

No. 629,709.

Patented July 25, 1899.

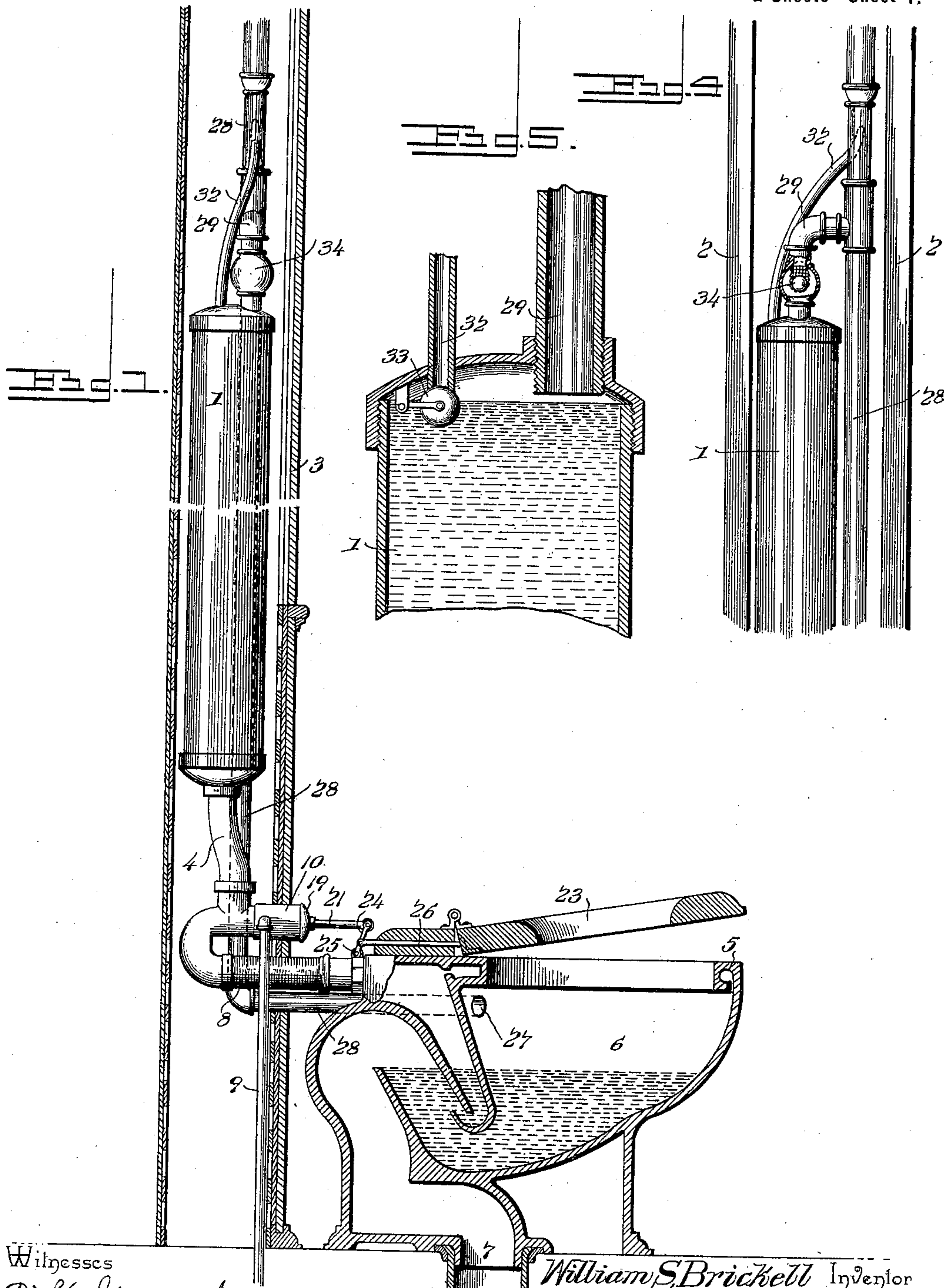
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CLOSET VENTILATING AND FLUSHING APPARATUS.

(Application filed Sept. 20, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

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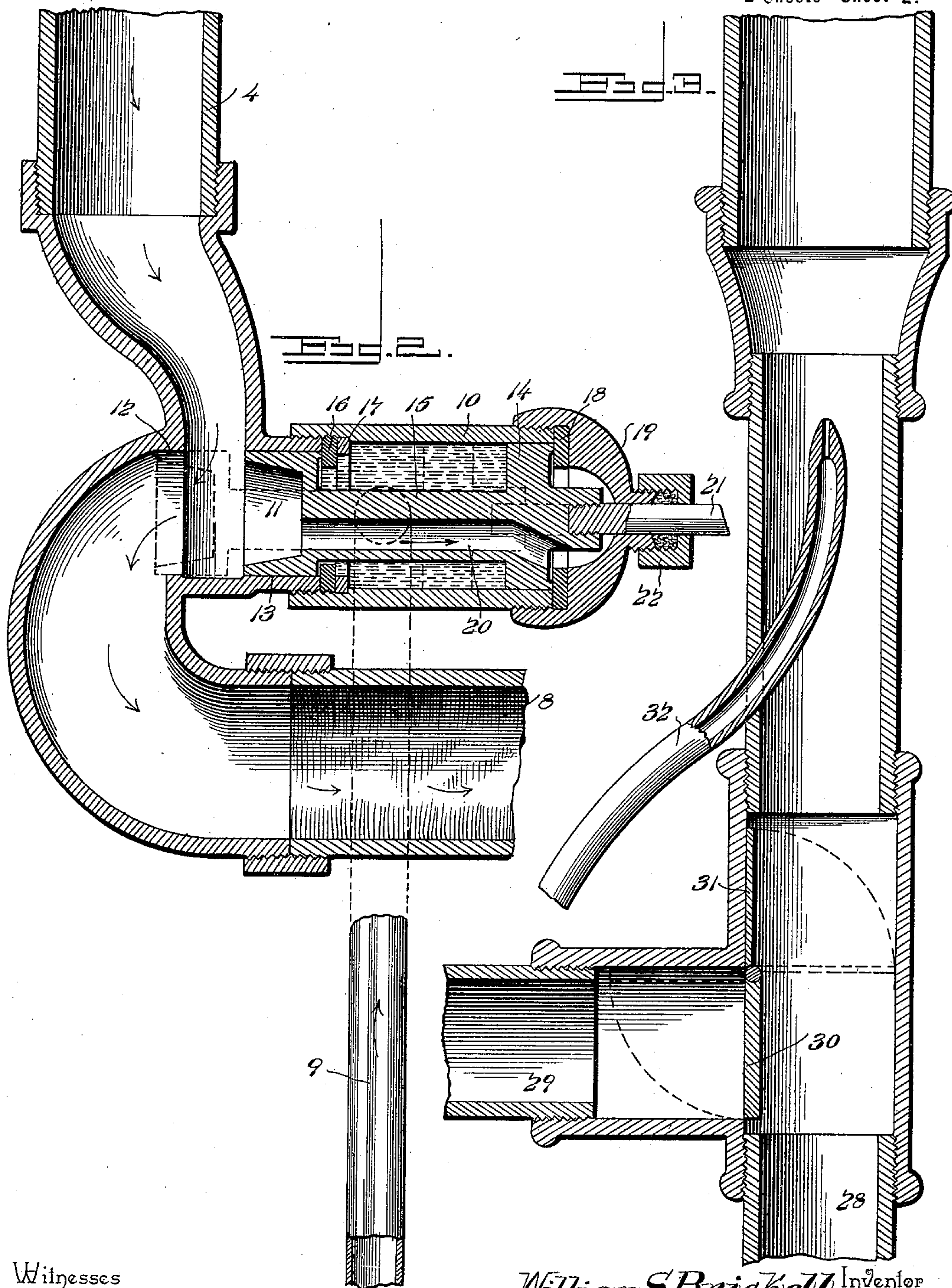
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Witnesses

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# UNITED STATES PATENT OFFICE.

WILLIAM SPENCER BRICKELL, OF OLEAN, NEW YORK.

## CLOSET VENTILATING AND FLUSHING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 629,709, dated July 25, 1899.

Application filed September 20, 1898. Serial No. 691,466. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM SPENCER BRICKELL, a citizen of the United States, residing at Olean, in the county of Cattaraugus and State of New York, have invented a new and useful Closet Ventilating and Flushing Apparatus, of which the following is a specification.

My invention relates to a flushing apparatus for water-closets, and has for its object to provide a simple and efficient automatic flushing device adapted to operate efficiently in the cleansing of the bowl, but designed particularly for maintaining a positive ventilating-current of air from the time of occupation of the water-closet seat until the completion of the flushing operation in order to remove gases and offensive odors from the bowl and prevent the escape thereof into the apartment.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a view, partly in section, of a flushing apparatus arranged in operative relation with a water-closet bowl; the tank and connections being housed in the partition-wall contiguous to which said bowl is located. Fig. 2 is a central sectional view of the supply-controlling valve and the contiguous portions of the flush-pipe. Fig. 3 is a detail sectional view of a portion of the vent-pipe and blow-off or relief pipe and also showing the air-inlet-controlling valve. Fig. 4 is a front view of the upper portion of the tank and the contiguous portions of the vent-pipe and blow-off or relief pipe. Fig. 5 is a detail vertical section of the upper portion of the tank with the contiguous extremities of the air-inlet and relief pipes.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

In practice I prefer to house the flushing-tank 1, with its immediate connections, in a partition-wall, as indicated in Fig. 1, between the vertical studding 2, (shown in Fig. 4,) the same being arranged in rear of a removable panel 3, whereby access may be had thereto with facility. Said tank communicates at its lower end with the flush-pipe 4,

which in turn communicates with the distributing or flushing rim 5 of the bowl 6, the latter being in communication, as in the ordinary practice, with an outlet or soil pipe 7. Between the flush-pipe proper and the bowl-rim I preferably interpose a flexible section 8.

A water-supply pipe 9 has a valve communication with the flush-pipe at an intermediate point between the tank and the bowl, and the same valve mechanism whereby the supply-pipe is controlled preferably serves to control the communication of the contents of the tank through the flush-pipe to the bowl. In the construction illustrated the controlling-valve casing 10 communicates at one end with the side of the flush-pipe, and the valve 11 is capable of adjustment to occupy a position in operative relation with either of two seats, the seat 12 being in the flush-pipe and being designed to allow the communication of the contents of the tank to the flushing-rim of the bowl and the seat 13 being in the valve-casing and being designed to control the communication of water from the interior of the casing to the tank, the supply-pipe 9 being in communication with the valve-casing. I preferably employ a piston-valve, as illustrated in detail in Fig. 2, of which the head or valve proper, 11, is connected with a return piston 14 by means of a reduced core 15, said return piston head or plunger 14 being of an area in excess of the valve head or piston 11, whereby supply-pipe pressure within the valve-casing is adapted to advance the valve in the direction indicated by the arrow in Fig. 2 to arrange the valve-head 11 in the supply-pipe seat 13, and thus cut off communication between the supply-pipe and the tank. A packing-ring 16 is arranged in the path of the valve-head 11, the same being held in place by means of a securing-ring 17, and a similar packing-ring 18 is arranged in the path of the return piston or plunger 14 and is held in place by means of a cap 19. The core 15 is provided with an equalizing port or channel 20, through which water or other fluid is adapted to pass alternately in opposite directions during the movements of the valve to prevent suction and facilitate the adjustment of the valve.

Connected with the valve is a stem 21, extending through a stuffing-box 22 in the head



19 and connected with a closet-seat 23. The means of connection between said stem and the closet-seat preferably consist of a lever 24, fulcrumed, as at 25, to a fixed object and having said stem connected with the opposite extremity thereof, and a push-rod 26, connected with said lever at an intermediate point and terminally arranged for contact with the rear end of the seat 23. Thus when the seat is depressed the push-rod 26 is advanced rearwardly to impart motion in a corresponding direction to the valve-stem 21, and thus shift the valve from its normal position in the seat 13 to a position in the seat 12, whereby communication between the tank and the flush-rim of the bowl is cut off. This change of position of the valve, however, opens communication between the casing 10, and hence the supply-pipe, and the tank to allow the tank to fill. Thus during the time that the seat 23 is depressed, as by the weight of an occupant, communication is opened between the supply-pipe, and the tank to allow the latter to be charged; but upon the release of the seat it is returned to its elevated position (indicated in Fig. 1) by the fluid-pressure upon the return piston or plunger 14, and simultaneously the valve-piston 11 is seated in the end of the casing 10, and communication is opened between the tank and the flush-rim of the bowl to allow the prompt flushing of the latter. In other words, instead of employing return springs or counterbalances for maintaining the yielding seat in its normal position I utilize the force of the supply-water by means of pistons of different areas operating, respectively, in portions of the valve-casing, which are of areas corresponding with said pistons. It will be noted, furthermore, that the valve-piston is operative only at the limits of its movements. In one terminal position it is fitted in the seat 12 and in the other terminal position it is fitted in the seat 13. Thus there is no intermediate point at which the valve may stop in its movement, the movement thereof to its position in the seat 12 being accomplished mechanically and positively by the depression of the seat 23, and the return thereof to its position in the seat 13 being accomplished by the water-pressure supplied through the pipe 9.

Communicating with a vent 27 in the bowl is a vent-pipe 28, which may extend into a chimney or to a point outside of the building in which the closet is located, said vent-pipe being in communication near the upper end of the tank with an inlet or suction pipe 29, and at the point of connection of the inlet or suction pipe 29 with the vent-pipe 28 is arranged a controlling-valve of plural-leaf construction, or adapted when the inlet or suction pipe is closed to open direct passage through the vent-pipe and when the vent-pipe is closed to open communication between said vent-pipe and the suction-pipe. An efficient construction of valve is that illustrated in the drawings, Fig. 3, consisting of a leaf 30,

adapted to close communication between the suction-pipe and the vent-pipe, and an attached leaf 31 for closing the direct passage through the vent-pipe. These leaves are arranged in alinement upon a common pivot, and when the leaf 30 is in the position indicated in full lines to cut off communication between the suction-pipe and the vent-pipe the leaf 31 is disposed in its folded position to open direct passage through the vent-pipe, whereas when the parts are in the dotted position indicated in Fig. 3 direct communication is open between the vent-pipe and the suction-pipe, while upward passage through the vent-pipe beyond the suction-pipe is cut off by the leaf 31. Normally this valve is held in the position indicated in full lines in Fig. 3 by the gravity of the leaf 30, which is of a weight in excess of the leaf 31, and therefore there is direct communication between the vent-opening 27 of the bowl and the outlet of the vent-pipe; but in case of a strong influx of air through the suction-pipe into the upper end of the tank the valve will be turned to occupy approximately the dotted position indicated in Fig. 3, whereby said influx of air will be from the bowl, while direct passage upwardly through the vent-pipe is closed. Also, in communication with the tank at its upper end is a blow-off or relief tube 32, which is arranged terminally in the vent-pipe 28 and has a reduced outlet-orifice forming a "time-discharge." This orifice may be made as small as desired to control the rapidity with which air may pass therethrough, and by means of this device I am enabled to control the rapidity with which the tank is filled with water by means of the supply-pipe, as will be understood from the following description of the operation.

The parts are normally located as indicated in Fig. 1 and in full lines in Figs. 2 and 3, the tank being empty. When the seat is depressed, the valve 11, by which the supply-pipe is controlled, is opened or is moved to the seat 12, whereby water from the supply-pipe passes into the tank. As the tank fills, the air contained therein is forced out through the blow-off or relief tube 32 and into the vent-pipe in an upward axial direction. This discharge of air into the vent-pipe causes an upward current of air in the latter, and thus induces a ventilating-current from the bowl, which continues as long as is required to fill the tank. Thus during the occupation of the seat a continuous ventilation of the bowl is maintained, and when the seat is released and is elevated by the return of the valve 11 to its normal position the water flows from the tank through the flush-pipe into the bowl and the latter is rapidly flushed; but the escape of water from the tank is accompanied by an influx of air through the suction-pipe 29, which closes the upper portion of the vent-pipe by means of the valve-leaf 31, whereby said air necessary to supply the tank is drawn from the bowl. Hence during the occupation of the seat a con-



tinuous ventilation of the bowl is maintained, and this ventilation continues after the seat is released until the bowl has been thoroughly flushed and cleansed. To close the inlet end of the relief-tube, I employ a float-valve 33, as shown in Fig. 5, and in the suction-pipe 29 is arranged a check-valve 34 for preventing the overflow of water from the tank into the vent-pipe, while allowing air to be drawn through the suction-pipe from the vent-pipe during the descent of water in the tank.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described my invention, what I claim is—

1. In a water-closet flushing and ventilating apparatus, the combination of a vent-pipe in communication at its inlet end with the closet-bowl, a tank having a relief-tube terminating in said vent-pipe to produce an influx of air at the inlet end of the vent-pipe during the filling of the tank, and means for controlling the flow of water into and out of the tank, substantially as specified.

2. In a water-closet flushing and ventilating apparatus, the combination of a closed flushing-tank, a vent-pipe communicating at its inlet end with the bowl of the closet, and connected with the interior of the tank to receive the air escaping from the latter during the filling thereof with water, the direction of said discharge being toward the outlet end of the vent-pipe, and means for controlling the flow of water into and out of the tank, substantially as specified.

3. In a water-closet flushing and ventilating apparatus, the combination of a vent-pipe in communication at its inlet end with the closet-bowl, a flushing-tank, a "time-discharge" relief-tube, extending from the top of the tank into the vent-pipe and extended therein toward the outlet end of said pipe, and means for controlling the flow of water into and out of the tank, substantially as specified.

4. In a water-closet flushing and ventilating apparatus, the combination with a closed flushing-tank, of a vent-pipe in communication with the closet-bowl and with the tank at its top, valve mechanism for closing communication between the vent-pipe and the tank simultaneously with opening communication directly through the vent-pipe, and a relief-tube connecting the tank with the vent-pipe above said valve mechanism, and means for controlling the flow of water into and out of the tank, substantially as specified.

5. In a water-closet flushing and ventilating apparatus, the combination of a flushing-tank, a vent-pipe in communication with the closet-bowl, and also in communication with the tank at its top by means of a suction-passage and a relief-passage, valve mechanism for controlling the communication between the

lower portion of the vent-pipe and the upper portion thereof and said suction-passage, respectively, and means for controlling the flow of water into and out of the tank, substantially as specified.

6. In a water-closet flushing and ventilating apparatus, the combination of a flushing-tank, a vent-pipe in communication with the closet-bowl, a suction-passage connecting the vent-pipe with the tank at its top, pressure-controlled valve mechanism for establishing communication between the suction-passage and the lower portion of the vent-pipe, and between the lower and upper portions of the vent-pipe, alternately, a relief-tube connecting the upper portion of the tank with the vent-pipe above the plane of said valve mechanism, and of less cross-sectional area than the vent-pipe, to cause an upward current of air in the vent-pipe, and a suction at the lower end thereof, during the filling of the tank, and means for controlling the flow of water into and out of the tank, substantially as specified.

7. In a water-closet flushing and ventilating apparatus, the combination of a flushing-tank, a vent-pipe in communication with the closet-bowl, a suction-passage connecting the vent-pipe with the tank at its top, pressure-controlled valve mechanism for establishing communication between the suction-passage and the lower portion of the vent-pipe, and between the lower and upper portions of the vent-pipe, alternately, a relief-tube connecting the upper portion of the tank with the vent-pipe above the plane of said valve mechanism, and of less cross-sectional area than the vent-pipe, to cause an upward current of air in the vent-pipe, and a suction at the lower end thereof, during the filling of the tank, the discharge end of said relief-tube, inclosed within the vent-pipe, being extended toward the outlet end of the latter, and means for controlling the flow of water into and out of the tank, substantially as specified.

8. In a water-closet flushing and ventilating apparatus, the combination of a flushing-tank, and means for controlling the flow of water into and out of the tank, of a vent-pipe adapted to be supplied with air at a point adjacent to the closet-bowl, and connections between the vent-pipe and the tank whereby air is discharged from the tank into the said pipe, and is drawn from said pipe into the tank, respectively, during the filling and emptying of the tank to induce an influx of air at that end of the pipe which is in the vicinity of the closet-bowl during both the filling and the emptying of the tank, substantially as specified.

9. In a water-closet flushing and ventilating apparatus, the combination of a flushing-tank, and means for controlling the flow of water into and out of the tank, of a vent-pipe having its inlet end located at a point adjacent to the closet-bowl, and fluid-controlled valve connections between the vent-pipe and the



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ing both the filling and the emptying of the  
tank, substantially as specified.

In testimony that I claim the foregoing as  
my own I have hereto affixed my signature in  
the presence of two witnesses.

WILLIAM SPENCER BRICKELL.

Witnesses:

THOS. J. BRICKELL,  
ORMEL W. PIERCE.