Nov. 6, 1945. J. B. GREEN 2,388,481

SAFETY LIQUID STOP

Filed July 27, 1944

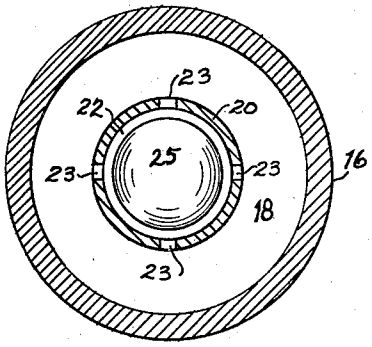


Fig 4

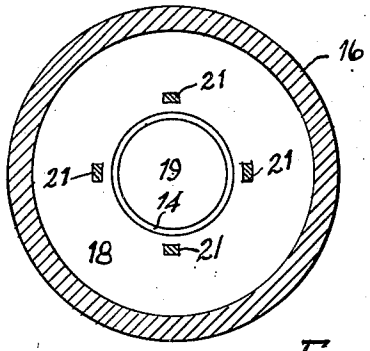


Fig. 3

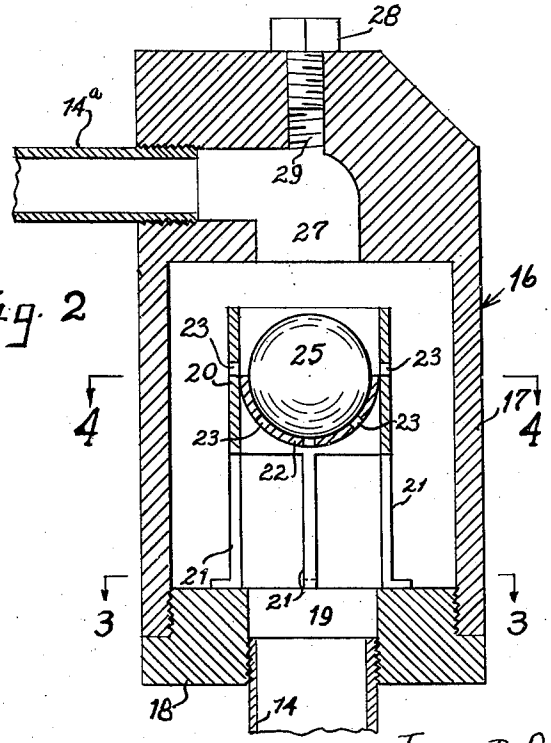


Fig. 2

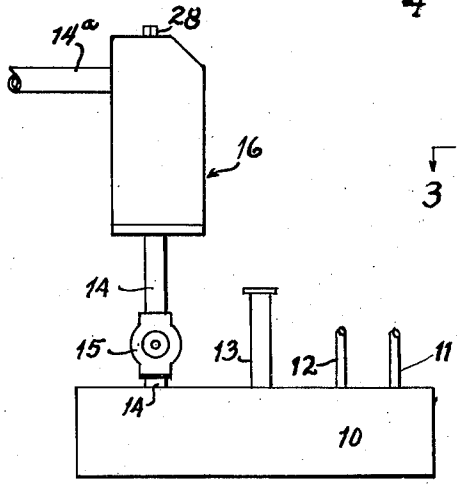


Fig. 1

JAMES B. GREEN,
Inventor

By

Attorney

Patented Nov. 6, 1945

2,388,481

UNITED STATES PATENT OFFICE

2,388,481

SAFETY LIQUID STOP

James B. Green, Sarasota, Fla., assignor to Green's Fuel, Incorporated, Sarasota, Fla., a corporation of Florida

Application July 27, 1944, Serial No. 546,856

1 Claim. (Cl. 137—69)

This invention relates to a safety device for liquid petroleum gas systems and more especially to a safety or check valve designed to permit the usual flow of vapor from a tank and at the same time prevent liquid passage into the service line when the tank is being filled. It is adapted to be used in connection with a system such as set forth in my previous Patent No. 1,968,141, granted July 31, 1934, or any other system employing a storage tank for the liquid petroleum gas. In such a system, there is a storage tank into which liquid petroleum gas is delivered and confined, and this storage tank is usually underground which acts as a heat exchanger to convert the liquefied gas into a vapor which flows through a service line into the house or other place where it is used in vapor form for heating, cooking, and other purposes. These storage tanks usually have a fill pipe through which the liquid gas such as butane, propane, or other volatile hydrocarbon liquids, is poured or pumped into the tank and also a return pipe which is usually connected to the top of the tank located on the delivery truck for allowing the displaced vapors to flow back into the top of the truck tank. It very often happens that the tank is over-filled, resulting in the liquid gas being forced into the service or vapor line leading to the house or other place where gas stoves or other appliances are connected to same, with the contingent possibility of serious damage.

It is an object of this invention to provide a safety device or check valve which will allow the usual flow of vapor, but which upon the liquid gas entering the service line, will automatically close the service line and prevent the liquid gas from flowing further along the service line, thus preventing flowing into the house and into the appliances therein to cause explosions and other serious damage should such happen.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds, when taken in connection with the accompanying drawing, in which:

Figure 1 is an elevation of an underground storage tank such as set forth in my above-mentioned patent, and showing my invention in greatly enlarged form associated therewith;

Figure 2 is a vertical sectional view through the safety valve device;

Figure 3 is a cross-sectional view taken along the line 3—3 in Figure 2;

Figure 4 is a transverse sectional view taken along the line 4—4 in Figure 2.

Referring more specifically to the drawing, the numeral 10 indicates a storage tank for liquid petroleum gas such as butane, propane, or other volatile hydrocarbon liquids, or mixtures of same, having a filler pipe 11 and a vapor return pipe 12, the filler pipe being adapted to be connected to a delivery truck tank for filling the storage tank 10, and this usually flows by gravity from the delivery truck tank into the storage tank though it may be pumped from the delivery tank into the storage tank if desired. In a system such as set forth in my above-mentioned patent, there is a vapor return pipe which is suitably connected to the top of the truck tank for allowing the vapors in the storage tank to be led back to the top of the truck tank, though sometimes the displaced vapors are vented into the air from the vapor pipe 12. Also, in some instances, the liquid gas is pumped into the storage tank without venting the vapors in the top of the storage tank.

An upstanding pipe 13 usually serves to house a suitable gauge mechanism.

Leading from the tank and shown in enlarged form is a service or vapor pipe 14 having a conventional valve 15 therein, the service pipe 14 usually leading into a residence, shop, or other place of business where it is connected to suitable gas burners and used in place of natural or artificial gas. Very often, it happens that the storage tank is filled too full, and the liquid gas is forced upwardly and out into the service pipe 14, sometimes going into the house in which the appliances are located. In order to prevent such occurrence, I have provided a suitable safety liquid stop or check valve 16 disposed in the line 14 which comprises a shell 17 having a plug 18 threadably secured in the lower end thereof and having a central opening 19 into which is threadably secured the pipe 14. This plug is threadably mounted in the lower end of the shell 17 and has integral therewith a cylindrical member 20 which has four upright posts 21 supporting cylindrical member 20. A float ball 25 is housed within the cylindrical member 20. The float 23 normally rests on a bottom 22.

The bottom 22 and cylindrical member 20 have holes 23 through which liquid gas may flow to raise ball 25. This float ball 25 is of any suitable structure to withstand the compression of the gases disposed in the system and which will not float in vapor, but which will float when liquid enters the shell 17.

In normal position, the ball 25 rests on the bottom 22 and the gas can escape out between the four posts 21 into the space between shell 17 and

the cylinder **20** and rise upwardly and through a passage **27** which is L-shaped and which has the service pipe **14***a* leading therefrom which leads into the building or other place where the appliances for burning the gas are located. The upper end of this shell **17** has a plug **28** threadably secured therein which can be removed and a suitable plug or rod can be inserted through the opening **29** in which the plug **28** is mounted for unseating the flat ball **25** from the lower end of the passageway **27**, after the liquefied gas in the pipe **14***a* has been vented or burned or otherwise disposed of.

It is thus seen that I have provided a simple safety check valve which has a float therein which will not be floated by the gas vapors passing therethrough, but which will be floated by any liquefied gas entering the device to therefore close the passageway **27** and prevent the flowing of the liquefied gas into the service pipe **14***a* leading to the gas appliances.

In the drawing and specification, there has been set forth a preferred embodiment of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only, and not for purposes of limitation, the scope of the invention being defined in the claim.

I claim:

In a liquid petroleum system having an uprising vapor pipe extending therefrom, a shell member having its lower end connected to the vapor pipe, a cylindrical member disposed in the shell member and having a plurality of legs secured at their lower ends to the lower end of the shell, a cup-shaped member mounted in the cylindrical member and having a hole in its lowermost portion and said cylindrical member having holes therein disposed above the upper edge of the cup-shaped member, a spherical float adapted to rest in the cup-shaped member, the upper end of the shell member having a right angle passageway therethrough, one leg of the passageway being vertically disposed and centered above the cylindrical member and the other leg being horizontally disposed, a vapor outlet pipe connected to the horizontally disposed portion of the passageway, a vertically disposed screw plug disposed in the upper end of the shell member and centered above the cylindrical member, rising of liquid into the shell member serving to raise the float to close the lower end of the vertical leg of said passageway in the upper portion of the casing.

JAMES B. GREEN.