

No. 832,897.

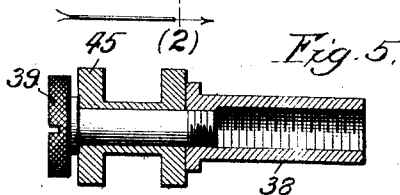
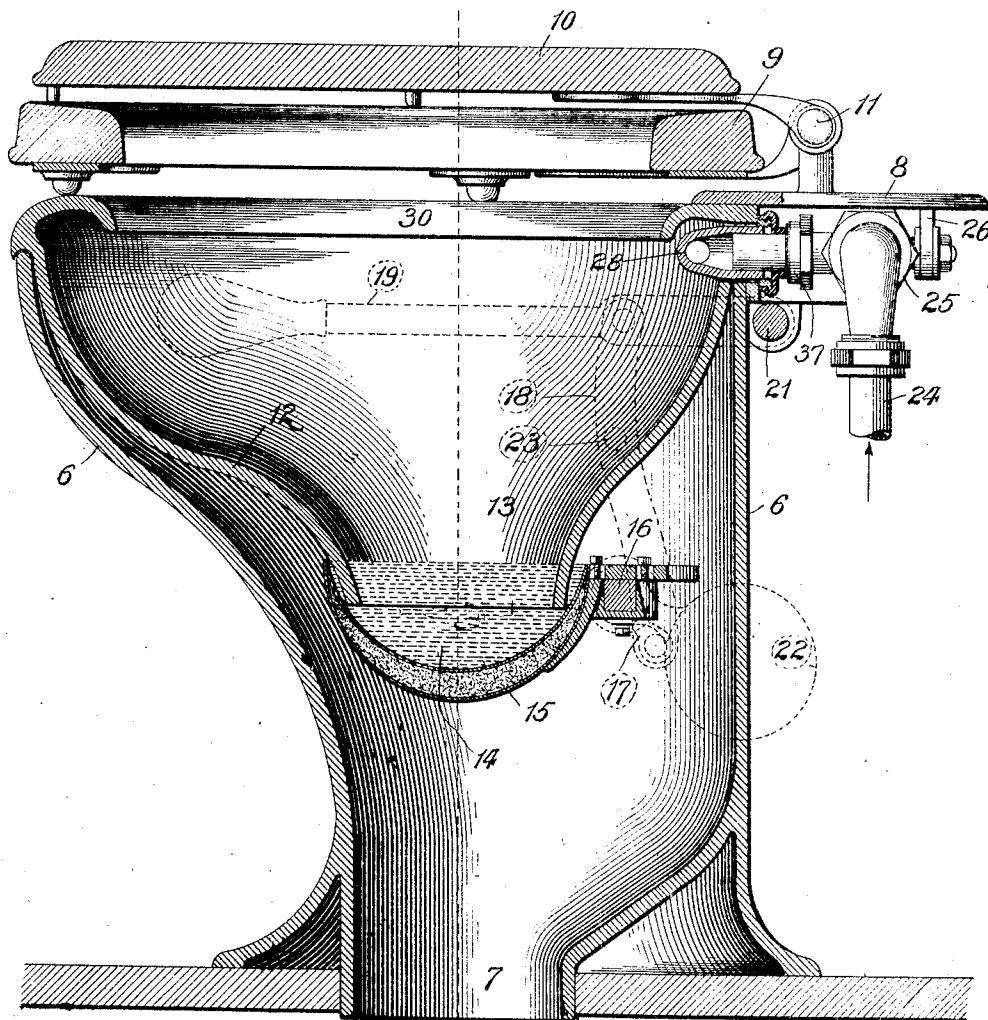
PATENTED OCT. 9, 1906.

J. C. DUNER.
WATER CLOSET.

APPLICATION FILED AUG. 12, 1903.

4 SHEETS—SHEET 1.

Fig. 1.



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4 SHEETS—SHEET 2.

Fig. 2.

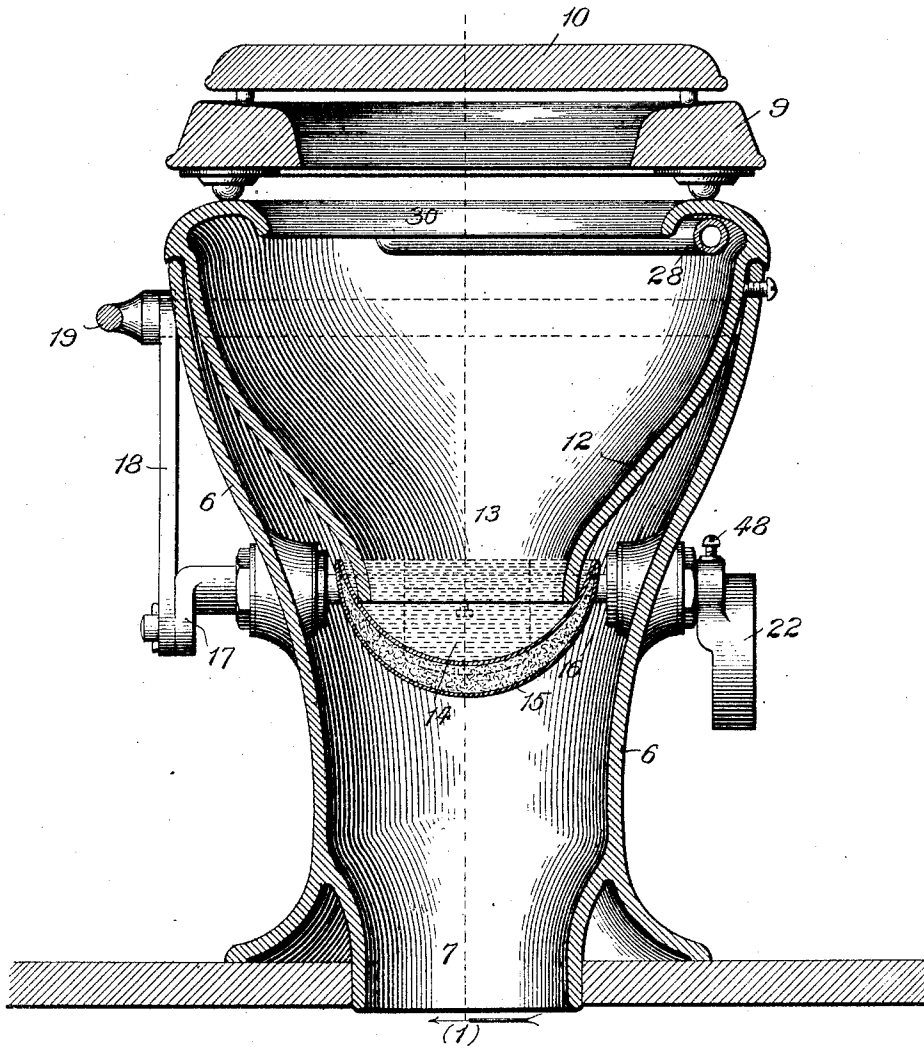
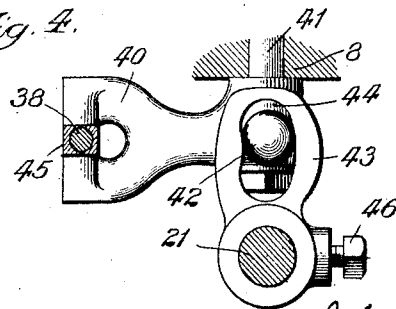


Fig. 4.



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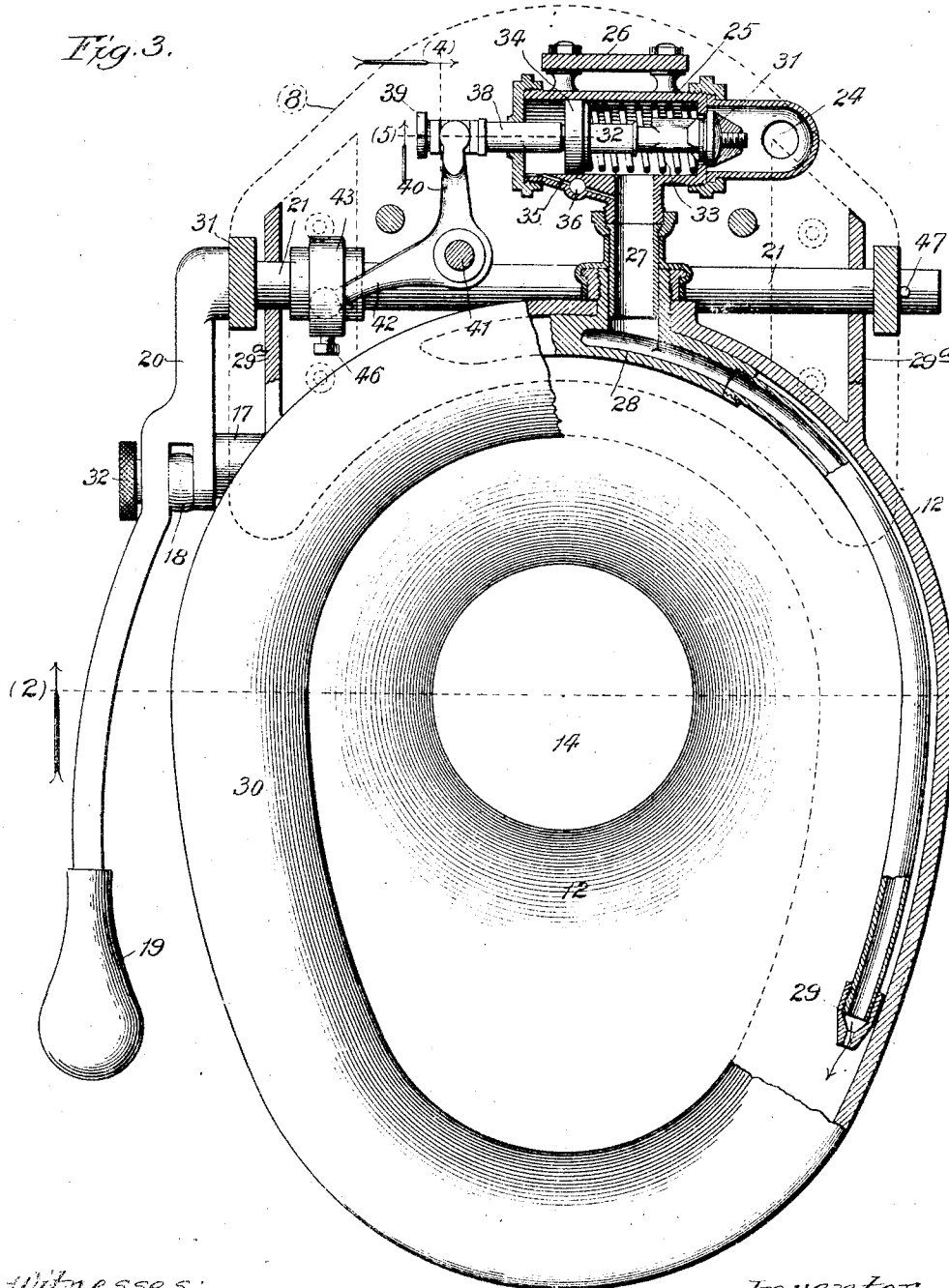
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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

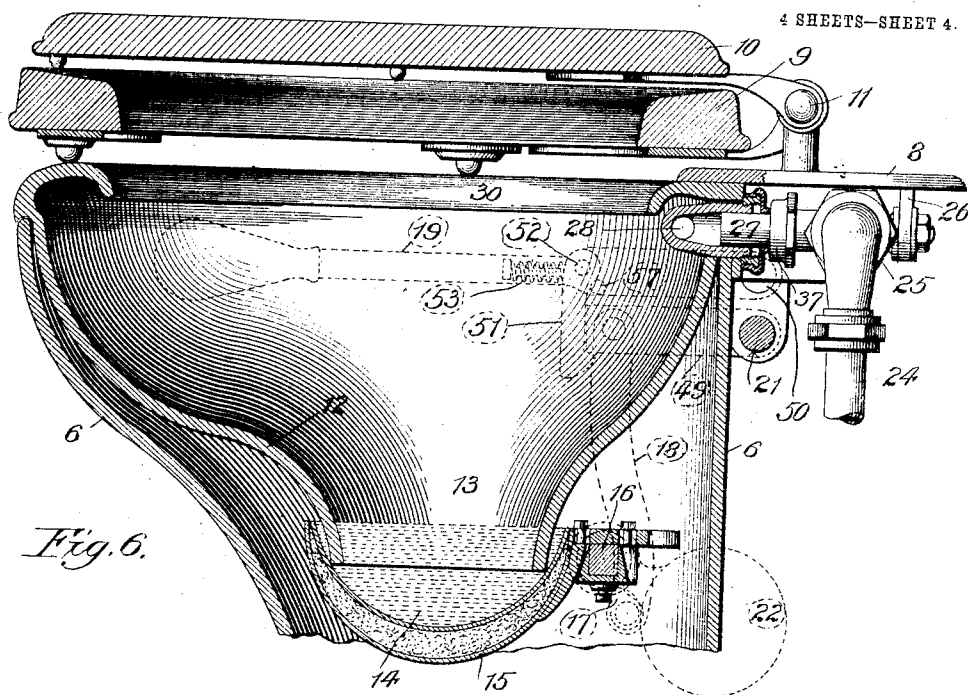
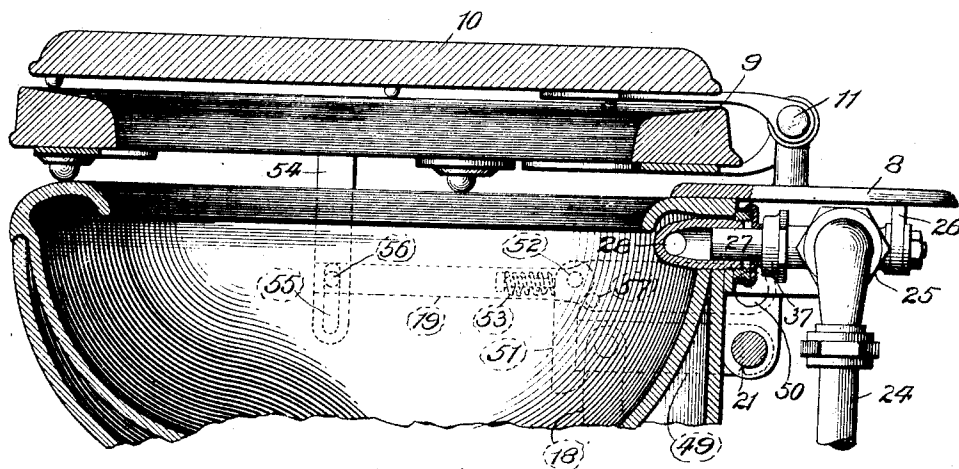


Fig. 6.

Fig. 7.



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UNITED STATES PATENT OFFICE.

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WATER-CLOSET.

No. 832,897.

Specification of Letters Patent.

Patented Oct. 9, 1906.

Application filed August 12, 1903. Serial No. 169,203.

To all whom it may concern:

Be it known that I, JOHN CHARLES DUNER, a citizen of the United States, residing at Chicago, in the State of Illinois, have invented certain new and useful Improvements in Water-Closets, of which the following is a specification.

My invention relates particularly to the hoppers or bowls of water closets and the means for dumping and flushing the same. In the form illustrated, the construction and operation is best adapted to use in railway trains and like positions, but the invention is as applicable to any other style of closet. The objects of the invention are, to provide a water closet which will be sanitary, the parts of which may be easily taken apart and cleaned, inspected, and repaired; to provide a convenient flushing attachment, reversible and easily removable from the rest of the apparatus; to provide simultaneous dumping and flushing devices which are very economical in the use of water and are adapted to keep the parts thoroughly clean; to provide against freezing of the water that stands in the bottom of the bowl; to provide a superior control for the flushing valve, and to generally improve the structure and operation of water closets.

The above objects, together with other advantages which will hereinafter appear, I attain by means of the structure illustrated in preferred form in the accompanying drawings, wherein—

Figure 1 is a central vertical section through the seat and bowl and parts of the mounting of the device, on line (1) in Figure 2;

Figure 2 is a vertical central section taken at right angles to that of Figure 1 and along the line marked (2) therein;

Figure 3 is a plan view and partial section of the bowl and the valve apparatus connected thereto;

Figure 4 is a detailed side elevation of the connection of the operating handle with the valve spindle; and

Figure 5 is a detail sectional view of the attaching sleeve for regulating the throw of the valve spindle.

Figures 6 and 7 show modifications of the dumping means.

From the accompanying illustration of my invention as adapted to use particularly in railway trains and other places where the bottom of the closet is open directly to the outside atmosphere, it will be seen that the

whole device is supported upon the casing 6 which is provided with suitable flanges to rest upon the floor and with an opening 7 at the bottom to register with the opening 60 through the floor. Resting upon the top ring of this casing 6 is the bowl 12 which conveniently may be made integral with a seat ring 30, and supported upon the top of this ring is an attached plate 8 which carries all of the parts of the valve structure and also the pivot stud 11 upon which are attached the wooden seat 9 and the cover 10, as usual.

The bottom opening 13 of the bowl 12 is closed by means of a dumping pan 14 which may conveniently be formed with double walls of copper and packed with felt 15, in order that the cold air from below, in winter time, may not freeze the water standing in the pan 14. This dumping pan is supported upon the shaft 16 and normally held up in closed position so that the lower end 13 of the bowl dips into the water therein, the weight of the pan being counterbalanced by the weight 22 attached upon the outside end of the shaft 16, as will be seen from Figure 2. The opposite end of the shaft 16, outside of the casing 6, is provided with a crank 17, to which is pivoted the link 18, carried by a lever 20 having an extended arm and handle 19 and which is itself removably attached to the shaft 21 for operating the valve. The link 18 is provided with an extra hole 23 for bolt 32 supporting handle 19, so that the pan 14 may be left standing open in case it is desired to use the device as a dry hopper and dispense with the use of the dumping pan.

The plate 8 fixed upon the top of the bowl ring extends backward and carries upon it all the apparatus for the flushing valve. The water supply pipe 24 may be brought up outside and behind the casing 6 and opens into the valve chamber 25, which is supported from the plate 8 by means of the depending lug 26 and the lateral nozzle engaging pipe 27 which leads into the pipe 28. This latter is arranged around the inside of the bowl underneath the overhanging ring 30 and lies in an annular groove in the bowl, as shown in the left of Figure 1. It ends in the nozzle 29 in order to give the water a gyratory motion in the groove and the bowl when the flushing takes place. The rear end has a wedge form to spread the stream of water (Figure 3.) The opening into the valve chamber from pipe 24 is controlled by valve 31 which is fixed upon a spindle 32 provided with a loose

plunger 34 fixed thereon and having a loosely fitting cup disk which allows the water to pass behind it, but confines the water in the casing on the return movement, forcing escape through the outlet 35. It is normally pressed back by coil spring 33. The valve stem 32 is provided with an adjustable sleeve 38 which extends through the rear of the casing 25 and there engages, through the agency of the sleeve 45 held in place by the screw 39, the arm 40 of the bell crank lever pivoted at 41 and which has the head of its arm 42 engaging the slot 44 in the cam 43 fixed upon the shaft 21. The shaft 21 is supported by means of the flanges 29^a preferably made integral with the bowl and serving as the supports for the plate 8 as before described.

The casing 25 has a small bleed passage 35 from the rear of the plunger 34 leading into the open pipe 27, and controlled by means of a choke screw 36. This is for the purpose of allowing the plunger 34 to return gradually to its rearward position through the effort of the spring 33, after the handle has been released, in order that the flow of water may be continued and cease gradually, and the bowl close gradually.

It will be observed that the parts of the flushing valve and the handle as well as the interior pipe 28 which is attached to the valve casing by the short pipe 27 and a coupling nut, rest loosely upon the supporting casing 6 or the bowl. Consequently when the bowl is lifted out of place it may carry with it the flushing apparatus and leave the casing 6 open for cleaning or inspection and the pan 14 also free from any connection with the other parts except its support upon the shaft 16.

From the above description, the operation will be evident: normally the pan 14 stands in horizontal position and is filled up to its rim with water so that the nozzle 13 of the bowl 12 dips therein and forms an effectual seal against gases or cold air from below. When the handle 19 is pulled up to dump the pan 14, it will be seen that by the same motion the cam 43 actuates the bell crank 40 and thrusts the sleeve 38 of the valve spindle inward so as to open the valve 31 and allow the water to flow freely from pipe 24 through pipe 27 and out through the nozzle 29 in the bowl giving it a gyratory motion in the groove underneath the overhanging seat ring 30 of the said bowl. This will continue until the bowl is closed, the water being kept up by the centrifugal force, till the pan closes, and will then flow down over the whole surface, the stream being spread by the rear end of the pipe 28. Upon the release of the handle, it returns to its horizontal position by reason of the counterweight 22 on the far side of the shaft 16 and the valve is gradually returned to place by the

spring 33, the water in the meanwhile which has passed by the plunger 34 to the rear, escaping gradually through the small opening 35, which may of course be controlled to make the time or rate of return of the valve plunger 34 as slowly as desired by means of a regulating screw 36. As the pan rises up gradually while the water is still running, it is thereby thoroughly cleansed before it comes into its horizontal position, and therefore only the last of the water left after the flushing remains in the now thoroughly cleansed pan. The valve and pan acting simultaneously the pan reaches its normal position before the centrifugal force of the water is exhausted and is therefore in position to receive the remaining clean water when it finally drops down, flowing on all sides of the bowl.

In the modification shown in Figure 6 the apparatus is the same as in Figure 1 except for the attachment of the handle with the dumping pan. It is desirable that the pan and valve at once return to their normal positions after dumping and for this purpose the handle 19 is pivoted on a separate pin 50 and the shaft 21 carries the operating arm 49 connected with link 18 directly and with the handle 19 by means of the spring catch 51, pivoted at 52, and pressed into position to engage the end of the bar 49 by a spring 53. The catch has a stop 57 behind it, so that as the handle 19 is raised, the angle changing, the catch 51 will be forced out of engagement and let the bar 49 and link 18 fall again re-turning the pan, and the valve actuated by shaft 21, to position, whether the handle be released or not. This results in an economy of water.

In Figure 7 I show another modification, in which the handle bar 19 is operated by the seat, through the agency of the link 54 which engages the pin 56 by means of the slot 55. Otherwise the structure is the same as in Figure 6; and the operation will be evident.

By this structure it will be seen that I attain a thorough flushing of the bowl with a minimum amount of water, requiring less than a third what is usual in such cases, and the water being introduced in a gyratory motion, adds to the efficiency of the same in cleaning the bowl. In returning to normal position all the movable parts, it will be observed, are actuated in the direction of motion of the valve itself and the incoming water, so that it will be assured of eventually seating and of returning all parts to normal position. The shutting off of the water is thus automatic and is doubly sure by means of the water pressure itself as well as the spring 33 and the counter weight 22. It will be seen that the position of the handle 19 is easily reversible by simply loosening the set screws 46 (see Figure 4) and 48 (see Figure 2) and removing the cotter pin 47 (see

Figure 3) and counter weight 22, whereupon the shafts 16 and 21 may be withdrawn and reinserted at the opposite side. The convenience of construction by which all the parts may be removed at once and inspected from beneath, will be apparent, as well as the advantage of the anti-freezing device in the double construction and the felt packing of the pan 14. Other advantages of the construction will readily occur to those familiar with such devices.

Having thus described my invention and illustrated its use, what I claim and desire to secure by Letters Patent is the following:

1. In a water closet the combination with a bowl and means for flushing the same, of a dumping pan embracing the outlet of said bowl and provided with a double bottom containing an insulating packing between the two layers of the bottom, substantially as and for the purpose described.

2. In a water closet, the combination of a supporting casing 6, a detachable upper bowl 12 therein, a cover plate on the upper bowl, and operating means comprising means for operating the dumping pan, a flushing device and means for operating the flushing device, all mounted upon the cover plate and removable from the supporting casing 6 with the bowl 12.

3. In a water closet the combination with a bowl and a dumping pan and means for flushing said pan, of a casing and valve for admitting the flushing water having means for gradually closing the valve and continuing to inject water into the bowl after the valve has closed, substantially as described.

4. In a water closet a flushing valve consisting of a casing and a stem having a valve fixed thereon, and an auxiliary plunger mounted upon said stem and spring-pressed in the casing and having a loose cup valve to admit and confine the water behind the same, so that as the valve first closes the plunger continues its movement to inject water from the casing into the cylinder, substantially as described.

5. In a water closet the combination with a bowl and a dumping pan, of a valve for introducing water to flush the bowl and means in the valve casing to continue the injection of water after the valve is closed, and a common handle to operate the pan and to manipulate the valve, substantially as and for the purposes set forth.

6. In a water closet a flushing valve comprising a casing having inlet and outlet passages, a puppet valve opening against the inflow of water therein, and a loose auxiliary cup plunger upon the valve stem and a spring to move it in the casing, and a bleed passage in the casing behind said plunger through which the water is caused to flow as the valve is closed, by the pressure of the plunger, substantially as described.

7. In a water closet a flushing valve comprising a cylinder having an inlet valve seat, a puppet valve opening against the incoming stream of water, an auxiliary plunger upon the stem of the valve and spring-pressed to push it through the casing, a loosely fitting cup valve on the plunger and a regulable bleed passage for escape of the water behind said plunger, and means for adjusting the throw of the valve plunger in operating the valve, substantially as described.

8. In a water closet the combination with a supporting casing 6 of a removable upper bowl 12 therein, a handle operating the dumping pan, a flushing valve, and means for operating the flushing valve, all carried upon a portion of the bowl and removable from the supporting casing 6 with the bowl, substantially as described.

9. In a water closet the combination with a bowl and a dumping pan, of a flushing valve, and a handle operating both the dumping pan and the flushing valve, means to return the pan and the valve to normal position, and an auxiliary plunger on the valve stem provided with means for causing the water to continue to flow as the valve is closed, to flush the pan after it is returned to normal position, substantially as described.

10. In a water closet the combination with a bowl and dumping pan, of a shaft attached to said pan for dumping the same, a lever arm and link for operating the shaft, means upon said latter shaft for reciprocating the flushing valve of the bowl, and means upon the flushing valve and spindle for regulating the flow of the valve, and closing of the pan, and automatic means to continue the water flow after the operating means is released and the pan is closed, substantially as described.

11. In a water closet the combination with a pivoted dumping pan and a handle and connections for operating it, of a flushing valve forming an immediate inlet from the feed-pipe to the pan actuated by means of the handle for dumping the pan, and an escapement hook on the handle engaging part of the dumping mechanism, whereby the link is dropped automatically at a predetermined point as the handle is raised, so that the valve may be held open after the pan is closed.

12. In a water closet a flushing valve therefor comprising a casing having a puppet valve opening toward the inflowing stream of water, a separate chamber of the valve casing having a regulable bleed passage leading therefrom, a loose plunger mounted on the stem of the valve and provided with a spring to press it into said separate chamber, whereby the flow of water to said bleed passage is independent of the movement of the valve, substantially as described.

13. In a water closet the combination with a bowl having a circumferential groove for a

stream of water and a dumping pan and flushing valve, of an injecting pipe emptying into the bowl-groove at the side distant from the valve and having a squirt nozzle, and means in the flushing valve for continuing the flow of water through the squirt nozzle after the valve is closed and the pan returned to place.

14. In a water closet the combination with a bowl and a dumping pan and means for returning the dumping pan to normal position, of a nozzle in the bowl adapted to introduce a stream in gyratory direction around said bowl, and a flushing valve including a casing having an inlet valve therein and an auxiliary piston on the valve stem with a spring for pressing it into the valve casing, and an escapement for liquid behind said piston to the nozzle, whereby the flow of water through

the nozzle into the bowl is continued after the valve is closed, substantially as and for the purpose described.

15. In a water closet the combination of a bowl having a circumferential groove around a top portion adapted to receive a gyratory stream of water, and an injection pipe lying therein and having a squirt nozzle at the end adapted to direct the stream of water to flow in gyratory direction in said groove and to be kept up by a centrifugal force, substantially as described.

In testimony whereof I have hereunder signed my name in the presence of the two subscribed witnesses.

JOHN C. DÜNER.

Witnesses:

PAUL CARPENTER,
CHAS. H. EBERT.