Dec. 15, 1970 W. E. WUSTNER 3,546,715

TOILET TANK FLUSH VALVE

Filed Oct. 21, 1968

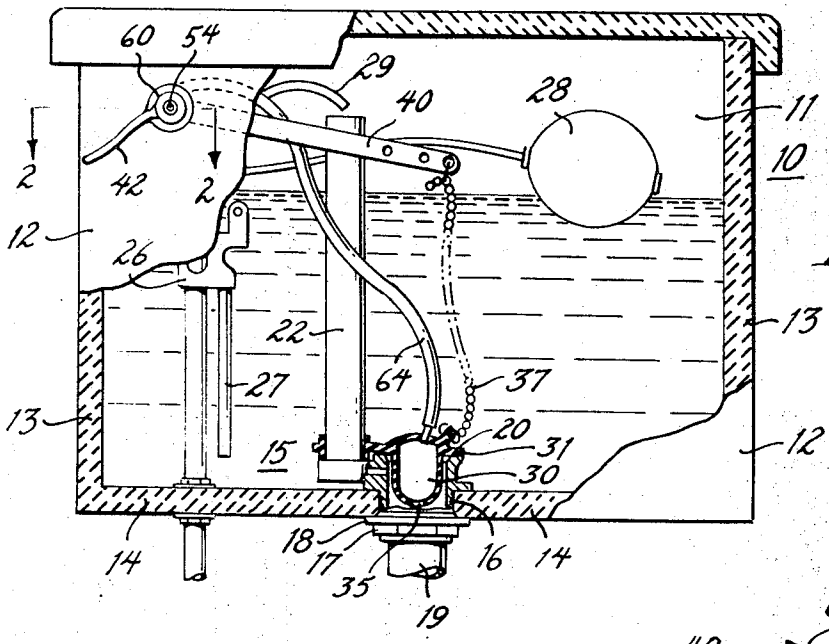


Fig. 1.

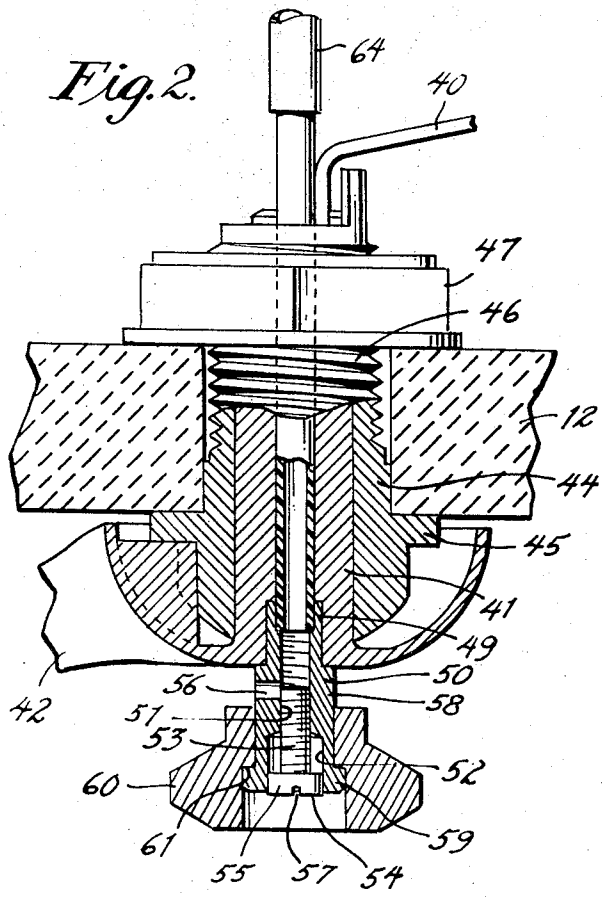


Fig. 2.

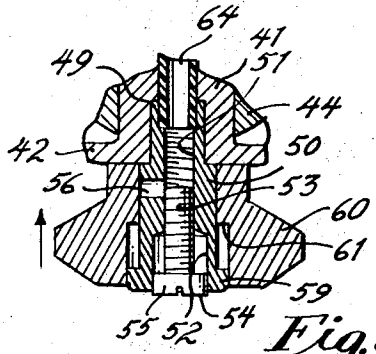


Fig. 3.

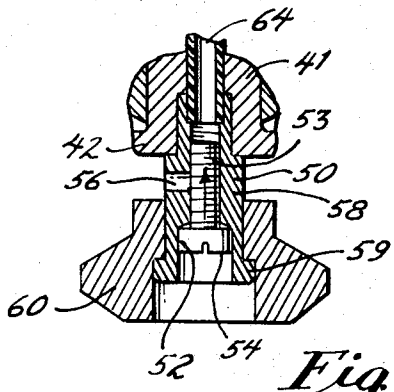


Fig. 4.

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TOILET TANK FLUSH VALVE

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U.S. Cl. 4—67 7 Claims

ABSTRACT OF THE DISCLOSURE

An adjustable toilet tank flush valve is provided, associated with the tank discharge handle, in which the discharge of water from the tank is reduced in accordance with the setting of an adjustable vent valve at the handle, a slidable control member being incorporated with the handle to override the reduced discharge as determined by the vent valve and permit of full tank discharge.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates to adjustable toilet tank flush valves and more particularly to such valves with manual adjustment to provide reduced discharge from the tank if desired, and also with a control element to permit of full tank discharge if desired.

BACKGROUND OF THE PRIOR ART

In some areas and at some seasons of the year water shortages are serious and it is desirable to conserve water to the maximum extent.

Various valves have heretofore been proposed to control the tank discharge so as to reduce unnecessary discharge of water from the toilet tank.

In my prior Patents Nos. 3,324,482 and 3,331,084 adjustable valves are shown in which the adjustment is made at the valve ball which controls the water delivery with provisions at the operating handle to select full discharge or reduced discharge as desired. These structures were however relatively complex to construct and assemble.

SUMMARY OF THE INVENTION

In accordance with the present invention an adjustable toilet tank flush valve is provided, with a simple but effective adjustable venting control valve at the handle and selector member at the handle to render the venting control valve ineffective if desired.

It is the principal object of the present invention to provide a selectively operable toilet tank flush valve for partial or complete toilet tank discharge which is simple in construction but effective in operation.

It is a further object of the present invention to provide a toilet tank flush valve of the character aforesaid which can be readily installed on toilets now in use and which may be used on new installations.

It is a further object of the present invention to provide a toilet tank flush valve in which the operating handle has built thereinto an adjustable air flow control valve to limit the tank discharge and which has associated therewith a slidable control element for rendering the air flow valve ineffective and thereby permitting complete discharge of the toilet tank.

Other objects and advantageous features of the invention will be apparent from the description and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The nature and characteristic features of the invention will be more readily understood from the following description taken in connection with the accompanying drawings forming part thereof, in which:

FIG. 1 is a view partly in elevation and partly in vertical section of a toilet flush tank having a preferred embodiment of the present invention incorporated therein;

FIG. 2 is a fragmentary sectional view, enlarged, taken approximately on the line 2—2 of FIG. 1, and showing the setting for partial toilet tank discharge;

FIG. 3 is a fragmentary view of a portion of the structure shown in FIG. 2, showing the setting for complete tank discharge; and

FIG. 4 is a view similar to FIG. 3 with the adjustable valve positioned for cut off of air flow.

It should, of course, be understood that the description and drawings herein are illustrative merely, and that various modifications and changes can be made in the structure disclosed without departing from the spirit of the invention.

Like numerals refer to like parts throughout the several views.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now more particularly to the drawings, a toilet flush tank **10** is shown having a rear wall **11**, a front wall **12**, side walls **13** and a bottom wall **14**.

A fitting **15** of well known type is provided having a threaded section **16** held in place by a nut **17** engaging a washer **18** and having a delivery pipe **19** communicating with the hopper (not shown) of the toilet, below the valve seat **20**.

The fitting **15** has an upright overflow pipe **22** of well known type carried thereby and connected below the valve seat **20** for discharge.

The tank **10** can have a water supply valve **26** with a water delivery pipe **27** carried thereby and controlled by a float **28** in a well known manner, with a hush tube **29** extending down into the overflow pipe **22**.

The fitting **15**, as shown in FIG. 1, has a hollow valve ball **30**, of rubber or the like, with a flexible carrying and seating plate **31** engageable with the valve seat **20** hingedly carried on a mounting ring on the pipe **22**. The ball **30** has an opening **35** in the bottom thereof to permit the entry of water to the interior, depending on its venting, and discharge of water from the interior.

A valve ball actuator comprising a chain **37** for raising the seating plate **31** from the valve seat **20**, is connected at its upper end to a lever **40**.

The lever **40** is secured to a shaft **41** on which a handle **42** is mounted for manual actuation.

The shaft **41** is carried within a sleeve **44** which has an enlarged head **45** engaging the exterior of the front wall **12** and a threaded portion **46**.

The sleeve **44** is held in place by a nut **47** which engages the threaded portion **46** and the interior of the wall **12**.

The shaft **41** has secured therein the shank **49** of a valve body **50**.

The valve body **50** has an internally threaded bore **51** with an enlarged outer end **52** for the reception of the threaded shank **53** of a screw **54** which serves as an adjustable valve plug. The screw **54** has a head **55** which is received in the end bore **52** and a transverse valve passageway **56** is controlled by the positioning of the screw shank **53**. The screw head **55** has a slot **57** for manual adjustment by a screwdriver.

The valve body **50** has an external cylindrical portion **58** with an outwardly extending terminal flange **59**.

A slidable control member **60** in the form of a knob is carried on the cylindrical portion **58** and has an internal shoulder **61** for engagement with the flange **59** to limit the outward movement thereof. The control member **60** in its outer portion, as shown in FIG. 2, exposes the valve passageway **56** and in its inner position as shown in FIG. 3 closes the passageway **56**.

The valve body **50** has extending therefrom, through a bore **63**, in the shaft **41**, a flexible vent tube **64** which extends to the interior of the valve ball **30** for venting air therefrom.

The mode of operation will now be pointed out.

Assuming that the flush tank **10** is filled with water to a level determined by the float **28**, the handle **42** can be turned to flush the toilet.

If it is desired to deliver the entire contents of the tank **10** the control knob **60**, prior to turning the handle **42**, is moved inwardly to the position shown in FIG. 3 to close the passageway **56**.

Upon turning the handle **42** and the shaft **41** to which it is connected the lever **40** through the chain **37** will raise the valve ball **30** from its seat **20** and permit water to be discharged through the fitting **15** in a conventional manner.

The valve ball **30** will be buoyed up in the usual manner and will fall with the falling water level in the tank **10**. The valve ball **30** will not be vented and will retain its maximum buoyancy.

If it is desired to discharge only part of the contents of the tank **10** and thereby conserve water, the control knob **60** is moved outwardly to the position shown in FIG. 2, prior to turning the handle **42**.

Upon turning of the handle **42** the valve ball **30** is raised from its seat **20** as before. The valve ball **30** will, by reason of the positioning of the control knob **60** with respect to the valve passageway **56**, have air discharged therefrom through the vent pipe **64**, the bore **51** and the passageway **56**.

At the same time, and dependent upon the setting of the shank **53** with respect to the passageway **56**, water will enter the valve ball **30** through the opening **35**, and reduce the buoyancy of the valve ball **30**. The valve ball **30** will thus move to closed position and engage the seat **20** before the entire contents of the tank **10** has been discharged.

The positioning of the shank **53** with respect to the passageway **56** permits of adjusting the rate of venting of the valve ball **30** and thus the rate of delivery of water into the interior of the valve ball **30** to reduce its buoyancy.

The position as shown in FIG. 3 is for non-venting and full discharge of water from the tank **10**.

After the valve ball **30** has been seated on the valve seat **20** any water therein will be drained out through the drain opening **35** so that upon the next actuation of the handle **42** either maximum or limited flushing can be selected and carried out.

Upon the completion of the desired flushing action water will be supplied to the tank **10** through the water supply valve **26** to bring the level in the tank **10** to that determined by the float **28**.

It will thus be seen that simple but effective apparatus has been provided for carrying out the objects and purposes of the invention.

I claim:

1. A toilet flush valve construction comprising

a discharge valve fitting having a seat,

a valve member for engagement with said seat and having a hollow interior portion and an opening in the bottom thereof,

manually operable members for moving said valve member from said seat including an actuating member connected to said valve member and an angularly swingable handle member connected to said actuating member and

means for controlling the buoyancy of said valve member,

said means including an air vent connection to the interior of said valve member and extending through said handle member, and

members for controlling the delivery of water from the tank into the interior of said valve member,

said last members including an adjustable air vent valve in said air vent connection and carried by said handle member,

said air vent valve controlling a discharge passageway portion of said air vent connection terminating at said handle member and

an exteriorly accessible movable control member carried by said handle member and selectively movable thereon to a position to close said discharge passageway and render said air vent valve ineffective.

2. A toilet flush valve as defined in claim **1**, in which said manually operable members include a shaft to which said handle member and said actuating member are connected, and

said air vent valve is carried by said shaft.

3. A toilet flush valve as defined in claim **2**, in which said air vent has a valve body carried by said shaft with a threaded member therein,

said valve body has said discharge passageway therein and said passageway is controlled by the positioning of said threaded member with respect thereto, and

said movable control member is slidably mounted on said valve body and is movable thereon with respect to said discharge passageway for selectively opening or closing said discharge passageway.

4. A toilet flush valve as defined in claim **3**, in which said air vent connection has a portion disposed in said shaft and communicating with said valve body.

5. A toilet flush valve as defined in claim **1**, in which said air vent valve includes a threaded member rotatable for venting adjustment.

6. A toilet flush valve as defined in claim **5**, in which said air vent valve has a valve body with a threaded member therein, and

said valve body has a vent passageway controlled by the positioning of said threaded member with respect to said passageway.

7. A toilet flush valve as defined in claim **6**, in which said control member is mounted on said valve body and is movable thereon for selectively opening or closing said discharge passageway.

References Cited

UNITED STATES PATENTS

3,365,730 1/1968 Chiappetta ---------- 4—67(A)

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