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H. A. HERKENHINE ET AL

3,172,131

SEWERAGE SYSTEM

Filed Jan. 30, 1962

FIG-1

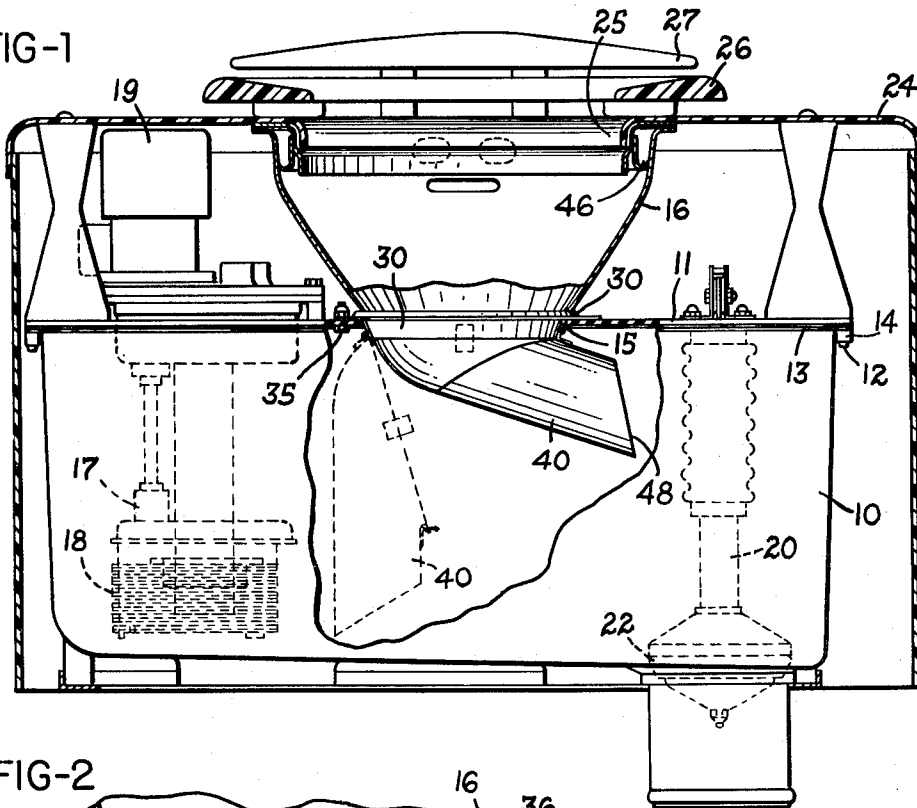


FIG-2

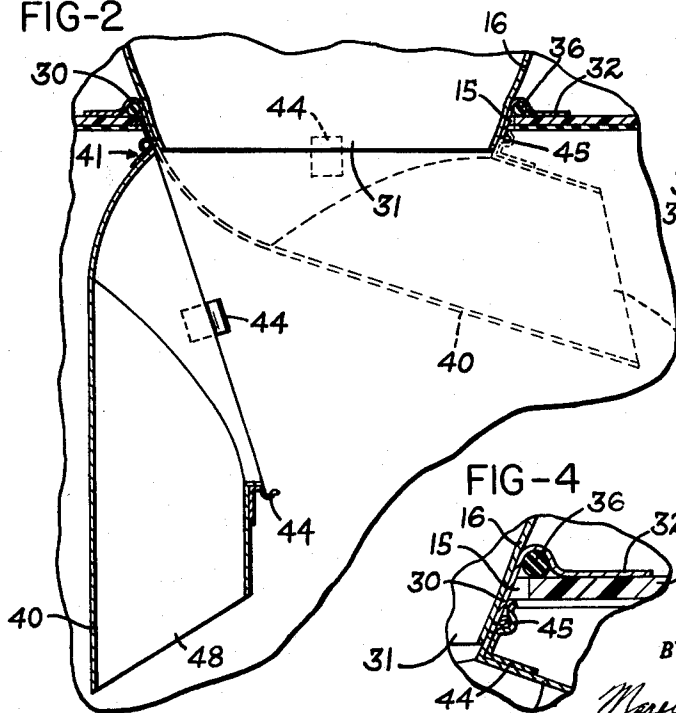


FIG-3

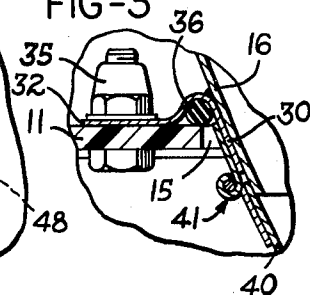
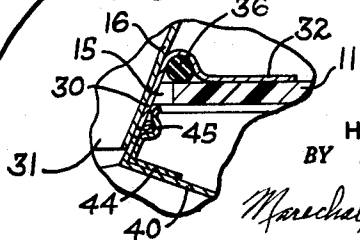


FIG-4



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SEWERAGE SYSTEM

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2 Claims. (Cl. 4—115)

The invention is especially related to sewerage systems of the type having application in commercial passenger vehicles, such as aircraft, busses or trains.

These systems comprise, generally, a flush bowl mounted on a tank containing chemical-water solution for flushing and deodorization. To flush the contents of the bowl into the tank a power operated pump is manually actuated to force the solution from the tank through a manifold surrounding the upper portion of the flush bowl from which it flows along the side walls of the flush bowl thereby washing contents of the bowl into the tank. Preferably the flush bowl has an extension or spout through which the contents of the bowl must flow to reach the tank and which projects laterally and slightly downwardly from the vertical axis of the bowl for the purpose of blocking the contents of the tank from view through the flush bowl, and preventing the contents of the tank from being splashed into the bowl. This extension, then, manifestly enhances the desirability of such a system from the standpoint of the user.

However, because the extension or spout extends laterally, solid and semi-solid matter in the bowl will pass into the tank only during the flushing cycle when they are washed into the tank by the swirling flow of flushing solution. Consequently, the use of such a system depends on the continued operation of the pump and the supply of the power thereof, and the system may become useless when the vehicle power fails or for some other reason the pump cannot be operated to produce the flush cycle.

In particular, the invention is useful with sewerage systems of the type disclosed in the copending application of John W. Dietz, Donald J. MacFadgen and Neal C. Bossemeyer, Serial No. 814,554, filed May 20, 1959 and assigned to the assignee of this invention now Patent No. 3,067,433, issued December 11, 1962.

Accordingly, it is one object of this invention to provide an improved sewerage for vehicular use which can be utilized during periods of power failure.

A further object of the invention is to provide a portable sewerage system which is normally automatically flushed and which can be satisfactory utilized when the automatic flushing operation is inoperative.

Another object of this invention is to provide a sewerage system which under preferred and normal operating conditions is fully automatic and includes apparatus for blocking the contents of the storage tank from view by the user and for preventing the splashing of the storage tank contents into the flush bowl, but which is nevertheless adaptable for use when the automatic system is, for one reason or another, inoperative.

Other objects and advantages of the invention will be apparent from the following description, the accompanying drawings and the appended claims.

In the drawings:

FIG. 1 is a vertical section view partially broken away and with some parts in elevation, through a sewerage system embodying the invention;

FIG. 2 is an enlarged fragmentary section of the feature of the invention;

FIG. 3 is another fragmentary sectional view illustrating on a larger scale the hinge connection shown in FIG. 2; and

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FIG. 4 is a view similar to FIG. 3, illustrating the releasable clasp for holding the spout in the raised position.

Referring to the drawings, which illustrate a preferred embodiment of the present invention, FIG. 1 illustrates a sewerage system generally in accordance with the invention disclosed in said application of Dietz et al. The system is self-contained and constructed as a compact unit having a tank 10 with its open top normally closed by cover 11, the later being secured in position by a number of conventional bolt fasteners 12 which extend through peripheral openings in the cover 11 and flanges 13 of tank 10 into threaded engagement with nuts 14.

The cover 11, having a centrally located aperture 15 therein, is designed to support substantially all of the operating components of the system so that they may easily be removed for maintenance purposes. Thus, the flush bowl 16, the pump 17, its associated filter 18, and drive motor 19, the drainage actuator tube 20 and its valve head 22 are secured in one manner or another to the cover.

A casing or housing 24 is mounted on and secured to the tank 10 and the upper portion of the flush bowl 16, thereby enclosing all of the operating components of the system. An opening 25 in the casing 24 is positioned immediately above the bowl 16, and the seat 26 and its cover 27 as shown in FIG. 1 are pivotally mounted thereabove on casing 24, forming a complete enclosure.

The flush bowl 16 has an annular flange 30 secured around the lower periphery of discharge outlet 31, preferably by brazing, but any expedient which will securely interconnect and seal the bowl 16 and flange 30 and prevent the passage of fluids therebetween, will be satisfactory. A portion 32 of the flange 30 extends horizontally therefrom to engage the cover 11 around the periphery of aperture 15 to support the flush bowl 16 on the cover 11. As shown in FIG. 3, bolts 35 are appropriately spaced around the flange 30 and project through the flange 30 and the cover 11 to interconnect these two components. In order to insure that splashing in the tank 10 will not cause fluids to seep between the flange 30 and the cover 11, a gasket 36 of a flexible durable material is placed therebetween as shown.

A spout 40 is pivotally connected to the flange 30 by a suitable hinge 41 which is secured thereto and to flange 30 by any suitable expedient, for example bolting or brazing, thereby permitting movement of the spout 40 to a normal position, as shown by the solid lines of FIG. 1, wherein waste material in the bowl 16 is flushed therefrom through the spout 40 and discharged into the tank 10 at a point spaced laterally from directly below the discharge outlet 31, so that the contents of the tank 10 are not visible through the flush bowl 16 and so that the liquid in the tank will not be splashed into the bowl. On the other hand, spout 40 can be pivoted to an inactive position, as shown by the solid lines of FIG. 2, wherein waste material can drop directly from the bowl 16 into the tank 10 without flushing it through the spout.

Secured to the spout 40 at spaced intervals around the upper periphery thereof are flexible pressure clasps 44 which engage the appropriately positioned beads 45 on the flange 30, as shown best in FIG. 4, in such a manner that the spout 40 will be maintained in a normal position when the clasps and beads 45 are engaged. When the spout 40 is in the aforesaid normal position, any solid matter in the flush bowl 40 is washed into the tank 10 by actuating the flush cycle. That is, the pump 17 draws fluid from tank 10 through filter 18 and pumps it into the manifold 46 around the upper

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periphery of bowl 16, from which it flows along the inside of the bowl 16 in a swirling manner to wash the contents of the bowl 16 through the spout 40 and into the tank 10.

However, when the power supply to the system is cut off or for any other reason, the pump 17 and hence the flushing system are inoperative, solid and semi-solid matter could collect particularly in the region of the relatively small diameter of the exit portion 48 of the spout 40, and due partially to the acute angle formed by the spout axis with the horizontal. To avoid possible occurrence of this condition, the spout 40 is moved to an inactive position, as shown by the dotted lines of FIG. 1 and the solid lines at FIG. 2, when the flushing system is not operable. Such movement is accomplished by merely inserting any convenient object through the bowl 16 and imparting a downward force on the spout 40, thereby disengaging the several pressure clasps 44 from the beads 45 and pivoting the spout 40 about the hinge 41 to the aforesaid inactive position. In this position all matter in the bowl 16 will drop therefrom through the relatively larger diameter discharge outlet 31 and into the tank 10. Hence, the system can be used during periods of power failure or other malfunction that immobilizes the pump 17 or some other portion of the flushing system.

When the system is subsequently cleaned and serviced the spout 40 can easily be returned to the normal position by merely rotating the spout in a counterclockwise direction, as shown in the drawings, to re-engage the pressure clasps 44 with the mating beads 45.

While the form of apparatus herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise form of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. In a self-contained power operated sewerage system, the combination of an enclosed tank having an aperture formed in the top thereof, a flush bowl having a lower periphery which defines a horizontal discharge outlet, an annular flange member having a downwardly extending portion which projects through said aperture and receives said lower periphery of said flush bowl, a horizontally extending portion on said flange member for engaging the periphery of said aperture to support said bowl on said tank above said aperture, seal means interposed between said flange and said top around the periphery of said aperture for blocking fluid flow from said tank between said flange and top, a discharge spout horizontally pivotally mounted on said flange and having a horizontal inlet opening aligned with said dis-

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charge outlet for receiving flow therefrom, said spout being movable between a normal position in communication with said outlet and extending laterally with respect to the axis of said discharge outlet to direct all waste material flushed from said bowl into said tank and an inactive position wherein said spout is spaced from said normal position for passage of waste material directly from said discharge outlet into said tank so that the contents of said tank cannot be splashed into or viewed from said bowl, means defining an outlet opening in said spout spaced from directly below any portion of said discharge outlet when said spout is in said normal position, and releasable means to secure said spout in said normal position.

2. In a self-contained power operated sewerage system, the combination of an enclosed tank having an aperture formed in the top thereof, a flush bowl having a lower periphery which defines a horizontal discharge outlet, an annular flange member having a horizontally extending portion for engaging the periphery of said aperture and a downwardly extending portion which projects through said aperture and receives said power periphery of said flush bowl to support said bowl on said tank, a discharge spout horizontally pivotally mounted on said flange and having a horizontal inlet opening aligned with said discharge outlet for receiving flow therefrom, said spout being movable between a normal position in communication with said outlet and extending laterally with respect to the axis of said discharge outlet to direct all waste material flushed from said bowl into said tank and an inactive position wherein said spout is spaced from said normal position for passage of waste material directly from said discharge outlet into said tank so that the contents of said tank cannot be splashed into or viewed from said bowl, means defining an outlet opening in said spout spaced from directly below any portion of said discharge outlet when said spout is in said normal position, and manually actuated fastening means to secure releasably said spout in said normal position.

References Cited in the file of this patent

UNITED STATES PATENTS

232,597	Coleman	Sept. 28, 1880
700,719	Allen et al.	May 27, 1902
1,167,920	Natsch	Jan. 11, 1916
1,247,480	Adams	Nov. 20, 1917
1,732,940	Larson	Oct. 22, 1929
2,011,511	Bennett et al.	Aug. 13, 1935

FOREIGN PATENTS

779,744	Great Britain	July 24, 1957
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