

Oct. 3, 1933.

C. C. CAMPUS
SIPHON JET FLUSHING NOZZLE, WATER CLOSET,
FLUSHING VALVE, AND BIDET COMBINATION
Filed Sept. 26, 1932

1,928,717

4 Sheets-Sheet 1

Fig: 1

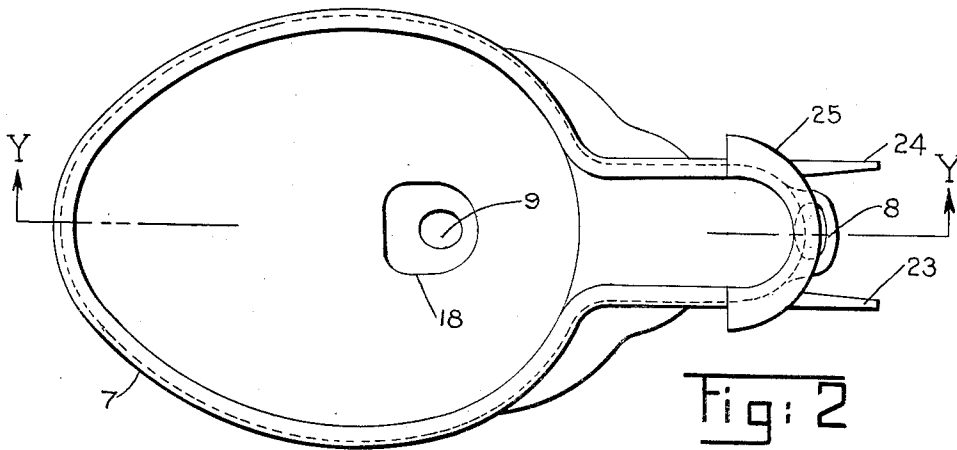
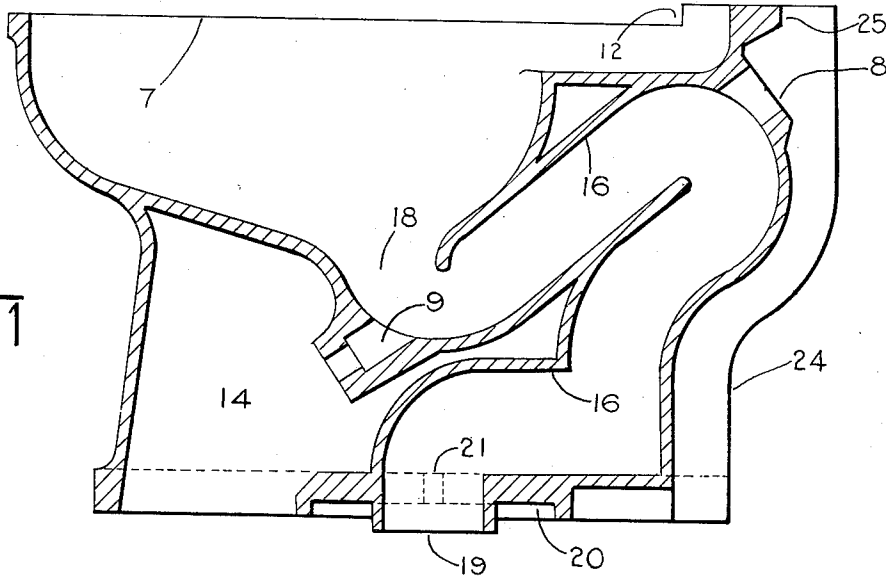
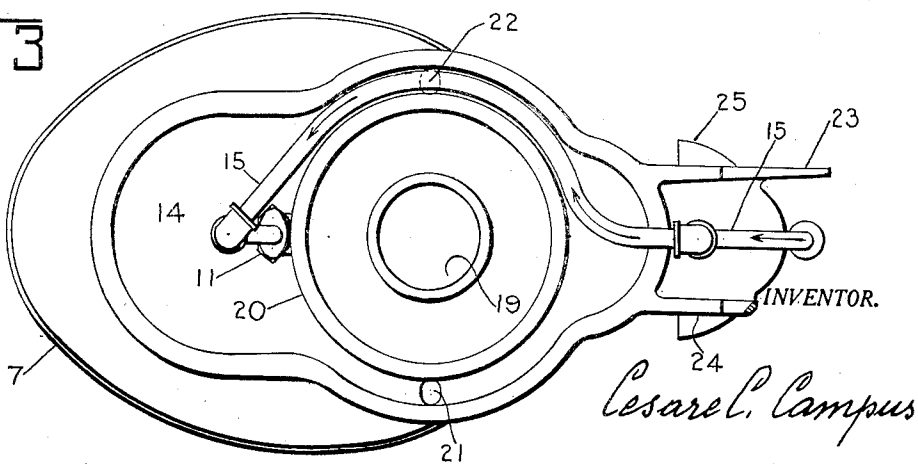


Fig: 3



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4 Sheets-Sheet 2

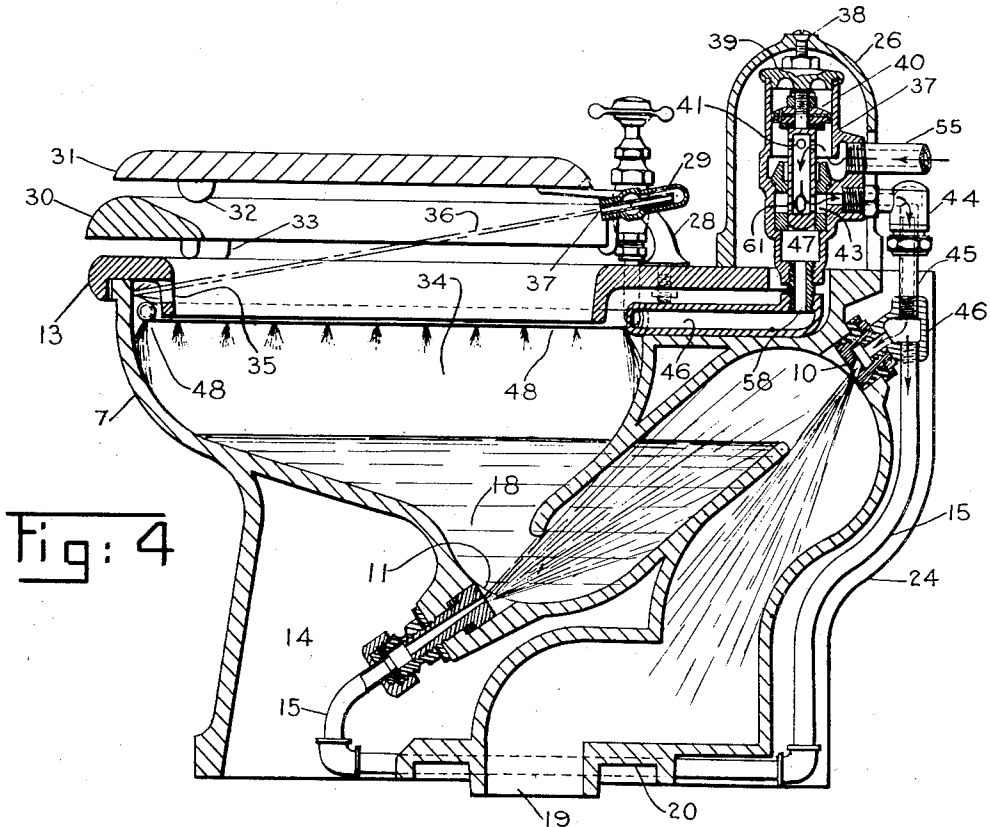


Fig: 4

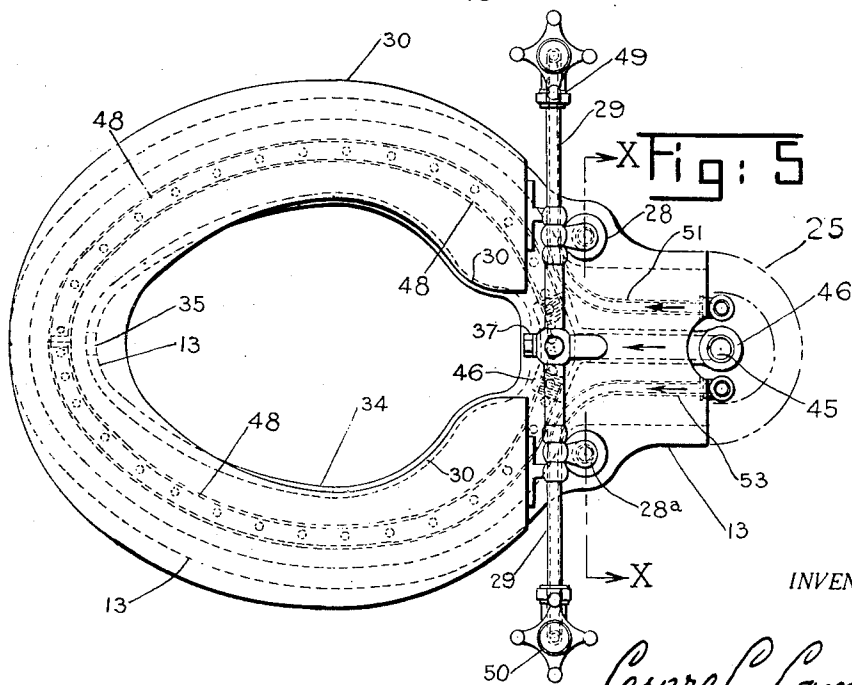


Fig: 5

INVENTOR.

Cesare C. Campus

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4 Sheets-Sheet 3

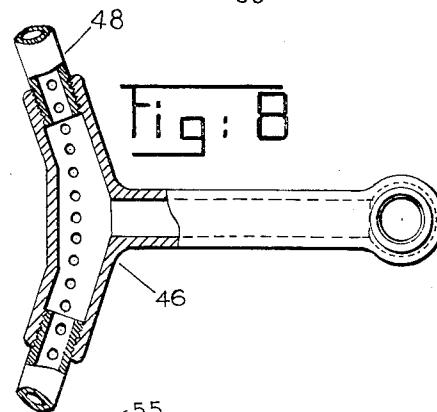
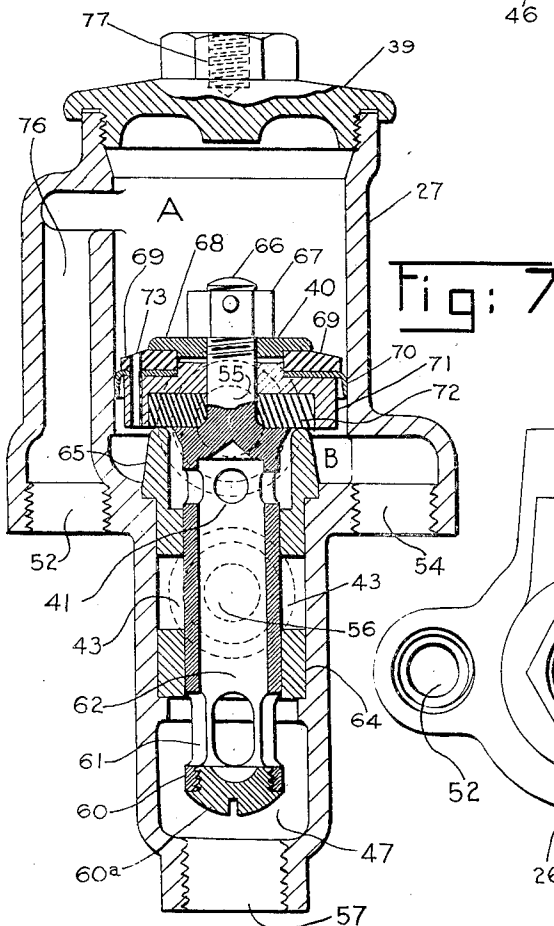
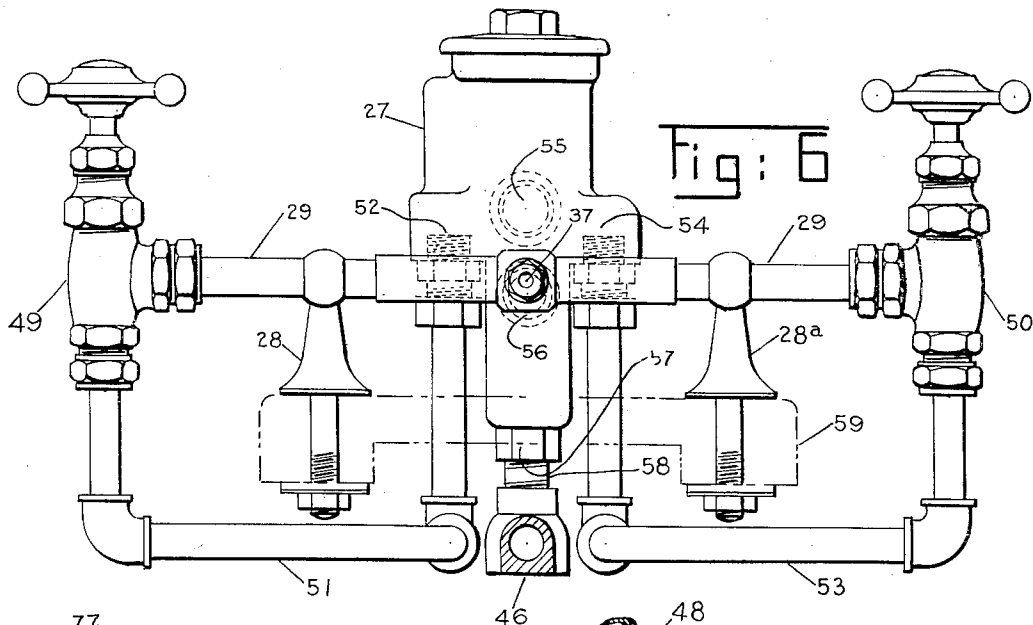


Fig: 7

Fig: 8

Fig: 9

INVENTOR.

Cesare C. Campus

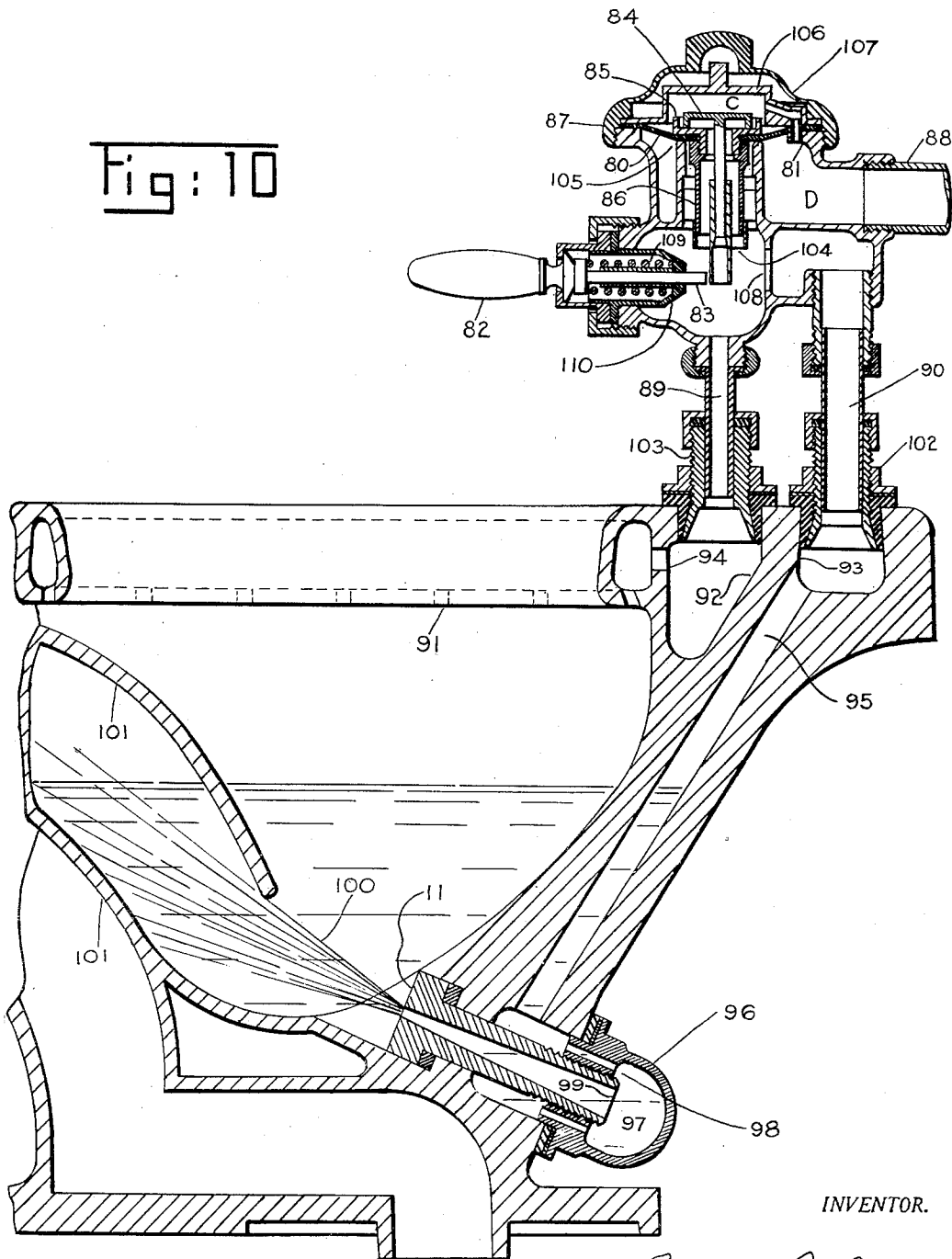
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4 Sheets-Sheet 4

Fig: 10



INVENTOR.

Cesare C. Campus

UNITED STATES PATENT OFFICE

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SIPHON JET FLUSHING NOZZLE, WATER
CLOSET, FLUSHING VALVE, AND BIDET
COMBINATION

Cesare C. Campus, Santa Monica, Calif.

Application September 26, 1932

Serial No. 634,865

8 Claims. (Cl. 4—70)

This invention relates to a substantial and practical improvement on the present method of flushing a closet bowl.

Two types of water closets are most in use, namely the so-called wash-down and the siphon jet.

All water closets empty on the principle of siphonic action. This is obtained by means of a flushing tank or a flushing valve in combination with a water closet; both apparatuses are provided with a comparatively large outlet suitable to obtain a large volume of water to rush into the bowl through the flushing rim at a very reduced pressure over that of the main water supply.

A water closet of a siphon jet type, is provided with an opening at the bottom of the bowl, thus when it is flushed the water enters first through said opening, forming a large, short and very slow jet without siphonic action; but it stimulates the flushing action by only starting the water up the gooseneck, which, simultaneously receiving the rushing water from the flushing rim, forms the siphonic action which flushes the bowl.

The flushing of the bowl with this type of siphon jet is somewhat quicker and more efficient than in a wash-down type water closet which does not carry a siphon jet.

Water closets, flushing tanks or flushing valves as customarily constructed and used in combination with a water closet, have several disadvantages.

The so-called siphon jet has no siphon action, thus the flushing of the bowl is slow, and as it does not perform the function that its name implies it cannot be considered a siphon jet.

In all types of water closets the flushing water has not sufficient pressure to always cleanse the bowl thoroughly.

The wash-down type water closet, while less expensive than the siphon jet type is not so efficient and sanitary.

The flushing tank action is slow and has the tendency to stir up the contents in the bowl, causing the odors to permeate into the room.

All flushing valves, as commonly in use have the inconvenience that they cannot work unless connected with a pipe line of not less than one inch diameter, thus resulting much more expensive than the piping required for the flushing tank; generally speaking, homes are equipped with half inch or less pipe line, for the flushing apparatus, therefore, a flushing valve cannot be used, but only a flushing tank.

The object of my invention is to overcome all of

the above described inconveniences, and principally the inefficiency of the so-called siphon jet.

Up to the present, either flushing tanks or flushing valves must have a large outlet for the flushing water, in order to obtain promptly a large volume of water at a much reduced pressure, and of course speed than that of the main water supply, whereas in my case a very much smaller outlet for the passing of the flushing water is required so as to obtain a much lesser volume of flushing water, but at the maximum pressure and speed obtainable, by causing it to pass from the original size of the water conduit to a very much reduced passage of a nozzle.

The ordinary water closets, cannot resist the high pressure of the main water line, whereas my improved one is provided with suitable conduit or conduits to resist said pressure.

The cleansing of the inside walls of the bowl is done by the water at full pressure from the main water supply, thus in all cases the cleansing is absolutely thorough.

The foregoing objects and advantages together with my subsequent features which may be developed in the description, may be best appreciated from a description read in conjunction with the drawings in which:

Fig. 1 is a vertical transversal section view on line Y—Y Fig. 2.

Fig. 2 is a plan view looking from the top of Fig. 1.

Fig. 3 is a plan view looking from the bottom of Fig. 4.

Fig. 4 is a vertical transversal section of the complete apparatus showing the two siphon jet nozzles in their respective positions and the other members of the apparatus.

Fig. 5 is a plan view of Fig. 4, looking from the top, showing only the flange carrying the seat, but without lid, the bidet apparatus and the perforated rim.

Fig. 6 is a front view of the flushing valve, of the bidet fixture, of the control valves, and in dotted line a supposed section of the flange on line X—X of Fig. 5.

Fig. 7 is a vertical transversal section of the improved flushing valve in a larger size.

Fig. 8 is a plan view of the T shaped fitting carrying at each end, a fragment of the perforated metal conduit, shown in position in Fig. 5.

Fig. 9 is a plan view looking from underneath the flushing valve Fig. 7, showing clearly the five connections, namely one for the inlet of the water supply and the others for the outlet of the water, to perform the different required operations.

Fig. 10 is a vertical transversal section of a fragment of a type of wash-down water closet, provided with one siphon jet flushing nozzle and an ordinary flushing valve, provided with two separate outlets.

In all the forms embodying my invention, the principal elements consist of one or more siphon jet flushing nozzles to form the siphon action in combination with the gooseneck of a water closet, without the aid of any other water supply.

The construction of my invention, shown in Figs. 1 to 9 inclusive is as follows:

7 in Fig. 1, is a rimless water closet without built-in passages, as is usually the case, to carry the water supply to the so-called siphon jet type water closet, provided with openings 8 and 9 to receive the siphon jet flushing nozzles 10 and 11, shown in Fig. 4; 12 is a drop on the bowl to receive flange 13 shown in Fig. 5; 14 is a pocket of suitable size to facilitate the connecting of conduit 15 to siphon jet flushing nozzle 11, shown in Fig. 4; 16 is the gooseneck, with which all kinds of closet bowls are equipped; opening 18 for the passage of the flushing water from the bowl, discharging through opening 19 into the sewer conduit, and flange 20 provided with holes 21 and 22 to fasten the water closet to the floor; ribs 23 and 24 more clearly shown in Fig. 2 are for the purpose of creating a recess to hide the upper end of conduit 15 shown in Fig. 4.

Fig. 2 is a plan view of Fig. 1, showing more clearly the position of ribs 23 and 24 forming the recess to hide conduit 15 shown in Figs. 3 and 4. 18 is the plan view of the opening of gooseneck 16; 25 is a semi-circular flange to complete the contours of flange 13, shown by broken line in Fig. 5 to hold also escutcheon 26 shown in Fig. 4 covering flushing valve 27, also shown in Fig. 4.

Fig. 3 is a plan view looking from underneath of Fig. 4 showing the recess to house conduit 15 in the base of the water closet, pocket 14 of suitable size to connect conduit 15 with siphon jet flushing nozzle 11.

Fig. 4 shows closet bowl 7 carrying a removable flange 13 on which are mounted hinge posts 28 and 28-a carrying bidet fixture 29 on which is swingably mounted toilet seat 30 provided with lid 31 carrying bumpers 32 and 33. Opening 34 centrally located on the removable flange 13, the contour of which is smaller at the back than the back of the contour of seat 30 mounted thereon, is clearly shown in Fig. 5. The purpose is to protect the undersurface of seat 30 from any splashing from the inside of the bowl. 35 is an opening in the rib of removable flange 13 to allow jet 36 from bidet nozzle 37 to strike the inside walls of bowl 7, thus protected by the undersurface of removable flange 13, the splashing of said jet 36 will be prevented from spilling outside of bowl 7.

This characteristic is already covered by claims allowed in Letters Patent granted me on Aug. 30th, 1932, filed April 28, 1932.

Escutcheon 26 is held in position by screw 38, mounted to flushing valve cover 39. The piston valve member 40 is provided with ports 41 into which enters the water supply; outlet 61 thereof distributes the water into chamber 47, supplying the water to perforated conduit 48 and to chamber 43 for the water supply to siphon jet flushing nozzles 10 and 11, passing through elbow 44, nipple 45, T shaped fitting 46 and conduit 15.

Fig. 5 shows control valves 49 and 50; 49 to operate flushing valve 27, and 50 to operate bidet nozzle 37; conduit 51, one end thereof is mounted

to outlet 52 of flushing valve 27, the other end is mounted to control valve 49. Water conduit 53, one end thereof is mounted to outlet 54 of flushing valve 27, the other end to control valve 50, more clearly shown in Fig. 6. The T shaped conduit 46 carries a perforated member 48 in two pieces for the cleansing of the inside walls of the bowl and the refilling thereof.

Fig. 6 shows flushing valve 27 with inlet 55 for the water supply; outlet 52 to operate flushing valve 27; outlet 54 to operate bidet nozzle 37; outlet 56 to operate the siphon jet flushing nozzles 10 and 11; outlet 57 to operate the perforated conduit 48; conduit 51 carries the water supply from outlet 54 to control valve 50; nipple 58 supplies the water through the T shaped fitting 46 to perforated rim 48. In dotted line is shown a section on line Y-Y Fig. 5 of a fragment of the removable flange 13 carrying hinge posts 28 and 28-a, provided with means to fasten them to said flange 13, carrying bidet fixture 29 and toilet seat 30 swingably mounted thereon as shown in Fig. 4.

Fig. 7 shows flushing valve 27, threaded cover 39 carrying threaded hole 77 to receive screw 38 to keep in position escutcheon 26, as shown in Fig. 4. Piston valve 40, centrally mounted, distributor member 60 at one end and closed by tap 60-a provided at the top end with port 41 for the inlet of water supply from chamber B and through conduit 62 to outlet port 61, alternately distributing the water supply by the movement of said piston valve 40 into chambers 47 and 43 and vice-versa during the upward and downward stroke of said piston valve member 40.

As flushing valve 37 carries a pipe line of a much smaller diameter than that carried and required by an ordinary flushing valve, in order to supply the water at the maximum pressure to the siphon jet flushing nozzle, which in this new device forms the siphon action to flush the bowl, it cannot at the same time supply the water to perforated rim 48 without hampering the siphonic action of the flushing nozzle.

It is understood that as an ordinary flushing valve is provided with a pipe line supplying a larger volume of water than the one above described, it can simultaneously supply the water to the perforated conduit and flushing nozzle, but it requires two separate outlets carrying conduit 89 of a smaller diameter than conduit 90 shown in Fig. 10, thus preventing the water supply from dropping to inadequate pressure from that required for the flushing action of the flushing nozzle.

In the event an ordinary flushing valve is wanted, but with only one outlet, this also can be done, namely by providing a pipe line of such a diameter that when simultaneously supplying the water to perforated rim and to the nozzles, the pressure of the water supply will not drop so as to hamper the flushing action of the nozzles. But in both these last described cases the pipe line must be much larger than the 1/2" required for this new device.

In said Fig. 7, bushings 64 and 65 are suitably mounted, to form chamber 43, from which the water flows through conduit 15, shown in Fig. 4 to supply the water to siphon jet nozzles 10 and 11 also shown in Fig. 4, bushing 65 acts also as a seat for valve 72. Conduit 62 is provided at one end with an extension 66 threaded at the end thereof, receiving nut 67 to hold in position washers 68 and 69, leather cup 70, member 71 carrying rubber valve 72, by-pass 73 to keep in communication dash-pot chamber A with water supply

chamber B; conduit 76 is for the outlet from dash-pot chamber A to operate flushing valve 27, herewith more specifically described. This new flushing valve, generally speaking is based on the same principle of an ordinary flushing valve, except for the two main characteristics, one of which is that the handle or push-button which is intended to operate said flushing valve is not mounted to the case thereof for the reasons already explained, but in substitution carries conduit 51 extending to one side of the closet bowl 7 connected to control valve 49, which in turn is mounted to bidet fixture conduit 29. When control valve 49 is operated it relieves the pressure in the dash-pot chamber A. Area of dash-pot being greater than area through main valve seat 65, the water supply to the valve, forces main valve 72 upwardly, opening valve 72 and forcing water from dash-pot chamber A through passage 76, conduit 51 and finally to control valve 49, discharging into the conduit of bidet fixture 29 and through bidet nozzle 37 into the bowl of water closet 7.

When control valve 49 closes, the water from supply enters dash-pot chamber A through by-pass 73 allowing main valve 72 to travel downwardly, causing valve to close. The refilling of the bowl is obtained when the outlet passage 61 of water supply is shut off by bushing 64 in the downward stroke of piston valve 40, thus causing the water to enter chamber 47 and through perforated conduit 48 until main valve 72 is reseated.

Fig. 8 shows the T shaped member 46 with perforations 1 closely placed, thus providing plenty water at the same pressure of the water supply, thus thoroughly cleansing in all cases the rear inside walls of the bowl; 48 shows a fragment of the perforated conduit shown in Figs. 4 and 5.

Fig. 9 shows inlet 55 for the main water supply, outlet 56 to supply the water to siphon jet flushing nozzles 10 and 11, outlet 52 to operate flushing valve 27; outlet 54 to supply the water to bidet nozzle 37 and outlet 57 to supply the water to perforated conduit 48 for the cleansing of the inside walls of the bowl 7.

Fig. 10 shows a fragment of a wash-down water closet, provided with a regular flushing rim 91 and two separate chambers 92 and 93, port 94 for the passage of the water supply to rim 91 built-in conduit 95, the walls thereof of suitable dimensions to resist the high pressure of the main water supply, for the water supply to nozzle 11; threaded cap 96 carrying chamber 97 and perforations 98 to permit the water supply from conduit 95 to enter conic conduit 99 of nozzle 11, discharging at the other end taking the shape of a conic jet 100 of great speed, discharging into goose-neck 101, thus forming the siphon action, substituting the water coming from the flushing rim which flushes any ordinary water closet. Flushing valve 87 connected to the main water supply conduit 88 and the two outlet conduits 89 and 90 connected to the bowl with spouts 102 and 103 which supply the water to the two separate chambers 92 and 93, rubber diaphragm 80 separates the valve into an upper chamber C and a lower chamber D with the pressure the same on both sides of diaphragm 80 equalized by by-pass 81; the slightest touch of handle grip 82 pushes in plunger 83 which tilts auxiliary valve 84, releasing the pressure in upper chamber C, then the pressure below in chamber D raises the entire working parts; 84 auxiliary valve, 80 diaphragm and 86 guide, which, is mounted to seat 85 of auxiliary valve 84, allowing the water

which flushes the bowl to go down through barrel 104; while this is occurring, a small amount travels up through by-pass 81 and gradually fills upper chamber C, thus closing the valve formed by diaphragm 80 on annular seat 105 carried by the flushing valve 27. 106 is the inside cover of chamber C; 107 is the outside cover which holds the other members in position. 108 is a port for the passage of the water supply to conduit 90. Spring 109 is to push back in position plunger 83, which is held in position by guide 110.

In view of the fact that the siphon jet applied to the ordinary water closet does not flush the bowl, but improves the flushing slightly, as explained, where as in my new apparatus either both or only one of the siphon jet flushing nozzles are able to form the siphon action in combination with the gooseneck to flush the bowl, without the help of any water from any other additional source; therefore, it is clear that the water coming from conduit 48, as shown in Figs. 4 and 5 performs only the function of cleansing the inside walls of the bowl and the refilling thereof.

The principle on which the flushing of an ordinary bowl is based, is that of a relatively large volume of water dropping into the bowl, thus by gravity causing the siphon action in combination with the gooseneck, whereas in this improved device the flushing of the bowl is based on the principle of the speed by which the water is discharged through a nozzle suitably shaped, whereby a jet of water, conically shaped invades entirely, at great speed the channel of the gooseneck, thus forming the siphon action that flushes the bowl.

From the foregoing description it will be seen that the purpose of my invention has been accomplished by the device as shown, and that the siphon jet flushing nozzle entirely precludes the inconvenience of a siphon jet without siphonic action, as the one at present in use, at the same time rendering a water closet of the utmost sanitation, also this new type of flushing valve eliminates the inconvenience of the necessity of a pipe line of a diameter of not less than 1", as it can work satisfactory with 1/2" and even 3/8" pipe line. This desirable result has been obtained without complications or increased cost.

What I claim as my invention and desire to secure by Letters Patents, is:

1. A water closet provided with recess or recesses to house one or more siphon jet flushing nozzles, suitably mounted therein, a base flange in combination with said water closet having a recess or recesses to house the conduit connecting the siphon jet flushing nozzle with the water supply, a suitable pocket to connect said flushing nozzle with said water conduit, a pair of ribs extending at the rear of said water closet, forming a recess to house the other end of said water conduit connected to the flushing valve.

2. For use in a device of the nature described, the combination of a trap bowl, a flushing valve therefor, a supply conduit leading from the water main and having an internal area less than that of a one inch standard pipe line connected to said valve, and a water connection from said flushing valve to the outlet portion of the bowl, said connection terminating in a restricted orifice of a smaller area than that of said supply pipe line.

3. For use in a device of the nature described, the combination of a trap bowl, a flushing valve therefor, a supply conduit leading from the water

- main and having an internal area less than that of a one inch standard pipe line connected to said valve, and a water connection from said flushing valve to the trap of said bowl, said connection terminating in a restricted orifice of a smaller area than that of said supply pipe line, said restricted orifice being disposed to direct a high velocity fluid jet rearwardly and upwardly into the discharge side of the trap of said bowl. 80
4. In flushing apparatus for water closets, the combination of a bowl having a trap, a flushing valve therefor, of a supply pipe leading from the water main and having an internal area less than that of a one inch standard pipe and receiving water under pressure, a discharge conduit leading from the flush valve, a control valve connected with the flush valve for controlling actuations thereof, and a nozzle connected with the conduit and opening into the trap and provided with a discharge bore of small diameter relative to that of said supply pipe and disposed so as to project a fluid jet through the trap in a direction toward the discharge end thereof, and at a velocity sufficiently high to produce an effective siphonic action in the trap for evacuating the bowl there-through. 85
5. For use in a device of the nature described, the combination of a trap bowl, a flushing valve therefor, a supply conduit leading from a source of supply in which a minimum pressure of twenty pounds and a maximum pressure of forty pounds is maintained, said supply conduit having an internal area less than that of a one inch standard pipe line connected to said valve, and a water connection from said flushing valve to the outlet portion of the bowl, said connection terminating in a restricted orifice of smaller area than that of said pipe line. 90
6. For use in a device of the nature described, the combination of a trap bowl, a flushing valve therefor, a supply conduit leading from the water main having an internal area less than that of a standard one inch pipe connected to the valve, and a water connection from said flushing valve to the outlet portion of the bowl, said connection terminating in a restricted orifice of a smaller area than that of the supply pipe, the restricted orifice being so located as to direct a high velocity jet of water upwardly against the walls of the outlet portion of the bowl, below the water level therein. 95
7. For use in a device of the nature described, the combination of a trap bowl, a flushing valve therefor, a supply conduit leading from the water main having an internal area less than that of a standard one inch pipe connected to the valve, and a water connection from said flushing valve to the outlet portion of the bowl, said connection terminating in a restricted orifice of a smaller area than that of the supply pipe, the restricted orifice being so located that the water issuing therefrom impinges against the walls of the upwardly extending leg of the trap. 100
8. For use in a device of the nature described, the combination of a trap bowl, a flushing valve therefor, a supply conduit leading from the water main having an internal area less than that of a standard one inch pipe connected to the valve, and a water connection from said flushing valve to the outlet portion of the bowl, said connection terminating in a restricted orifice of a smaller area than that of the supply pipe, the restricted orifice being so located that the water issuing therefrom impinges against the walls of the upwardly extending leg of the trap. 105
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