

Jan. 10, 1928.

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1,655,894

VALVE GUIDE

Filed May 27, 1927

Fig. 1.

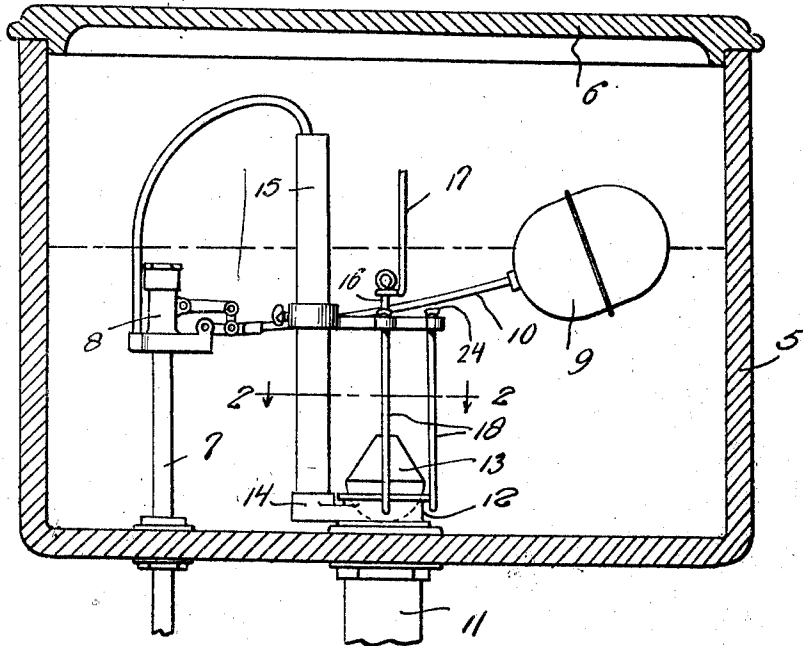


Fig. 2.

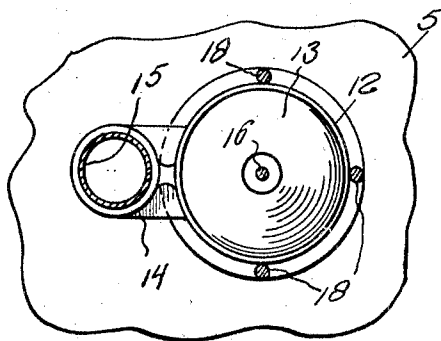
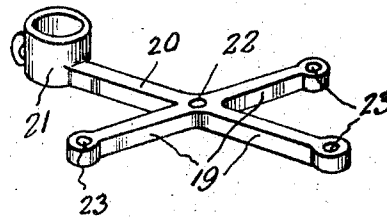


Fig. 3.



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VALVE GUIDE.

Application filed May 27, 1927. Serial No. 194,712.

This invention relates generally to valve guides, and has more particular reference to an improved device especially adapted for use in properly guiding the flush or outlet valve of a water closet tank to its seat.

It is well known that water closet tanks now in extensive use are not entirely satisfactory in operation, due to the fact that the outlet valve is allowed undue freedom of lateral movement and is not positively guided properly to its seat. In fact, the outlet valve is often laterally displaced to such an excessive extent as to become caught over the float arm of the valve which controls the supply of water to the tank. In either case, an objectionable continued supply of water to and discharge thereof from the tank results, and it becomes necessary to gain access to the interior of the tank for properly restoring the outlet valve to its seat, so that the water will be brought to the necessary level in the tank for flushing purposes and then flow thereof entirely stopped until the outlet valve is again intentionally unseated.

It is accordingly the primary object of the present invention to provide a thoroughly reliable and practical means for limiting the freedom of lateral movement of the outlet valve of a water closet tank and guiding it properly to its seat, whereby the objections referred to are effectively overcome.

A more specific object is to provide a device, for overcoming the objections noted above, which may be constructed and readily placed in use in existing tanks at a nominal cost.

A further object is to provide a guide of the above kind adapted to replace the usual guide bracket for the stem of the water closet outlet valve, and requiring no attachment to or modification of the outlet valve.

Other objects will become apparent as the nature of the invention is better understood, and the same consists in the novel form, combination and arrangement of parts hereinafter more fully described, shown in the accompanying drawing and claimed.

In the drawing, wherein like reference characters indicate corresponding parts throughout the several views;

Figure 1 is a view partly in vertical section and partly in elevation, of a water closet tank having an outlet valve equipped with a guide constructed in accordance with the present invention.

Figure 2 is an enlarged fragmentary hori-

zontal section taken on line 2—2 of Figure 1; and

Figure 3 is an enlarged perspective view of the bracket forming part of the guide 60 shown in Figure 1.

Referring more in detail to the drawing, 5 indicates a conventional form of water closet tank provided with a cover 6 and having the usual water supply pipe 7 equipped with a valve 8 closed by the rising of a float 9 through operating connections including a float arm 10. Connected with the bottom wall of the tank is an outlet pipe 11 which is provided on its upper end and within the bottom of the tank with the usual fitting embodying a seat member 12 for the outlet or flush valve 13 and a lateral branch 14 leading from beneath said seat and having an upright overflow pipe 15 rising therefrom to a point above the high water level of the tank and arranged beside the float arm 10. The outlet valve 13 has the lower end of the usual stem 16 detachably secured thereto, and the usual manually operable means is provided to unseat the valve 13, which means includes a link 17 loosely and slidably connected at its lower end to the valve stem 16. It is the usual practice to clamp a horizontal bracket arm on the over-flow pipe 15 and to have the stem 16 loosely fit and slide in a vertical opening in the outer free end of this arm. Such usual construction, while having a certain guiding effect on the outlet valve, allows the latter such excessive freedom of lateral play or movement that the above mentioned objectionable occurrences are experienced.

In accordance with the present invention, a plurality of vertical guide rods 18 are mounted about and adjacent the valve 13 and these rods 18 extend from the upper limit of movement of valve 13 to the seat 12 so as to effectively limit such lateral movement of the valve and effectively guide it to the seat. For this purpose, three rods 18 are preferably employed at equally spaced points, one opposite the overflow pipe 15, and the other two in opposed relation between the said one rod and the overflow pipe, as shown in Figure 2. In this way, the rods 18 and the overflow pipe form an effective guiding cage for and throughout the full path of movement of the outlet valve.

The rods 18 are preferably carried by and mounted to depend from the outer free ends of horizontal extensions or fingers 19 radiat-

ing from and formed integral with the outer end of a horizontal bracket arm 20 clamped upon the overflow pipe 15. The inner end of the bracket arm 20 has a suitable clamp 21 for engagement with the overflow pipe so that the bracket may be adjusted to and secured at the proper height, and the outer end of said bracket arm 20, at the juncture of the fingers 19 therewith is formed with a vertical opening 22 in which the stem 16 is loosely engaged and free to slide. The outer free ends of the fingers 19 are preferably formed with vertical openings 23 into which the rods 18 may be inserted from above, the upper ends of said rods being suitably enlarged or headed, as at 24, for engagement with the fingers so as to be loosely suspended from the latter and engaged at their lower ends with the peripheral edge of the seat 12. So constructed, the device may be cheaply manufactured, readily assembled or taken apart, and compactly arranged for shipment when taken apart.

The only changes over existing equipment consist in providing a bracket arm of ordinary form with the radiating apertured fingers, and furnishing the three inexpensive headed guide rods for association with said fingers.

In use, the bracket of the device is clamped upon the overflow pipe in the same manner as now practiced with the usual bracket arms, the stem 16 being lowered into association with link 17 and through the opening 22 for connection with valve 13. The rods 18 are then dropped into the openings 23, and the device is ready to function.

In view of the above, the construction, operation and advantages of the invention will be readily understood and appreciated by those skilled in the art, and minor changes may be made without departing from the spirit and scope of the invention as claimed.

What I claim as new is:—

1. A valve guide comprising a horizontal bracket arm having a vertical valve stem guide opening in one end, horizontal fingers radiating from said end of the bracket arm, and guide rods depending from the outer ends of the fingers.

2. A valve guide comprising a horizontal bracket arm having a vertical valve stem guide opening in one end, horizontal fingers radiating from said end of the bracket arm, and guide rods loosely suspended from the outer ends of the fingers.

3. A valve guide comprising a horizontal bracket arm having a vertical valve stem guide opening in one end, horizontal fingers radiating from said end of the bracket arm, and depending guide rods removably carried by the outer ends of the fingers.

4. The combination with the freely suspended outlet valve and the upright adjacent overflow pipe of a water closet tank,

of a plurality of spaced vertical guide rods disposed adjacent and about said valve to cooperate with the overflow pipe and form a guiding cage for said valve.

5. The combination with the freely suspended outlet valve and the upright adjacent overflow pipe of a water closet tank, of a plurality of spaced vertical guide rods disposed adjacent and about said valve to cooperate with the overflow pipe and form a guiding cage for said valve, and a bracket clamped upon said overflow pipe from which said guide rods depend.

6. The combination with the freely suspended outlet valve and the upright adjacent overflow pipe of a water closet tank, of a plurality of spaced vertical guide rods disposed adjacent and about said valve to cooperate with the overflow pipe and form a guiding cage for said valve, and a bracket clamped upon said overflow pipe from which said guide rods depend, said bracket having a vertical guide opening for the stem of said outlet valve.

7. The combination with the freely suspended outlet valve and the upright adjacent overflow pipe of a water closet tank, of a plurality of spaced vertical guide rods disposed adjacent and about said valve to cooperate with the overflow pipe and form a guiding cage for said valve, one of said guide rods being disposed opposite the overflow pipe, and the remaining guide rods being disposed in opposed relation at uniformly spaced points from and between said one guide rod and the overflow pipe.

8. The combination with the freely suspended outlet valve and the upright adjacent overflow pipe of a water closet tank, of a plurality of spaced vertical guide rods disposed adjacent and about said valve to cooperate with the overflow pipe and form a guiding cage for said valve, and a bracket clamped upon said overflow pipe from which said guide rods depend, said guide rods being freely suspended from said bracket.

9. The combination with the freely suspended outlet valve and the upright adjacent overflow pipe of a water closet tank, of a plurality of spaced vertical guide rods disposed adjacent and about said valve to cooperate with the overflow pipe and form a guiding cage for said valve, a bracket clamped upon said overflow pipe from which said guide rods depend, said guide rods being removably carried by said bracket.

10. A guide for the outlet valve of a water closet tank having an overflow pipe comprising a bracket arm having means at one end to clamp the same upon the overflow pipe, fingers radiating from the other end of said bracket arm, and guide rods depending from the outer ends of said fingers.

11. A guide for the outlet valve of a water closet tank having an overflow pipe comprising a bracket arm having means at one end to clamp the same upon the overflow pipe, fingers radiating from the other end of said bracket arm, and guide rods depending from the outer ends of said fingers, said fingers having vertical openings in their outer ends through which the guide rods removably project, and suspension heads on the upper ends of said guide rods resting on the fingers.

12. A guide for the outlet valve of a water closet tank having an overflow pipe comprising a bracket arm having means at one

end to clamp the same upon the overflow pipe, fingers radiating from the other end of said bracket arm, and guide rods depending from the outer ends of said fingers, said fingers having vertical openings in their outer ends through which the guide rods removably project, and suspension heads on the upper ends of said guide rods resting on the fingers, said bracket arm having a vertical guide opening for the stem of said outlet valve at the juncture of said fingers therewith.

In testimony whereof I affix my signature.

WALTER D. DAVENPORT.