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Gongolewski

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[54] **PROTECTIVE CAP FOR A CYLINDRICAL TANK**

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[52] **U.S. Cl.** ..... **224/45 P,** 248/224

[51] **Int. Cl.** **A45c 13/26**

[58] **Field of Search** ..... 224/45 P, 42.38, 36; 248/224, 73

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[57] **ABSTRACT**

A protective cap having a split band which changes around the cylindrical portion of the tank, and a handle yoke which extends over the top of the tank protecting the valves and providing a handle. Channels are provided around the split band for protecting and storing the hose. A retaining member securably holds the cap in a secure position against a fixed wall.

2 Claims, 10 Drawing Figures

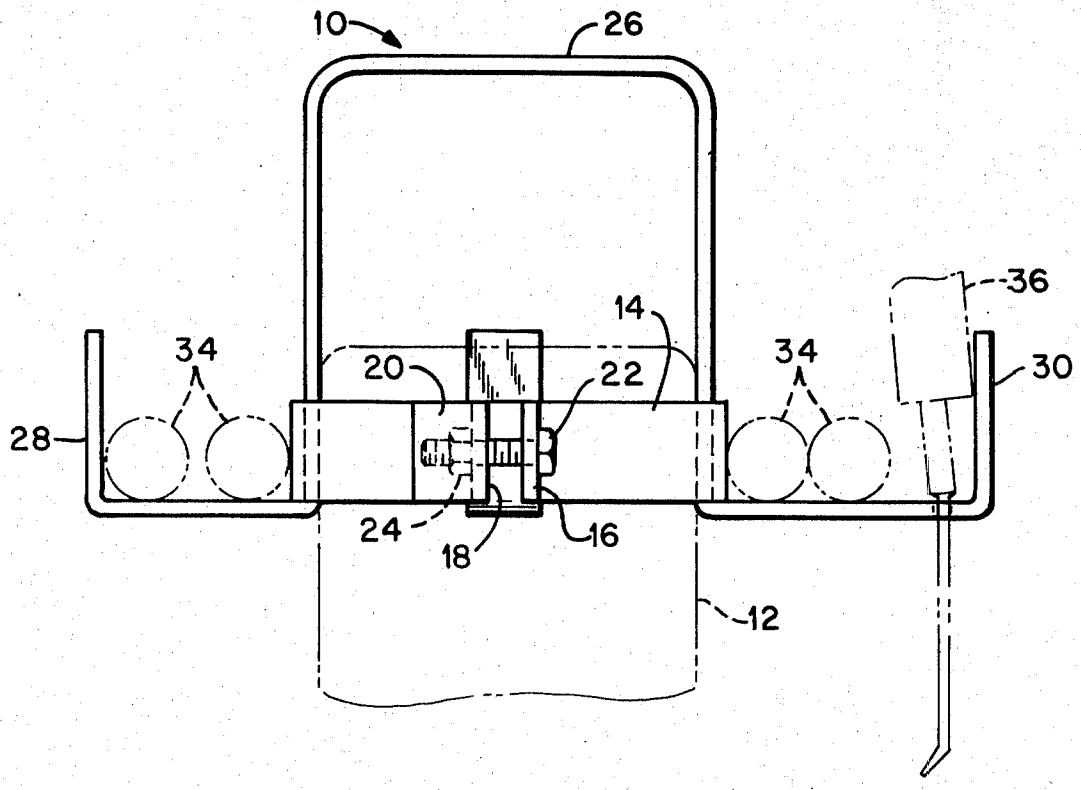


FIG. 1

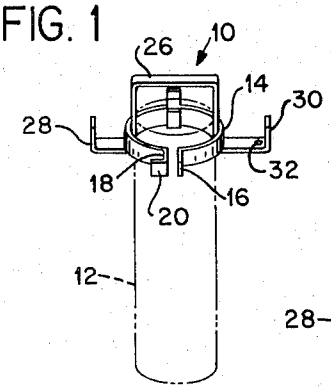


FIG. 2

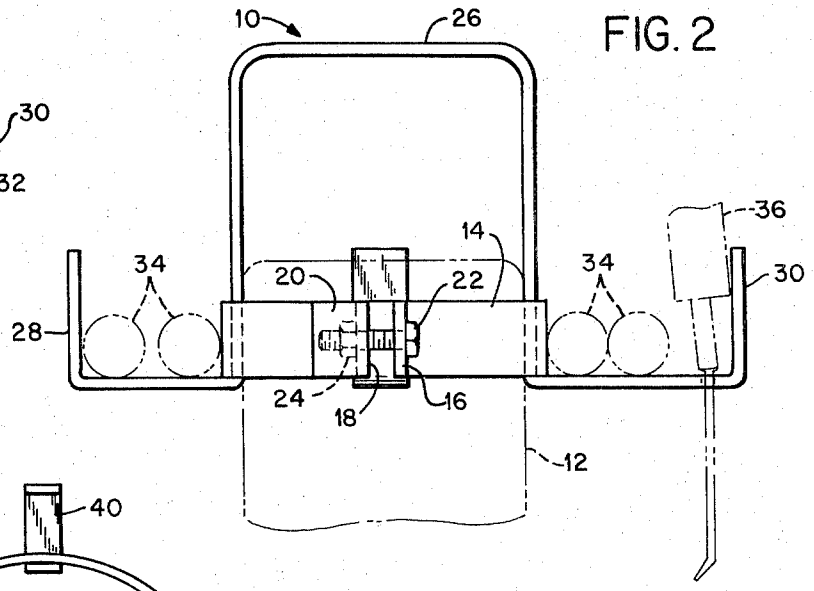


FIG. 3

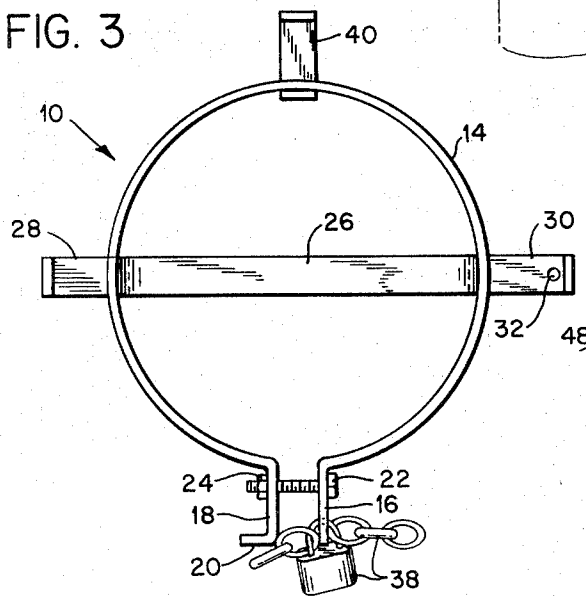


FIG. 4

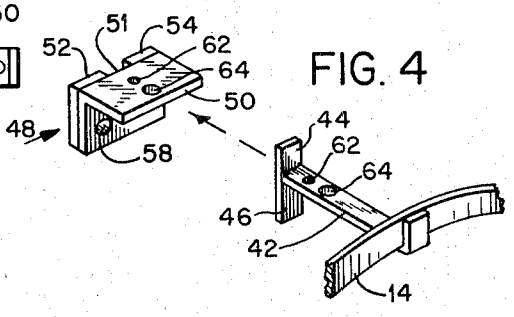


FIG. 5

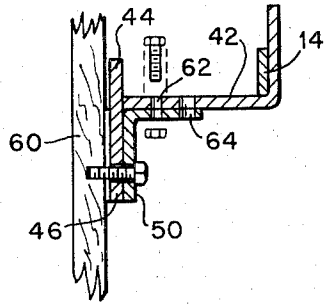


FIG. 6

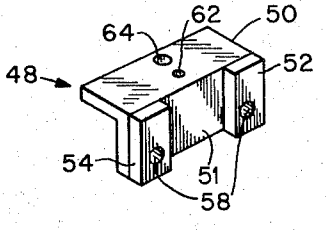


FIG. 9

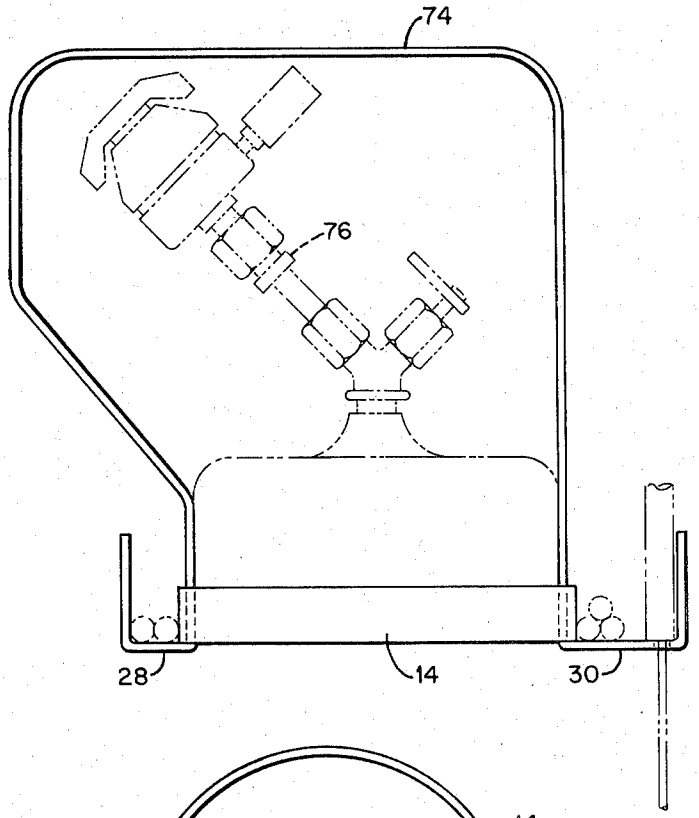


FIG. 10

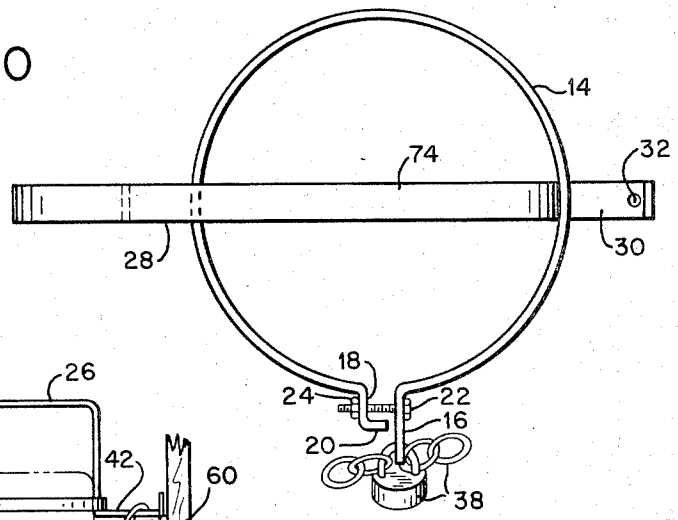


FIG. 7

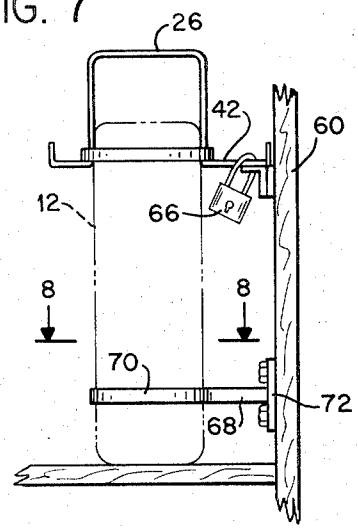
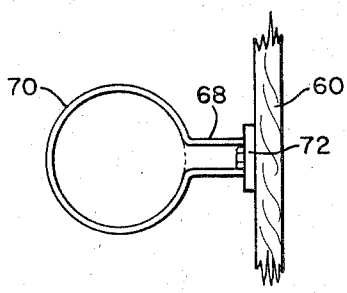


FIG. 8



PROTECTIVE CAP FOR A CYLINDRICAL TANK

The aforementioned Abstract is neither intended to define the invention of the application which, of course, is measured by the claims, nor is it intended to be limiting as to the scope of the invention in any way.

This invention relates to a protective cap for a cylindrical tank and more particularly to a device for use with portable pressure vessels which provides protection to the valve and facilitates handling and transportation of the vessel.

BACKGROUND OF THE INVENTION

High pressure cylinders or similarly constructed tanks for holding gases and liquids are commonly used for numerous types of applications. Such tanks are usually in the form of elongated cylinders having one flat end on which the cylinder normally rests, the other end of which is usually rounded and is equipped with valves to permit the contents of the cylinders to be drawn off. One of the most important considerations in the handling of such cylinders is the protection of the valves and other fittings associated with the cylinders on the top portion thereof. Damage to these items frequently breaks or dislodges them thus, endangering nearby persons and property. Should the cylinders contain combustable gases, for example, a serious fire and explosion may occur, or a slow leak may develop allowing the gas to escape unnoticed. Such damage imposes considerable economic penalties in addition to the cost of transporting and repairing the damaged cylinders.

Because of the elongated cylindrical shape and since generally the tanks are exceedingly heavy it is difficult for workmen to handle them and obtain a good grab on them when lifting or moving them. Therefore, when moving a tank of this type there is a natural tendency to grab a portion of the valves or fittings to manipulate the tanks. This handling procedure is both inefficient and dangerous, for it to may dislodge the valves and fittings and cause them to be displaced thereby permitting the contents of the cylinder to be leaked.

Furthermore, as the cost of the cylinders and their contents become more expensive, the tanks have been the subject of numerous robberies and burglaries. If a number of these tanks are stored in the open on job site constructions for example, when the workmen are not guarding the tanks they can be stolen from the premises.

While many types of protective devices and handles are presently available for such tanks, pressure vessels, and similar containers, none of these provide all of the required needs for the common practical use of these containers. For example, one known device of the prior art contains a rotatable handle which requires the user to roll the tank along the ground while holding the rotating handle. Other known devices for manipulating the tanks used to be welded onto the tank itself and thereby do not provide readily detachable devices. Other known devices completely enclose the valve and fittings and therefore do not permit free access to these connections when the protective device is in place. It is therefore required to remove the protective device each time the container must be used. Furthermore, while some of the known devices may provide protection for the valve, and other devices may provide transporting aids to workmen, the devices of the prior art do not provide the additional features of preventing the entire tank from being removed from a job site. Also, the known devices do not provide the additional benefits of protecting associated equipment used with the cylinders such as a hose or a torch. It is generally required to separately carry and store these accessories and separate protective devices and folding equipment are required to securely retain them during transporting and storing.

It is therefore an object of this invention to provide a cap for a portable pressure vessel of the cylindrical type which avoids the aforesaid problems of prior art devices.

A further object of the invention is to provide a protective device for use with portable pressure vessels.

Still a further object of the invention is to provide a readily attachable protective device for portable pressure vessels which also furnishes means for easily grasping of the cylinder during handling.

Yet another object of the invention is to provide a cap for portable pressure vessels which protects the valve and fittings and yet permits free access to these connections during use.

Another object of the invention is to provide a cap for a portable pressure vessel which protects the valves and fittings, serves as handle means to aid in the movement of the cylinders, and also provides retaining means for holding the cylinder in a secure position during transporting thereof.

Still a further object of the invention is to provide cap means for a portable pressure valve which includes storage means for the hose associated with the vessel and a torch for use in connection with the vessel.

Yet a further object of the invention is to provide a protective device for a portable pressure vessel which includes means to connect the protective device to a fixed location to prevent movement and removal of the device during transportation and storage.

Still a further object of the invention is to provide a cap for a portable pressure vessel which can be used both to protect the vessel and to manipulate the vessel and wherein the cap can be disassembled into two easily stored flat members.

These and other objects and features of the invention will be readily apparent from the examination of the drawings and the following description of the preferred embodiments of the present invention.

BRIEF DESCRIPTION OF THE INVENTION

Briefly, the cylinder cap for the portable pressure vessel in accordance with the present invention includes a split band of steel or other strong material constructed to encircle the cylindrical tank and containing outwardly extending tabs at its ends which form clamp jaws which can be drawn together to clamp the band securely around the container. A handle yoke is rigidly joined to the split band at diametrically opposed sides of the band, and the handle extends upward to pass over the valves and the fittings. At the bottom ends of the yoke handle at the point of joinder with the split band are contained U-shaped channels extending radially outward from the band, for holding the hose and the torch used for the cylinder. In one embodiment of the invention, one of the U-shaped channels has a tongue at the outer end thereof which fits into a retaining member spaced from but tightly secured to a retaining wall. In another embodiment of the invention

means are provided to securely chain the cap to a retaining member to prevent removal of the entire cylinder. The shape of the yoke handle can be made to fit various types of valves and fittings. The yoke and the split band can be formed of independent members which are bolted together prior to attachment to the cylinder whereby the cap can be stored and transported separately as substantially two flat members.

BRIEF DESCRIPTION OF THE DRAWINGS

In the various figures of the drawing like reference characters designate like parts.

FIG. **1** is an isometric view of the cylinder cap of the present invention fixed to one of a portable pressure vessel;

FIG. **2** is an elevational view of the cap;

FIG. **3** is a top view of the cap;

FIG. **4** is an isometric view of the two parts of the securing arrangement including the retaining means and the extension of the cap;

FIG. **5** is a partly sectioned, elevational view of the retaining means as attached to a retaining member;

FIG. **6** is an isometric view of the retaining means;

FIG. **7** is an elevational view of the cap and a holder secured to a retaining member for holding the pressure vessel in place;

FIG. **8** is a top view of the holder as taken along line **8—8** of FIG. 7;

FIG. **9** is an elevational view of another embodiment of the cap in accordance with this invention; and

FIG. **10** is a top view of the embodiment shown in FIG. **9.**

DETAILED DESCRIPTION OF THE INVENTION

Referring now to FIGS. **1** through **3** wherein like parts are similarly identified, there is seen the protective cap shown generally at **10** secured to a cylindrical tank **12** shown in phantom. The cap comprises a split band **14** of steel or other strong material which is constructed to encircle the cylindrical tank **12.** The two adjacent end members of the split band **14** extend outwardly from the container forming tabs **16, 18.** One of the tabs **18** is shown having its end **20** bent forming an L-shaped member. A clamping arrangement is provided for drawing the split band together and clamping it around the cylindrical body. As is shown, a bolt **22** and nut **24** are provided for this purpose. The bolt passes through holes in the abutting ends of the tabs **16** and **18.** The split band is held in place on the container by the clamping action of the split band against the wall of the container when the ends of the band are drawn together by the clamping arrangement of the bolt and the nut. The split band should be made of slightly larger than the cylinder to facilitate placing and removing of the device from the cylinder.

A handle yoke **26** is secureably attached to the split band at diametrically opposed points of the split band and extends vertically upward from the split band. As is shown in the embodiments of FIGS. **1** and **3,** the handle yoke is approximately an inverted U-shape. The handle yoke **26** serves to protect the valves and fittings **28** which extend from the upper end of the cylinder **12.** The handle yoke **26** also serves as means to graps the device in order to facilitate manipulating of the cylinder. At the lower ends of the yoke **26** near the point of attachment to the split band **14** there are formed channels **28, 30** integrally with the yoke **26.** The channels **28, 30** have a horizontal portion extending radially outward from the cylindrical tank and an outer vertical portion bent upwards. One of the channels, **30** contains a hole **32** in the horizontal portion. Generally, the cylindrical tanks require a hose for connection to the valves. The hose is frequently lost or easily misplaced. With the embodiment of the cap in accordance with this invention, the hose can be wound around the cylindrical member within the channels **28** and **30.** Similarly, when the cylindrical tank contains compressed gas used in connection with welding, a torch must be provided and the torch itself can similarly be misplaced and lost. The hole **32** in channel **30,** is used to insert the torch **36** therein shown in phantom in FIG. **2.**

In operating the protective cap in accordance with this invention the cap is placed over the top portion of the cylindrical tank where the valves and fittings are located. The yoke is placed over the valves and fittings and the split band lowered onto the cylindrical body. The clamp bolt is tightened and the split band in fixed around the cylindrical body to secureably remain in place thereon. The hose **34** can then be wound within the channel and the torch **36** then be inserted in the channel hole.

When cylindrical tanks of the type described are used on construction sites for example, it is a frequent occurrance that when the workmen are not immediately available to guard and protect the tanks they are easily removed and stolen. As shown in FIG. **3,** an additional hole can be placed within the tab **16** such that a chain and lock **38** can be inserted therethrough and the chain then passed to a retaining wall or post. While the chain is shown passing through only one of the tabs **16,** it is understood that the chain could pass through both the tabs **16** and **18** and tightened therebetween to prevent the removal of the cap from the cylinder once the cap has been tightened thereon.

In addition to the channels **28** and **30** which are an integral part of the handle yoke **26,** additional channels **40** can be connected to the split band to provide additional support for the hose **34** placed around the cylinder.

In moving and transporting the cylinders by means of trucks or other vehicles the creates problem is that the cylinders tend to fall and may either break the valves and fittings associated with the cylinder or cause the compressed gas and liquid to leak out. Also, when the cylinders must be maintained for a period of time in an unprotected area they are subject to being removed by theives. Referring, therefore, to FIGS. **4** through **6** there is shown another embodiment of the invention providing additional protection and securing means for the cylinder by means of the cap of the present invention. As is shown, one of the channels **42** extending from the cap has a longer horizontal portion which therefore extends radially outward more then the other channels. Furthermore, at the outer end of the channel an upward **44** and lower **46** tongue arrangement is provided abutting the horizontal portion of the channel **42.** The channel **42** can be either one of those formed as an integral part of the yoke handle **26** or it can be one of the additional channels attached to the split band **14.** A retaining member shown generally as **48** comprises an L-shaped member **50** and two spacer members **52, 54** connected on one leg of the L-shaped member **50.** The spacer members **52, 54** are separated from each other providing groove **56** therebetween. Holes **58** are

provided which pass through both the L-shaped member **50** and the spacers **52, 54.** The retaining member **48** is secureably mounted onto a retaining wall **60,** such as a truck or a fastening post, by means of bolts **62** passing through the holes **58.** When mounted on the retaining wall **60** the groove **56** serves as the groove a passageway for the lower part of the tongue **46** inserted therein. The upper tongue **44** will then rest flat against the retaining wall **60** and provide support against bending. The horizontal portion of the channel **42** will rest upon the top leg of the L-shaped retaining member **50.** Two holes **62, 64** are aligned through the horizontal portion of the channel number **42** and the top leg of the L-shaped retaining member **48.** One of these holes can be used for passing therethrough a pin or a nut and bolt combination for holding the cap to the retaining member. A lock can be placed through the other hole to permenently retain in secured relationship the cap, holding the cylinder, onto the retaining wall **60.**

Referring now to FIG. **7** there is shown the embodiment of the cap having the retaining means described in FIGS. **4** through **6.** As is seen, the cap is secured onto the cylinder and then fastened to the retaining wall by means of the channel **42** having its tongue inserted within the groove of the retaining member **48** and a lock **66** passed through one of the holes aligned between the channel and the retaining member.

In order to insure that the tank cannot be removed by sliding it out from under the cap, or when transporting the tank in a truck that the tank should not slide out from under the cap, an additional holder **68** is provided. As is shown in FIGS. **7** and **8** the holder comprises a split band **70** constructed to approximately encircle the cylinder and having its adjacent ends outwardly extending and mounted onto holding means **72** connected to the wall **60.** The holding means **72** can be a simple clamping arrangement or can be a tongue and groove arrangement as described with regard to the cap.

Although the valves and fittings are usually vertically arranged with respect to the cylinder, sometimes the valves are offset and are not coaxial with the cylinder. In such situations it is possible to form the yoke handle with a shape approximating the offset arrangement of the valves and fittings. Referring to FIGS. **9** and **10** there is shown an embodiment of the cap wherein like parts are numbered as in previous figures. As is seen, the yoke handle **74,** although it extends from the split band **14** is shaped in an offset arrangement permitting the protective enclosure of the valves and fittings **76.** It is understood, that the particular shape of the yoke handle is not restricted to shapes shown in the drawings but can be of any shape to fit over and protect the valves and fittings.

The cap of this invention has been described as being formed of two members, namely the split band and the yoke handle. These two portions can be rigidly joined by rivoting or welding at the extremeties of the yoke handle to the split band. However, the two pieces could be formed with aligned holes to permit bolting of the two members together. In this way the two portions can be carried and transported separately thereby providing relatively flat members and eliminating the space required for the protruding yoke when the two portions are combined. The two flat members can be assembled at the job site by means of bolting them together and then the assembled cap can be attached to the cylinder for use.

As is shown in FIG. **10,** the end **20** of one of the tabs **18** is bent inward towards the other tab **16.** In this manner the inwardly bent portion **20** serves as a protective stop to the clamping action thereby preventing excessive clamping of the split band and avoiding the possibility of breaking the cylindrical walls by too much pressure.

There has been disclosed heretofore the best embodiments of the invention presently contemplated. However, it is to be understood that various changes and modifications may be made by those skilled in the art without departing from the spirit of the invention.

What I claim as new and desire to secure by letters Patent is:

1. A protective cap for a portable cylindrical tank which tank has one end accommodating a valve assembly, the cap comprising a split band adapted to encircle the cylinder and having its ends forming outwardly protruding tabs, clamping means contacting said tabs to draw them together for clamping the split band onto the cylinder, handle yoke means attachable to said split band and extending upwardly therefrom to pass over the valve assembly when said split band is clamped onto the cylinder, and at least two U-shaped channels each extending radially outward from said split band and circumferentially spaced from each other around said split band, and wherein one of said U-shaped channels further comprises a vertical tongue extending downward at the outer end thereof and said cap means further comprises retaining means including a groove portion, said tongue designed to fit within said groove portion, and wherein both said retaining means and said channel having said tongue each having a hole therein, said hole being aligned when said tongue is within said groove.

2. A protective cap as in claim **1** wherein said retaining means comprises an L-shaped member and two spacer members, said spacer members secureably connected to one leg of said L-shaped member in aligned relationship therewith and spaced apart from each other thereby forming said groove portion therebetween.

* * * * *