United States Patent [19]

Cleary

[11] **3,894,299**

[45] **July 15, 1975**

[54] **DUAL FLUSH FOR TOILETS**

[76] Inventor: **William P. Cleary**, 160 Riviera Dr., Bricktown, N.J. 08773

[22] Filed: **May 29, 1974**

[21] Appl. No.: **474,341**

[52] **U.S. Cl.** ..... **4/67 A**; 4/34; 4/57 R

[51] **Int. Cl.** **E03d 1/34**; E03d 5/02; A61b 19/00

[58] **Field of Search** ..... 4/67 R, 67 A, 57 R, 57 P, 4/34, 37, 1, 18, 12, 58, 60, 65

[56] **References Cited**

UNITED STATES PATENTS

2,351,672	6/1944	Engel	4/67 R
3,487,476	1/1970	Stiern et al.	4/57 R
3,605,125	9/1971	Gibb et al.	4/58
3,810,261	5/1974	Hollander	4/65

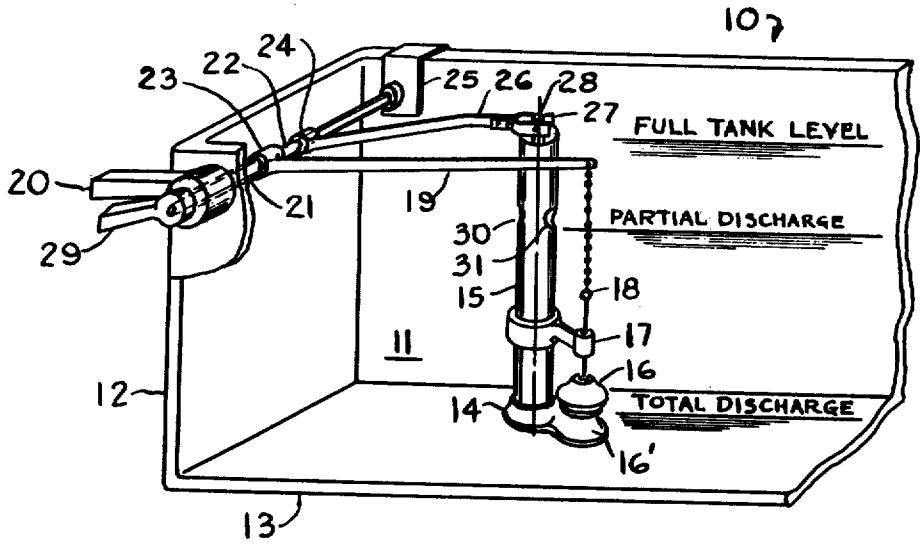
Primary Examiner—Henry K. Artis

Attorney, Agent, or Firm—Imirie, Smiley & Linn

[57] **ABSTRACT**

A dual flush system for toilets whereby a regulated partial amount of water may be used to flush the bowl comprising, in addition to a main valve, flush control means therefor, an overflow pipe and flush tank filling means, a spring-loaded valve inserted into the overflow pipe and separate control means for actuating the spring-loaded valve.

5 Claims, 3 Drawing Figures



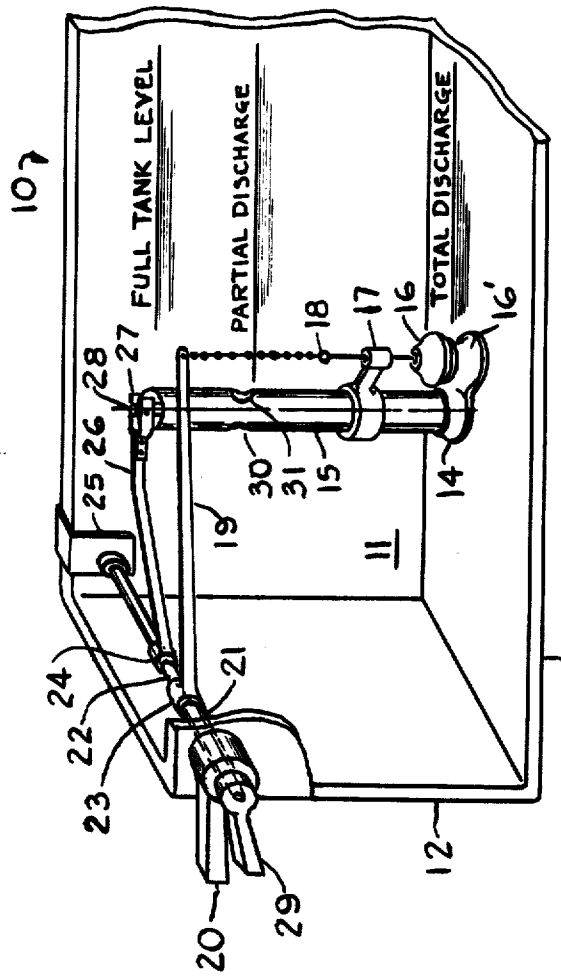

10
FULL TANK LEVEL
PARTIAL DISCHARGE
TOTAL DISCHARGE
11
12
13
14
15
16
16'
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31

FIG. 1

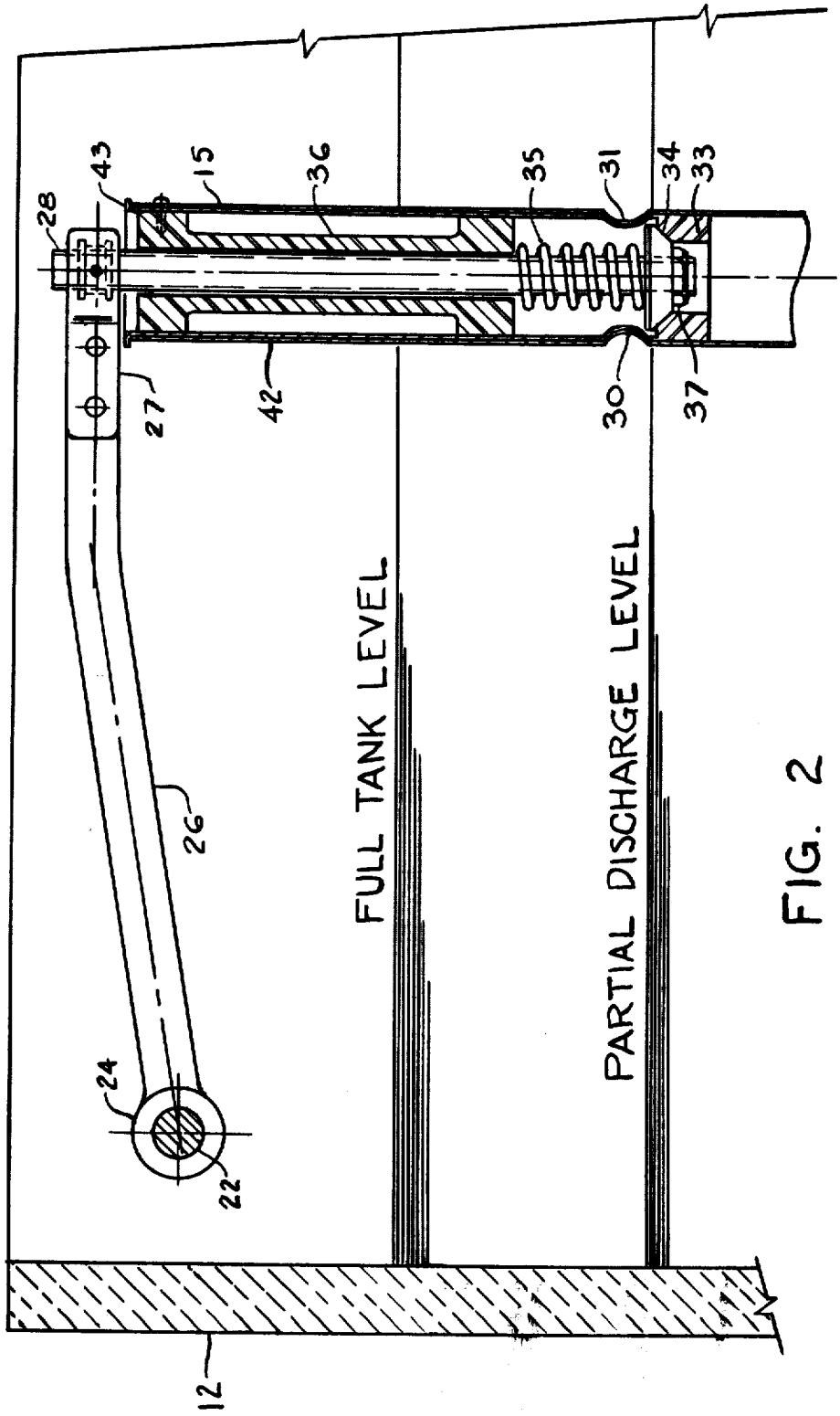

28
43
15
36
35
31
34
33
27
42
30
37
26
24
22
12
FULL TANK LEVEL
PARTIAL DISCHARGE LEVEL

FIG. 2

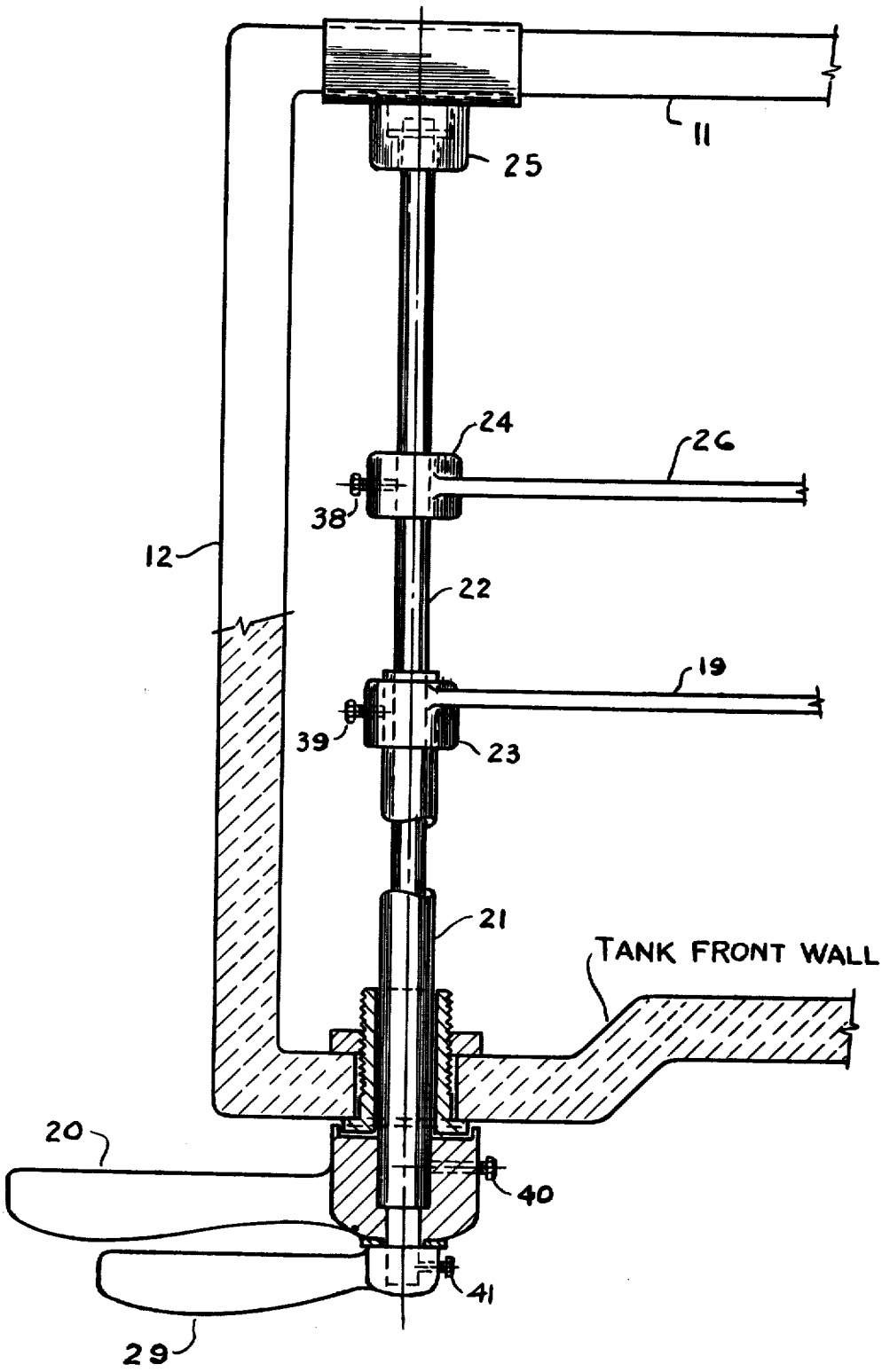


FIG. 3

DUAL FLUSH FOR TOILETS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention generally relates to an improved toilet flush tank construction, and more particularly to an improved valving arrangement for regulating the amount of water utilized in flushing the tank of a toilet.

2. Description of the Prior Art

Toilet flush tanks provided with dual flush systems are known. See, for example, those described in U.S. Pat. Nos. **3,574,866** Sievers; **2,803,833** Charest; **934,353** Prichett; **2,237,294** Easley; **2,351,672** Engel; **1,474,288** Rath; and **2,505,091** Brebis. While these devices generally function in the manner intended, most require major modifications in the tank structure of a conventional single flush tank to achieve the desired result.

There is a need therefore for a dual flush tank which is simple in construction, easy to operate and relatively simple to install in a conventional tank system.

SUMMARY OF THE INVENTION

It is a primary object of the present invention to provide a dual flush toilet tank system which is free of the above disadvantages.

It is a further object of the invention to provide a dual flush system which can be installed in a conventional single flush tank without difficulty by a non-skilled person.

It is yet a further object of the present invention to provide a dual flush toilet tank system which can be operated with ease and effectively.

Other objects and advantages will become apparent from the ensuing description.

The above objects are realized by the dual flush system of the present invention which comprises, in a conventional toilet tank, a spring-loaded valving mechanism inserted into the overflow pipe, the latter being provided with holes above the level of the valving mechanism to permit water to flow therein (and eventually into the bowl), and control means to permit the spring-loaded valve to open and thereby permit the tank to be partially emptied of water. The use of the spring-loaded valve permits the tank to be emptied of any quantity of water up to and including that amount of water in the tank above the level of the holes in the overflow pipe.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a front elevation view, with parts broken away and omitted, of the dual flush system of the invention.

FIG. **2** is a front view, partly in cross-section, showing in detail the system of the invention.

FIG. **3** is a top plan view, partly in cross-section, of the flush control means of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. **1**, a toilet flush tank **10** is shown which comprises base **13**, side wall **12** and backwall **11**, the remaining portions of the enclosure not being shown. An overflow pipe **15** is provided therein connected with base **13** at **14**, and communicating with the bowl of the toilet (not shown). A main valve **16**, shown in position on valve seat **16'**, enables the tank to be

emptied of water when handle **20** is depressed, as is conventional. After all the water drains out of the tank and into the bowl, the valve **16** is again seated on seat **16'** and water begins to enter the tank through a fill pipe (not shown). A float-regulated valve (not shown) controls the amount of water that flows into the tank, as is conventional.

The modifications necessary to provide a dual flush system according to the present invention are as follows:

1. a spring-loaded valve mechanism is inserted into the overflow pipe and at least one hole is drilled in the same above the level of the valve seat of the spring-loaded valve; and

2. secondary flush control means is installed for the spring-loaded valve, which means is operable separately from the main valve control means for operating the main valve for total tank discharge. The secondary flush control means conveniently is a separate handle **29** secured to rotatable rod **22** to which in turn is secured a sleeve **24** and lever arm **26.**

The spring-loaded valve and the flush control means are illustrated in greater detail in FIGS. **2** and **3.** The main flush handle **20** is secured to a hollow shaft **21** such as by means of set screw **40.** To the opposite end of shaft **21** is secured (such as by means of set screw **39**) sleeve **23** and lever arm **19** (the latter two are conveniently integral).

Separate handle **29** is secured to rod **22** such as by means of set screw **41.** Rod **22** is adapted to rotate in bearing means **25** and supports a sleeve **24** and lever arm **26** (the sleeve **24** and lever arm **26** may be an integral unit), the sleeve **24** being secured to rod **22** such as by means of set screw **38.**

To the opposite end of lever arm **19** is attached main valve **16** through chain **18** (or other suitable connection means) supported by guide **17.**

The spring-loaded valve is inserted into the overflow pipe **15** and comprises a hollow tube **28** supporting at its lower end a valve **34.** The lower portion of tube **28** may be threaded and valve **34** may be held securely thereto by threaded nut **37.** In closed position, valve **34** is positioned in valve seat **33** which is disposed below holes **30** and **31** provided in overflow pipe **15.** The valve seat **33** is secured to overflow pipe **15** in this position. A guide means **36,** secured to overflow pipe **15,** provides a guide for the vertical movement of tube **28** and defines a space between its lower end and valve **34,** in which space is provided a spring **35** around tube **28,** the spring simultaneously bearing against valve **34** and lower end of guide means **36** tending to keep valve **34** in valve seat **33.**

Conveniently, valve seat **33** is integral with sleeve **42** as shown in FIG. **2** for ease of installation. Thus, valve seat **33** and sleeve **42** are inserted into the overflow pipe **15** and flange portion **43** of sleeve **42** is seated on the upper portion of overflow pipe **15.** The hole **30,** and if necessary hole **31,** may then be drilled in overflow pipe **15** and sleeve **42** and the balance of the assembly inserted into overflow pipe **15.** Alternatively, the hole(s) in sleeve **42** may be pre-drilled prior to insertion thereof in overflow pipe **15.**

The upper end of tube **28** is secured to fork **27** which in turn is secured to lever arm **26** by any suitable means.

In operation, should one wish to totally empty the flush tank, one would depress handle **20** which would,

in turn, rotate hollow shaft **21** and lever arm **19**, thereby freeing main valve **16** from valve seat **16'**, permitting the level of water in the tank to decrease from the full tank level (FIG. **1**) to the total discharge level.

On the other hand, should one desire or find it necessary only to partially empty the flush tank, one would depress handle **29**. As a result, rod **22** (which is capable of rotation independently of hollow shaft **21**) rotates counterclockwise, thereby raising lever arm **26**. Valve **34**, connected to the lower end of tube **28**, is thereby lifted off valve seat **33** permitting the water in the tank to flow through holes **30** and **31**, down overflow pipe **15** and then into the bowl. As long as handle **29** is kept depressed, valve **34** will remain open and the water level in the flush tank will fall from the full tank level to the partial discharge level (FIG. **1**).

Thus, depending on how long handle **29** is kept depressed and the location of holes **30** and **31** on the overflow pipe **15**, one can easily vary the amount of water released from the flush tank into the bowl. Once a sufficient amount of water flows into the bowl to flush away the contents thereof, and handle **29** is released, valve **34** will automatically close since it is spring-loaded.

Since tube **28** is hollow, the function of the overflow pipe is retained since the overflow water can flow through tube **28** down into the overflow pipe **15** beneath valve seat **33** and then into the bowl.

Two holes **30** and **31** are shown in the drawings, but only one hole is necessary for operation. The guide means **36**, valve **34** and valve seat **33** may be composed of any suitable material, such as natural or synthetic rubber, nylon, etc. Any conventional spring can be employed and the force exerted by the spring can be regulated by the distance between the lower end of guide means **36** and the valve seat **33**.

The advantages of the device of the invention are as follows:

1. The system of the invention can be installed in any conventional toilet without substantial structural modifications by one having minimum mechanical skill, such as the average homeowner.

2. Only the desired amount of water is released from the tank, a significant advantage especially in those areas served only by septic tanks (since overloading can be avoided) or in those areas where potable water costs are high (since this device wastes little water).

3. The device is simple to operate even for the young.

4. No leakage around the secondary valve **34** would occur since it is spring-biased against valve seat **33**.

It will be understood by those skilled in the art that various changes, substitutions and/or modifications may be made in the device as shown and described, despite the fact that the invention has been illustrated by reference to preferred embodiments thereof. It is the intention therefore that the invention be limited only by the scope of the appended claims.

What is claimed is:

1. A dual flush system for a toilet whereby a regulated partial flush of the flush tank can be obtained comprising, in a conventional toilet, having an over flow pipe, spring-loaded secondary valve means disposed in the overflow pipe at a point intermediate the lower and upper ends thereof and separate flush control means for said spring-loaded secondary valve said spring-loaded secondary valve comprising a valve seat disposed in said overflow pipe, said valve seat being secured to said overflow pipe, a hollow tubular member supporting said valve at a position adjacent its lowermost end and extending through said valve communicating with the space in the overflow pipe below said valve seat when said valve is seated in said valve seat, and at least one hole in said overflow pipe provided in the wall of said overflow pipe above said valve seat whereby actuation of said separate flush control means releases water above the level of said hole into the bowl of said toilet.

2. The dual flush system of claim **1** wherein the uppermost end of said tubular member extends at least as high as the uppermost end of the overflow pipe, thereby permitting overflow water to flow down through said tubular member below said valve seat and eventually into the bowl.

3. The dual flush system of claim **2** wherein said separate flush control means is operable independently of the main flush control means used to operate the main valve of the toilet.

4. The dual flush system of claim **3** wherein said flush control means comprises two separate handles each secured to separate rotatable shafts and separate lever means secured to each of said rotatable shafts and to each of said main and secondary valves, whereby when said handles are depressed, said shafts rotate thereby lifting said lever means which opens said valves.

5. The dual flush system of claim **4** wherein said rotatable shaft of said separate flush control means is disposed concentrically within the rotatable shaft of the main flush control means and extends outwardly through the first handle which operates the main valve at which point the second handle is secured to the smaller shaft for operating the secondary valve means.

* * * * *