

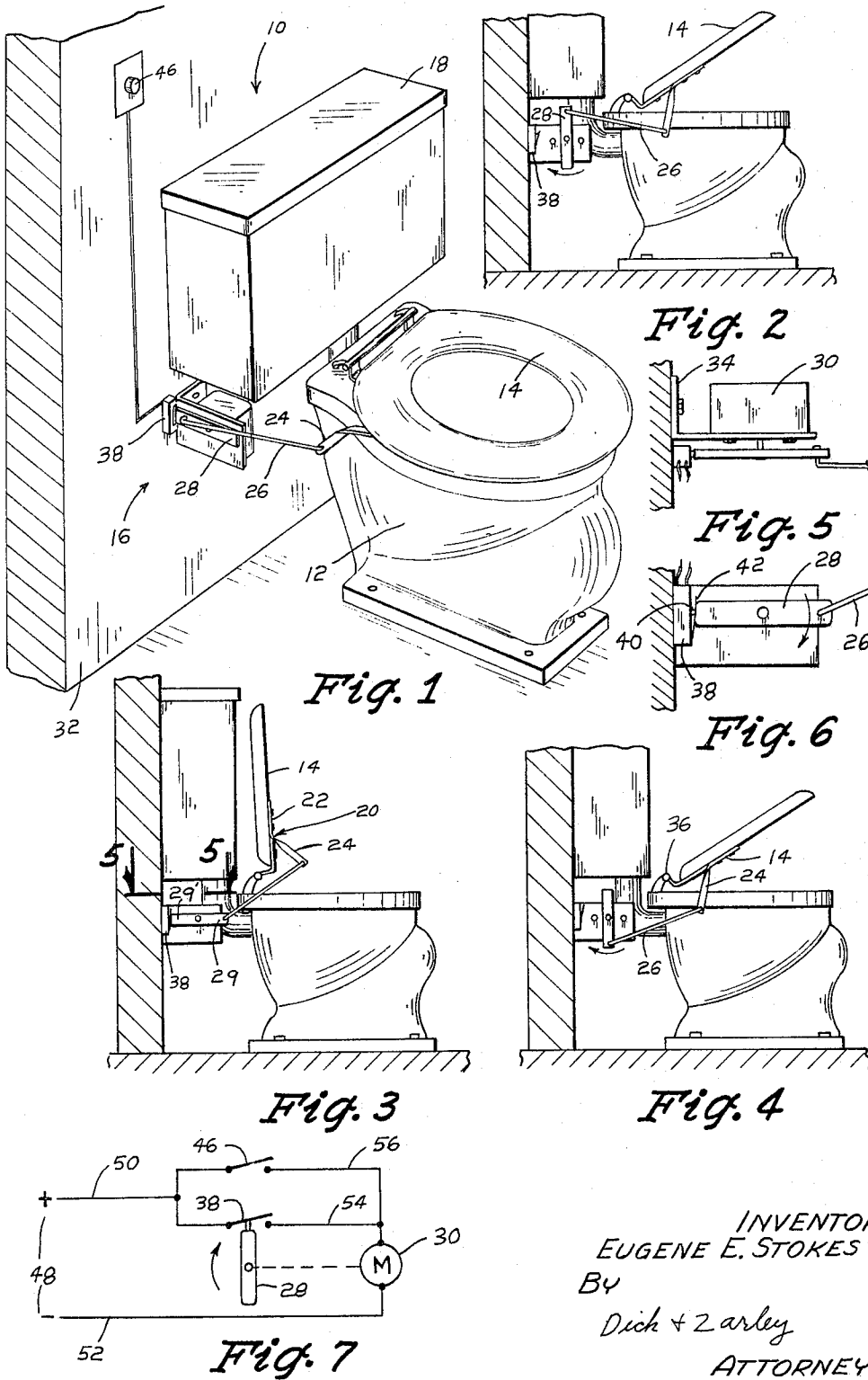
Nov. 15, 1966

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3,284,810

TOILET SEAT LIFT

Filed March 2, 1964



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3,284,810

TOILET SEAT LIFT

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Filed Mar. 2, 1964, Ser. No. 348,342
6 Claims. (Cl. 4-251)

This invention relates to a toilet seat lift and in particular to the apparatus for automatically raising and lowering a toilet seat.

It is one of the objects of this invention to provide a toilet having a toilet seat which may be automatically lowered and raised by the push of a button.

It is another object of this invention to provide a toilet having a seat which is connected to an electrically operated means which when energized will automatically alternately raise and lower the toilet seat.

It is a still further object of this invention to provide a toilet having a toilet seat which does not require manual handling for raising and lowering.

A further object of this invention is to provide a toilet seat lift which is simple in design, economical to manufacture and refined in appearance.

This invention consists in the construction, arrangements, and combination of the various parts of the device, whereby the objects contemplated are attained as hereinafter more fully set forth, specifically pointed out in the claims, and illustrated in the accompanying drawings, in which:

FIG. 1 is a perspective view of a toilet in combination with the toilet seat lift apparatus;

FIG. 2 is a fragmentary side elevation view of the toilet and toilet seat lift apparatus and showing the toilet seat in a partially raised position;

FIG. 3 is a side elevation view of the toilet and toilet seat lift apparatus showing in particular the toilet seat in its fully raised position;

FIG. 4 is a view similar to FIG. 2 showing the toilet seat partially raised but with the crank arm advanced 180° as it rotates moving the seat to a lower position;

FIG. 5 is a top plan view of only the toilet seat lift mechanism;

FIG. 6 is a side elevation view of the toilet seat lift mechanism; and

FIG. 7 is a wiring diagram for the toilet seat mechanism.

In FIG. 1 of the drawings the toilet and toilet seat lift apparatus are referred to generally by the reference numeral 10 and are shown to comprise a conventional toilet bowl 12 with a toilet seat 14 operatively connected to the seat lift apparatus 16. A conventional water tank 18 is also shown above and rearwardly of the bowl 12.

As best shown in FIGS. 2, 3 and 4, the toilet seat 14 is provided with a bracket member 20 which has a first portion 22 secured by screws to the under side of the seat 14 and a second portion 24 as shown in FIG. 1, extending downwardly and rearwardly of the toilet seat 14 when it is in its horizontal lowered position.

A connecting rod 26 has one end pivotally connected to the free end of the bracket member portion 24. The opposite end of the connecting rod 26 extends rearwardly of the toilet seat 14 and is pivotally connected to a crank arm 28 rotatably connected intermediate its ends 29 and 29' to a motor 30. The motor 30 is mounted to a wall 32 behind the toilet bowl 18 by a bracket 34 in such a manner that the crank arm 28 rotates about an axis parallel to the pivotal hinge axis 36 between the toilet seat 14 and the toilet bowl 12. In the same horizontal plane with the pivotal axis of the crank arm 28, a normally closed micro switch 38 is affixed to the wall 32. As shown in FIG. 6, the switch 38 is provided with a pin element 40

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normally biased outwardly towards the crank arm 28 and a leaf spring 42 is hinged to the front face of the micro switch 38 and extends between the pin 40 and the crank arm 28.

Positioned above the micro switch 38 is a manually operated normally open switch 46. One side of a power supply 48 is connected by a lead wire 50 to each of the switches 38 and 46. The other side of the power supply 48 is connected directly to the motor 30. Between the motor 30 and the switches 46 and 38 are provided lead wires 54 and 56 respectively.

Thus it is seen that in operation if the seat is lowered as shown in FIG. 1 and it is desired to raise it to the position of FIG. 3, it is necessary to merely actuate the manually operated normally open switch 46 which closes a circuit through the motor 30 and causes the crank arm 28 to be rotated in a clockwise direction as indicated by the arrows in FIGS. 2, 4 and 6. The rotation of the crank arm 28 only a few degrees moves it out of contact with the micro switch 38 thereby permitting it to close another circuit through the motor 30 since this switch is normally closed. Once switch 38 is closed, it is no longer necessary to depress the switch 46. As the crank arm 28 continues to rotate, it moves to a vertical position, as shown in FIG. 2, with the seat 14 partially raised and finally to a horizontal position with the seat 14 fully raised to a vertical position as shown in FIG. 3. At this time the crank arm 28 has rotated 180° and its opposite end is now in contact with the micro switch 38 thereby opening the electrical circuit through the motor 30.

If it is desired to close the seat 14 by moving it to its horizontal position of FIG. 1, it is easily accomplished by repeating the operating steps for raising the seat, which include manually depressing the switch 46 to cause the crank arm 28 to move out of engagement with the micro switch 38 whereupon the crank arm will rotate until it has returned to its original position as shown in FIG. 1 at which time the micro switch 38 is again opened and the motor 30 is stopped.

Some changes may be made in the construction and arrangement of my toilet seat lift without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim:

1. In combination with a toilet having a seat hingedly mounted thereon,

a toilet seat lift comprising,

a member extending downwardly from said seat,

a connecting means pivotally connected to one end of said member and extending rearwardly of said seat,

a crank arm having one end pivotally connected to the other end of said connecting means,

an electrical power means for rotating said crank arm,

starter means for energizing said power means to begin the rotation of said crank arm,

means for de-energizing said power means to stop the rotation of said arm after it has moved one half a revolution,

said starter means adapted to be operated repeatedly for energizing said power means to advance the rotation of said crank arm one-half revolution, and

said crank arm being positioned so that at the end of one-half revolution said connecting means has been moved rearwardly of said seat to move said seat to a horizontal position and at the end of another one-half revolution said connecting means is moved forwardly and upwardly for rising said seat to a vertical position.

2. In combination with a toilet having a seat hingedly mounted thereon,

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a toilet seat lift comprising,
 a member extending downwardly and rearwardly from said seat,
 a connecting rod means pivotally connected to one end of said member and extending rearwardly of said seat,
 a crank arm having one end pivotally connected to the other end of said connecting means, said arm adapted to rotate about an axis parallel to the axis of pivotal movement of said toilet seat,
 an electrical power means for rotating said crank arm, starter means for energizing said power means to begin the rotation of said crank arm,
 means for de-energizing said power means to stop the rotation of said arm after it has moved one half a revolution,
 said starter means adapted to be operated repeatedly for energizing said power means to advance the rotation of said crank arm one-half revolution, and said crank arm being positioned so that at the end of one-half revolution said connecting means has been moved rearwardly of said seat to move said seat to a horizontal position and at the end of another one-half revolution said connecting means is moved forwardly and upwardly for raising said seat to a vertical position.

3. In combination with a toilet having a seat hingedly mounted thereon,
 a toilet seat lift comprising,
 a member extending downwardly from said seat,
 a connecting rod means pivotally connected to one end of said member and extending rearwardly of said seat,
 a crank arm having one end pivotally connected to the other end of said connecting means,
 an electrical power means for rotating said crank arm, starter means for energizing said power means to begin the rotation of said crank arm,
 a normally closed switch means positioned adjacent said crank arm, the ends of said arm adapted to alternately engage and actuate said switch to an open position, said switch being in an electrical circuit with said electrical power means,
 said starter means serving as a normally open switch in a circuit with said electrical power means,
 said starter means adapted to be momentarily manually held in a closed position to close the circuit through said power means and begin rotation of said crank arm whereby after one end of said arm has moved out of engagement with said switch means said circuit through said switch means is closed and said crank arm continues rotating until the other end of said arm moves into engagement with said switch means to again open the electrical circuit through said switch means and said power means,
 said starter means adapted to be operated repeatedly for energizing said power means to advance the rotation of said crank arm one-half revolution, and said crank arm being positioned so that at the end of one-half revolution said connecting rod means has been moved rearwardly of said seat to move said seat to a horizontal position and at the end of another one-half revolution said connecting rod means is moved forwardly and upwardly for raising said seat to a vertical position.

4. In combination with a toilet having a seat hingedly mounted thereon, a toilet seat lift comprising,
 a member extending downwardly and rearwardly from said seat,
 a connecting rod means pivotally connected to one end of said member and extending rearwardly of said seat,
 a crank arm having one end pivotally connected to the other end of said connecting means, said arm adapted

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to rotate about an axis parallel to the axis of pivotal movement of said toilet seat,
 an electrical power means for rotating said crank arm, starter means for energizing said power means to begin the rotation of said crank arm,
 a normally closed switch means positioned adjacent said crank arm, the ends of said arm adapted to alternately engage and actuate said switch to an open position, said switch being in an electrical circuit with said electrical power means,
 said starter means serving as a normally open switch in a circuit with said electrical power means,
 said starter means adapted to be momentarily manually held in a closed position to close the circuit through said power means and begin rotation of said crank arm whereby after one end of said arm has moved out of engagement with said switch means said circuit through said switch means is closed and said crank arm continues rotating until the other end of said arm moves into engagement with said switch means to again open the electrical circuit through said switch means and said power means,
 said starter means adapted to be operated repeatedly for energizing said power means to advance the rotation of said crank arm one-half revolution, and said crank arm being positioned so that at the end of one-half revolution said connecting rod means has been moved rearwardly of said seat to move said seat to a horizontal position and at the end of another one-half revolution said connecting rod means is moved forwardly and upwardly for raising said seat to a vertical position.

5. In combination with a toilet having a seat hingedly mounted thereon,
 a toilet seat lift comprising,
 a member extending from said seat,
 a connecting means pivotally connected at one end to said member,
 a crank arm having one end pivotally connected to the other end of said connecting means,
 an electrical power means for rotating said crank arm, starter means for energizing said power means to begin the rotation of said crank arm,
 a normally closed switch means positioned adjacent said crank arm, the ends of said arm adapted to alternately engage and actuate said switch to an open position, said switch being in an electrical circuit with said electrical power means,
 said starter means serving as a normally open switch in a circuit with said electrical power means,
 said starter means adapted to be momentarily manually held in a closed position to close the circuit through said power means and begin rotation of said crank arm whereby after one end of said arm has moved out of engagement with said switch means said circuit through said switch means is closed and said crank arm continues rotating until the other end of said arm moves into engagement with said switch means to again open the electrical circuit through said switch means and said power means,
 said starter means adapted to be operated repeatedly for energizing said power means to advance the rotation of said crank arm one-half revolution, and said crank arm being positioned so that at the end of one-half revolution said connecting means has moved said seat to a horizontal position and at the end of another one-half revolution said connection means has moved said seat to a vertical position.

6. In combination with a toilet having a seat hingedly mounted thereon,
 a toilet seat lift comprising,
 a member extending downwardly from said seat,
 a connecting rod means pivotally connected to one end of said member and extending rearwardly of said seat,

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a crank arm having one end pivotally connected to the other end of said connecting means,
 an electrical power means for rotating said crank arm,
 starter means for energizing said power means to begin the rotation of said crank arm,

a normally closed switch means positioned adjacent said crank arm, the ends of said arm adapted to alternately engage and actuate said switch to an open position, said switch being in an electrical circuit with said electrical power means,

said starter means serving as a normally open switch in a circuit with said electrical power means,

said starter means adapted to be momentarily manually held in a closed position to close the circuit through said power means and begin rotation of said crank arm whereby after one end of said arm has moved out of engagement with said switch means said circuit through said switch means is closed and said crank arm continues rotating until the other end of said arm moves into engagement with said switch means to again open the electrical circuit through said switch means and said power means,

said starter means adapted to be operated repeatedly

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for energizing said power means to advance the rotation of said crank arm one-half revolution, and said crank arm being rotated in the same direction at all times of operation and being positioned so that at the end of one-half revolution said connecting rod means has been moved rearwardly of said seat to move said seat to a horizontal position and at the end of another one-half revolution said connecting rod means is moved forwardly and upwardly for raising said seat to a vertical position.

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