

April 13, 1937.

R. H. KOCH
DISAPPEARING TOILET
Filed May 1, 1935

2,076,950

2 Sheets-Sheet 1

Fig. 1.

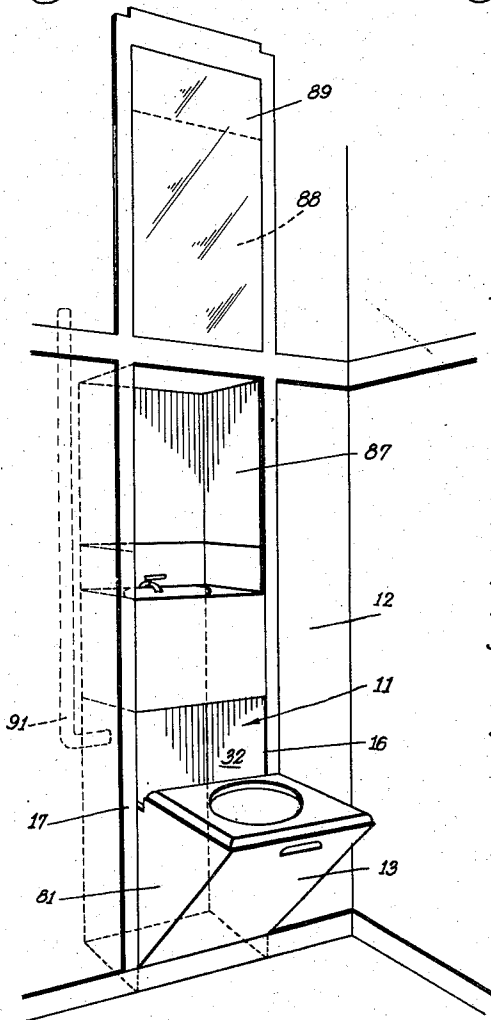


Fig. 2.

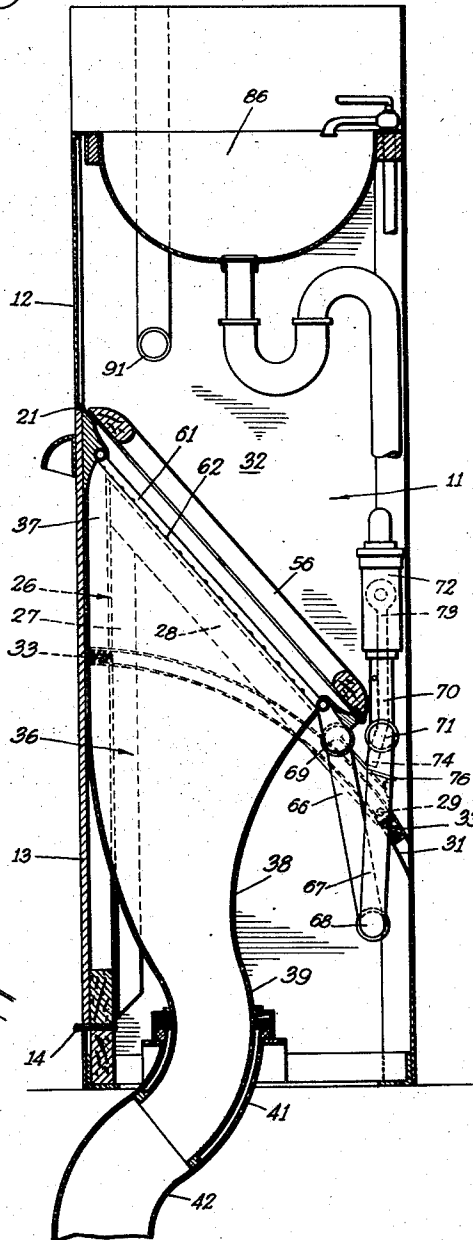
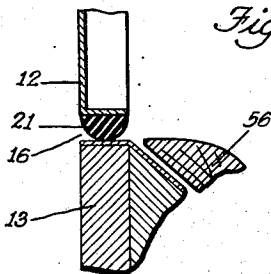


Fig. 5.



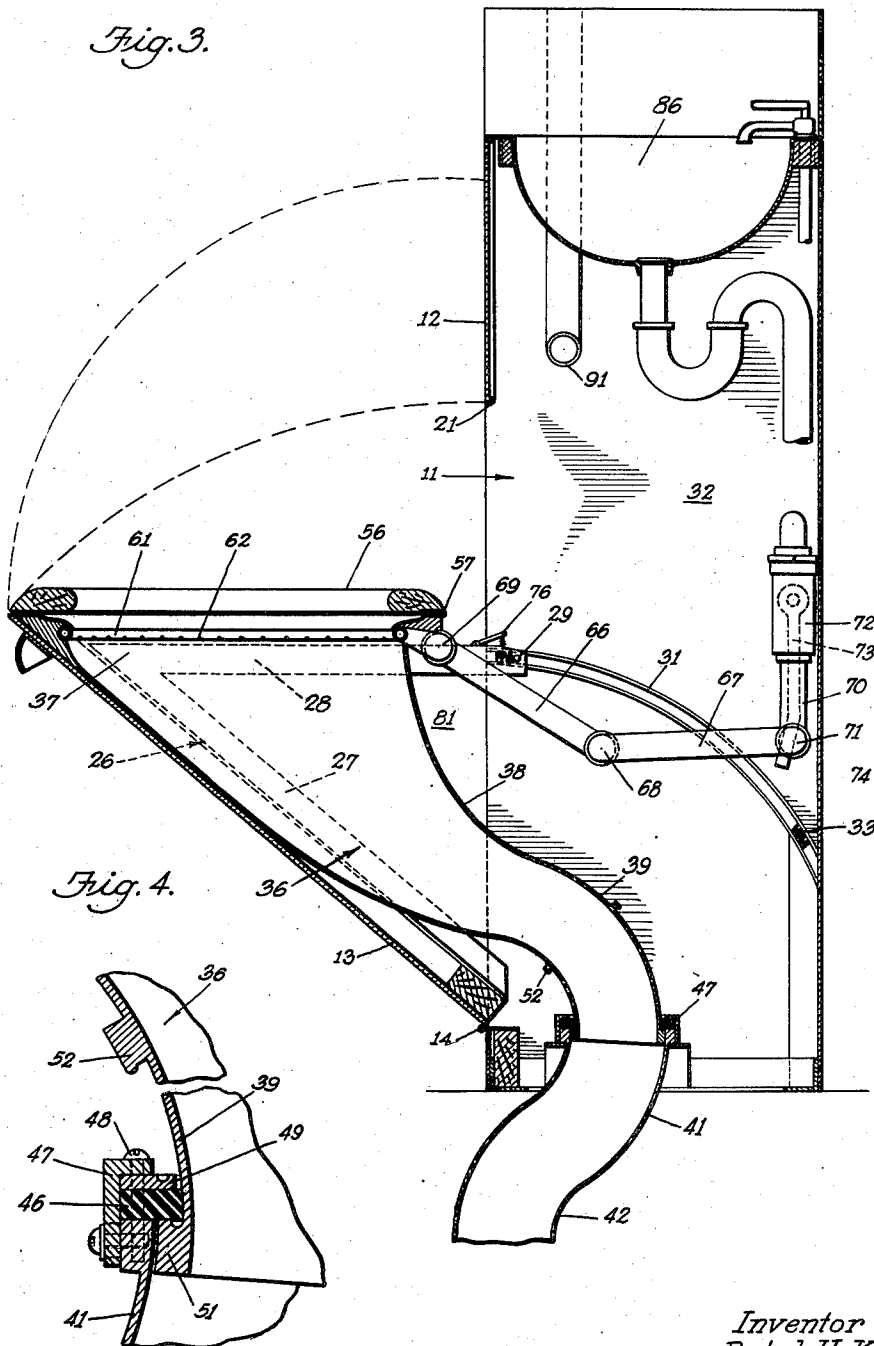
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,076,950

DISAPPEARING TOILET

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Application May 1, 1935, Serial No. 19,135

9 Claims. (Cl. 4-3)

My invention relates to plumbing fixtures, and more particularly to toilet fixtures movably mounted in such a manner that whereas they are normally disposed in a convenient, out of the way place and/or concealed from view, they can be withdrawn to operative position for convenient use whenever desired.

An object of the present invention is to provide a disappearing toilet construction of the character indicated, wherein a toilet bowl is mounted upon the inner face of a panel so arranged that by drawing the panel outwards, the toilet bowl can be withdrawn from a recess in a wall or other suitable supporting structure, and thus placed in operative position with the utmost convenience, and by replacing the panel the bowl can be caused to recede into the recess and completely concealed from view.

It is also an object of the present invention to provide novel means for interconnecting the toilet bowl with a suitable waste pipe for the disposal of waste matter from the bowl, whereby a substantially fluid-tight engagement therebetween is maintained, regardless of the position of the bowl.

Another object is to provide efficient means for preventing the escape of any gases and/or noxious odors from the recess to the apartment in the wall of which the recess is formed.

A further object of my invention is to provide means for causing the bowl automatically to flush itself upon its movement into the recess.

Still another object is to provide a suitable reinforcing and supporting structure for the bowl and the panel whereupon it is mounted, thereby enabling it to support an ample amount of weight without damage.

A further object of the present invention is to provide a disappearing toilet construction having the above mentioned and other advantages and yet which requires only a very small amount of space for its accommodation, which is easy and inexpensive to manufacture, which is adaptable to comply with the plumbing requirements of any community, which is altogether inapt to get out of order but is susceptible to facile repairs when necessary, and which is of very simple and light construction whereby the device is particularly fitted for use in various types of aircraft, although it should be understood that the device is by no means limited to such use inasmuch as it offers great convenience in such locations as offices, apartments, and both large and small boats.

The invention possesses other objects and ad-

vantageous features, some of which with those enumerated will be set forth in the following description of the preferred embodiment of the invention illustrated in the drawings accompanying and forming a part of this specification. It should be understood, however, that these drawings and description are utilized in this specification only in an exemplary and not in a limiting sense, inasmuch as I may adopt variations of the preferred form of my invention within the scope thereof, as set forth in the claims.

Referring to the drawings:

Figure 1 is a perspective view showing a portion of a room showing a disappearing toilet construction embodying the principles of the present invention operatively installed in a wall thereof.

Figure 2 is an enlarged transverse vertical, sectional view, taken through the recess which is provided for the accommodation of the toilet fixture and showing the device retracted to its inoperative concealed position.

Figure 3 is a view similar to Figure 2 showing the fixture withdrawn to operative position.

Figure 4 is an enlarged detail view in vertical section showing the manner of interconnection between the bowl and the waste pipe.

Figure 5 is an enlarged detail view illustrating the means provided for establishing a tight seal for the door of the recess whereby escape of gases and/or odors from the recess when closed is prevented.

In terms of broad inclusion, the toilet fixture of the present invention comprises a toilet bowl of suitable design mounted upon the door of a recess which is provided in a wall or other suitable supporting structure. By moving the door to its closed position, the toilet bowl may be caused to recede into the recess and be completely concealed from view by the door. By swinging the door outwards, however, the toilet bowl may be extended into conveniently operative position for use; and means are provided for suitably supporting and reinforcing the bowl so as to present a structure suitably rigid and rugged to withstand sufficient hard usage. Means are also provided for flushing the bowl, preferably having an automatic valve tripped by the bowl itself, when pushed back into the recess to its retracted position. Preferably a lavatory also is provided in the same recess and accessible through preferably a separate closure panel so that access to the lavatory can be had without having to remove the toilet bowl from its concealed position. In this manner, hence, by means of a device of this invention, I have provided a toilet bowl and lava-

tory fixture adapted for installation in the wall of an ordinary living or business room, which is normally entirely concealed from view, thus permitting unrestricted use of the room by enabling an occupant of the room to have access to lavatory and toilet facilities with the utmost convenience. Moreover, the entire arrangement occupies only a minimum of space and is an extremely light, though rugged and durable construction, the result being that it is particularly well adapted for installation in the restricted quarters available in aircraft, small boats, such as cruisers and yachts, and staterooms of large passenger carrying vessels.

Figure 1 illustrates a preferred embodiment of my invention installed in association with a recess 11 in a wall 12. For this recess 11 a closure panel 13 is provided, this panel 13 being mounted for swinging movement about a horizontal axis as by hinges 14 at the lower end of the panel 13. When closed the panel 13 lies preferably in planar alignment with the wall 12, or slightly offset therefrom, to present the appearance of a decorative panel whereby the fixture is more effectively concealed, particularly if the opening 16 in the wall 12 which the panel 13 is adapted to close is surrounded by suitable molding strips 17.

Preferably a substantially gas-tight and odor-tight seal is established between the panel 13 and the edges of the opening 16 as by means of a resilient strip 21 (see Fig. 5) affixed to the edges of the wall 12 surrounding the opening 16 and adapted to engage the edges of the panel 13 when the latter is moved to closed position.

Affixed to the inner face of the panel 13 is a framework construction 26 comprising rigid strips 27, preferably angle irons, extending along the vertical edges of the panel 13, and strips 28, also preferably of angle iron, extending angularly inwards from the upper ends of the strips 27. Rigid with the inner ends of the strips 28 are pins 29 which are slidably received within the channel guides 31 which are rigid with the side walls 32 of the recess 11 and are of arcuate form, the axis of the arcs described by the guides 31 lying in the axis of the pintles of the hinges 14. Secured at each end of each channel guide 31 is a coil compression spring 33 or other suitable resilient cushioning means, adapted to be engaged by the pins 29 to limit both inward and outward movement of the panel 13. The parts are so proportioned and arranged that when the panel 13 reaches its outer stream of movement, as illustrated upon Figure 3, the pins 29 engage the springs 33 at the outer ends of the guide 31 and the strips 28 are substantially horizontal.

Mounted upon the inner face of the panel 13 and supported and reinforced by the framework 26 is a toilet bowl 36 which is preferably constructed of non-corrosive sheet metal and which is of substantially funnel shape, inasmuch as it has a large, open, upper end 37 the plane of which is substantially parallel to that of the arms or strips 28, a tapering body portion 38, and a tubular portion 39, of relatively small diameter, leading down from its lower end. This tubular, lower end 39 describes an arc, the axis of which also lies in the axis of the pintles of the hinges 14. This arcuate, tubular portion 39 is telescopically engaged within the upper end 41 of a waste pipe 42 which leads from the recess 11 to a suitable point of discharge. The upper end 41 of the waste pipe 42 is also of arcuate form; and the arcs described by the portions 39 and 41 are coaxial so

that as the panel 13 and the bowl 36 carried thereby move in swinging movement about the axis of the hinges 14 the portion 39 can move freely into or out of the portion 41, depending upon direction of movement of the panel 13, as will clearly be understood by reference to Figure 2 and 3.

Means are provided for establishing a gas-tight seal between the telescopically engaged portions 39 and 41 in any position of the toilet. This can best be provided through the expedient of a packing ring 46 (see Fig. 4) carried by preferably the lower member, i. e., the upper end 41 of the waste pipe 42, and frictionally engaging the outer surface of the lower end 39, or discharge pipe, of the bowl 36. This ring 46 is releasably retained in operative position by a suitable retaining gland 47 and machine screws 48 or their equivalent; and preferably an annulus 49 of metal is disposed on the upper surface of the packing 46. Annular shoulders 51 and 52 are provided on the outer surface of the arcuate discharge pipe 39, the lower shoulder 51 being at or adjacent the end of the discharge pipe 39 and the other shoulder 52 being spaced therefrom a distance determined by the extent of movement of the discharge pipe 39 into the waste pipe 41, i. e., the shoulders 51 and 52 are so positioned that the lower shoulder 51 engages the under side of the packing 46 when the panel 13 and bowl 36 are in extended position, as in Figure 3, and the upper shoulder 52 engages the upper surface of the annulus 49 when the panel 13 and bowl 36 are in retracted position as in Figure 2.

A suitable toilet seat 56, is affixed preferably, as by hinges 57, to the upper, large end 37 of the bowl 36.

Means for flushing the bowl 36 are also provided. For this purpose, a tube 61 is mounted just inside the upper end 37 of the bowl 36 and is provided with a plurality of orifices 62 adapted to distribute fluid evenly and preferably at considerable force over preferably the entire inner surface of the bowl 36. Fluid at suitable pressure is supplied to the distribution tube 61 by means of a flexible conduit, preferably in the form of metal tubes 66 and 67 articulated as at 68, connected to the distribution tube 61 by a suitable articulated joint 69 and to a supply pipe 70 by another articulated joint 71. In the supply pipe 70 an automatic flush valve 72 is mounted; and the handle 73 of the flush valve 72 carries an extension 74 in position to be engaged by a spring-pressed trip 76 which is mounted upon one of the arms 28, as the bowl 36 and panel 13 approach their inner extreme of movement, and in that manner actuate the valve 72. Thus it may be seen that the toilet is caused automatically to flush itself when it is retracted to its concealed position.

Preferably side panels 81 are mounted upon the framework 26 so as to conceal the bowl 36 from view when in extended position, and to provide a more attractive and readily cleansed construction.

Thus it may be seen that I have provided a collapsible or disappearing toilet construction capable of operating entirely satisfactorily to perform all the usual functions of a conventional toilet fixture, and yet it can be caused to recede into the recess 11 when not desired for use, for the purpose of saving space and/or concealing the fixture from view. Consequently, the device is well suited for installation in the

wall of a room normally used for other purposes, such as a private business office, hotel or apartment room, or a stateroom of a passenger vessel. The device also finds extreme utility in other types of vehicles, such as aircraft, busses, railway cars, and small boats, such as cruisers and yachts where saving of space is of importance. It should be emphasized, however, that whereas the device of my invention is of ample strength and rigidity to prevent damage thereto through all the exigencies of normal usage, nevertheless, it is of relatively little weight, which feature particularly fits it for use in aircraft.

Moreover, the device requires such a small amount of space that it is also particularly well adapted to be received, when retracted, within the same recess 11 as that which accommodates in its upper portion a lavatory bowl 86. I prefer, however, that the bowl 86 be accessible for use through a separate opening 87 so as to avoid the necessity of extending the toilet bowl 36 into operative position whenever it is desired to use the lavatory bowl 86. Consequently, I prefer to provide a separate closure panel 88 which can be removed from its closing position as by sliding upwards behind one of the fixed panels 89 of the wall 12, as indicated upon Figure 1.

In order to enhance the efficacy of the gaskets 21 in preventing the escape of odors and/or noxious gases from the recess 11, I prefer that a vent pipe 91 be provided, leading from that portion of the recess 11 with which the toilet bowl 36 is provided, and extending upwards therefrom, preferably within the wall 12 to a suitable point of discharge.

I claim:

1. In a plumbing construction, means providing a recess, a waste pipe leading therefrom, a bowl mounted for movement optionally into or out of said recess, an outlet pipe leading from said bowl, said pipes telescopically engaging each other to permit movement of said bowl, and packing means carried by one of said pipes and slidably engaging the other to establish a fluid-tight seal therebetween in all positions of said bowl, said packing means comprising a packing ring carried by one of said pipes and surrounding and frictionally engaging the other of said pipes, and an annular shoulder rigid with said other pipe in position to engage said packing ring when said bowl reaches its outer extreme of movement.

2. In a plumbing construction, means providing a recess, a waste pipe leading therefrom, a bowl mounted for pivotal movement optionally into or out of said recess, an outlet pipe leading from said bowl, said pipes having co-axial arcuate portions telescopically engaging each other to permit movement of said bowl without disturbing the connection thereof to said waste pipe, a pair of spaced annular shoulders rigid with one of said arcuate portions, packing means surrounding and frictionally engaging said arcuate portion between said shoulders and carried by the other of said arcuate portions in position to be engaged by one of said shoulders as said bowl reaches each of its extremes of movement, a source of fluid under pressure, a valve in said fluid supply, and a conduit connecting said valve and said bowl.

3. A plumbing fixture of the character described comprising means providing a recess, a closing panel therefor mounted for pivotal movement about a predetermined axis, channel guides

rigid with walls of said recess and arcuate about said axis, pins rigid with said panel and slidably engaged within said guides and means adjacent ends of said channel guides engageable by said pins to limit movement of said panel, a bowl carried by said panel, an outlet pipe leading from said bowl, and a waste pipe leading from said recess, said pipes having telescopically engaged portions co-axially arcuate, the common axis of said arcuate sections coinciding with the axis of movement of said panel.

4. A plumbing fixture of the character described comprising means providing a recess, a closing panel therefor mounted for pivotal movement about a predetermined axis, channel guides rigid with walls of said recess and arcuate about said axis, pins rigid with said panel and slidably engaged within said guides, and cushioning means adjacent ends of said channel guides engageable by said pins to limit movement of said panel, a bowl carried by said panel, an outlet pipe leading from said bowl, and a waste pipe leading from said recess, said pipes having telescopically engaged portions co-axially arcuate, the common axis of said arcuate sections coinciding with the axis of movement of said panel.

5. A plumbing fixture of the character described comprising means providing a recess, a closing panel therefor mounted for pivotal movement about a horizontal axis, channel guides rigid with walls of said recess and arcuate about said axis, pins rigid with said panel and slidably engaged within said guides, and cushioning means adjacent ends of said channel guides engageable by said pins to limit movement of said panel, a bowl carried by said panel, and means for conducting waste from said bowl out of said recess.

6. A plumbing fixture of the character described comprising means providing a recess, a closing panel therefor mounted for pivotal movement about a horizontal axis, channel guides rigid with walls of said recess and arcuate about said axis, pins rigid with said panel and slidably engaged within said guides, and cushioning means adjacent ends of said channel guides engageable by said pins to limit movement of said panel, a bowl carried by said panel, a waste pipe leading from said recess, and means connecting said bowl to said waste pipe in all positions of said bowl.

7. A plumbing fixture of the character described comprising means providing a recess, a closing panel therefor mounted for pivotal movement about a horizontal axis, channel guides rigid with walls of said recess and arcuate about said axis, pins rigid with said panel and slidably engaged within said guides, and cushioning means adjacent ends of said channel guides engageable by said pins to limit movement of said panel, a bowl carried by said panel, means for conducting waste from said bowl, and means establishing a substantially gas-tight seal between said panel and walls of said recess when said panel is in closed position.

8. A plumbing fixture of the character described comprising means providing a recess, a closing panel therefor mounted for pivotal movement about a horizontal axis, channel guides rigid with walls of said recess and arcuate about said axis, pins rigid with said panel and slidably engaged within said guides, and cushioning means adjacent ends of said channel guides engageable by said pins to limit movement of said panel, a bowl carried by said panel, means for

conducting waste from said bowl, means establishing a substantially gas-tight seal between said panel and walls of said recess when said panel is in closed position, and a vent pipe leading
5 from said recess.

9. In a plumbing construction, means providing a recess, a waste pipe leading therefrom, a bowl mounted for pivotal movement optionally into or out of said recess, means connecting said
10 bowl to said waste pipe, a source of fluid under

pressure, a valve in said fluid supply, and means for conducting fluid from said valve to said bowl comprising a tube leading into said bowl, a pair of tubes connected by an articulated joint to each other, one of the tubes of said pair being connected by an articulated joint to said bowl tube, and the other by another articulated joint to said valve, the axes of all of said articulated joints being parallel. 5

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