May 28, 1940. R. J. DELHAYE ET AL 2,202,095

SANITARY WATER CLOSET SEAT

Filed Dec. 23, 1938 3 Sheets-Sheet 1

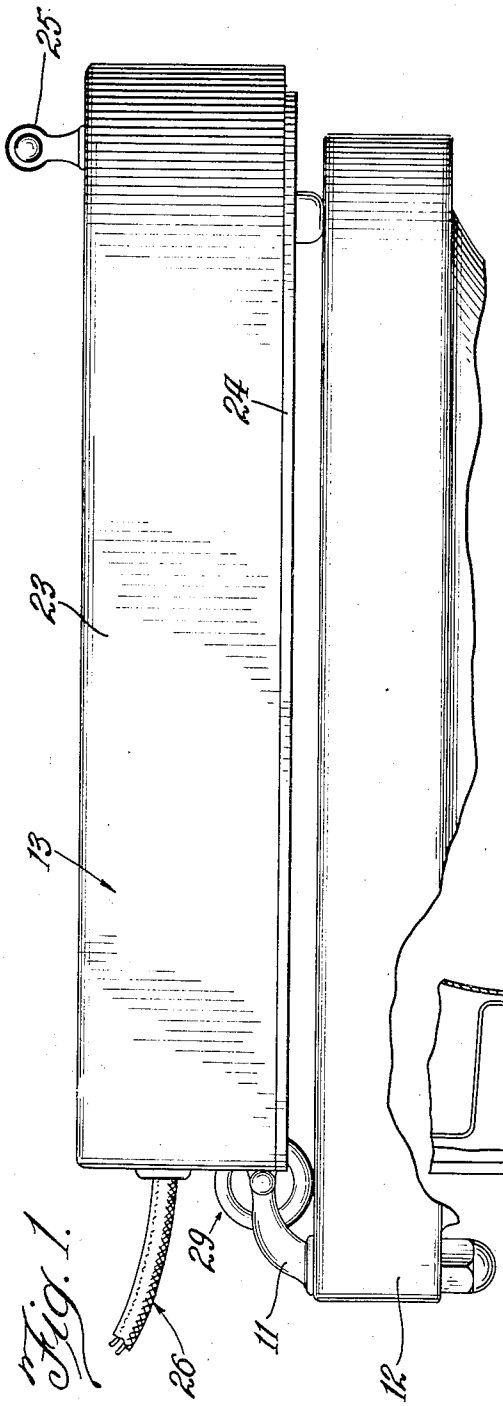


Fig. 1.

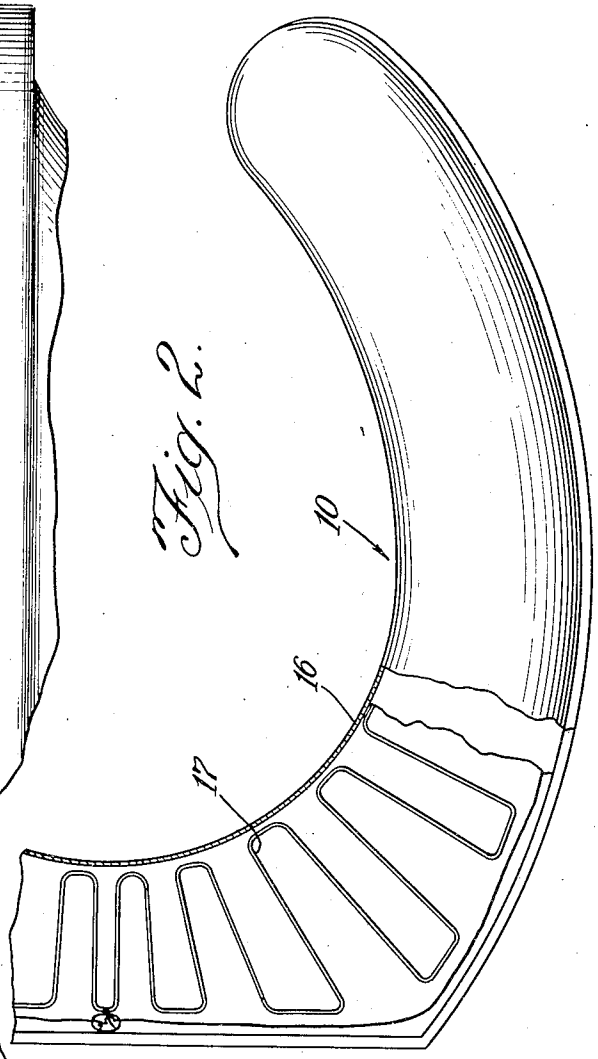


Fig. 2.

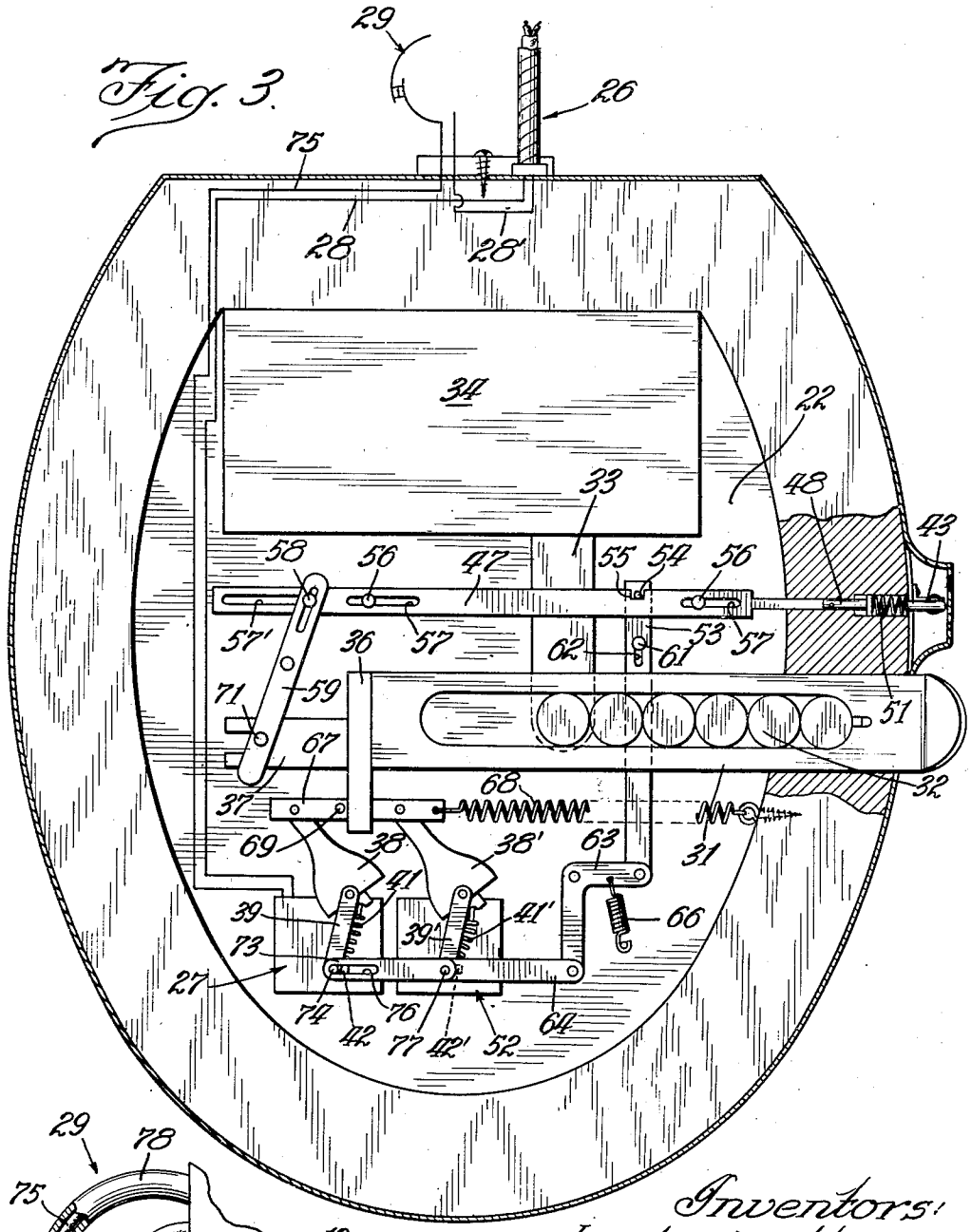
Inventors:
Lestie Delhaye
and Roy J. Delhaye
By: Foorman L. Mueller
Atty.

May 28, 1940. R. J. DELHAYE ET AL 2,202,095

SANITARY WATER CLOSET SEAT

Filed Dec. 23, 1938 3 Sheets-Sheet 2

Fig. 3.



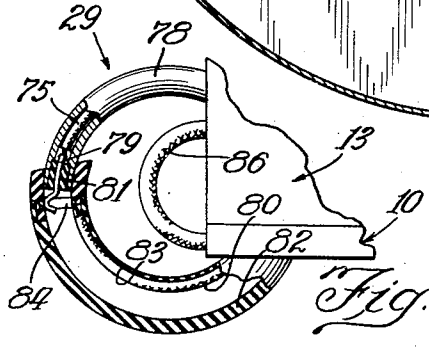


Fig. 4.

Inventors:
Lestie Delhaye
and Roy J. Delhaye
By: Foorman L. Mueller
Atty.

May 28, 1940. R. J. DELHAYE ET AL 2,202,095

SANITARY WATER CLOSET SEAT

Filed Dec. 23, 1938 3 Sheets-Sheet 3

Fig. 5.

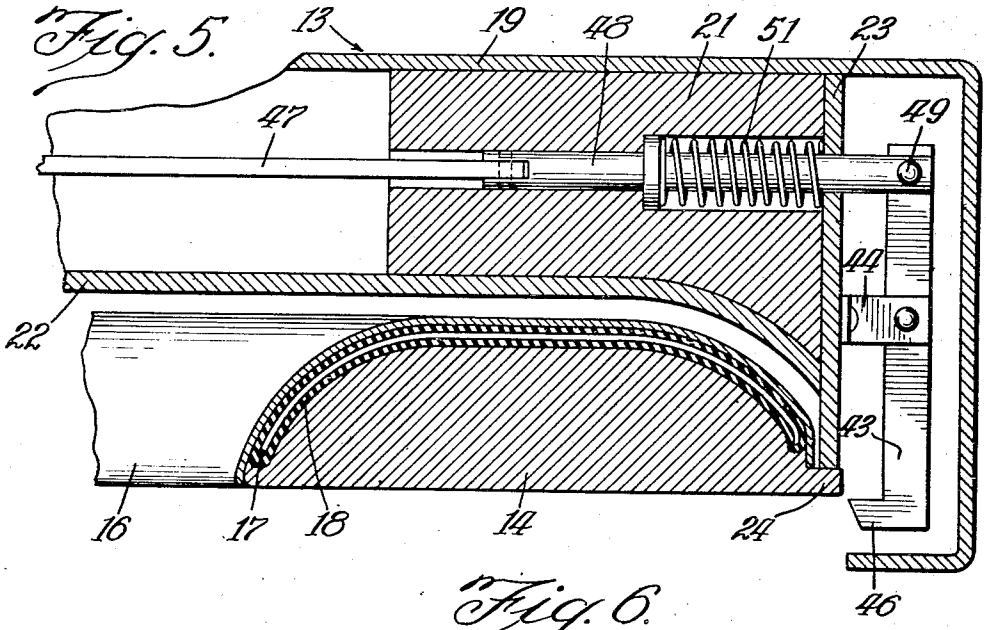
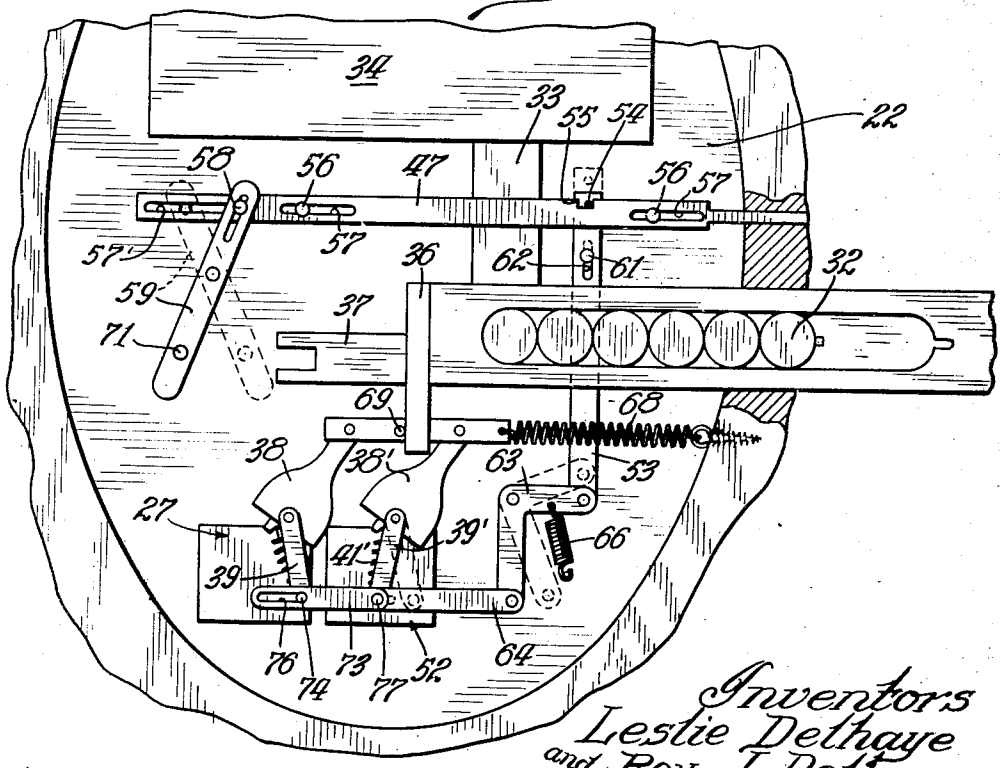


Fig. 6.



Inventors
Leslie Delhaye
and Roy J. Delhaye
By: Norman L. Meeks
Atty.

Patented May 28, 1940 2,202,095

UNITED STATES PATENT OFFICE

2,202,095

SANITARY WATER CLOSET SEAT

Roy J. Delhaye and Leslie Delhaye, Highland Park, Ill.

Application December 23, 1938, Serial No. 247,340

10 Claims. (Cl. 4—233)

Our invention relates in general to toilet seats but more in particular to sanitary toilet seats which are electrically heated to a temperature necessay for sterilization.

It has undoubtedly always been a problem to provide toilet facilities, especially in public places, which are sanitary and free from infectious germs which may come from a user and remain to infect subsequent users. Efforts to overcome this problem except with the use of a staff of attendants have not proven successful even though many devices employed for this purpose have been complicated and expensive. The use of disposable covers has been popular, but so often the coverage is not complete enough nor rugged enough to insure against contact with highly infectious germs.

An object of our invention is to provide an improved sanitary toilet seat.

Another object is to provide such a device which will positively kill all infectious germs and fungi thereon.

Another object is to provide such a device with all of the sanitary advantages, and yet which looks normal, and can be installed and operated in a substantially normal manner.

A further object of our invention is to provide such a device in a relatively simple, fool-proof structure which readily lends itself to pay use so that it can become a satisfactory commercial venture as well as provide sanitary facilities.

A still further object of our invention is to provide a toilet seat which is electrically heated to a high temperature and yet provided in such a construction that the heat is quickly dissipated to make the seat ready for use.

It is also an object of our invention to provide a toilet seat which can be completely sterilized at the user's option and before each use, or can be used without specific sterilization with each use and still will provide a seat more sanitary than normal.

One of the features of our invention is the provision of a toilet seat which may be sterilized by heating electrically, and the electrical operation is so controlled that all danger of use of the seat before cooling is eliminated. The seat is quickly heated and quickly cooled so that little time is required to complete the sterilization process.

Another feature of our invention is the provision of a toilet seat which not only heats but also dehydrates any germs, fungi, pubic lice, or the like on the seat to thoroughly sterilize the same.

Other objects, advantages, and features of our invention will be apparent from the following description taken with the drawings, in which:

Fig. 1 is a side elevation of our complete device with the toilet seat and cover therefor in closed position.

Fig. 2 is a fragmentary plan view of the toilet seat with portions broken away to show the layer construction thereof.

Fig. 3 is a plan view of the cover for our device with the top thereof removed, and the electrical control structure in the cover shown in a somewhat diagrammatic manner.

Fig. 4 is a detailed sectional view of the contact mechanism between the seat and cover for operating the electrical coil in the seat.

Fig. 5 is an enlarged detail view in vertical section of the locking structure between the seat and cover.

Fig. 6 is a fragmentary view of the structure of Fig. 3 with the electric control apparatus in an advanced position in the sterilization cycle as compared to the position of the same structure shown in Fig. 3.

In practicing our invention we provide a metal covered toilet seat with a heat dissipating body and an insulated heating unit in said seat. The heating unit is energized from a source of electricity such as 110 volt A. C., and the energizing circuit is controlled by switch structure in a cover which may be locked onto the seat for a timed interval during which the seat is heated to a degree sufficient to completely dehydrate and kill all foreign matter on the seat including many types of germs and fungi, and then cooled sufficiently by heat dissipation from the body thereof to avoid burning of a user. The toilet seat itself is provided in a clean, neat construction of an ordinary appearance for use with or without sterilization. Furthermore, the complete structure and control circuit lends itself readily for combination with coin control and operation to provide a possible profitable commercial venture as well as a sanitary unit.

Referring now to Figs. 1, 2 and 5, particularly, we provide a water closet seat 10 of the usual configuration, so far as the outside is concerned, which is pivotally mounted on a bracket 11 which in turn is bolted onto the usual bowl 12 for a water closet in a position such that the seat 10 may rest thereon in the usual manner. A cover 13 for said seat may be likewise pivotally mounted at the bracket 11 and the seat 10 and cover 13 may be pivoted independently of one another or may be pivoted together. The cover 13 will be more fully described hereinafter.

The seat 10 is adapted to be quickly heated to a temperature high enough to dehydrate and kill all infectious germs, skin fungi, and the like thereon so as to render the seat completely sterile and is adapted to subsequently be just as quickly cooled, so that it is available for use. In order to accomplish this result, and at the same time

provide a neat-appearing, readily movable unit, we provide such seat with a solid core 14 in a metal which is light in weight and dissipates heat therefrom very quickly. Aluminum has been found to be the most satisfactory metal for this purpose. The top surface and sides of the seat are covered with a non-corrosive and highly polished metal plate 16, such as stainless steel, and such cover is rigidly secured to the core 14 at the inside edge and the outside edge thereof as is shown in Fig. 5. Intermediate the outer covering 16 and the core 14 we provide a heating coil 17 suitably insulated on all sides by electric insulating material 18 adjacent the covering 16 and core 14. The heating coil and insulation are provided in such a manner that they occupy a relatively small space intermediate the covering and the core so that the entire seat structure as shown in the cross-section of Fig. 5 is a relatively solid unit. The insulating material is adapted to be highly conductive as to heat and with the covering 16 so closely positioned to the coil, the heat therefrom is quickly transmitted thereto. With the core in physical contact with the covering at some portions thereof and adjacent thereto over the remainder of the seat, heat is quickly dissipated from the seat through the core by virtue of such construction and the particular metal of the core.

An energizing circuit for the heating coil 17 may be connected into any ordinary source of electrical power and this circuit is controlled by switch means in the cover 13, and intermediate the cover 13 and seat 10. It has been found that satisfactory sterilization can be accomplished by heating the seat to a temperature of 250° F. for a period of approximately thirty seconds. Employing such a high temperature it is of course wise to prevent a user from touching the seat during the heating operation and until it is cooled. The cover 13 provides the necessary guard and yet is not cumbersome to handle nor unsightly in appearance. The cover 13 comprises a pressed-to-shape sheet metal housing 19 supported on a wooden frame 21, corresponding in outside dimensions substantially to like dimensions of the seat 10, and a closure member 22 engages the sidewall 23 of such housing as well as the undersurface of the frame 21 to substantially seal the cover 13 on the bottom. As previously stated, the cover 13 is pivotally mounted at the bracket 11 and rests on the seat with the sidewall 23 in engagement with a flange 24 integral with the core 14 for the seat. The closure member 22 is spaced from the seat sufficiently to permit circulation of air over said seat to cool the same. A handle 25 at the front thereof is used to raise and lower the cover. Standard friction means may be employed at the pivotal mountings for the cover and seat so that neither cover nor seat will drop to cause unnecessary jar on the apparatus. This is simply a precaution, however, for the entire apparatus is very compact and rugged.

A connection for the heating coil circuit to a source of electrical power is provided through an insulated cable 26 extending into the cover 13 for connection through one conductor 28 on one side of the line to a control switch 27, and then to an intermediate switch unit 29 (Fig. 4). The circuit through the switch 29 extends to the coil or unit 17, while the other side of the power line extends to the heating coil 17 through a conductor 28'.

Although the embodiment of our invention illustrated and described herein is simple and relatively inexpensive, it naturally does represent an investment greater than the usual toilet seat and cover having no provision for maintaining the same sanitary. In order to make the apparatus entirely practical commercially for the majority of installations, a pay feature is included which will enable the party having the same to gradually take care of his investment and provide for any necessary maintenance. As a result, the control apparatus is originally actuated and set into operation by the movement of a standard coin slide 31 shown somewhat diagrammatically in Figs. 3 and 6 which is adapted to carry a coin 32 to a position over a coin chute 33 which deposits the coin in a receptacle 34 carried in the cover. The coin slide 31 is entirely effective only if a coin 32 is deposited therein and carried to the point where it will drop into the chute 33 in accordance with the usual practice. It is understood, however, that the initial actuation of the control apparatus can be accomplished by a movable mechanism corresponding to the coin slide and having no pay feature whatever. A flat bar or arm 36 is rigidly secured to the end of the coin slide 31 and extends to one side of such slide. A bifurcated extension 37 is likewise provided on the slide 31 and acts as a continuation of such slide as will be apparent. The slide 31 is shown in idle position in Fig. 6.

The time-controlled switch 27 in the energizing circuit includes a toggle arm 38 pivoted on the housing for the switch, a switch arm 39 operated by the toggle arm, and switching mechanism within the housing operated by movement of the switch arm 39, and including spring means 41 for holding the switch arm 39 in an operated position such as shown in Fig. 3. The switch arm 39 is shown in idle position in Fig. 6. The switch arm 39 is directly held in operated position under spring pressure by means of a retractable lug 42 which is projected out of the housing when the switch arm is set in operated position and is maintained in the projected position for the interval of time over which the switch operates. At the end of this period the lug is automatically retracted and the switch arm 39 is pressed to the idle position of Fig. 6 by the spring means 41.

Before moving the coin slide 31, and in order to guard the seat against use during the sterilization cycle the cover 13 is pivoted into closed position over the seat. The locking structure for maintaining the cover 13 over the seat 10 during the sterilization cycle includes a pivoted locking lever 43 pivotally supported from a bracket 44 secured to a side 23 of the cover housing, and is provided with a locking lip 46 adapted to be moved so as to hook below the flange 24 of the core 14 on the seat. The lever 43 is actuated by slidable means including a slide arm 47 with a plunger 48 coupled thereto, directly pivoted to the lever 43 at 49, and carrying thereon a spring 51 retained in a cavity in the wooden frame 21. The frame acts to guide the sliding movement of this mechanism as is evident from Fig. 5. The lever 43 is retained in locked position for a predetermined time interval by means of a control unit 52 which can be substantially identical with the switch 27 except that it has no electrical function. The unit 52 is provided with a toggle arm 38', a switch arm 39', spring means 41', and a retractable lug 42', all operating as heretofore explained. As mentioned above, we have found

that operating the coil for a period of thirty seconds to provide a temperature of approximately 250° F. will accomplish the desired sterilization. We have also found that this temperature need be maintained for only approximately thirty seconds and the seat will then satisfactorily cool with our construction in an additional period of thirty seconds. The switch 27 is therefore timed for thirty seconds and the control unit 52 for sixty seconds. A slidable arm 47 is operatively connected with the unit 52 by means including a sliding link 53 having a projection 54 thereon for engagement in a corresponding notch 55 in the arm 47. The arm 47 is slidable in a straight line on guide pins 56 which rest in corresponding slots 57 in the arm. A combination pivot and guide pin 58 rides in a corresponding slot 57' and is secured to a pivoted lever 59 for moving the arm 47 as will be explained. The link 53 may be pivoted slightly as is necessary, and likewise moved toward and away from the arm 47 while maintained on a guide and pivot pin 61 in the slot 62 in such link. A bell-crank lever 63 is pivotally connected to the link 53 and to a second link 64 pivotally secured to the switch arm 39' and movable with the latter. A tension spring 66 is connected to the bell crank lever 63 and acts to hold the projection 54 in the notch 55 on the arm 47. The toggle arms 38 and 38' are connected by a bar 67 secured to each arm with such bar 67 being connected with a tension spring 68.

Operation

To set the complete control apparatus in operation and energize the coil 17, the cover 13 is pressed down onto the seat 10, a coin 32 is deposited on the slide 31 and the latter pushed inwardly into the cover 13 or to the left as viewed in Fig. 6, from the idle position of Fig. 6 to the operated position of Fig. 3. During this sliding movement the arm 36 engages a stud 69 on the bar 67 and at approximately the same time or shortly thereafter, the extension 37 on the slide 31 engages a stud 71 on the lever 59 to pivot the same from the dotted line idle position of Fig. 6 to the full line operated position. During the final movement of the slide and after the coin has dropped in the chute 33, the toggle arms 38 and 38' are moved to the left to set position. Also, the pin 58 in the lever 59 engages against the right-hand end of the slot 57' in the arm 47 to move the latter to the right to pivot the locking arm 43 and catch the lip 46 below the seat 10. During this operation the spring 51 is compressed while the spring 68 is extended and put under tension. As the switch arm 39' is moved from the dotted line position of Fig. 6 to the full-line position in the same figure, as well as in Fig. 3, the link 64 pivots the bell crank lever 63 from the dotted line position shown in Fig. 6 to the full-line position in the same figure. The spring 66 being under tension in the idle position of the bell-crank lever 63 assists this setting operation and pulls the link 53 with the projection 54 thereon into the notch 55 in the sliding arm 47 to hold the latter in locked position. As soon as the operator's finger is removed from the coin slide 31, the tension in the spring 68 returns the slide to idle position, and the stud 69, in engagement with the arm 36, moves the bar 67 to the right to carry the toggle arms 38 and 38' therewith. The switch arms 39 and 39' operate independently of the toggle arms and the latter are used merely to set the switch arms in operating position. The various arm and connecting links as well as the locking arm 43 are then maintained in operated position entirely by the time-controlled projections or stop lugs 42 and 42'.

When the stop lug 42 for the switch 27 is automatically retracted at the end of a thirty-second interval, for instance, the switch arm 39 is pressed to the right moving the switching mechanism in the switch so as to break the circuit to the heating coil 17. During the succeeding thirty seconds, if that is the period of time chosen, the seat 10 is cooling and at the end of that period the stop lug 42' is retracted permitting the switch arm 39' to be thrown to the right to the dotted position shown in Fig. 6. In order to prevent any danger of the switch arm 39' being released to release the locking structure before the heating coil circuit is broken, a safety link 73 connects the two switch arms 39 and 39', and with the switch arm 39 in the operating position shown in Fig. 3 a pin 74 in a slot 76 in such link holds such link in the operating left-hand position shown in both Figs. 3 and 6. This link is pivotally connected to the switch arm 39' at a pivot pin 77 so that the switch arm 39' cannot throw to the right to idle position unless the switch arm 39 is likewise in idle position as shown in Fig. 6 so that the slot 76 will move past the pivot pin 74 in such arm 39. With these switch arms operating in successive order as above explained, however, when the switch arm 39' throws to the right, it pivots the bell-crank lever 63 to the dotted line position shown in Fig. 6 to raise the link 53 and release the projection 54 from the corresponding notch 55 in the arm 47. The pressure in spring 51 moves the plunger to the left to release the locking arm 43 and also pivot the lever 59 to idle position shown in dotted lines in Fig. 6. The cover 13 may now be lifted at the handle 25 and the seat is ready for use.

From a consideration of the drawings and the above description as to the operation of our apparatus, it is evident that a control apparatus in the cover 13 could be operated by movement of the coin slide 31 with a coin 32 therein, to set the time control units 27 and 52 even though the locking arm 43 was not in locking engagement with the seat 10. To prevent this, however, and therefore avoid any possibility of a user heating the seat without it being guarded to prevent burning, we provide the switch 29 which is connected into the energizing circuit on one side of the line and prevents the completion of the energizing circuit unless the cover is actually closed onto the seat as shown in Fig. 4. The switch comprises a curved element 78 secured to the housing 19 for the cover 13 and carrying therein a wire 75 from the switch 27. The wire is soldered or otherwise secured to a spring contact 79 carried in an insulated bushing 81 at the mouth of the member 78 and the latter is adapted to telescope into a corresponding insulating tube 82 rigidly secured to the seat 10 at the core thereof for carrying a wire or conductor 80 connected to one end of the heating coil 17. The members 78 and 82 are circular in configuration to correspond to a pivotal movement of the cover 13 with relation to the seat 10. The insulating tube 82 has a channel 83 at one side thereof for carrying the conductor 80 which in turn is soldered or otherwise secured to a ring contact 84 rigidly mounted into the wall of the tube 82. The spring contact 79 is illustrated in Fig. 4 in contact with the ring 84 and in this position completes the electric energizing circuit. When the cover 13 and seat 10 are separated, however, the member 78 is telescoped into

the tube 82 and the contacts 79 and 84 separated so that the energizing circuit cannot be completed even though the switch 27 is closed. The second conductor 28' in the energizing circuit is enclosed in a flexible cable 86 extending between the cover and the seat and bending in the usual manner when the cover and seat are separated.

The disclosures of this application are illustrative and the invention is not to be limited by them. In fact, if modifications or improvements are not at once obvious they may be devised in the course of time to make additional use of the broad ideas taught and covered by this application. The claims are intended to point out novel features and not to limit the invention except as may be required by the prior art.

We claim:

1. A sanitary water closet seat adapted to be electrically heated for sterilizing the same including a metal outer portion, a heat dissipating metal core within said outer portion, and an energizable heating coil for said seat intermediate said outer portion and core and insulated from each.

2. In a sanitary water closet seat having a heating unit in said seat and guard means adapted to be closed in a position to substantially prevent access to said usable surface, means for simultaneously energizing said heating unit and locking said guard in closed position, with said means continuing operative during an interval of time sufficient to heat said seat to sterilize the usable surface and for said usable surface to subsequently become cooled.

3. In a sanitary water closet including a seat having an electric heating unit in said seat, an energizing circuit for said unit, and a time-controlled switch for closing and opening said circuit, means for actuating said switch including a slidable coin carrying member adapted for receiving a coin and to be finger-pressed thereafter to a position at which said coin is lost, and engaging means on said member operatively connected with said switch for actuating the same to an operating circuit closing position when said member has lost said coin.

4. In a movable sanitary water closet seat comprising a non-corrosive metal outer portion, having a time-controlled heating unit beneath said outer portion for heating the same, electric insulating material enclosing said heating unit, and a light weight heat conducting solid metal core within said outer portion and rigidly connected thereto for supporting said outer portion and conducting heat therefrom.

5. A sanitary water closet seat, including in combination, a solid aluminum core, a metal covering for said core, a heating unit carried in said seat intermediate said cover and said core, and insulating means separating said heating unit from said cover and core and providing therewith a substantially solid seat.

6. In water closet apparatus including a sterilizable seat and means comprising a cover movable relative to said seat and adapted to be positioned substantially over said seat for preventing use of the seat during sterilizing, the combination of locking means for locking said cover over said seat including a pivoted locking arm mounted on said cover having a locking portion at one end adapted to engage under said seat and link means connected to said arm at the other end thereof, and manually operated means operatively connected with said link means and extending out of said cover for movement to actuate said link means and pivot said locking arm into locking engagement with said seat.

7. In water closet apparatus including a seat having a heating unit therein with an energizing circuit therefor, a switch for said circuit and a cover for covering said seat while it is being heated, the combination of locking means having a pivoted locking arm mounted on said cover and adapted to engage said seat to lock said seat and cover together, a coin carrying slide slidably mounted on said cover, and movable link means operatively connecting said slide with both said locking means and said switch, with said coin slide carrying a coin therein adapted to be moved to a position to lose said coin and to thereafter move the locking arm to lock said seat and said cover together and to close said switch to energize said heating unit.

8. In water closet apparatus including a seat, an electric heating unit in said seat, and a cover mounted for pivotal movement relative to said seat and having an electric conductor therein connected with a source of electric power for energizing said heating unit, the combination of switch means intermediate said cover and said seat for completing a circuit through said conductor and said heating unit when said seat and cover are in adjacent position, said switch means including a curved tube member secured to said cover, a spring contact rigidly secured in said tube electrically connected to said conductor, a second curved tube of larger diameter than said first tube rigidly secured to said seat having a contact portion rigidly carried therein and electrically connected to said heating unit, with said first tube adapted to telescope into said second tube when said cover is pivoted with reference to said seat, and said spring contact and said contact portion positioned in said tubes in a manner such that they are in engagement when said seat and said cover are in adjacent position.

9. In a sanitary water closet including a seat, an electric heating unit in said seat, and an energizing circuit for said heating unit, the combination of a time-controlled switch connected into said circuit for closing and opening the same, with said switch adapted to maintain said circuit closed for no more than thirty seconds on a single heating operation, guard means for rendering said seat non-usable during said heating period and time-controlled means for maintaining said guard means in position for an additional period beyond said heating period sufficient to permit said seat to cool after the heating thereof.

10. In a sanitary water closet including a seat, electric heating means in said seat, guard means for rendering said seat non-usable during a heating period thereof having locking means therewith, and time-controlled means for completing an energizing circuit to said heating unit and maintaining said guard means in locked position during said heating, the combination of an actuator for initiating operation of said heating unit and locking said guard means, link means operatively connecting said actuator, said time-controlled means and said locking means to set said time-controlled means and lock said locking means upon movement of said actuator, and connecting means intermediate said locking means and said time-controlled means acting to unlock said locking means upon expiration of a controlled period of time for the heating and the cooling of said seat.

ROY J. DELHAYE.
LESLIE DELHAYE.