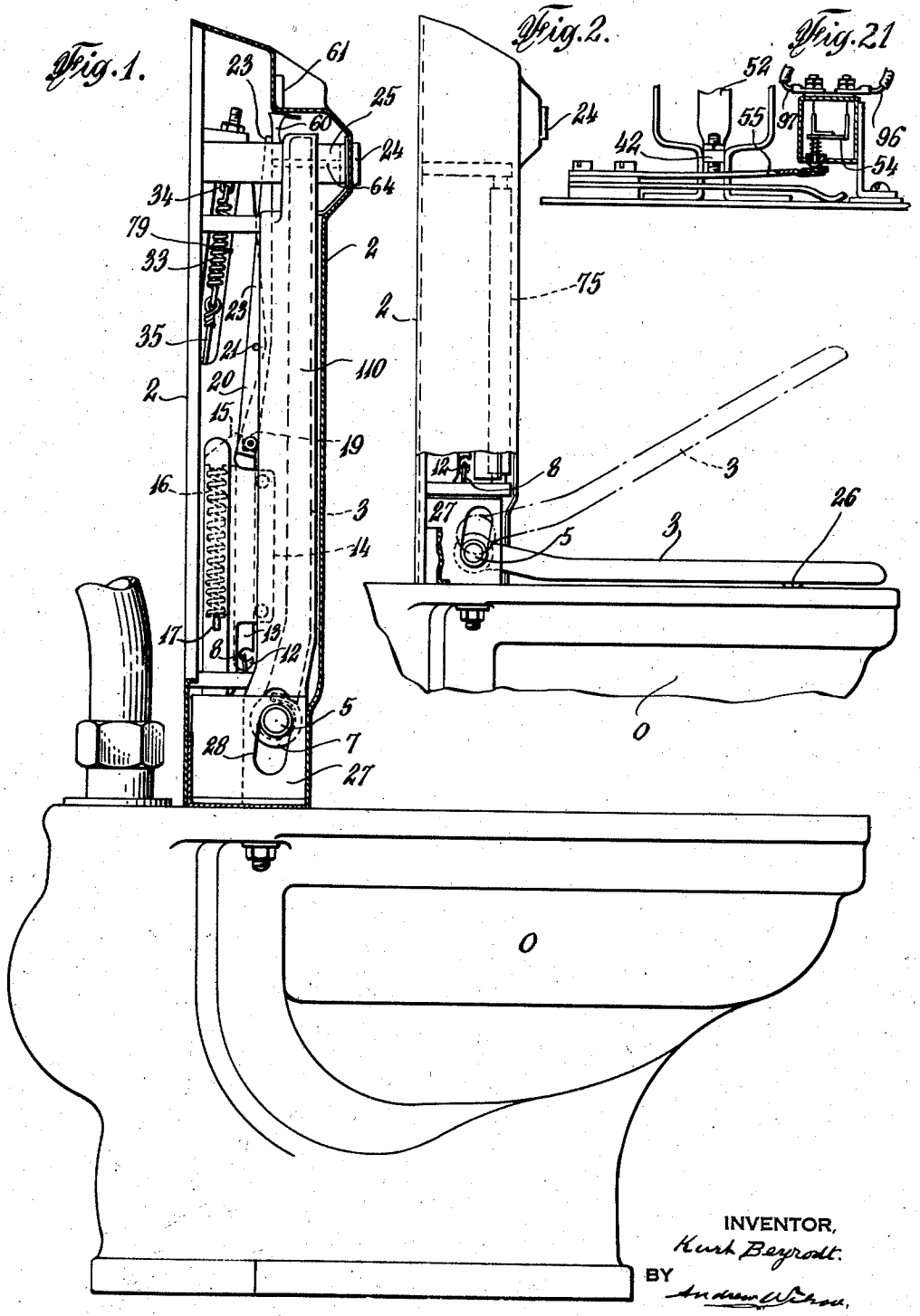
Nov. 3, 1942. K. BEYRODT 2,300,904

TOILET SEAT

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Fig. 3.

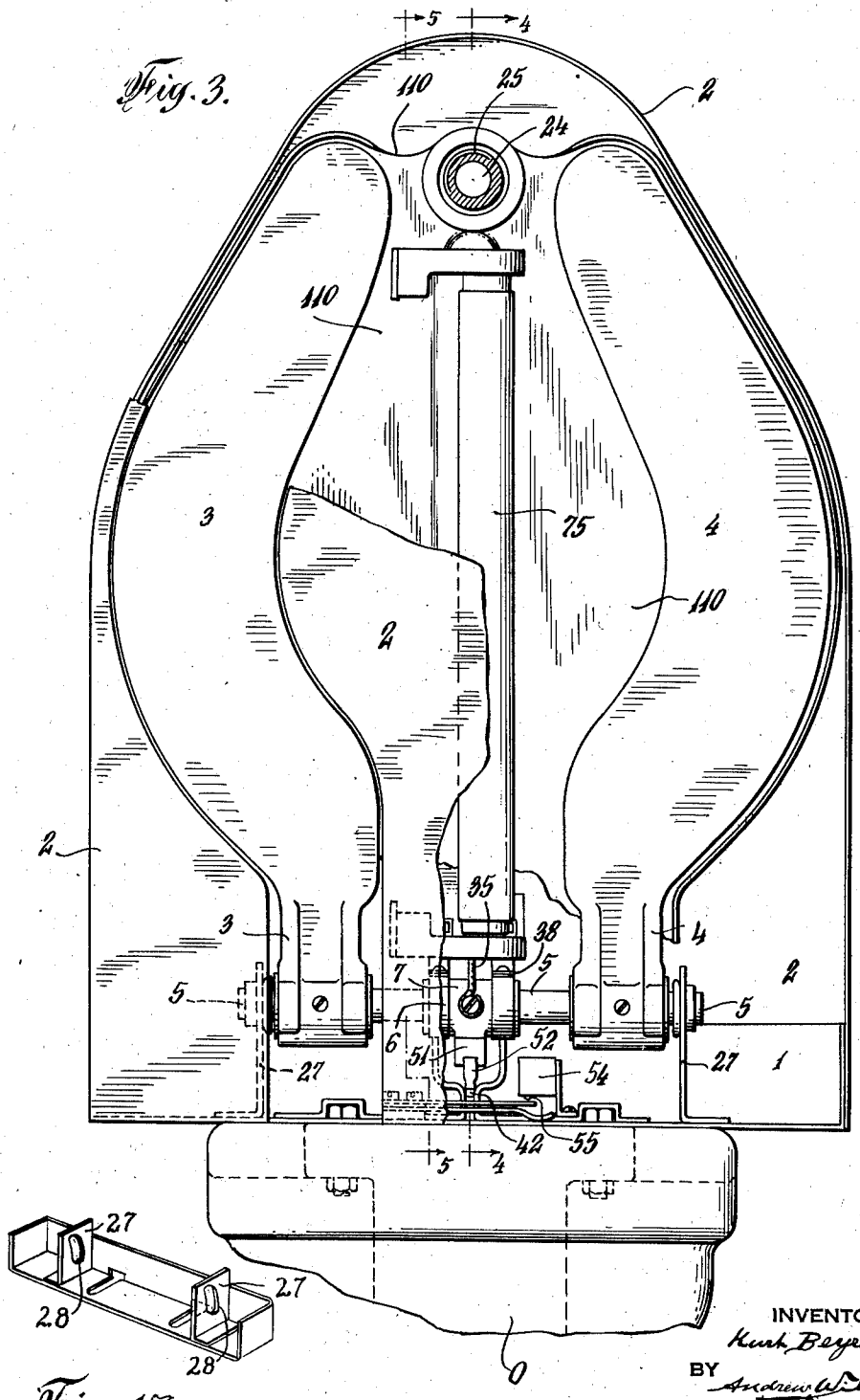


Fig. 17

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Fig. 4.

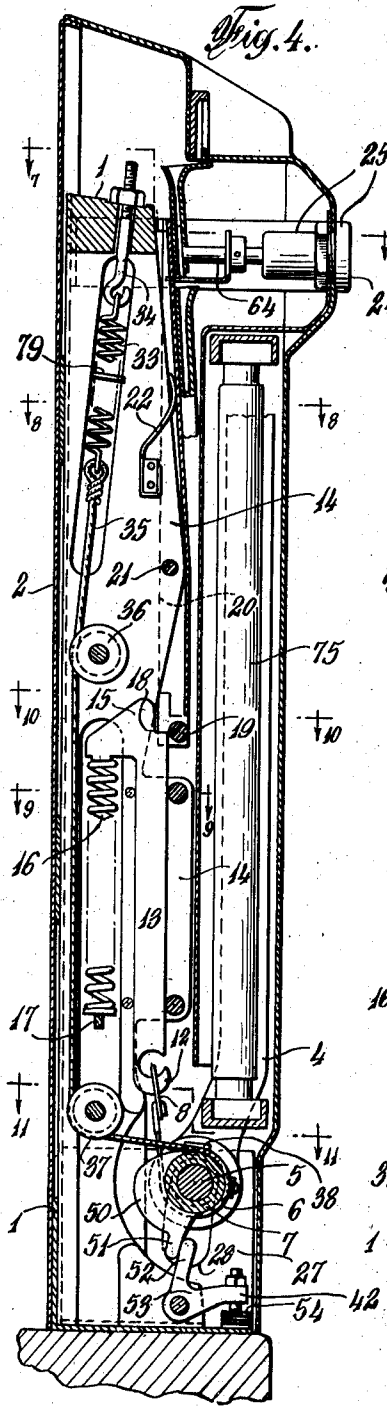


Fig. 5.

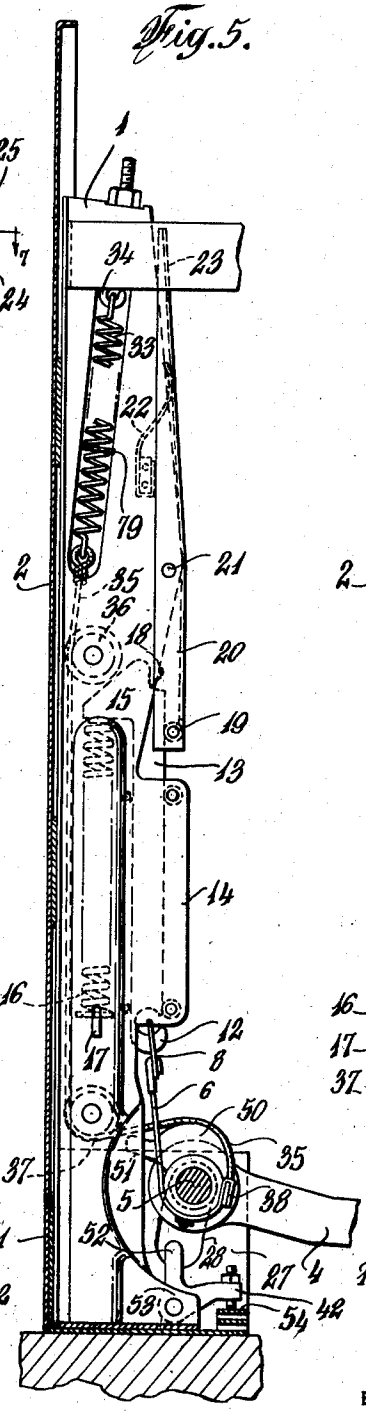
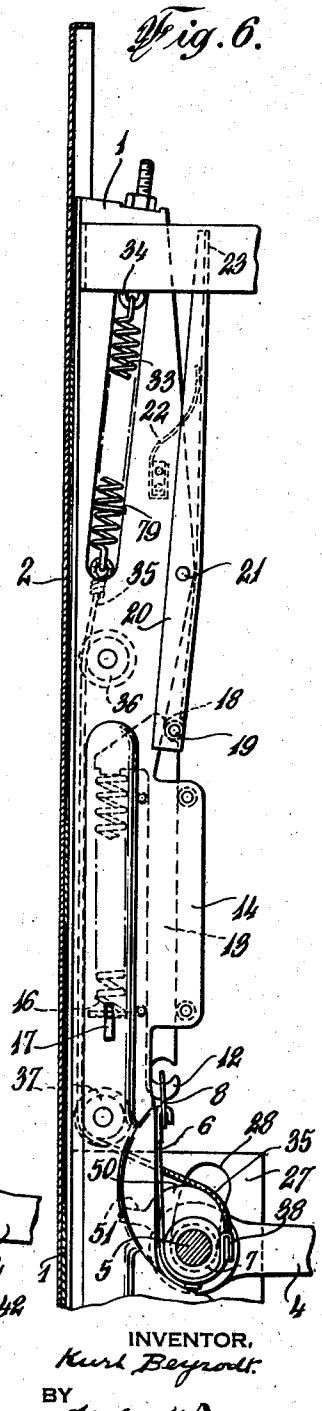


Fig. 6.



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Fig. 7.

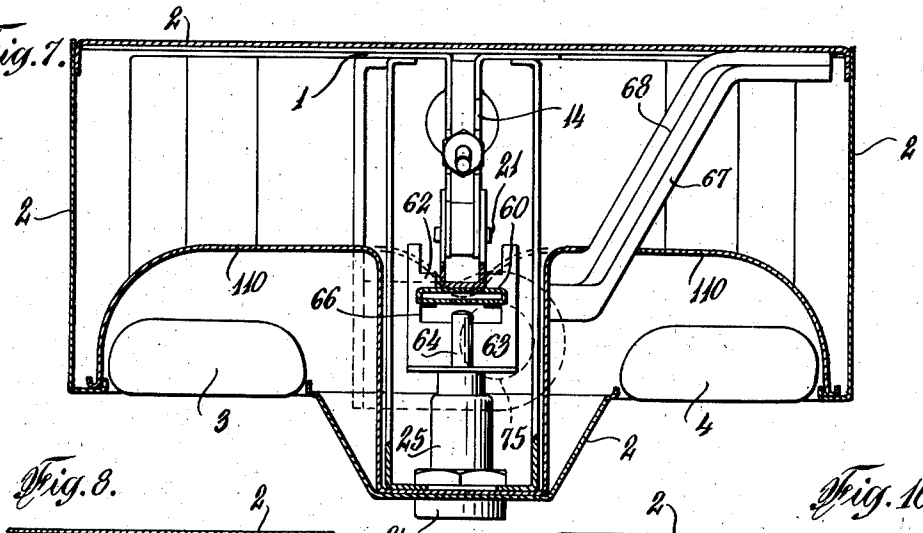
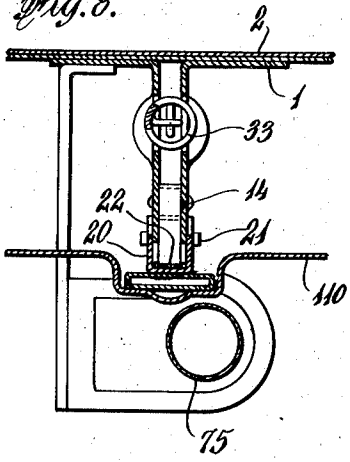


Fig. 8.



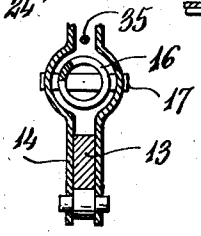


Fig. 9.

Fig. 10.

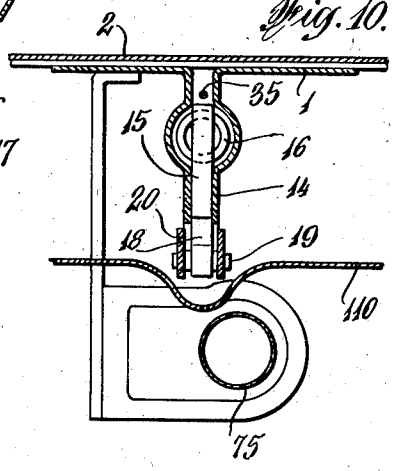
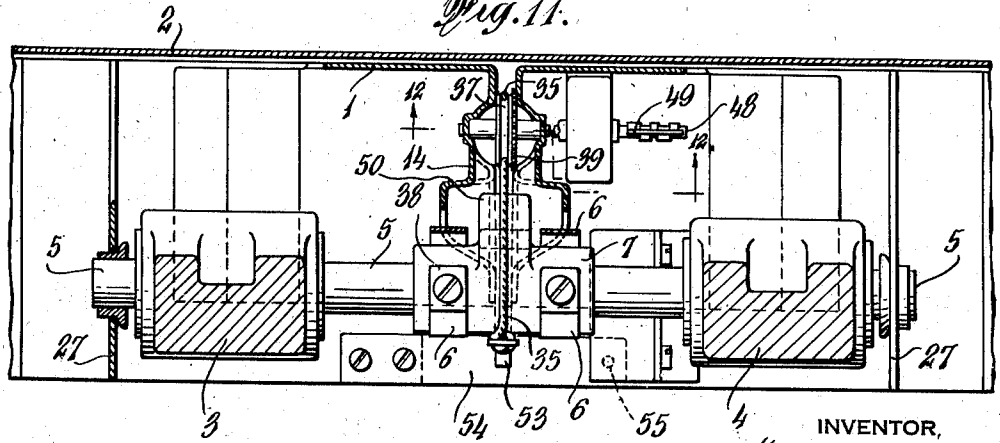


Fig. 11.



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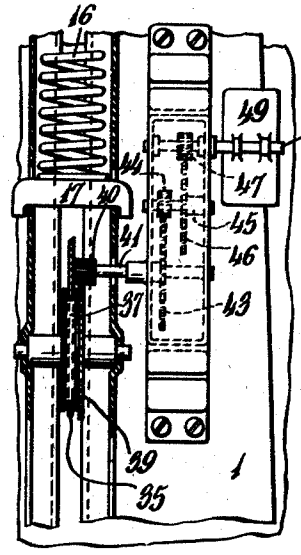


Fig. 12.

Fig. 16.

Fig. 13.

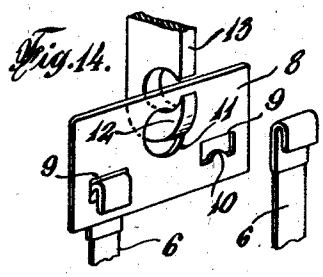


Fig. 14.

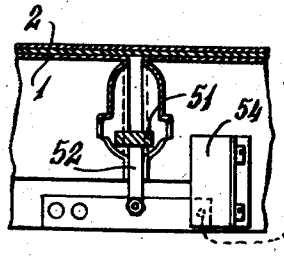


Fig. 15.

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TOILET SEAT

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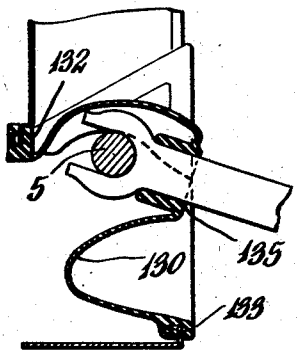


Fig. 20.

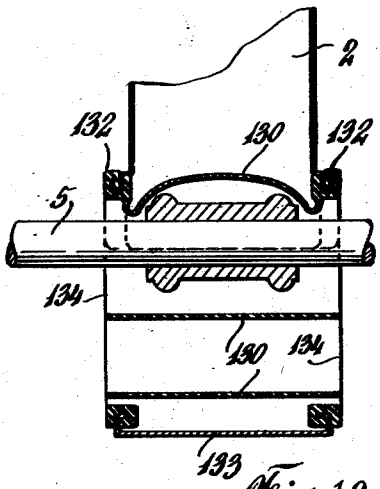
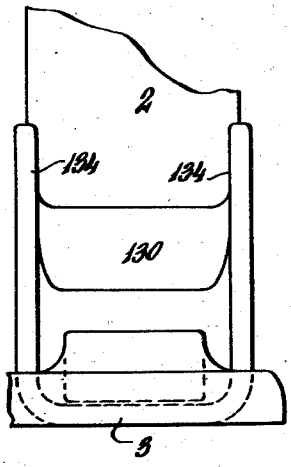


Fig. 19.

Fig. 18.



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Patented Nov. 3, 1942 2,300,904

UNITED STATES PATENT OFFICE

2,300,904

TOILET SEAT

Kurt Beyrodt, Flushing, N. Y., assignor to Electric Steam Sterilizing Company, Inc., New York, N. Y., a corporation of Delaware

Application March 6, 1940, Serial No. 322,431

10 Claims. (Cl. 4—233)

My invention relates to the art of sterilizing toilet seats; and my improvements are particularly directed to means for efficiently carrying out a process of sterilization.

Objects of my invention are to make the operation of the mechanism of the seat automatic; to avoid the necessity of contacting the seat with the hands, before, during or after its use; to simplify operating mechanism and reduce costs of manufacture; to produce a seat suitable for general use by the public without the supervision or instruction of skilled persons; and to secure the other advantages hereinafter more specifically pointed out and claimed.

I will now describe means suitable for securing the objects in view.

The type of seat illustrated and described has two side members to support the user, which side members are lowered for use and raised for sterilization. These two side members constitute the seat. The seat may be made in one piece instead of two.

In the drawings Fig. 1 is a side elevation of the apparatus, with the seat raised, the casing being removed to show operating elements contained within it; Fig. 2 is a similar view, on a somewhat smaller scale, showing the seat lowered, the casing being shown partly broken away toward its bottom; Fig. 3 is a front view, on an enlarged scale, showing the seat raised in normal, initial position, the casing being partially broken away; Fig. 4 is a vertical, sectional view, on a somewhat enlarged scale, taken as on line 4—4 of Fig. 3; Fig. 5 is a similar view, but shows the seat in its first lowered position and is taken on the line 5—5 of Fig. 3; Fig. 6 is a similar view taken on the line 5—5 of Fig. 3, but shows the seat lowered to its final position; Fig. 7 is a top view on the scale of Fig. 3, with the casing broken away; Figs. 8, 9 and 10 are details in cross section looking down as on lines 8—8, 9—9 and 10—10 respectively of Fig. 4, showing the locking latch for the operating mechanism; Fig. 11 is a horizontal, sectional view, on an enlarged scale, taken on line 11—11 of Fig. 4, of part of the seat raising mechanism; Fig. 12 is a detail view on an enlarged scale taken as on line 12—12 of Fig. 11; Fig. 13 is a detail looking to the left on Fig. 12; Fig. 14 is a perspective detail of the lowering bands' connection with the operating spring; Fig. 15 is a cross sectional view taken on the line 15—15 of Fig. 16; Fig. 16 is a front elevation of the seat lowering mechanism, the lower ends of the seat being shown in section; Fig. 17 is a detail in perspective of the cam guide for the seat hinge; Figs. 18, 19 and 20 are details of flexible protectors near the bottom of the case; and Fig. 21 is a front detail of a switch control.

My improved apparatus may be used in combination with the conventional bowl 0, upon the rear of which it may be mounted, the various parts being assembled upon a suitable frame 1. Preferably, the apparatus is inclosed in a casing 2 recessed to receive the seat-halves when raised, and which houses the operating mechanism.

The seat halves 3, 4 are fixed on and carried by a shaft 5 which hangs upon flexible metallic strips 6, 6, the lower ends of which are shown as attached to and rolled anticlockwise partly around fixed hub 7 on shaft 5, the upper ends of the strips being attached to a plate or cross head 8 by being hooked through holes 9, 9 in the plate, which holes have on their bottoms hump-like projections 10, 10 over which the hooks of strips 6 may rock laterally to adjust themselves to lateral inclinations of the shaft 5 if the seat-halves are deflected into different relative planes, as may occur if the weight of a person is placed principally on one of the halves. The plate 8 also has a hole 11 which receives a hook 12 on the lower end of a bar 13, sliding vertically in a guide 14 mounted in the case, the upper end of the bar being provided with an arm 15, resting upon the upper end of a spring 16, the lower end of which is supported by a suitable stop 17 within the case, so that when the bar 13 is pulled down the spring will be compressed; and the upper end of the bar 13 being also provided with a recess or socket 18, which receives a small roller 19 carried by the end of a channeled locking bar 20, pivoted on a pin—as at 21, pressed to locking duty by spring 22, the upper end 23 of the bar 20 extending to a point where it can be conveniently reached by a starting element such as a push button 24, carried by a suitable bearing as sleeve 25 fixed in the frame 1.

When the seat-halves are raised, as in Fig. 1, the apparatus will be locked until it is released by pushing in the upper end of channel bar 20, as by means of the stem 64 of the push button 24, operating directly or through an intervening coin mechanism as indicated in Fig. 4 but not claimed herein, which will free the detent roller 19 from above the bar 13, and permit it to be pushed up by the expansion of the spring 16, unwinding the strips 6 from around the hub 7 fixed on shaft 5, thus rotating the shaft clockwise and lowering the seat-halves into the position shown in Fig. 5 where their conventional elastic bearings 26, one on each seat half, will

rest upon the upper edges of the bowl, in which position the seat-halves will come to rest with their inner ends and pivot shaft 5 somewhat raised above the bowl, as shown in Fig. 5.

If now the weight of a person is placed upon the seat-halves their rear ends and the pivot shaft will be pushed down into the position shown in Fig. 6, pulling down the bar 13, compressing the spring 16, and allowing the roller 19 of locking bar 20, under impulse of spring 22, to seat itself into the socket 18 of bar 13, thus locking the springs 16 under compression in readiness for its next lowering action.

To prevent the bumpers 26 from rubbing forward on the edges of the bowl when the rear ends of the seat-halves are lowered, as above described, the bottom of the frame or case is provided with guides 27, 27 having cam slots 28, 28 therein, through which the ends of the shaft 5 pass, and which act to guide the shaft down on a true curve from the bumpers serving as pivots.

I will now describe the means for raising the seat-halves, the actuating means for accomplishing which operation are shown as embodying a spring 33, fastened at the upper end to the frame of the apparatus, as at 34, and to the lower end of which spring is fastened a small cable or cord 35, running down over grooved guide rollers 36, 37, and adapted to wind clockwise over hub 7 to which the end of it is fastened, as at 38, so that when the hub is turned clockwise, during the lowering of the seat, the cable will be wound partially around the hub 7 as shown in Figs. 5 and 6. The guide roller 37 carries with it on its pivot shaft a gear wheel 39, which through pinion 40, shaft 41, gear wheel 43, pinion 44, shaft 45, gear wheel 46, and pinion 47, turns shaft 48, carrying damping fan 49, so that the chain of gears causes the fan to retard the action of the spring 33 and thereby avoid slamming of the seat-halves when they are raised into the case.

The hub to which the cable 35 is attached is eccentric in form, as at 50, where the cable passes around it, so that the drag of the spring 33, being furthest from shaft 5, when the seat-halves are fully lowered is its greatest, and diminishes as the hub revolves with the rising of the seat-halves and the consequent progressive diminishing of the weight to be lifted by the spring as the seat-halves gradually approach a vertical position.

As the seat-halves are lowered the pull of the spring 16, with the weight of the seat-halves, and the final, added weight of a user of the seat, overcomes the resistance of the spring 33, stretching it, and allows the cable 35 to be wound partly around the eccentric 50 on the shaft 5. When, however, the lowering mechanism has been locked out of operation by the locking bar 20, and the weight of the user has been removed from the seat-halves, the pull of the spring 33 will be sufficient to turn the hub and shaft backward, and to thereby raise the seat-halves gradually into a vertical position in the front of the casing, so that the apparatus will be returned to its initial and locked position.

The eccentric on the hub also carries an arm 51 positioned to engage an arm 52 on a bell crank 53, the other arm 42 of which bell crank extends over and is adapted to press down on a spring 55 controlling switch 54, and thereby open a circuit through the switch and lines 96, 97 which may if desired be used to actuate other mechanism associated with the seat operating mechanism.

To prevent the entrance of objectionable liquid or other foreign matter into the base of the apparatus, I provide screens, or closures, 130, covering the openings in the front 131 of the casing 2, adjacent to the inner ends of the seat halves and their carrying shaft and shaft guides. These closures, illustrated in Figs. 36, 37 and 38 consist of flexible curtains or gaskets, marginally attached near the tops 132, 132, bottoms 133, 133, and sides 134, 134 of the openings, and provided with preferably reinforced openings 135, 135, through which the inner ends of the seat may pass and be snugly embraced by the screens. These screens are sufficiently slack to permit the downward and upward movements of the seat without displacement of the screens; and they operate efficiently with the casing to completely close the bottom of the casing which entirely incloses the other parts of the apparatus in conjunction with the back of the frame. Hence, any liquid or other foreign matter is prevented from entering the bottom of the casing; and if any such matter should find entrance thereinto it may be conveniently removed by lowering the screens, afterwards replacing them.

The apparatus operates as follows:

With the seat in the raised and locked position, the apparatus is unlocked, and the seat is automatically lowered into an initial position on the bowl. The user then sits on the seat, thereby pushing its ends down on a true arc from its points of contact with the bowl, recompressing the lowering spring and locking it out of operation. When the user rises from the seat, the raising mechanism functions automatically to raise the seat gently to its initial position where it will be automatically locked in place. Thus manual contact with the apparatus is avoided, and the whole cycle of operation becomes automatic.

I wish it to be understood that the embodiment of my invention which I have illustrated and described is to be regarded as typical and not exclusive, for construction may be modified as by the use of substantial equivalents, without departing from the spirit of my invention and the scope of my claims.

Having thus described my invention what I claim and desire to secure by Letters Patent of the United States is:

1. In a toilet seat, the combination, with a bowl, of a seat, a pivotal support embodying a transverse bar provided with a centrally disposed hub for the rear end of the seat, and automatic means embodying an actuating spring and connecting means, attached to the hub, for swinging the seat downward from a raised position to rest upon the bowl.

2. In a toilet seat, the combination, with a bowl, of a seat, a pivotal support embodying a transverse bar provided with a centrally disposed hub for the rear end of the seat, and automatic means embodying an actuating spring and flexible connecting means, attached to the hub, for swinging the seat downward from a raised position to rest upon the bowl.

3. In a toilet seat, the combination, with a bowl, of a seat, a pivotal support embodying a transverse bar provided with a centrally disposed hub for the rear end of the seat, and automatic means embodying an actuating spring and flexible connecting means, attached to the hub, embodying parallel, metal strips interposed be-

tween the spring actuated means and the hub and adapted to wind around it.

4. In a toilet seat, the combination, with a bowl, of a seat, a pivotal support embodying a transverse bar provided with a centrally disposed hub for the rear end of the seat, and automatic means embodying an actuating spring and flexible connection means, attached to the hub, embodying parallel, metal strips interposed between the spring actuated means and the hub and adapted to wind around it and a rockable cross head to which each strip is attached at one end in laterally swingable relation, and means forming a pivoted connection between an end of the spring actuated means and the cross head.

5. In a toilet seat, the combination, with a bowl, of a seat, a pivotal support for the rear end of the seat, and automatic means for swinging the seat downward from a raised position to rest forwardly, and means embodying cams controlling the pivotal support for further depressing the rear of the seat on an arc of a true circle from the forward point of contact of the seat with the bowl.

6. In a toilet seat, the combination, with a bowl, of a seat, a pivotal support for the rear end of the seat, automatic means for swinging the seat downward from a raised position to rest upon the bowl, automatic means embodying a spring, a flexible element connecting the spring with the said pivotal support and operative to rotate such support and thereby return the seat to a raised position.

7. In a toilet seat, the combination, with a bowl, of a seat, a pivotal support for the rear end of the seat, and automatic means for swinging the seat downward from a raised position to rest upon the bowl, automatic means embodying a spring, a flexible element connecting the spring with the said pivotal support and operative to rotate such support and thereby return the seat to a raised position, and means for progressively diminishing effective rotating force of the spring as the seat rises.

8. In a toilet seat, the combination, with a bowl, of a seat, a pivotal support for the rear end of the seat, automatic means for swinging the seat downward from a raised position to rest upon the bowl, and automatic means embodying a spring, a flexible element connecting the spring with the said pivotal support and operative to rotate such support and thereby return the seat to a raised position, and means for dampening the action of said spring.

9. In a toilet seat, the combination, with a bowl, of a seat, a pivotal support for the rear end of the seat, automatic means for swinging the seat downward from a raised position to rest upon the bowl, automatic means embodying a spring, a flexible element connecting the spring with the said pivotal support and operative to rotate such support and thereby return the seat to a raised position, and means embodying a train of gears and a rotary fan for dampening the action of said spring.

10. In a toilet the combination with a bowl, of a seat normally raised in a substantially vertical, initial position above the bowl, a pivoted support for the rear end of the seat, expansible, automatically-actuable spring means and connecting means for swinging the forward end of the seat downward to rest upon the bowl, optionally actuable means for depressing the rear end of the seat and thereby recompressing said expansible spring and holding it compressed, an automatically acting seat raising spring tensioned by the lowering of the seat, and seat lowering connecting means, whereby the lowering, use and raising of the seat to initial position may be carried out in a cycle of operations without manual contact with the seat.

KURT BEYRODT.