Nov. 26, 1929. J. H. VIELE 1,737,529

VALVE FOR FUEL STORAGE TANKS

Filed May 5, 1927

Fig. 1.

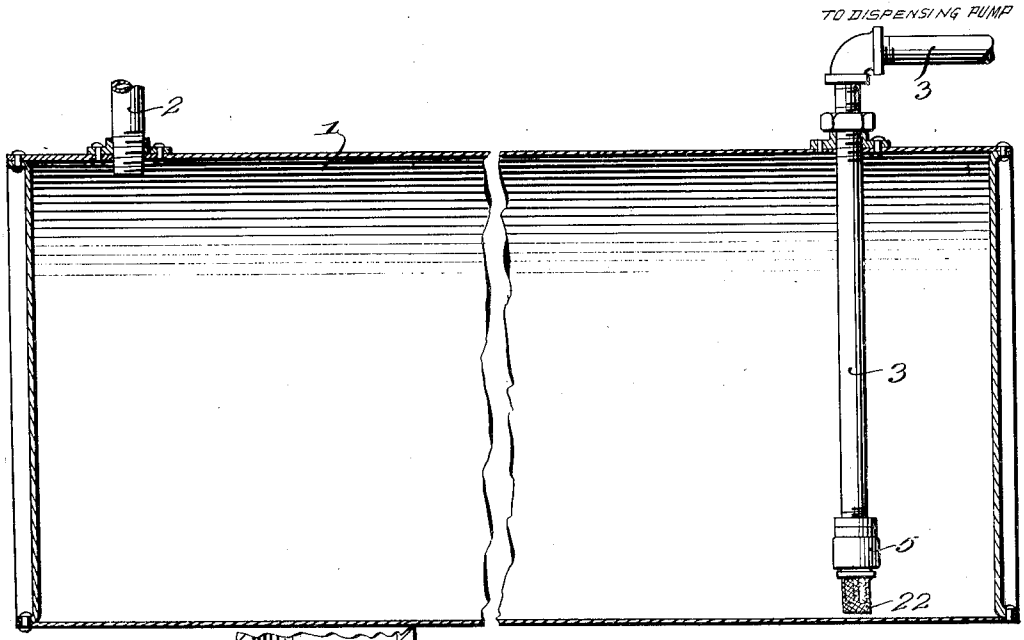


Fig. 2.

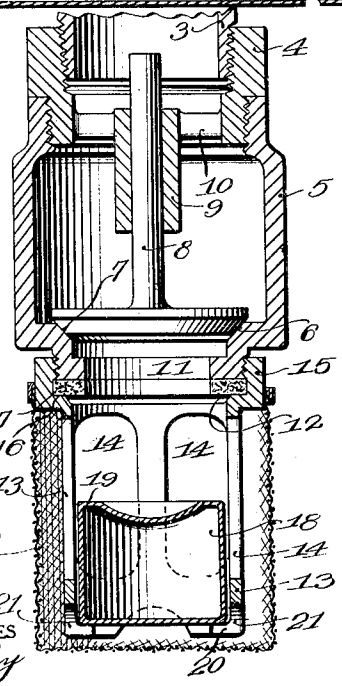
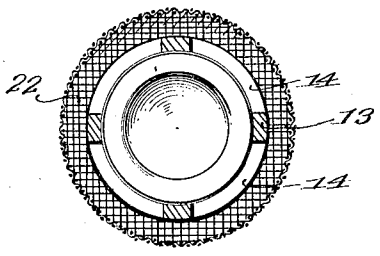


Fig. 3.



WITNESSES

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VALVE FOR FUEL-STORAGE TANKS

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This invention relates to means for preventing water which, despite all precautions, enters into the contents of storage tanks, from being drawn therefrom with the stored contents of the tank, and is particularly concerned with means for preventing water which has seeped into gasoline or kerosene storage tanks from being sucked into the pumps which draw the gas or kerosene and dispense it to the public. When water is thus drawn out with gasoline, for example, the retailer, though innocent of harmful intention, loses a customer; the gasoline company and tank and pump manufacturer are placed under suspicion in the mind of the retailer, and in freezing weather, particularly, the water, so drawn into the pump freezes, frequently damaging the pump beyond repair.

It is the object of my invention to provide a simple attachment which not only is effective to trap and prevent water from being drawn from a storage tank into the dispensing pump line, but which operates by affecting the operation of the pump in a particular way, to warn the operator of the pump that water is in his storage tank. Additionally, the construction provided by this invention is such as to make it impossible further to operate the pump until the accumulated water has been pumped from the tank, as by the usual bilge pump inserted through the filler pipe of the tank.

In the installation of gasoline storage tanks and dispensing pumps, a suction pipe extends from the pump to a point closely adjacent to the bottom of the tank and carries what is known as a foot valve which actually is a check valve to prevent gas once drawn up through the suction pipe from draining back into the storage tank.

The device forming the subject matter of the present invention is designed to be placed at the lower end of such a suction pipe and I have shown a preferred embodiment of it in conjunction with such a check valve since their structural combination affords substantial advantages and economies from the standpoint of manufacture and installation.

The described features and advantages will be more fully apparent from the following detailed specification when read in conjunction with the accompanying drawings forming part thereof and in which,

Figure 1 is a view in vertical section of a hydrocarbon fuel storage tank embodying the present invention,

Figure 2 is a vertical section on an enlarged scale through the combined foot and float valve casings,

Figure 3 is a horizontal section taken on the line 3—3 of Figure 2.

Referring to the drawings by numerals, 1 indicates a hydrocarbon fuel, hereafter referred to as gasoline, storage tank of usual construction and as usual, buried beneath the ground and having the usual filler pipe 2 extending upwardly to the surface of the ground and appropriately capped. At the opposite end of the tank, a suction pipe 3 of usual construction except at its lower end extends upwardly from adjacent to the bottom of the tank and up through the ground to the usual dispensing pump.

The lower end of the suction pipe 3 is threaded into the internally threaded neck 4 of a foot or check valve casing indicated generically at 5 and provided adjacent to its lower end with a tapered valve seat 6 against which the cooperating face of a valve 7 seats, the valve having a stem 8 extending upwardly therefrom and guided for vertical movement through a circular guide tube 9 connected to and made integrally with the casing 5 by spaced webs 10. The valve 7 normally rests by gravity on its seat 6, but is lifted therefrom by the suction of the dispensing pump and drops back again on its seat when suction ceases, checking the return of the fuel drawn upwardly into pipe 3 by the suction pump. The lower end of the casing 5 below the valve seat 6 is reduced in internal diameter providing a port 11 and an adjacent bottom face 12 forming a second valve seat. The outer face of the lower end of casing 5 is also reduced in diameter and threaded.

To this threaded end is secured a float valve casing 13 having a plurality of vertically extending slots 14 therein communicating with port 11 in the check valve 5.

The upper end of the valve casing is provided with an annular enlargement 15 internally threaded and with an internal shoulder 16 alined with and extending partly inward over said valve seat 12. A valve seat facing washer 17 of suitable compressible material and of a diameter corresponding to valve seat 12 is seated on the shoulder 16 and clamped on the valve seat 12 when the threaded enlarged end 15 of the float valve casing is screwed on to the threaded lower end of the foot valve casing 5.

Seated within and guided by the slotted walls of casing 13 is a float valve shown as constructed of thin metal and hollow, its upper face being centrally depressed to form an annular valve face designed to aline with and seat against the compressible facing 17 of its valve seat. This hollow valve is made of material giving it a predetermined specific gravity which is greater than that of hydrocarbon fuel, but less than that of water so that it normally (when no water is present in the tank) is seated with its lower face resting on the inturned flange 20 at the lower end of casing 13, which casing at its bottom edge is formed with a plurality of slots 21 to permit water to enter beneath the float 18. Preferably a suitable strainer 22 encircles the slotted valve casing 13 and may be suitably secured to its enlarged upper end.

When the float valve is in its lowermost position, as shown in Figure 2, the hydrocarbon fuel may be freely drawn in through its slots 14 and up through port 11 into the pipe 3 by the operation of the suction pump which as before stated causes the check valve 7 to close when its operation ceases.

When water however, has seeped or otherwise entered into the tank, being heavier, or of greater specific gravity than hydrocarbon, it lays on the bottom of the tank. This water will enter beneath the float valve 18 by way of the slots 21 and as the height of water increases and approaches the height at which it might be drawn into the suction line from the pump, the valve 18 contacts with its seat at 17 and closes off all suction, preventing any more gasoline from being drawn up pipe 3 by stopping suction, locking the pump against operating movement, and warning the operator that water is present in the storage tank, and that this must be removed before the pump can be operated to dispense gasoline. This is effected by the use of a bilge pump the tube of which is inserted down to the bottom of the tank through the filler pipe 2.

The compressible facing 17 of the seat for the float valve ensures a tight non-leakable seat. While it is incidental to the purpose of the present invention, it may be here stated that by reversing the operation and putting water into the gasoline tank at night when a pump in an unfrequented location is left unattended, it may be rendered theft-proof, even though the pump lock be broken. The water, of course, would be drawn off by the attendant when he begins the next day's work.

While I have described my invention as applied to hydrocarbon fuel storage tanks and therefore applicable to gasoline, kerosene, and distillate, it will be evident that it is equally applicable to other liquids which are stored in tanks and drawn therefrom in small quantities.

What I claim and desire to secure by Letters Patent is:

1. In a device of the character described, in combination, a storage tank for hydrocarbon fuel, a suction pipe extending upwardly from the bottom of the tank and from the tank to a point of discharge, a float casing at the lower end of said suction pipe with its base closely adjacent to and ported in communication with the base of the tank therebelow and having a discharge port at its upper end communicating with the suction pipe and edged by a valve seat and having its sides slotted between said seat and its base, and a float mounted in said casing below said valve seat having a determinate specific gravity causing it to sink in hydro-carbon but to rise in water to engage said valve seat to check further suction of liquid through said pipe, the upper face of said float being shaped to engage and closely to fit the face of the valve seat and functioning as a valve.

2. In a device of the character described, in combination, a storage tank for hydrocarbon fuel, a suction pipe extending upwardly from the bottom thereof, a slotted tubular casing connected to the lower end of said suction pipe with its upper end having a discharge port communicating with the suction pipe and edged by a valve seat, the casing depending from said seat to form a tubular float chamber with its sides between the valve seat and its base slotted and with its lower end formed with a float seat thereabove and ported to permit the entrance of fluid beneath said seat, a float seated in said casing for vertical movement upwardly toward the valve seat to engage the same and close the suction pipe, said float being of a specific gravity less than that of water and greater than that of hydro-carbon and having its upper face shaped to engage and closely to fit the face of said valve seat and functioning as a valve.

3. A suction discharge pipe for hydro-carbon fuel storage tanks having a suction opening at its lower end edged by a valve seat and a tubular float casing therebelow slotted between its upper and lower ends, a float mounted in said casing and supported above its lower end having a specific gravity greater than that of hydro-carbon but less than that of water, the bottom of said casing having a

liquid intake port permitting entrance of liquid below said float.

4. A suction discharge pipe for hydro-carbon fuel storage tanks having a suction opening at its lower end edged by a valve seat, and a valve float suspended below said seat having a specific gravity to sink in hydro-carbon but buoyant in water and subject when buoyant by immersion in water, to upward suction toward said valve seat to cut off suction of liquid therethrough.

5. In a liquid hydrocarbon fuel storage tank, a suction discharge pipe extending upwardly from a point adjacent its bottom and having a valve seat formed therein adjacent its lower end, a float cage depending from said valve seat having a liquid inlet port, and a valve float housed in and guided by said cage for movement toward and from said valve seat, said float having a specific gravity to sink in hydrocarbon but providing for buoyancy thereof in water and subject, when buoyant by immersion in water, to upward suction toward said valve seat through suction in said discharge pipe.

JOHN H. VIELE.