March 19, 1963 M. QUERCIA 3,081,802

CONTAINER FOR FLUIDS UNDER PRESSURE

Filed May 4, 1960

Fig. 3.

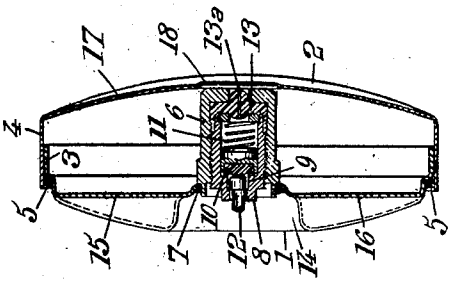


Fig. 2.

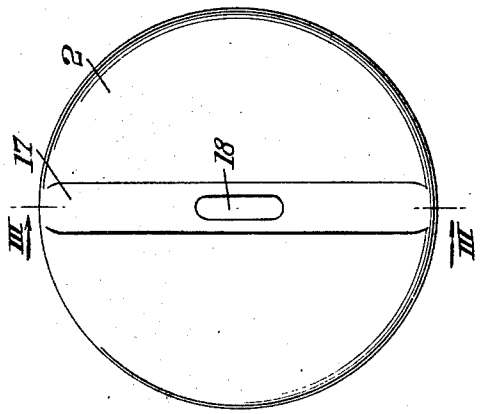
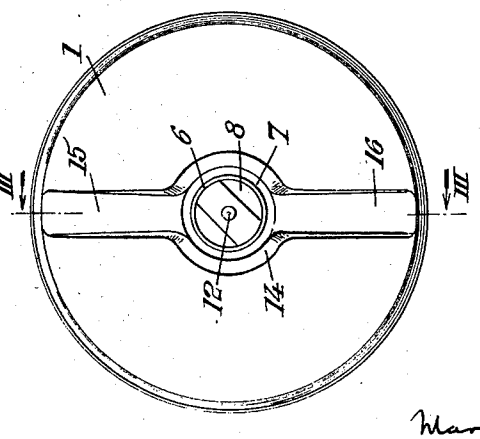


Fig. 1.



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CONTAINER FOR FLUIDS UNDER PRESSURE

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This invention relates to containers for fluids under pressure and more particularly for liquefied gases, as for instance combustible gas containers used in gas lighters.

The primary object of this invention is to reduce the manufacturing cost of such containers.

In accordance with the present invention a container of the above-mentioned type is formed of two flat cups with their rims in mutual gas-tight interfitting engagement and with the inner sides of their bottoms facing each other to provide a box-like assembly, the bottom portions of these cups having in any direction a dimension greater than the depth of the cups, while the bottom portion of one of the cups is provided with a device adapted to form a gas outlet, but which may also serv for charging the container.

In the annexed drawings:

FIGS. 1 and 2 are top and bottom plan views of a container according to this invention.

FIG. 3 is a section thereof taken along line III—III of FIGS. 1 and 2.

The container illustrated comprises two flat cups having a preferably bulging bottom portion, respectively **1** and **2**, and a circular edge or rim, respectively **3** and **4**, the height of this edge or rim being only a fraction of the dimensions of the said bottom portion, and the outer diameter of the rim **3** of the first cup being substantially equal to the inner diameter of the second cup. These cups **1**, **3** and **2**, **4** are assembled by engaging the rim **3** of the first one into the rim **4** of the second one, so as to form a box-like unit.

Owing to their flat conformation, as above-mentioned, the cups may be established in a particularly inexpensive manner by merely cutting and pressing a metal sheet. After the assembling operation by mutual interfitting engagement of their rims **3** and **4**, as described, the cups are secured to each other in a gas-tight manner by soldering, as for instance by a circular endless line of solder **5** disposed between the edge of rim **4** and the portion of rim **3** adjacent to the corresponding bottom portion **1** of the first cup. As indicated the rim **3** of the first cup **1**, **3** has preferably a zone of somewhat reduced diameter adjacent the corresponding bottom portion **1**, so as to form an intermediate shoulder, and the edge of the rim **4** of the second cup is disposed beyond this shoulder. There is thus formed between rims **3** and **4** a circular groove of small cross-section and the line of solder **5** fills this groove. The soldering operation is thus quite easy.

Further, one of the cups, preferably cup **1**, **3** which has the smaller rim diameter to fit into the second cup **2**, **4**, is provided with a gas outlet device **6** which may also serve as a gas charging device for the container.

Although this device may be of very simple construction (as for instance formed of a mere resilient perforatable plug or diaphragm) it is of particular advantage in the case of a gas lighter to provide same with a gas pressure regulator and preferably a valve, the whole unit thus obtained extending lengthwise, in perpendicular relation with respect to the circular cross-section of the container and taking advantage of the full axial height of the latter.

The said device **6** is conveniently disposed substantially with its full length within the container, its outlet

end being soldered to the edge of a central opening provided in the bottom portion **1** of cup **1**, **3**, as indicated at **7**. Here again the solder line **7** is disposed in a circular groove determined by the outwardly projecting end of socket **6** and by an inwardly depressed annular zone of reduced width provided in the bottom portion **1** around the central perforation thereof.

It will be appreciated that both solder lines **5** and **7** are exterior to the container and on the same side thereof, whereby the soldering operation is particularly easy.

The outlet device **6** is in the form of an internally screw-threaded socket to receive a correspondingly screw-threaded member **8** having in its outer end a central opening **9** the edge of which forms a seat for a valve **10** applied thereon by a spring **11**. Valve **10** is actuated against spring **11** by a pusher rod **12** which protrudes outwardly in such a manner that when it is itself pushed from the outside, it displaces valve **10** from its seat, thereby permitting exhaust of gas from the container. A pressure regulator is disposed at the other or inner end of the member **8**, upstream with respect to valve **10**, such regulator comprising a disc **13** made from a resilient material. This disc **13** is axially perforated, as indicated at **13***a*, to provide a gas passage in combination with a hole in the bottom of socket **6**. The effective cross-sectional area of the perforation **13***a* of disc **13** may be varied by more or less compressing the said disc between the inner end of member **8** and the bottom of socket **6**.

The above-described device may conveniently be mounted in a central depression **14** provided in the bottom portion **1** of the first cup. This central depression **14** extends preferably towards the outer edge of the said bottom portion in the form of radial grooves **15**—**16** disposed in line with each other to provide a straight-line valley-like passage. The lateral walls of the depressions or grooves **14**, **15**, **16** impart the desired rigidity to bottom portion **1** and they also prevent pusher rod **12** from being unwillingly actuated. The said passage may further accommodate the valve actuating members and the connecting means provided between the gas outlet of the container and the burner of the lighter, not illustrated.

It is also convenient to provide in the bottom portion **2** of the second cup a stiffening diametral groove **17**, FIG. 2 which further permits to retain the container in position during some of the manufacturing operations and/or during its filling.

There is preferably provided in the bottom portion **2** of the second cup, as for instance by pressing, an inner groove **18** which is smaller in width and greater in length than the diameter of the adjacent end of socket **6**, this groove leaving in any case a free passage for the gas between the inlet end of perforation **13***a* and the adjacent wall of the container, even when the central zone of the bottom portion **2** is applied against the inner end of the socket.

In some cases the inner space between the cups, or effective volume of the container, may be filled with an absorbent material, as for instance cotton, which may serve for preventing liquid butane gas from moving freely within the container.

In the embodiment described both cups are metallic and they are assembled and sealed by soldering. But one cup could be made of metal and the other one of plastic material, the rim of the metallic cup being curled on the edge of the bottom of the plastic cup. Alternatively both cups could be made of plastic material, sealing being obtained by electric welding.

In a further modification the cup which comprises the gas outlet (and which may be the cup of smaller diameter, as in FIG. 3, or the cup of larger diameter) may be formed as a single part together with the socket

6. It is of advantage in this case to realize this single component of the container in a plastic material by an appropriate molding process.

Owing to their quite reduced manufacturing cost the containers according to this invention may be rejected after use and replaced by a fresh container, instead of being re-filled.

I claim:

1. A container arrangement for gas under pressure comprising, in combination, a first cup-shaped member having a peripheral wall and a bottom wall substantially in the form of a spherical segment; a second cup-shaped member having a bottom wall substantially in the form of a spherical segment and a peripheral wall overlapping and fluid tightly joined to the peripheral wall of said first cup-shaped member to form a closed container therewith, one of said bottom walls being formed with a central depression extending inwardly in said container and being formed at the bottom thereof with an opening and said one bottom wall being formed with a pair of external radial grooves extending from said depression in opposite directions substantially up to the periphery of said container, said bottom walls extending in any transverse direction substantially farther than the height of said peripheral walls and said members being formed from sheet material; and gas outlet means comprising a housing fluid tightly connected at one end thereof to said one bottom wall about said opening and having a shoulder engaging the inner face of said one bottom wall, said housing extending from said connected end up to the other bottom wall, a valve carried in said housing in the region of said one end thereof, and fluid regulating means carried in said housing in the region of the other end thereof, said valve being openable upon exertion of pressure in direction toward said other bottom wall, whereby said housing fixed to said one and abutting against the other of said bottom walls will positively determine the distance between said bottom walls.

2. A dispenser for compressed gas comprising, in combination, an elongated gas outlet unit having opposite end faces and an outlet opening in one of said end faces, said gas outlet unit having a reduced gas outlet portion at one end thereof forming a shoulder between itself and the remainder of said unit; a first substantially cup-shaped container member having a first bottom wall and a first annular rim portion, said first bottom wall being formed with an aperture having a cross-sectional area larger than the cross-sectional area of the reduced gas outlet portion but smaller than the cross-sectional area of said remainder of said elongated gas outlet unit; and a second substantially cup-shaped container member having a second bottom wall and a second annular rim portion, said container members engaging each other along said annular rim portions thereof with said gas outlet unit located therebetween and said reduced gas outlet portion protruding through said aperture in said first bottom wall of said first container member and the other end of said gas outlet unit abutting against the inner face of said second bottom wall of said second substantially cup-shaped container member, said elongated gas outlet unit thus being located within said assembled container members irremovable without disassembly thereof and firmly spacing said bottom walls and thereby said container members at a predetermined distance from each other.

3. A container for compressed gas comprising, in combination, a first cup-shaped member having a first bottom wall and a first rim portion; a second cup-shaped member arranged opposite said first cup-shaped member and having a second bottom wall and a second rim portion telescopically engaging said first rim portion, said second bottom wall having an opening therein; and gas outlet means including a housing fixed to said second bottom wall and extending into said opening thereof at one of its ends, said housing having a shoulder thereon adjacent said one end thereof for engaging said second bottom wall inside said container, and said housing extending through said container and engaging said first bottom wall, whereby the distance between said first and second bottom walls and the depth of the telescoping engagement of said first and second rim portions are positively determined by the distance from said shoulder of said housing to said other end of said housing.

4. A container arrangement for gas under pressure comprising, in combination, a first cup-shaped member having a first bottom wall and a first rim portion; a second cup-shaped member having a second bottom wall and a second rim portion telescopically engaging and fluid-tightly joined to said first rim portion to form a container with said first cup-shaped member, said second bottom wall being formed with a central opening therein, said bottom walls extending in any transverse direction substantially farther than the height of said rim portions, and both of said cup-shaped members being formed from sheet material; and gas outlet means including a housing fixed to said second bottom wall and extending into said opening thereof at one of its ends, said housing having a shoulder thereon adjacent said one end thereof for engaging said second bottom wall inside said container, and said housing extending through said container and engaging said first bottom wall, whereby the distance between said first and second bottom walls and the depth of the telescoping engagement of said first and second rim portions are positively determined by the distance from said shoulder of said housing to said other end of said housing.

5. A container arrangement as set forth in claim 3, in which said second rim portion is inserted in said first rim portion so that the area of junction is accessible from that side of the container where said housing extends into said opening in said second bottom wall, whereby said rim portions may be secured to each other and said housing may be secured to said second bottom wall from the same side of said container.

References Cited in the file of this patent

UNITED STATES PATENTS

1,572,727	Kerr	Feb. 9, 1926
2,302,505	Rayniak	Nov. 17, 1942
2,594,539	Brown	Apr. 29, 1952
2,695,508	Gruber	Nov. 30, 1954
2,836,044	Zellweger	May 27, 1958
2,989,091	Lowenthal	June 20, 1961

FOREIGN PATENTS

14,680	Great Britain	1913
855,792	France	Feb. 26, 1940