SNAP ACTION DRAIN CONTROL DEVICE

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Application July 31, 1945, Serial No. 607,938

3 Claims. (Cl. 4—199)

This invention relates to a drain control device. In the industry, lavatories, sinks and bath tubs are provided with an overflow and a bottom drain usually suitably connected together to a common waste line. The bottom drain may be controlled by a so-called pop-up valve exposed in the bottom of the aforesaid fixture and movable to open and closed position by an actuator, usually overflow drain intake mounted. The bottom drain may be controlled by a sleeve valve or the like operable by such a mounted actuator.

The chief object of the present invention is to provide means for positive opening or closing of a drain control valve, such operation being of the snap action type so that the valve is quickly and fully opened or quickly and fully closed.

The chief feature of the present invention resides in the control unit for valve operation and for attaining the snap action.

Another feature resides in the incorporation of such unit anywhere as desired in the mechanical connection between the valve and manually operable member.

Other objects and features of the invention will be set forth more fully hereinafter.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims.

In the drawings—

Fig. 1 is a central sectional view of a conventional bottom drain, pop-up valve, and snap action unit immediately associated therewith, the manual actuator therefor and overflow drain being omitted.

Fig. 2 is an end view of the overcenter device.

Fig. 3 is a central sectional view of a modified form of the invention as applied to another conventional bottom drain and overflow system, the drain valve being of sleeve type and concealed.

In Fig. 1 of the drawings 15 indicates the bottom of a sanitary fixture such as a bath tub, lavatory or sink. At its lowest point it is provided with a drain opening 11 having a flared seat 12 at the exposed face and defined on the opposite face by annular portion 13.

A tubular connector and drain 14 includes the seat receivable flange 15 and the drain is externally threaded to take nut 16 which bears on washer 17 and gasket, 18 whereby such connector is sealed in the bottom of the sanitary fixture.

The upper open end of drain 14 is flared at 19 to seat tightly a pop-up valve 20 carried by stem 21. The latter is provided with guide vanes or wings 22 which also serve as a weight mass to insure gravity lowering and seating of the valve.

Adjacent the lower end of the stem 21 is a collar portion 23 which is rigid with the stem and may be integral therewith as illustrated. The lower free end 24 of the stem, thus collar defined, is seated in an elongated slot 25 in the laterally enlarged end 26 of rod arm 27 having rigid connection with ball 28 as by being threaded thereto as at 29.

Portion 24 is laterally enlarged at 24a, an appreciable distance from the collar. Normally arm 27 lies a slight distance below collar 23 when the valve is seated. When arm 27 is tilted clockwise, the collar is picked up and the valve opened and with a snap action. When arm 27 is tilted reversely, the valve immediately drops into seated relation, since arm 27 is snapped downwardly and the enlargement 24a is engaged thereby.

Herein a T 30 has its upper end threaded to the lower end of connector 14 and its lower end threaded to drain line 31. The lateral branch 32 of the T includes the arm 27. The outer end of the branch is threaded as at 33.

A ball housing 34 is internally threaded as at 35 and thus connected to branch 32. Within said housing is externally threaded stop collar 36 whereby the same can be adjusted longitudinally of the housing as desired or required.

A resilient gasket 37 is apertured at 38 to take arm 27 and may have a preformed partially spherical seat 39 to seat ball 28. Such gasket is confined by said collar 35. It is yielding so that it will not interfere with arm lifting but will retain the seal.

Extending from the ball 28 in a direction opposite from arm 27 is an arm 40 threaded to the ball as at 41. This arm also may be a rod or bar and is suitably actuated by a fixture exposed manually operable member.

The housing 34 is enlarged outwardly as at 42 and includes in its outer end the elongated slot 43 so that rod 40 that passes therethrough is confined to tilting in a plane. The enlargement includes two oppositely directed and longitudinally aligned bores 44 in each of which is mounted a ball 45 retained by lip 46 against escape into the slot 43. Each ball is backed by spring 47 retained by plug 48 threaded at 49 in the bore 44.

The arm 40, when tilted up or down by suitable means manually actuated, snaps over the opposed balls, the springs yielding for such purpose and the arm accordingly is yieldingly locked over-center in either direction and the pop-up valve 20 is snapped open or shut.

Reference will now be had to Fig. 3. The tub
is indicated by 50 with overflow outlet 51 and bottom drain outlet 52. An elbow 53 connects to riser 54 that discharges to a T 55. The central branch connects to line 56 that connects to elbow 57 opening at tub bottom drain 52 and suitably connected to the tub. The lower end of the T 55 discharges to waste line 58.

In this T is a tubular valve 59 having passage 60 therethrough. This valve can be raised from a position blocking branch 56 or lowered therefrom as desired. The former is preferred. When positioned as shown (blocking) water in the tub will be retained therein. When moved from this position, the tub water will waste to line 58. In either form any overflow will pass through passage 60 in valve 59 to the waste 56.

Any suitable overflow 61, herein shown as a small wire structure, connects at its lower end to valve 59 and at its upper end as at 62 to the end of lever arm 63. Arm 63 has cross pin 64 to limit the ends of the oscillatory travel of the arm by engaging face 65 of housing 66 provided with elongated slot 67 therein like slot 43. On opposite sides of the slot are the aligned, yieldingly mounted balls 68, similar to balls 45 and similarly mounted. To housing 66 is connected portion 69 retained in adjusted position as at 70 and carried by the apertured overflow masking plate 71 suitably secured to the tub or elbow 55 in the conventional manner.

Plate 71 has central aperture 72 smaller than ball 73 from which projects handle 74. To ball 73 is secured arm 63. No packing is here required in this embodiment of the invention. Movement of handle 74 is of snap-action type and valve 59 has corresponding movement.

While the invention has been illustrated and described in great detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character.

The several modifications described herein as well as others which will readily suggest themselves to persons skilled in this art, all are considered to be within the broad scope of the invention, reference being had to the appended claims.

The invention claimed is:

1. In a snap action control for a drain valve, the control having a ball, means rigid therewith and extending oppositely therefrom, guide means having an elongated slot for limiting the first mentioned means to oscillatory movement to a single plane, and support means for the ball, the combination of means extending toward the first mentioned means and at the neutral position thereof and directed transverse to the oscillatory plane, and yielding means constraining the transversely disposed means toward said plane and into engagement with the rigid means.

2. A control as defined by claim 1 wherein the transversely disposed means is of multiple character and disposed at opposite sides of the plane and normally directed toward the same.

3. A control as defined by claim 1 wherein the transverse means includes a bore seated ball and the yielding means comprises a compression spring seated in the ball receiving bore and operatively bearing at one end upon the bore seated ball, and means at the end of that bore closest to the oscillation plane to prevent escape of the ball from the bore but permitting a portion of the ball to project from the same.

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