

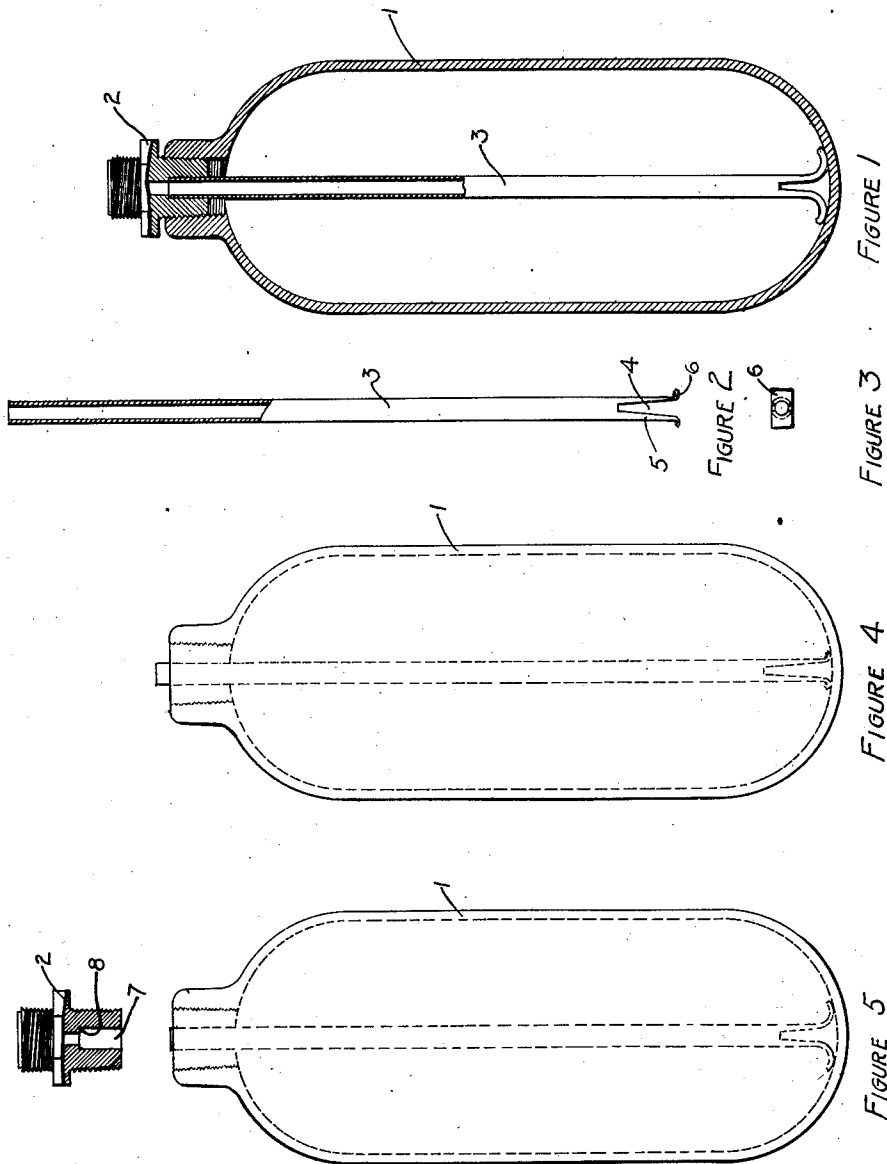
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CONTAINER FOR PRESSURE PROPELLED LIQUIDS

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CONTAINER FOR PRESSURE PROPELLED
LIQUIDS

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4 Claims. (Cl. 220—85)

This invention relates to containers of the type in which a liquid is stored under the pressure either of its own vapor or of some other pressure medium and which is to be discharged for some useful purpose, e. g., for extinguishing fires, such containers normally being discharged in an upright position and having a valve or other closure member at the top thereof and a tube connected with the valve and dipping below the surface of the liquid in the container to a point near the bottom thereof.

It is generally known to those skilled in the art that commercial containers of the type employed for this purpose vary considerably both in external height and in internal depth, so that it has become common practice to manufacture dip tubes of a proper length for use with the container of least internal depth likely to be encountered in practice, so as to insure free access of the liquid to the lower ends of the dip tubes. While it would be advantageous in each case to have the dip tubes come as close as possible to the bottoms of the containers, so as to remove as great a proportion of the liquid as possible, the reason for the foregoing practice will be readily appreciated when it is considered that the manufacturing cost would be increased by individual fitting of the dip tubes.

Although the practice above-referred to has been found to be generally satisfactory, the use of such containers in places where the element of vibration is encountered, as on aeroplanes, motor boats and the like, has resulted in breaking off of the dip tubes at the points where they are connected to the container valves, such action, of course, resulting in rendering the dip tubes ineffective for the purpose for which they were intended. In this connection it is believed that the effect of vibration on an otherwise unsupported dip tube is to cause crystallization of the dip tube at its single point of support where it is connected with the container valve, the dip tube gradually weakening ultimately breaking off under the action of continued vibration.

The present invention proposes to overcome this difficulty caused by vibration by supporting the dip tube additionally on its lowermost end, and it is accordingly an object of the present invention to provide a dip tube capable of being supported in a container at its end remote from its point of connection with the container valve so that it cannot be broken by vibration.

It is another object of the invention to provide a dip tube of the type referred to which is capa-

ble of being employed in commercial containers of varying internal depths.

It is a still further object to provide a dip tube which is capable of accomplishing the desired result without any modification being required in the commercial container in which it is used.

The invention will now be described in greater detail in connection with the accompanying drawing, wherein:

Figure 1 is a view in longitudinal section showing a container and a dip tube assembled therein.

Figure 2 is a view, partly in section, of a dip tube as formed prior to assembling.

Figure 3 is a view looking at the cleft end of the dip tube of Figure 2.

Figure 4 is a view illustrating with the aid of dotted lines the first step in the process of assembling a container and a dip tube.

Figure 5 is a view similar to Figure 4 showing the second step in the process of assembling.

Referring to Figure 1 of the drawing, 1 represents a container, such as is employed, for example, for the storage of liquid carbon dioxide. The reference numeral 2 represents any suitable closure member adapted to cooperate with the container 1 to retain a pressure propelled liquid therein and to release the liquid when desired, while 3 represents a dip tube or syphon tube, as it is commonly known, for permitting the discharge of the liquid through the closure member under the influence of the pressure in the container.

Until the advent of the present invention, the practice was to initially secure the dip tube in the closure member, cutting off the dip tube to a length such that it would clear the bottom of the container when the closure member was assembled in the container, so as to provide for free entry of the liquid within the dip tube. The result of such practice has been that, when the containers are subjected to more or less severe vibration, as is encountered on aeroplanes, motor boats and the like, continued movement of the free end of the dip tube has caused crystallization of the metal of the tube adjacent its point of support in the closure member, causing gradually weakening and ultimate breaking off of the dip tube at or near this point under the continued vibration. Such action, of course, renders a dip tube ineffective for the purpose for which it is intended.

The present invention overcomes this difficulty by providing a dip tube (Figure 2) cleft or slotted at its lower end, as shown at 4, so as to form two

or more lips or prongs 5, which are preferably turned outwardly to some extent, as shown at 6.

The dip tube is made of a length somewhat greater than the internal depth of the container (Figure 4), and, the dip tube being placed within the container as shown, the upper end of the tube is tamped or hammered so as to spread the lips 5 against the bottom of the container until the top of the tube is practically flush with the top of the container (Figure 5), the top of the tube being preferably left at this stage slightly above the top of the container so as to permit easy engagement of the closure with the tube.

The closure member 2 (Figure 5), having been formed with a bore 7 of a diameter adapted to receive the upper end of the dip tube with a fairly close fit and of a depth such that the shoulder 8 will engage the upper end of the tube before the assembly is complete, is then made up into the container to the required degree of tightness against leakage, the engagement of the shoulder 8 with the tube causing further spreading of the lips 5 against the bottom of the container, with the result as shown in Figure 1.

With this construction the lower end of the dip tube is held securely against movement, at the same time that free entry of the liquid within the tube is provided for, and the result is that the dip tube will not break off near its point of connection with the closure member when subjected to more or less severe vibration.

It will also be seen that the construction provided is such that no alteration is required in the container itself, and that a given length dip tube can be used in any container whose internal depth varies, but within known commercial limits from a given standard size, as the degree of spreading of the lips on the lower end of the tube is immaterial.

It will of course be understood that the invention has been described with reference to a preferred embodiment thereof; but it will be further understood that various modifications may be made within the spirit of the invention, both in respect of the formation of the lower end of the dip tube and in respect of the method of securing the upper end thereof within the closure member. Still further, variations within the scope of the invention are possible in the steps by which the final assembly is accomplished. Accordingly, the invention is not to be limited save as defined in the appended claims.

I claim:

1. The combination with a container for a liquid medium stored under the pressure of its own vapor or of some other pressure medium and having an open end and a closure therefor, of a dip tube within the container supported at one end on the closure member and at the other end

on the bottom of the container, said dip tube being adapted to be driven against the bottom of the container by the application of the closure to the container and having its lower end cleft to form a plurality of lips, whereby application of the closure to the container will drive the lips against the bottom of the container, causing them to deform and securely hold the dip tube in contact with the container.

2. The combination with a container for a liquid medium stored under the pressure of its own vapor or of some other pressure medium and having an open end and a closure therefor, of a dip tube within the container supported at one end on the closure member and at the other end on the bottom of the container, said dip tube being adapted to be driven against the bottom of the container by the application of the closure to the container and having its lower end cleft to form a plurality of lips, said lips being curved outwardly with respect to the axis of the dip tube, whereby application of the closure to the container will drive the lips against the bottom of the container, causing them to spread and to securely hold the dip tube in contact with the container.

3. A dip tube for use in connection with a container of a liquid medium stored under the pressure of its own vapor or of some other pressure medium having one end adapted to be supported in the closure of the container and the other end cleft into a plurality of lips curved outwardly with respect to the axis of the dip tube and of a length such that application of the closure to the container will cause the tube to be securely held between the closure and the bottom of the container.

4. The combination comprising a container for a liquid medium stored under the pressure of its own vapor or of some other pressure medium, said container having an open end and a closure for the open end, and a dip tube adapted to be secured against movement in said container and connectible with the closure for conveying the liquid medium to the closure, said dip tube being cleft at its lower end to form lips, said lips being curved outwardly with respect to the axis thereof, and said dip tube being of a length such that it will project beyond the open end of the container when inserted therein, the said closure member being adapted to receive and engage the upper end of the dip tube when the closure is inserted in the container so as to spread the lips at the lower end thereof whereby the dip tube will be firmly held in contact with the container upon completion of the engagement of the closure with the container.

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