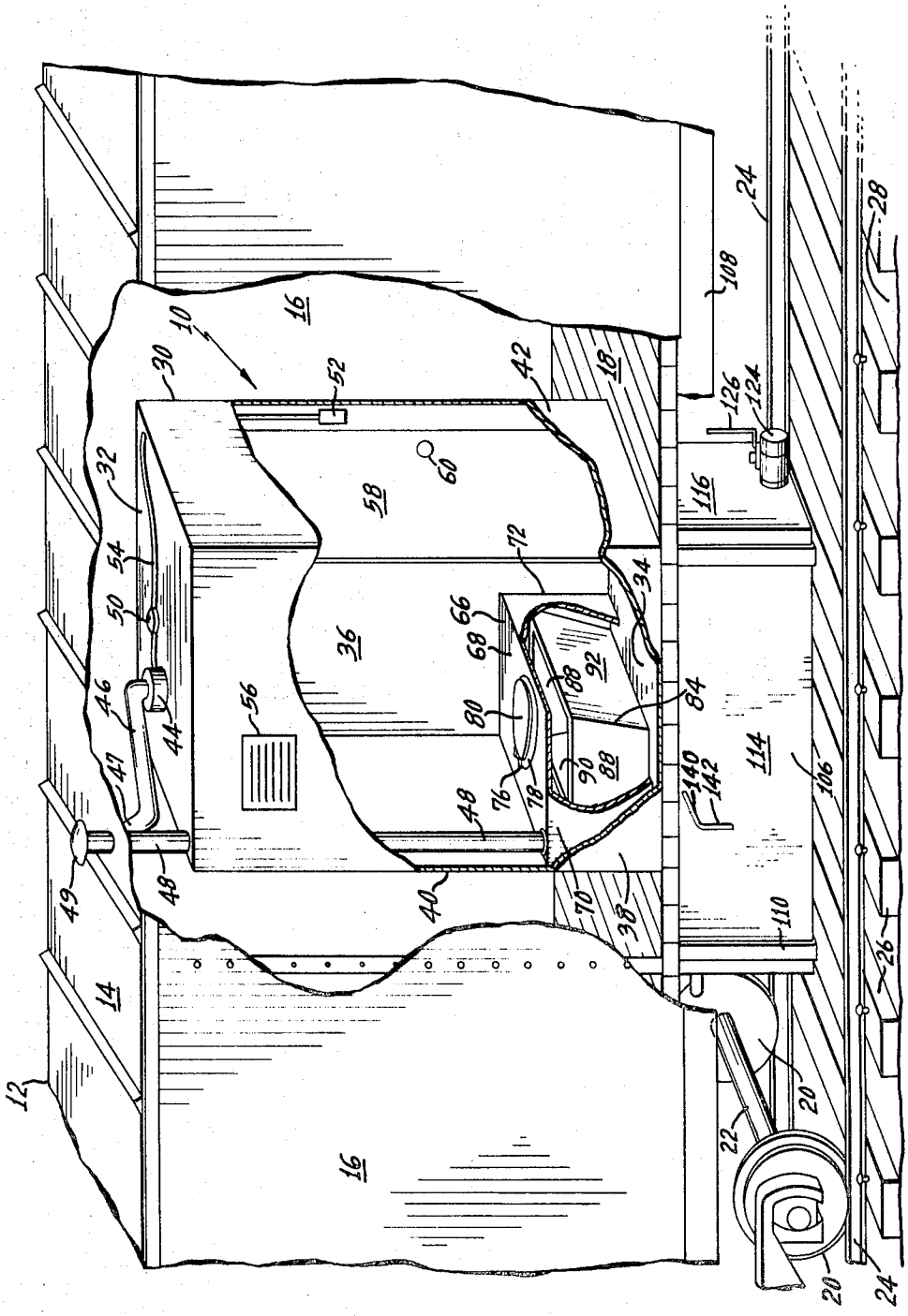
March 16, 1971 F. L. ELLIS ET AL 3,570,016

PORTABLE CHEMICAL TOILET SYSTEM

Filed March 6, 1969 2 Sheets-Sheet 1

FIG. 1



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PORTABLE CHEMICAL TOILET SYSTEM

Filed March 6, 1969 2 Sheets-Sheet 2

FIG. 2

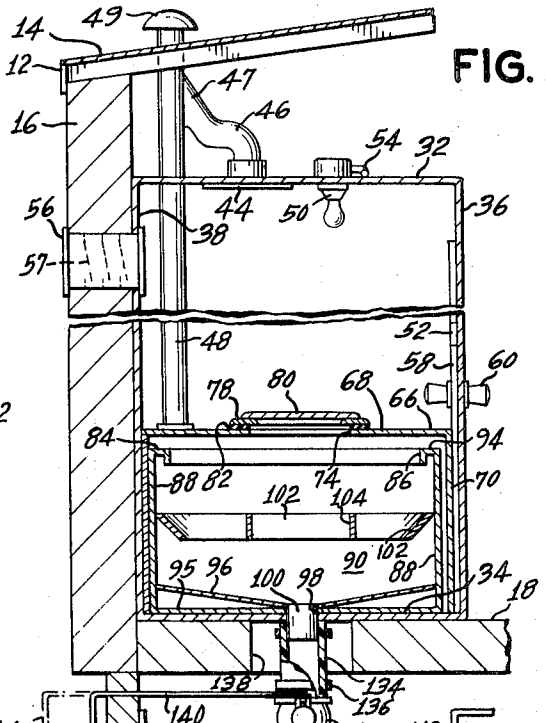


FIG. 5

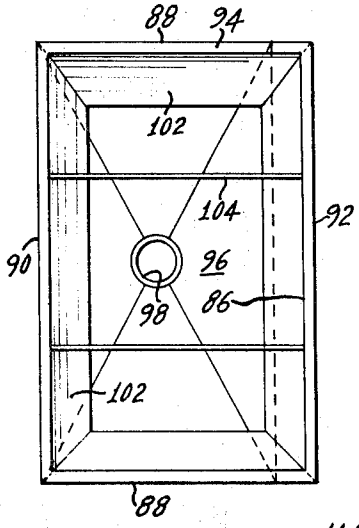


FIG. 4

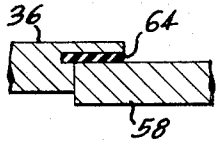
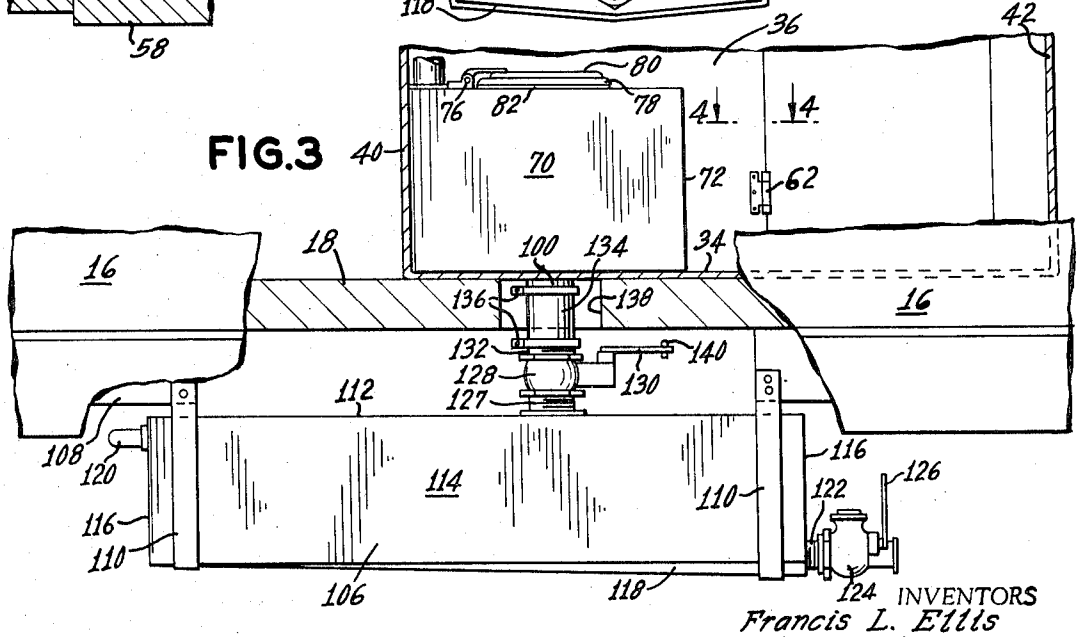


FIG. 3



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3,570,016

PORTABLE CHEMICAL TOILET SYSTEM

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Int. Cl. B61d 35/00
U.S. Cl. 4—8 10 Claims

ABSTRACT OF THE DISCLOSURE

A portable toilet system mounted on a railroad car including a toilet housing compartment positioned within the railroad car and having a receiving tank positioned therein adapted to contain a liquid chemical solution for decomposing purposes and a toilet seat having an opening therethrough mounted in the compartment. The receiving tank has a passageway communicating with the toilet seat opening and is adapted and arranged to receive excrement from the toilet seat opening. The system also includes an enclosed holding tank positioned below the receiving tank and exteriorly of the railroad car therebeneath which is adapted and arranged to receive and hold periodic discharges of the contents of the receiving tank after excreta has built up therein, and passage means communicating between the tanks with selectively operable valve means positioned in the passage means for transferring the contents of the receiving tank into the holding tank. The handle of the valve means is inaccessible to the user of the toilet within the compartment and is operable from a position exteriorly of the railroad car.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates to an improved toilet system. More particularly the invention disclosed herein pertains to an improved sewage disposal system and toilet device for use in vehicles which can be quickly and conveniently operated to provide a safe storage for excreta for long periods of time until convenient disposal is available. The system, adapted for vehicular use, employs a chemical toilet and includes a receiving tank positioned within the vehicle and a holding tank positioned beneath the vehicle adapted to periodically receive discharges from the receiving tank and adapted to hold a plurality of these discharges for a long period of time until disposal is available.

DESCRIPTION OF THE PRIOR ART

Toilet systems and more particularly sewage disposal systems including a toilet device, adapted for vehicular use or of a portable nature have been previously devised, such prior art arrangements and systems being generally disclosed in the U.S. Pats. Nos. 1,081,130; 1,303,358; 1,439,748; 1,859,925; 2,011,511; 2,514,230; 2,604,635; 2,740,971; 2,755,482; 2,817,846, and 3,042,933. Applicants' invention of an improved sanitary toilet device and sewage disposal system, disclosed herein, is an improvement over such prior devices, as shown for example in the above mentioned patents.

SUMMARY OF THE INVENTION

It is a general object of this invention to provide an improved means for collecting and temporarily retaining for long periods of time the matter commonly deposited in a vehicular toilet.

Another object of the invention is to provide a toilet and

sanitary disposal system particularly adapted for portable or vehicular use and including a receiving tank and a holding tank, which system may be used and employed for long periods of time without the necessity of recharging the receiving tank and for longer periods of time without the necessity of emptying or draining the holding tank.

Yet another object of the subject invention is to provide an improved, relatively inexpensive, easily operated portable toilet system readily adaptable to vehicular use, which may be characterized as essentially odorless, sanitary, relatively compact, being able to fit into a small space, easily serviced, and generally simplifying the problem of sewage disposal.

Still another object of the instant invention is to provide in the above described type of toilet system simplified control means for regenerating the system and simplified control means for emptying or draining the system at points where regular and convenient sewage disposal means are available.

A further object of this invention is to provide in a toilet and sanitary disposal system including a receiving tank and a holding tank, a valve positioned between the receiving tank and holding tank and having an operative handle conveniently located to the caretaker of the system and out of the reach of the user of the toilet whereby the operative handle may not be disturbed by the user of the toilet but may be quickly and conveniently operated by the caretaker of the system.

In general these objects are attained by providing a toilet system including a toilet housing compartment having a receiving tank positioned therein adapted to contain chemical solution for decomposing purposes, with a toilet seat having an opening therethrough mounted in the compartment. The receiving tank has a passageway communicating with the opening of the toilet seat and receives excrement from the toilet seat opening. The system further includes a closed holding tank positioned below the receiving tank adapted and arranged to receive and hold periodic discharges of the contents of the receiving tank after excreta has built up therein, and passageway means communicating between the tanks with selectively operable valve means positioned in the passageway means for transferring the contents of the receiving tank into the holding tank. The handle of the valve means is inaccessible to the user of the toilet within the compartment and is operable from a position exteriorly of the compartment.

BRIEF DESCRIPTION OF THE DRAWING

The novel features which are believed to be characteristic of this invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and method of operation may best be understood by reference to the following description taken in connectiton with the accompanying drawings, in which:

FIG. 1 is a perspective view showing the intsallation and use of the improved toilet system of this invention within a railroad car;

FIG. 2 is an end view of the improved toilet system of the invention, portions thereof being shown in cross-section;

FIG. 3 is a partial side view of the improved toilet system of this invention, portions thereof being broken away and portions thereof being shown in cross-section;

FIG. 4 is an enlarged partial cross-sectional view taken along line 4—4 of FIG. 3; and

FIG. 5 is a top plan view of the receiving tank used in the improved toilet system of this invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With detailed reference to the drawings, and in particular to FIG. 1 thereof, the improved vehicular toilet system **10** and of this invention is seen to be mounted in or installed on a railroad camp car structure or railroad work crew car **12** for operation and use therewith. Although the toilet system **10** is shown in connection with railroad car **12**, the device is readily adaptable and usable in similar form with any vehicle. Railroad camp car **12** is seen to include a roof **14**, sidewalls **16**, floor **18** and wheels **20** mounted on axle **22** for movement over and along rails **24** which are secured to ties **26** positioned on the ground surface **28**. Toilet system **10** includes two main portions, the first portion being that positioned interiorly of the railroad car **12** or above the floor **18** thereof, and the second portion being positioned exteriorly of car **12** or below floor **18** thereof. There are additionally portions of the system extending through the floor **18** and connecting together the upper and lower portions of the system.

Positioned within railroad car **12** and on or above floor **18** thereof is a toilet compartment or enclosure **30** having a ceiling **32**, a floor **34**, opposite sidewalls, **36** and **38** and opposite endwalls **40** and **42**. Toilet enclosure **30** further includes an exhaust fan **44** for exhausting air from enclosure **30** when the same is in use into exhaust duct **46** attached thereto and into the main exhaust or ventilating duct **48** of the systems, which is attached to duct **46** by Y-joint **47**. An electric light socket and bulb **50** is included to illuminate the interior of enclosure **30** and is controlled by a switch **52** positioned on sidewall **36** which switch additionally controls the operation of exhaust fan **44**. An electric conductor **54** extends between and is connected to switch **52**, light **50** and exhaust or ventilating fan **44**.

The toilet room **30** is additionally provided with an automatic ventilating louver **56** which extends through the sidewall **38** thereof and the sidewall **16** of the railroad car **12** to permit fresh air to be drawn from the exterior of the railroad car into the interior of toilet room **30** by means of the exhaust or ventilating fan **44**. Automatic ventilating louver **56** is provided with sealing flaps or members **57**, which are normally gravity sealed in the closed position, but which are opened by air passing through louver **56** upon operation of exhaust fan **44**. The toilet room or enclosure **30** is constructed to be air-tight with respect to the interior of the vehicle or railroad car **12**.

With further reference to FIG. 1, and in addition FIGS. 2, 3 and 4, toilet room or enclosure **30** is provided with a door **58** opening inward of room **30** from the interior of railroad car **12** to provide ingress into and egress from the interior of toilet room **30**. Door **58** is provided with a handle or nob **60** for opening, closing and generally operating the same. Door **58** is pivotally mounted and attached to sidewall **36** of room **30** by means of hinges, as at **62** (see in particular FIG. 3) such as pivoted inward thereof. A gasket or appropriate weather stripping **64** (FIG. 4) is provided between sidewall **36** and door **58**, and extends around door **58** to seal the doorway or entranceway of toilet room **30**, making the same air-tight with respect to the interior of the vehicle or railroad car **12** thereby preventing the escape of any possible noxious odors into the interior of car **12**.

Positioned within the lower portion of toilet room **30** is a toilet seat box **66** including a top **68**, side walls **70** and a front wall **72**. Top **68** of toilet seat box **66** is provided with an opening or hole **74** extending therethrough and generally centrally positioned therein. Hingedly attached to toilet seat box top **68** by means of hinge **76** is a toilet seat **78** which surrounds opening **74** and a toilet seat lid **80** adapted and arranged to cover toilet seat **78**. A gasket **82** extends around opening **74** and forms

an airtight seal with toilet seat **78** when the seat is in its lowered position as depicted in FIGS. 2 and 3. The toilet seat cover or lid **80** is likewise provided with a gasket which forms an airtight seal with toilet seat **78** when the cover **80** is in its lowered posititon as depicted in FIGS. 2 and 3.

The lower end portion of main exhaust or ventilating duct **48** extends downward through the top **68** of toilet seat box **66** and opens outwardly into the interior of seat box **66** to provide natural ventilation of the interior of toilet seat box **66**. The upper end portion of duct **48** extends upward through toilet room ceiling **32** and roof **14** of car **12** and opens outwardly to the atmosphere thereabove. A protective cap **49** is provided extending over the upper end of ventilating duct **48**.

Positioned within toilet seat box **66** is a receiving or toilet seat tank **84**, see in particular FIGS. 1, 2 and 5. Toilet seat or receiving tank **84** includes an open top **86**, generally upright side walls **88**, a generally upright back wall **90** and an inwardly and downwardly inclined front wall **92**. Tank **84** is further provided with an inwardly and downwardly extending lip **94** surrounding the open top **86** thereof, an outer bottom **95** and an inner inwardly and downwardly sloping bottom **96** to aid in the rapid flushing and complete emptying of tank **84**. The inwardly and downwardly sloping sides and ends of inner bottom **96** meet in the central portion of the bottom of receiving tank **84** where an opening or passageway **98** is provided through the inner **96** and outer **95** bottoms on tank **84**. A nipple or coupling pipe **100** extends through opening or passageway **98** and is connected to outer and inner bottoms **95** and **96** of receiving tank **84**.

Tank **84** further includes inwardly and downwardly extending baffle plates **102** connected to and extending completely around the walls (**88**, **90** and **92**) of tank **84** and positioned approximately mid-way between the top and bottom thereof. Additional generally upright baffle plates **104** are connected to and extend across forward and rearward wall baffle plates **102** to act with baffle plates **102** to prevent the splashing and sloshing around within tank **84** of the contents contained therein when car **12** is in motion.

With particular reference to FIGS. 2 and 3, the improved toilet system **10** of this invention further includes a large holding or storage tank **106** positioned outward of and below toilet enclosure **30** and floor **18** of car **12**. Holding or storage tank **106** is attached to the framework **108** of car **12** by means of a pair of mounting straps or brackets **110** attached thereto by appropriate means such as bolts or the like. Holding or storage tank **106** includes an upper generally horizontal top wall **112**, a pair of generally upright sidewalls **114**, a pair of generally upright end walls **116** and a bottom **118**.

Tank **106** is equipped with a pressure relief valve **120** positioned in and extending through the upper portion of one wall **116** to provide an escape for gases which may build up from the waste product within the tank. Relief valve **120** in addition to being automatically pressure operable to relive pressure from within tank **106** is a hand operated valve such that when operated by hand liquid will overflow therefrom in the event that the liquid level within tank **106** has reached the height of relief valve **120**. In this manner relief valve **120** acts as an indicator for indicating the liquid level build-up within tank **106**.

A threaded nipple **122** extends through the other upright end wall **116** closely adjacent the bottom **118** of tank **106** for connection thereto of a quick opening disk type valve **124**. Quick opening valve **124** is provided with an operating handle **126** by which the build-up of excreta and the mixture of chemical and water contained within holding tank **106** may be disposed of when the tank becomes substantially full, by flushing through this valve **124** into an appropriate sanitary sewer system or

other like means of disposal. The bottom **118** of holding tank **106** is V-shaped, as can be readily seen in FIGS. 2 and 3, especially adjacent the valve end thereof, to aid and assist in the rapid flushing and complete emptying of the liquid contained in tank **106** by means of valve **124**.

Connected to and opening through top wall **112** of holding tank **106** is a threaded nipple **127** to which is connected a second quick-opening disk type valve **128** provided with a control handle **130** through which the contents of receiving tank **84** pass into holding or storage tank **106**. A short nipple **132** is attached to the upper portion of valve **128** and extends a short distance upward therefrom. A neoprene hose or sleeve **134** connects the lower portion of nipple **100** extending downward from receiving tank **84** and the upper portion of nipple **132** extending upward from valve **128** and is secured thereto by means of a pair of clamps **136**. Nipple **100** and hose or sleeve **134** extend through an opening or passageway **138** provided within the floor **18** of railroad car **12**. An extension handle or rod **140** is attached to the operating handle **130** of quick-opening valve **134** and extends outward to the side thereof through an appropriate opening within the framework **108** of car **12**. Extension rod or handle **140** is movable from an inoperative position **142** in which valve **134** is closed to an operative position **144** (shown in dashed line configuration in FIG. 2) in which valve **134** is in its opened position whereby the contents, excreta and mixture of chemical and water, contained in receiving tank **84** may be quickly flushed by gravity into holding or storage tank **106**. Extension rod or handle **140** is positioned outward of toilet enclosure **30** and car **12** to prevent the unintended or inadvertent operation of valve **128** and the flushing of receiving tank **84** into holding tank **106** by users of the toilet system or other unauthorized personnel from the interior of toilet room **30** or car **12**, but is so positioned as to be convenient to the attendant or caretaker of the toilet system for operation of valve **128** and the flushing of receiving tank **84** into holding tank **106** at the appropriate times when the build-up of excreta in tank **84** reaches the point where it is appropriate or becomes necessary for disposal.

When the improved toilet system **10** of this invention is in operation the attendant thereof will charge receiving tank **84** contained within toilet seat box **66** with an appropriate amount of a mixture of chemical and water. Then when the system is used excreta will be deposited into receiving tank **84** to be contained in the mixture of chemical and water therein and buildup to the point where it becomes necessary or appropriate for disposal, at which time the attendant will flush the contents of receiving tank **84** into holding or storage tank **106** by opening valve **128** through the operation of handle **130** and extension rod **140** associated therewith. Thereafter, when the contents of tank **84** have been emptied into tank **106**, valve **128** will be closed and a new mixture of water and chemical is again charged or applied to tank **84** for another cycle of use. After many such cycles of operation, involving the flushing and recharging of receiving tank **84**, excreta and the mixture of chemical and water will build up in holding tank **106** until this tank becomes substantially full, thereafter the contents of holding tank **106** can be properly disposed of into a sanitary sewer system or appropriate vehicle for transportation to a sanitary sewer system, by the opening of valve **124** using operating hand **126** thereof and flushing the contents contained within holding tank **106** through valve **124**.

During the entire operation of the toilet system **10**, holding or storage tank **106** is entirely sealed from the atmosphere and is opened thereto only when valve **128** is periodically opened to flush the contents of receiving tank **84** thereinto or when it becomes necessary to drain tank **106** through valve **124**.

When the toilet system is in operation, ventilation is provided thereto by outside air being drawn into toilet room **30** by exhaust fan **44** pulling the same through louver **56** and opening the sealing member **57** therein. During these periods of ventilation air from both inside the toilet room **30** and the interior of toilet seat box **66** is exhausted to the atmosphere through ducts **46** and **48**. When the toilet room is not in use or operation and the toilet seat **78** and lid **80** are in their closed positions, as depicted in FIGS. 2 and 3, natural ventilation of the interior of seat box **66** will occur through the main ventilating duct **48**.

While the improved toilet system **10** of this invention has been shown and described in connection with railroad car **12** the system is readily adaptable for use in operation in any vehicle. Furthermore, the toilet system could be incorporated in a single housing or structure and be used as a portable chemical toilet with particular adaptability to construction sites and other building areas, parks, playgrounds, recreational areas and the like.

While only a certain preferred embodiment of this invention has been shown and described by way of illustration, many modifications within the true spirit and scope of this invention and within the following claims will occur to those skilled in the art.

What is claimed as new and what it is desired to secure by Letters Patent of the United States is:

1. A toilet system comprising a toilet housing compartment having a large receiving tank positioned within said compartment and containing a liquid chemical solution for decomposing purposes, a toilet seat mounted in said compartment and having an opening therethrough, said receiving tank having a passageway communicating with said toilet seat opening and being adapted and arranged to freely receive excrement from said toilet seat opening into said receiving tank, an enclosed holding tank positioned below said receiving tank and being larger than said receiving tank, passage means communicating between said tanks, said holding tank being adapted and arranged to receive and hold a plurality of periodic discharges of the contents of said receiving tank after excreta has built up therein, selectively operable valve means positioned in said passage means for transferring the contents of said receiving tank into said holding tank, said valve means including handle means inaccessible to the user of the toilet within said compartment to prevent inadvertent escape of the contents from said receiving tank to said holding tank.

2. The toilet system as defined in claim **1** wherein said holding tank includes an end wall and a bottom wall, another valve means connected to said end wall of said holding tank closely adjacent said bottom wall, said valve means communicating with the interior of said holding tank whereby the contents of said holding tank may be periodically discharged through said other valve means.

3. The toilet system as defined in claim **2** wherein said bottom wall of said holding tank is generally V-shaped adjacent said end wall, said bottom wall adjacent said end wall being at a lower elevation than said bottom wall adjacent the other end wall, said other valve means being positioned closely adjacent the lower portion of said V-shaped bottom to permit the rapid and substantially complete discharge of the contents of said holding tank.

4. The toilet system as defined in claim **1** wherein said receiving tank includes baffle means generally horizontally disposed therein and extending thereacross, said baffle means being connected to the sides of said receiving tank at the approximate liquid level thereof to deter movement of the liquid chemical solution therein during use of the toilet and during transportation of the toilet system.

5. The toilet system as defined in claim **1** further comprising a toilet seat box positioned within said compartment and enclosing said receiving tank, said toilet seat box having a top wall with an opening therethrough, said

toilet seat being pivotally attached to said top wall of said toilet seat box with its opening in registry with the opening through said top wall of said toilet seat box, a first sealing gasket positioned between and sealing said toilet seat and said top wall of said toilet seat box, a second sealing gasket connected to the cover of said toilet seat and sealing therewith whereby noxious odors generated within the receiving tank are inhibited from entering said compartment when said toilet seat and cover thereof are in their closed positions.

6. The toilet system as defined in claim **5** wherein said toilet housing compartment includes a doorway for ingress and egress of the users of the toilet system, a door hingedly attached to said compartment for closing said doorway, and sealing gasket means positioned between said door and doorway and sealing with said door when in its closed position whereby noxious odors generated within the receiving tank and become present in said compartment are inhibited from escaping therefrom.

7. The toilet system as defined in claim **1** wherein said holding tank includes an end wall, a relief valve positioned in said end wall closely adjacent the top of said holding tank, said relief valve communicating with the interior of said holding tank to provide an escape through said relief valve for gases which may build up from waste products within said holding tank.

8. The toilet system as defined in claim **1** wherein said receiving tank includes a bottom wall having a centrally disposed opening therein communicating with said passage means, said bottom wall of said receiving tank being generally funnel-shaped and including portions which slope generally downwardly and inwardly toward the opening therein whereby the contents of said receiving tank may be rapidly and completely discharged through said passage means into said holding tank.

9. The toilet system as defined in claim **1** wherein said system is mounted on a railroad car with said toilet housing compartment and its contents being positioned interiorly of the railroad car, said holding tank being positioned exteriorly of the railroad car therethrough and said handle means being operable from a position exteriorly of the railroad car.

10. The toilet system as defined in claim **1** wherein said system is mounted on a railroad car with said toilet housing compartment and its contents being positioned interiorly of the railroad car, said holding tank being

positioned exteriorly of the railroad car therebeneath, said handle means being operable from a position exteriorly of the railroad car, said toilet housing compartment including a doorway for ingress and egress of users of the toilet system, a door hingedly attached to said compartment for closing said doorway, sealing gasket means positioned between said doorway and door and sealing with said door when in its closed position whereby noxious odors generated within the receiving tank and become present in said compartment are inhibited from escaping therefrom into the interior of the railroad car, a toilet seat box positioned within said compartment and enclosing said receiving tank, said toilet seat box having a top wall with an opening therethrough, said toilet seat being pivotally attached to said top wall of said toilet seat box with its opening in registry with the opening through said top wall of said toilet seat box, a first sealing gasket positioned between and sealing said toilet seat and said top wall of said toilet seat box, a second sealing gasket connected to the cover of said toilet seat and sealing with said toilet seat whereby noxious odors generated within the receiving tank are inhibited from entering said compartment when said toilet seat and cover thereof are in their closed positions.

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U.S. Cl. X.R.

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