(No Model.) 2 Sheets—Sheet 1.

O. J. McGANN.

WATER CLOSET.

No. 306,092. Patented Oct. 7, 1884.

Fig. 1.

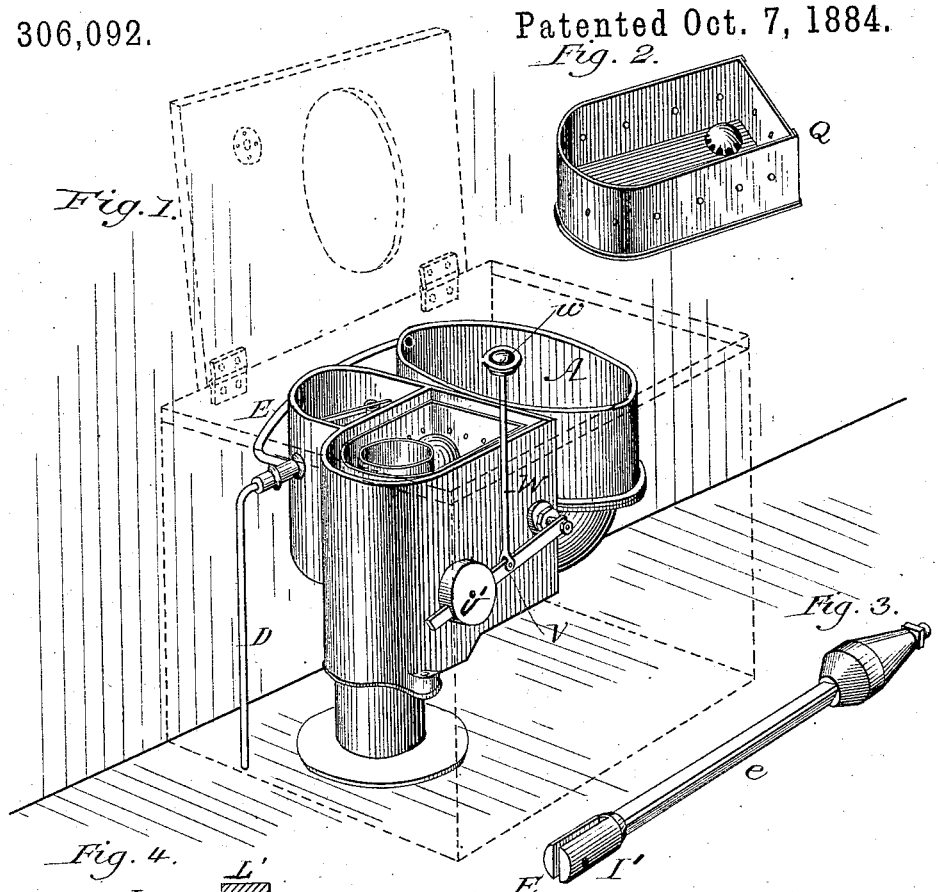
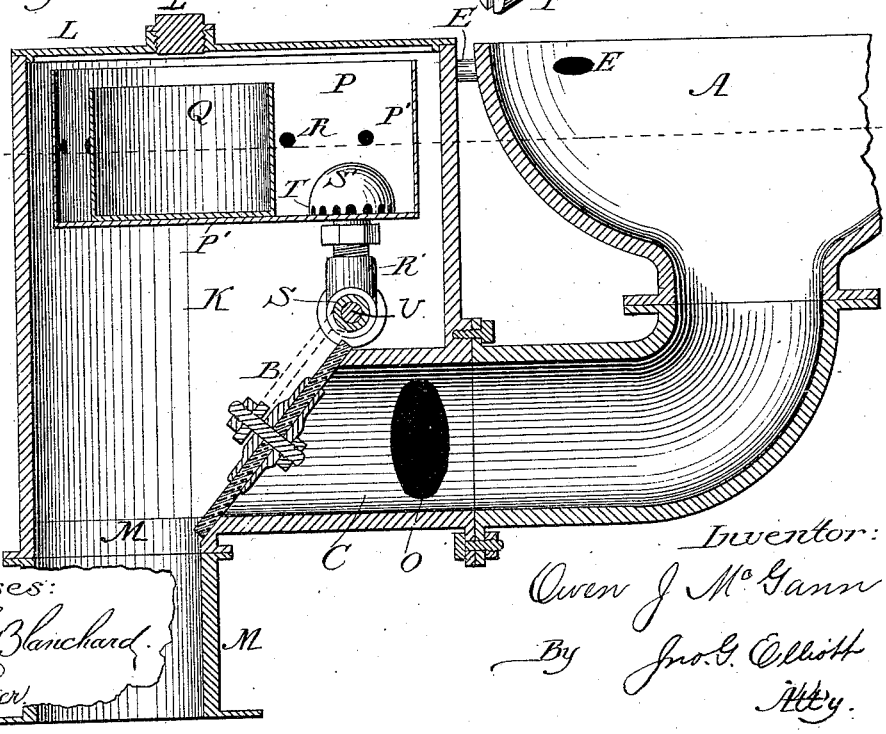


Fig. 2.

Fig. 3.

Fig. 4.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 5.

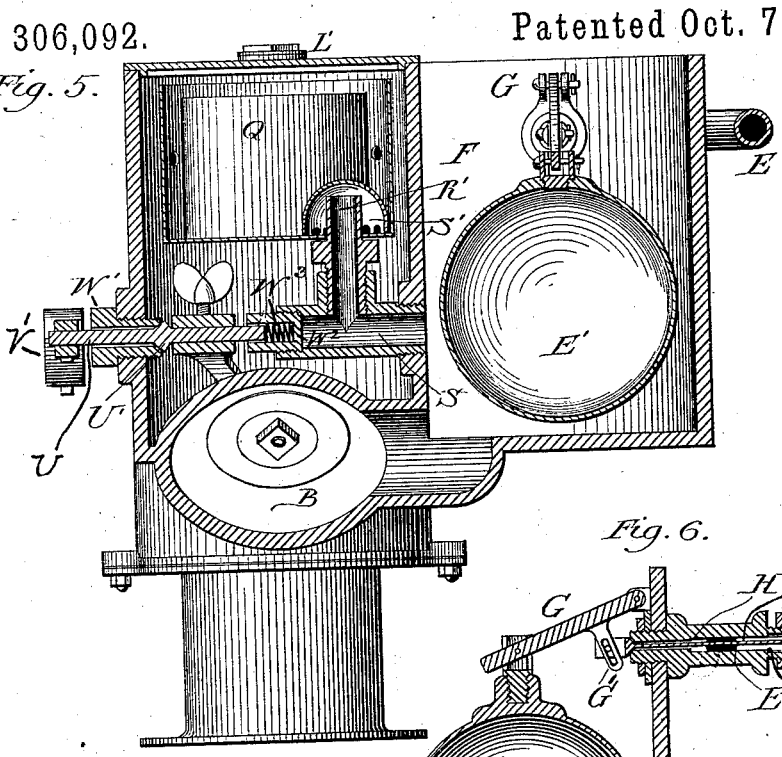


Fig. 6.

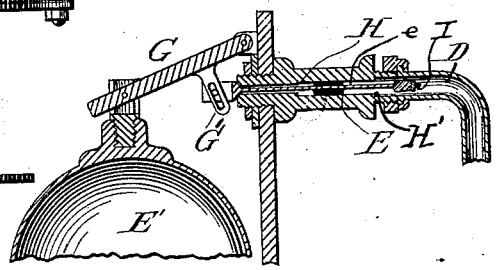
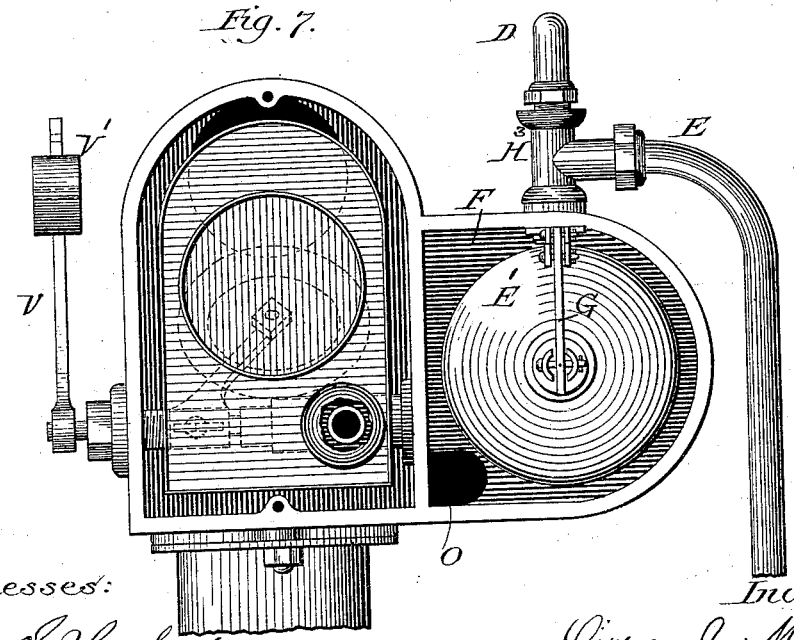


Fig. 7.



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WATER-CLOSET.

SPECIFICATION forming part of Letters Patent No. 306,092, dated October 7, 1884.

Application filed April 14, 1883. (No model.)

To all whom it may concern:

Be it known that I, OWEN J. McGANN, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Water-Closets, of which the following is a specification.

This invention relates to improvements in water-closets in which a hinged valve is employed for opening or cutting off communication between the bowl and the soil-pipe, a float-valve arranged for automatically regulating the supply of water to the bowl, and means provided for disinfecting the soil-pipe into which the contents of the bowl are discharged.

The object of my invention is to provide a water-closet with a disinfecting-chamber containing some suitable disinfectant, and arranged to communicate with the soil-pipe in such a way that at each time a discharge occurs through the soil-pipe a disinfected air from the disinfecting-chamber shall, by reason of the tendency of the said discharge to create a vacuum in the soil-pipe, be sucked or drawn down into the soil-pipe, so as to disinfect the same; also, to provide a water-closet with a disinfecting-chamber arranged so that at each discharge from the bowl into the soil-pipe the tendency of the discharge to create a vacuum in the latter shall draw disinfected air from the chamber into the soil-pipe, and also so that when the valve between the soil-pipe and the bowl is closed and water backed up within the latter, water shall also rise in the disinfecting-chamber in a quantity suitable for absorbing some of the disinfectant contained therein, and for overflowing from the said chamber into the soil-pipe, in which way at each discharge from the bowl into the soil-pipe the latter will be disinfected, and in case the supply of water should partially fail or be too limited to cause an overflow from the disinfecting-chamber disinfected air from the latter will with each discharge be drawn down into the soil-pipe.

A further object is to provide novel means for effectively draining off water from the service-pipe between a valve-cock and the bowl after the valve-cock has been closed, and also to provide a water-closet with certain novel and improved features of construction and combination, all as hereinafter described and claimed, and illustrated in the annexed drawings, in which—

Figure 1 is a perspective view of my improved water-closet, with the box or casing shown in dotted lines. Fig. 2 is an enlarged perspective view of the disinfecting-chamber. Fig. 3 is a detail representing the valve-cock. Fig. 4 is a section taken on a vertical plane through the water-closet. Fig. 5 is a vertical section taken at right angles to Fig. 4. Fig. 6 is a detail representing the float valve-cock in section. Fig. 7 is a top or plan view of the water-closet.

Referring by letters to the several figures of the drawings, in which like letters denote like parts, A indicates the bowl, and B the discharge-valve, that is provided for opening or closing a pipe, C, which leads from the bowl for the purpose of carrying off its contents and discharging the same into the soil-pipe. The seat for this discharge-valve is made on an incline, so that when the valve is closed it shall lie in an inclined position, as shown in Fig. 4. By such arrangement the valve will close by reason of its gravity, which will also serve to hold the valve down upon the inclined seat, and thereby render the valve more effective in resisting the pressure of the water in the bowl and pipe than if it hung in a vertical plane when closed.

Water for flushing the bowl and drain-pipes is conducted from a supply service-pipe, D, through a branch pipe, E, leading from the latter to the bowl. This branch E is practically a portion of the supply or service pipe, so that the service-pipe will be understood to include the said parts D and E.

As a means for automatically opening and closing the service-pipe, so as to permit the flow of water into bowl after the discharge-valve has been opened, and to cut off the supply after the said valve has been closed, I provide a float valve-cock, which will close when the water rises to a certain height in the bowl, and open as soon as the water sinks below such level. The float E′ of this valve-cock is arranged within a chamber, F, along-

side the bowl, and is connected with a pivoted lever, G, for actuating the valve-stem. As herein shown, a sliding connection between the valve-stem and the float-lever is made by means of a pin on the valve-stem, arranged to work in a slotted arm, G′, on the float-lever; but it will be obvious that other forms of joint between the said stem and lever could be employed.

The valve-stem *e*, having at one end a valve, I, has a bearing in a drain-passage, H, which connects the float-chamber with the service-pipe. As herein arranged, the valve-stem crosses the point of communication between the members D and E of the service-pipe and extends into the member D, which latter has a slat, H′, for the valve I.

For convenience, I provide a T-pipe joint, H^3, (see Fig. 7,) screwed into one side of the float-chamber, and by such arrangement the drain-passage is easily formed and connected with the passage through the service-pipe.

By referring to Fig. 6 it will be seen that the area of the passage through the two sections D and E of the service-pipe is adequate to the volume of water required to pass through the same for flushing the bowl, but that the drain-passage H between the float-chamber and the service-pipe is contracted so as to form a bearing for the stem.

This valve-stem *e* is made triangular or of other angular form in cross-section, so that a way or passages are left between the stem and the wall of the passage in which it works, for the purpose of drawing off into the float-chamber such water as shall be left in the branch pipe or cock after the supply-pipe has been closed by the valve. In order to prevent such flow of water into the float-chamber while the valve is open and water being discharged into the bowl, the valve-stem is provided at one end with a small valve, I′, that is arranged to close the passage leading from the cock to the float-chamber when the valve-cock is open.

A valve-chamber, K, in which the discharge-valve is hung, is located alongside of the float-chamber and provided with a suitable cover, L, having an opening that is closed by a screw or other plug, L′, through which opening the disinfectant can be introduced. The passage from the bowl opens into this chamber at such point that when the discharge-valve is opened the water and other matter passing through such passage shall empty into a soil-pipe, M, leading from the said chamber.

The float-chamber communicates with the passage between the discharge-valve and the bowl through the medium of a port or opening, O, Fig. 4, whereby, after the discharge-valve has been closed, the water running into the bowl will also pass into and rise within the float-chamber in order to raise the float, and thereby close the valve-cock at the proper moment.

In order to disinfect the drain or soil pipe, I provide within the upper portion of the valve-chamber, at a point above the valve, a disinfecting-chamber, P, that is formed by a metal or other open box or casing, P′, suitably supported and adapted to hold a cup or pan, Q, for containing some suitable disinfectant—such, for example, as chloride of lime. This disinfecting-chamber communicates with the float-chamber, so that when the water rises to a certain height in the latter it will also rise in the disinfecting-chamber. The wall of the latter is provided with outlets R, formed at such height above its bottom that a suitable body of water will accumulate in the chamber before any overflow through its outlets shall occur. In this way after the discharge-valve has been closed the water in the closet will stand at the same height in both the bowl and the float and disinfecting chambers, while any excess of water in the disinfecting-chamber will flow out through its perforated wall and pass down into the drain or soil pipe. The water remaining in the disinfecting-chamber will become saturated with the disinfectant contained therein, and hence will be kept in readiness for the next overflow.

The passage between the float and disinfecting-chamber is formed by a vertical pipe, R′, leading from a pipe, S, which connects with the float-chamber.

In order to seal the passage between said two chambers, so as to prevent gases from the disinfecting-chamber passing into the float-chamber, the pipe R′ is extended above the bottom of the disinfecting-chamber and covered by a casing, S′, forming a chamber into which the water from the pipe will flow before entering the disinfecting-chamber through perforations T, formed in the casing S′ near its base. The pipe terminates in the upper portion of the chamber formed by said casing, so that the water below the upper terminal of the pipe will constitute an efficient seal.

When the discharge-valve is open, the contents of the bowl and the float-chamber will discharge into the soil-pipe, and as the water in the float-chamber runs out the descent of the float will cause the valve-cock to open, and thereby allow water from the supply-pipe to run into the bowl; but as soon as the discharge-valve is closed the water running into the bowl will back up into the same, and also rise in the float-chamber and disinfecting-chambers until the valve-cock has been closed by reason of the ascent of the float, at which moment the passage from the valve-cock to the float-chamber will be automatically opened, and hence the water from the branch pipe between the valve-cock and bowl will run out into the float-chamber.

It will be evident that each time the discharge-valve is opened and the contents of the bowl discharged into the soil-pipe the discharge in the latter will tend to create a vacuum therein, and that this will, as soon as the valve closes, create a draft through the disinfecting-chamber. In this way at each discharge air from the disinfecting-chamber will be drawn into the soil-pipe, and hence should

the supply of water fail or be too limited to have caused an overflow from the disinfecting-chamber, air from the latter, impregnated with the disinfectant employed, will be sucked or drawn down into the soil-pipe.

As shown, the disinfecting-chamber communicates with the soil-pipe through the medium of the valve-chamber in which the disinfecting-chamber is located; but it will be evident that should the disinfecting-chamber be arranged outside of the valve-chamber, air from the disinfecting-chamber will still be drawn into the soil-pipe at each discharge so long as the soil-pipe and the disinfecting-chamber communicate with each other and the general principles of my invention are observed in constructing the same.

It will also be observed that the disinfecting-chamber herein shown communicates with the bowl through a passage at a point between the bowl and the discharge-valve, since, while under the arrangement shown the disinfecting-chamber connects with the bowl through the medium of the float-chamber and pipe-connections, yet in effect a passage is formed between the said chamber and bowl, no matter how many bends or enlargements the passage may have; also, that the seal located in this passage prevents the disinfected air from passing back to the bowl. The disinfecting-chamber, aside from such convenient connection with the bowl, whereby advantage can be taken of an overflow, has a still more marked and important feature, which consists in its connecting with the soil-pipe through an open passage or a passage which is at all times open, and which connects the disinfecting-chamber with the soil-pipe at a point beyond the discharge-valve of the water-closet. In this way a discharge from the bowl will not only cause a current of air to be drawn into the soil-pipe, but even when the discharge-valve of this particular closet is closed a discharge into the soil-pipe from any other source—as, for example, from another closet—will likewise cause air from the disinfecting-chamber to be drawn into the soil-pipe, which, it will be seen, cannot be attained in closets where the bowl has a space or chamber in one of its sides for a piece of soap, or the like, which said chamber is simply washed out by water rising in the bowl.

The discharge-valve is suspended from a spindle, U, which passes through one of the walls of the valve-chamber, and is provided with a suitable lever, V, arranged outside of the casing and connected with a pull-rod, W, having a knob or button on its upper end, and arranged to be conveniently grasped by a person using the closet. A weight, V′, can also be provided upon the lever V as an auxiliary means for holding the discharge-valve down upon its seat; but irrespective of said weight the valve will be held on its seat and maintained by gravity against the pressure of water in the bowl, and hence while under the arrangement herein shown the gravity of the pull-rod, the button, and the weighted lever is added to the gravity of the valve, yet I propose making the valve of such weight that it will by its own weight rest and maintain a closed position against the water in the bowl.

The valve-spindle passes through a bearing, W′, which is fitted in the casing of the valve-chamber, and a ground joint for preventing escape of gas or water is provided. This joint is formed by means of a shoulder, U′, upon the spindle, and an expansion-spring, W^3, arranged to act against the inner end of the spindle, so as to force the said shoulder against the inner end of the bearing, at which a suitable seat is provided, whereby the shoulder on the spindle, being held by spring-pressure against the said seat, will provide at all times a tight joint. This spring can be conveniently arranged on a bearing, W^2, that is provided for the inner end of the spindle, and the said bearing can be fitted in one end of or formed with the pipe S, that constitutes a portion of the passage between the float and the disinfecting chambers.

In conclusion, it will be observed that the valve-cock opens against the pressure of the water in the supply-pipe, and hence that when the float rises and draws the valve toward its seat, by reason of the intermediate connections hereinbefore described, the pressure of the water upon the valve will assist in closing the same, so that certainty of action on the part of the valve is at all times insured; also, that as the water is drained off from the cock and branch pipe there will be no danger of freezing during cold weather.

It will be understood that I do not claim, broadly, a check-valve seating downward upon an inclined seat, but that I confine myself to a water-closet in which an inclined seat is arranged between the bowl and the soil-pipe, and a check-valve is hung in an enlarged chamber over the inlet end or mouth of the soil-pipe. By such arrangement the valve will, by reason of its weight, insure with certainty its being seated and held down against the pressure of water within the bowl, irrespective of any weighted arm that may be attached to the valve-spindle, which, in the case of a vertically-seating valve, cannot always be relied on. It will also be observed that should the soil-pipe become choked up above its mouth the valve can be more readily raised, or that when it is seated the valve-chamber can be more easily cleaned, and the obstructing matter pushed down the soil-pipe, since the inclined top face of the valve forms a wall inclining downwardly to the mouth of the soil-pipe, and thereby leaving no horizontal ledge between the edge of the valve and the said pipe. Where a vertical seat is used, and a weighted arm connected with the valve-spindle solely relied upon to hold the valve seated, any disarrangement in the adjustment of the parts frequently prevents the valve from being closely held upon its seat, and hence water will leak out from the bowl and

gas escape from the soil-pipe into the latter. It will be seen, however, that where the weight of the valve resting on an inclined seat is taken advantage of such accidents will not occur.

Having thus described my invention, what I claim is—

1. The combination, with a water-closet, of a disinfecting-chamber connected by an open passage with the closet at a point between the discharge-valve of the closet and the soil-pipe, so as to have at all times an open communication with the soil-pipe, whereby each discharge through the soil-pipe from any source has a tendency to create a vacuum in the passage between the disinfecting-chamber and the soil-pipe, and thereby induces a current of disinfected air from the former into the latter, substantially as described.

2. The combination, with a water-closet and a soil-pipe, of a disinfecting-chamber connected with the soil-pipe by a passage between the discharge-valve and soil-pipe, substantially as described.

3. The combination, with a water-closet bowl, the soil-pipe, and a discharge-valve situated between the bowl and the soil-pipe, of a disinfecting-chamber communicating with the soil-pipe at a point beyond the discharge-valve, and communicating with the bowl at a point back of the said valve, substantially as described.

4. The combination, with a water-closet, the soil-pipe, and a discharge-valve situated between the bowl and the soil-pipe, of a disinfecting-chamber connecting with the soil-pipe through an open passage, and connecting with the bowl through a passage provided with a seal, by which the backflow of disinfected air from the disinfecting-chamber to the bowl is prevented, substantially as described.

5. The combination, with the service-pipe for a water-closet bowl, of a valve-stem provided with two valves and fitted to work within a drain-passage branching from the service-pipe, and a float for operating the valve-stem, one of said valves being arranged to open against the pressure of the water, and to control the flow of water to the bowl, and the remaining valve being arranged to close the drain-passage when the valve for the service-pipe is open, and to open the drain-passage when the said valve for the service-pipe is closed, whereby when said valve for the service is closed water between the said valve and the bowl shall flow off through the drain-passage, substantially as described.

6. The combination, with the service-pipe provided with a lateral drain-passage, of a valve-stem made angular in cross-section and arranged to work within the drain-passage, whereby space for the flow of water is left between the stem and the walls of the passage, said stem being provided with two valves, one of which is arranged to open and close the service-pipe, and the other arranged to open and close the drain-passage, substantially in the manner and for the purpose described.

7. The combination, in a water-closet, of the bowl, with the float-chamber communicating with the bowl, and a disinfecting-chamber communicating with the float-chamber, to allow water that rises above a determinate height therein to pass out and flow into the soil-pipe, substantially as described.

8. The combination, in a water-closet, of the bowl, with a float-chamber communicating with the bowl and with a disinfecting-chamber located within a valve-chamber in which the discharge-valve for opening communication between the bowl and the soil-pipe is located, substantially as described.

9. The combination, in a water-closet, of a bowl, a disinfecting-chamber, a connection between said bowl and chamber, and a water-seal between the disinfecting-chamber and bowl, substantially as described.

10. The combination, in a water-closet, of the bowl with a valve-chamber connected with the soil-pipe, a valve located between said chamber and a passage leading from the bowl, a float-chamber communicating with said passages, and a disinfecting-chamber located within the valve-chamber above the discharge-valve and communicating with the float-chamber, substantially as described.

11. The combination, with the bowl, of the disinfecting-chamber communicating with the bowl, the inlet-pipe R′, for the disinfecting-chamber, and forming a chamber inclosing the upper end portion of the inlet-pipe, the case having an outlet below the top or discharge end of said inlet-pipe and above the bottom of the disinfecting-chamber, substantially as and for the purpose described.

12. The swinging valve and its spindle U, in combination with a bearing through which the spindle passes, and a ground joint for the spindle formed by a shoulder, U′, on the spindle, and a spring acting so as to hold the said shoulder against a seating in the bearing, substantially as described.

13. The combination, with the discharge-valve, of the spindle U, operated by a pull-rod, the bushing W′, through which the spindle passes, and a ground joint for the spindle formed by a shoulder, U′, on the spindle, and a spring acting against the inner end of the spindle, substantially as described.

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