United States Patent [19]

Connolly

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[54] **PROTECTIVE CAP**

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[52] **U.S. Cl.** **137/382**

[51] **Int. Cl.** **F16k 35/00**

[58] **Field of Search** 137/377, 382, 383, 382.5

[56] **References Cited**

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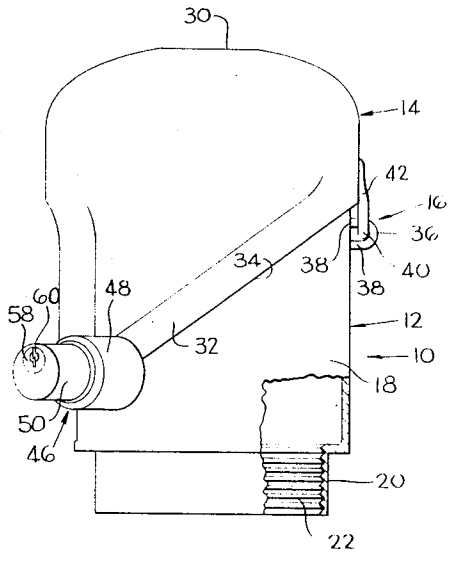
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[57] **ABSTRACT**

A protective cap for gas cylinder valves including a base and a cover pivotally mounted on the base forming an enclosure therewith. A concealed locking mechanism is provided on the cover and is key activated to insert a locking pin through aligned openings in the base and cover to lock the latter in a closed position.

5 Claims, 3 Drawing Figures



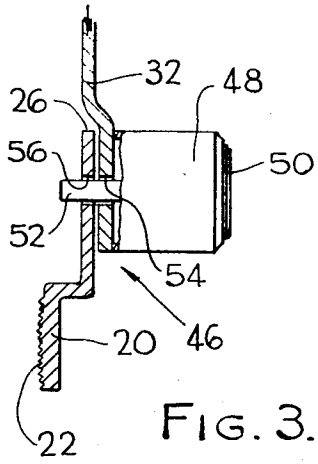


FIG. 3.

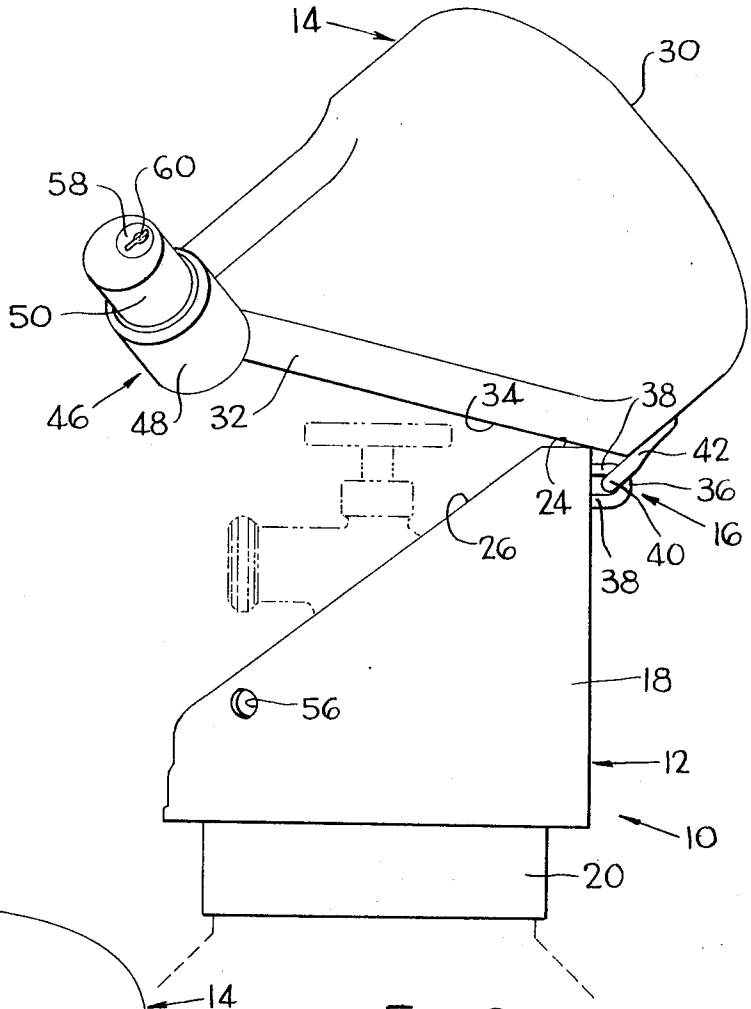


FIG. 2.

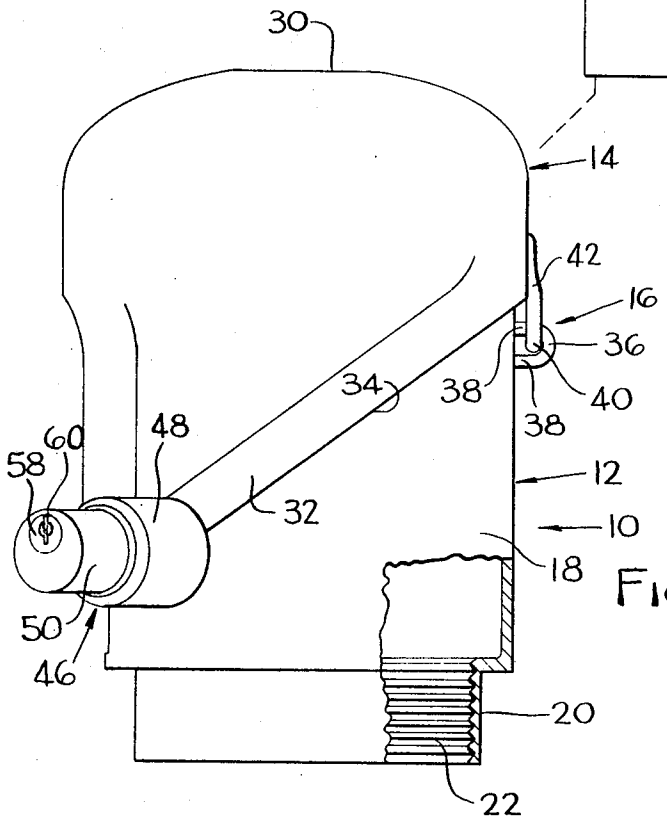


FIG. 1.

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PROTECTIVE CAP

BACKGROUND OF THE INVENTION

This invention relates to a protective cap or cover mounted on one end of a high pressure gas cylinder for enclosing control valves and, more particularly, to such a protective cap having concealed locking means.

Gases under high pressures are conventionally stored in thick-walled metal cylinders having control valves mounted on one end of such cylinders. In order to protect these control valves and the attendant fittings during storage and handling, a threaded cap is secured to the upper reduced end of the cylinder. However, the task of threading and unthreading these covers is difficult and time consuming. Protective caps provided with a pair of hinged portions, one of which can be pivoted out of the way for access to the control valve and fittings therein when required for use without the necessity of unthreading the cap, are known. While these hinged covers facilitate the opening and closing of the cap for easy access to the control valves housed therein, they also encourage unauthorized access thereto and use of the gaseous contents. Especially susceptible to such unauthorized use are gaseous anesthetics, such as nitrous oxide for example, which produces an euphoric effect. While it is known to provide protective covers with locks, these conventionally take the form of a padlock located exteriorly of the cap and in which the shackle thereof can be easily severed or sawed through to disable the padlock by those wishing to pilfer the gas.

SUMMARY OF THE INVENTION

Accordingly, it is a primary object of the present invention to provide an improved protective cap having concealed locking means preventing unauthorized access to the contents of a gas-filled container.

The protective cap of the present invention, as hereinafter described, provides a solution to the above problems by providing a protective cap having a base and a pivotable cover forming with the base an enclosure for the control valve and associated fittings. The cover is provided with a cylindrical locking mechanism which is key activated to insert a concealed locking pin into an opening in the base to lock the cover in the closed position.

The foregoing and other objects, advantages and characterizing features of the protective cap of the present invention are pointed out in detail in the following description of a typical embodiment thereof considered in conjunction with the accompanying drawing depicting the same wherein like numerals represent like parts throughout the various views.

BRIEF DESCRIPTION OF THE DRAWING FIGURES

FIG. 1 is a side elevational view of a protective cap constructed in accordance with this invention;

FIG. 2 is a view similar to FIG. 1 showing the cover pivoted into an open position; and

FIG. 3 is a fragmentary sectional view, on an enlarged scale, illustrating the locking pin in its extended position locking the cover to the base of the protective cap of this invention.

DETAILED DESCRIPTION OF AN ILLUSTRATIVE EMBODIMENT

Referring now in detail to the drawing, there is shown in FIG. 1 an illustrative embodiment of a protective cap, comprehensively designated **10**, constructed in accordance with this invention and adapted to be mounted on the upper end of a high pressure gas storage cylinder for enclosing the control valve means therefor. Cap **10** comprises a base **12** and a cover **14** pivotally connected together by means of a hinge arrangement **16** to form an enclosure for the control valve, the handwheel therefor, and the associated fittings, shown in phantom in FIG. 2.

Base **12** comprises a hollow, generally cylindrical upper portion **18** and a lower portion or neck **20** of reduced diameter provided with internal threads **22** for engagement with the externally threaded collar at the upper end of a conventional gas cylinder, also indicated in phantom in FIG. 2. Portion **18** is provided with an upper marginal edge comprised of a rear, horizontally extending portion **24** and a major inclined portion **26** extending downwardly at an angle from rear portion **24** to the front of portion **18**. The terms upper, lower, top, bottom, and the like, as used herein, are applied only for convenience of description with reference to the drawing and are not used in a limiting sense. For purposes of this description, the forward end of cap **10** is taken to be the left side thereof as viewed in FIGS. **1** and **2**.

Cover **14** has a hollow, generally cylindrical configuration open at its lower end and closed at its upper end by a curved, dome-like end wall **30**. The lower end of cover **14** is provided with an outwardly offset peripheral flange or skirt **32** adapted to overlie the upper portion of base **12** in the closed position as shown in FIG. **3**, the offset of skirt **32** providing a shoulder seating on edge **26** when the cover is closed. Skirt **32** is provided with an inclined lower edge **34** extending downwardly at generally the same angle as inclined portion **26** toward the front of cover **14**. A suitable opening (not shown) is provided in the front or face of cover **14** which opening extends through edge **34** to provide access into cap **10** when cover **14** is closed for the passage of hoses and conduits therethrough leading to the equipment adapted to utilize the gas. The conduit opening is narrow and does not permit access to the control valve when the cover is closed.

Hinge arrangement **16** includes an elongated, generally U-shaped lug **36** provided with spaced legs **38** welded or otherwise fixedly secured to the rear end of base **12** adjacent the upper edge thereof. Cover **14** is provided with a U-shaped member **40** having the bight portion thereof disposed in lug **36** and provided with spaced legs **42** welded or otherwise fixedly secured to the rear end of cover **14** adjacent the lower edge thereof.

A significant feature of this invention is the provision of a concealed locking mechanism generally designated **46**, formed integral with cover **14** for locking the latter in its closed position to prevent the unauthorized opening of cover **14** and access to the control valve enclosed therein. Locking mechanism **46** is provided with a cylindrical housing **48** connected to skirt **32** adjacent

the forward end thereof and welded or otherwise fixed thereto. It could be formed integral therewith. A spring loaded plunger **50** is telescopically received in housing **48** and is provided with a locking pin **52** (FIG. 3) at its inner end. Skirt **32** and the upper, forward portion of base **12** are provided with openings **54** and **56**, respectively, which are in registry when cover **14** is in the closed position to receive pin **52** and thereby lock cover **14** to base **12**.

Plunger **50** contains the usual locking components and tumblers (not shown) actuated by a rotatable member **58** provided in plunger **50** and having a key slot **60** for receiving a key. When plunger **50** is depressed within housing **48** against the bias of a spring or some other suitable resilient means (not shown) to insert pin **52** into the aligned openings **54** and **56** (FIG. 3) in the closed position of cover **14**, member **58** is key actuated and rotated in one direction to actuate the internal locking components and/or tumblers to lock plunger **50** in such depressed position. In releasing plunger **50**, member **58** is key actuated in the opposite direction to disable the internal locking components and allow the biasing means to urge plunger **50** axially outwardly, withdrawing pin **52** out of locking engagement with openings **54** and **56** to allow cover **14** to be swung into an open position. The lock mechanism for actuating pin **52** is of a conventional type, well understood by those familiar with lock mechanisms.

It is a feature of this invention that locking pin **52** is completely concealed and in its locking position is virtually inaccessible for tampering by unauthorized persons. Moreover, the combined thicknesses of the telescopic members **48**, **50** or the overall diameter of locking member **46** in its locking position is many times greater than the diameter of the conventional shackle of a padlock customarily used for such purposes, to discourage the use of a hacksaw or other makeshift tool to saw through the locking mechanism thereby rendering the latter more tamper proof.

From the foregoing, it is apparent that the objects of the present invention have been fully accomplished. As a result of this invention, cover **14** is securely locked to base **12** by means of a concealed locking mechanism to prevent the unauthorized opening of cover **14** and thereby prevent unauthorized access to the control valve enclosed therein. Locking mechanism **46** is fixed to cover **14** and when in the locked position, completely shields locking pin **52** so as to render the latter virtually inaccessible and discourage the tampering therewith by unauthorized persons.

A preferred embodiment of this invention having been disclosed in detail, it is to be understood that this has been done by way of illustration only.

I claim:

1. A protective cap for valves on pressurized gas containers comprising: a base having means for attachment to a gas storage cylinder and an open end, a cover having an open end, means pivotally mounting said cover on said base for pivotal movement between an open position and a closed position, said cover having an offset portion adjacent the open end thereof overlying a portion of said base open end when in said closed position, said base portion having an opening therein, and key actuated locking means including a pin insertable into said opening to lock said cover to said base.

2. A protective cap according to claim **1** in which said locking means is carried by said cover offset portion.

3. A protective cap according to claim **1** wherein said locking means includes a housing carried by said cover for shielding and concealing said locking pin.

4. A protective cap according to claim **1** wherein said base open end is defined by a marginal edge having a straight portion and a major inclined portion extending from the region of said pivotal means downwardly at an angle toward said locking means, said cover offset portion being substantially parallel to said inclined portion of said base marginal edge in overlapping relation thereto in the closed position of said cover.

5. A protective cap according to claim **1**, wherein said offset portion has an opening therethrough aligned with said base portion opening when said cover is closed, said locking means being contained in a housing carried by said cover and said lock pin passing through said alined openings.

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