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ADJUSTABLE FLUSH TANK VALVE FOR WATER CLOSETS

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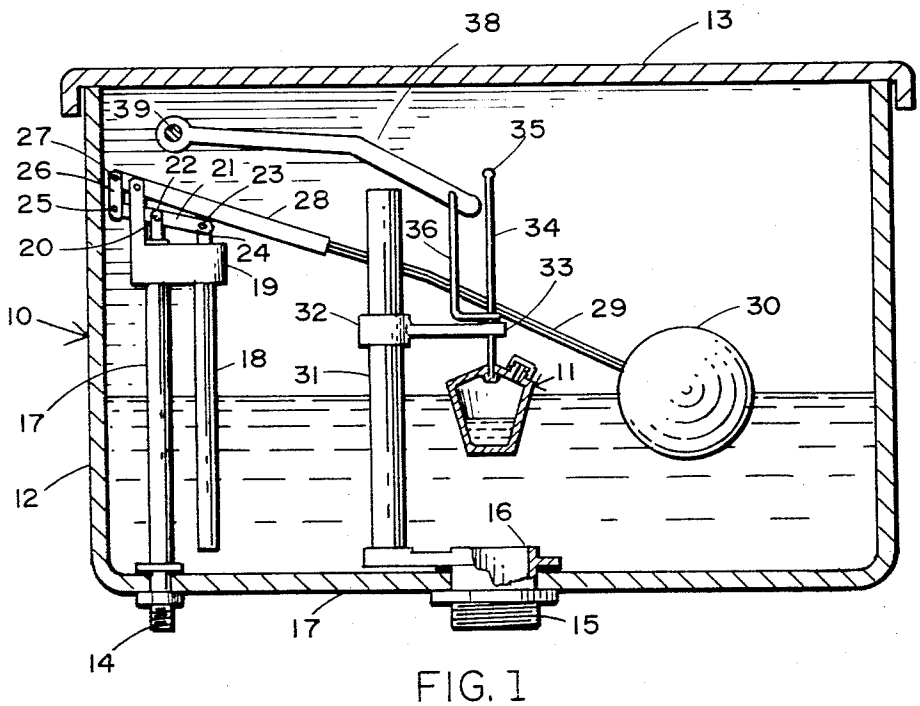


FIG. 1

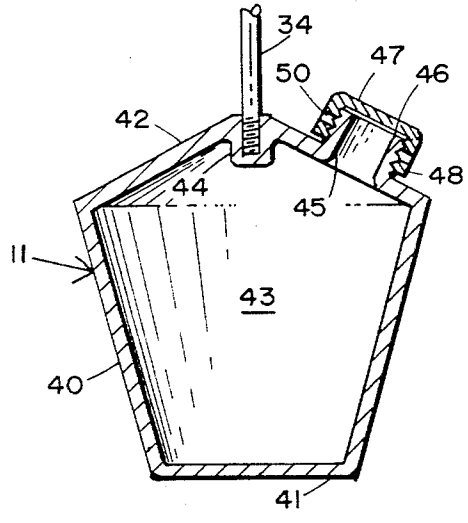


FIG. 2

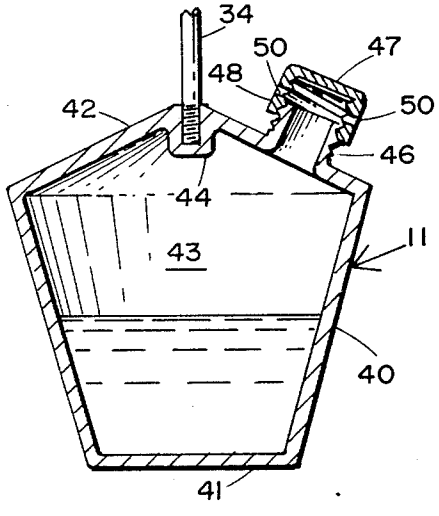


FIG. 3

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ADJUSTABLE FLUSH TANK VALVE FOR WATER CLOSETS

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ABSTRACT OF THE DISCLOSURE

The invention consists of a hollow tank valve for water closets whose weight may be varied by placing water therein so that upon the flushing of a toilet and upon releasing the operating handle, the valve will return to its seated position upon the discharge of a predetermined amount of water in the tank and prior to its complete evacuation whereby water will be conserved and the toilet is properly flushed.

This invention relates to flush valves for water closets and is more particularly directed to such a valve that is adjustable.

In the conventional water closets, the flush valves which are highly buoyant permit the complete discharge of the tankful of water before becoming seated to close off the outlet and permit the tank to fill up again ready for the next flushing operation. Consequently each time the operating lever is actuated to flush a toilet, the same tankful of water is discharged, thereby resulting in a waste of water. Inasmuch as water has become a valuable and a relatively costly product, the need to conserve water and use only the minimum required to accomplish the particular function desired is paramount. The present invention contemplates the use of a flush valve that can be adjusted as to weight which valve will become seated and stop the further discharge of water from a tank to a toilet bowl when a predetermined amount of water has been discharged to flush a toilet properly and completely.

Therefore a principal object of the present invention is to provide a water closet with a hollow flush valve whose weight may be adjusted by the amount of water placed therein whereby the flush valve will become seated upon the discharge of a certain amount of the water from the tank.

Another object of the present invention is to provide a water closet with a flush valve whose weight is slightly less equal to or slightly heavier than the water displaced by it whereby the current created by the water being discharged will draw the flush valve down to its seated position when a predetermined amount of water still remains in the tank to prevent any further discharge of water from the tank.

A still further object of the present invention is to provide a flush valve having a chamber and being truncated cone shaped which can be partially filled with water to vary its weight by unscrewing a closure cap that is provided with openings whereby water is permitted to flow into the chamber while the valve is being held submerged in the water in the tank.

With these and other objects in view, the invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawing forming a part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing of the drawing but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawing:

FIGURE 1 is a cross sectional view of a conventional water closet tank showing my adjustable flush valve in its open position after the operating handle had been actuated and released.

FIGURE 2 is a detailed cross sectional view of my flush valve.

FIGURE 3 is a similar view showing the closure cap unthreaded to expose the openings therein whereby with the flush valve submerged in water, water would flow into the flush valve to vary its weight.

Referring to the drawing wherein like numerals are used to designate similar parts throughout the several views, the numeral **10** refers to a watercloset that is conventional in all respects except as to the structure and function of the flush valve **11**. However, in order to better understand the invention a description of the water closet **10** is given herein. The water closet **10** consists of a tank **12** having a cover **13** with a water inlet pipe **14** and outlet **15** secured to a bottom wall **16** of the tank **12**. The outlet pipe **14** is provided with a seat portion **16** on which the flush valve **11** becomes seated to cut-off the discharge of water from the tank **12** while the water inlet **14** is provided with a standpipe **17**. The upper end of the standpipe **17** is connected to a water inlet pipe **18** at the top portion by a header **19**. Mounted within the header **19** is a valve **20** for the control of flow from the standpipe **17** through the header **19** and through the inlet pipe **18** to be discharged into the bottom portion of the tank **12**.

The water control valve **20** extends upwardly to a lever **21** where it is pivotally connected by a pivot pin **22** at the mid-portion of the lever **21** whose one end is pivoted as **23** to an arm **24** extending upwardly of the header **19**. The other end of the lever **21** is pivoted as at **25** to the lower end of a link **26** whose upper end is pivoted by a pivot pin **27** to one end of a float lever **28**. The latter is provided with an extension rod **29** that is secured at its free end to a ball float **30**.

It is readily noted that the conventional structure of the valve and float system described hereinabove will operate to open the valve **20** and permit water to enter the tank **12** as shown by FIGURE 1. When the float **30** has arrived at its highest position in the tank **12**, that is after the flush valve **11** has become seated on the valve seat **16** and water permitted to collect in the tank **12** when the float lever **28** and extension lever **29** have assumed an approximately horizontal position.

Supported by the outlet pipe **15** and extending upwardly within the tank **12** is an overflow pipe **31** on which a bracket **32** is mounted. The bracket **32** is provided with a guide **33** through which a valve stem **34** extends whose upper end terminates in an enlarged portion **35**.

The valve **11** is lifted from its valve seat **16** by an L-shaped link **36** whose foot portion **37** engages the enlarged portion **35** of the valve stem **34**. The link **36** is connected to one end of an operating lever **38** whose other end extends to the front wall (not shown) of the tank **12** where it is connected to the stub shaft **39** of an operating handle (not shown).

The flush valve **11** which constitutes the essence of this invention is a hollow truncated conical member with a slanting side wall **40** that seats in the valve seat **16**. There are provided a flat bottom wall **41** and a conical top wall **42** forming a chamber **43**. In the apex of the top wall **42** is a threaded portion **44** for receiving the threaded end of the valve stem **34**. Access to the chamber **43** is gained through an opening **45** formed in the top wall **42**. About the opening **45** extends a threaded neck portion which receives a threaded cap or cover **47**. The side walls **48** of the cap **47** is provided with a plurality of openings **50** that permits water to flow into the chamber **43** when the cap **47** has been rotated from its sealed position as shown by FIGURE 2 to expose the openings **50** as shown by FIGURE 3 with the flush valve **11** submerged below

the level of the water in the tank **12**. Also, the cap **47** can be completely removed from the threaded neck portion **46** and water poured into the latter to fill the chamber **43** to any desired depth.

The purpose of providing a hollow flush valve **11** is to permit weighting it by filling the chamber **43** of the valve **11** with a desired amount of water. When the flush valve **11** is to weighted as to be slightly lighter equal to or slightly heavier than the water it displaces then when the flush valve **11** has become unseated and water is permitted to be discharged through the outlet **15** to flush a toilet, at a certain level of water still remaining in the tank **11**, the flush valve **11** will be drawn downwardly by the current created by the discharge of water and become seated on the valve seat **16** to stop the further flushing of the toilet. Consequently there is a saving of water with each flushing of the toilet. If too much of the water in the tank **12** is flushed at each operation of the operating handle, then more water is required in the chamber **43** of the flush valve **11**. By unscrewing the cap **47** when the flush valve is seated on the valve seat **16** with the tank **12** filled with water, water will enter the openings **50** and flow into the chamber **43** of the flush valve **11**.

By experimentation, a person can ascertain the amount of water that must be contained in the chamber **43** of the flush valve **11** in order that the valve **11** will seat itself at the moment a certain amount of the water in the tank **12** has been discharged. In the conventional water closets the flush valves are entirely buoyant so that upon actuation of the operator handle, the flush valve floats to the surface of the water in the tank and remains there until all of the water in the tank has been discharged. If the flush valve **11** is now weighted by the addition of water therein so as to be slightly heavier than the water it displaces, then only a small amount of the tank full of water will be discharged. As soon as the operating handle is released, the heavier than water flush valve will slowly descend on the water until seated, the discharge of water from the tank commencing at the time the operating handle was actuated and ending when the flush valve settled on the valve seat. If it is decided that not enough water has been discharged into the toilet bowl, water is removed from the flush valve **11** to lighten it and be somewhat equal in weight to the water it displaces. Now the flush valve will become seated by the current of water created by the flow of water from the tank **11** into the outlet **15** to suction the flush valve downwardly to its

seated position while water still remains in the tank **12**. If still not enough water has been discharged by each manipulation of the operating handle, the flush valve can be further lightened by further removal of water from the flush valve **11**. Now the flush valve **11** will be slightly buoyant and will come to a closed position only when closer to the valve seat **16** than heretofore. In this instance a greater amount of water has been discharged than when the flush valve **11** was heavier. Also, in view of the fact that the valve **11** is heavy weighted, when it is in its closed position, it will seat on the valve seat **16** more firmly and thereby be more effective to present leakage of water than the conventional float type flush valve.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. An adjustable flush tank valve for water closets comprising a hollow body member having a substantially cone shape, a substantially flat bottom wall and an inclined top wall, said inclined top wall having an opening perpendicular thereto, a threaded neck portion surrounding said opening and a closure cap threadedly mounted on said neck portion.

2. The structure as recited by claim **1** wherein said closure cap is provided with a plurality of openings along its sidewall whereby upon unthreading said closure cap partially on said neck portion said openings communicate with hollow body member and permit the flow of liquid into said hollow body member whereby the weight of said flush tank valve may be adjusted.

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