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A. N. KERR

LIQUID FUEL CONTAINER

Filed June 20, 1924

Fig. 1.

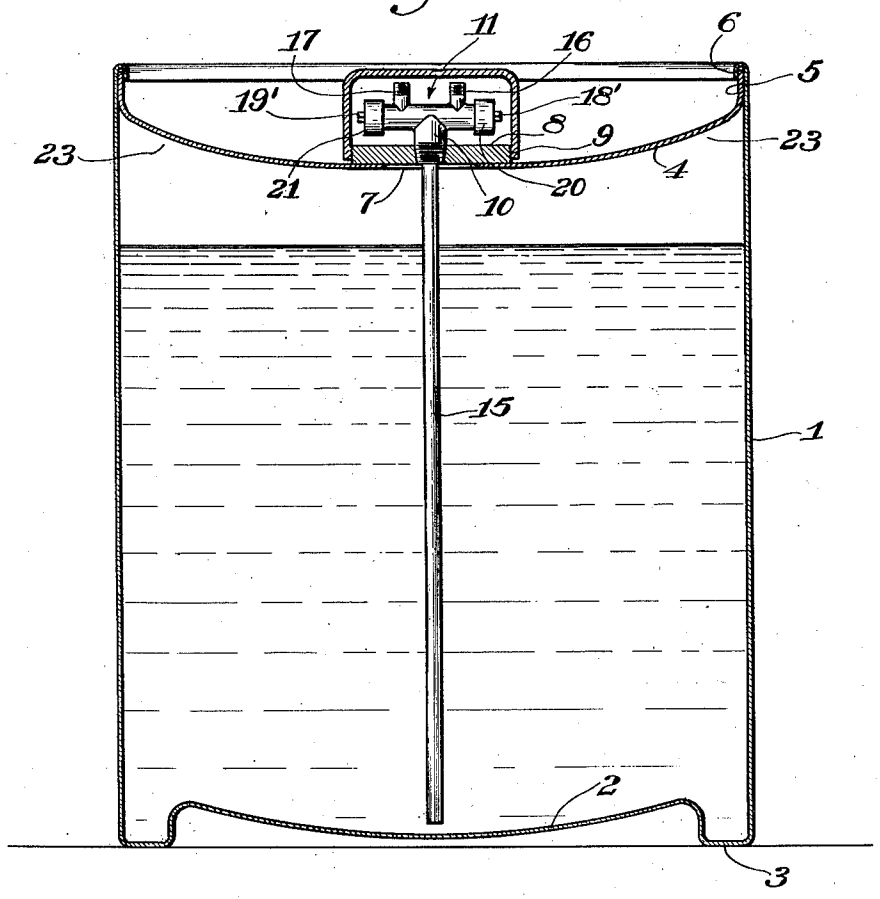
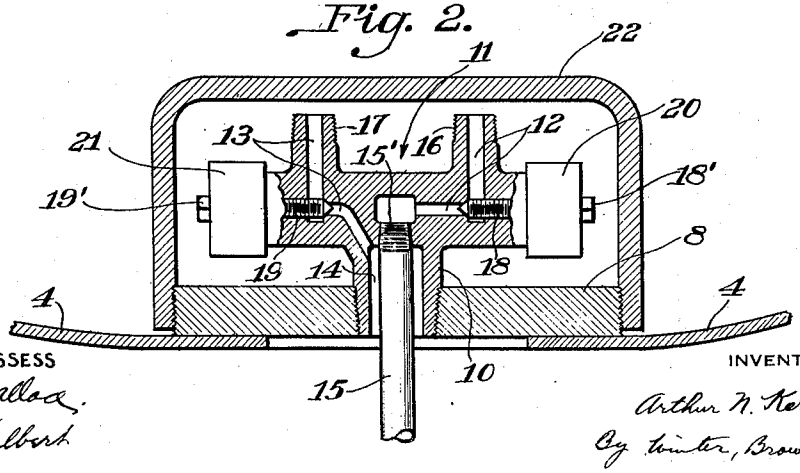


Fig. 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

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LIQUID-FUEL CONTAINER.

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To all whom it may concern:

Be it known that I, ARTHUR N. KERR, a citizen of the United States, and a resident of Bellevue, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Liquid Fuel Containers, of which the following is a specification.

This invention relates to containers, and particularly to containers adapted for storing and transporting fluids which are of a highly volatile nature, and has been designed especially for use in connection with liquids which are so highly volatile that they may be termed semi-liquid and semi-gaseous.

It is an object of the invention to provide a container for this purpose which is simple, compact, strong and durable, economical to manufacture, and highly efficient in operation.

Great difficulty has been experienced heretofore in transporting fluids of the character referred to either because of the danger of disrupting or breaking the valve means necessarily forming a part of the container due to the fact that parts thereof ordinarily project outwardly therefrom because of leakage in the mechanisms used, or because of the excessive space required for more rugged and durable constructions. It is an object of this invention to overcome the above noted disadvantages while at the same time providing a structure which may be easily handled similarly to ordinary cylindrical containers and barrels.

It is a special object to provide a container with a head depressed below the adjacent end of its body portion equipped with a combined filling and dispensing valve mechanism so constructed and positioned as to cooperate with the depressed head to form a container which may be readily handled and transported without danger of breakage.

It is another special object to provide a container with a depressed head shaped to trap gaseous portions of the contained fluid and prevent overfilling of the container with the liquid portions, one in which the combined filling and dispensing valve mechanism is so associated with the remaining parts as to permit variations in the position of the depressed head without causing the valve mechanism to be projected beyond the end of the body of the container, one which can be alternately employed as a gas machine or carburizing tank if occasion should render such use desirable, and one in which the valve mechanism may be readily removed from or attached to the head as a separate unit.

These and other objects of the invention will more fully appear when taken in conjunction with the following description and the appended claim.

In the drawings, Fig. 1 is a vertical sectional view, with parts in elevation, illustrating one embodiment of the invention; and Fig. 2 an enlarged fragmentary detail sectional view of the combined filling and dispensing valve mechanism, illustrating its association with the remaining parts.

The body portion of the container is indicated at 1, and has integrally formed therewith the bottom 2, the peripheral portion of which is shaped as indicated at 3, in accordance with the practice common in this art.

The top or head of the container shown at 4 consists of a curved disk, the upturned peripheral flange 5 of which coacts with the upper edge of the body portion 1 to form a sealed joint, the extreme upper edge of the body portion 1 being preferably turned inwardly in the manner shown at 6 so as to grip the marginal flange 5 between portions of the metal forming the body of the container. The head 4 is curved downwardly from its peripheral flange 5 towards its center at which point it is provided with the opening 7.

Rigidly attached to the head 4, and covering the opening 7, is an apertured supporting plate 8, the body of the plate 8 projecting above the head 4 and being provided with the peripheral threads 9. The supporting plate may be connected to the head 4 in any suitable manner to form a sealed joint, as by welding. The aperture in the plate 8 is preferably located at the center thereof, and is adapted to threadedly receive the depending recessed nipple 10 of a generally T-shaped valve block indicated at 11. A pair of fluid conducting ducts extend through the valve body 11, one of these ducts being indicated at 12, while the remaining one is indicated at 13, the latter communicating with the recess 14 within the nipple 10. The duct 12 communicates with the upper end of a pipe 15 which is

anchored in the valve block at 15', and which extends downwardly to a point adjacent the bottom 2 of the container. The cross-sectional dimension of that portion of the pipe lying within the recess 14 is somewhat smaller than the cross-sectional dimension of the recess whereby to leave an open annular space surrounding the pipe, for a purpose to be subsequently set forth more at length. Preferably the upper ends of each of the ducts 12 and 13 terminate in exteriorly threaded nipples 16 and 17 so as to provide a convenient means for attaching a hose or equivalent conduit during the filling or emptying of the container.

Both of the ducts are off-set at a point midway of their length so as to provide a suitable valve seat, in the manner clearly shown in Fig. 2 of the drawings. A needle valve 18 threadedly engages with a suitable bore in the valve block and cooperates with the seat provided in the duct 12 so as to control the flow of fluid therethrough, the outer extremity of the valve stem being made polygonal in shape as indicated at 18' to enable it to be conveniently rotated by means of a wrench, in an obvious manner. A similar needle valve 19 with the polygonal extremity 19' cooperates with the valve seat of the duct 13. Ordinarily, suitable packing is disposed around the outer portions of the valve stems, such packings being held in place by means of the gland caps shown at 20 and 21, respectively. The valve stems 18 and 19 project laterally through the horizontally extending portion of the T-shaped valve body, preferably lie in a horizontal plane and in alignment with each other, thus enabling the entire valve mechanism to be positioned close to the supporting plate 8, without requiring an excessive space to accommodate the same, and enabling either or both of the valve stems to be conveniently actuated.

An inverted cup-shaped cover 22 is internally threaded adjacent the lower edge of the depending flanged portion thereof so as to cooperate with the external threads 9 provided on the periphery of the supporting plate 8, this cover being preferably unbroken throughout its entire extent, and so proportioned as to completely house and protect the enclosed valve mechanism while at the same time lying below the top edge of the container, as clearly shown in Fig. 1 of the drawings.

It is noted that the central portion of the head 4, in the region of the supporting plate 8, occupies a position nearer the surface of the liquid contained within the container, thus providing an annular pocket 23 extending entirely around the container in the region of the body portion 1, in which the gaseous contents within the container will be trapped, should the liquid portions therein rise sufficiently high to contact the plate 8. This feature is intended to serve as a means to prevent excessive filling of the container with the liquid portions, since the trapping of the gaseous portions within the space 23 will cause some of the liquid to be discharged through the upper ends of the ducts 12 and 13, when the needle valves 18 and 19 are in open condition, thus indicating that the container is filled with liquid to the point for which it has been designed.

In order to fill the container, both of the needle valves are opened, and the fluid injected into the tank through the duct 12 and the depending pipe 15, any air within the tank above the level of the liquid during the filling operation being freely discharged through the recess within the nipple 10 and the duct 13. It is understood that the fluid injected may be led from any source of supply by means of a conduit or hose which may be attached to the nipple 16, and likewise the air or gas escaping from the duct 13 during the filling operation may be conducted away by means of a hose or conduit connected to the nipple 17. As before explained, warning is given when the container has been filled to the limit for which it has been designed by the discharge of a portion thereof from the ducts, due to the trapping of some of the gaseous portions within the annular space 23.

When the container is filled to the desired extent, both of the needle valves 18 and 19 are closed, and the cover 22 securely threaded in place.

Due to the nature of the fluid for which this particular container has been designed, namely a volatile fluid which may be termed semi-liquid and semi-gaseous, gaseous portions are constantly present. Consequently, during storage, the gaseous portions due to volatilization of the liquid collect at the upper portion of the container and exert a pressure upon the surface of the liquid portions. Ordinarily this pressure, particularly during warm weather, is sufficient to discharge the liquid contents whenever the needle valve 18 is opened. If such pressure is not sufficient for this purpose, a suitable gas under pressure may be admitted through the duct 13 and the nipple 10 by connecting a source of supply to the nipple 17, the flow of the gas being controlled by the needle valve 19.

The entire valve mechanism consisting of the valve block 11, together with all of the parts attached thereto including the recessed nipple and the depending pipe 15, form a separate unit which may be bodily inserted within the aperture of the supporting plate 8 or removed therefrom, as occasion may require.

It is obvious that the pressure of the gaseous content of the container will vary

from time to time, resulting in changing the relative position of the depressed head 4. In other words, changes in the pressure within the container will cause a flexing of the head 4 towards or away from the interior of the container. In order to accommodate the parts to such changes, while retaining all of the advantages previously described, the valve mechanism and the cover or housing therefor are positioned a sufficient distance below the top edge of the container so that these parts will at no time project thereabove.

In the event that it should be desirable to utilize the invention as a gaseous machine or carburizing tank, instead of a storage and shipping container, it is obvious that the container may be partially filled with a suitable liquid hydro-carbon and an appropriate gaseous carrier injected through the duct 12 and the depending pipe 15, which carrier escaping at a point adjacent the bottom 2 will bubble upwardly through the liquid content and collect at the upper portion of the container from which it may be drawn to the point of use through the recessed nipple 10, the duct 13, and a suitable conveying conduit attached to the nipple 17.

It is thus seen that the invention provides a storage and shipping container particularly adapted for use in connection with highly volatile liquids, which is simple, compact, durable and efficient in operation, in which the entire valve mechanism necessarily forming a part thereof together with the cover or housing therefor is so related to the remaining parts that the container may be handled in the ordinary manner employed with cylindrical containers or barrels without extreme danger of breakage or leakage either during handling or shipment, and which may be readily utilized as a carburizing apparatus should occasion arise.

I claim:

The combination of a closed shipping container for volatile liquids comprising a body, a depressed head fixed to one end of the body, said head being curved downwardly from its periphery toward its center, an apertured supporting plate attached to the central portion of the head projecting above the head and having its periphery threaded, a T-shaped valve block having a depending recessed nipple removably anchored in the aperture of said plate, said block being equipped with a pair of fluid conducting ducts, a pair of oppositely disposed laterally extending needle valves threaded in said block for controlling flow through the respective ducts, one of said ducts communicating with a depending pipe attached to the block and extending through the nipple, the cross-sectional dimension of the pipe within the nipple being smaller than that of the recess therein whereby to provide an annular space within the nipple, the remaining duct communicating with the said annular space, an inverted cup-shaped cover threadedly engaging the said threaded peripheral portion of the said plate and completely housing the valve mechanism, the head together with all of the parts carried thereby being disposed entirely below the upper edge of the container.

In testimony whereof, I sign my name.

ARTHUR N. KERR.