P. J. MADDEN.

WATER CLOSET.

APPLICATION FILED MAR. 22, 1915.

1,229,303.

Patented June 12, 1917.

2 SHEETS—SHEET 1.

Fig. 1

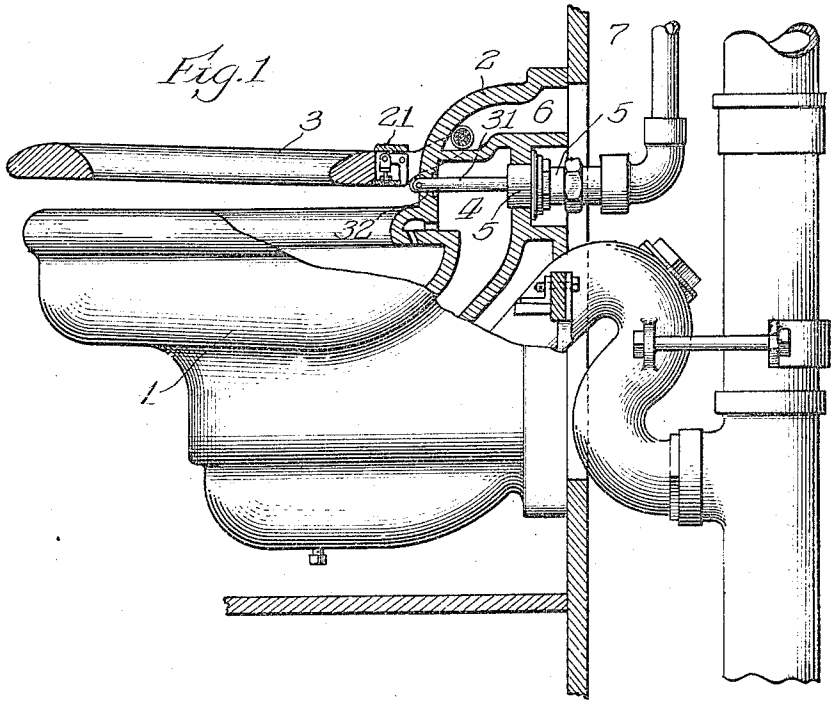
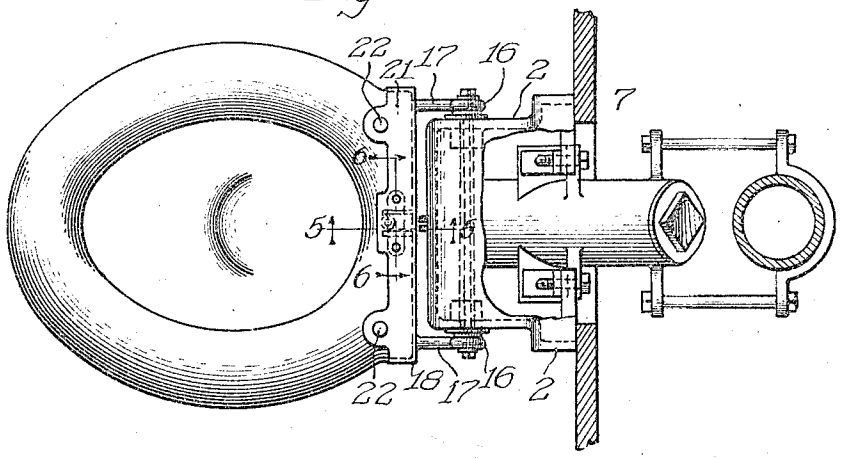


Fig. 2



Witnesses:
R. Bauerle
A. J. Sauser.

Inventor:
Patrick J. Madden
by Wilkinson
Atty.

P. J. MADDEN.

WATER CLOSET.

APPLICATION FILED MAR. 22, 1915.

1,229,303.

Patented June 12, 1917.

2 SHEETS—SHEET 2.

Fig. 3

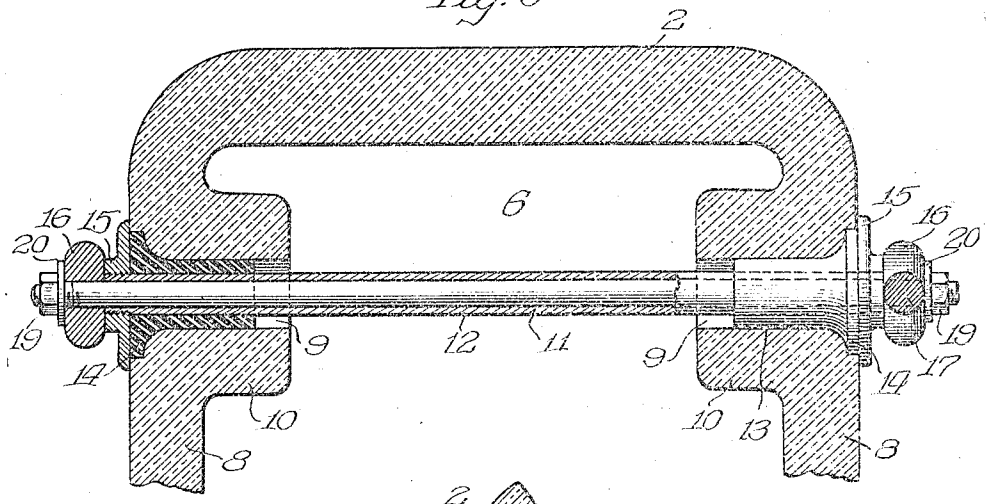


Fig. 4

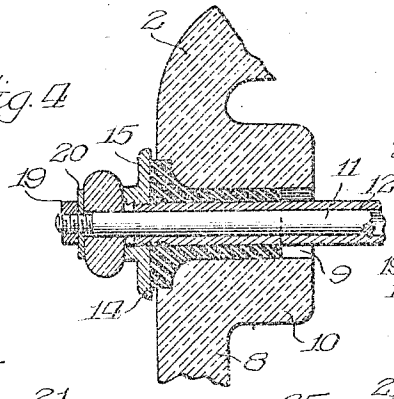


Fig. 4a

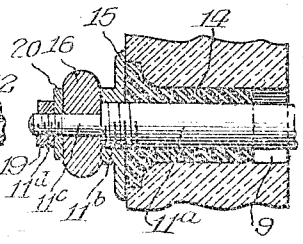


Fig. 5

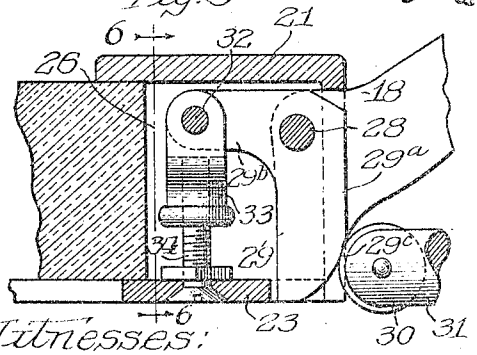
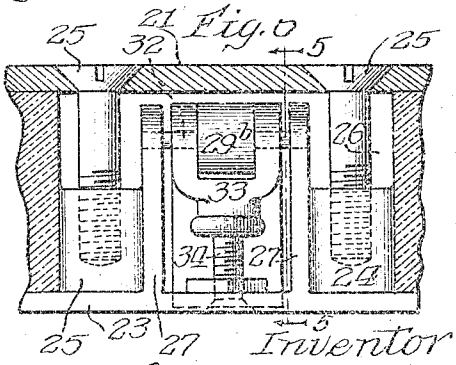


Fig. 6



Witnesses:
R. Bauerle
A. J. Sauser.

Inventor
Patrick J Madden
by [illegible]
Atty.

UNITED STATES PATENT OFFICE.

PATRICK J. MADDEN, OF CHICAGO, ILLINOIS.

WATER-CLOSET.

1,229,303. Specification of Letters Patent. Patented June 12, 1917.

Original application filed June 6, 1913, Serial No. 772,132. Divided and this application filed March 22, 1915. Serial No. 16,074.

To all whom it may concern:

Be it known that I, PATRICK J. MADDEN, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Water-Closets, of which the following is a specification.

This application is a division of my application filed June 6, 1913, Serial No. 772,132.

The invention relates in part to the hinge connection between the seat and the bowl, of whatever material this latter may be made. One object of this part of the invention is to provide a hinge-connection of such construction as will lessen the liability of breaking the bowl, which oftener than not, according to present day practice, is made of earthenware. The breakage here contemplated is liable to occur as a result of setting up the parts too tight in the act of assembling them, especially if the adjacent portions of the ware are not true and accurate; or it is liable to occur as a result of the strains that react upon the ware when downward pressure is exerted upon the seat for the purpose of unseating the normally spring-seated water-supply valve. To eliminate or minimize breakage from these and other causes which subject the wear to undue strains in the vicinity of the hinge, elastic buffers are so interposed between the metallic parts of the hinge-connection and all adjacent portions of the ware that they do not contact at any point which is subject to any considerable contact-pressure.

The invention relates in part also to the valve-operating mechanism or the mechanism for transmitting motion from the hinged seat to the stem of the water-supply valve for operating it when the hinged seat is depressed. One object of this part of the invention is to provide such mechanism with a cam, carried by the back part of the hinged seat and normally engaging the forward end of the valve stem, the arrangement being such that the movement of the valve stem due to the arcuate or angular movement of the hinged seat about its hinged center will be augmented by the action of the cam.

Another object of this part of the invention is to provide improved means for adjusting the parts of this valve-operating mechanism whereby the movement of the water-inlet valve may be adjusted to a nicety.

Other objects of the invention will appear hereinafter.

The invention consists in the features of novelty that are hereinafter described with reference to the accompanying drawings which are hereby made a part of this specification, and in which—

Figure 1 is a view partly in side elevation and partly in vertical section of a water-closet embodying the invention.

Fig. 2 is a plan view thereof with some of the parts broken away.

Fig. 3 is a horizontal section of the hinge-joint and accessories on a larger scale, showing the parts after they are tightened up and in final normal condition.

Fig. 4 is a similar view of one end thereof showing the parts before the elastic buffer is compressed to its final normal condition.

Fig. 4ª is a view similar to Fig. 4 showing a modification in the construction of the pintle.

Fig. 5 is a vertical section on the line 5—5, Figs. 2 and 6 looking in the direction of the arrows.

Fig. 6 is a vertical section on the line 6—6, Figs. 1, 2 and 5, looking in the direction of the arrows—rearward.

The bowl, 1, is constructed and mounted as shown and described in my application aforesaid and the bowl has at its back a hollow projection, 2, which rises above the level of the top of the hinged seat, 3, and supports the valve device. This projection has within it a chamber, 4, adapted to receive from the casing, 5, of the valve-device, water for supplying the bowl with the flushing water, and also an air chamber, 6, which communicates with the ventilating flues of the bowl and also with a ventilating stack, 6, which leads to the atmosphere. The side walls, 8, of the extension, 2, are provided with alined perforations, 9; having coincident axes, and said walls are thickened around these perforations forming bosses, 10, through which the perforations extend, the outer ends of said perforations being "counter-bored"—or of enlarged diameter. The object of these bosses

is to afford a long bearing for receiving the pressure of the hinge-pintle which is constructed of a solid rod, 11, and a tube, 12, which surrounds it with a slip fit. The tube is of less diameter than the perforations, 9, and within the perforations the tube is surrounded by elastic sleeves, 13, which completely fill the annular spaces between the tube and the inner surfaces of the perforations, thus forming buffers which prevent the tube from contacting with the ware and cushions the strains which the hinge pintle exerts upon the ware, through the medium of said buffers when downward pressure is applied to the hinged seat for the purpose of unseating the water-supply valve in the manner hereinafter described. The outer ends of the buffers are enlarged or flanged as shown at 14, so that each resembles one half of a spool such as is ordinarily used for sewing thread or the like and the outer ends of the perforations are flared or counter-bored to provide sockets or recesses of complementary shape in which these enlarged or flanged ends of the buffers fit with a snug fit. The flanges, 14, before the parts are completely assembled, are somewhat thicker than the depth of the sockets, as shown in Fig. 4, and they are engaged by the flat inner faces of flanged nuts, 15, which are turned onto the threaded ends of the tube, 12. The flanges of the nuts, 15, are of somewhat greater diameter than the flanges, 14, of the buffers, so that they will project beyond them and when the parts are tightened up as shown in Fig. 3, the inner faces of the flanges, 15, adjacent to their peripheries will come flush against the outer surfaces of the side walls, 8, the intention being, however, that these flanges, 15, shall not exert any considerable amount of pressure against said side walls. When the nuts are tightened up they compress the flanges, 14, of the buffers and cause them to expand radially so that they bear firmly against the walls of the "counterbores" or enlarged portions of the perforations, 9, and also to contract radially so that they bear firmly against the tube or sleeve, 12. In this condition the flanges will tend to hold the pintle in its normal position and cushion the strains of the tube upon the wave, and force the tapering portions of said buffers into the flaring portions of the perforations, 9. The rod, 11, projects at both ends beyond the ends of the tube, 12, and upon these projecting portions are loosely mounted eyes, 16, formed on the rear ends of the arms, 17, which are integral with and project rearwardly from a plate, 18, secured to the rear side of the seat and straddle the projection, 2. The eyes, 16, are capable of turning freely on the projecting ends of the rod, 11, and are held in place thereon by nuts, 19, turned onto the threaded extremity of the rod, washers, 20, being interposed between the nuts, 19, and the eyes, 16. The plate, 18, occupies a vertical plane and forms a facing for the rear side of the seat and integral with this face plate is a plate, 21, which lies upon the top side of the seat, the two plates, 18 and 21, being in fact the two webs or flanges of an angle iron, being secured to the seat by screws, 22.

To still further strengthen the connection between the angle-plate, 18—21, and the seat, a plate, 23, is secured against the under side of the seat and carries threaded sockets, 24, with which engage screws, 25, which pass through the plate, 21, and have their heads countersunk so as to be flush therewith. The rear side of the seat is cut away to provide a recess, 26, in which these sockets are located, and certain other parts, notably a pair of posts or standards, 27, which are integral with the plate, 23, and are perforated near their upper ends for the passage of a stub shaft, 28. This shaft passes through and forms the fulcrum of a bell-crank lever, 29, one arm, 29^a, of which occupies a vertical position and near its lower end engages an anti-friction roller, 30, journaled to the forward end of the valve stem, 31. This valve stem passes through a perforation, 32, in the front wall of the chamber, 4, whereby it is guided and at the rear side of this chamber it enters a casing, 5, within which is a valve device which may be constructed and operate in the manner shown and described in Patent No. 931,937 which was granted me August 24, 1909. The other arm, 29^b, of this bell-crank lever is connected by a pivot pin, 32, with the perforated ears of a nut, 33, which latter is engaged by an adjusting screw, 34, swiveled to the plate, 23, and the lower end or head of which is accessible from beneath said plate for the purpose of adjustment. By turning this adjusting screw in one direction or the other, the position of the arm, 29^a, of the bell-crank lever with relation to the valve stem, 31, is adjusted. This arm, 29^a, of the bell-crank lever has a cam surface, 29^c, which engages the anti-friction roller, 30. It is manifest that as the seat is raised and lowered it will have an arcuate movement about the pintle of the hinge center. This arcuate movement will cause the arm, 29^a, of the bell-crank lever to bear against the anti-friction roller, 30, and force the valve stem, 31, rearward. By reason of the location of the pivotal axis of the hinge with relation to the end of the valve stem, the rearward movement of the arm, 29^a, will be very slight and it is in order to augment this movement that the surface of the arm, 29^a, which engages the anti friction roller, 30, is made of cam shape. Being of cam shape, as the rear side of the seat moves

downward the lower end of the arm, 29ª, will act as a wedge with a tendency to force the valve stem rearward.

Preferably the pintle of the hinge-connection is constructed as shown in Figs. 3 and 4, but instead thereof it may be constructed as shown in Fig. 4ª, in which features of the rod, 11, and sleeve, 12, of Figs. 3 and 4 are continued in a single piece—a rod, 11ª, which is threaded at 11ᵇ for the reception of the flanged nuts, 15, has unthreaded portions, 11ᶜ, which afford bearings upon which the eyes, 16, are mounted, and a threaded portion, 11ᵈ, upon which the nuts, 19, and washers, 20, fit. While this Fig. 4ª, shows only one end of the hinge joint it will be understood that it is of similar construction at both ends. It may here be stated that while the drawing shows this hinge-connection applied to a bowl of a particular construction, it may nevertheless be used in connection with a bowl of any construction, so far as the broad inventive idea is concerned.

What I claim as new is:

1. In a water closet the combination with a bowl and a seat, said bowl having a projection extending upward above the level of the seat, of a hinge-connection between said seat and projection, said hinge-connection having a pair of arms projecting rearward from the seat, and a horizontal pintle upon which the rear ends of said arms are mounted, the projection being perforated horizontally to provide a bearing through which said pintle extends, and a buffer of elastic material surrounding the pintle within said bearing.

2. In a water closet the combination with a bowl and a seat, said bowl having at the back thereof a hollow projection extending upward above the level of the seat, of a hinge-connection between them, said hinge-connection having a pair of arms projecting rearward from the seat and straddling said upward projection, a horizontal pintle upon which the rear ends of said arms are mounted, the opposite side walls of said hollow projection having alined perforations providing a bearing for said pintle, and elastic sleeves surrounding the pintle within said perforations and forming buffers for cushioning the strain of the pintle upon said projection.

3. In a device of the class described the combination with a bowl and a seat, said bowl having at the back thereof a hollow projection extending upward above the level of the seat, of a hinge-connection between the bowl and seat, said hinge-connection having a pair of arms projecting rearward from the seat and straddling said hollow projection, the rear ends of said arms having eyes, a pintle upon which said eyes are mounted, the opposite side walls of said upward projection having alined perforations providing a bearing for said pintle and elastic sleeves surrounding the pintle within said perforations and forming buffers for cushioning the strain of the pintle upon said projection, said perforations being flared at their outer ends and enlarged to provide recesses and the outer ends of the elastic buffer sleeves being of complementary shape, nuts turned onto the projecting ends of said pintle and adapted to engage the outer ends of the buffer sleeves for compressing them and forcing them into the recesses aforesaid and into the perforations.

4. In a device of the class described, the combination with a bowl and a seat, of a hinge-connection, said hinge-connection comprising a central rod or shaft, a tube surrounding it with a slip fit, elastic sleeves surrounding the said tube, the bowl having alined perforations through which said tube passes and within which said buffer sleeves are located, the outer ends of said perforations being flared to provide recesses and the outer ends of said buffer sleeves being of complementary shape, flanged nuts turned onto the outer ends of the tube and engaging the outer ends of the buffer sleeves, arms projecting rearward from the seat and having eyes mounted upon said rod, or shaft, and nuts turned onto the extremities of said rod or shaft for holding the eyes in place.

5. In a device of the class described the combination with a bowl, a seat, and a valve device supported by the bowl in rear of the seat and having a forwardly projecting horizontal valve-stem, of a hinge-connection between the bowl and seat, said hinge-connection having arms projecting rearward from the seat, a pintle by which the rear ends of the arms are supported, and a bell-crank lever fulcrumed to the rear side of the seat and having an arm extending downward from its fulcrum and engaging the forward end of said valve-stem.

6. In a device of the class described, the combination with a bowl and a seat, said bowl having at the back thereof a projection extending upward above the top of the bowl, said projection having within it a water supply chamber, a valve device having a casing communicating with said chamber and having also a forwardly projecting valve stem, the front wall of said chamber being provided with a perforation through which said valve stem passes, arms projecting rearward from the seat and hinge-jointed to said upward projection, a device carried by the rear side of the seat and engaging the forward end of said valve stem, whereby when the seat is moved downward about its hinge-joint said device will exert a backward pressure upon the forward end of the valve stem.

7. In a device of the class described, the combination with a bowl and a seat, said

bowl having at the back thereof a projection extending upward above the level of its top, a valve device having a valve stem projecting forward from said projection, a bell-crank lever fulcrumed to the rear side of the seat and having a vertical arm engaging the forward end of the valve stem and also a horizontal arm, a nut to which the horizontal arm is jointed and a screw engaging said nut and swiveled to the hinged seat whereby the movement of the screw will adjust the position of the bell-crank lever.

8. In a water-closet the combination with a bowl and a seat, said bowl having at the back thereof a projection extending upward above the level of the seat, of a hinge-connection between the bowl and seat, said hinge connection having in combination arms projecting rearward from the seat and straddling said projection, a pintle upon which the rear ends of said arms are mounted, bearings in said projection through which said pintle passes, elastic buffer sleeves surrounding the pintle within said bearings and nuts turned onto the pintle and engaging said buffer sleeves for compressing them.

9. In a device of the class described, the combination with a bowl, a seat and a valve device having a forwardly extending valve stem, means for transmitting movement from the seat to the valve stem, said transmitting means having a bell-crank lever carried by the seat, and having a vertical arm engaging the forward end of the valve stem and having also a horizontal arm, a nut to which said horizontal arm is jointed, a screw engaging said nut and a part carried by the seat, to which part said screw is swiveled, whereby by turning the screw the position of the bell-crank lever is adjusted.

10. In a device of the class described, the combination with a bowl, a seat and a valve device having a forwardly extending valve stem, of means carried by the seat for engaging the forward end of said valve stem for moving it rearward when the seat is moved downward, said means having a plate resting upon the top side of the seat, and a plate integral therewith forming a facing for the rear side of the seat, flanges carried by said plates and having perforations or bearings, a stub shaft occupying said bearings, a bell-crank lever mounted upon said shaft and having a vertical arm engaging the forward end of the valve stem and having also a horizontal arm, a nut to which said horizontal arm is jointed, a screw engaging said nut and a part carried by the seat to which said screw is swiveled, whereby by turning the screw the position of the bell-crank lever is adjusted.

11. In a device of the class described, the combination with a bowl, a seat and a valve device supported by the bowl in rear of the seat and having a forwardly projecting horizontal stem, of a hinge-connection between the bowl and seat, said hinge-connection having arms projecting rearward from the seat, a pintle by which the rear ends of said arms are supported, a bell-crank lever fulcrumed to the rear side of the seat, and having an arm extending downward from the fulcrum and engaging the forward end of said valve stem.

12. In a device of the class described the combination with a bowl, a seat and a valve device having a forwardly projecting horizontal valve-stem, said bowl having at the back thereof a projection extending upward above the level of the seat and supporting said valve device, and said projection having an opening extending through it horizontally from front to back, through which opening the valve stem extends and from which its forward end projects, of a hinge-connection between said seat and projection, said hinge-connection having arms projecting rearward from the seat and straddling said projection, and a horizontal pintle by which the rear ends of said arms are supported, said projection being provided with an opening extending through it horizontally from side to side, said opening being located at a level above the level of the valve stem to provide a bearing through which said pintle extends, whereby when the seat is moved downward the rear side of the seat will move rearward and the valve stem also will be moved rearward.

13. In a device of the class described, the combination with a bowl and a seat, said bowl having at its back a hollow projection extending upward above the top thereof, of a hinge-connection between the bowl and seat, said hinge-connection having a pair of arms projecting rearward from the seat and straddling said hollow projection, a pintle supporting the rear ends of said arms, the opposite side walls of said hollow projection having alined perforations through which said pintle passes, elastic buffers surrounding the pintle and contacting with said hollow projection, and means carried by the pintle and engaging said buffers for compressing them against the hollow projection.

14. In a device of the class described, the combination with a bowl and a seat, said bowl having at its back a hollow projection extending upward above the top thereof, of a hinge-connection between the bowl and seat, said hinge-connection having a pair of arms projecting rearward from the seat and straddling said hollow projection, a pintle supporting the rear ends of said arms, the opposite side walls of said hollow projection having alined perforations through which said pintle passes, the outer ends of said perforations being of enlarged diame-

ter, elastic buffers mounted on said pintle and occupying the enlarged outer ends of the perforations and means carried by the pintle for compressing said buffers in the direction of the length of the pintle and thereby distorting it radially both outwardly and inwardly.

15. In a device of the class described, the combination with a bowl and a seat, said bowl having at its back a hollow projection extending above the top thereof, of a hinge-connection between the bowl and seat, said hinge-connection having a pair of arms projecting rearward from the seat and straddling said hollow projection, a pintle, the opposite side walls of said hollow projection having alined perforations through which said pintle passes, said pintle having a rod and a tube or sleeve surrounding it, elastic buffers fitted upon the sleeve and engaging said hollow projection, means carried by the sleeve and engaging said buffers for compressing them against the hollow projection, the rear ends of said rearwardly projecting arms having eyes mounted upon the rod of the pintle, and nuts turned onto said rod and engaging the rear ends of said rearwardly projecting arms.

16. A water closet having, in combination, a bowl having at its back a hollow extension rising above the top thereof, a seat located above the top of the bowl and adapted to rest thereon when depressed, a hinge-connection between the seat and bowl, and a valve device supported by said hollow extension and having a valve stem extending through it and projecting forward therefrom, the axis of the seat hinge being located in a horizontal plane above the plane of the valve stem and the forward end of the valve stem located in the horizontal plane of the rear side of the seat when the latter is depressed.

17. A water closet having, in combination, a bowl, having at its back a hollow extension rising above the top thereof, a seat located above the top of the bowl and adapted to rest thereon when depressed, a hinge-connection between the seat and bowl, and a valve device supported by said hollow extension and having a valve stem extending through it horizontally from front to back and projecting therefrom at its forward end, the axis of the hinge being located in a horizontal plane above the plane of the valve stem and in a vertical plane in rear of the forward end of the valve stem, the forward end of the valve stem being located in the horizontal plane of the rear side of the seat when the latter is depressed.

18. A water closet having a bowl provided with an upwardly extending integral portion at the rear side thereof and above the upper edge, a seat pivoted directly to said integral extension, a valve to control the flushing of the bowl, and a spring-pressed valve stem slidably mounted in the extension and having its exposed end located in the horizontal plane of the rear side of the seat when the latter is depressed.

19. The combination with a bowl and a seat of a hinge-connection having two plates located at the back of the seat and bearing against the upper and lower surfaces thereof, respectively, threaded sockets carried by one of said plates, the other of said plates having, opposite said sockets, openings for the passage of screws, screws extending through said openings and engaging in said sockets and a device located between said plates and adapted to engage and operate the stem of a valve device.

PATRICK J. MADDEN.

Witnesses:
MABEL GRANT,
L. M. HOPKINS.