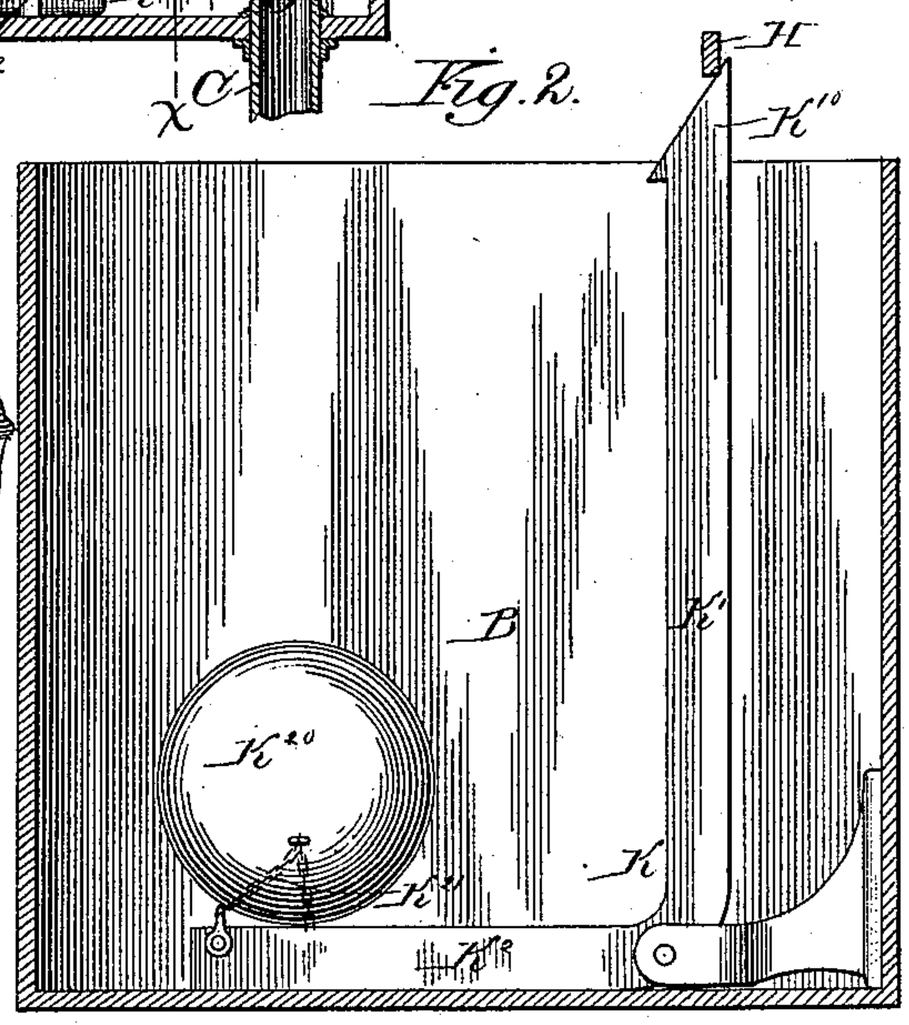


Fig. 4.

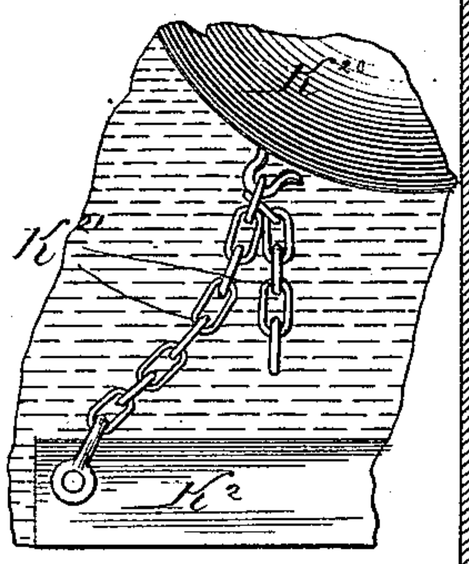
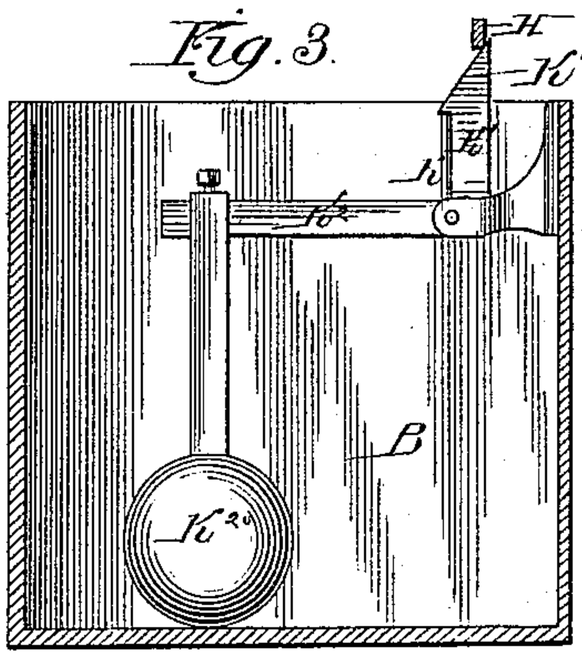


Fig. 3.



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UNITED STATES PATENT OFFICE.

PATRICK HARVEY, OF MILWAUKEE, WISCONSIN.

TANK-OPERATING DEVICE FOR WATER-CLOSETS.

SPECIFICATION forming part of Letters Patent No. 354,701, dated December 21, 1886.

Application filed May 21, 1886. Serial No. 202,849. (No model.)

To all whom it may concern:

Be it known that I, PATRICK HARVEY, a citizen of the United States, residing at Milwaukee, in the State of Wisconsin, have invented certain new and useful Improvements in Tank-Operating Devices for Water-Closets, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part thereof, wherein—

Figure 1 is a sectional front elevation of a tank service-box and valve-operating mechanism. Fig. 2 is a vertical section through *x x*, Fig. 1. Fig. 3 is a similar vertical section showing a modification of the means of adjusting the float in the service-box. Fig. 4 is a detail of the means of such adjustment shown in Figs. 1 and 2.

The purpose of this invention is to provide improved means for admitting and controlling the flow of water from a tank to the water-closet with which it is connected, to the end that the user may operate the mechanism to admit the water by an instantaneously completed movement and without the necessity of holding the valve or gate open in order to continue the flow of flushing-water, and that the mechanism shall be reversed and cause the flow to cease after a predetermined interval or amount of flow, and that when the valve has once been opened it shall remain open until the predetermined flow has actually occured, even though at the time there was no water in the tank and no flow occurred or could occur until water was subsequently supplied. The desirability of such action is most obvious in cases where the tank is located in the upper part of a building which is supplied at low pressure, so that at times the use of water on the lower floors leaves nothing to supply the tanks, which nevertheless will eventually receive the supply at intervals when the use on the lower floors is intermitted. In such case at the time the closet is used the tank may be empty and incapable of affording the flushing water to the bowl, and it is desirable that the user may be able to leave the mechanism in such condition that, without subsequent attention, whenever water comes to the tank the closet shall be properly flushed, and after proper flushing the water cut off automatically.

Similar letters indicate similar parts in all the figures.

A is the tank. B is the service-box. C is the pipe leading to the closet-bowl.

The tank is supplied in the usual manner through the pipe D, controlled by the valve E, operated by the float F in the usual familiar manner. The partition *a* between the tank and the service-box being lower than the walls of the said chamber allows for overflow at *b*. The service-box is supplied from the tank through the large aperture A′, and the service-box communication with the closet through the aperture B′, leading into the pipe C, said aperture being much smaller than A′. Both apertures A′ and B′ are controlled by valves G′ and G^2 on the hollow stem G, the valve G′ seating below the aperture A′, and the valve G^2 seating above the aperture B′, the former, therefore, moving upward and the latter moving downward to seat. The movement, therefore, which opens one valve closes the other, so that never are both closed at once, though both may be open at once. Toward the upper end of the hollow stem G it has the aperture *g*, by which the water may overflow from the tank A directly through the stem G into the pipe C, and then to the closet-bowl, independently of the valves G′ and G^2. The valve-stem G is connected at the upper end to the lever H, which is pivoted on the tank A, and has at one end the weight H′, and is connected at the other end to the pull-cord H^2.

K is a bell-crank lever located in the service-box and pivoted directly below the lever H. Its vertical arm K′ terminates in the catch-nose K^{10}, and the other arm, K^2, is connected to the float K^{20}.

The operation of this device is as follows: When not in operation the valve G′ is closed and the valve G^2 is open, and the service-box B is therefore empty. When it is desired to put it into operation to flush the closet, the user will pull the cord H^2, allowing the valve-stem G to descend, opening the valve G′ and closing the valve G^2 and bringing the lever H against the inclined upper surface of the catch-nose K^{10}, and thereby swinging the bell-crank lever K, lifting the arm K^2 and the float K^{20}, and finally catching under the catch-nose and bring itself locked in that position, and holding the lever also locked in that position, with

the float lifted some distance off the bottom of the service-box B. The water now flowing through the aperture A′ into the service-box B fills it up, until, by lifting the float to the position shown in Fig. 4, it rocks the bell-crank lever K back and releases the lever H from the catch-nose K^{10}, and the weight H′ causes the lever H, rocking over its pivot, to lift the valves G′ and G^2 until the aperture B′ is opened and the aperture A′ is closed, stopping the flow of water from the tank into the service-box and permitting the water which has accumulated in the latter to flow out through the pipe G to the closet-bowl.

Obviously the amount of water which will accumulate in the service-box before the lever H is released from the catch-nose K^{10} will depend upon the connection of the float K^{20} to the lever H, and for the purpose of adapting the quantity of water used to the necessities of the case the float is made adjustable in relation to the lever. This may be done in a great variety of ways. The simplest means is is shown in Fig. 2, the float being connected to the lever by a chain, K^{21}, which may be shortened or lengthened to fix the depth of water which shall accumulate before the float will exert a pulling force on the lever-arm K^2 to disengage the catch-nose K^{10} from the lever H. Another method is shown in Fig. 3, the float merely being adjustable on the arm K^2 toward and from the pivot of the lever, the pivot being so placed that the arm H^2 is horizontal when the float rests on the bottom of the service-box, so that the said adjustment does not affect the position of the lever when the service-box is empty; but the farther the float is from the pivot the farther must it be raised by the water, in order to rock the lever through the angle necessary to disengage the nose. I do not confine myself to any one method or means of effecting this adjustment.

The overflow-aperture *g* is located at such height that when the valve-stem G is raised and the valve G′ closed it stands above the water-level (as determined by the adjustment of the float) and is below that level when the valve-stem G is dropped to open the valve G′. It is thus made the means of furnishing the "fore-wash" for the closet, the water passing through the hollow stem G directly into the flushing-pipe C and thence to the bowl, and continuing to-flow until the level of water in the tank has fallen below said aperture.

In connection with some forms of closets the valve G^2 is not needed, and its presence is never essential to the operation of my device, because, the aperture A′ being so much larger than the aperture B′, the service-box will fill, even though no valve is used to close the latter aperture.

If there is no water in the tank when the valve is opened by the user of the closet, the valve will remain open until the tank receives water and the same flows into the service-box, and the devices will then operate as described, furnishing the predetermined quantity of water to flush the bowl, the flow ceasing at such predetermined limit.

I claim—

1. In combination with the tank and service-box and the valve which controls communication between them, the lever which operates said valve, and a second lever having a catch-nose, whereby it is operated by and engages the first lever, and a float in the service-box connected to and operating the second lever to disengage its catch-nose from the first lever, substantially as set forth.

2. In combination with the tank and service-box and the valve which controls and communicates between them, the lever which operates said valve, and a second lever having a catch-nose, whereby it is operated by and disengages the first lever, and a float in the service-box adjustably connected to and operating the second lever to disengage its catch-nose from the first lever, substantially as set forth.

3. In combination, the tank and service-box, the valve between them, and the lever which operates it, the bell-crank lever K, having the catch-nose K^{10} on the upwardly-extended arm, and the float K^{20}, connected to the other arm, substantially as set forth.

4. In combination with the tank and service-box, the valve between them, and the lever which operates it, the bell-crank lever K, having the catch-nose K^{10} on the upwardly-extended arm, and the float K^{20}, connected to the other arm by the chain K^{21}, adapted to be lengthened and shortened at will, substantially as set forth.

5. In combination with the tank and service-box and the flushing-pipe, the valve-stem G, having rigid with it the valves G′ and G^2, the lever which operates said stem to open the former and close the latter valve simultaneously, and a second lever having a catch-nose, whereby it is operated by and engages the first lever, and a float in the service-box connected to and operating the second lever to disengage its catch-nose from the first lever, substantially as set forth.

6. In combination with the tank, service-box, and flushing-pipe, the tubular valve-stem having its longitudinal duct communicating at the upper end with the tank and at the lower end with the flushing-pipe, and carrying the valve G^2 above the said lower communication, seating downward to close communication between the service-box and the flushing-pipes, whereby the said downward movement which seats the valve G^2 seats the tubular stem through the service-box and leaves free communication from the tank to the flushing-pipe, for the purpose of affording the fore-wash, substantially as set forth.

7. In combination with the tank, service-box, and flushing-pipe, the tubular valve-stem G, having its longitudinal duct communicating at the upper end with the flushing-pipe and carrying the valves G′ and G^2, the former controlling communication between the tank and

service-box and seating upward, and the latter between the service-box and flushing-pipe, and located above the said communication of the tubular stem with the flushing-pipe and seating downward, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 12th day of May, 1886.

PATRICK HARVEY.

Attest:
W. J. HARVEY,
CHAS. S. BURTON.