May 18, 1926. 1,584,854

C. DILL ET AL

LIQUID CONTAINER

Filed Oct. 6, 1923 2 Sheets-Sheet 1

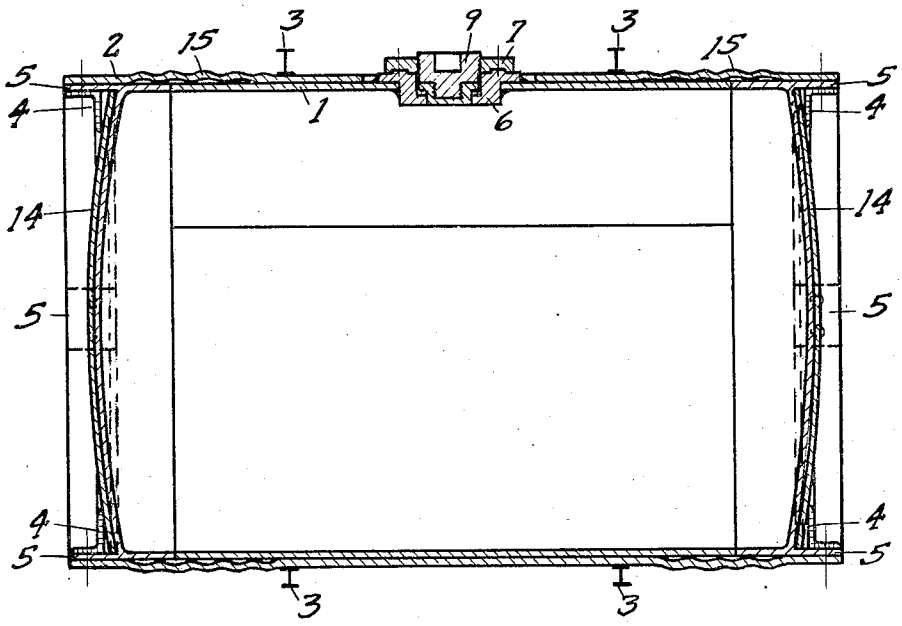


FIG. 1

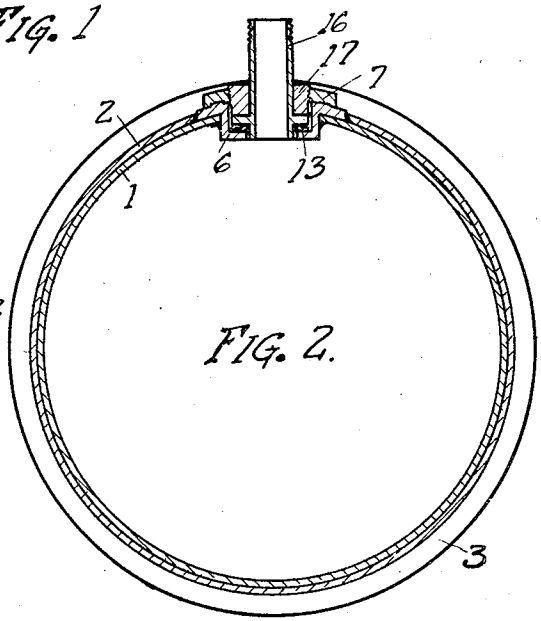


FIG. 2.

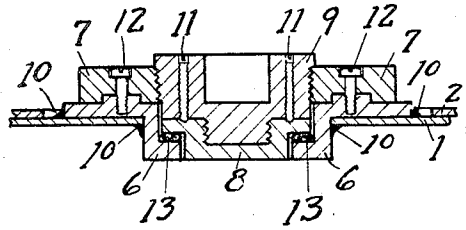


FIG. 3

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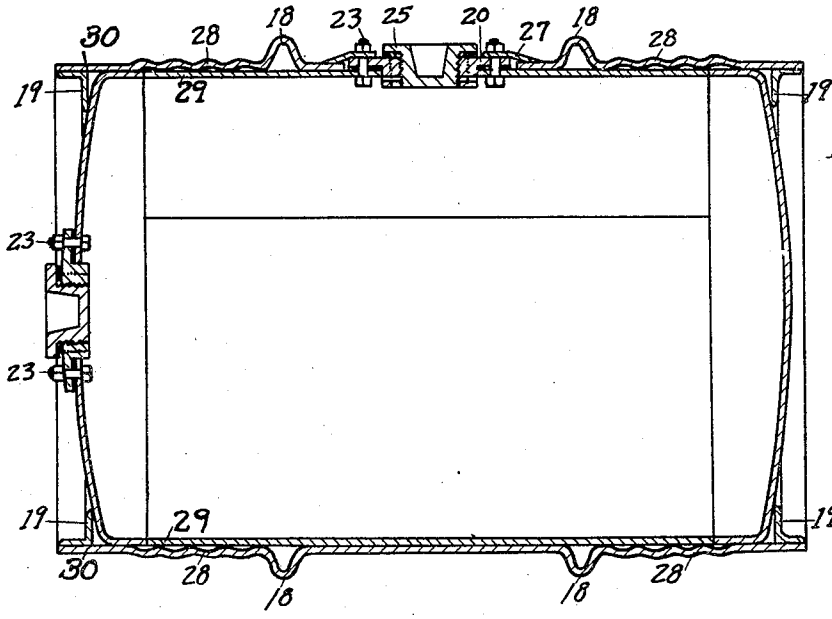


Fig. 4.

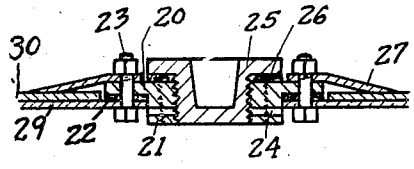


Fig. 6

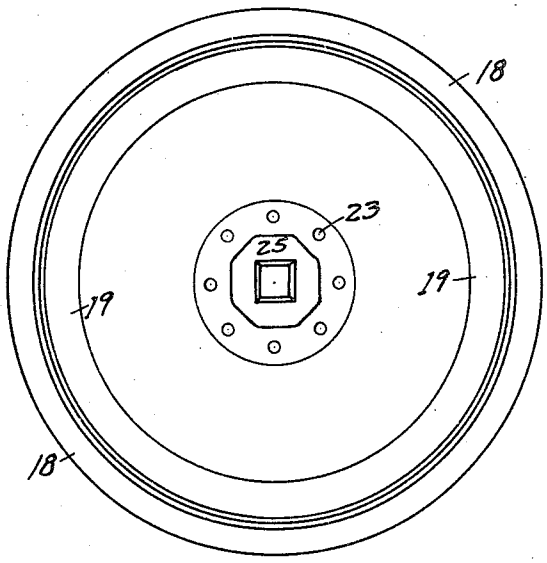


Fig. 5

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Patented May 18, 1926. 1,584,854

UNITED STATES PATENT OFFICE.

COLBY DILL, OF WOODBRIDGE, AND LESTER MARIUS WHITE, OF PERTH AMBOY, NEW JERSEY, ASSIGNORS, BY MESNE ASSIGNMENTS, TO THE ROESSLER & HASSLACHER CHEMICAL COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

LIQUID CONTAINER.

Application filed October 6, 1923. Serial No. 666,886.

This invention relates to liquid containers and method of constructing same, such as are used to carry liquids in considerable quantity, for example, in quantities of 50 gallons or more. The object of our invention is to provide a container which shall possess all the advantages inherent in the various types of such containers now known and avoid certain disadvantages inherent in them.

As examples of liquids for which this package is particularly adapted, we will specify nitric and acetic acids. Manifestly the package which is adapted to carry these liquids may be used for a large variety of liquids and we do not limit our invention to its use for any particular liquid.

Nitric acid is a commodity which is widely used as a raw material in the manufacture of chemicals and in other industries. It is extremely corrosive to most metals and to all organic products, such as wood or fiber. Under these circumstances, the problem of procuring satisfactory containers has been a difficult one.

Hitherto, the only container which it has been possible to use has been the glass carboy. The glass carboy is bulky, heavy, fragile, and of limited capacity. These disadvantages are so serious that carboys are only used as shipping containers when no other suitable containers are available.

As a consequence of the fragile nature of the carboy many drastic rules have been promulgated in regard to its use with a view not only of minimizing breakage, and loss of acid, but also of protecting other freight.

Acetic acid has been shipped in carboys and in containers made of selected white oak of the best quality, sawed from the heart wood of the tree. Before use, these barrels are coated on the inside with molten paraffin. Barrels of this type though widely used are subject to well known disadvantages. They are expensive and even when constructed with the greatest care they permit loss of the contents by absorption and leakage. This loss is the occasion of serious annoyance and may become prohibitive in case of long distance shipments unless the barrels are from time to time recoopered while in transit. Moreover, the porous nature of even the best quality of wood coated with paraffin causes a direct loss of the contents by reason of the absorption of the material by the wood.

A more serious objection to this type of container is that white oak of the necessary quality is becoming increasingly scarce.

It is found that the requisite qualities of freedom from attack from the aforementioned acids, lightness in shipping weight and necessary strength of container are combined in aluminum and light alloys thereof, which are now readily obtainable in sheet form for making the convenient cylinder shaped form herein illustrated, with impervious seams formed by welding.

The package which we have invented is intended to be constructed in sizes to contain 50 gallons and upwards and is superior in several respects to acid carboys or barrels hitherto employed for shipments of large quantities.

Our container is illustrated in the accompanying drawings in which:

Figure 1 is a section of the preferred form of our improved package.

Figure 2 is a transverse section.

Figure 3 is an enlarged detail.

Figure 4 is a section of alternative form of construction.

Figure 5 is the end view of the alternative form.

Figure 6 is an enlarged detail.

1 is the container of generally cylindrical form made of sheet aluminum by stamping or spinning, etc. wherein any seams will be integrally closed by welding so as to produce a unitary container. 2 represents a casing comprising a cylinder in which the container 1 frictionally fits and having external stiffening and rolling hoops 3. To each end of the container 1 are provided aluminum lugs 5 welded to it. These lugs 5 if desired may be replaced by an aluminum ring welded to each end of the container 1. The casing is also provided with corrugations 15 which serve also as cushions to hold the inner container firmly in place in such manner that blows or shocks delivered to the casing are dissipated before being transmitted to the container.

The casing 2 may preferably be made of steel which may be further protected by

coating with zinc, tin, paint, or other corrosion resisting material.

The ends of the casing are closed by steel circles 14 suitably attached to angle irons 4. The angle irons 4 may be riveted or spot welded to the ends of the casing. The casing is provided with a suitable hole for the bung and bushing to project through.

6 is an aluminum bung bushing welded to the container 1 at 10. 7 is a ring of brass or other suitable material fastened to the aluminum bushing 6 as by cap screws 12. The cap screws may be prevented from turning by soldering to the brass ring after insertion. 8 is an aluminum end cap threaded to the bung 9 which may be of brass or other material. The aluminum end is prevented from turning relative to the bung by any suitable means such as counter-sunk set screws 11 which also may be prevented from turning by soldering to the bung after insertion. A gasket 13 made of a piece of thin sheet aluminum having a U-shaped cross section filled with asbestos completes the joint. It is known that threaded articles made of aluminum when screwed together heat very materially and tend to "seize". In unscrewing such pieces enough force may be required to strip the threads or otherwise damage them. The objects of a bung bushing and bung of this character are to provide a closure that will be able to withstand the wear and tear on the threads incident to the repeated use of a container of this sort and at the same time prevent the contents from coming in contact with any metal other than aluminum.

16 is a removable aluminum spout seating on the bushing gasket 13 and provided with a fastening nut of brass or other metal which fits into the bushing threads. The upper end of the spout is threaded for connection to usual drum discharging apparatus. The object of this spout is to facilitate emptying the drum without the contents coming in contact with the upper part of the bung bushing or the casing.

In assembling, the container 1 is completely fabricated including welding thereto the aluminum part of the bung bushing 6 and the lugs 5 (or an aluminum ring if it is desired to use it in place of the lugs). In making the two concentric welds 10 which secure the bung bushing 6, the aluminum sheet surrounding the bung bushing becomes annealed from the heat of the welding. This permits the bung bushing 6 being driven into the container so that its upper edge is flush with the surface thereof without cracking or otherwise injuring the container. With the bushing 6 in this position the container is pushed into the casing 2 until the lugs 5 are flush with the ends of the casing, the bushing in the container and the hole in the casing being concentric. The end rings 4 are then fastened in place as by putting rivets through the casing, lugs, and end rings. The bung bushing 6 is then pulled out to its original position by means of a hook and the brass part 7 placed into position secured by the fastenings 12. The lugs 5 being fastened by means of the end rings 4 prevents both longitudinal and rotational movement. The package can now be filled and the bung applied and sealed in a known manner. The casing when ready to receive the container is galvanized and protectively coated inside and out and the end rings are similarly protected so that there is nothing to rust or corrode.

The container as described above is capable of successfully withstanding the most severe conditions a liquid container may be called upon to meet. Where conditions are less severe such as when the container is used for other than acid liquors, an alternative form as shown in Figs. 4, 5, and 6 may be entirely suitable. As an example of a liquid which may be suitably shipped in this alternative form we specify formaldehyde solutions.

29 is a container of the same shape and construction as 1. 30 is a casing corresponding to 2 in Fig. 1. Owing to the thickness of the material of which the container 1 may be made the ends of the casing need not be closed by circles 14 in Fig. 1 nor need the lugs 5 be provided. The ends of Fig. 4 being shown open and the container secured in position by means of angle iron rings 19 only. Rolled in rolling hoops 18 may be provided in place of I beam rolling hoops 3. Both the container and casing are provided with holes in the side which will register in close contact when the container is pushed into the casing and abuts one of the end rings 19. These holes are closed by a bung bushing and the bung shown in detail in Fig. 6, wherein 20 represents the bung bushing, 22 a gasket which fits in a larger hole in the casing 30 so as to rest on the container 29 and 23 represents the fastenings which fasten the bushing to the container. 25 represents the bung with square socket hole screwed in the bushing 20 against the gasket 26. The thickness of metal in the bung bushing 20 may preferably be great enough to permit having one or more new threads being tapped into the bushing 20 as at 21 when the original thread becomes worn. It is understood that when larger threads are installed a larger bung will be required. 24 represents holes drilled through the bushing 20 in line with the inside wall of the container 29 to permit easy and complete emptying of the container. 27 represents an apron fastened to the bung bushing 20 by means of the same fastening 23 as secured the same bushings to the container which extends over the outer shell 30

in order to prevent the outer shell from riding over the bung and bushing.

In assembling, the container 29 is pushed into the casing 30 until it strikes one of the end rings 19, with the holes in the casing and container concentric. Then the bushing and gasket are applied (the bung being removed) and the fastenings 23 inserted through the fastening holes in the container and the fastening holes in the bushing and flange, and externally fastened as by nuts. When this is completed the other end ring 19 is applied and fastened, so that the end rings hold the container against longitudinal movement and the bushing flange and apron prevent rotation. The package can now be filled and the bung applied and sealed in a known manner.

The casing when ready to receive the container is galvanized or otherwise protectively coated inside and out, the end ring last to be applied being also similarly protected so that there is nothing to rust or corrode.

This application is a continuation in part of our application, Serial No. 419,567, filed October 26, 1920.

We claim:

1. A liquid container and an outer protecting casing therefor, each provided with substantially concentric holes therethrough, the casing hole being enlarged about the container hole, a bushing secured on said container in said casing hole and extending into said container, and a bung secured in said bushing.

2. An aluminum liquid container and an outer protecting casing therefor of harder metal, an aluminum bushing extending about a filling hole in the container, a bung of harder metal than aluminum provided with a non-corrosive inner surface, and means also of said harder metal for securing said bushing and said bung.

3. An aluminum liquid container and an outer protecting casing therefor of harder metal, an aluminum bushing extending about a filling hole in the container, a bung of harder metal than aluminum secured in said bushing and provided with an aluminum inner surface, and rolling hoops projecting outwardly from the casing to protect the bung and bushing.

4. An aluminum liquid container and an outer protecting casing therefor of harder metal, an aluminum bushing extending about a filling hole in the container, a bung of harder metal than aluminum secured in said bushing, and rolling hoops projecting outwardly from the casing to protect the bung and bushing, said bung being provided with an aluminum lower end portion, the connection between said aluminum bushing and aluminum portion of the bung being liquid tight.

5. An aluminum liquid container having a filling opening, an aluminum bushing on said container extending in the opening, a ring of harder metal secured to the bushing, a bung threaded into said ring of harder metal and being provided with an aluminum end portion, the connection between said aluminum bushing and aluminum portion of the bung being liquid tight.

6. An aluminum liquid container provided with a filling opening in the side of the container, a bung for said opening, a casing of harder metal than aluminum enclosing the container and having an opening larger than said bung and spaced therefrom, and angle irons at the ends of the container and casing inside the casing and outside the container end wall for preventing relative rotation of the container within the casing.

7. An aluminum liquid container provided with a filling opening therein, an aluminum bushing secured on the container and extending into said opening with an inwardly extending flange on the lower portion of said bushing, a shouldered aluminum member adapted to rest on the bushing flange, and means of harder metal than aluminum for retaining said shouldered member in the bushing, and comprising a metal harder than aluminum secured to said shouldered aluminum member.

Signed at Perth Amboy, in the county of Middlesex, and State of New Jersey, this fourth day of October, A. D. 1923.

COLBY DILL.
LESTER MARIUS WHITE.