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M. MAURAN

VALVE FOR LIQUEFIED GAS CONTAINERS

Filed May 18, 1922

Fig. 1.

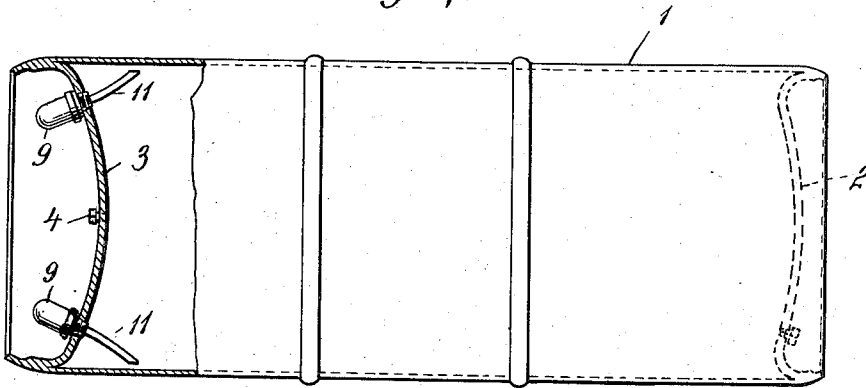


Fig. 3.

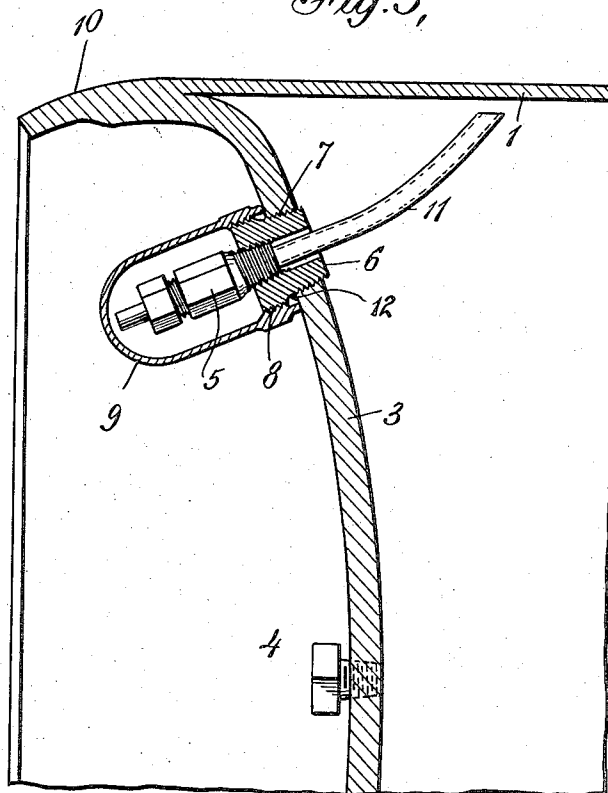
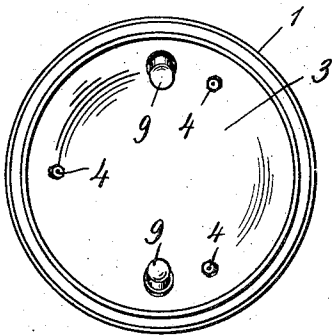


Fig. 2.



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By his Attorneys

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UNITED STATES PATENT OFFICE.

MAX MAURAN, OF NIAGARA FALLS, NEW YORK, ASSIGNOR TO THE MATHIESON
ALKALI WORKS, INC., OF NEW YORK, N. Y., A CORPORATION OF VIRGINIA.

VALVE FOR LIQUEFIED-GAS CONTAINERS.

Application filed May 18, 1922. Serial No. 562,002.

To all whom it may concern:

Be it known that I, MAX MAURAN, a citizen of the United States, residing at Niagara Falls, in the county of Niagara, State of New York, have invented certain new and useful Improvements in Valves for Liquefied-Gas Containers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in containers intended for the storage and transportation of liquefied gases, such as chlorine, liquefied sulphur dioxide, etc. More particularly, it relates to such containers having valves arranged to permit the withdrawal of either the liquefied gas in a liquid state or of the vaporized liquid from the container while protecting the valves during transportation and storage of the containers so as to prevent or minimize the danger of the injury to the valves and accidental discharge of the contents of the containers.

In containers for liquefied gases, and particularly where the liquefied gases are of a poisonous or dangerous character, it is important to insure the safe transportation of the gases, and also to provide for the safe and convenient use of the gases when desired. The present invention provides an improved container which enables the liquefied gases to be transported, stored and used in a convenient and advantageous manner and with a minimum of danger from injury to the valves by means of which the liquefied gases are to be withdrawn for use.

The invention relates more particularly to relatively large containers, such as drums or cylinders of about one-ton capacity, which contain a radically increased amount of the liquefied gases as compared with the relatively small containers heretofore commonly used.

More particularly, the invention relates to containers in the form of drums or cylinders which have one or both of their ends concave and which have overhanging chimes extending beyond the heads, so that a recess is provided by the overhanging chime and the concave head.

According to the present invention I provide valves in the concave head near the periphery thereof and so arrange the valve

that it is protected by the overhanging chime while nevertheless permitting ready access thereto for withdrawing the liquefied gas. With the concave arrangement of the head, the valve is advantageously arranged near the edge of the head, so that it projects more or less toward the center of the head, as well as outwardly, and so that, on the inside of the head, it is directed toward the periphery of the drum. In order that the contents of the drum may be withdrawn either from the extreme top or from the extreme bottom, two valves are arranged at diametrically opposite parts of the head and each valve is provided with a short extension which extends into the drum to near the periphery. A minimum length of pipe is required in this arrangement. The arrangement, moreover, is such that the valves can be readily placed in the head without any reinforcing or thickening of the head, that is, so that the valves can be placed in the head after it has been welded in place in the drum.

The invention will be further described in connection with the accompanying drawing illustrating the preferred construction and in which—

Figure 1 is a side view of the container with parts broken away and shown in section;

Figure 2 is an end view; and

Figure 3 is an enlarged sectional view of part of one end of the container.

The container 1 is generally cylindrical in form and in practice may have a capacity of about one ton of liquefied gas, for example, liquefied chlorine. This drum has welded-in heads 2 and 3, the head 2 being dished outwardly as shown, while the head 3 is dished inwardly. The heads carry safety plugs 4, three of which are shown in the head 3.

As illustrated in Figure 3, the head 3 is of somewhat thicker material than the cylindrical body portion of the drum, and the concave or dished head is turned outwardly at its edges and integrally united to the cylindrical portion of the container (e. g., by welding). Extending beyond the concave head is an overhanging rim or chime 10 which is curved inwardly and forms with the concave head 3 a recess or depression of considerable size at the end of the container.

Arranged at diametrically opposite parts of the head 3 are two valves, one of which is indicated at 5 in Figure 3. The valves are connected with the head through intermediate bushings 6. These bushings can be inserted in the head by screwing them into a threaded opening, using a rather small thread, and with a slight taper on both the threaded opening in the head and the threaded portion of the bushing, so as to secure a tight fit of the bushing when screwed in place in the head.

The valve 5 is similarly inserted in the bushing 6 through tapered threaded portions to insure a tight fit.

The bushings 6 also have enlarged externally threaded portions 8 which are adapted to be engaged by internal threads on the cup-shaped hoods or covers 9, which further serve to protect the valve from injury.

It will be seen from Figure 3 that the valve is arranged near the edge of the head where the concave head is inclined somewhat from the vertical, so that the valve itself extends outwardly and downwardly away from the chime 10, thus facilitating access to the valve; while the valve at its inner end is directed outwardly toward the periphery in the direction from which the flow of liquid or gas is to take place. A short pipe 11 extends inwardly from the valve toward the periphery of the drum, stopping short of the periphery as shown. In present tank construction, the pipes corresponding to pipes 11 are not connected directly to the valve, but on the contrary attached to the heads of the tank. It has been found in practice that the pipes corrode and break off or become clogged, and when this happens it is impossible to replace the pipes, without removing the heads, and it is not feasible to remove the heads. In the present construction, the pipes being connected with the valves may be removed when the valves are removed. The pipes are shown as curved, although it is obvious that they might be straight. The curve facilitates the withdrawal through the bushing, and when curved, the radius of the curve should be such that the pipes may be easily withdrawn through the bushing. By arranging two valves in the manner shown, provision is made for drawing off the liquid from the bottom of the drum, or the gas and vapor from the top of the drum, so that either the liquid or the gas can be withdrawn as desired, until substantially the entire contents of the drum are removed.

The arrangement of the valves near the periphery of the drum greatly reduces the length of the short pipes and insures that these pipes will connect with the interior of the drum near its periphery, while danger of clogging is reduced to a minimum by the short length of the pipes.

The bushing 7 can be spot welded to the head 3 as indicated, for example, at 12 in Figure 3, so that accidental turning and removal of the bushing is prevented, and so that the bushing becomes, in effect, an integral part of the head.

The arrangement of the valves in the manner illustrated is such that they are protected by the overhanging and inwardly extending chime 10, but so that they are, nevertheless, readily accessible. The provision of the hoods or covers 9 further protects the valves from injury. The provision of separate valves at diametrically opposite portions of the head enables either valve to be used without disturbing the other and enables either valve to be used as either the top or bottom valve by rotating the drum through 180 degrees.

It will thus be seen that the present invention provides an improved container with valve arrangements for utilizing the contents of the container with a minimum danger of injury to the valves during transportation. The construction is also one which can readily be applied to drums already made without special provision of enlarged or thickened portions of the head for the application of the valves thereto. The construction of the heads themselves can, therefore, be simplified and made less expensive in that the heads can be made of sheet metal of uniform thickness. The bushing might be dispensed with, in which case the valve will be engaged directly with the head, and means can be provided for engagement by the hood to hold the hood in place.

I claim:

1. A container for liquefied gases having a dished head and a chime extending beyond the head, the head having one or more projections beyond its outer surface near its junction with the cylindrical wall of the container, an internally threaded bore through each such projection, a valve screwed into the bore, the valve having its operating mechanism lying beyond the end of the projection and having a pipe extending through the bore into the container to a point near the wall of the latter, and a cap for enclosing and protecting the valve removably mounted on the projection.

2. A container for liquefied gases having a dished head and an overhanging and inwardly extending chime, one or more threaded openings in said head near the periphery thereof, a bushing screwed into each opening and having a portion lying beyond the head, a valve screwed into the bushing, this valve having a pipe extending through the bushing into the container to a point near the cylindrical wall thereof, the operating mechanism of the valve lying beyond the head, and a cap for enclosing and protecting the exposed parts of the valve

removably mounted on the portion of the bushing which lies beyond the head.

3. A container for liquefied gases, having a dished head and a chime extending beyond the head, said head having tapered internally threaded openings at diametrically opposite parts of the head, tapered bushings threaded into the openings, and valves engaging the bushings, each valve having a pipe extending inwardly therefrom through the bushing to near the periphery of the container, said openings and valves being near the chime and arranged to be protected thereby, each bushing having an externally threaded portion outside the head and a cover for the valve threaded on to said portion.

4. A container for liquefied gases having a dished head and a chime extending beyond said head, said head being provided with one or more projections extending beyond its outer surface near the junction with the cylindrical wall of the container, these projections being integrally united to the head, an internally threaded bore through each such projection, a valve mounted in the bore, this valve having its operating mechanism lying beyond the end of the projection and having a pipe extending through the bore into the container to a point near the wall of the latter, a screw thread formed on the exposed portion of the projection, and a cap screwed onto said screw thread and serving to enclose and protect the exposed part of the valve, the cap terminating within the edge of the chime.

5. A container for liquefied gases having a dished head and a chime extending be-

yond the head, said head having one or more projections of increased thickness near its junction with the cylindrical wall of the container, an internally threaded bore in each projection, a removable valve threaded into each bore and having attached thereto a pipe extending through the bore and into the container to a point near the cylindrical wall of the latter, a screw thread formed on the wall of the projection around the bore, and a cap screwed onto the thread and serving to protect the exposed part of the valve, this cap in turn terminating within the edge of the chime so as to be protected by the latter.

6. A container for liquefied gases having a dished head and a chime extending beyond the head, threaded openings formed in the head near the periphery thereof, a bushing having two sets of threads on its outer surface mounted in each opening, with one set of threads engaged in the threads of the opening, that portion of the bushing carrying the other set lying beyond the face of the head, a threaded bore extending through the bushing, a valve threaded into the bore with its operating mechanism lying beyond the end of the bushing, this valve having a pipe rigidly secured thereto extending through the bore and into the container to a point near the wall thereof, and a cap for enclosing and protecting the exposed parts of the valve threaded on the second set of threads of the bushing, this cap terminating at a point within the edge of the chime.

In testimony whereof I affix my signature.
MAX MAURAN.