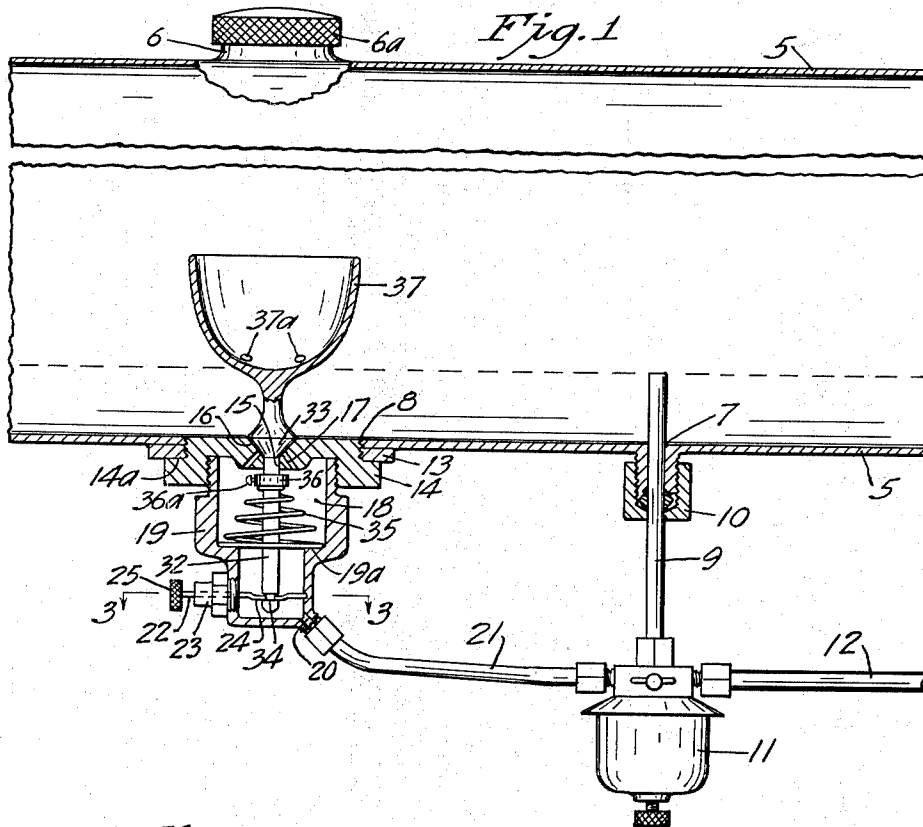
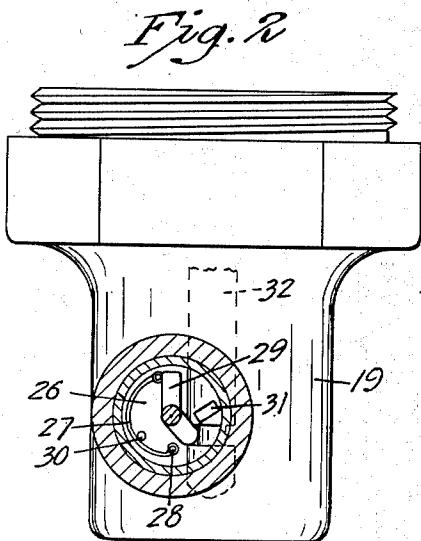
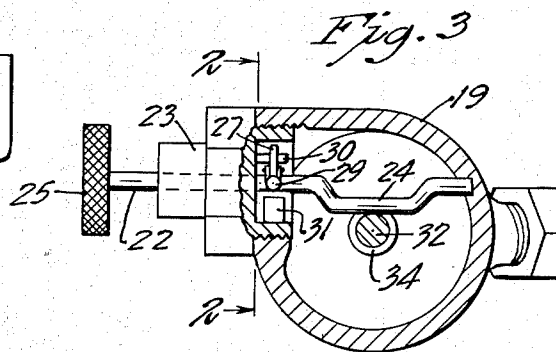


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 DEVICE FOR MAINTAINING RESERVE
 SUPPLY IN LIQUID SUPPLY TANKS
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DEVICE FOR MAINTAINING RESERVE
SUPPLY IN LIQUID SUPPLY TANKS

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This invention relates to devices for maintaining a reserve in liquid supply tanks such as gasoline tanks and the like.

It is an object of my invention to provide a novel and improved, highly efficient, relatively inexpensive device for maintaining a reserve in a liquid supply tank.

More specifically, it is an object to provide in a tank having a normal outlet in spaced relation above the bottom thereof and a reserve outlet in the extreme bottom thereof, a valve in said reserve outlet for controlling the flow of liquid therethrough, said valve being adapted to be controllably opened to permit liquid to flow through said outlet and being adapted to be automatically closed when additional liquid is supplied in the normal manner to said tank.

Still more specifically, it is an object to provide a valve for liquid supply tanks having a spring latch mechanism for locking the same in closed position and a resilient element for opening the same when said latch mechanism is released, and a liquid receiving cup adapted to have the liquid supplied to said tank impinge thereon, the force of impingement of said liquid upon said cup closing said valve, and said spring latch mechanism being adapted to lock said valve in closed position.

These and other objects and advantages of my invention will more fully appear from the following description made in connection with the accompanying drawings wherein like reference characters refer to the same or similar parts throughout the several views and in which;

Fig. 1 is a longitudinal vertical sectional view taken substantially through the central portion of a liquid supply tank such as a gasoline tank and showing the connection of my improved device in the bottom of said tank;

Fig. 2 is a vertical sectional view taken substantially along the line 2—2 of Fig. 3; and,

Fig. 3 is a fragmentary horizontal sectional view taken substantially along the line 3—3 of Fig. 1.

As illustrated in Fig. 1 of the accompanying drawings, I show a conventional gas tank 5 with the inlet 6 and closure cap 6a. The tank 5 has two outlet openings formed at the bottom thereof, one being the normal outlet opening 7 and the other being the reserve outlet opening 8.

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A normal outlet pipe 9 is sealingly mounted in outlet opening 7 and has its upper extremity disposed in spaced relation above the bottom of tank 5. A conventional packing gland 10 sealingly connects pipe 9 to tank 5. The tube 9 extends downwardly from packing gland 10 into sediment basin 11 and thence communicates with fuel-line 12. The enlarged outlet opening 8 in the form illustrated has a reinforcing annular ring 13 fixed therearound as by being welded and the reinforced opening 8, has a mounting insert 14 threadably mounted in sealed relation therein. The flange 14a of insert 14 abuts the outer surface of reinforcing ring 13 and may have a sealing gasket inserted therebetween as necessary.

A reserve outlet passage 15 is formed through the central portion of insert 14 and has a downwardly converging tapered valve seat 16 formed at the top portion thereof. In the form shown, a pair of supply passages 17 intersect the seat 16 and extend downwardly therefrom to afford communication between the bottom of the tank 5 and supply chamber 18 formed by the bowl 19 which is threadably connected to insert 14. The inside of bowl 19 has an enlarged upper portion and a diminished lower portion with a spring receiving shoulder 19a formed therebetween around the inner periphery of said bowl. An outlet 20 is formed at the bottom of bowl 19 and has a conduit 21 sealingly connected therewith for communication with sediment basin 11 and fuel-line 12. A spring latch mechanism is provided and has an oscillatable control shaft 22 extending horizontally into the lower portion of chamber 18 through a packing gland 23 to be journaled in said gland. The shaft 22 has a crank arm 24 formed in an intermediate portion thereof within lower portion of chamber 18. A control knob 25 is fixed to the outer end of shaft 22 and the inner end of said shaft is journaled in a suitable recess in bowl 19 as best shown in Fig. 3.

As best shown in Fig. 2, a recess 26 is formed adjacent packing gland 23 disposed inwardly therefrom and a spring 27 has one end fixed to a post 28 and extends therefrom around the inner periphery of recess 26 and is pivotally connected to an outstanding detent 29 which is fixed to shaft 22. A fulcrum post 30 is disposed in spaced

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relation to post 28 adjacent spring 27 and in closely spaced relation to the outer wall of recess 26 as best shown in Fig. 2. A stop element 31 is adapted to engage detent 29 and limit the oscillation of shaft 22 in a clockwise direction.

An elongated valve shaft 32 is slidably mounted in vertically disposed relation within outlet 15 and has a tapered valve 33 adapted to be sealingly seated in tapered seat 16 to normally close off communication between tank 5 and chamber 18. The lower portion of shaft 32 extends downwardly through the chamber 18 and has a latch receiving groove 34 transversely formed around the lower periphery thereof and the bottom extremity of shaft 32 is gradually rounded off to provide a slightly tapered lower extremity. A tapered projection spring 35 has its lower enlarged portion seated on shoulder 19a and has its upper diminished portion fixed to an intermediate portion of shaft 32 in normally spaced relation below insert 14, as by collar 36 and set screw 36a. A liquid receiving retraction cup 37 is mounted in upstanding relation on the upper portion of shaft 32 above valve 33 and is disposed directly below the liquid inlet 6 to receive liquid supplied therethrough and permit said liquid to impinge on said cup 37. There are a plurality of outlet apertures 37a formed in the bottom of cup 37 to empty the same when the liquid level in the tank falls below the cup 37.

The following is a description of the operation of my improved device for maintaining a reserve in liquid supply tanks. Normally, the liquid will be supplied to the fuel line 12 through normal outlet pipe 9 but when the level in the tank falls below the top of the pipe 9, as indicated by the dotted line in Fig. 1, liquid will no longer be supplied to the pipe 9 and in the case of a gasoline tank supplying fuel to a gasoline engine, the engine will stop because of an insufficient gas supply. At this point, the operator merely turns the knob 25 in a clockwise direction to release the crank arm 24 from groove 34 in shaft 42 where it normally resides, and the projection spring 35 will raise the shaft 32 and valve 33 to permit gas to flow downwardly into supply chamber 18 through supply passages 17. The reserve supply outlet 15 is, of course, disposed in the bottom of the tank 5 and the amount of gas disposed between the top of normal supply pipe 9 and the bottom of the tank will obviously be the amount of reserve supply in the tank.

When the tank 5 is subsequently being refilled through the inlet 6, the discharge into the tank through inlet 6 will impinge upon retraction cup 37 and the force of this impingement will retract shaft 32 and valve 33 downwardly to close valve 33 and the spring latch mechanism will securely lock said valve and shaft in closed, retracted position. The bottom extremity of shaft 32 being tapered, will engage the crank arm 24 and displace the same slightly to permit the crank arm to ride along the lower side portion of said shaft 32 until it is received in retaining groove 34. The spring 27 normally urges the crank arm 24 inwardly and securely holds it in locked position in groove 34.

It will be seen that I have provided an extremely simple, highly efficient device for maintaining reserve in liquid supply tanks. One of the most important features of my invention is the self-closing reserve valve which is responsive to a discharge of liquid into said tank for closing off communication between the tank and the reserve chamber 18. The self-locking latch mechanism

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is particularly adapted to use with my disclosed device and provides a highly efficient releasable lock for securely holding said valve in closed position. The projection spring 35, of course, has a very light tension to permit the easy retraction of the shaft 32 by impingement of the refilling discharge on cup 37. The only manual operation connected with my device, is the releasing of the valve by turning the knob 25 and thereafter, the valve will be closed automatically when the tank is refilled.

It will, of course, be understood, that various changes may be made in the form, details, arrangement and proportions of the parts without departing from the scope of my invention.

What I claim is:

1. A device for maintaining a reserve supply in a liquid supply tank of the type having a reserve outlet at the extreme bottom thereof as well as a normal outlet disposed in spaced relation above the bottom thereof, said device comprising a valve seat formed around said reserve outlet, a valve adapted to be received in said seat to close off said outlet, a spring latch mechanism for normally holding said valve in closed position, a resilient element for urging said valve into open position when said latch mechanism is released, and an element connected with said valve and responsive to the impingement of a stream of inflowing liquid discharged thereagainst to close said valve when said tank is refilled, said spring latch mechanism locking said valve in normally closed position.

2. For use in a liquid supply tank of the type having a liquid inlet at the top thereof and a reserve outlet at the extreme bottom thereof as well as a normal outlet disposed in spaced relation above the bottom thereof, a device comprising a valve seat formed around said reserve outlet, a valve adapted to be received in said seat to close off said outlet, a manually releasable spring locking latch mechanism for normally holding said valve in closed position, a resilient element normally tensioned when said valve is closed to shift said valve into open position when said latch mechanism is released, and a cup element connected with said valve and disposed beneath said tank inlet to receive the discharge stream of inflowing liquid therethrough when said tank is refilled, the force of the impinging stream of liquid shifting said valve into said seat to close said valve, said spring latch mechanism resetting said valve in closed position when the same is seated by the impinging stream of liquid.

3. The structure set forth in claim 2 and the lower portion of said cup element being apertured to permit the liquid therein to flow out therefrom when the level of the liquid in the tank falls below said cup.

4. For use in a liquid supply tank of the type having a reserve outlet at the extreme bottom thereof as well as a normal outlet disposed in spaced relation above the bottom, a device for maintaining a reserve supply in said tank comprising an elongated valve shaft vertically mounted for longitudinal shifting movement in said reserve outlet, a downwardly tapered valve seat formed in the upper portion of said outlet and having at least one liquid supply passage intersecting said seat and forming an outlet from said tank, a tapered valve fixed on said shaft and adapted to be sealingly received in said seat to normally close off said supply passage when said shaft is in retracted position, a manually releasable spring latch mechanism adapted to lock said

shaft in closed position, means for resiliently urging said shaft upwardly to open said valve when said spring latch mechanism is released, and a liquid receiving element connected to the upper portion of said shaft and positioned to receive the discharge stream of inflowing liquid when said tank is refilled, the force of impingement of the liquid stream thereon being sufficient to retract said shaft and close said valve, and said spring latch mechanism locking said valve in closed position.

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