Nov. 10, 1964 M. S. JOHNSTON 3,156,252

BEER SIPHON ASSEMBLY

Original Filed April 29, 1960 2 Sheets-Sheet 1

FIG. 1

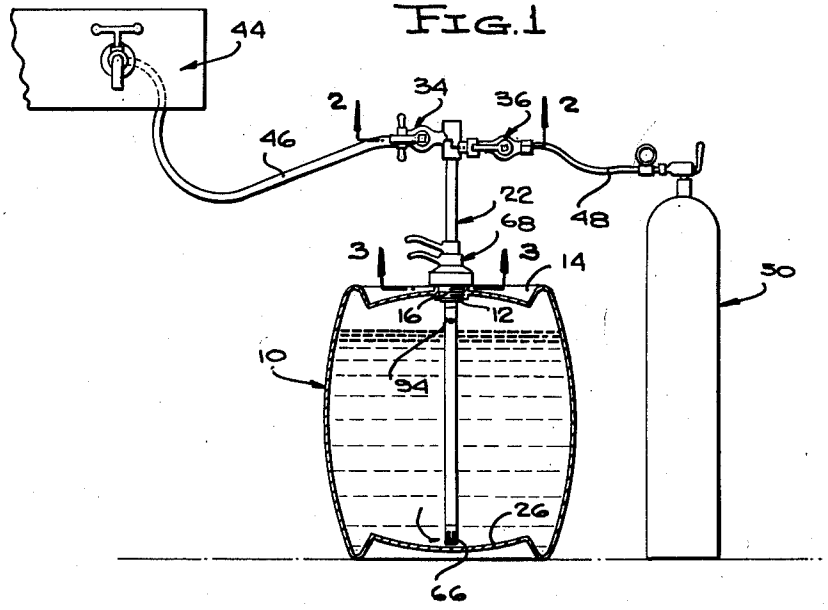


FIG. 2

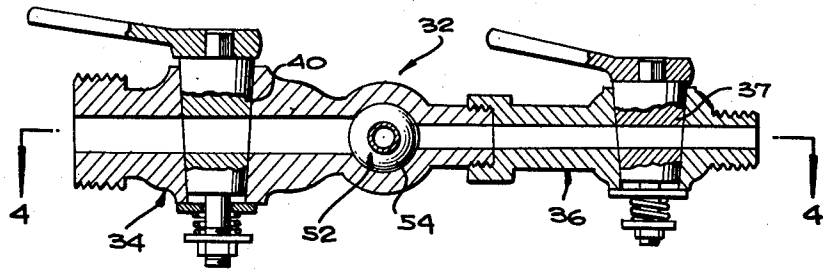
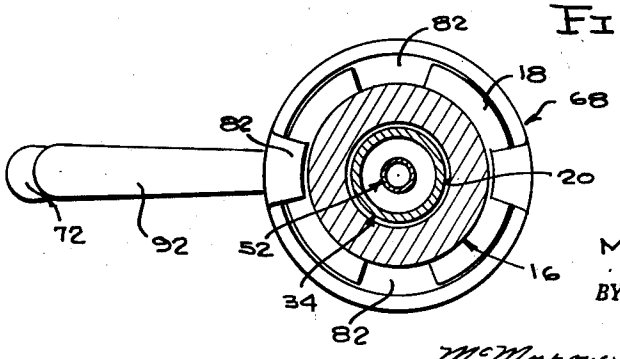


FIG. 3



INVENTOR.
MACK S. JOHNSTON
BY

McMorrow, Berman & Davidson
ATTORNEYS

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FIG. 4

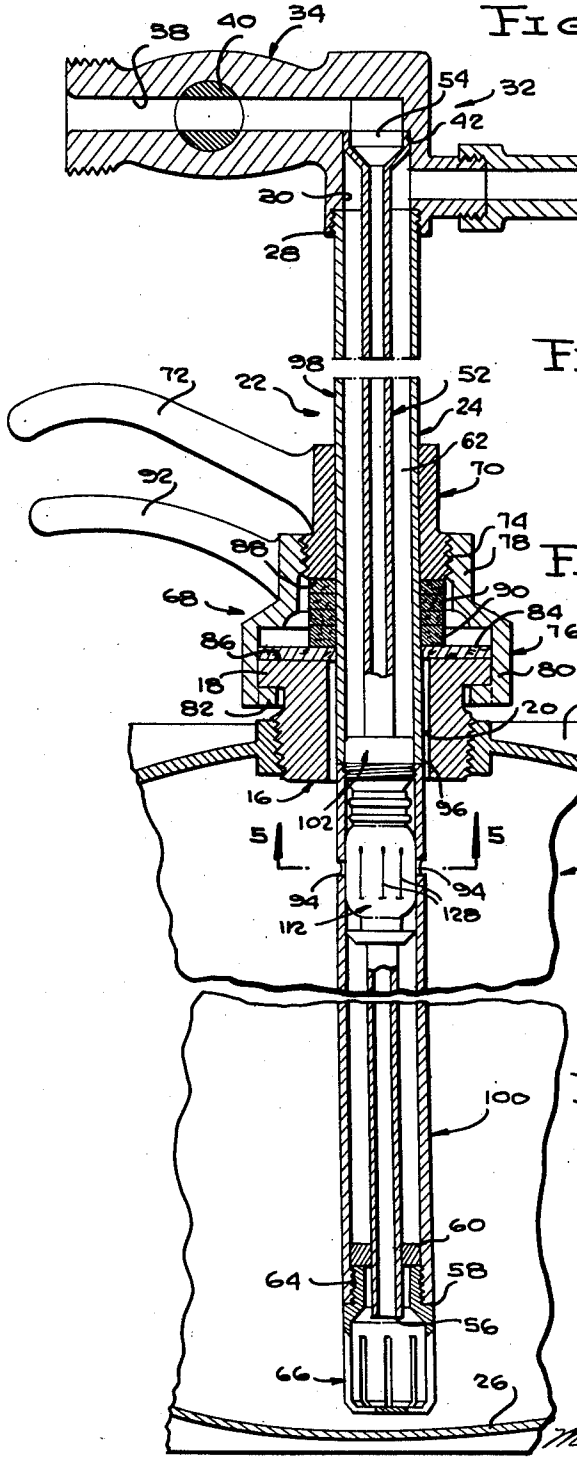


FIG. 5

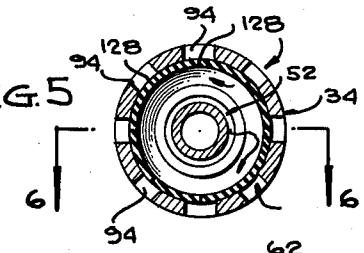


FIG. 6

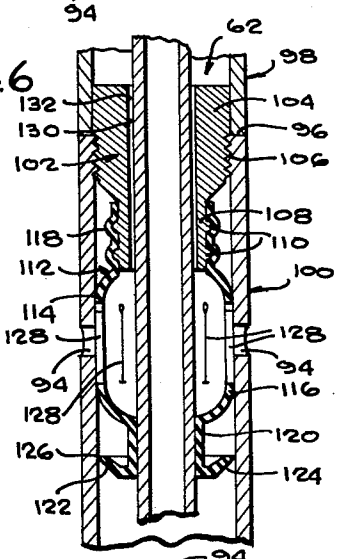
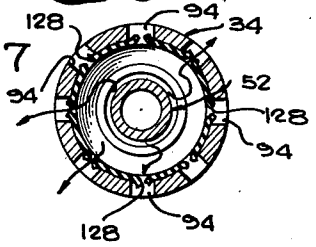


FIG. 7



INVENTOR.
MACK S. JOHNSTON

BY

McMorrow, Berman & Davidson
ATTORNEYS

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BEER SIPHON ASSEMBLY

Mack S. Johnston, P.O. Box 41, Kalispell, Mont.

Continuation of application Ser. No. 25,592, Apr. 29, 1960. This application Dec. 8, 1961, Ser. No. 159,818
12 Claims. (Cl. 137—212)

This invention relates to a novel and improved gas pressure siphon assembly for drawing fluids, such as beer, from containers such as beer kegs or barrels.

The primary object of the invention is the provision of a more efficient assembly of the kind indicated which involves means for preventing contaminating contacts between the beer or other liquid and the gas or air applied to the assembly under pressure for expelling liquid from a container.

Another object of the invention is the provision of an assembly of the character indicated above which involves a gas passage which is isolated and sealed from the beer passage, and novel automatic valve means, in conjunction with a tube defining a gas passage and having opening means opening into the container, which serves to vent gas or air from the gas passage into the container, only when the pressure of the gas or air entering the gas passage is greater than the gas or air pressure within the container, so that beer is forced out of the container.

A further object of the invention is the provision, in an assembly of the character indicated above, of a novel sectional tap nut for connecting the assembly to the tap hole plug of a container, and sealing means between one of the sections which is adapted to be compressed onto the plug by rotation of one of the sections relative to the other, this arrangement requiring only a partial turn of one of the sections to seal and secure the tap nut and the assembly to the plug.

Other important objects and advantageous features of the invention will be apparent, wherein, for purposes of illustration only, a specific form of the invention is set forth in detail.

In the drawings:

FIGURE 1 is a schematic view showing an assembly of the invention installed relative to a beer dispenser, a source of gas under pressure, and a beer keg, the last being broken away and in section.

FIGURE 2 is an enlarged horizontal section taken on the line 2—2 of FIGURE 1.

FIGURE 3 is an enlarged horizontal section taken on the line 3—3 of FIGURE 1.

FIGURE 4 is a further enlarged and contracted vertical transverse section taken on the line 4—4 of FIGURE 2.

FIGURE 5 is an enlarged horizontal section taken on the line 5—5 of FIGURE 4.

FIGURE 6 is a vertical transverse section taken on the line 6—6 of FIGURE 5.

FIGURE 7 is a horizontal section, similar to FIGURE 5, but showing the valve slits open and communicating with ports of the outer tube.

Referring in detail to the drawings, wherein like numerals designate like parts throughout the several views, there are shown a conventional beer keg 10 having an opening 12 in its top wall 14, in which is threaded a plug 16 having on its upper end a lateral annular flange 18, the plug 16 having an axial opening 20 therethrough, an assembly of the present invention being mounted on and extended through the plug 16.

The illustrated assembly, generally designated 22, comprises, as shown in FIGURE 4, an outer rigid tube 24, of a length that its upper end is above the keg 10 and its lower end, within the keg, is closed to the keg bottom 26. The outer tube 24 is threaded at its upper

end, as indicated at 28, into a socket 30 in the lower side of a standard or conventional fitting 32, which is composed of an outlet cock 34, and a gas inlet cock 36 having a plug valve 37. The socket 30 communicates with the bore 38 of the outlet cock 34, which is blocked by an manual plug valve 40. At the meeting of the bore 38 and the socket 30 is a stop shoulder 42, which is spaced upwardly from the upper end of the outer tube 24. As shown in FIGURE 1, the outlet cock 34 is connected to a dispenser 44, as by means of a flexible tube 46; and the gas inlet cock 36 is connected, as by means of a flexible tube 48, to a gas cylinder 50 or other source of gas or air under pressure.

Positioned axially in and concentrically spaced within the outer tube 24 is a smaller diameter rigid inner tube 52 having an open bell 54 on its upper end which bears upwardly against the stop shoulder 42 in the outlet cock 34. The inner tube 52 has an open lower end 56 which extends below the lower end 58 of the outer tube 24. Near its lower end, the inner tube has secured thereon an annular seal 60, which acts to seal the space between the inner and outer tubes and serve as a closed lower end for the gas passage 62 which is defined between the two tubes. Threaded into the lower end of the outer tube 24 is a tubular ferrule 64 which spacedly surrounds the inner tube 52. Engaged in the lower end of the ferrule 64 is a strainer 66 which is connected to and is in communication only with the lower end of the inner tube 52.

The outer and inner tubes extend freely down through the opening 20 of the plug 16, and a tap nut, generally designated 68, surrounds the outer tube 24. The tap nut 68 comprises an upper section 70, which is journaled on the outer tube 24, has a lateral handle 72, and external screw threads 74 at its lower end; and a lower section 76. The lower section 76 is larger in diameter than the upper section 70 and has a tubular upper portion 78 which is threaded on the screw threads 74, and an enlarged downwardly flaring lower portion 80 which has internal lugs 82 at its lower end, which engages under the flange 18 of the plug 16. A lower seal ring 84, of the diameter of the top 86 of the plug 16 is circumposed on the outer tube 24 and bears upon the top of the plug. Circumposed on the outer tube 34 and compressed between the lower end 88 of the upper tap nut section 70 and the seal ring 84, is a plurality of smaller diameter seal rings 90. The lower tap nut section 76 has a lateral handle 92 thereon. To seal and secure the tap nut 68 on the plug 16 it is necessary only to turn the upper section 70 a partial turn, relative to the lower section 76.

On a level a short distance below the top wall 14 of the keg 10, the outer tube 24 is formed with circumferentially spaced ports 94, and at a location above the ports 94, the outer tube has a separation 96 which divides the outer tube 24 into upper and lower sections 98 and 100, respectively. A tubular ferrule 102 has a larger diameter upper portion 104 which is suitably fixed in the upper section 98 at the lower end thereof, and is externally threaded at its lower end, as indicated at 106, and the upper end of the lower section is threaded thereon, to connect the sections 98 and 100. The ferrule 102 has a reduced diameter lower portion 108 having vertically spaced annular ribs 110 extending therearound.

A flexible and resilient valve, generally designated 112, comprises an enlarged diameter, vertically elongated intermediate portion 114 having a sidewall 116 in covering relation to the ports 94 in the outer tube 24, an upstanding reduced diameter neck 118 which is securably engaged on the lower portion 108 of the ferrule 102, and a downwardly extending reduced diameter neck 120

which is circumposed on the inner tube 52, and which terminates at its lower end in a cuff 122. The cuff 122 has an upwardly and outwardly angled peripheral wall 124 which has a peripheral edge 126 which bears sealingly against the interior of the outer tube 24. The sidewall 116 of the intermediate portion 114 of the valve 112 is formed with vertically elongated slits 128, which, as shown in FIGURES 5 to 7, are registered with the outer tube ports 94. As shown in FIGURE 6, the bore 130 of the ferrule 102 is larger in diameter than and is concentrically spaced from the inner tube 52, so as to provide a restricted gas passage 132 between the valve 112 and the gas passage 62 outside of the inner tube 52, above the ferrule 102.

In operation, the outlet cock 34 and the gas inlet cock 36 being open, gas can flow under pressure from the tank 50, through the cock 36 into and down through the gas passage 62, through the restricted gas passage 132 into the valve 112. If the pressure within the keg 10 is lower than that of the incoming gas, the sidewall 116 of the valve 112 is expanded against the interior of the outer tube 34, and its slits 128 open, as shown in FIGURE 7, and enable flow of gas from the valve 112, through the slits 128 and the ports 94 into the keg 10, so as to force beer out of the keg, to the dispenser 44, via the screen 66 and the inner tube 52, and not otherwise. When the pressure in the keg 10 balances the pressure of the incoming gas, the valve slits 128 close and the outer tube ports 94 are sealed by the valve sidewall 116, so that there is no static contact between the gas and beer in the gas passage 62, with the result that beer reaching the dispenser 44 through the siphon 22 is in a cleaner and fresher condition.

This application is a continuation of my copending application Serial No. 25,592, filed April 29, 1960, now abandoned, for "Beer Siphon Assembly."

Although there has been shown and described a preferred form of the invention, it is to be understood that the invention is not necessarily confined thereto, and that any change or changes in the structure of and in the relative arrangements of components thereof are contemplated as being within the scope of the invention as defined by the claims appended hereto.

What is claimed is:

1. A pressure siphon assembly comprising a rigid outer tube having upper and lower ends, an inner tube smaller in diameter than the outer tube and having the upper and lower ends, said inner tube extending through and being circumferentially spaced from the outer tube to define a gas passage, sealing means closing the gas passage in the region of the lower ends of the tubes, said inner tube extending through said sealing means, a screen on the lower end of the outer tube reaching below the lower end of the outer tube and providing fluid entrance means, a cock fitting comprising an outlet cock and a gas inlet cock, said outlet cock having a bore therethrough and a socket communicating with said bore, the upper end of the outer tube being open and secured in said socket, the upper end of the inner tube opening into said socket, the gas outlet cock being in communication only with said gas passage at the upper end of the outer tube, said outer tube having port means intermediate its ends, and a valve surrounding said inner tube and located in the gas passage, said valve comprising a tubular ferrule secured to the outer tube and having a bore larger in diameter than and spaced from the inner tube to define a restricted passage only between the interior of the valve and the part of the gas passage above the valve, said valve comprising a tubular body fixed at its upper end to said ferrule and communicating with said restricted passage, gas seal means on said inner tube in sealing engagement with the interior of the outer tube, said gas seal means being disposed below said valve body, said valve body having a resilient and flexible sidewall normally closing said port means, and orifice means

in said sidewall adapted to communicate with the port means under pressure of gas entering the valve body, said valve body being relatively thin in transverse cross-section with respect to the size of said ports so that the fluid pressure from within said valve will effect an opening of said orifice means.

2. A pressure siphon assembly comprising a rigid outer tube having upper and lower ends, an inner tube smaller in diameter than the outer tube and having upper and lower ends, said inner tube extending through and being circumferentially spaced from the outer tube to define a gas passage, sealing means closing the gas passage in the region of the lower ends of the tubes, said inner tube extending through said sealing means, the lower end of the outer tube being open to provide fluid entrance means, a cock fitting comprising an outlet cock and a gas inlet cock, said outlet cock having a bore therethrough and a socket communicating with said bore, the upper end of the outer tube being open and secured in said socket, the upper end of the inner tube opening into said socket, the gas outlet cock being in communication only with said gas passage at the upper end of the outer tube, said outer tube having port means intermediate its ends, and a valve surrounding said inner tube and located in the gas passage, said valve comprising a tubular ferrule secured to the outer tube and having a bore larger in diameter than and spaced from the inner tube to define a restricted passage only between the interior of the valve and the part of the gas passage above the valve, said valve comprising a tubular body fixed at its upper end to said ferrule and communicating with said restricted passage, gas seal means carried on said inner tube in sealing engagement with the interior of the outer tube below the lower end of said valve body, said valve body having a resilient and flexible sidewall normally closing said port means, and orifice means in said sidewall disposed for communication with said port means and adapted to communicate with the port means under pressure of gas entering the valve body, said valve body being relatively thin in transverse cross-section with respect to the size of said ports so that fluid pressure from within said valve will effect an opening of said orifice means, and a tap nut surrounding said outer tube above the valve for securing the assembly on the tubular plug in an opening of a liquid container wall.

3. A pressure siphon assembly comprising a rigid outer tube having upper and lower ends, an inner tube smaller in diameter than the outer tube and having upper and lower ends, said inner tube extending through and being circumferentially spaced from the outer tube to define a gas passage, sealing means closing the gas passage in the region of the lower ends of the tubes, said inner tube extending through said sealing means, the lower end of the outer tube being open to provide fluid entrance means, a cock fitting comprising an outlet cock and a gas inlet cock, said outlet cock having a bore therethrough and a socket communicating with said bore, the upper end of the outer tube being open and secured in said socket, the upper end of the inner tube opening into said socket, the gas outlet cock being in communication only with said gas passage at the upper end of the outer tube, said outer tube having port means intermediate its ends, and a valve surrounding said inner tube and located in the gas passage, said valve comprising a tubular ferrule secured to the outer tube and having a bore larger in diameter than and spaced from the inner tube and defining a restricted passage only between the interior of the valve and the part of the gas passage above the valve, said valve comprising a tubular body fixed at its upper end to said ferrule and communicating with said restricted passage, gas seal means carried on said inner tube in sealing engagement with the interior of the outer tube below the lower end of said valve body, said valve body having a resilient and flexible sidewall normally closing said port means, and orifice means in said sidewall registered with said port means and

adapted to open to the port means under pressure of gas entering the valve body, said port means comprising circumferentially spaced ports, said valve body being relatively thin in transverse cross-section with respect to the size of said ports so that fluid pressure from within said valve will effect an opening of said orifice means, and said orifice means comprising circumferentially spaced slits in the valve body sidewall.

4. A pressure siphon assembly comprising a rigid outer tube having upper and lower ends, an inner tube smaller in diameter than the outer tube and having upper and lower ends, said inner tube extending through and being circumferentially spaced from the outer tube to define a gas passage, sealing means closing the gas passage in the region of the lower ends of the tubes, said inner tube extending through said sealing means, a screen on the lower end of the inner tube reaching below the lower end of the outer tube and providing fluid entrance means, a cock fitting comprising an outlet cock and a gas inlet cock, said outlet cock having a bore therethrough and a socket communicating with said bore, the upper end of the outer tube being open and secured in said socket, the upper end of the inner tube opening into said socket, the gas outlet cock being in communication only with said gas passage at the upper end of the outer tube, said outer tube having port means intermediate its ends, and a valve surrounding said inner tube and located in the gas passage, said valve comprising a tubular ferrule secured to the outer tube and having a bore larger in diameter than and spaced from the inner tube and defining a restricted passage only between the interior of the valve and the part of the gas passage above the valve, said valve comprising a tubular body fixed at its upper end to said ferrule and communicating with said restricted passage, said valve body having a cuff on its lower end in sealing engagement with the interior of the outer tube, said valve body having a resilient and flexible sidewall normally closing said port means, and orifice means in said sidewall registered with said port means and adapted to open to the port means under pressure of gas entering the valve body, said valve body being relatively thin in transverse cross-section with respect to the size of said ports so that fluid pressure from within said valve will effect an opening of said orifice means, in combination with a container having a wall opening, a plug engaged in said opening and having a lateral annular flange outside of the container, said plug having an axial bore through which the outer and inner tubes extend, and a tap nut journaled on the outer tube and having internal lugs engaged behind the plug flange.

5. A pressure siphon assembly comprising a rigid outer tube having upper and lower ends, an inner tube smaller in diameter than the outer tube and having upper and lower ends, said inner tube extending through and being circumferentially spaced from the outer tube to define a gas passage, sealing means closing the gas passage in the region of the lower ends of the tubes, said inner tube extending through said sealing means, a screen on the lower end of the inner tube reaching below the lower end of the outer tube and providing a fluid entrance means, a cock fitting comprising an outlet cock and a gas inlet cock, said outlet cock having a bore therethrough and a socket communicating with said bore, the upper end of the outer tube being open and secured in said socket, the upper end of the inner tube opening into said socket, the gas outlet cock being in communication only with said gas passage at the upper end of the outer tube, said outer tube having port means intermediate its ends, and a valve surrounding said inner tube and located in the gas passage, said valve comprising a tubular ferrule secured to the outer tube and having a bore larger in diameter than and spaced from the inner tube and defining a restricted passage only between the interior of the valve and the part of the gas passage above the valve, said valve comprising a tubular body fixed at its upper end to said ferrule and communicating with said restricted passage, said valve body having a cuff on its lower end in sealing engagement with the interior of the outer tube, said valve body having a resilient and flexible sidewall normally closing said port means, and orifice means in said sidewall registered with said port means and adapted to open to the port means under pressure of gas entering the valve body, said valve body being relatively thin in transverse cross-section with respect to the size of said ports so that fluid pressure from within said valve will effect an opening of said orifice means, in combination with a container having a wall opening, a plug engaged in said opening and having a lateral annular flange outside of the container, said plug having an axial bore through which the outer and inner tubes extend, and a tap nut journaled on the outer tube and having internal lugs engaged behind the plug flange, said tap nut comprising an upper section circumposed on the outer tube and having an external thread thereon, a lower section having an upper portion threaded on the thread of the upper section, said lower section having an enlarged diameter hollow lower portion surrounding the plug flange and having said internal lugs thereon, and sealing ring means circumposed on the outer tube and compressed between the bottom of the upper section and the top of the plug.

6. A pressure siphon assembly comprising a rigid outer tube having upper and lower ends, an inner tube smaller in diameter than the outer tube and having upper and lower ends, said inner tube extending through and being circumferentially spaced from the gas passage in the region of the lower ends of the tubes, said inner tube extending through said sealing means, a screen on the lower end of the inner tube reaching below the lower end of the outer tube and providing fluid entrance means, a cock fitting comprising an outlet cock and a gas inlet cock, said outlet cock having a bore therethrough and a socket communicating with said bore, the upper end of the outer tube being open and secured in said socket, the upper end of the inner tube opening into said socket, the gas outlet cock being in communication only with said gas passage at the upper end of the outer tube, said outer tube having port means intermediate its ends, and a valve surrounding said inner tube and located in the gas passage, said valve comprising a tubular ferrule secured to the outer tube and having a bore larger in diameter than and spaced from the inner tube and defining a restricted passage only between the interior of the valve and the part of the gas passage above the valve, said valve comprising a tubular body fixed at its upper end to said ferrule and communicating with said restricted passage, said valve body having a cuff on its lower end in sealing engagement with the interior of the outer tube, said valve body having a resilient and flexible sidewall normally closing said port means, and orifice means in said sidewall registered with said port means and adapted to open to the port means under pressure of gas entering the valve body, said valve body being relatively thin in transverse cross-section with respect to the size of said ports so that fluid pressure from within said valve will effect an opening of said orifice means, and a tap nut surrounding said outer tube above the valve for securing the assembly on the tubular plug in an opening of a liquid container wall, said outer tube comprising upper and lower sections separated on a level with said ferrule, said ferrule having an upper portion fixed on the upper section of the outer tube and blocking the gas passage and a lower portion threaded in the lower section of the outer tube and connecting the sections together.

7. A pressure siphon assembly comprising: a siphon tube having an outlet at one end thereof and an inlet at the other end thereof; an outer tube disposed about said siphon tube adjacent the outlet end thereof and spaced therefrom to define a passage therebetween; fluid pressure inlet means communicating with the end of said

outer tube adjacent the outlet end of said siphon tube; and generally cylindrical valve means surrounding said siphon tube, the upper portion of said valve means spaced from the outer peripheral surface of said siphon tube to provide a fluid pressure passage, the lower portion of said valve means in sealing relation with the outer peripheral surface of said siphon tube, the intermediate portion of said valve means being formed of a relatively thin flexible material and having at least one valve slit formed therein; said outer tube having at least one aperture in cooperative relation with said slit valve means, whereby sufficient pressure within said inlet means in relation to the pressure surrounding said slit valve means exterior will effect an opening of the slit in the intermediate portion of said valve means and cause a flow of fluid out through the slit and said aperture in said outer tube; the outer periphery of said valve means adjacent the upper end sealingly connected to the wall of said outer tube.

8. A pressure siphon assembly comprising: a siphon tube having an outlet at one end thereof and an inlet at the other end thereof; an outer tube disposed about said siphon tube and spaced therefrom to define a passage therebetween; fluid pressure inlet means communicating with one end of said outer tube; and generally cylindrical valve means surrounding said siphon tube, the upper and intermediate portions of said valve means being spaced from the outer surface of said siphon tube to provide a fluid passage, the upper portion of said valve means being in sealed relation with said outer tube and a lower portion of said valve means being in sealed relation with the outer surface of said siphon tube, the intermediate portion of said valve means being formed of a relatively thin flexible material and having at least one valve slit formed therein; said outer tube having a tubular section with at least one aperture in cooperative relation with said valve slit, whereby sufficient pressure within said inlet means and the inside of said valve means in excess of the pressure surrounding said slit valve means exterior will effect opening of said valve slit and cause a flow of fluid out through said slit and said aperture in said outer tubular portion.

9. A pressure siphon assembly as defined in claim 8 wherein said tubular section having said aperture is an integral part of said outer tube.

10. A pressure siphon assembly as defined in claim 8 wherein said valve has a plurality of slits and said tubular section has a plurality of apertures in cooperative relation with said valve slits.

11. A pressure siphon assembly as defined in claim 10 wherein said apertures in said tubular section are disposed adjacent said valve slits.

12. A pressure siphon assembly comprising: a siphon tube having an outlet at one end thereof and an inlet at the other end thereof; a tubular member disposed about said siphon tube and spaced therefrom to define a passage therebetween; fluid pressure inlet means communicating with the inside of said outer tubular member; generally cylindrical valve means surrounding said siphon tube having upper and intermediate portions spaced from the outer surface of said siphon tube to provide a fluid passage, with the upper portion of said valve means in sealed relation with said outer tubular member, and said valve means having a lower portion in sealing relation with the outer surface of said siphon tube, the intermediate portion of said valve means being formed of a relatively thin flexible material and having at least one valve slit formed therein, whereby sufficient pressure within said inlet means and the inside of said valve means in excess of the pressure surrounding said slit valve means exterior will effect opening of said valve slit and cause a flow of fluid out through said slit.

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