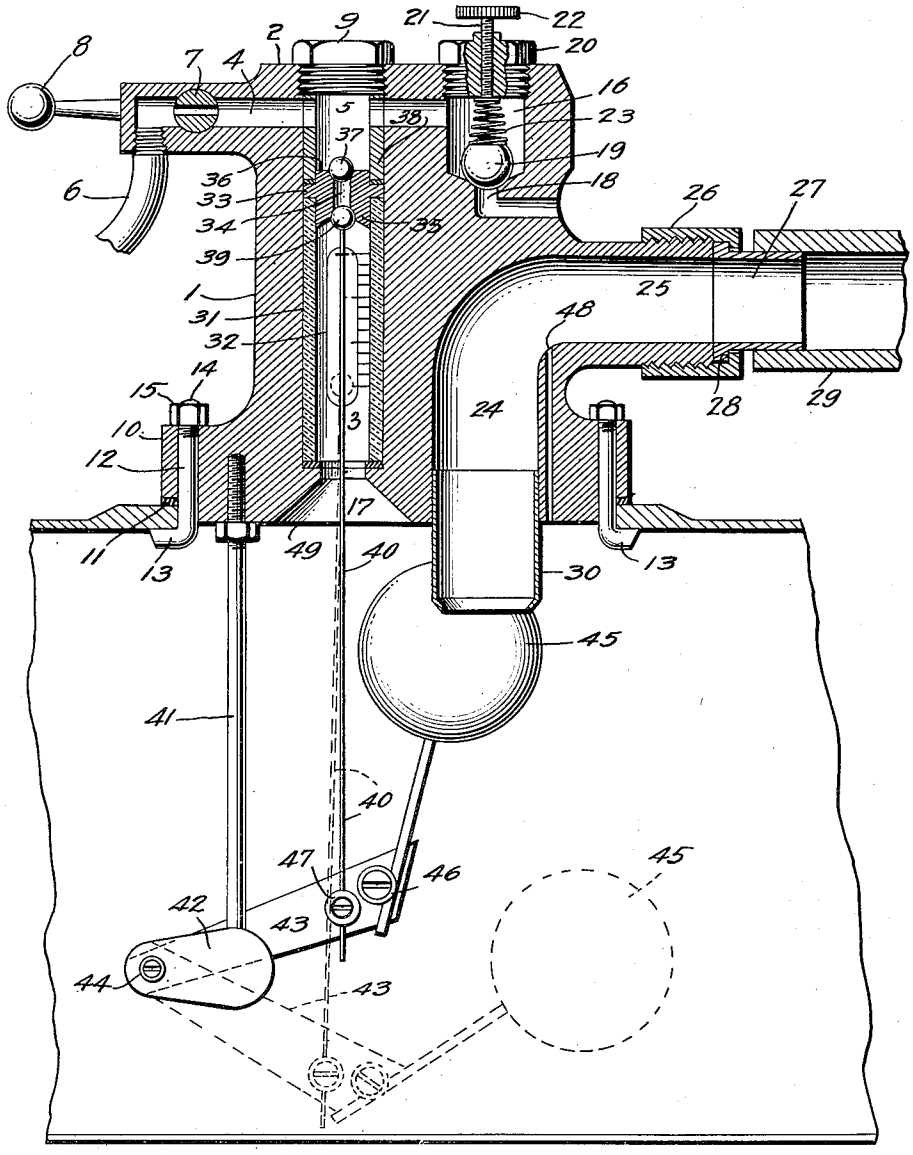
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TANK FILLING DEVICE

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TANK FILLING DEVICE

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This invention relates to means for filling the fuel tanks of automotive vehicles, particularly tractors and the like which often cannot conveniently be taken to a gasoline station. Again when these machines are at work on a farm of any considerable size a great amount of time would be consumed running them to a filling station.

It is customary to take gasoline or other fluid fuel out to the field in drums of fifty gallons or more. These are inconvenient to lift, and even so a large amount of fluid is often spilled. Filling a fuel tank under such circumstances is a slow, time consuming process.

It is an object of the present invention to eliminate all danger of spilling or contaminating the gasoline and also to greatly expedite the filling process.

It is a further object of the invention to eliminate all labor in such refueling operation and utilize the reduced pressure of the intake manifold as a means of pumping the gasoline from the drums into the fuel tank.

It is an object of the present invention to provide means whereby the flow of gasoline is automatically stopped when the level in the fuel tank has attained a sufficient height.

It is an object of the invention to provide a readily visible indication of the quantity of fuel within the fuel tank at all times.

It is a further object of the invention to provide means whereby the operation of the engine is not interfered with by the fluid fuel.

It is an object of the invention to provide a compact, cheap, readily attachable and adjustable means whereby the filling of the fuel tank of a vehicle is greatly facilitated.

A fuller understanding of the invention and other features thereof may be had from the accompanying drawing and the following description showing one form of the device wherein like numerals indicate like parts throughout.

The figure is a sectional elevation of the device mounted on a conventional fuel tank.

Referring in detail to the drawing, numeral 1 indicates the filling device in general which in the embodiment shown has a cast or forged body 2 which is provided with a central bore 3 extending from top to bottom. Near the top of the body 2 is transverse bore 4 which intersects bore 3 at 5. Bore 4 extends to one side of the body 2 and has fitted to its opening a hose or conduit 6 leading to the intake manifold of the engine or some other point of low pressure. In the bore 4 between intersection 5 and conduit 6 is situated a valve 7 having an operating lever 8. The upper end of bore 3 is provided with a threaded closure 9.

The body 2 is provided at its lower end 10 with a seat 11 so shaped as to fit the regular filling opening of tractor gas tanks. The portion 10 is enlarged and provided with anchor bolts 12 which extend through it. Anchor bolts 12 are provided with lugs adapted to grip the inner surface of the tractor tank and hold the body 2 firmly in place.

Bolts 12 are provided with kerfs 14 and flattened portions 15. Flattened portion 15 is on the same side of the body of the bolt as lug 13. Slot 14 may be made to extend in the same direction as the lug 13.

In the upper part of body 2 is a bore 16 with which an end of bore 4 communicates. The bottom of bore 16 is of conical shape as at 17 and is provided with an opening 18 leading to the atmosphere. Resting on the conical surface 17 is a ball 19 which effectively seals opening 18. The upper end of bore 16 is closed by a threaded closure 20 which has mounted on it a threaded member 21 having a knurled adjusting screw 22 which acts upon a spring 23 resting upon ball 19.

In the lower portion of body 2 is an L shaped channel 24. The upper portion of channel 24 extends outward from the body 2 as at 25 which is threaded to receive housing 26.

Tube 27 seats against the end of 25 of channel 24 and is held in place by housing 26 and flange 28. Tube 27 is of such size as to fit within a flexible hose or the like 29 which leads to the bulk fuel supply. From the opposite end of channel 24 projects tube 30 which extends a substantial distance from body 2.

Within bore 3 and snugly fitting the walls thereof is a transparent tube 31 which is visible through opening 32 in body 2. A valve seat 33 having a central bore 34 fits within bore 3 and on the upper edge of tube 31 having an extension 35 extending within the tube 31 and snugly fitting the walls thereof. Seat 33 also has an upper extension 36 which serves to seat ball 37. Ferrule 38 aids in holding valve seat 33 in position.

Ball 39 seats on the lower side of seat 33 and is attached to the end of rod 40. Mounted on the lower surface of body 2 is a rod 41 having a projection 42 to which is pivoted an arm 43 by means of bolt 44. Arm 43 carries a float 45 which is adjustably attached to it by screw 46. Rod 40 is also attached to arm 43 by screw 47.

A small channel 48 leads from the bend of L shaped channel 24 to the inner side of body 2.

The lower portion of bore 3 has a flared or conical shape as at 49.

The operation of the invention is as follows.

The assembled device is placed over the conventional opening in a vehicle gas tank and held firmly in place by bolts 12. A gasket may be provided to insure freedom from leakage. Conduit 6 is connected to the intake manifold of the engine. Hose 29 is fitted over tube 27 and its other end is placed in a drum of gasoline. Valve 7 is then opened. Because of the low pressure in the intake manifold air moves from the tank of the vehicle through bore 3 to the intake manifold.

By means of channel 24, hose 29 the pressure differential between the atmosphere and the inside of the tank is available to force the gasoline in the drum into the tank. As the level of gasoline rises in the tank, float 45 rises with it causing rod 40 and ball 39 to rise also. Ball 39 may be seen through opening 32 which thus gives an indication of the amount of gasoline in the tank. If desired the transparent tube 31 may be graduated to enable a more accurate determination, and provided with gaskets at top and bottom. Also a pointer may be attached to rod 40. When the tank is full ball 39 seats on a depressed portion of extension 35 thus stopping the flow of air and vapor to the intake manifold which in turn stops the flow of gasoline into the tank.

Tube 30 holds the incoming gasoline in a solid stream thus preventing the formation of spray and excessive vapor which would choke the engine if carried over through bore 4 and conduit 6. It also prevents the fuel itself from being drawn directly into bore 3.

Right conical portion 49 of bore 3 while actually increasing the speed of the air and vapor causes it to change direction and since the inertia of the heavy drops of fuel carries them on the same path they hit the wall and are stopped.

Valve 36 and ball 37 act as a flame arrestor in case of a flash back from the motor thus preventing fire from reaching the fuel tank.

Ball 19 and surface 17 act as a relief valve in case the reduction of pressure within the tank is so great as to cause collapse. When the pressure differential is sufficient, ball 19 lifts and admits air. Knurled member 22 permits adjustment of the tension on spring 23.

Small channel 48 serves to prevent syphoning of some of the contents of the tank back into the drum. It introduces air into channel 24 from the very top of the tank. If this stream were not broken the level would again be lowered to near the bottom of tube 30.

In mounting the device on the tank it is necessary to turn lugs 13 under the tank wall. Flattened portions 15 indicate the position of the lugs 13. To a lesser extent so can kerfs 14.

When the tank is full lever 8 is again operated and valve 7 closed. The device is intended as a permanent installation. However, it could readily be moved from vehicle to vehicle as needed.

The foregoing is intended as illustrative and not as limiting. Many changes may be made without departing from the spirit of the invention.

We claim:

1. In a tank filling device, a body member adapted to be mounted on a tank, a passage in said body member communicating with the tank and a point of reduced pressure, a fuel delivery conduit communicating with the tank and a suitable fuel supply, said delivery conduit extending into the tank whereby fuel is delivered with a minimum of splash and droplet formation, and a syphon breaking conduit communicating with said delivery conduit and the tank.

2. In an internal combustion engine tank filling device, a body member adapted to be mounted on a fuel tank and having a channel therein, valve means in said channel whereby vapor and fluid flow may be stopped and flame propagation arrested, a second channel means communicating with said first channel means and a suitable point of reduced pressure, a fuel delivery channel communicating with the tank and a suitable fuel supply, so arranged that pressure at a point above the fuel supply may be reduced, said delivery channel extending into the tank whereby the fuel is delivered into the tank with a minimum of splash and droplet formation, a syphon breaking channel communicating with said delivery channel and the tank.

3. In a tank filling device, a body member adapted to be mounted on a tank, a passage in said body member communicating with the tank and a point of reduced pressure, a fuel delivery conduit communicating with the tank and a suitable fuel supply, said delivery conduit extending into the tank whereby fuel is delivered with a minimum of splash and droplet formation, and a syphon breaking conduit communicating with said delivery conduit and the tank, float operated valve means in said passage whereby the level of fuel in the tank automatically controls fuel flow.

4. In an internal combustion engine tank filling device, a body member adapted to be mounted on a fuel tank and having a channel therein, valve means in said channel whereby vapor and fluid flow may be stopped and flame propagation arrested, a second channel means communicating with said first channel means and a suitable point of reduced pressure, relief valve means whereby the pressure differential on the tank walls is maintained at a safe value, a fluid delivery channel communicating with the tank and a suitable fuel supply, so arranged that pressure at a point above the fuel supply may be reduced, said delivery channel extending into the tank whereby the fuel is delivered into the tank with a minimum of splash and droplet formation, a syphon breaking channel communicating with said delivery channel and the tank.

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