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FLUSH TANK BALL OPERATOR

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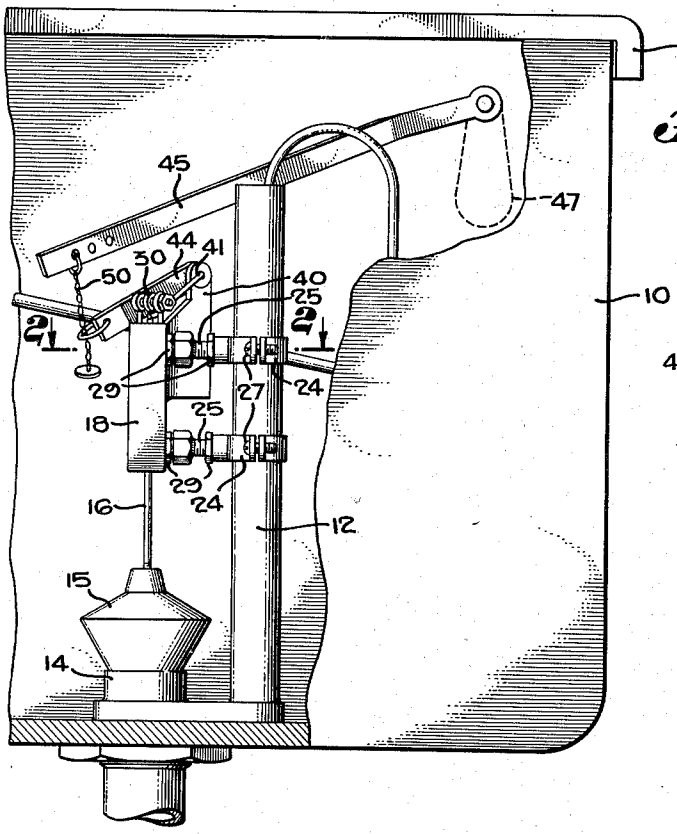


Fig. 1.

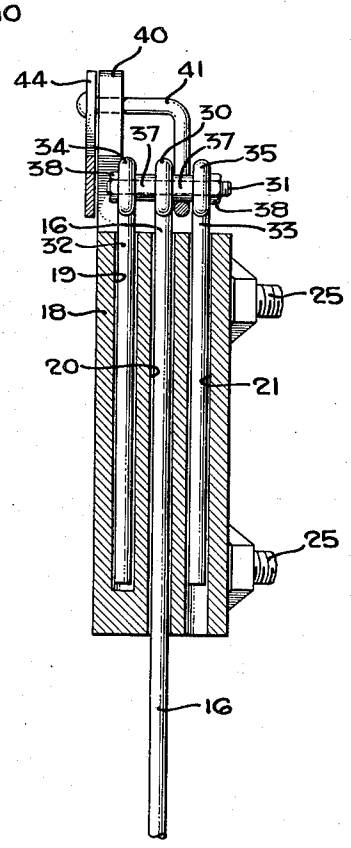


Fig. 2.

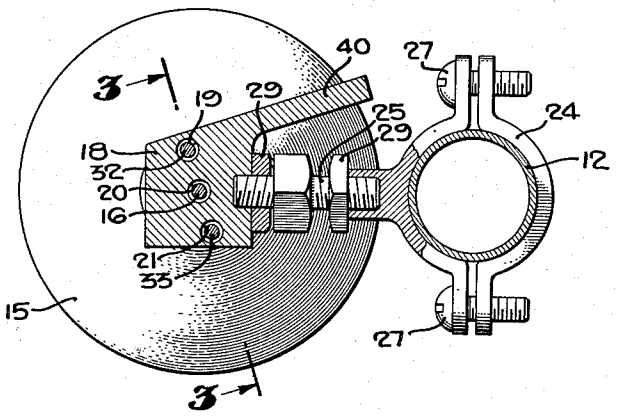


Fig. 3.

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FLUSH TANK BALL OPERATOR

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2 Claims. (Cl. 4—57)

1

This invention relates to a flush tank or valve mechanism, and in particular to an apparatus or mechanism adapted to be used with a flush tank for guiding and supporting the tank ball of the flush tank.

It is well known that after a period of use it is not unusual for the mechanism or apparatus within the flush tank to become jammed, and one of the reasons for this is the fact that the lift rod which supports the tank ball turns or twists relative to the lift arm and the lift arm and lift rod do not properly engage, resulting in springing and jamming of the lift rod.

The main object of the present invention is to provide an apparatus for supporting the tank ball wherein means are provided to positively prevent rotating, turning, or twisting of the lift rod during operation of the mechanism.

Another reason for jamming of the mechanism is that the guide for the lift rod in prior devices has not been of satisfactory construction, and another object of the present invention is to provide a satisfactory guide which will prevent any possibility of jamming or springing of the lift rod.

Still another cause of jamming is that the lever or levers connecting the lift arm and the tripping lever of the flush tank become stuck or tangled, and another object of the present invention is to eliminate this jamming by providing a chain to connect the lift arm and the tripping lever.

Another object of the present invention is to provide a stop to limit downward movement of the lift rod and the tank ball to prevent collapse of the tank ball and for lessening chances of jamming.

With the foregoing and other objects in view, which will be made manifest in the following detailed description and specifically pointed out in the appended claims, reference is had to the accompanying drawings for an illustrative embodiment of the invention, wherein:

Figure 1 discloses an elevation view of a flush tank with part of the tank broken away to show the flush tank mechanism;

Fig. 2 is a plan view in section of the device for guiding the lift rod; and

Fig. 3 is a vertical sectional view along the lines 3—3 of Fig. 2.

Referring to the accompanying drawing wherein similar reference characters designate similar parts throughout, Fig. 1 discloses the flush tank 10 with a cover 11, said flush tank being provided with an overflow pipe 12 which is supported from the base of the flush tank 10. A seat 14 is provided for the tank ball 15, said tank ball being connected to and supported by a lift rod 16.

2

Means providing a plurality of elongated parallel passageways are provided in the flush tank and comprise the elongated body member 18 which has passageways 19, 20, and 21, passageway 19 having the lower end thereof closed by portions of the body member 18. The lift rod 16 rides within passageway 20, said passageway being somewhat larger than the diameter of the lift rod to allow some play of the lift rod during its movement but guiding the lift rod so that there is no possible springing or jamming of the lift rod.

The body member 18 is supported from the overflow pipe 12 by means of clamps 24 and threaded adapters 25, clamp 24 being of the two-part construction having screws 27 adapting the clamp 24 to be clamped about overflow pipe 12. Each of the threaded adapters 25 has one end thereof with left-hand threads and the other end thereof with right-hand threads, and the clamps 24 and body member 18 are suitably threaded to receive the threaded adapters 25. By this construction upon rotation or turning of the threaded adapters 25 the body member 18 and therefore the lift rod 16 and the tank ball 15 are moved away from or toward the overflow pipe 12 so that the tank ball 15 may be positioned directly above its seat 14. Lock nuts 29 are provided on the opposite ends of threaded adapters 25 so that whenever the correct position of the body member is located so that the tank ball seats correctly on its seat, then these lock nuts 29 are threaded up against the clamps 24 and body member 18 to lock the parts in their adjusted position. The upper end of lift rod 16 is bent to form an eye 30, said eye fitting on a supporting bar 31. Guide rods 32 and 33 are provided for the mechanism, guide rod 32 fitting within passageway 19 and guide rod 33 fitting within passageway 21, the upper ends of said guide rods being formed to provide eyes 34 and 35 which fit on supporting bar 31. Spacers 37 are provided on supporting bar 31 to properly space the guide rods and the lift rod from one another and nuts 38 are threaded on the ends of the supporting bar 31 to hold the guide rods and lift rod in their spaced positions. The body member 18 is preferably provided with an upstanding flange 40, the upper end of which is bored to receive a lift arm 41 which is bent downwardly to fit under supporting bar 31 so that on

upward swinging movement of the lift arm 41 the supporting bar and the guide rods are lifted, the lift arm and guides being lifted by the supporting bar during this movement.

The lift arm 41 may be a single unitary piece or it may be formed of several pieces, and in the particular embodiment of the invention shown the lift arm has the lifting part 41 of rod-like structure and a lever portion 44 fixedly connected to lift portion 41 so that whenever the lever portion of the lift arm is swung upwardly the lifting portion 41 of the lift arm is swung upwardly, it being understood that the composite lift arm is formed of parts 41 and 44. A tripping lever 45 of any suitable construction is provided on the flush tank 10 and fixedly connected to a handle 47 so that upon pivoting of the handle 47 the tripping lever 45 is pivoted.

In prior devices, levers and links of various sorts have been used to connect the lifting arm and the tripping lever but as has been before brought out, this type of construction resulted in jamming. In the present invention it is preferred to provide a chain 50 for connecting the lift arm and the tripping lever and with this construction there is no chance of jamming of the parts. Chain 50 passes through a hoop or the like fixedly mounted on the lever portion 44 of the lift arm and chain 50 has a washer or the like on the lower end thereof.

It will be seen that the guide rod 32 will contact the closed end of passageway 19 before the lift arm 41 or the supporting bar 31 and therefore guide rod 32 provides a stop for the mechanism and the parts are so constructed that the tank ball 15 is allowed to thoroughly seat on seat 14 before the guide rod 32 contacts the closed end of passageway 19. This construction serves to prevent collapse of the tank ball 15 while allowing it to seat satisfactorily and also prevents the supporting bar 31 and the spacers and other parts from coming in contact with body member 18, and therefore, lessening the likelihood of wear and jamming of the parts.

It will be appreciated that the guide rods and lift rod, the supporting bar and the spacers and the nuts may be replaced easily and quickly as a unit whenever this is desired due to corrosion and wear of the parts.

As will be seen from Fig. 2, the lift rod and the guide rods are guided by long passageways and this construction ensures that there is no chance of springing or misalignment of the lift rod and the guide rods 32 and 33 positively preventing rotation, turning, or twisting of the lift rod 16 with relation to the lift arm 41, thereby preventing any possibility of incorrect engagement of the lift arm 41 and the spacers 37 and supporting bar 31. It will be appreciated that only one guide rod could be provided for the lift rod 16 or two guide rods could be provided as shown, the two-guide rod method serving to more positively guide the lift rod than if there were only one guide rod.

By providing the threaded adapters with left and right-hand threads the apparatus of the present invention can be applied to the overflow pipe of any type of flush tank and the tank ball 15 correctly positioned with relation to its seat, this being accomplished by merely rotating the threaded adapters 25 in the correct direction.

Various changes may be made in the details of construction without departing from the spirit and scope of the invention as defined by the appended claims.

I claim:

1. An apparatus of the class described adapted to be used with a flush tank comprising means providing a plurality of vertically arranged parallel guides, means for attaching the last named means to the overflow pipe of a flush tank, a lift rod slidable within one of the guides to be guided thereby, a tank ball secured to the lower end of the lift rod to be carried thereby, a horizontally disposed supporting bar having the lift rod connected thereto intermediate the ends of the supporting bar, a pair of guidable members connected to the ends of the supporting bar and slidable within other of the guides for preventing bodily rotation of the supporting bar and for maintaining the supporting bar in a horizontal position, and means engageable with the supporting bar for lifting the supporting bar and the lift rod and the guideable members.

2. An apparatus of the class described adapted to be used with a flush tank comprising means providing a plurality of vertically arranged parallel guides, means for attaching the last named means to the overflow pipe of a flush tank, a lift rod slidable within one of the guides to be guided thereby, a tank ball secured to the lower end of the lift rod to be carried thereby, a horizontally disposed supporting bar having the lift rod connected thereto, a guidable member connected to the supporting bar at a point spaced from the point of connection of the lift rod and slidable within another of the guides for preventing bodily rotation of the supporting bar and for maintaining the supporting bar in a horizontal position, and a lift arm engageable beneath the supporting bar for lifting the supporting bar and the lift rod and the guidable member.

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