Sept. 2, 1958 J. L. GYLLENBERG 2,849,728

HYDRAULIC TOILET SEAT LIFTER

Filed Nov. 5, 1956 2 Sheets-Sheet 1

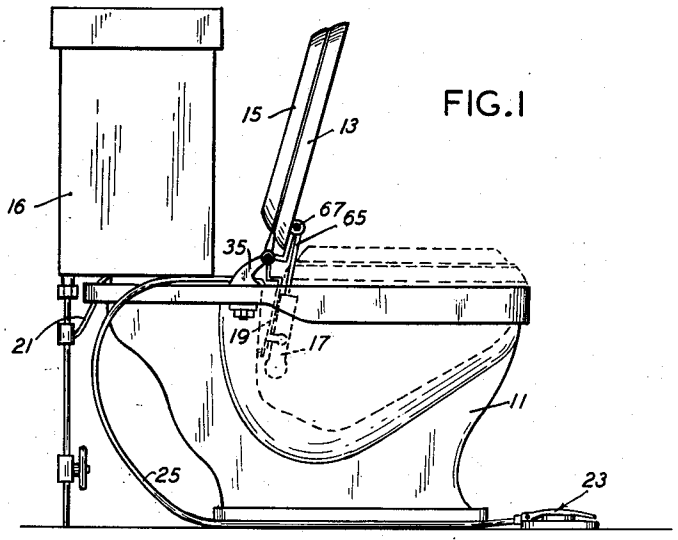


FIG. 1

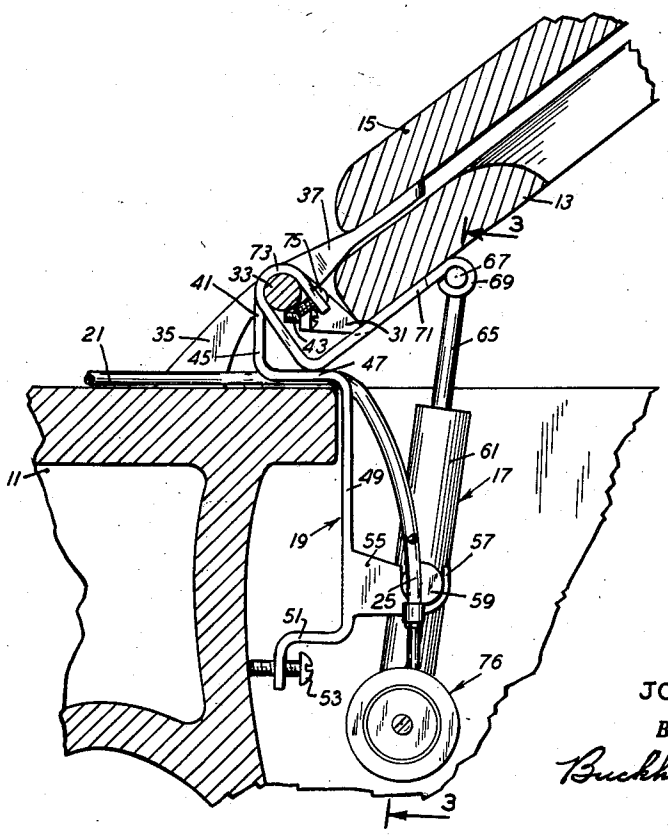


FIG. 2

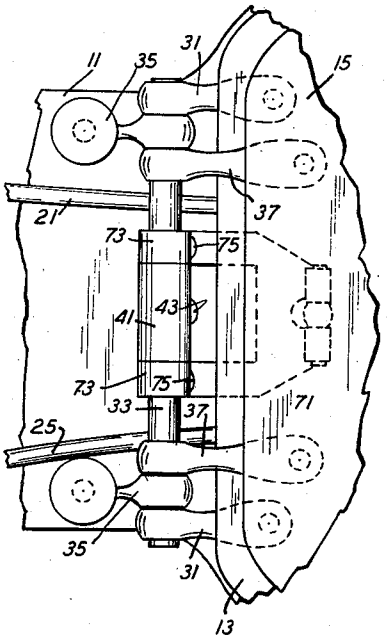
INVENTOR.
JOHN L. GYLLENBERG
BY
Buckhorn, Chatham & Blore
ATTORNEYS

Sept. 2, 1958 J. L. GYLLENBERG 2,849,728

HYDRAULIC TOILET SEAT LIFTER

Filed Nov. 5, 1956 2 Sheets-Sheet 2

FIG.4



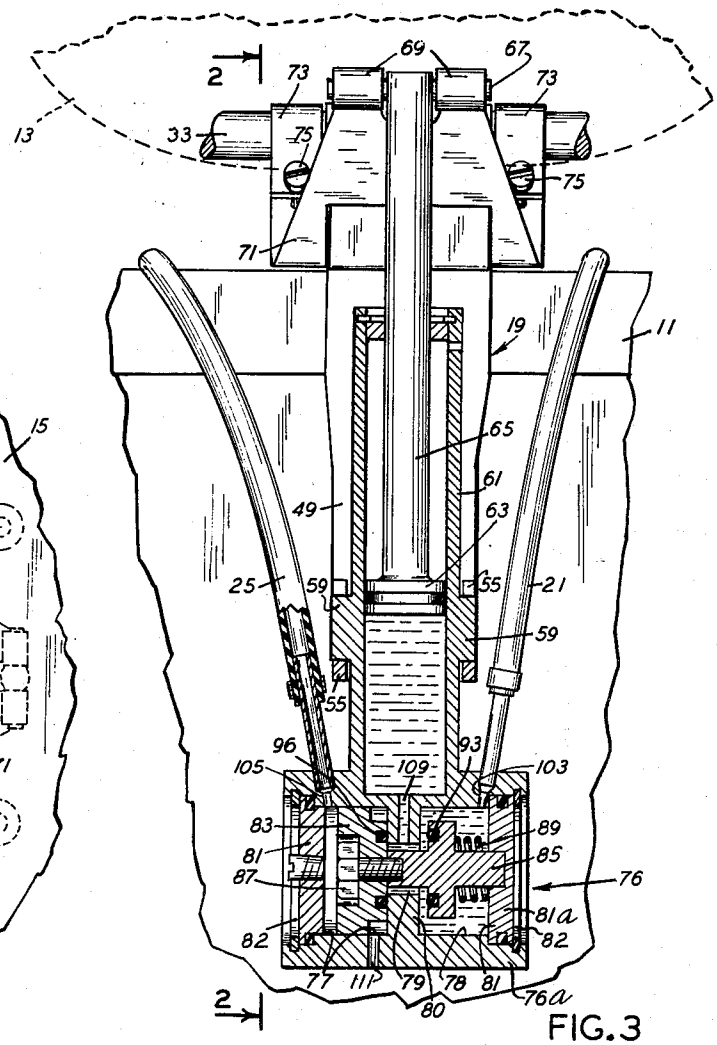


FIG.3

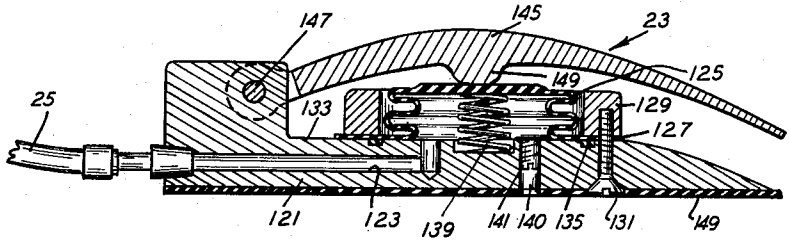


FIG.5

INVENTOR.
JOHN L. GYLLENBERG
BY
Buckhorn, Chrisham & Blore
ATTORNEYS

United States Patent Office

2,849,728

Patented Sept. 2, 1958

2,849,728

HYDRAULIC TOILET SEAT LIFTER

John L. Gyllenberg, Baker, Oreg.

Application November 5, 1956, Serial No. 620,269

12 Claims. (Cl. 4—251)

This invention relates to a toilet seat lifter.

Prior toilet seat lifters have been objectionable in that they required modification of the water closet or partial disassembly thereof in order to facilitate installation of the lifter. Also most lifters have been clumsy in appearance and located in exposed positions to mar the appearance of the water closet. Further, many lifters have been unreliable in operation and of complex and expensive construction.

A main object of the present invention is to provide a simple and inexpensive lifter which may be mounted on many of the conventional water closets now in use without modification thereof and without requiring any disassembly thereof.

A further object of the invention is to provide such a lifter having a lifter device mounted within the toilet bowl so as not to mar the exterior appearance of the water closet.

A still further object of the invention is to provide a lifter having a novel and unique means by which it may be readily operated by the foot of the user.

A still further object is to provide such a lifter which is operated by the pressure of the water supplied to the water closet.

The lifter of the present invention comprises a lifter device which is hung from the hinge rod of the toilet seat in a position within the bowl at the rear portion thereof. The lifter device has a thrust connection with the toilet seat for raising the same but permitting the seat to be lifted independently of the lifter device. The lifter device is in the form of a hydraulic ram connected to the source of water pressure to the closet, and there is a foot-operated unit for controlling the supply of water to the hydraulic ram and the exhaust of water from the ram.

Various other objects of the invention will be apparent from the following description taken in connection with the accompanying drawings wherein:

Fig. 1 is a side view in elevation of a water closet having a lifter of the present invention installed thereon;

Fig. 2 is a fragmentary vertical section on an enlarged scale taken longitudinally of the toilet bowl and showing more fully details of construction, the view being taken along line 2—2 of Fig. 3;

Fig. 3 is a sectional view on an enlarged scale taken along line 3—3 of Fig. 2;

Fig. 4 is a plan view of the hinge rod showing the lifter device hanger, the toilet seat and lid being shown in their down positions; and

Fig. 5 is a vertical section through the foot pedal control unit showing the construction thereof.

Referring to Figs. 1 and 2, the water closet includes a bowl 11 having a seat 13 and a lid 15 for the seat. A water chest 16 is at the rear of the bowl. The seat, and therefore the lid, may be raised by a lifter device generally indicated at 17 mounted within the bowl by a hanger 19. The lifter device is supplied with water under pressure through a tube 21 and the operation of the lifter device is

controlled by a foot pedal operated unit 23 connected by tube 25 to the lifter device.

More in detail and referring to Figs. 2 and 4, the seat 13 is mounted in conventional fashion by a pair of arms 31 on a hinge rod 33 which in turn is mounted by a pair of support brackets 35 on the bowl 11. The lid 15 is also mounted in conventional fashion by a pair of arms 37 on the hinge rod 33.

The hanger 19 for the lifter device 17 is in the form of a bent metal strip having a U-shaped upper end 41 which removably fits over the hinge rod 33 and is retained in place by a screw 43. The hanger has a vertical portion 45 extending downwardly from the U-shaped portion and then a horizontal portion 47 extending forwardly therefrom, a vertical portion 49 extending downwardly from the front edge of the horizontal portion 47 and then a rearwardly and downwardly bent bottom portion 51 having an adjustment screw 53 threaded therethrough for engagement with the interior wall of the bowl at the rear end thereof. The hanger 19 is provided with a pair of wing portions 55 which are bent forwardly in parallel relation and are formed with upwardly facing U-shaped notches 57 to receive a pair of trunnions 59 on the cylinder 61 of the lifter device 17.

Referring to Figs. 2 and 3, the cylinder 61 has a piston 63, the piston and cylinder constituting a hydraulic ram. The piston has a piston rod 65 projecting through the upper end of the cylinder 61 and connected by a pivot pin 67 to the spaced knuckles 69 of an angle-shaped mounting piece 71. The upper or lefthand portion of the mounting piece 71 is bifurcated to straddle the upper end of the hanger 19 and the bifurcated portions are bent into U-shaped form at 73 to removably embrace or fit on the hinge rod 33. Screws 75 releasably retain the mounting piece in place on the hinge rod 33. The mounting piece merely bears against the underside of the seat 13 and is not fastened or secured to the seat.

Referring to Figs. 1 and 3, water under pressure from the line 21, previously mentioned, is supplied to the hydraulic ram 61, 63 under the control of a valve 76 having a hollow cylindrical valve body 76*a* formed integrally with the lower end of the cylinder 61, and extending at right angles to the length of the cylinder. The valve body has a lefthand valve chamber 77 and a righthand valve chamber 78 connected by a central bore 79 formed in a central wall 80 of the valve body. The ends of the valve body are closed by plugs 81 and 81*a* held in place by snap rings 82.

The valve includes a compound valve member which comprises a first disc-shaped valve element 83 slidably arranged within the valve chamber 77 and a second spool-shaped valve element 85 disposed in the valve chamber 78 and having a hub portion extending in spaced relation through the bore 79 and secured to valve element 83 by a screw 87. The valve element 85 has another hub portion slidably fitting into and guided by the associated plug 81*a*. A coil spring 89 urges the valve element toward the wall 80. The valve element 85 has an O-ring 93 adapted to seat against the wall 80, and the valve element 83 has an O-ring 96 to seat against the opposite side of the wall.

The tube 21 communicates with the chamber 78 through a port 103, and the tube 25 communicates with the chamber 77 at the lefthand side of the valve element 83 through a port 105. An inlet passage 109 extends from the bore 79 to the cylinder 61, and an exhaust passage 111 communicates with the chamber 77 at the righthand side of the valve element 83 and extends through the wall of the valve body. The operation of the valve unit and the remaining parts of the device will be presently explained.

Referring to Figs. 1, 3 and 5, the tube 25 is connected at its opposite end to the body 121 of the foot pedal unit

23. The body 121 is formed with a passage 123 which places the tube 25 in communication with the interior of a bellows 125 which has a lower outwardly extending flange portion 127 clamped by a ring 129 and screws 131 against an upper flat surface portion formed on the body 121. A suitable seal 135 may be provided beneath the bellows flange. A compression spring 139 is disposed within the bellows and urges the bellows to assume an extended position.

The interior of the bellows, the interior of the passage 123, the tube 25 and the lefthand portion of chamber 77 of the valve are filled with a hydraulic fluid, the fluid being initially supplied through an opening 140 in the body 121. The opening is normally closed by a plug 141. A foot pedal 145 is pivoted at 147 on the body 121 and has a projection 149 engaging the center of the bellows 125 for compressing the bellows.

The body 121 is provided with a rubber pad 149 on the lower surface thereof to provide a nonslip engagement between the foot pedal unit and the floor upon which it rests.

The operation of the device is as follows. Figs. 3 and 5 show the lifter in its operating condition with the pedal 145 depressed to supply hydraulic fluid under pressure to the chamber 77 to move the compound valve member to the right, as the parts are shown in Fig. 3, to force the valve element 83 against the wall 80 and thus cut off communication between inlet passage 109 and exhaust passage 111. Such movement of the compound valve member also separates the valve element 85 from the wall 80 and allows water under pressure from line 21 to flow into the cylinder 61 to elevate the piston 63 and raise the seat and the lid to the Fig. 1 position of the parts.

When it is desired to lower the seat, the pressure on the pedal 145 is released and the spring 139 returns the bellows 125 to its extended position, while the compound valve element in the valve moves to the left under the influence of spring 89 to close off communication between the port 103 and the passage 109 and to place the passage 109 in communication with the exhaust passage 111. The weight of the seat, the lid, and the piston and its piston rod, applies pressure to the fluid within the cylinder 61 forcing the water out the exhaust port 111 into the bowl 11.

Referring to Fig. 2, during elevation of the seat 13, the cylinder 61 must pivot on the hanger 19 because the distance between the fixed hinge rod 33 and the pivot pin 67 varies. The trunnions 59 permit such pivotal movement.

When attaching the lifter device to the hinge rod 33, the seat 13 and lid 15 are raised to vertical positions and the mounting piece 71 and the hanger 19 are slipped onto the hinge rod from the rear thereof.

Having described the invention in what is considered to be the preferred embodiment thereof, it is desired that it be understood that the invention is not to be limited other than by the provisions of the following claims.

I claim:

1. In a toilet seat lifter for a water closet of the type having a bowl and a seat mounted on a hinge rod supported by said bowl, a lifter device disposed within the bowl and operable to lift the toilet seat, and means for suspending said device from the hinge rod, said means being detachably connected to the hinge rod and removable from the hinge rod in a direction at right angles to the length of such rod.

2. In a toilet seat lifter for a water closet of the type having a bowl and a seat pivoted on a hinge rod supported by such bowl, a lifter device disposed within such bowl for lifting the seat and having a part movable about the hinge rod as a center, means suspended from the hinge rod for supporting said lifter device, said means providing for movement of said lifter device relative to such bowl to provide for movement of said part.

3. In a toilet seat lifter for a water closet having a bowl and a seat therefor, a hydraulic lifter device comprising a cylinder, a piston within the cylinder operatively connected to the seat for raising the same, a compound valve for controlling the supply of water under pressure to said cylinder, means for connecting a source of hydraulic pressure to said valve, a compound valve element in said valve movable in one direction under the influence of said hydraulic pressure to provide for the supply of water to said cylinder and movable in the opposite direction upon release of said hydraulic pressure for exhausting water from said cylinder, and means for controlling the supply of hydraulic pressure to and the release of hydraulic pressure from said valve body.

4. In a hydraulic toilet seat lifter for a water closet, a hydraulic ram within the bowl of said closet for raising said toilet seat, means for supporting said ram from the hinge rod of the toilet seat, said supporting means being in the form of a hanger having a U-shaped upper end fitting onto said hinge rod, said supporting means including a part in abutting engagement with the interior of said bowl to take the thrust of said ram when said ram raises said seat.

5. In a hydraulic toilet seat lifter for a water closet, a hydraulic ram for raising said toilet seat, means for supporting said ram from the hinge rod of the toilet seat, said supporting means being in the form of a hanger having a U-shaped upper end fitting onto said hinge rod, said ram being connected to said seat by a mounting piece having a bifurcated upper end straddling the upper end of said hanger.

6. In a toilet seat lifter for a water closet of the type having a bowl and a seat mounted on a hinge rod supported by said bowl, a lifter device disposed within the bowl and operable to lift the toilet seat, and a hanger for suspending said device from the hinge rod, said hanger being detachably connected to the hinge rod and removable from the hinge rod in a direction at right angles to the length of such rod.

7. In a toilet seat lifter for a water closet of the type having a bowl and a seat mounted on a hinge rod supported by said bowl, a lifter device disposed within the bowl and operable to lift the toilet seat, and a hanger for suspending said device from the hinge rod, said hanger having a portion partially encircling said hinge rod, said hanger having means for detachably retaining said portion on said hinge pin and providing for removal of said portion from said hinge pin in a direction at right angles to the length of such rod.

8. In a toilet seat lifter for a water closet of the type having a bowl and a seat pivoted on a hinge rod supported by such bowl, a fluid operated piston and cylinder device disposed within such bowl for lifting the seat, a member movable about said hinge rod as a center and being operatively connected to said piston and cylinder device in spaced relation from said rod, means suspended from the hinge rod for supporting said piston and cylinder unit, said means providing for movement of said piston and cylinder device relative to such bowl to provide for movement of said member.

9. In a toilet seat lifter for a water closet of the type having a bowl and a seat pivoted on a hinge rod supported by such bowl, a fluid operated piston and cylinder device disposed within such bowl for lifting the seat, a member movable about said hinge rod as a center and being operatively connected to said piston and cylinder device in spaced relation from said rod, means suspended from the hinge rod for supporting said lifter device, said means providing for rocking movement of said piston and cylinder device relative to such bowl to enable movement of said member about said rod.

10. In a toilet seat lifter for a water closet of the type having a bowl and a seat pivoted on a hinge rod supported by such bowl, a fluid operated piston and cylinder device disposed within such bowl for lifting the seat, a

member movable about said hinge rod as a center and being operatively connected to said piston and cylinder device in spaced relation from said rod, means suspended from the hinge rod for supporting said piston and cylinder device, said means being pivotally connected to said piston and cylinder device to enable movement of said member about said rod.

11. In a toilet seat lifter for a water closet having a bowl and a seat therefor, a fluid operated lifter device comprising a cylinder, a piston within the cylinder operatively connected to the seat for raising the same, valve means for controlling the supply of water under pressure to said cylinder, means for connecting a source of fluid under pressure to said valve, said valve means including valve element means movable in one direction under the influence of said fluid presure to provide for the supply of water under pressure to said cylinder and movable in the opposite direction upon release of said fluid pressure for exhausting water from said cylinder, and means for controlling the supply of fluid pressure to and the release of fluid pressure from said valve means.

12. In a hydraulic toilet seat lifter for a water closet, a ram for raising said toilet seat, means for supporting said ram from the hinge rod of the toilet seat, said supporting means being in the form of a hanger having a U-shaped upper end fitting onto said hinge rod, said ram being connected to said seat by a mounting piece having a U-shaped upper end fitting on said hinge rod, one of said ends being bifurcated and straddling the other end.

References Cited in the file of this patent

UNITED STATES PATENTS

354,631	Forney	Dec. 21, 1886
1,821,027	Oya	Sept. 1, 1931
1,826,640	Sturgis	Oct. 6, 1931
2,045,445	Davis	June 23, 1936
2,214,323	Carter	Sept. 10, 1940
2,440,232	Davidson	Apr. 20, 1948