Aug. 4, 1942. C. E. JOHNSON 2,291,811

TANK SUPPORT

Filed March 6, 1940

Fig.1.

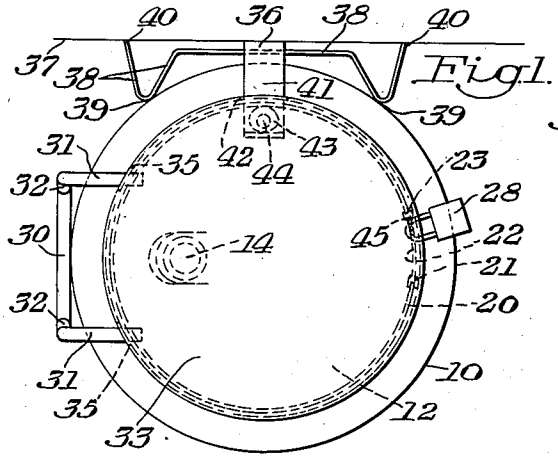



Fig.2.

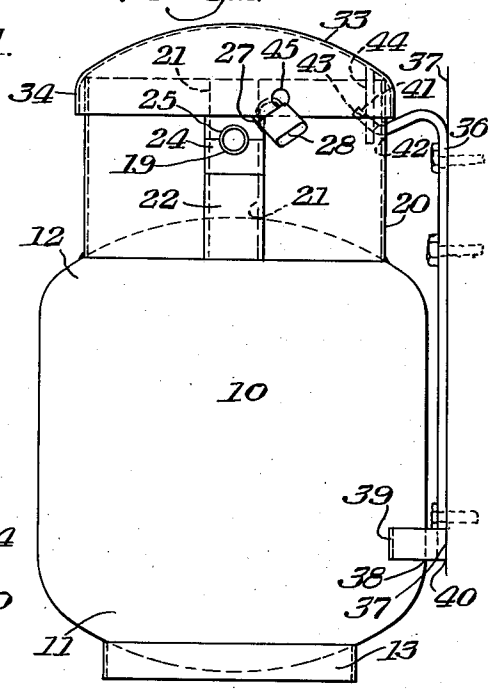



Fig.3.

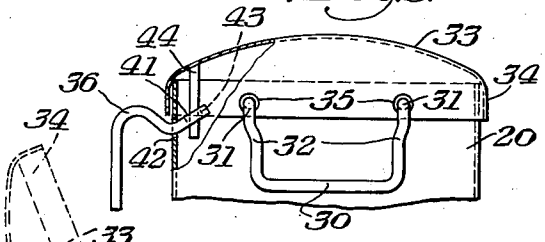



Fig.4.

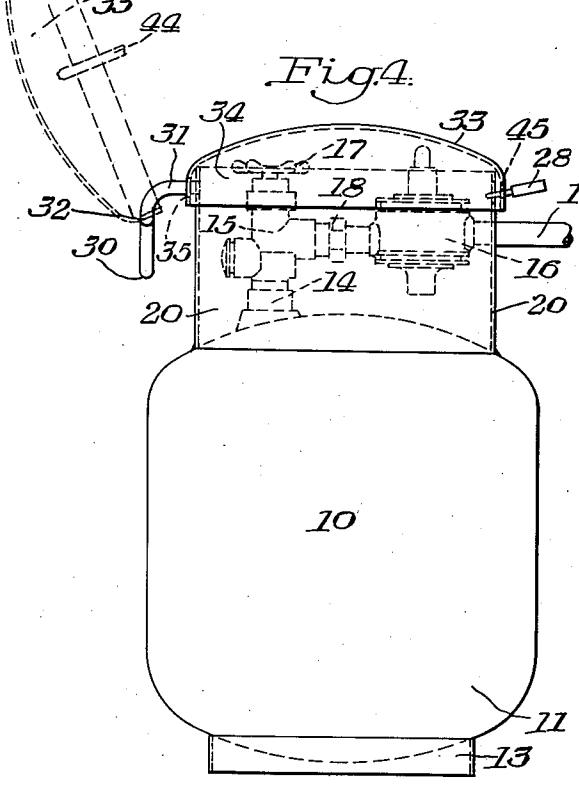



Fig.5.

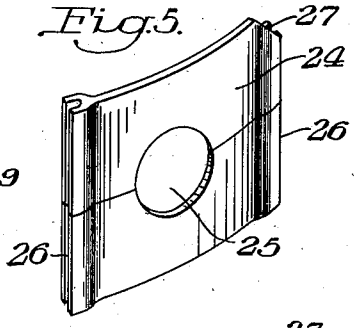
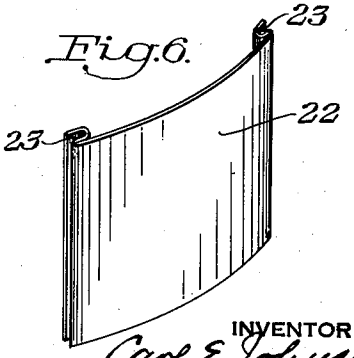



Fig.6.




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# UNITED STATES PATENT OFFICE

2,291,811

## TANK SUPPORT

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Application March 6, 1940, Serial No. 322,505

5 Claims. (Cl. 220—18)

This application relates generally to a container or cylinder for liquefied petroleum gas and more particularly to a housing for protecting the valvular and pressure-regulating mechanism.

Liquefied petroleum gases such as propane, butane or pentane are used commercially as industrial and domestic fuel, the operation of internal combustion engines, in chemical manufacture and for many other purposes.

The liquid gas is delivered to the consumer in containers or cylinders sometimes referred to as bottles. These cylinders are ordinarily provided with a valve arranged to connect the cylinder with the service lines which they are to supply. The pressure of the gas is too high for domestic service and must be stepped down by means of a pressure reducing apparatus. Ordinarily a pressure of an eleven inch column of water is sufficient for domestic purposes.

Propane will boil at temperatures above 44° F. and butane at temperatures above 33° F. If either of these liquefied petroleum gases are confined in a closed cylinder, a vapor pressure is created within the cylinder corresponding to the temperature of the atmosphere surrounding the cylinder. Thus at a temperature of 100° F. the confined gas pressure of propane rises to 196 pounds per square inch and butane will rise to a pressure of 37 pounds per square inch. These cylinders are often exposed to temperature of this magnitude caused by the sunshine when in transit or when in use and vapor pressure of this or higher values are common. For these reasons strict regulations controlling the specifications of the cylinders and associated equipment have been set up by Federal and State commissions. These regulations control construction, manner of handling and installing these cylinders to guard against explosions and fires.

The principal object of this invention is the provision of a housing for a gas cylinder to protect the valves, regulators and/or other fittings used in conjunction with the filling or dispensing of the liquefied petroleum with the cylinder. This housing protects one or more of these fittings against blows due to handling or shipping while in transit.

Another object is the provision of a housing for protecting the valves and fittings of a liquefied gas cylinder against theft or tampering by children or unauthorized persons as when the cylinder is installed and connected to the piping.

Another object is the provision of a housing which protects the valve and fittings against the weather.

Another object is the provision of an improved manner of hingedly enclosing the valve and fittings of a liquefied gas cylinder.

Other objects and advantages appear in the following description and claims.

In the accompanying drawing a practical embodiment illustrating the principles of this invention are illustrated wherein:

Fig. 1 is a top plan view of the cylinder and housing with the lid locked in place.

Fig. 2 is a side elevation of the cylinder shown in Fig. 1 illustrating the manner in which the connections pass into the housing and also illustrating the cylinder hung on the bracket which has been previously attached to the wall of the building.

Fig. 3 is a side elevation of the cylinder shown in Fig. 1 illustrating the grasping handle which is also a hinge for the cover.

Fig. 4 is a front elevation of the cylinder with the lid of the housing raised in its opened position.

Fig. 5 is an enlarged view of the resilient partitions used for closing a part of the opening in the housing.

Fig. 6 is an enlarged view of a metal partition used for closing a part of the opening in the housing.

Referring to the drawing, 10 represents the pressure vessel or cylinder which ordinarily is fabricated from a steel drum closed at its ends by the convex heads 11 and 12. These drums vary in lineal and circumferential dimension in accordance with the required volume and the use to which they are applied. An annular supporting ring 13 is fixed concentrically to the lower head 11 by welding. This ring is sufficiently deep to prevent the convex head 11 from engaging the floor and thus provides means for supporting the cylinder in its upright position on the floor.

The upper head 12 is provided with a threaded connection 14 to the interior of the cylinder. This connection is preferably positioned at one side of the axial center of the cylinder so that the valve 15 and the pressure regulator 16 will be within the diametrical dimensions of the cylinder if a regulator is to be contained within the housing at any time.

The casing of the valve 15 is threadably secured to the connection 14. A horizontally disposed valve handle 17 extends upwardly from the valve casing and is arranged when operated to control the flow of the liquefied gas to and from the cylinder. The pressure regulator 16, when used with the system described is located within

the housing, and is connected to the valve casing by means of the union 18 and its associated fittings. This regulator in turn is connected with the service line 19. Another valve may be provided in the service line for preventing the escape of gas from the system when the cylinder has been disconnected at the union 18.

The valve 15 and the pressure regulator 16 are surrounded by the cylindrical housing 20. This housing is preferably welded to the upper head 12. A vertically disposed slot 21 is provided on one side of the housing to admit the service pipe 19 for connection with the pressure regulator 16. If it could be assured that the service line would always be at a predetermined elevation the slot 21 would be unnecessary as a clearance hole large enough to admit the service pipe is all that would be required. However the elevation of the service pipe and the different character of valves 15 necessitate the use of the slot 21.

The bottom of the housing 20 immediately adjacent to the head 12 may be continuous, thereby forming a complete cylindrical housing. However it has been found more economical to use a cylindrically shaped plate with its spaced ends forming the slot 21. A metal plate 22 having slots 23 formed on the ends thereof arranged to engage the edges of the housing forming the slot 21 may be provided for closing this slot as indicated in Fig. 2. This plate may be formed arcuately as indicated in Fig. 6 so that its surface conforms to the surface of the cylindrical housing 20. One or more plates of this character but of different height may be provided. By changing their relative position in the slot 21 the opening for a particular service pipe 19 may be determined and the rest of the slot will be closed.

A partible resilient plate 24 having an opening 25 therein may be provided for closing the slot 21 around the service pipe 19. This plate is preferably made of suitable flexible material such as rubber to allow for slight inaccuracies in the elevation of the valve connection and the service pipe. The edges of this plate are thickened and provided with grooves 26 which engage the adjacent edges of the housing forming the slot 21 and the plates 22. The corner of the plate may be cut away as indicated at 27 to admit the shackle or bow of the padlock 28.

A U-shaped handle 30 is secured adjacent the upper edge of the side of the housing 20 opposite the slot 21. This handle is preferably welded to the housing. Each stem 31 of the handle 30 projects horizontally from the housing and curves downwardly. An offset 32 is formed in each stem. The convex housing cover or lid 33 is provided with a cylindrical rim 34 which fits over the housing and is provided with spaced holes 35. These holes loosely receive the stems 31 of the handle and permit the cover to be raised from the housing, slid back on the stems of the handle and down over the curved portions until it is stopped by the offsets 32 as illustrated in dotted lines in Fig. 4. Thus the handle 30 acts as a hinge to permit pivoting of the lid or cover on the housing, and also supports the open lid.

To be assured that the elevation of the valve and the service line are the same it is preferable to support the cylinder on a wall. Thus a hanger bracket 36 is arranged to be secured to the wall surface 37 by any suitable means. The lower portion of the hanger bracket is provided with a horizontal cradle 38 the outer portions of which engage the lower cylindrical surface of the cylinder at spaced points, as indicated at 39, while the ends of the bracket are provided with rearwardly extending legs which engage the surface of the wall as indicated at 40.

A hook 41 formed integral with the upper end of the bracket extends through the opening 42 in the wall of the housing 20 below the flange 34 of the lid, and thus supports the weight of the cylinder. The outer end of the hook is provided with a hole 43 arranged to receive the stud or pin 44 which is secured to the lid. Thus when the cylinder is hung on the hook and the lid is closed the pin 44 extends through the hole 43 in the hook 41, thereby preventing the removal of the cylinder from the hanger.

The shackle or bow of the padlock 28 extends through the aligned holes 45 and back through the slot 21. Other means for locking the lid closed on the housing may be equally as effective but the simple padlock is believed to be the simplest and most economical. Thus when the lid is closed and locked it is impossible to lift the cylinder from the hook or to tamper with the valve and the regulator within the housing. These fittings are enclosed from the weather.

When the cylinder is to be installed the padlock is removed, the lid opened and the cylinder is then lifted on to the hook of the hanger bracket. The service pipe is then connected and the valve is opened. The closure plates may then be inserted around the service pipe and the lid is closed. The depending pin locks the cylinder on the hanger bracket and the padlock is then inserted to lock the lid. Most of these cylinders are installed outside of the building. They may be in the open, in wells, or sheds. In either event it is necessary to guard against tampering by unauthorized persons.

I claim:

1. In a housing for enclosing the valve and associated fittings of a liquefied gas container, the combination of a vertically disposed wall mounted on the container and surrounding the valve and fittings, said wall being provided with an aperture, a lid hingedly mounted on said wall and arranged to close the open end thereof, a support for the container having a portion extending through the aperture, said portion provided with a hole, and a member carried by the lid and arranged when the lid is in its closed position to engage the hole and prevent unauthorized access to the valve and fittings when the lid is closed.

2. In means for supporting a container for liquefied gas or the like, the combination of a wall secured to the container and surrounding a space to be occupied by the valve and other fittings, said wall being provided with an aperture, a fixedly supported hook arranged to extend inwardly through said aperture, a lid arranged to engage said wall and close said space, and a member carried by the lid and arranged to interlock with said hook to prevent the disengagement of the container from the hook while the lid is in its closed position.

3. In means for supporting a container for liquefied gas or the like, the combination of a wall secured to the container and surrounding a space to be occupied by the valve and other fittings, said wall being provided with an aperture, a hanger bracket arranged to be mounted on a vertical wall or other fixed support, an abutment on the bracket arranged to engage the container and hold it in spaced relation to the fixed support, a hook extending from said bracket and arranged

to protrude inwardly through the aperture to provide vertical support for the container, a lid arranged to engage said surrounding wall and close said space, and a member carried by the lid and arranged to interlock with the hook to prevent the disengagement of the container from the hook while the lid is in its closed position.

4. In means for supporting a container for liquefied gas or the like, the combination of a wall secured to the container and surrounding a space to be occupied by the valve and other fittings, said wall being provided with an aperture, a fixedly supported hook arranged to extend inwardly through said aperture, a lid arranged to engage said wall and close said space, a member carried by the lid and arranged to interlock with said hook to prevent the disengagement of the container from the hook while the lid is in its closing position, and means for locking the lid in its closed position.

5. In means for supporting a container for liquefied gas or the like, the combination of a wall secured to the container and surrounding a space to be occupied by the valve and other fittings, said wall being provided with an aperture, a fixedly supported hook arranged to extend inwardly through said aperture, the inner end of the hook being provided with an opening, a lid arranged to engage said wall and close said space, and a projection depending from the underside of the lid and arranged to engage the opening in the hook when the lid is closed to prevent the release of the container from the hook while the lid is in its closed position.

CARL E. JOHNSON.