

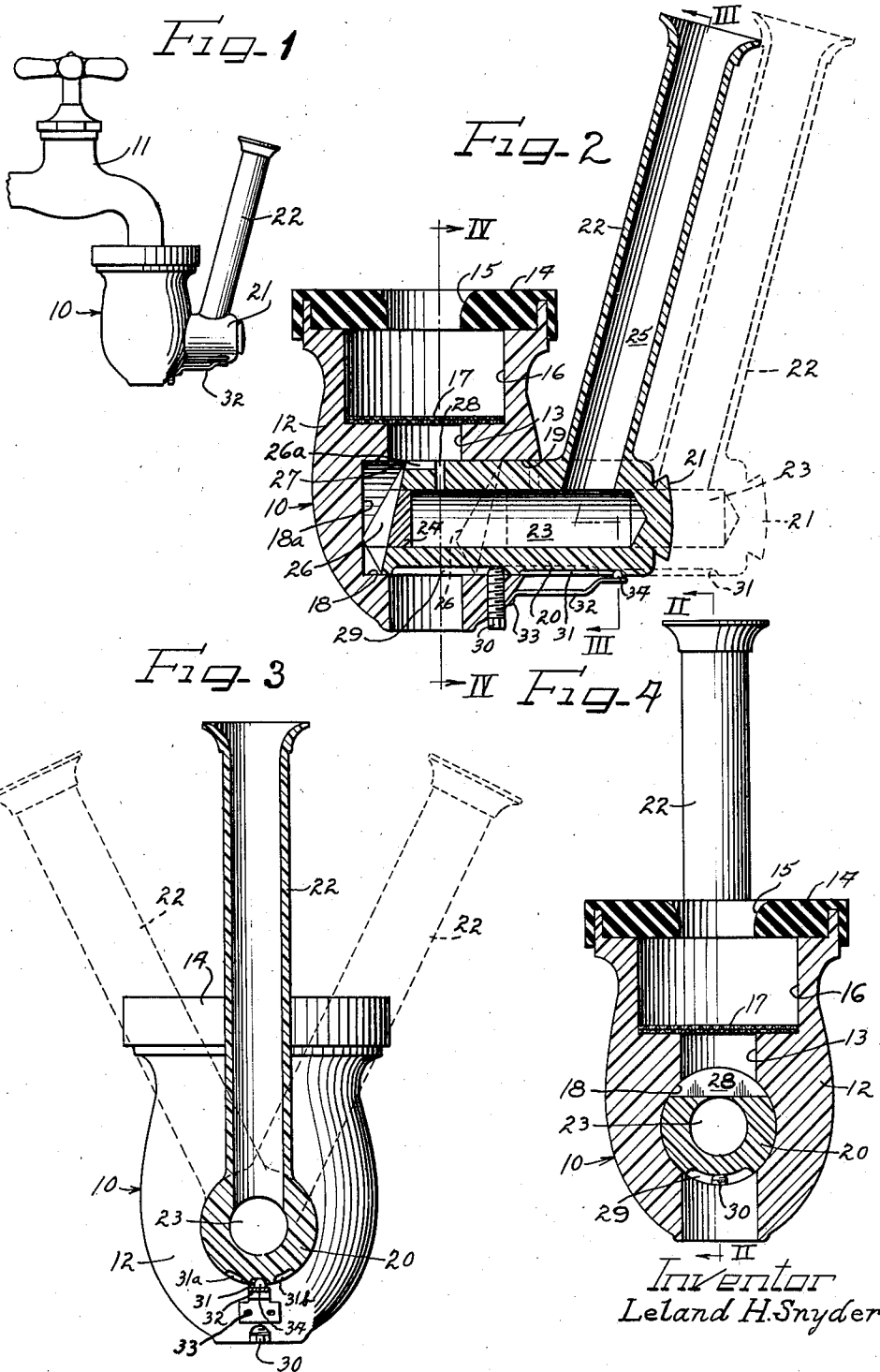
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BUBBLE FOUNTAIN DEVICE

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BUBBLE FOUNTAIN DEVICE

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1

This invention relates to a bubble fountain device, and more particularly to a device for attachment to an ordinary water outlet, such as a faucet, to permit the faucet to be used as a bubble fountain whenever desired without interfering with the use of the faucet for normal purposes.

In accordance with my present invention, I provide a device comprising a bulbous casing having an adapter for attachment to a water outlet, faucet or the like, and having a combination spout and valve adjustable with respect to the casing to divert water from the casing into the valve and spout and thus convert the faucet into a bubbler. The spout-valve combination is so arranged as to be movable into a position such as not to obstruct the ordinary passage of water through the casing when the water outlet is being used for other purposes than to provide a bubbler. Means are also provided for effecting the automatic movement of the spout-valve combination into through-passage-opening position whenever the water outlet is opened up full, thereby preventing against excessive pressure of water causing spurting of the water from the spout.

It is therefore an important object of this invention to provide a bubble fountain device for attachment to any ordinary water outlet, such as a faucet or the like, for converting such outlet into a bubble fountain whenever desired, while at other times not interfering with the normal through-flow of water from the outlet.

It is a further important object of this invention to provide a bubble fountain device having a combination spout and valve that is semi-automatic in its action to prevent objectionable spurting of the water from the spout when the full force of water at the outlet is turned on.

It is a still further important object of this invention to provide a bubble fountain device having a spout-valve combination that controls its operation as a bubbler and that is so constructed and arranged as to automatically be rendered inoperative as a bubbler when full water pressure is turned on.

Other and further important objects of this invention will be apparent from the disclosures in the specification and the accompanying drawings.

On the drawings:

Figure 1 is a side elevational view of a bubble fountain device embodying the principles of my invention, installed upon a faucet.

Figure 2 is a longitudinal sectional view of the device taken substantially along the line II—II of Figure 4, showing in dotted lines the operation of the spout-valve combination.

Figure 3 is a sectional view taken substantially along the broken line III—III of Figure 2,

2

illustrating in dotted lines the tilting of the bubbler spout.

Figure 4 is a sectional view taken substantially along the line IV—IV of Figure 2.

As shown on the drawings the reference numeral 10 indicates generally a device embodying the principles of my invention, which device is shown in Figure 1 as attached to the end of an ordinary faucet 11. Said device 10 comprises a bulbous casing 12, which may suitably be formed of plastic, metal or other material, and which is provided with a passage 13 extending axially therethrough. An adapter 14, suitably formed of relatively soft sheet rubber, is attached to said casing at the upper end of said passage 13 and is provided with a reduced opening 15 for receiving the end of the faucet 11. The adapter 14 thus serves by frictional engagement with the faucet end to attach the device 10 thereto.

Said through passage 13 provides at its upper end an enlarged cylindrical recess 16, against the bottom of which is positioned a screen or filter 17. Below said filter 17, the through passage 13 is intersected by a transverse bore 18, having a closed inner end 18a and opening through the casing wall at one side thereof, as at 19.

A hollow cylindrical valve, indicated generally by the reference numeral 20, is slidably and rotatably mounted in said bore 17 with its end 21 projecting therefrom. A spout 22 is integrally formed with said valve 20 and extends upwardly and at a slight angle from the outer end 21 thereof. The spout-valve combination may be integrally molded from a plastic, or may be made of other suitable material. Alternatively, the spout and valve may be formed separately. In that case the valve may be slidable, only, while the spout may be so connected to the valve as to be tiltable without rotating the valve but movable with the valve as the latter moves into open or closed position.

The valve 20 has a cylindrical cavity 23 that is closed at its inner end by a closure 24 and that is in flow communication with the interior 25 of the spout 22. The end surfaces of the valve 20 are cut away as at 26 and at 26a so that when the valve is in the closed position illustrated in full lines in Figure 2 the passage 13 above said valve is uncovered, as at 27, to permit water to flow into the end of the blind bore 18 back of the valve. The purpose of this will be explained later. A thin slot 28 in the upper cylindrical wall of the valve 20 affords reduced flow communication between the passage 13 above said valve and the interior 23 of the valve. Water can thus flow through said slot 28 into the interior of the valve and out through the spout 22 when the device is used as a bubbler.

3

Means are provided for limiting the axial sliding movement of the combination spout and valve. Said means comprise a wide longitudinally extending groove 29 in the under side of the valve 20 and a threaded stop member 30 extending through the lower wall of said casing 12 into said groove. As shown in Figure 2, when the spout-valve assembly is in the full-line position closing the passage 13, the threaded stop member 30 abuts against the righthand end of the groove 29, as viewed, and the slanting end wall 26 abuts the end wall 18a of the bore 18, thereby limiting the further inward movement of the valve 20. In the dotted line position shown in Figure 2, however, the threaded stop member 30 abuts the lefthand end of the groove 29 to prevent further outward movement of the valve 20. It will also be noted that in the closed position of the valve 20 the upper portion of the passageway 13 above the valve 20 is uncovered to provide an entrance 27 into the blind end of the bore 18 behind said valve. Should the faucet 11 be opened up wide while the valve is in the closed position shown in Figure 2, the pressure of water in back of the valve 20 would act against the end wall 26 to shove the valve over to its open position as indicated in dotted lines and thus permit the full flow of water through the passage 13 and shut off flow through the valve-spout combination, the opening 28 being covered when the spout-valve combination is in its righthand position.

Consequently, whenever excessive pressure develops while the valve is closed, the valve is automatically opened to prevent spurting of water out of the spout 22. The stop 30 in cooperation with the groove 29 limits the outward movement of the spout-valve combination under these circumstances.

Means are also provided for permitting the spout 22 to be tilted into either of the positions illustrated in dotted lines in Figure 3. The purpose of this is to accommodate the person using the bubbler, depending upon whether such person is approaching the bubbler on the right or lefthand side. Such means include a plurality, three as shown, parallel grooves 31, 31a and 31b (Fig. 3) formed along the lower external surface of the valve 20 and terminating short of the extremity of the exposed end 21 of the valve. A detent 32 is provided for cooperation with anyone of said grooves 31, 31a or 31b. Said detent 32 comprises a spring metal finger secured at one end, as at 33 to the lower portion of the casing 12, and having a rounded lug 34 extending upward from its free end for riding in one of said grooves.

By reason of the resiliency of the detent 32, the lug 34 can be easily displaced from any one of the grooves 31, 31a or 31b, and the valve-spout combination moved in either direction until the lug 34 again falls into a groove. In this connection, it is noted that the groove 29 is of sufficient width to permit this limited swiveling movement of the valve 20.

Because of the provision of the adapter 14, my bubble fountain device may be attached to any of the usual water outlets, regardless of the diameter of the outlet or whether threaded or not. Ordinarily, whenever the bubbler device is not in use, the spout-valve combination will be in its outward position, as indicated in dotted lines in Figure 2. When in such position, there is an unobstructed flow of water, when the faucet is turned on, through the passage 13, and the outlet can be used for any of its usual purposes.

When, however, it is desired to convert the out-

4

let into a bubble fountain, the spout-valve combination is moved to its inward position, shown in full lines in Figure 2, and the faucet 11 opened gradually until the desired height of fountain is playing from the spout 22. In this case, the flow of water is downwardly through the screen 17 and the upper portion of the passage 13, through the opening 28 into the interior 23 of the valve 20 and thence up through the passage 25 in the spout 22.

If, accidentally or otherwise, the faucet 11 should be turned on too full while the device 10 is being used as a bubbler fountain, the pressure of water behind the valve 20 will, as previously described, force the spout-valve combination over to its extreme righthand position, as indicated in dotted lines in Figure 2, thereby shutting off the fountain from the spout 22 and reestablishing full flow communication through the passage 13.

It will, of course be understood that various details of construction may be varied through a wide range without departing from the principles of this invention and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim as my invention:

1. A device comprising a fitting adapted to be attached to a fluid outlet and having a fluid flow passage extending therethrough, a hollow cylindrical valve extending transversely of said passage and slidable therein to close or open said passage and a spout movable with said valve and connected to the interior thereof to divert fluid from said passage when the same is closed by said valve.

2. A bubble fountain device comprising a casing for attachment to a water faucet having a passage therethrough and a bore extending transversely of said passage and closed at one end, a hollow cylindrical valve rotatably and slidably mounted in said bore, a spout movable with said valve and means limiting the axial movement of said valve to determine passage closing and opening positions thereof.

3. A bubble fountain device comprising a casing for attachment to a water faucet having a passage therethrough and a bore extending transversely of said passage and closed at one end, a hollow cylindrical valve having its interior in reduced flow communication with said passage and slidably and rotatably mounted in said bore, a spout movable with said valve and in communication with the interior of said valve, means limiting the sliding movement of said valve to determine passage closing and opening positions thereof and means providing stops limiting the extent of rotating movement of said valve.

4. A water bubble fountain, comprising a casing having a passage therethrough, an adapter at one end of said passage for attaching the casing to a faucet, said casing having a cylindrical bore extending transversely of said passage and closed at its inner end, a hollow cylindrical valve mounted in said bore and slidable therein to open and close said passage and a spout connected to the outer end of said valve and in flow communication with the interior of said valve to deliver water from said passage when said valve is in passage closing position.

5. A water bubble fountain comprising a casing having a passage therethrough, an adapter at one end of said passage for attaching the casing to a faucet, said casing having a cylindrical bore extending transversely of said passage and closed at its inner end, a hollow cylindrical valve

mounted in said bore and slidable therein to open and close said passage, said valve having an opening through its cylindrical wall affording communication between the delivery side of said passage and the interior of said valve when said valve is in passage closing position, and a spout secured to the outer end of said valve and in flow communication with the interior of said valve to deliver water from said passage when said valve is in passage closing position.

6. A water bubble fountain, comprising a casing having a passage therethrough, an adapter at one end of said passage for attaching the casing to a faucet, said casing having a cylindrical bore extending transversely of said passage and closed at its inner end, a hollow cylindrical valve mounted in said bore and slidable therein to open and close said passage, said valve having an opening through its cylindrical wall affording communication between the delivery side of said passage and the interior of said valve when said valve is in passage closing position and having a downwardly inclined closure wall at the inner end of said valve providing for flow of water into said closed end of said bore when said valve is in passage closing position and a spout extending from the outer end of said valve and in flow communication with the interior of said valve to deliver water from said passage when said valve is in passage closing position.

7. A water bubble fountain, comprising a casing having a passage therethrough, an adapter at one end of said passage for attaching the casing to a faucet, said casing having a cylindrical bore extending transversely of said passage and closed at its inner end, a hollow cylindrical valve mounted in said bore and slidable therein to open and close said passage, said valve having an opening through its cylindrical wall affording communication between the delivery side of said passage and the interior of said valve when said valve is in passage closing position, a spout extending from the outer end of said valve and in flow communication with the interior of said valve to deliver water from said passage when said valve is in passage closing position and means limiting the axial sliding movement of said valve.

8. A water bubble fountain comprising a bulbous casing having a through passage and a bore extending transversely of said passage and closed at its inner end, a hollow cylindrical valve slidably and rotatably positioned in said bore, said valve having an inner closed end and a hole in its side wall adjacent said end providing reduced flow of water from the intake side of said passage into the interior of said valve when said valve is in passage closing position, a spout carried by said valve for the delivery of water from the interior thereof and means providing stops limiting the extent of the rotational and sliding movements of said valve.

9. A water bubble fountain comprising a bulbous casing having a through passage and a bore extending transversely of said passage and closed at its inner end, a hollow cylindrical valve slidably and rotatably positioned in said bore, said valve having an inner closed end and a hole in its side wall adjacent said end providing reduced flow of water from the intake side of said passage into the interior of said valve when said valve is in passage closing position, a spout

carried by said valve for the delivery of water from the interior thereof and means providing stops limiting the extent of the rotational and sliding movements of said valve, said inner closed end of said valve being inclined to provide for the flow of water into said closed bore end in back of said valve when said valve is in passage closing position, whereby when sufficient water pressure is developed in back of said valve the same is caused to slide outwardly to open said passage for the flow of water therethrough.

10. A water bubble fountain comprising a bulbous casing having a through passage and a bore extending transversely of said passage and closed at its inner end, an adapter at the intake end of said passage for attaching said casing to a faucet, a hollow cylindrical valve slidably and rotatably positioned in said bore, said valve having an inner closed end and a hole in its side wall adjacent said end providing reduced flow of water from the intake side of said passage into the interior of said valve when said valve is in passage closing position, a spout carried by said valve for the delivery of water from the interior thereof and means providing stops limiting the extent of the rotational and sliding movements of said valve.

11. A water bubble fountain comprising a bulbous casing having a through passage and a bore extending transversely of said passage and closed at its inner end, a hollow cylindrical valve slidably and rotatably positioned in said bore, said valve having an inner closed end and a hole in its side wall adjacent said end providing reduced flow of water from the intake side of said passage into the interior of said valve when said valve is in passage closing position, a spout carried by said valve for the delivery of water from the interior thereof and means providing stops limiting the extent of the rotational and sliding movements of said valve, said means including a plurality of longitudinal grooves in the external wall of said valve and detents adapted to extend into said grooves.

12. A water bubble fountain for attachment to an outlet, comprising a casing having a through passage, a combination spout and valve associated with said casing and adjustable to open said passage for the flow of water therethrough or to close said passage for diverting water through said valve and spout, means providing stops limiting the adjustment of said spout-valve combination, and means on said valve cooperating with said passage to effect the automatic opening of said through passage upon excessive water pressure developing when said valve is in closed position and said outlet is open.

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