Aug. 15, 1961 L. D. MITCHELL ET AL 2,996,213

CONTAINERS

Filed Sept. 10, 1958

Fig.1.

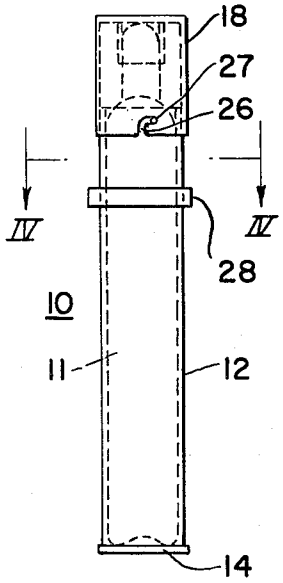


Fig.2.

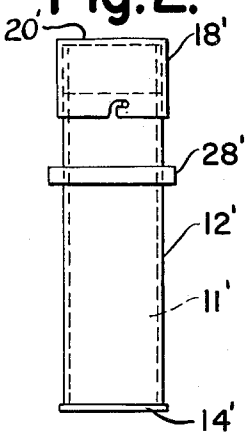


Fig.3.

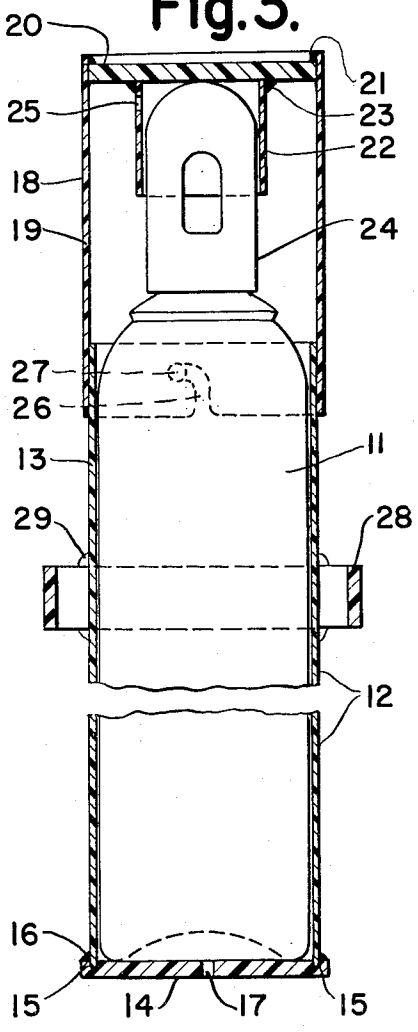


Fig.4.

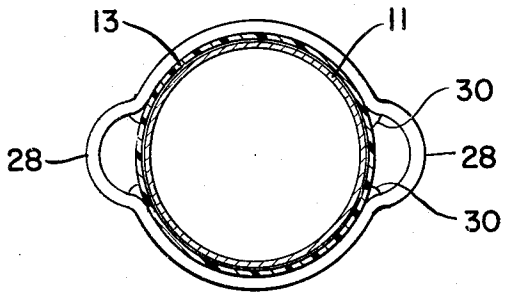
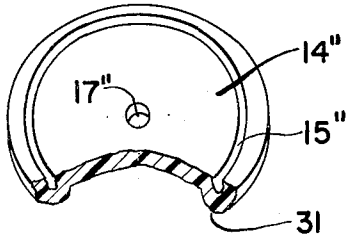


Fig.5.



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2,996,213

CONTAINERS

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1 Claim. (Cl. 220—9)

This invention relates to containers and particularly to non-sparking containers for use with compressed gas cylinders and the like.

It is a known fact that the transfer and storage of uncovered compressed gas cylinders in places laden with volatile dusts and gases is just as dangerous if not more dangerous than the actual use of such cylinders. This is so because in transferring or storing such cylinders in such places, as for example, in a coal mine, it is possible that the metal cylinders may come in contact with electric power lines or some other metal equipment or flinty substance and strike a spark with possible disastrous results. Whenever cylinders are used as in an acetylene torch in a mine, many necessary and expensive precautions are taken to prevent accidents from the flame. But in the transfer and storage of the cylinders in the mine these precautions are not taken because the expense involved would be too great. It is therefore desirable to cover the gas cylinders in a non-sparking container of a permanent nature. Prior containers have been made but have not been satisfactory for several reasons. First, wooden containers have been tried, but they are too easily subject to breakage and will rot in damp places such as a coal mine. Likewise leather and heavy cloth fabrics such as canvas have been tried and they too were unsatisfactory, being subject to both tearing and rotting. Non-sparking metals are prohibitive costwise and dipped or painted protective coatings have failed because they tend to chip off.

Our invention solves these problems in that it is non-sparking, durable and will not rot, and is constructed to facilitate ease of handling, storage, identification and operation without the necessity of removing the gas cylinder from the container.

We provide a base tube for the reception of the gas cylinder, and a cap tube closing over the base tube, the diameters of which are such as to provide as close a fit as is practicable with the gas cylinder placed therein, entirely constructed of a semi-rigid non-sparking material such as normal polyethylene.

Other details, objects and advantages of the invention will become apparent as the following description of a present preferred embodiment thereof proceeds.

In the accompanying drawings we have shown certain present preferred embodiments of the invention which:

FIGURE 1 is a front elevational view of a container according to this invention for compressed gas bottles and the like that have valve protector caps extending from the end thereof;

FIGURE 2 is a front elevational view of a container according to this invention for compressed gas bottles and the like that do not have valve protector caps extending from the end thereof;

FIGURE 3 is an enlarged fragmentary cross sectional view of FIGURE 1 with a compressed gas cylinder in full elevation;

FIGURE 4 is an enlarged cross sectional view taken on line IV—IV of FIGURE 1;

FIGURE 5 is a fragmentary isometric view of the base plate of a container according to another preferred embodiment of this invention.

Referring now to the drawings and in particular to FIGURES 1 and 3, we have illustrated a container **10**

with a compressed gas cylinder **11** of the extended valve protector cap type placed therein. Container **10** has a base tube **12** constructed of a hollow cylindrical base wall **13** closed at the end by base plate **14**. Base plate **14** is preferably constructed of comparatively heavy gauge stock relative to base wall **13**, as for example in a present preferred embodiment base plate **14** may be of ½ inch thick stock and base wall **13** of .150 inch thick stock. Base plate **14** has a well groove **15** cut therein spaced slightly inwardly from its outer circumference for the reception therein of the end to be closed of base wall **13**. The end of base wall **13** to be closed is placed in well groove **15** of base plate **14** and is welded about its circumference thereto at **16**. The diameter of base tube **12** is slightly larger, as for example in a present preferred embodiment ⅛ inch to ¼ inch larger, than the diameter of the cylinder to be placed in it. This prevents the cylinder from shifting or rocking within the container and further provides support to base wall **13** whenever pressure is applied to base wall **13** as for example when the container is picked up by a sling wrapped around base wall **13** of the container. A hole **17** is placed in base plate **14** to vent base tube **12**. Hole **17** prevents any difficulty arising from air entrapment in placing cylinder **11** in base tube **12** and also allows any moisture collected within base tube **12** to escape therethrough. Cap tube **18** is constructed of a hollow cylindrical cap wall **19** with a top plate **20** inserted to fill one end thereof and welded about its circumference thereto at **21**. Within cap tube **18** is a hollow cylindrical retainer tube **22** welded at one end about its circumference to top plate **20** at **23** so that the center axes of cap tube **18** and retainer tube **22** substantially coincide. The diameter of cap tube **18** should be slightly different from that of base tube **12** so that a close fitting sliding engagement between the two may be had. In a present preferred embodiment the diameter of cap tube **18** is slightly larger than the diameter of base tube **12** and therefore closely fits in a sliding engagement over the outside of base wall **13**, thus better preventing any moisture leakage into base tube **12** about the engaged openings.

The diameter of retainer tube **22** is just sufficient to allow valve protector cap **24** of cylinder **11** to enter therein. When container **10** with cylinder **11** in place is closed by placing cap tube **18** over base tube **12**, cylinder cap **24** is received within retainer tube **22**. Thus cap tube **18** is held in alignment with base tube **12** and may not be bumped or jarred askew or off of base tube **12**. To further assure that cap **18** may not become unintentionally disengaged from base tube **12**, we provide in a present preferred embodiment a locking means preferably of the bayonet type comprised of two inverted L-shape openings **26** on opposite sides along the edge of the open end of cap tube **18** for the reception of two pins **27** welded on opposite sides near the open end on the outside of base tube **12**. Thus by placing cap tube **18** over base tube **12** so that pins **27** coincide with and enter into openings **26**, and by then turning cap tube **18** clockwise to base tube **12** whereby pins **26** are trapped in the inverted L-shape of openings **27**, cap tube **18** is securely locked to base tube **12**. A hole **25** may be located in retainer tube **22** to eliminate air entrapment in retainer tube **22** as cylinder cap **24** enters therein which may otherwise make it difficult to close the container.

In a present preferred embodiment, we provide for ease of handling, handles **28**, which may be simply formed from a strip placed around base tube **12** and welded about its circumference thereto at **29** with a pair of loops **28**, one on each side, for handles. For added strength handles **28** should be positioned above the center of gravity of container **10** with cylinder **11** inside in its

standing position, so that there is no danger from tipping when the loaded container is picked up by handles **28**.

In another embodiment, as shown in FIGURE 2, cylinder **11'** is of the type that does not have an extended valve protector cap **24**, as for example acetylene torch cylinders, and thus eliminates the necessity of retainer tube **22** being placed within cap tube **18'**. Cap tube **18'** may be thus appreciably shortened and is firmly seated on base tube **12'** so that it may not be bumped askew or off of base tube **12'** by virtue of the fact that cap tube **18'** will slide down all the way over base tube **12'** until the open end of base tube **12'** is seated against the inside of top plate **20'** of cap tube **18'**.

In still another embodiment as shown in FIGURE 5, base plate **14''** may be a moulding of the configuration there shown. The advantage of this embodiment is that a heavy rim section **31** may be built up along the outer diameter portions of base plate **14''** where it is needed for strength and wear without the center portion thereof being of equal thickness when it is not needed; thereby saving unneeded material in said center portion. Well grooves **15''** and hole **17''** may either be cut in the moulding or may be moulded in the original casting which would provide additional saving in material.

The present preferred embodiments are made entirely of a semi-rigid plastic material such as normal polyethylene. This material is a non-conductor of electricity and will not spark upon contact with metallic flinty or other kinds of substances. Further this material may be readily welded and is available in all colors. Thus various color combinations are available for use in identification of the type of gas or other contents held by the cylinder within our container. As for example, for oxygen cylinders our container could be made of green colored polyethylene, for nitrogen cylinders it could be made of orange, for hydrogen—red, for acetylene—yellow, and so on.

Some other advantages of our container are that it is not subject to rust nor will it rot under damp conditions; in addition, it is tough and durable and will not shatter or splinter upon rough contact with other objects.

While we have shown and described certain present

preferred embodiments of the invention, it is to be distinctly understood that the invention is not limited thereto, but may be otherwise variously embodied within the scope of the following claim.

We claim:

In combination, a base container comprising a hollow cylindrical side wall having one end open and the other end closed by a bottom plate having at least one vent hole therein, a metal cylinder such as for compressed gas disposed in the base container, said cylinder having a discharge head protruding out of the open end of the base container, said metal cylinder closely fitting said side wall whereby upon the application of external forces thereto the side wall is supported and strengthened by the metal cylinder and a cap container member surrounding the discharge head and lockably closing the open end of the base container and having seating means therein engaging the discharge head whereby said cap container member is held in fixed alignment with said base container, said base container and cap container member being composed of a semi-rigid non-sparking plastic material such as normal polyethylene.

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