

J. CLIFFORD & J. H. GAVIN.
WATER CLOSET.
APPLICATION FILED FEB. 23, 1911.

Patented Dec. 12, 1911

2 SHEETS-SHEET 1

1,011,159.

Fig. 1

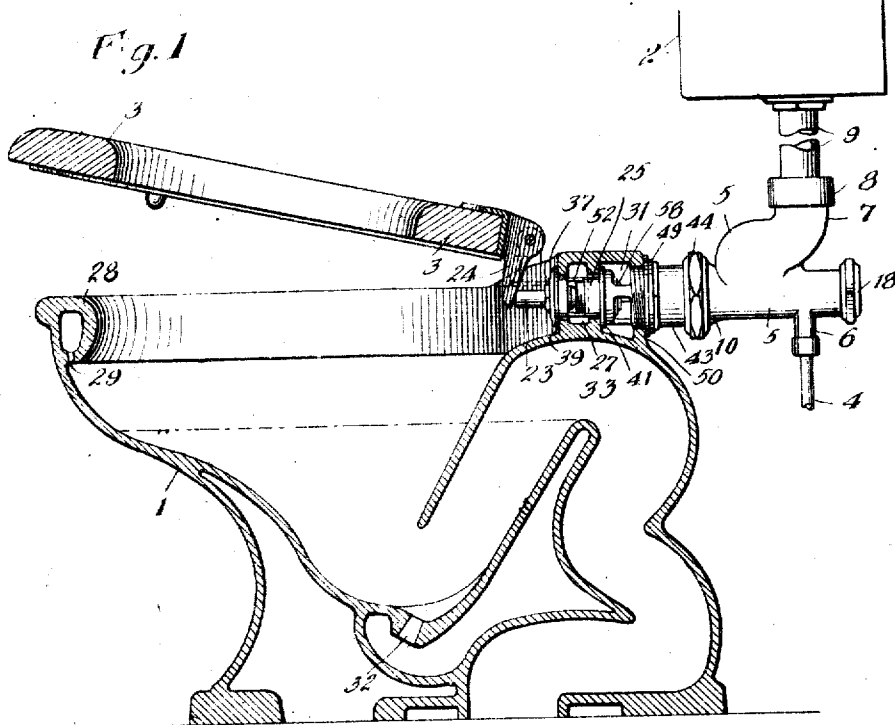
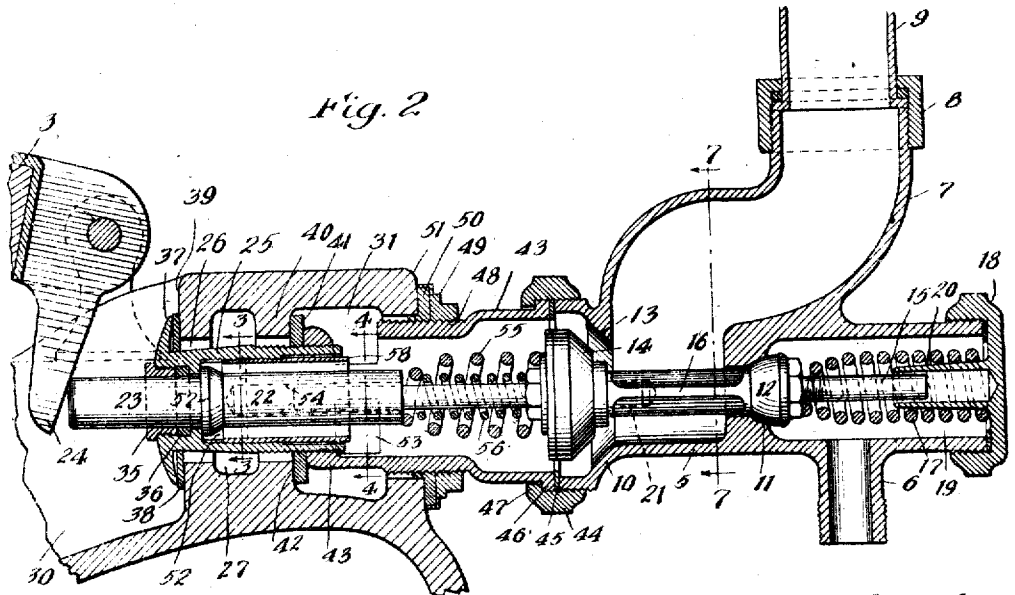


Fig. 2



Witnesses:

Wm. Geiger
H. M. Sunday

Inventors
John Clifford
John H. Gavin
By *Monday Evans* *Week & Clarke*
Attys.

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Fig. 3

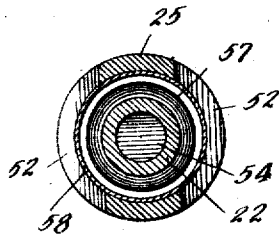


Fig. 5

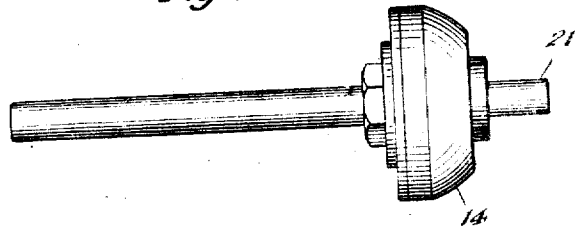


Fig. 4

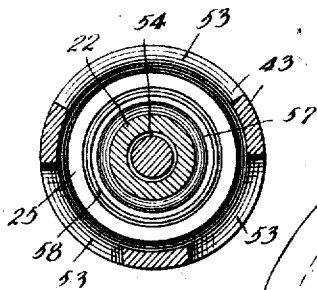


Fig. 6

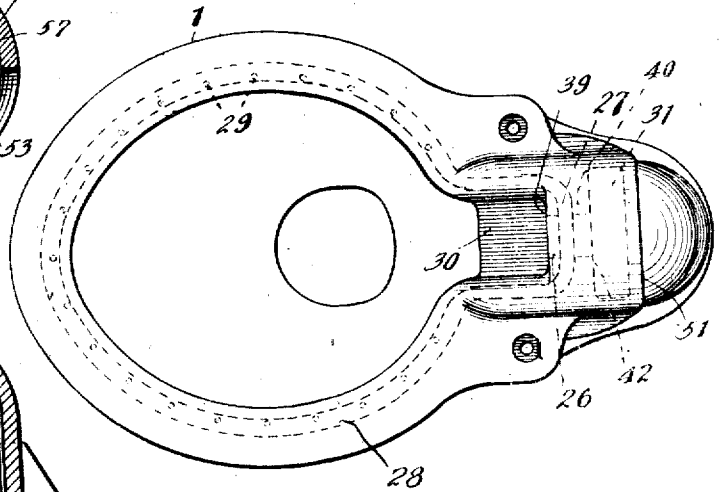
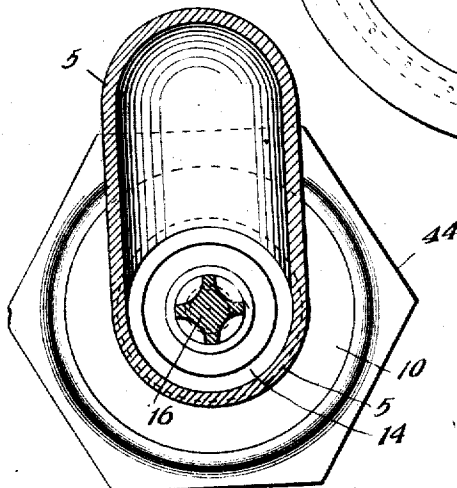


Fig. 1



Witnesses

Wm. Guiger
A. W. Munday

Inventors
John Clifford
John H. Gavin

By Munday, Evans, Adevock & Clarke
Attys.

UNITED STATES PATENT OFFICE.

JOHN CLIFFORD AND JOHN H. GAVIN, OF CHICAGO, ILLINOIS, ASSIGNORS TO L. WOLFF
MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

WATER-CLOSET.

Specification of Letters Patent.

Patented Dec. 12, 1911.

1,011,159.

Application filed February 23, 1911. Serial No. 610,149.

To all whom it may concern:

Be it known that we, JOHN CLIFFORD and JOHN H. GAVIN, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Water-Closets, of which the following is a specification.

Our invention relates to improvements in water closets and more particularly to improvements in water closets of the kind having a pressure flushing tank and flushing valve operated by the seat.

The object of our invention is to provide a pressure flushing tank water closet in which the flushing valve is operated by the seat, which will be of a strong, simple, efficient and durable construction, the parts of which may be quickly and easily installed or put together, in which the valves will be self adjusting to the bumpers of the seat so that the seat may always properly close down against the rim of the closet without exerting undue strain upon the valve mechanism or upon the hinges of the seat, and in which the flow of water to the flushing rim and to the bowl proper may be easily and conveniently adjusted as required to suit different conditions.

Our invention consists in the novel constructions of parts and devices and in the novel combinations of parts and devices herein shown and described and more particularly specified in the claims, by which the above and other objects or results are practically accomplished.

In the accompanying drawing forming a part of this specification, Figure 1 is a side elevation, partly in central, vertical section of a pressure tank seat operated flushing valve water closet embodying our invention. Fig. 2 is an enlarged detail vertical section. Figs. 3 and 4 are detail cross sections on line 3—3 and 4—4 respectively of Fig. 2. Fig. 5 is a detail view of the flushing valve and its stem. Fig. 6 is a detail plan view of the water closet bowl and Fig. 7 is an enlarged detail section on line 7—7 of Fig. 1.

In the drawing, 1 represents a water closet bowl, 2 the pressure flushing tank, 3 the seat, 4 the water supply pipe, 5 the valve shell having a threaded branch or nipple 6 connecting with the water supply pipe, a branch 7 connected by a coupling 8 with the flushing pipe 9 leading to the pressure

tank 2 and a threaded branch 10 connecting with the water closet bowl.

The valve shell 5 has a valve seat 11 which is engaged by the supply valve 12 and a valve seat 13 against which the flushing valve 14 closes. The supply valve 12 and valve 14 are arranged axially in line with each other and the supply valve has an outwardly projecting stem 15 and an inwardly projecting hollow stem 16. The supply valve is normally held closed by the pressure of water from the supply pipe and also by a spring 17 which is interposed between the valve 12 and the screw cap 18 which closes the chamber 19 in which the valve 12 fits. The screw cap 18 is furnished with an integral hollow stud 20 to support the spring and serve as a guide for the valve stem.

The stem 21 of the flushing valve 14 fits at one end within the hollow stem 16 of the valve 12 and at its inner end in the hollow end 22 of the piston 23 which is operated by the lever arm 24 secured to the hinged seat 3.

The valve operating piston 23 is mounted to reciprocate in a hollow bushing 25 which extends through an opening 26 in the upper back portion of the water closet bowl 1. The valve opening 26 through the upper rear portion of the water closet bowl intersects the flushing channel 27 which is formed in the hollow rim 28 of the bowl and which is furnished with the customary discharge openings 29 distributed around the rim of the bowl. The bowl is provided in its upper back portion with a recess or pocket 30 around which the flushing channel 27 extends and which recess or pocket serves to receive the front end of the piston 23 and the front end of the hollow bushing 25 in which the piston is mounted and also to accommodate the operating arm 24 which is attached to the seat. This pocket or recess in the bowl thus prevents the piston and operating arm of the seat from projecting into the interior of the bowl and thus promotes cleanliness and sanitary conditions. The valve opening 26 in the bowl also intersects the wash-out channel 31 leading to the interior of the bowl at the bottom portion thereof through the discharge orifice 32 which is directed as usual into the horn or outlet portion 33 of the bowl.

The hollow bushing 25 is provided with an internal annular flange 34 and with a

stuffing box 35, 36, through which the piston 23 extends to form a tight joint, while permitting the piston to reciprocate as required. The stuffing box preferably comprises a threaded sleeve member 35 and an elastic packing ring member 36. The hollow bushing 25 is also provided at its front end with an external flange 37 and a packing ring 38 which is interposed between said flange and the rear upright face 39 of the pocket or recess 30 in the water closet bowl to form a tight joint between the bushing 25 and the water closet bowl when the bushing is properly clamped against the bowl.

The water closet bowl is provided with an integral web 40 between its flushing channel or chamber 27 and its wash-out channel or chamber 31, and an elastic closure disk or packing ring 41 is clamped against the outer shoulder 42 of the web 40 by the connecting sleeve 43, the inner end of which is threaded upon the externally screw threaded outer end of the bushing 25, thus producing a water tight closure between the flushing channel and the wash-out channel of the water closet bowl. The connecting sleeve 43 is connected to the externally screw threaded branch 10 of the valve shell 5 by a coupling nut 44, an elastic packing 45 being interposed between the abutting ends of the connecting sleeve 43 and branch 14 and the sleeve 43 having a shoulder 46 for engagement with the annular shoulder 47 of the nut.

The connecting sleeve 43 has internal screw threads 48 at its middle portion for engagement with the clamp nut 49 by which the connecting sleeve 43 and hollow bushing 25 are clamped in position on the water closet bowl, an elastic packing 50 being interposed between the nut 49 and the outer face 51 of the bowl. The hollow bushing 25 is provided with flushing ports or openings 52 therethrough to supply water to the flushing rim of the bowl, and the connecting sleeve 43 is provided with wash-out ports or openings 53 therethrough to supply water to the washout channel of the bowl. The hollow bushing is furnished on its inside with an adjustable sleeve 58, preferably screw threaded to said bushing for regulating the relative size of the flushing ports, and thus the relative amount of water admitted to the flushing rim of the bowl. This adjusting sleeve also serves to increase or diminish the relative flow of water through the wash-out ports.

The valve operating piston 23 is made hollow at its inner end or furnished with a recess 54 to receive the inner end of the flushing valve stem and support the same in line with the piston. The piston and flushing valve stem are adapted to slide or telescope in respect to each other to a limited extent, and springs 55, 56 are interposed

between the flushing valve 14 and the outer end of the piston, thus affording a yielding or spring connection between the flushing valve and the piston and thereby causing the stroke of the operating arm on the hinged valve seat to automatically adjust itself to the required movement of the flushing valve, and preventing all danger of injuring the valve or straining the hinges of the seat. The springs 55, 56 are made relatively stiff and strong so that substantially the whole movement of the piston 23 will be communicated to the flushing valve 14, while at the same time allowing for the necessary compensatory movement or adjustment.

In operation, the depression of the seat moves the piston 23 and through the springs 55, 56 closes the flushing valve 14, and at the same time opens the supply valve 12, the springs 55, 56 being stronger than the spring 17, and enough so to overcome the pressure of the water and thus causes the pressure tank 2 to fill with water, the inflowing of the water compressing the air in the upper portion of the pressure tank in the usual manner. When the seat is released, the spring 17 closes the supply valve 12 and opens the flushing valve 14 and permits the water in the pressure tank 2 to flow into the bowl in part through the flushing rim and in part through the washout channel. By turning the port adjusting sleeve 58 in the hollow bushing 25, the relative flow of water through the flushing rim may be regulated as desired. The piston 23 is furnished with a stop collar 57 to limit the inward movement of the piston.

We claim:—

1. In a pressure tank flushing valve water closet, the combination with a bowl having a wash-out channel and a flushing rim channel and an opening intersecting said channels to receive the valve mechanism, of a valve shell, supply valve and flushing valve, a hollow bushing and a connecting sleeve between said bushing and valve shell, said hollow bushing and connecting sleeve having ports therethrough communicating with the flushing channel and washout channel of the bowl, and a disk surrounding said bushing and separating the flushing and washout ports from each other, substantially as specified.
2. In a pressure tank flushing valve water closet, the combination with a bowl having a washout channel and a flushing rim channel and an opening intersecting said channels to receive the valve mechanism, of a valve shell, supply valve and flushing valve, a hollow bushing and a connecting sleeve between said bushing and valve shell, said hollow bushing and connecting sleeve having ports therethrough communicating with the flushing channel and washout channel of the bowl, and a disk surrounding said bushing

and separating the flushing and washout ports from each other, and a port adjusting device for regulating the relative flow to the flushing rim of the bowl, substantially as specified.

3. In a pressure tank flushing valve water closet, the combination with a bowl having a washout channel and a flushing rim channel and an opening intersecting said channels to receive the valve mechanism, of a valve shell, supply valve and flushing valve, a hollow bushing and a connecting sleeve between said bushing and valve shell, said hollow bushing and connecting sleeve having ing ports therethrough communicating with the flushing channel and washout channel of the bowl, and a disk surrounding said bushing and separating the flushing and washout ports from each other, and a port adjusting sleeve for regulating the flow of water to the flushing rim, substantially as specified.

4. In a pressure tank flushing valve water closet, the combination with a bowl having a washout channel and a flushing rim channel and an opening intersecting said channels to receive the valve mechanism, of a valve shell, supply valve and flushing valve,

a hollow bushing and a connecting sleeve between said bushing and valve shell, said hollow bushing and connecting sleeve having ing ports therethrough communicating with the flushing channel and washout channel of the bowl, and a disk surrounding said bushing and separating the flushing and washout ports from each other, and a port adjusting sleeve for regulating the flow of water to the flushing rim, said port adjusting sleeve fitting inside and being screw threaded to said hollow bushing, substantially as specified.

5. In a pressure tank flushing valve water closet, the combination with a bowl having a pocket at its upper back portion to receive the inwardly projecting end of the valve operating piston, and provided with a flushing rim channel extending around said pocket, of a flushing valve mechanism, substantially as specified.

JOHN CLIFFORD.
JOHN H. GAVIN.

Witnesses:

PEARL ABRAMS,
H. M. MUNDAY.