

No. 669,990.

Patented Mar. 19, 1901.

H. HAYNES.

WATER CLOSET FLUSHING APPARATUS.

(Application filed Nov. 15, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

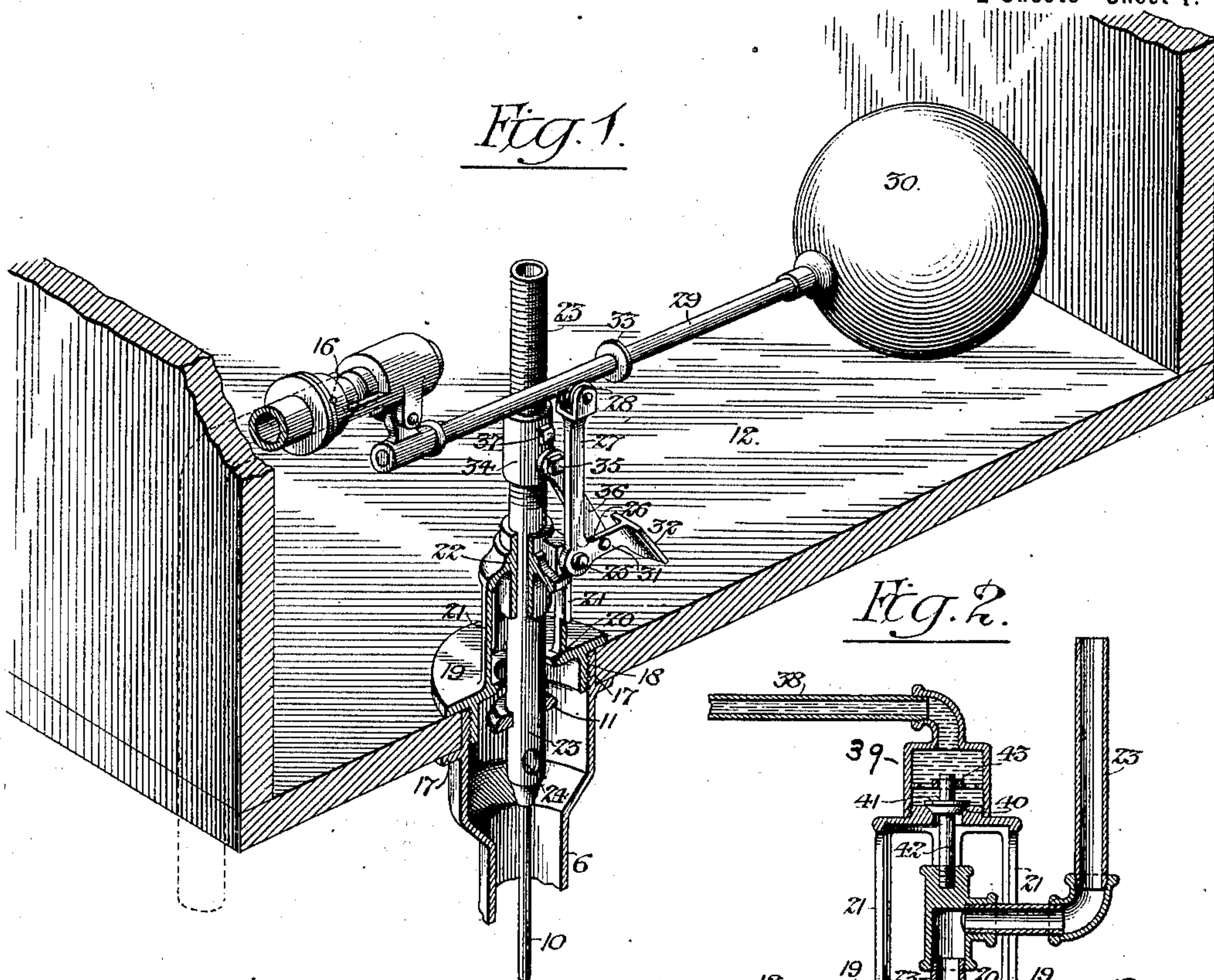
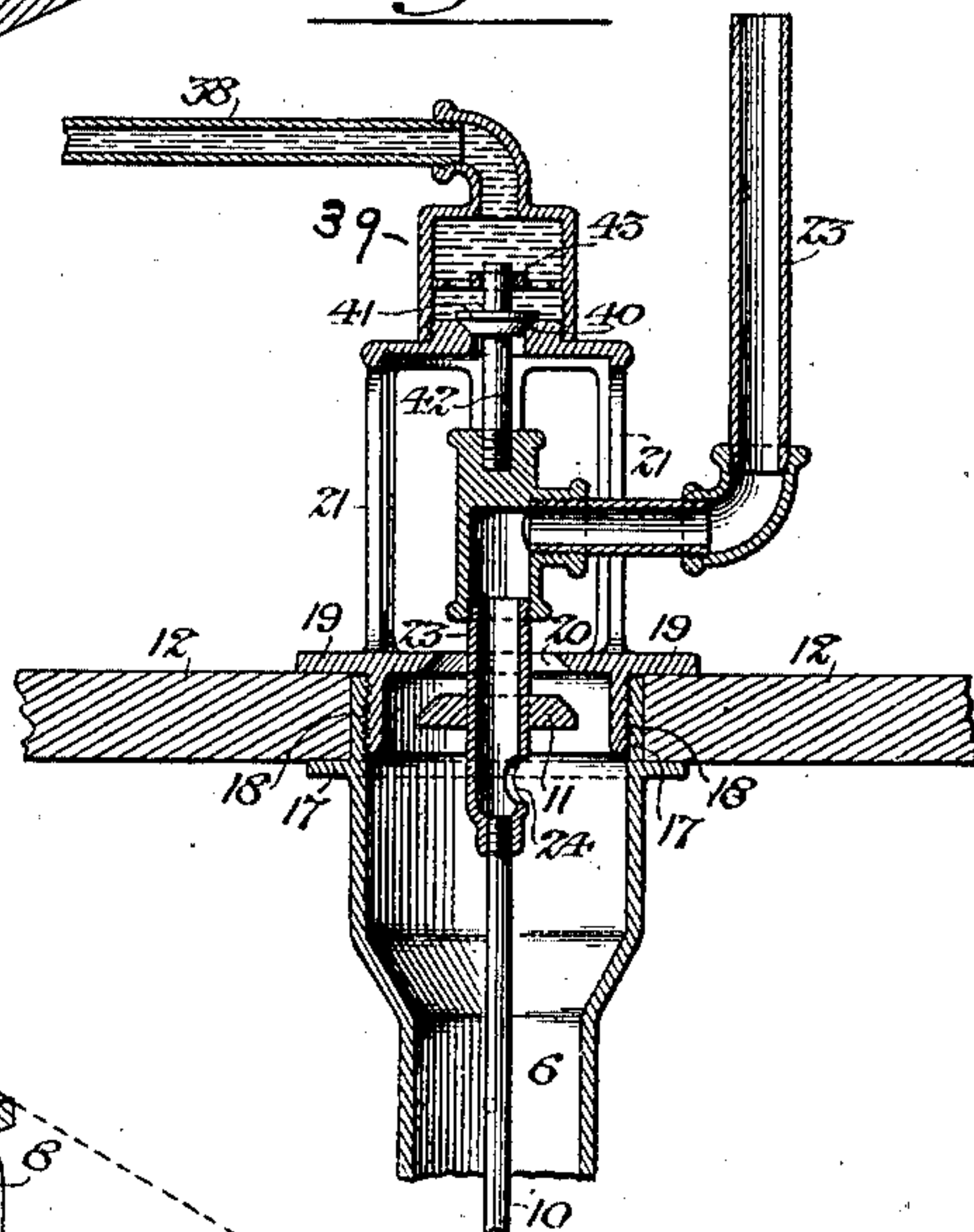


Fig. 2.



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2 Sheets—Sheet 2.

Fig. 3.

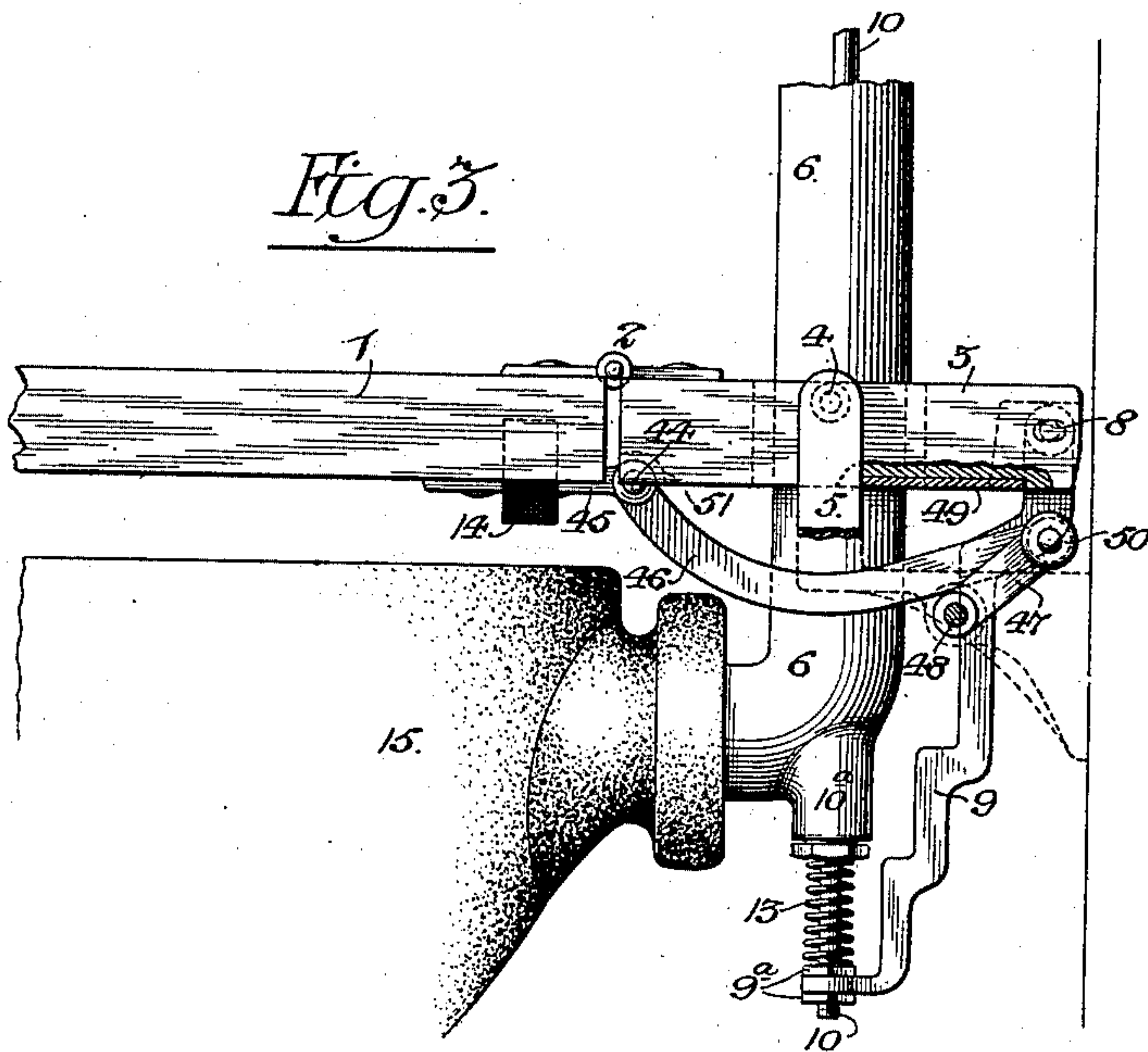
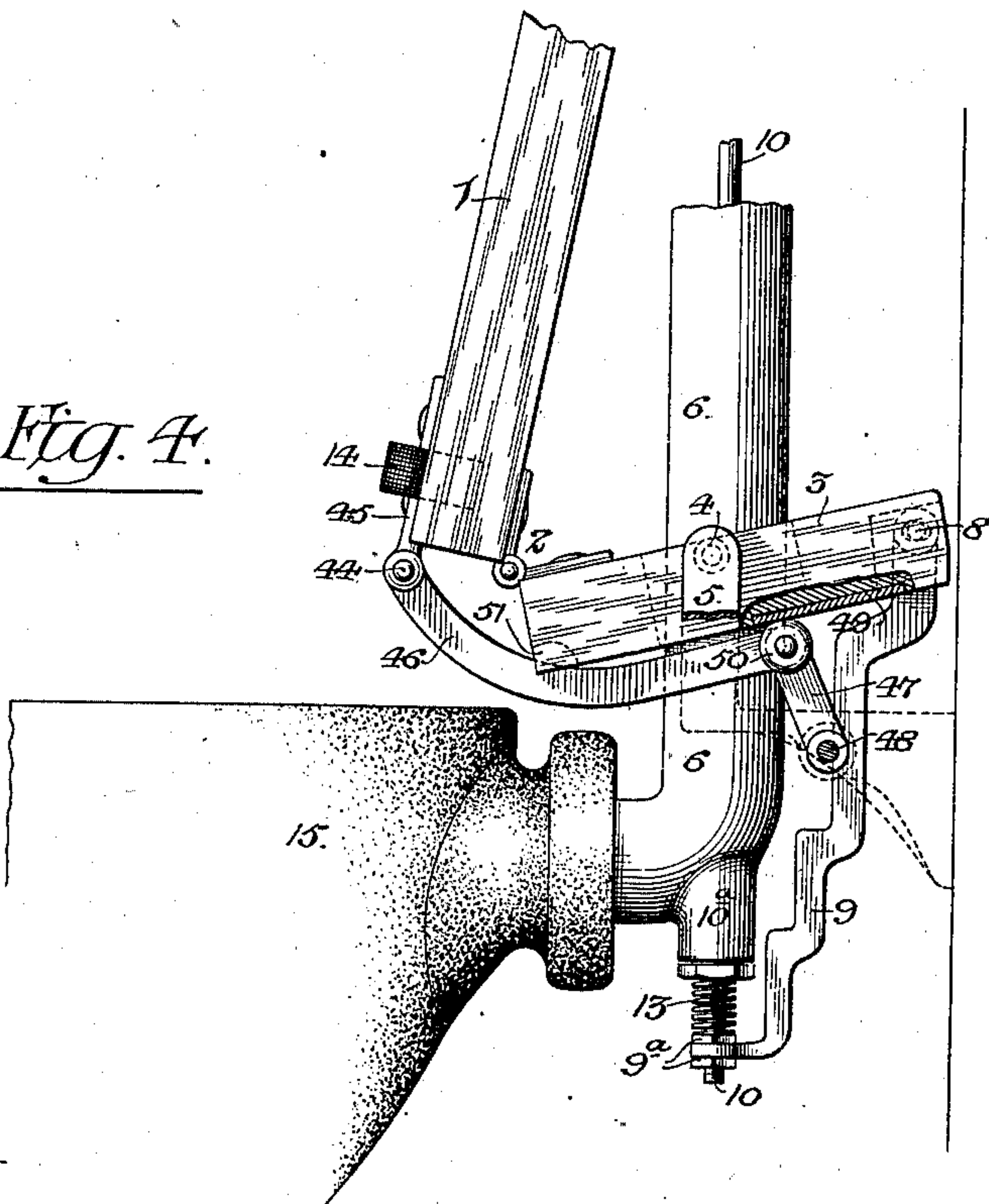


Fig. 4.



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# UNITED STATES PATENT OFFICE.

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## WATER-CLOSET FLUSHING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 669,990, dated March 19, 1901.

Application filed November 15, 1899. Serial No. 737,084. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY HAYNES, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain  
5 Improvements in Water-Closet Flushing Apparatus, of which the following is a specification.

My invention relates to certain improvements in water-closet flushing apparatus,  
10 adapted more particularly for use in that class of closets in which the flushing-tank is normally empty.

My present improvements relate to certain novel features of construction in connection  
15 with the valve structure located in the tank and the combination of an air-vent with the same and to a novel form of seat for the bowl, whereby the valves in the tank are operated  
20 when the closet is used, such seat operating the valves when sat upon and also when raised and tilted back should it be desired to use the bowl as a urinal.

My invention is fully illustrated in the accompanying drawings, in which—

25 Figure 1 is a sectional perspective view, partially broken away, showing the seat-operated mechanism controlling the valves in the tank and also the valve mechanism located therein. Fig. 2 is a view of a special form of valve  
30 structure forming part of my invention, adapted to control the inlet of water to the tank; and Figs. 3 and 4 are sectional views illustrating the mechanism controlled by the seat for operating the valves in the tank when  
35 the seat is tilted back.

As I have already stated, my invention relates to that class of water-closets in which the flushing-tank is normally empty, the discharge-valve being open and the inlet-valve  
40 closed when the closet is not in use. When a person occupies the seat, however, the discharge-valve is closed, the inlet-valve is opened, and the tank fills with water until the inlet is cut off by a float-valve in the tank  
45 closing said inlet. When the person rises from the seat, the latter resumes its normal position, the discharge-valve opens, and the water passes from the tank through a suitable pipe to flush the bowl, the tank empty-  
50 ing and remaining empty until the seat is oc-

cupied again, when the valves will be operated as before noted.

Referring now to Fig. 1 of the drawings, 1 represents the seat, provided with hinges 2, connecting it to a rear tilting shelf or frame  
55 3, which is pivoted at each side at 4 to brackets 5, carried by the wall of the inclosing structure or by any other suitable support. The water-discharge or flushing pipe 6 passes  
60 through an aperture 7 in the tilting shelf 3, and this aperture is of such size that the pipe 6 will not interfere with the shelf when the latter is tilted.

Carried by the tilting shelf 3 and pivoted to the same at 8 is an arm or lever 9, secured  
65 at its lower end by nuts 9<sup>a</sup> to a rod 10, which passes through the flushing-pipe 6 and controls the discharge-valve 11 in the tank 12. A spring 13 serves to keep the rod 10 in the  
70 normal lowered position. The seat 1 is provided with a rubber pad 14, set in the under surface of the same, and this pad contacts with the bowl 15 when the seat is occupied,  
75 preventing all danger of cracking the bowl and serving also to dissipate any jar to the body due to the lowering of the seat after sitting down on the same. When a person sits  
80 on the seat, the rear of the same is depressed, and this portion being connected to the tilting shelf it causes the latter to rise at the back. The arm or lever 9 being connected to  
85 the rear portion of the shelf is carried up by the same and raises the rod 10 in the water-discharge or flushing pipe 6 and closes the discharge-valve 11 of the tank, the same ac-  
90 tion opening the inlet-valve 16, and the tank fills with water while the seat is occupied. As soon as the person rises from the seat the tilting shelf 3 resumes its normal position, the  
95 rod 10 in the discharge-pipe 6 drops, carrying the valve 11 away from its seat, being assisted by the spring 13, and the water which has collected in the tank 12 flows out of the same  
100 through the pipe 6 to flush the bowl. To prevent leakage from the service or flushing pipe 6, the rod 10 in the same passes through a stuffing-box 10<sup>a</sup>, arranged below the turn in the pipe 6.

The upper end of the pipe 6 is enlarged, as shown in Figs. 1 and 2, and has a flange 17,



upon which the bottom of the tank 12 rests. The enlarged portion of the pipe 6 is threaded at 18, and adapted to this threaded portion is the externally-threaded flange of a plate 19, which has a seat 20 for the valve 11. When the plate 19 is screwed in place, the bottom of the tank is confined between said plate and the flange 17 of the pipe 6. The plate 19 has a series of posts 21, supporting a sleeve 22, which serves as a guide for an overflow and air-vent pipe 23, connected at its lower end to the rod 10 in the service-pipe 6. This air-vent pipe 23 has an opening 24, arranged below the valve 11, carried by the same.

Pivotaly hung to the sleeve 22 at 25 is a bell-crank lever 26, carrying at the upper end of its long arm 27 a small roller 28, on which the stem or arm 29 of a float 30, controlling the inlet-valve, rests, the short arm 31 of this lever 26 having a flat portion 32 on which said arm 29 rests when the rod 10 is pushed up to close the valve 11. A flexible washer 33 is carried by the stem 29 of the float to engage the flat portion 32 of the short arm of the bell-crank lever, so that there will be no jar to the parts nor noise when the stem 29 contacts with said flat portion 32. The rod 10 is threaded at its upper end and is adapted to a threaded socket in the end of the overflow-pipe 23, so that when this rod 10 is raised through the movement of the tilting shelf 3 the pipe 23 is also raised. The pipe 23 is threaded at the top and carries a collar 34, adapted to this threaded portion. Pivotaly hung at 35 to this collar is a link 36, the opposite end of which is connected to the arm 31 of the bell-crank lever 26. This collar has a set-screw 37, whereby it may be locked to the pipe 23. By means of the link 36 the bell-crank lever is turned when the rod 10 is raised, allowing the float-controlled valve 16 to open, so that the tank 12 may fill with water. As the tank fills the float rises and closes the inlet-valve, and when the person that has been using the closet rises from the seat the bell-crank lever will resume its normal position as the rod 10 drops, the roller 28 supporting the stem or arm of the float and keeping the inlet-valve closed, as shown in Fig. 1.

The arrangement of the combined overflow and air-vent pipe 23 to carry the outlet-valve of the tank, with the lower opening of said air-vent pipe below the valve, is such as to make the action of flushing the bowl practically noiseless.

In Fig. 2 I have shown a special form of valve structure adapted to be located in the tank 12, in which both the inlet and discharge valves of the tank are carried by the air-vent or overflow pipe 23, this pipe 23 in this structure, as well as in that shown in Fig. 1, being carried by the rod 10. In the arrangement shown in Fig. 2 the float-valve controlling the supply of water to the tank is not affected by the movement of the rod 10 in the pipe 6, and hence it is not illustrated in connection with Fig. 2. The supply-valve for the struc-

ture shown in Fig. 2 is open at all times except when it is closed by the water in the tank causing the float to rise to cut off the supply; but although the valve is open the water from the source of supply does not empty directly into the tank 12, but into a pipe 38, which terminates in an enlarged chamber 39, having a valve-seat 40, to which is adapted a valve 41, controlling the flow of water to the tank, and this valve is mounted on a stem 42, projecting from the air-vent or overflow pipe 23, carried by the rod 10 in the pipe 6. The stem 42 is preferably guided in a spider-frame 43, located in the chamber 39. In this arrangement the air-vent pipe 23 is bent, as shown, and projects between the posts 21, carried by the plate 19. The valve 11, controlling the outlet of water from the tank to the discharge or flushing pipe 6, is arranged in the same manner as the structure shown in Fig. 1.

The pipe 38 is always filled with water, as the valve of the water-supply controlled by the float is always open except when the tank has filled with water during the use of the closet. Normally the chamber 39, with which the pipe 38 communicates, is closed by the valve 41, and the tank begins to fill from the pipe 38 as soon as the seat of the closet is operated, such action raising the rod 10 in the pipe 6, and thereby lifting the valve 41 from its seat. This valve is arranged to close with the pressure, and being adapted to a ground seat there is little or no danger of leakage when the closet is not in use.

When it is desired to use the bowl of the closet as a urinal, the seat 1 is lifted, as a matter of course, and is thrown back against the pipe 6. This action serves to operate the valve mechanism in the tank in substantially the same manner as when the seat is sat upon. To accomplish this, special devices are carried by the seat, which serve to move the tilting shelf into the same position to raise the rod 10 as when the seat is occupied, and this structure is fully shown in Figs. 3 and 4. Pivotaly hung at 44 to a bracket 45, carried by the under side of the seat 1, is a lever 46, connected at its opposite end to a link 47, pivoted at 48 to one of the brackets 5, which serve to support the tilting shelf 3, or to any other fixed support. When the seat 1 is raised, the lever 46 acts to tilt the shelf 3, so as to raise the rod 10 in the pipe 6, thereby closing the discharge-valve 11 of the tank and opening the inlet-valve 16. While the seat is in the raised position the tank will fill with water, and when the seat is lowered the parts will resume their normal positions, permitting the discharge-valve to open, and the water that has filled the tank will flow out of the same through the pipe 6 and flush the bowl, the parts acting in the same manner as when the seat is returned to its normal position after being sat upon. By raising the seat 1 part way only, however, the discharge-valve will be only partially closed and the inlet-valve



will open partially, and a slight continuous flow of water may be had while the bowl is being used as a urinal without the necessity of flushing the bowl.

5 A wearing-plate 49 is preferably let into the under side of the tilting shelf 3, so as to take the wear of the links 47, these links being further provided with antifriction-rollers 50 to reduce the wear as much as possible and  
10 facilitate the movements of the parts. The tilting shelf 3 is cut away at 51 to accommodate the movement of the lever 46.

The seat 1, as before noted, is provided with cushions 14, let into the under side of the same  
15 at the front and rear, such cushions being of rubber, felt, or other suitable resilient material, so that the body will not be jarred when a person sits on the seat, and there will be no danger of injuring the bowl by the accidental  
20 dropping of the seat. The front pad or cushion (not shown) is higher than the rear cushion, so that the rear portion of the seat may be maintained normally in the raised position, as shown in Figs. 1 and 3.

25 Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination in a water-closet flushing apparatus, of the bowl, a tank, a service-  
30 pipe for flushing the bowl, inlet and discharge valves in said tank, a rod carrying the discharge-valve, a guide for said rod, means carried by said guide for controlling the inlet-valve, means for raising said rod, and a connection between said rod and the means carried by its guide for opening the inlet-valve  
35 when the rod is raised.

2. The combination in a water-closet flushing apparatus, of the bowl, a tank, a service-  
40 pipe for flushing the bowl, inlet and discharge valves in said tank, a rod carrying the discharge-valve, a guide for said rod, means controlled by said rod for operating the inlet-valve, an adjustable sleeve carried by said  
45 rod, means for raising the rod, and a link connecting the rod with the means for operating the inlet-valve, the upward movement of said rod serving to open the inlet-valve and close the discharge-valve, substantially as de-  
50 scribed.

3. The combination in a water-closet flushing apparatus, of the bowl, a tank, a service-  
pipe for flushing the bowl leading from said tank, inlet and discharge valves in said tank,  
55 a rod carrying the discharge-valve, a guide for said rod located in the tank, means controlled by said rod for operating the inlet-valve, an adjustable sleeve carried by said rod, means for raising the rod, and a link  
60 connecting the sleeve carried by said rod with the means for operating the inlet-valve, the movement of said rod operating both valves in the tank, substantially as described.

4. The combination in a water-closet flushing apparatus, of the bowl, a service or flush-  
65 ing pipe communicating therewith, a tank supported above the bowl and communicat-

ing with the service-pipe, a pivotally-mounted tilting shelf below said tank, and a water-  
closet seat hinged at its rear end to the front  
70 end of the tilting shelf and supported thereby above the top of the bowl; the forward end of said seat being supported rigidly on the front of the bowl, said seat and tilting shelf being normally on a horizontal plane, sub-  
75 stantially as described.

5. The combination in a water-closet flushing apparatus, of the bowl, a service-pipe for flushing said bowl, valves controlling the flow  
80 of water to said pipe, a rod located in said pipe for operating the valves, a seat for the bowl rigidly supported at the front of the same, and a tilting shelf to which said seat is hinged and supported at the rear of the same above the level of the bowl, the connec-  
85 tion between the seat and the shelf and between the shelf and the rod in the service-pipe being such, that the valves controlling the flow of water to said service-pipe will be operated when the rear portion of the seat is  
90 depressed.

6. The combination in a water-closet flushing apparatus, of the bowl, a service-pipe for flushing the same, valves controlling the flow  
95 of water to said pipe, a rod for operating said valves, a seat for the bowl rigidly supported at the front of the same, and a tilting shelf supported wholly free from the bowl to which said seat is hinged and supported at  
100 the rear of the same, said shelf being so connected to the rod that the valves controlling the flow of water to the service-pipe will be operated when the rear portion of the seat is depressed, substantially as described.

7. The combination in a water-closet flush-  
105 ing apparatus, of the bowl, a tank, a service-pipe leading from the tank and communicating with the bowl for flushing the same, valves in said tank controlling the inlet and outlet of water, a rod located in said pipe and  
110 controlling the operation of said valves, a seat for the bowl rigidly supported at the front of the same, and a tilting shelf to which said seat is hinged and supported at the rear of the same, said shelf being so connected to  
115 the rod in the service-pipe that the valves in the tank will be operated when the seat is depressed at the rear.

8. The combination in a water-closet flushing apparatus, of the bowl, a tank, a service-  
120 pipe leading from the tank for flushing the bowl, valves in said tank controlling the inlet and outlet of water, a rod located in the service-pipe for operating said valves, a pipe providing an air-vent and overflow carried by  
125 the upper end of said rod, the valve controlling the outlet of water from the tank being secured to said pipe, a seat for said bowl rigidly supported at the front of the same, and  
130 mechanism actuated by said seat for operating the valves through the medium of the rod in the service-pipe, said mechanism being operated when the seat is depressed, said overflow-pipe having an opening below the valve



carried by the same, such opening forming an air-vent and serving to prevent noise in the service-pipe while the bowl is being flushed.

9. The combination in a water-closet flushing apparatus, of the bowl, a tank, a service-pipe leading from the tank for flushing the bowl, inlet and discharge valves in said tank, a float connected to the inlet-valve, a rod carrying the discharge-valve, a guide for said rod, a bell-crank lever pivoted to said guide, the float being supported by one arm of said bell-crank lever, means for raising said rod, and a connection between said rod and the bell-crank lever whereby the upward movement of the rod to close the discharge-valve will operate the bell-crank lever, releasing the float and permitting the inlet-valve to open.

10. The combination in a water-closet flushing apparatus, of the bowl, a tank, a service-pipe leading from the tank for flushing the bowl, inlet and discharge valves in said tank, a float connected to the inlet-valve, a rod in the service-pipe carrying the discharge-valve, a guide for said rod located in the tank, a bell-crank lever pivoted to said guide, the longer arm of which lever serves to support the stem of the float, means for raising the rod in the service-pipe, and a link connecting said rod and the bell-crank lever, whereby the upward movement of the rod to close the discharge-valve will move the bell-crank lever, releasing the float and permitting the inlet-valve to open.

11. The combination in a water-closet flushing apparatus, of the bowl, a tank, a service-pipe for flushing the bowl, inlet and discharge valves in said tank, a float controlling the inlet-valve, a rod carrying the discharge-valve, a guide for said rod located in the tank, a bell-crank lever pivoted to said guide, the longer arm of which lever serves to support the stem of the float, an adjustable sleeve carried by said rod, means for raising the rod, and a link hung from said adjustable sleeve and connected to said bell-crank lever whereby the upward movement of said rod to close the discharge-valve will release the bell-crank lever, permitting the float to fall and open the inlet-valve.

12. The combination in a water-closet flushing apparatus, of the bowl, a tank, a service-pipe for flushing the bowl, inlet and discharge valves in said tank, a float controlling the inlet-valve, a rod carrying the discharge-valve, a bell-crank lever mounted in said tank and in operative engagement with the rod, said lever having an arm adapted to support the float when the inlet-valve is closed and another arm engaged by the stem of the float when the inlet-valve is opened, and means for raising the rod, the connection between the rod and the bell-crank lever being such that the latter will be moved when the rod is raised, substantially as described.

13. The combination in a water-closet flush-

ing apparatus, of the bowl, a tank, a service-pipe for flushing the bowl, inlet and discharge valves in said tank, a float controlling the inlet-valve, a rod carrying the discharge-valve, a bell-crank lever mounted in said tank and in operative engagement with the rod, said lever having an arm adapted to support the float when the inlet-valve is closed, an antifriction-roller carried by said arm in contact with the stem of the float, said lever having another arm adapted to support the stem of the float when the inlet-valve is opened, a cushion carried by the stem of the float and adapted to contact with one arm of the bell-crank lever when the float falls, and means for raising the rod, the connection between the bell-crank lever and the rod being such that when the rod is raised the bell-crank lever will be moved, substantially as described.

14. The combination in a water-closet flushing apparatus, of the bowl, a tank, a service-pipe for flushing said bowl, an arrangement of valves controlling the inlet of water to the tank, a valve controlling the discharge of water from the tank to the service-pipe, a rod located in the service-pipe controlling the inlet and outlet valves of the tank, a pipe forming an air-vent and providing an overflow-passage connected to the rod controlling the inlet and outlet valves, the outlet-valve being carried by said pipe above the air-vent opening, and means for moving the rod in the service-pipe whereby the valves controlling the flow of water to and from the tank will be actuated, substantially as described.

15. In a flushing apparatus for water-closets of the character described, including a bowl, a service-pipe for the same, valves controlling the flow of water to said pipe and a rod for actuating said valves, the combination with a seat for said bowl rigidly secured to the front of the same, a tilting shelf to which said seat is hinged, a support at the rear above the bowl, and an arm carried by said shelf and connected to the rod for operating the valves, said seat being capable of downward movement at the rear of the same, such movement tilting the shelf and causing the arm carried thereby to raise the rod and actuate the valves controlling the flow of water to the service-pipe, substantially as described.

16. In a flushing apparatus for water-closets, including a bowl, a service-pipe for the same, valves controlling the flow of water to said pipe, and a rod located in the pipe for actuating said valves, in combination with a seat for the bowl, a tilting shelf to which said seat is hinged, an arm depending from said shelf at the rear of the same and connected to the rod in the service-pipe, said seat being capable of downward movement at the point of its connection with the tilting shelf, such movement rocking the shelf and causing the depending arm carried by the same to raise the rod in the service-pipe and operate the valves, substantially as described.



17. In a flushing apparatus for water-closets, including a bowl, a service or flushing pipe for the same, valves controlling the flow of water to said pipe, and a rod for actuating said valves located in the service-pipe, in combination with a seat for the bowl, a tilting or rocking shelf at the rear of the seat to which the latter is hinged, brackets carrying pivots supporting said shelf, an arm depending from the shelf at the rear of the same and connected to the rod, and a jointed lever connecting the tilting shelf and the seat whereby said shelf will be moved when the seat is raised, substantially as described.

18. In a flushing apparatus for water-closets, including a bowl, a service or flushing pipe for the same, valves controlling the flow of water to said pipe, and a rod located in the service-pipe for actuating said valves, in combination with a seat for the bowl, a tilting shelf to which said seat is hinged, brackets carrying pivots supporting said shelf, a depending arm carried by the shelf at the rear of the same and connected to the rod, a lever carried by the seat, and a link pivoted to the shelf-bracket and connected to the lever of the seat, said link being in engagement with the shelf and acting on the rear of the same

when the seat is raised, substantially as described.

19. In a flushing apparatus for water-closets, including a bowl, a service or flushing pipe for the same, valves controlling the flow of water to said pipe, and a rod located in the service-pipe for actuating said valves, in combination with a seat for the bowl, a tilting shelf to which said seat is hinged, brackets supporting said shelf, a depending arm carried by the shelf at the rear of the same and secured to the rod, a lever carried by the seat, a link pivoted to one of the shelf-brackets and connected to the lever of the seat, said link being in engagement with the shelf and acting on the rear of the same when the seat is raised, a roller carried by said link in engagement with the shelf, and a wearing-plate set in the under side of the shelf, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY HAYNES.

Witnesses:

MURRAY C. BOYER,  
JOS. H. KLEIN.