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VALVE GUIDE FOR FLUSH TANKS

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5 Claims. (Cl. 4—57)

This invention relates to a novel lower valve guide for flush tanks adapted to function in conjunction with the conventional upper valve guide and which is mounted for movement with the valve to prevent lateral displacement of the valve while in a raised, open position and to insure return of the valve to a properly seated and closed position.

Another object of the invention is to provide a lower valve guide which is swingably supported on the overflow pipe and which is restrained against lateral displacement during its swinging movement with the valve by said overflow pipe for insuring proper return of the valve to a closed position.

A further object of the invention is to provide a lower guide having a free end supported on the upper end of the valve and whereby the weight of the guide will insure proper return of the valve to a closed position.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawing, illustrating a presently preferred embodiment thereof, and wherein:

Figure 1 is a side elevational view, partly in section, showing the valve guide in an applied position;

Figure 2 is a horizontal sectional view taken substantially along a plane as indicated by the line 2—2 of Figure 1 and showing the valve guide in top plan, and

Figure 3 is a cross sectional view on an enlarged scale, taken substantially along a plane as indicated by the line 3—3 of Figure 1.

Referring more specifically to the drawing, for the purpose of illustrating a preferred application and use of the valve guide, designated generally 5 and comprising the invention, a portion of a conventional flush tank 6 has been illustrated including a part of the flush tank bottom 7. The upper end of a conventional outlet pipe 8 extends into the tank through the bottom 7 and has a liquidtight connection therewith by conventional securing means. The upper end of the outlet pipe 8 opens into the lower end of a conventional valve seat 9 having a lateral extension 10 which supports the usual upstanding overflow pipe 11 and forms a communicating passage between said pipe 11 and the outlet pipe 8. A conventional type flush valve 12 seats in the open upper end of the valve seat 9. A valve stem 13 has a lower end detachably secured to the top of the valve 12, as by a threaded connection, so that said valve may be replaced when required and said valve stem extends upwardly therefrom through the eye 14 of a conventional valve guide 15 which is detachably clamped to an upper portion of the overflow pipe 11. A trip wire 16 is pivotally connected at its upper end to the free end of a pivotally mounted arm or lever 16a of the flushing mechanism and which is vertically swingable for raising and lowering the trip wire. Said trip wire 16 has a laterally turned lower end terminating in an eye 17 which loosely engages the valve stem 13 between the guide eye 14 and an eye 18, formed on the upper end of the stem 13 and

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providing a stop for the eye 17. The parts 6 to 18, inclusive, are all of conventional construction and have been illustrated and briefly described merely to afford a better understanding of the valve guide 5.

The valve guide 5 includes a bracket, designated generally 19, having a clamp 20 at one end thereof which is detachably clamped around the pipe 11 for detachably and adjustably supporting the bracket 19 thereon. An arm 21 extends from the clamp 20 in a direction away from the valve 12 and has an upturned outer end 22 the terminal portion of which is bifurcated to provide laterally spaced furcations 23, as best seen in Figure 3.

The guide 5 also includes a lever, designated generally 24 which includes an integral elongated loop portion 25 which is spaced from the ends thereof. One end of the lever 24 fits turnably between the furcations 23 and is provided with an opening or eye 26 which turnably fits the shank of a bolt and nut fastening 27 which extends through the furcations 23 and is detachably secured thereto. The axis of the eye or opening 26 is disposed at a right angle to the plane of the loop 25 so that the lever 24 is swingably supported at its end 26 on the bracket 19 for swinging movement in a plane normal to the plane of the loop 25. Said loop 25 is of a width to loosely straddle the overflow pipe 11, around which it is disposed and of adequate length to allow the lever to swing upwardly to substantially above its horizontal position of Figure 1 or downwardly to beneath said position if necessary. The lever portions defining the sides of the loop 25 are supported slightly out of contact with the pipe 11 or sufficiently close thereto to prevent any appreciable lateral movement of the lever 24 relatively to the pipe 11. The other end of the lever 24 terminates in an eye 28 which is disposed coplanar with the loop 25 and through which the valve stem 13 loosely extends. The free end 28 of the lever rests upon the upper end of the valve 12 around the stem 13, so that said free end is supported by the valve.

In applying the guide 5, it is only necessary to detach the valve stem 13 so that the conventional guide 15 may be loosened and removed from the pipe 11, after which the assembled valve guide unit 5 may be applied over the upper end of the pipe 11. When the bracket 19 is properly positioned the clamp 20 is tightened for securing the bracket to the overflow pipe. The conventional valve guide 15 and the valve stem 13 are then reapplied. Thus, it will be seen that the guide unit 5 constitutes an attachment which may be applied to the flushing unit of a conventional flush tank without any modification of the conventional structure and said guide unit 5 actually constitutes a lower guide which functions with the conventional guide 15.

As the valve 12 is raised in a conventional manner by an upward swinging movement of the lever 16a, the guide lever 24 is caused to swing upwardly therewith since the eye 28 thereof is resting on the valve 12. The eye 28 is sufficiently large to accommodate movement of the lever relatively to the valve stem 13 occurring in the normal opening movement of the valve. The lever 24 will guide the valve 12 in its upward movement but its primary function is to guide the valve in its return movement downwardly back toward a closed position and will prevent the valve 12 from swinging horizontally in any direction sufficiently so that the valve will not return to a properly seated position. Additionally, the weight of the lever 24 will assist the gravity return of the valve 12 to its closed position of Figure 1 and insure a proper seating thereof.

Various modifications and changes are contemplated and may obviously be resorted to, without departing from the spirit or scope of the invention as hereinafter defined by the appended claims.

I claim as my invention:

1. A flush valve guide of the character described comprising a lever having a free end adapted to rest on a flush valve, means adapted to be supported on a flush tank overflow pipe and to which the opposite end of said lever is pivotally connected for vertical swinging movement of the lever, said lever having an elongated loop portion spaced from the ends thereof and disposed around said overflow pipe, and the free end of said lever having an eye adapted to engage loosely around a valve stem which rises from the valve and by which the valve is raised from a closed position, the weight of said lever urging the valve downwardly to a closed position from a raised open position and said eye cooperating with the valve stem to restrict horizontal movement of the valve while in an open position and for causing the valve to be guided by the lever back to a properly seated closed position.

2. A flush valve guide as in claim 1, said loop having spaced side portions straddling the overflow pipe and normally spaced slightly therefrom whereby the overflow pipe functions as a guide to prevent lateral swinging movement of said lever.

3. A flush valve guide as in claim 1, said means for pivotally mounting the lever comprising a bracket having a clamp adjustably secured to the overflow pipe for mounting the bracket thereon, an arm projecting from said clamp in a direction away from the valve and hav-

ing an upstanding free end, and pivot means pivotally connecting the pivoted end of said lever to the upstanding end of said arm.

4. A flush valve guide as in claim 3, said upstanding end of the arm having a bifurcated upper portion between which the pivoted end of the lever is disposed for swinging movement and through which said pivot means extends, said pivoted end of the lever having an eye turnably engaging said pivot means and disposed in a plane at a right angle to the plane of said loop and of the eye of the free end of said lever.

5. A flush valve guide as in claim 1, the pivoted end of said lever being disposed slightly above the level of the top of the valve when the valve is in a closed position whereby the lever is supported by said pivot means and the valve in substantially a horizontal position when said valve is in a closed position.

References Cited in the file of this patent

UNITED STATES PATENTS

1,201,416	Zierner	Oct. 17, 1916
2,067,759	Gavin	Jan. 12, 1937
2,142,393	Halteman	Jan. 3, 1939
2,190,160	Mason	Feb. 13, 1940
2,512,924	Dysart	June 27, 1950
2,598,967	Bennett	June 3, 1952
2,602,933	Curry	July 15, 1952