March 4, 1930. O. A. ROSS 1,749,356

SEWAGE CONTROL FOR MOVING VEHICLES

Filed Aug. 9, 1928

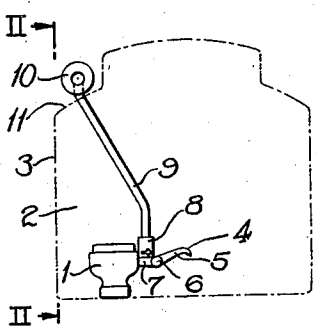


Fig. 1,

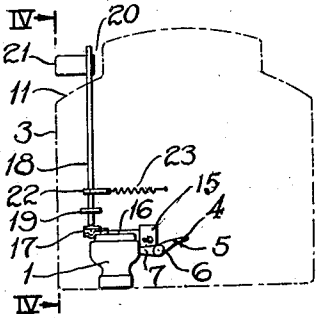


Fig. 3,

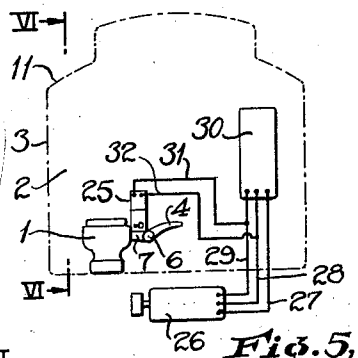


Fig. 5,

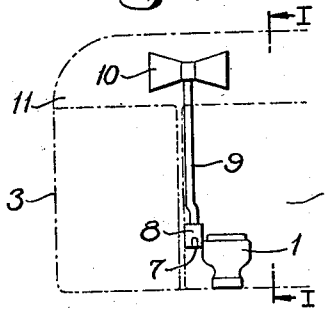


Fig. 2,

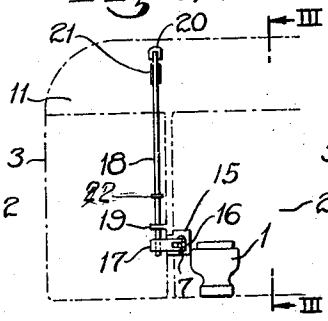


Fig. 4,

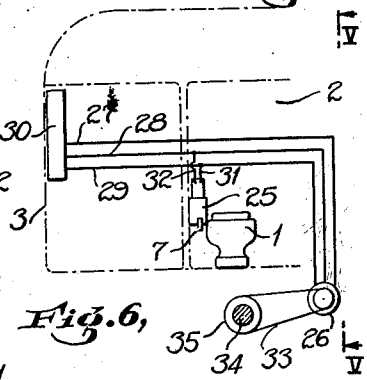


Fig. 6,

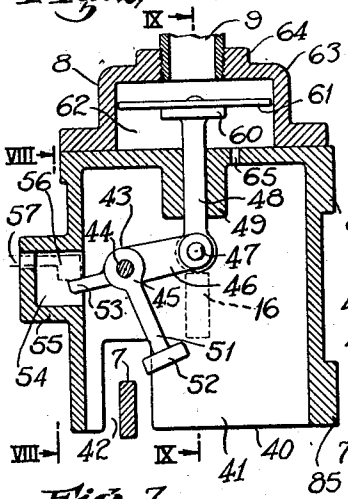


Fig. 7,

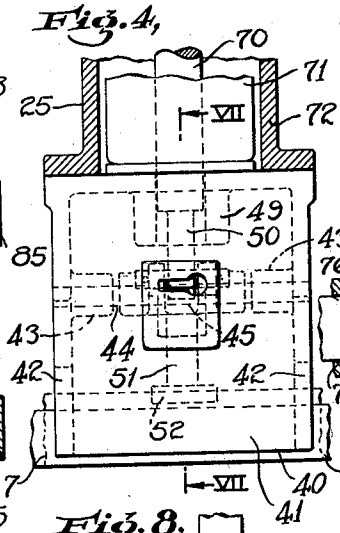


Fig. 8,

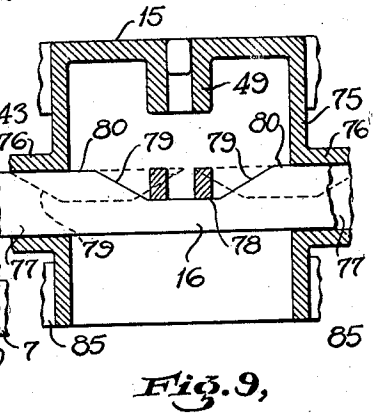


Fig. 9,

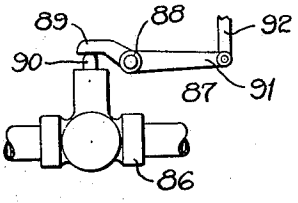


Fig. 10,

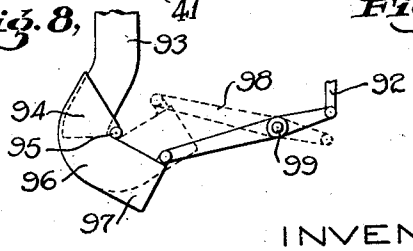


Fig. 11

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UNITED STATES PATENT OFFICE

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SEWAGE CONTROL FOR MOVING VEHICLES

Application filed August 9, 1928. Serial No. 298,448.

This invention refers to systems of sewage control and more particularly to systems of sewage control for toilet fixtures on moving vehicles, as, for example, railway passenger coaches.

The prime object of this invention is to provide for preventing evacuation of waste from a toilet fixture supported by a passenger coach or similar vehicle forming part of a train which may be stopping at a railway station, or, is traveling at a slow rate of motion, either approaching or leaving said station.

Another object is to furnish novel means of control for preventing the evacuation of a toilet fixture when a railway train is operating below predetermined speed or is completely at rest for storage.

Another object is to furnish novel means for preventing the flushing of a toilet under certain conditions of reduced speed, or complete stoppage, of a railway train, or similar vehicle.

Other objects and advantages will appear as the description of the invention progresses, and the novel feature of the invention will be pointed out in the appended claims.

This invention consists in the novel construction and arrangement of parts hereinafter described, delineated in the accompanying drawings, and particularly pointed out in that portion of this instrument wherein patentable novelty is claimed for certain and peculiar features of the apparatus, it being understood that, within the scope of what hereinafter thus is claimed, divers changes in the form, proportions, size and minor details of the structure may be made without departing from the spirit of, or sacrificing any of the details of the invention.

In describing the invention in detail, reference is had to the accompanying drawings, wherein I have illustrated embodiments of my invention, and, wherein like characters of reference, designate corresponding parts throughout the several views, and in which:—

Figure 1, is a plan view of one embodiment of the invention taken on line 1—1 of Fig. 2 and, Fig. 2, is a plan view of the same taken on line 2—2 of Fig. 1, and, Fig. 3, is a plan view of a modified form of the invention taken on line 3—3 of Fig. 4, and, Fig. 4, is a similar view of the same taken on line 4—4 of Fig. 3, and Fig. 4, is a plan view of still another modified form of the invention taken on line 5—5 of Fig. 6, and, Fig. 6, is a plan view of the same taken on line 6—6 of Fig. 5, and, Fig. 7, is a sectional view of part of the control apparatus taken on line 7—7 of Fig. 8, and Fig. 8, is part plan, part sectional view of the same taken on line 8—8 of Fig. 7, and, Fig. 9, is a sectional view of a modified form of the same control apparatus taken in part on line 9—9 of Fig. 7, and, Fig. 10, is a plan view of a modified form of control apparatus, and Fig. 11, is a plan view of still another modified form of control apparatus.

Referring to Figs. 1, and 2, the toilet fixture 1, in toilet room 2, of passenger coach 3, is arranged to be flushed by depression of handle 4 forming part of lever 5, pivoted on pin 6, and the extension 7 of which is arranged to control the discharge of sewage from toilet 1, as well as control the supply of water thereto, for the flushing thereof. Controlling extension 7 of lever 5 is control unit 8, more fully hereinafter described, arranged to be actuated by a partial vacuum produced in pipe or conduit 9 by venturi 10 secured exteriorly to the roof 11 of coach 1 when said coach is traveling in excess of a predetermined minimum speed in either direction.

Referring to Figs. 3 and 4, showing a modified form of control for lever 5, of toilet 1, control unit 15, more fully hereinafter described, is arranged to prevent flushing of toilet 1, by lever 5, by the following apparatus. Cam bar 16 comprises one portion passing through control unit 15 for effecting operation thereof and another portion pivotally connected to the free end of crank 17 secured to rod 18, operating in bearings 19 and 20, and supporting vane 21 the plan of which is normally restrained to assume a transverse position with relation to the longitudinal axis of coaches by crank 22 rigidly secured to said rod and normally biased by spring 23, one end of which is secured to the free end of said crank and the other end suitably attached to the body of coach 3.

Referring to Figs. 5, and 6, showing still

another modified form of control for lever 5, of toilet 1, control unit 25, more fully hereinafter described, is arranged to prevent operation of lever 5 to flush toilet 1, by the following apparatus; generator 26 driven in known manner by car axle 34, normally supplies energy for lighting coach 3, and operating auxiliary apparatus therein, through conductors 27, 28 and 29, said generator being effective to supply said energy only when said coach is travelling in excess of a predetermined minimum speed, the control of said generator to supply said energy being effected by switch board, or control panel 30, it being understood that when coach 3 is traveling in excess of a predetermined minimum speed the generator 26 is rendered effective to energize control unit 25, through conductors 31 and 32 and when said coach is traveling at less than said minimum speed said generator is ineffective to supply said energy to unit 25.

On steam railway coaches the generator 26 is more conveniently driven by car axle 34 supporting pulley 35 driving generator 26 through belt 33.

Referring to Figs. 7 and 8, Fig. 7, showing control unit 8 and Fig. 8, control unit 25, the locking unit 40 of which is similar for both of said control units, said locking unit 40 comprises housing 41, having slots 42—42 arranged to receive extension 7 of lever 5, also bosses 43—43 supporting shaft 44 pivoted on which is bell crank 45 to the bifurcated extension 46 of which is pivotally secured by pin 47, the rod 48, operating in boss 49, of control unit 8 only, the rod 50 operating in a similar boss in the control unit 25 only.

Bell crank 45 also has locking extension 51, having locking head 52 arranged to be moved over extension 7 of lever 5 whereby said lever cannot be operated to flush the toilet.

Also formed on bell crank 45 is lug 53 extending into recess 54 of key hole boss 55 having key hole 56, and through which key 57 may be inserted, and when turned, will depress lug 53 thereby moving locking head 52 away from extension 7 of lever 5, whereby said lever may be operated to flush toilet 1.

Referring to control unit 8 of Fig. 7, the upper end of rod 48 is formed with a flange 60, arranged to support a disk or loosely fitting piston 61, operating in cylinder 62 of housing 63, secured to housing 41 of unit 40, said housing 63 having boss 64 arranged to receive pipe or duct 9, whereby the partial vacuum therein generated by Venturi unit 10 will be communicated to cylinder 62 thereby raising piston 61 and rod 48 whereby bell crank 45 is rotated counter-clockwise to remove locking head 52 from the path of extension 7 of lever 5, in this manner permitting toilet 1 to be flushed.

A suitable vent 65 supplies air to the under side of piston 61 to compensate for leakage of air therepast and displacement due to the rise of said piston.

Referring to Fig. 8, showing control unit 25, to the upper end of shaft 50, is secured magnet core 70 operating in magnet 71 secured in combined magnet housing and magnetic yoke 72 secured to housing 41 of unit 40. When magnet 71 is energized, as will be more fully hereinafter described, magnet core 70 and likewise rod 50 is moved upwardly thereby simultaneously rotating bell crank counter-clockwise to permit operation of lever 5.

Referring to Fig. 9, showing control unit 15, the modified locking housing 75 is formed with bosses 76—76 having rectangular orifices 77—77 through which cam bar 16, (Figs. 3 and 4) is arranged to reciprocate, said bar having a lower cam face 78, inclined cam faces 79—79 and elevated cam faces 80—80.

When a car as 3, is at rest, and vane 21, (Figs. 3 and 4) is transversely positioned as shown, bar 16 is positioned as shown by Fig. 9, the bifurcated extension 47 of bell crank 45 resting on recessed cam face 78, in this manner restraining locking head 52 (not shown) to lie in the path of extension 7 of lever 5 whereby toilet 1 cannot be flushed thereby.

When said car 3 has accelerated to a predetermined speed vane 21, acted upon by the air current passing over the roof of said car, will be deflected thereby causing rotation of rod 18 and longitudinal movement of bar 16, said longitudinal movement depending upon which direction said car is traveling, in either event the inclined cam face 79 will elevate extension 47 of bell crank 45 and locking head 52 will be removed from the path of extension 7 whereby lever 5 may be operated to flush toilet 1.

Housings 41 and 75 are formed with suitable lugs, as 85—85, for suitably securing control units, as 8, 15 and 25, to the body of coach 3.

Referring to Fig. 10, showing a modified form of control for toilet fixture 1, the valve 86 is arranged in the water supply line for flushing toilet 1, and is normally closed. Lever 87, pivoted on pin 88, has one extension 89 arranged to depress valve stem 90 and open said valve, and another extension 91 pivoted to rod 92 which may form an extension of rods 48 or 50 in this manner eliminating the use of unit 40 where flow of water is required for sewage evacuation, as operation of lever 5 if actuated, cannot supply water to flush toilet 1 unless valve 86 is open.

Referring to Fig. 11, showing a modified sewage discharge conduit of toilet fixture 1, the upper end of waste pipe 93 is assumed to communicate with the waste outlet of toilet fixture 1, and to the lower angularly disposed end 94 of which, is hinged, by pin 95, elbow

96, having discharge end 97, pivoted to which is lever 98, pivoted on pin 99, arranged to raise said elbow 96, by means of rod 92, to the dotted position shown, whereby any sewage discharged by said toilet fixture will be retained in said elbow until the end 97 thereof is lowered for discharge thereof. As described in connection with Fig. 10, rod 92 may be an extension of rods 48 or 50 whereby the discharge end 97 of elbow 96 will only normally discharge when car 3 is traveling in excess of a predetermined minimum speed.

Whereas car 3 has been shown as a railway coach, or pullman sleeping car, it may be some other form of conveyance arranged to travel on paved roadways.

From the foregoing description it will be apparent that applicant has disclosed apparatus for preventing the discharge of sewage or other waste matter from toilet fixtures supported by moving conveyances unless said conveyance is traveling in excess of a prescribed minimum rate of travel and whereas the novel form of control has been shown as applied to a toilet fixture, or bowl, it may be equally well adapted to wash basin fixtures or urinals.

What I claim is:—

1. In combination with a passenger vehicle having a comfort station thereon, the station having one or more toilet fixtures arranged to discharge sewage to the exterior of the vehicle, of means controlled by the rate of travel of the vehicle for controlling the discharge of the sewage from the fixtures to the exterior of the vehicle, and key operated means arranged to be operated at will for annulling the rate of control means whereby the sewage may be discharged at any time.

2. In combination with a passenger vehicle having a comfort station thereon, the station having one or more toilet fixtures arranged to discharge sewage to the exterior of the vehicle, of means controlling the discharge of the sewage from the fixtures to the exterior of the vehicle normally positioned to prevent discharge therefrom, means controlling the discharge means affected by a predetermined increase in the rate of travel of the vehicle for rendering the discharge control means effective to discharge the sewage, and key operated means arranged to be actuated at will for annulling the control of the discharge means by the rate of control means whereby the sewage may be discharged at any time.

3. In combination with a passenger vehicle having a comfort station thereon, the station having one or more toilet fixtures arranged to discharge sewage to the exterior of the vehicle, of means controlling the discharge of the sewage from the fixtures to the exterior of the vehicle normally positioned to prevent discharge therefrom, means controlling the discharge means affected by the rate of travel of the vehicle for rendering the discharge control means effective to discharge the sewage when the vehicle is traveling above a predetermined rate of travel and ineffective to so discharge when the vehicle is traveling below the predetermined rate, and key operated means arranged to be actuated at will for annulling the control of the discharge means by the rate of control means whereby the sewage may be discharged at any time.

4. In combination with a railway car having a walled room containing a toilet, the toilet having a lever pivotally supported by the walled structure for effecting a flushing of the toilet, of a locking device supported by the walled structure normally arranged to lockingly engage the lever to prevent operation thereof to flush the toilet, and means controlled by the rate of travel of the car for effecting an unlocked position of the device upon a predetermined increase in the rate of travel thereof whereby the lever may be rendered operative to flush the toilet.

5. In combination with a railway car having a walled room containing a toilet, the toilet having a lever pivotally supported by the wall structure for effecting a flushing of the toilet, of a locking device supported by the walled structure normally arranged to lockingly engage the lever to prevent operation thereof to flush the toilet, means controlled by the rate of travel of the car for effecting an unlocked position of the device upon a predetermined increase in the rate of travel thereof whereby the toilet may be flushed, and key operated means for manually unlocking the device whereby the toilet may be flushed independently of the rate of travel control means.

6. In combination with a railway car having a walled room containing a toilet, the toilet having a pivotally supported lever for effecting a flushing of the toilet, of a locking device having a housing arranged to encompass one extension of the lever, locking means supported by the housing normally effecting a locked position of the extension whereby the toilet cannot be flushed, and means controlled by the rate of travel of the car rendered effective by a predetermined increase in the rate of travel thereof for effecting an unlocked position of the locking means whereby the toilet may be flushed.

7. In combination with a railway car having a toilet fixture arranged to be flushed for discharge of sewage therefrom, of means for flushing the toilet, a locking device normally arranged to lockingly engage the flushing means and prevent the flushing of the toilet, means controlled by the rate of travel of the car rendered effective by a predetermined increase in the rate of travel thereof for unlocking the device whereby the flushing means may be actuated to flush the toilet, means supported by the device ar-

ranged to insertingly receive a key member, and means operated by the key member after insertion for unlocking the device whereby the toilet may be flushed independently of the rate of travel control means.

8. In combination with a passenger vehicle having a toilet fixture arranged to be flushed for discharge of sewage therefrom, of means for flushing the toilet to discharge the sewage, locking means normally arranged to lock the flushing means and prevent flushing of the toilet and air pressure controlled means rendered effective by a predetermined increase in the rate of travel of the vehicle through the atmosphere for unlocking the locking means whereby the toilet may be flushed.

9. In combination with a passenger vehicle having a toilet fixture arranged to be flushed for discharge of sewage therefrom, of means controlled by the air pressure established by the movement of the vehicle through the atmosphere for preventing flushing of the toilet during comparatively low speeds of movement thereof and permitting flushing of the toilet during relatively high speeds thereof.

10. In combination with a railway car having a toilet, the toilet having a pivotally supported lever for effecting the flushing thereof, of a locking mechanism normally arranged to lock the lever whereby the toilet cannot be flushed, and means rendered effective by a predetermined increase in the rate of travel of the car for unlocking the mechanism whereby the lever will be rendered operative to flush the toilet.

11. In combination with a railway car having a toilet, the toilet having a pivotally supported lever for effecting the flushing thereof, of a locking mechanism normally arranged to lock one extension of the lever against movement whereby the toilet cannot be flushed, and means rendered effective by a predetermined increase in the rate of travel of the car for rendering the mechanism ineffective to lock the lever extension whereby the toilet may be flushed at any time thereafter.

12. In combination with a railway car having a toilet arranged to be flushed for the ejection of sewage therefrom, of means for flushing the toilet, a control unit therefor comprising, a housing, a control mechanism supported therewithin against molestation arranged to normally prevent flushing of the toilet, means rendered effective by a predetermined increase in the rate of travel of the car for annulling the control of the flushing means by the control unit whereby the toilet may be flushed by the flushing means, and a key member arranged to be inserted into the unit for annulling the control of the flushing means by the control mechanism whereby the toilet may be flushed by the flushing means at any time.

13. In combination with a railway car having a toilet arranged to be flushed for ejection of sewage therefrom, of means for flushing the toilet, a control unit therefor comprising, a housing, a control mechanism supported therewithin normally arranged to prevent operation of the flushing means, a second housing arranged in juxtaposition to the first named housing, actuating means supported therewithin arranged in operative connection with the control mechanism, and means rendered effective by a predetermined increase in the rate of travel of the car for rendering the actuating means effective to annul the control of the flushing means by the mechanism whereby the toilet may be flushed.

In testimony whereof I affix my signature.

OSCAR A. ROSS.