

Oct. 7, 1958

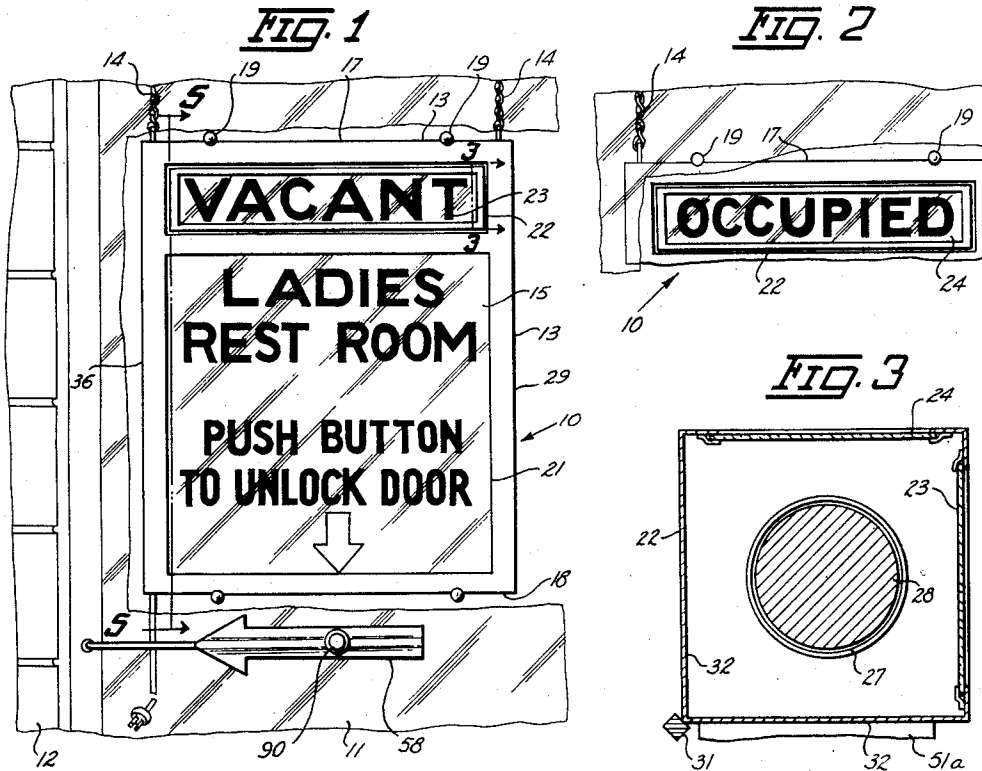
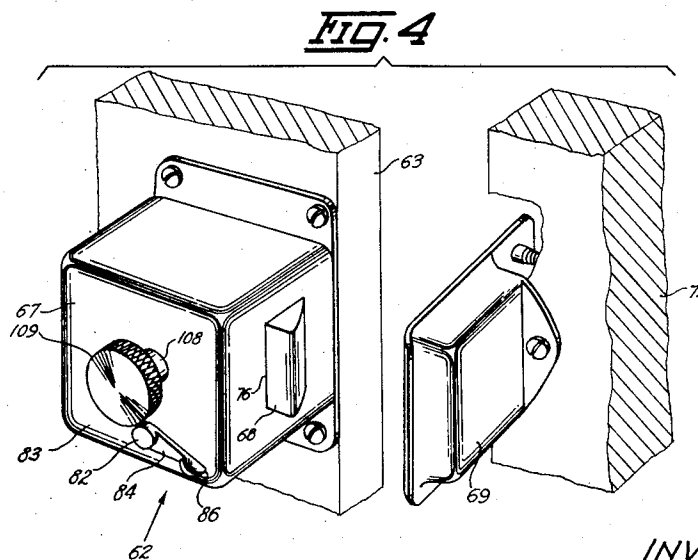
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2,855,235

DOOR LOCK ASSEMBLY FOR REST ROOM CONTROL APPARATUS

Filed July 6, 1956

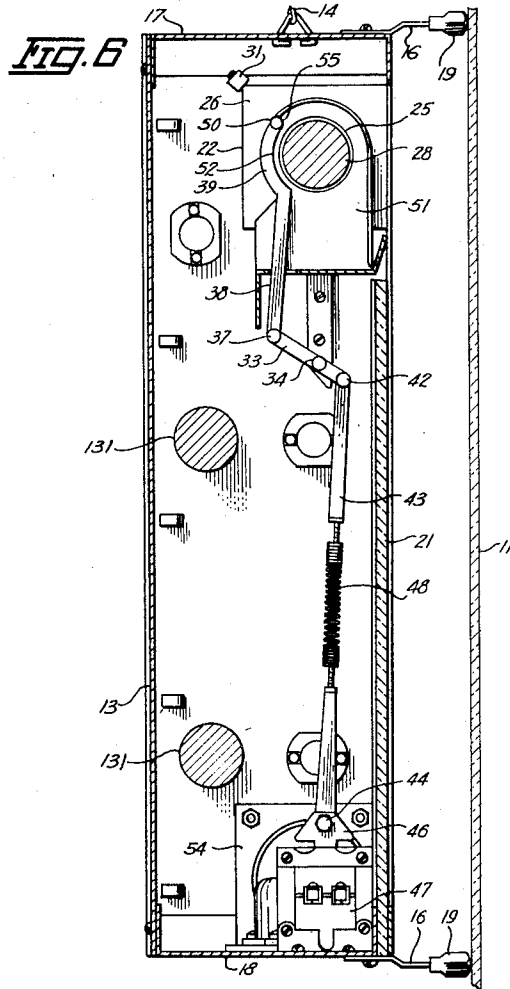
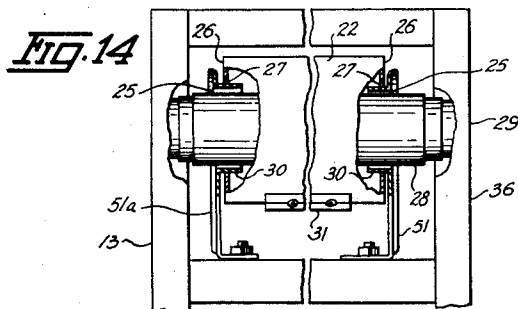
3 Sheets-Sheet 1



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FIG. 8

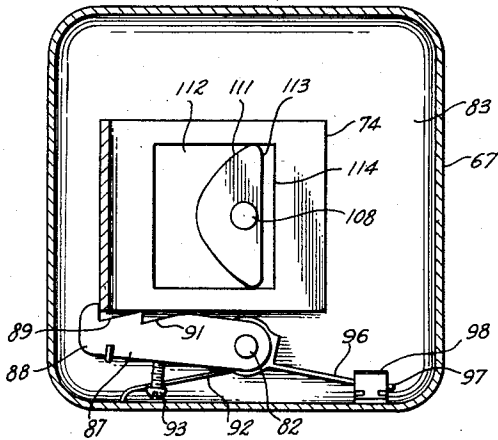


FIG. 11

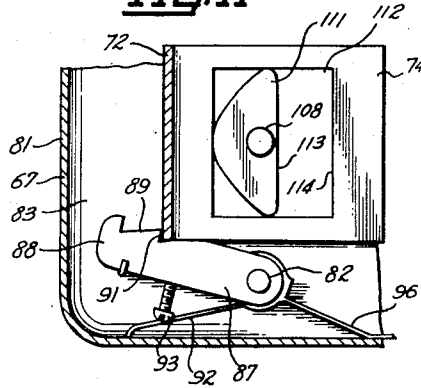


FIG. 12

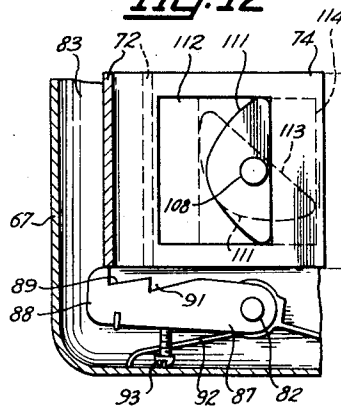


FIG. 9

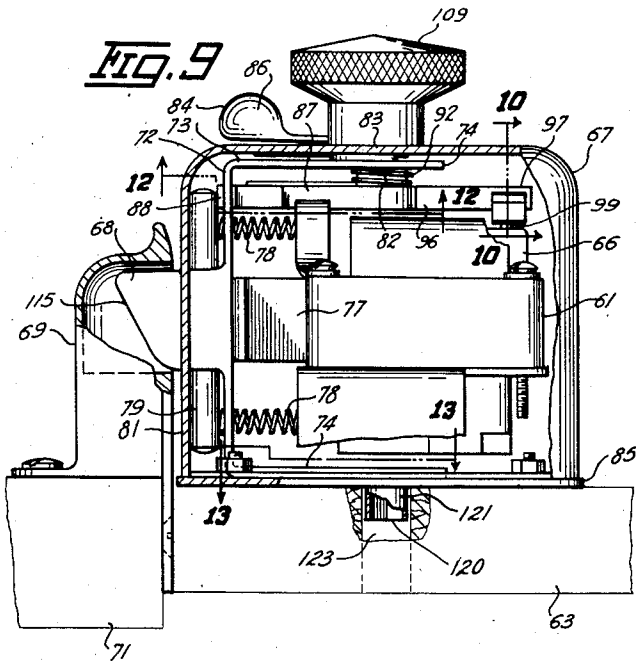


FIG. 13

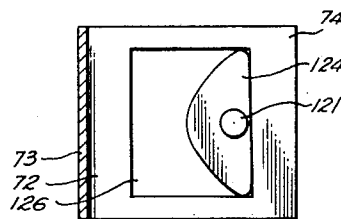
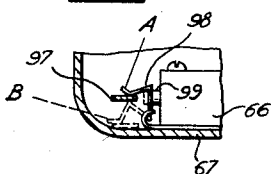


FIG. 10



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DOOR LOCK ASSEMBLY FOR REST ROOM CONTROL APPARATUS

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1 Claim. (Cl. 292—169)

This invention relates generally to public rest rooms and more particularly to apparatus for maintaining a public rest room locked when not in use and for visually indicating, on a sign or the like located outside the rest room, the vacant or occupied status of the room.

Unauthorized uses of public rest rooms, such as those in filling stations, is a familiar problem to filling station operators and others whose duty it is to maintain these rest rooms in a clean condition. In an effort to overcome this problem, many filling station operators keep the rest rooms locked so that a customer or patron must ask the operator for the key to the rest room. However, in the case of women embarrassment is first encountered in first attempting to enter a locked rest room and again encountered to a greater extent when required to request the key to the rest room from the station operator.

It is an object of this invention, therefore, to provide improved apparatus for solving all of these problems, namely, for maintaining the rest room locked when not in use, for visually indicating on a readily viewable sign located outside the rest room the vacant or occupied status of the room, and for providing a push button located adjacent the sign and operable on actuation to unlock the rest room door only when the room is vacant.

A further object of this invention is to provide an apparatus of the above described type a door lock assembly which includes a switch and a door latch operatively associated with the switch for opening and closing the switch in response to operation of the assembly to lock and unlock the door.

Another object of this invention is to provide an apparatus of the above described type a door lock assembly which includes a switch connected in circuit with a remotely located sign for operating the sign in response to operation of the assembly to lock or unlock the door.

A further object of this invention is to provide apparatus for maintaining the door to a public rest room locked when the rest room is not in use, which apparatus includes a solenoid operated latch member on the door movable to a position unlocking the door in response to closing of remotely located switch.

A further object of this invention is to provide apparatus of the above described type which is simple in construction and installation, economical to manufacture, and efficient in operation in keeping the rest room locked when not in use and in visually indicating the occupied or vacant status of the room.

Further objects, features and advantages of this invention will become apparent from a consideration of the following description when taken in connection with the accompanying drawing in which:

Fig. 1 is a fragmentary elevational view of the sign and push button assembly used in the apparatus of this invention, shown mounted on a filling station, only a portion of which is shown;

Fig. 2 is a fragmentary elevational view of a portion of the sign shown in Fig. 1 and illustrating a changed position of a movable portion of the sign;

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Fig. 3 is an enlarged transverse sectional view of the movable portion of the sign looking along the line 3—3 in Fig. 1;

Fig. 4 is a perspective view of a door locking assembly used in the apparatus of this invention;

Fig. 5 is an enlarged transverse sectional view of the sign shown in Fig. 1, looking along the line 5—5 in Fig. 1;

Fig. 6 is an enlarged transverse sectional view of the sign illustrated similarly to Fig. 5, and showing a moved position for the movable portion of the sign;

Fig. 7 is a diagrammatic view of the electrical circuit used in the apparatus of this invention;

Fig. 8 is an enlarged vertical sectional view through the door locking assembly shown in Fig. 4, showing one position of the latch control bar therefor;

Fig. 9 is a top plan view of the door locking assembly, with some parts broken away and other parts shown in section for the purpose of clarity;

Fig. 10 is a transverse sectional view looking along the line 10—10 in Fig. 9;

Figs. 11 and 12 are fragmentary vertical sectional views illustrated similarly to Fig. 8 showing changed positions for the latch control bar;

Fig. 13 is a transverse sectional view looking along the line 13—13 in Fig. 9; and

Fig. 14 is a sectional view looking along the line 14—14 in Fig. 5 with certain parts broken away and other parts shown in section for the purpose of clarity.

With reference to the drawing, the apparatus of this invention is illustrated in Fig. 1 as including a sign assembly, indicated generally at 10, mounted for viewing through a window pane 11 supported in a wall 12 of a filling station or the like (not shown). The sign 10 is preferably mounted to the inside of the window pane 11 so as to be readily visible to occupants of cars parked to receive gas from the usual filling station pumps (not shown).

The sign 10 includes a sheet metal boxlike casing 13 suspended on chains 14 secured to a suitable support (not shown) located above the window pane 11. Four metal finger members 16 are secured to the top and bottom ends 17 and 18, respectively, of the casing 13 and carry rubber caps 19 engageable with the rear or inner side of the window pane 11 for maintaining the casing 13 in a predetermined spaced relation with the window pane 11. The casing 13 is provided with a removable glass front portion 21 (Figs. 1, 5 and 6) which carries the identifying lettering 15 shown in Fig. 1.

Arranged within the casing 13 at a position above the glass front portion 21 is an elongated rectangular housing 22 which is rotatably mounted on the casing 13. The housing 22 (Figs. 1, 2 and 3) has a pair of glass side portions 23 and 24 which carry the indicia "vacant" and "occupied," respectively. The housing 22 has end walls 26 (Fig. 14), each of which is provided with an opening 27 through which a fluorescent tube 28 is extended. The tube 28 is supported on and extends between the ends 29 of the casing 13. The housing 22 is rotatable about the tube 28 between a pair of stop positions illustrated in Figs. 5 and 6.

A counter weight 31, secured to the housing 22 at the juncture of the metal walls 32 therefor, biases the housing 22 to the stop position illustrated in Fig. 5. In this position of the housing 22, the "vacant" indicia is visible directly above the glass casing portion 21, as shown in Fig. 1. In the Fig. 6 position of the housing 22, the side 24 thereof is in a viewing position so that the "occupied" indicia is visible directly above the portion 21 as shown in Fig. 2.

For moving the housing 22 between the Fig. 5 and Fig. 6 positions therefor, a lever 33 is pivotally supported

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at 34 on a sidewall 36 of the casing 13. One end of the lever 33 is pivotally connected at 37 to the lower end of link 38 having a curved terminal end portion 39 pivotally connected at 50 to one end wall 26 of the housing 22. The opposite end of the lever 33 is pivotally connected at 42 to one end of a link unit 43, the opposite end of which is pivotally connected at 44 to the plunger or movable member 46 of a solenoid assembly 47. The link unit 43 includes, as a part thereof, a coil spring 48 interposed in the unit 43 between the ends thereof.

As shown in Fig. 5, when the solenoid plunger 46 for the solenoid assembly 47 is free to move upwardly or to an extended position, the counter weight 31 moves the housing 22 to a position in which the lever 33 is inclined downwardly and rearwardly. When the solenoid assembly 47 is energized, in a manner hereinafter to be described, the plunger or movable member 46 is moved downwardly or retracted to in turn move the lever 33 to an upwardly and rearwardly inclined position shown in Fig. 6. In this position of the lever 33, the link 38 is moved upwardly to in turn rotate the housing 22 about the bulb 28 to a position in which the housing portion 24 is in substantially the plane of the casing portion 21. On retraction of the plunger 46, which action is almost instantaneous when the solenoid 47 is energized, the spring 48 is initially loaded or placed under tension. Movement of the spring 48 to its normal or contracted condition acts to rotate the housing 22 to its position shown in Fig. 6. Rotation of the housing 22, between its stop positions thus takes place without any sudden or jarring movement, namely, rotational movement to its position shown in Fig. 5 is the result of the counter weight 31 acting against the weight of the plunger 46, and rotational movement to its position shown in Fig. 6 by the pressure of the spring 48 acting against the counter weight 31.

With the casing 22 in its position shown in Fig. 6, the curved terminal end portion 39 of the link 38 is in a concentric relation with the tube 28. A sheet metal stop plate 51 is mounted on the casing 13 at a position between the casing side wall 36 and the housing 22 and includes a curved track portion 52 on which the pivot 40 rides during movement of the link 38. Engagement of the pivot 40 with the lower and upper ends 50 and 55, respectively, of the track 52 defines the stop positions of the housing 22.

As best appears in Fig. 14, the plate 51 and a similar plate 51a are arranged adjacent opposite ends 26 of the casing 22. A central opening 26 in each of the plates 51 and 51a is bounded by an inwardly directed annular flange 30 extended through the housing end openings 27 for rotatably supporting the housing 22. The flanges 30 are positioned about and are in a concentric relation with the tube 28.

Mounted within the casing 13 at a position below the fluorescent tube 28 are a pair of vertically spaced fluorescent tubes 131 (Figs. 5 and 6). When the tubes 131 are on, they facilitate the reading of the identifying lettering 15 on the casing front portion 21. The fluorescent tube 28 insures an easy reading of the "vacant" and "occupied" wording on the side walls 23 and 24 of the housing 22.

As best appears in Fig. 7, the fluorescent tubes 28 and 131 are connected in parallel across the lead lines 132 and 133 of a one hundred and ten volt electrical supply at a position ahead of a one hundred and ten volt to twenty-four volt step down transformer 54 (Figs. 5, 6 and 7) mounted on the casing bottom wall 18 and also connected across the leads 132 and 133. A line 56 connects one terminal 53 on the twenty-four volt side of the transformer 54 with a switch 57 (Figs. 1 and 7) operated by a push button 90 mounted on an arrow shape member 58 secured to the outside of the window pane 11 at a position below the sign 10. The arrow shape member 58 points in the direction of the ladies rest room (not shown) to facilitate a locating of the rest room by a filling station patron.

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A line 59 connects the push button switch 57 with one side 60 of a solenoid assembly 61 in a lock assembly, indicated generally at 62 (Fig. 4) for the door 63 to the ladies rest room in the filling station. The opposite side 65 of the solenoid is connected by a line conductor 70 to the terminal 104 of a two-way switch 66. Terminal 102 of the two-way switch 66 is connected through a conductor 64 with the terminal 80 on the low or twenty-four volt side of the transformer 54. One side 35 of the solenoid 47 is connected by a conductor 40 to the conductor 56 extended between the transformer 54 and the switch 57. The opposite side of the solenoid 47 is connected by a conductor 100 to a terminal 103 for the switch 66.

The lock assembly 62 (Fig. 4) includes a movable latch or bolt member 68 mounted within and projected outwardly through an opening 76 in a casing 67, which is mounted on the rest room door 63. A catch or bolt receiving member 69 is mounted on the door frame 71 for cooperation with the latch member 68 to maintain the door 63 locked.

The latch member 68 (Fig. 9) is mounted on the base portion 72 of a U-shape frame member 73 arranged within and movable relative to the casing 67. The frame 73 constitutes a part of the latch member 68 and includes a pair of transversely spaced leg members 74 arranged in vertical planes adjacent the front and back walls 83 and 85, respectively, of the casing 67.

Also arranged in the casing 67 is the solenoid 61 which includes a plunger or movable member 77 connected to the base portion 72 of the frame member 73. A pair of springs 78 extended between the solenoid 61 and the base frame portion 72 normally urge the portion 72 to an extended position in which the latch member 68 projects outwardly through the casing opening 76 for reception in the latch receiving member 69. A rod 79 secured to the frame base portion 72 engages the casing side wall 81 in the extended position of the latch 68. On energization of the solenoid 61, the movable member 77 is retracted to withdraw the latch member 68 to a position in a clearance relation with the latch receiving member 69 so that the door 63 can be opened. In this position of the latch member 68, the frame base portion 72 is in the position illustrated in Fig. 11.

A shaft 82 extends through and is rotatably supported on the front side 83 of the casing 67. Secured to the outer end of the shaft 82 and arranged outwardly of the casing 67, is a small actuating lever 84 having a dished thumb receiving portion 86 at its terminal end. A bar 87 (Figs. 8, 9, 11 and 12) is secured at its inner end to the shaft 82 and is formed adjacent its outer or free end 88 with a pair of notches 89 and 91. As best appears in Fig. 9, the outer end 88 of the bar 87 is arranged directly below the frame base portion 72 in the extended position of the latch member 68. As a result, the bar 87 is movable upwardly into engagement with the base portion 72 in any inwardly moved position of the portion 72. A torsion spring 92 wound about the shaft 82 and engaged with the casing 67 biases the bar 87 upwardly into engagement with the base portion 72. To move the bar 87 out of engagement with the portion 72, it is necessary to manually exert a downward pressure on the lever 84 to thus move the bar 87 downwardly into a clearance relation with the frame base portion 72. A screw 93 carried on and extended downwardly from the bar 87 at a position intermediate the ends thereof engages the casing 67 to limit the downward movement of the bar 87.

It is seen, therefore, that the frame base portion 72 is movable inwardly away from the casing wall 81 to thus retract the latch member 68 in response to energization of the solenoid 61. In this position of the frame base portion 72, illustrated in Fig. 11, the torsion spring 92 moves the bar 87 upwardly so that the base portion 72 is received in the notch 91 in the bar 87. When the solenoid 61 is de-energized, and the bar 87 is rotated

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in a counter clockwise direction as viewed in Fig. 11, in response to manual rotation of the lever 84, the springs 78 operate to move the base portion 72 to a position in which the rod 79 engages the wall 81, corresponding to an extended position of the latch member 68 (Figs. 9 and 12). In this position of the frame base portion 72 the lever 87 is entirely below the frame 73 as illustrated in Fig. 12.

Secured to and extended in an opposite direction from the lever 87 is a flat arm 96 having its terminal end 97 arranged below and in engagement with a downwardly biased angle shape actuating lever 98 for the two-way switch 66. The lever 98 is operable, when moved to the solid line position A shown in Fig. 10, to depress a button 99 for the switch unit 66. On depression of the button 99, a contact blade 101 for the switch 66 is moved to a position bridging the contacts or terminals 102 and 103 (Fig. 7). On movement of the lever 98 toward a dotted line position B shown in Fig. 10, the button 99 is released and the switch blade 101 is moved to a second position bridging the contacts 102 and 104.

As best appears in Fig. 10, in the rotated position of the latch control bar 87 illustrated in Figs. 9 and 12, the arm 96 is swung upwardly so that the terminal end 97 thereof moves the switch actuating lever 98 to a position depressing the button 99. In any other position of the arm 96, the terminal end 97 thereof is in a position in which the lever 98 is spaced from the button 99.

With reference to Fig. 7, it is seen that when the switch actuating lever 98 is in the position A illustrated in Fig. 10, the blade 101 bridges the contacts 102 and 103 closing a circuit for the solenoid 47 which operates when energized to move the housing 22 to a position in which the "occupied" indicia thereon is visible on the sign 10. For convenience of description, the circuit for the solenoid 47, indicated generally at 106 in Fig. 7, will hereinafter be referred to as "sign circuit." Likewise, the circuit for the solenoid 61 is indicated generally at 107, and will hereinafter be referred to as the "latch circuit."

When the sign circuit 106 is closed at the switch 66, the solenoid 47 is energized to show on the sign 10 that the rest room is occupied. When the lock circuit 107 is closed at the switch 66 and the push button switch 57, the solenoid 61 is energized to retract the latch member 68.

For manually retracting the latch member 68, which is required when a patron leaves the rest room as will later be described, a shaft 108 is extended through the casing front wall 83 and is formed on its outer end with an enlarged knurled knob 109 (Figs. 4 and 9). Mounted on the inner end of the shaft 108 is a half-moon shape plate 111 (Figs. 8, 11 and 12) positioned within a rectangular opening 112 in one of the frame leg portions 74. On rotation of the knurled knob 109 in either direction the plate 111 is rotated so that the flat side 113 thereof engages the frame leg portion 74 at the end 114 of the opening 112. As a result, the frame 72 is moved inwardly of the casing 67 against the action of the springs 78. In a fully rotated position of the plate 111, illustrated in dotted lines in Fig. 12, the frame base portion 72 is moved inwardly to a position between the notches 89 and 91 in the bar 87 which corresponds to a position of the latch member 68 in which it will clear the latch receiving member 69.

In the use of the apparatus of this invention, assume that the rest room is unoccupied and that the latch control bar 87 is in the position illustrated in Fig. 8 so that the sign circuit 106 is open and the sign 10 indicates "vacant." A door closer (not shown) mounted on the frame 71 and the door 63 insures the closing of the door 63 when the rest room is not occupied.

Now assume that a woman patron, observing the "vacant" indicia on the sign 10 and desiring to use the rest room, follows the directions on the sign 10 and pushes the button 90 thereby closing the switch 57.

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Since the switch blade 101 for the switch unit 66 is in a position engaging the contact 104, the lock circuit 107 is energized on closing of the switch 57. As a result, the solenoid 61 is energized to retract the latch member 68 so that the frame base portion 72 is in the position shown in Fig. 11. In this position the torsion spring 92 pulls the latch control bar 87 upwardly to a position in which the base portion 72 is received in the notch 91 in the bar 87. The latch member 68 is thus positively held in a retracted position after release of the button 90 and consequent opening of the switch 57 and during the time the woman walks from the sign 10 to the rest room door 63. As a result, the rest room door can be pushed open so that the woman can enter the rest room.

After entering the rest room and closing the door 63, the occupant is instructed by a sign (not shown) on the inside of the door 63 to move the control lever 84 down to insure privacy. The occupant then pushes the lever 84 down to a stop position in which the screw 93 engages the casing 67 (Fig. 12) permitting the springs 78 to move the frame 73 to a stop position in which the latch member 68 is fully extended and positioned within the latch receiving member 69.

Also, in response to downward movement of the control lever 84 the terminal end 97 of the arm 96 is moved upwardly to the position A (Fig. 10) in which the operating button 99 for the switch 66 is depressed thus moving the switch blade 101 from the contact 104 to the contact 103. Such movement of the blade 101 results in a closing of the sign circuit 106 so that the solenoid 47 is energized to retract the plunger member 46. Such retraction results in rotation of the lever 33 and movement of the sign housing 22 through an angle of ninety degrees so that the "occupied" indicia appears above the sign front portion 21. On release of the control lever 84, the control bar 87 is positively maintained in the down position illustrated in Fig. 12 by the engagement of the terminal end 88 thereof with the frame base portion 72. Accordingly, the sign circuit 106 is maintained closed.

It is seen, therefore, that once the patron has entered the rest room and moved the control lever 84 downwardly, the rest room is positively locked so that it cannot be opened from the outside. In addition, the sign 10 is immediately operated to indicate that the rest room is occupied so that other patrons do not need to attempt to open the door 63 in order to find out that the rest room is locked. In the event another patron, not observing the "occupied" notice on the sign 10, pushes the button 90 to close the switch 57, it is apparent from Fig. 7 that such closing of the switch 57 has no effect on the lock circuit 107 which is open at the switch 66. Further, since the circuit 107 is open at the switch 66, closing of the switch 57 cannot cause any buzzing or humming of the solenoid 61 which would frighten or annoy a rest room occupant. Thus, the patron is assured of complete privacy while in the rest room.

To leave the rest room, the occupant need only turn the knob 109 in either direction to a stop position (Fig. 12) in which the latch member 68 is retracted to a position in a clearance relation with the latch receiving member 69. Immediately on retraction of the latch 68 and the frame 73, the bar 87 is moved upwardly by the torsion spring 92. Consequently the arm 96 and the switch actuating lever 98 are moved downwardly to provide for an opening of the sign circuit 106. The solenoid 47 is thus de-energized and the counter weight 31 provides for movement of the housing 22 to a position in which the "vacant" indicia thereon is exposed (Fig. 5).

The patron then pulls on the knob 109 to open the door 63. On release of the knob 109, the frame 73 moves outwardly under the action of the springs 78 until the base portion 72 is received in the notch 89 (Fig. 8). The door 63 then closes under the action of the door closer (not shown) with an inclined side 115 of the

latch member 68 riding over the latch receiving member 69 so that the latch 68 is received in the member 69. The door 63 is then locked against further opening movement until the push button 90 is operated to momentarily close the switch 57.

From the above description, it is seen that this invention provides apparatus which visually indicates the vacant or occupied status of a public rest room so that it is not necessary to first try the door 63 to determine the status of the rest room. Further, an occupant of the rest room is assured of complete privacy since the door 63 cannot be opened from the outside while the rest room is occupied. The connection of the sign and lock circuits 106 and 107, respectively, to the twenty-four volt side of the transformer 54 eliminates any danger of a harmful shock to a patron when depressing the push button 90. In addition, no conduits are required in the installation of the circuits 106 and 107 to thereby provide for an economical installation.

It is apparent that in the event of a power failure, the rest room door 63 could not be opened since closing of the switch 57 would be ineffective to retract the latch member 68. To provide for use of the rest room in such event, therefore, a shaft 120 is mounted in the outer wall 85 of the casing 67. The shaft 120 has a hollow outer end portion 121 positioned within an opening 123 formed in the door 63. On its inner end the shaft 121 carries a half-moon shape plate 124, like the plate 111 on the shaft 108, which is received in a rectangular opening 126 in a leg 74 for the frame 73. A screw driver or the like (not shown) may thus be extended into the door opening 123 and the hollow shaft portion 121 for rotating the shaft 120 to retract the frame 73 and the latch member 68 so the door 63 may be opened.

Although the invention has been described with respect to a preferred embodiment thereof, it is to be understood that it is not to be so limited since changes can

be made therein which are within the scope of the appended claim.

I claim:

- For use with a stationary latch receiving member, a door lock assembly adapted to be mounted on a door, said assembly comprising a casing, a latch member movably mounted in said casing for movement between a position projected outwardly thereof for reception in said latch receiving member and a retracted position in a clearance relation with said latch receiving member, spring means in said casing engageable with said latch member for continuously biasing said latch member toward said projected position, solenoid means in said casing connected to said latch member for moving the latch member to said retracted position on energization of said solenoid means, means movably mounted in said casing for releasable engagement with said latch member to restrain the latch member against outward movement in a position intermediate said projected and retracted positions, manually operable means engageable with said latch member for moving the member to a position in a clearance relation with said latch receiving member to provide for opening of said door, means for biasing said movably mounted means into engagement with said latch member to restrain the latch member in said intermediate position against outward movement on release of said manually operable means to provide for reception of said latch member in said latch receiving member on closing of said door.

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