May 25, 1954 F. F. HUMBARGER 2,679,332

VALVE PROTECTOR FOR GAS CYLINDERS

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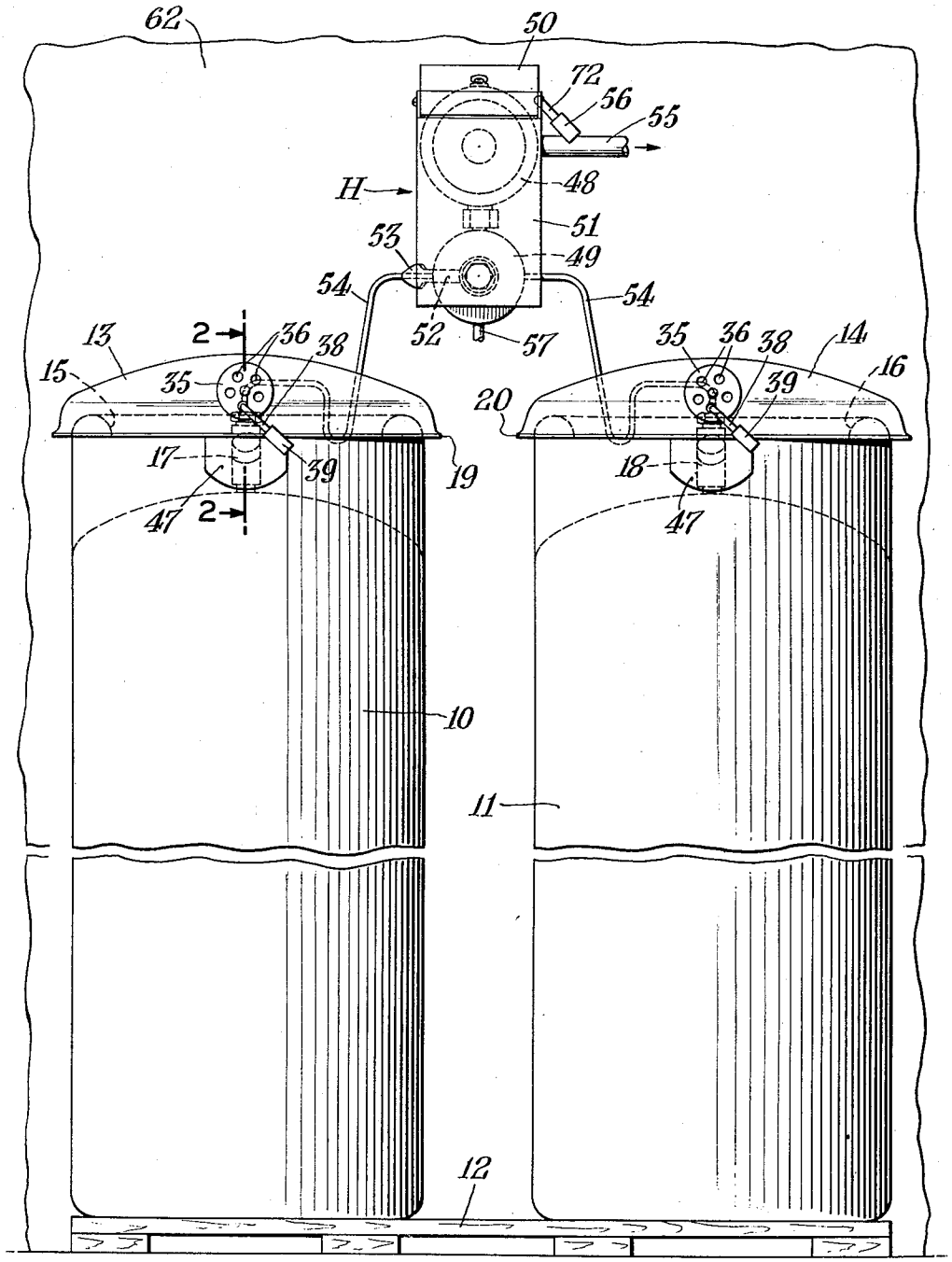


Fig. 1.

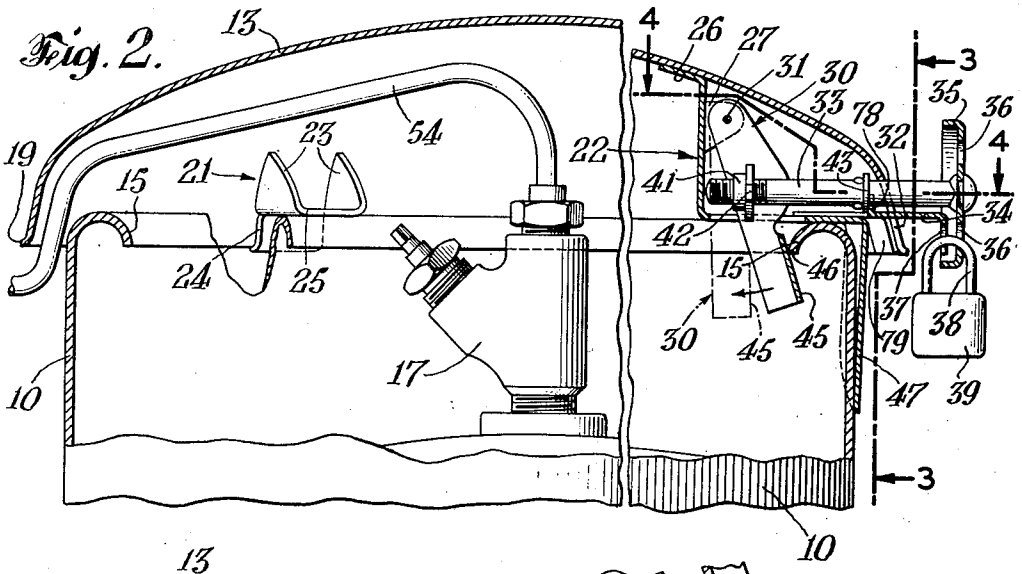
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VALVE PROTECTOR FOR GAS CYLINDERS

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Fig. 2.



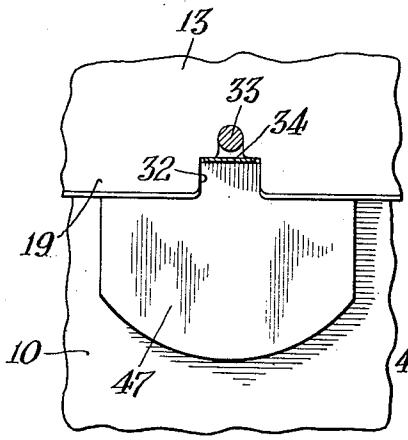


Fig. 3.

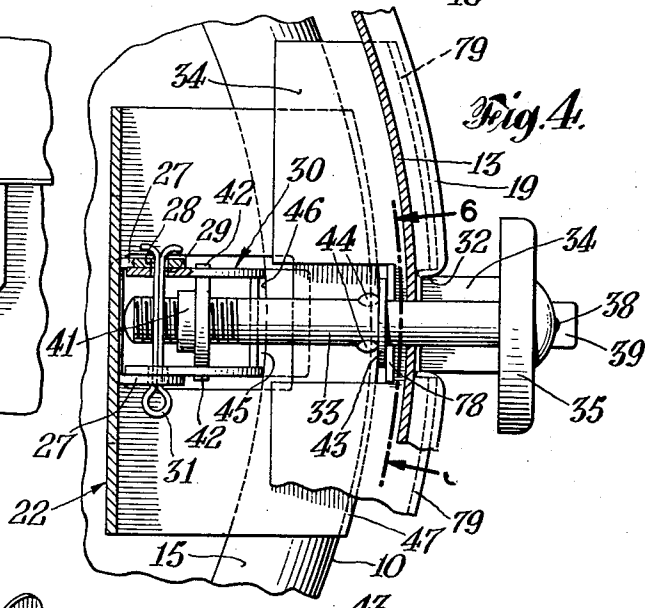


Fig. 4.

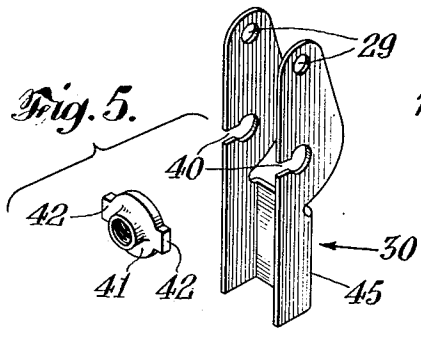


Fig. 5.

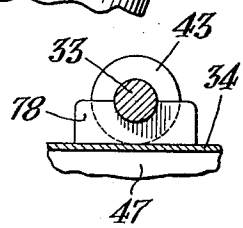


Fig. 6.

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VALVE PROTECTOR FOR GAS CYLINDERS

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Application May 18, 1949, Serial No. 94,002

5 Claims. (Cl. 220—85)

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This invention relates to the apparatus required for protecting the valves of cylinders of fuel gas such as are used for domestic cooking and other purposes. An object of this invention is to simplify this tamper proof apparatus. Another object is to provide such apparatus which is easy to assemble, is of reduced cost, and makes unnecessary the provision of any heavy supports therefor, yet the hood for each cylinder is safely and non-removably attached when locked in place.

The need for rendering the valves of fuel gas cylinders tamper proof, was long ago recognized by the fire underwriters. Many suggestions have been made for accomplishing this result. Perhaps a most widely used proposal for filling this need has been a cabinet for entirely enclosing these cylinders and regulator, the cabinet being affixed to the outside of a dwelling. Such cabinets have been heavy and expensive. Other suggestions have contemplated one or several hoods slidable or pivotally mounted to open and provide access to these parts but not fully enclosing the cylinders. An objection to these proposals has been the necessity of having heavy supports for the one or more hoods.

According to this invention the need for the previous heavy hood supports has been eliminated by the provision of a separate hood or cover for each cylinder so constructed as to be readily removed or opened for providing access to the valve on top of each cylinder, yet incapable of being opened or raised when locked in place. A feature of this invention resides in the ability to lock a cover on a cylinder without the necessity of some locking element being built onto or into the cylinder and without the need for more than one locking member being attached to each cover. Specifically this is made possible by the provision of a light support for the regulator cover provided on an adjacent building independently of the covers for each cylinder. The cover for each cylinder rests upon the rim of the cylinder at three angularly separated positions. At one such position the cover is provided with an apron cooperating with the outer surface of the cylinder for preventing the cover being raised by tilting an opposite edge thereof. Preferably at this same position a locking device is provided to engage the cylinder rim to prevent the cover being raised at this position. Thus with the cover locked it is incapable of being either raised vertically off the cylinder and also incapable of having any portion of the cover rim tilted enough to provide access to the cylinder valve beneath it.

Other objects as well as novel features of construction, combination and arrangement of parts will become apparent by reference to the following description and accompanying drawings, in which:

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Fig. 1 is a front elevational view of combined cylinder dome covers and regulator housings illustrating the invention;

Fig. 2 is a vertical cross-sectional view of the dome cover taken along the line 2—2 of Fig. 1 with part broken away and with certain portions shown in elevation;

Fig. 3 is a fragmentary view of a vertical section taken along the line 3—3 of Fig. 2;

Fig. 4 is a fragmentary view of an irregular cross-section taken inside the dome cover of Fig. 2 along the line 4—4;

Fig. 5 is an isometric view of an exploded detail of the tongue and swivel nut shown in Fig. 2;

Fig. 6 is a view of a section taken along the line 6—6 of Fig. 4.

Referring to the drawing and especially to Fig. 1, a pair of gas cylinders are indicated at 10 and 11, one of which constitutes a service source of gas supply, and the other a reserve source of gas supply. The cylinders 10 and 11 stand upon a base 12 and have individual dome covers 13 and 14 respectively.

Inwardly turned rims 15 and 16 are provided on the top edge of the cylinders for protecting cylinder valves 17 and 18 during transportation. On each of these rims 15 and 16 are seated the dome covers 13 and 14 made of sheet metal pressed into the form of a flanged and shallow dome with downturned peripheral edges or flanges 19 and 20, to the inside of each of which are secured two rest members 21 (of which one is seen in Fig. 2) and a rest member in the form of a clamp-bracket 22. The rest members and clamp-bracket are preferably secured to the inside of each dome spaced 120° from each other and have portions projecting inwardly of the dome edges. Each rest 21 is formed from a sheet metal blank which is bent to provide two vertically projecting flanges 23, a lip 24 extending downwardly and conforming with the shape of the periphery of the dome and an inwardly projecting rim seat 25.

The functions of the rests 21 and a rim seat portion of the clamp-bracket 22 are to assist the operator in positioning the dome 13 at installation and to safeguard the entire assembly against deformation in the event of a weight or other force being applied on the top of the dome. Flanges 23 of the rest 21 engage with the inner surface of the dome, while lip 24 is secured to

the peripheral flange 19 by suitable means such as bolting or welding.

The clamp-bracket 22 (see Figs. 2 to 6) is also of sheet steel bent to the desired shape. A flange 26 of the upwardly extending portion of clamp-bracket 22 is secured to the top of the dome cover 13 by welding or other means. The upwardly extending portion of clamp-bracket 22 has two outwardly bent (punched out) ears 27 formed with pivot holes 28 to align with two pivot holes 29 in the upper end of a downwardly extending tongue or detent 30. A cotter pin 31 or similar means is inserted through the holes 28 and 29, thereby pivotally suspending the swingable detent 30.

A notch 32 in the flange 19 of dome cover 13 permits a screw 33 and a lock-bracket 34 to pass horizontally through. The lock-bracket 34 has laterally extending portions 79 secured to the inside of the flange 19 of dome cover 13 by bolting, welding, or other suitable means. To the end of the screw 33, a handwheel 35 is permanently attached, allowing easy turning of said screw. To prevent turning of the handwheel 35, a series of holes 36 are spaced about the hub of the handwheel so that one will align itself with a hole 37 in the lock-bracket 34 to allow the yoke or bow 38 of a padlock 39 to pass through the aligned holes.

The tongue 30 has two slots 40 through which are engaged two projections 42 of a swivel nut 41. The screw 33 with the attached handwheel 35 is threaded into the swivel nut 41 by means of said handwheel. A washer 43 on the neck of screw 33 retained by upset lugs 44 is used to prevent longitudinal movement of the screw 33 by engagement with an upstanding projection 78 of bracket 34.

The dome cover 13 cannot be vertically lifted off the cylinder rim when a locking surface 45 of tongue 30 contacts with and extends below the inturned portion of rim 15 of cylinder 10 at point 46. Tilting of the dome cover 13 is also prevented by a downwardly dependent apron member 47 of clamp-bracket 22 which is curved to conform with the external curvature of the cylinder 10, as shown in the position indicated in Figs. 2, 3, and 4. The apron 47 extends below the rim 15 and the cover edge 19.

Fig. 2 illustrates the dome cover 13 in its locked position. To remove the cover, the padlock is removed and handwheel 35 is turned so that the swivel nut 41 feeds along the screw 33, pivoting the tongue 30 to the open position indicated by the dot and dash lines. The exact travel of the tongue 30 as caused by the rotation of screw 33 is determined by the size of the valve protecting band or inwardly turned rim 15 of the cylinder 10 encountered. By having individual dome covers 13 and 14, replacement of either cylinder when empty is facilitated by only removing the padlock 39, releasing the tongue 30 and then lifting the dome cover 13 off the cylinder. Thus by having the cylinder dome cover 13 rest on the cylinder by the rests 21 and a clamp-bracket 22, a convenient, simple, and efficient means is provided enabling any authorized person to move the dome cover out of its normal position.

This construction, by having an adjustable clamping device, allows for a variation in cylinder sizes, being able to accommodate variations up to one-half inch of the width across the rim on the top edge of the cylinder valve protecting band and is capable of accommodating similar irregularity in the vertical depth of the said protective rim. The ability of the cover of this invention to accommodate variations is important as modifications in cylinder design have resulted over a period of years in large numbers of cylinders in service.

A regulator 48 and an automatic changeover valve 49 are protected by a housing H comprised of two sections, a top cover 50 and a front cover 51. A suitable regulator, for example, may be similar to the one shown in United States Patent No. 2,319,659 issued to Herman W. Carnes. Automatic changeover valve 49, which is coupled to the inlet of regulator 48, is preferably of the type illustrated in United States Patent No. 2,075,600 issued to Harry J. Baker. Such an automatic changeover valve has a lever 52 extending laterally to either side and may desirably be formed in the shape of an arrow or pointer 53 as to indicate from which of the cylinders gas is being withdrawn by the direction of the pointed head. When the lever 52 is thrown to the left, as shown in Fig. 1, gas will flow from the left cylinder 10 acting for the moment as a service cylinder, through a tube 54 from the cylinder 10 to the automatic changeover valve 49 into the regulator 48 and thence out into a consumer appliance line 55. When gas cylinder 10 is empty, the changeover valve performs the automatic function of providing continued withdrawal from the reserve cylinder 11. Upon replacement of the gas cylinder 10, now assumed empty, the person furnishing the full replacement cylinder opens and removes lock 56 and raises the front cover 51 of the regulator housing H in order to turn changeover lever 52 through a rotation of 180° in a vertical plane to allow re-establishment of gas flow conditions but in a manner or sequence exactly opposite to those prevailing prior to manipulation of changeover lever 52.

To indicate when the service cylinder has become exhausted, if desired, a signalling device such as a signal gauge (not shown) may be attached to the tube 57. Said signal gauge has a dial and indicator especially designed for public interpretation and can be attached to regulator housing H or can be installed inside the customer's dwelling.

What is claimed is:

1. A protective device for a gas container having cylindrical side walls with an upper inwardly turned annular rim, said device comprising a cover having a downwardly directed perpheral edge outside and of larger diameter than said rim; and a locking mechanism for securing said cover in position on the container, said mechanism including: a bracket secured to the inside of the cover adjacent its rim and having a seating portion extending inward of said cover edge for engagement on said container rim, a rigid downwardly extending apron member secured to said bracket within said outside peripheral edge, constructed to engage with an outer side wall surface of the gas container below said rim and below the edge of the cover for preventing the tilting of the cover, said locking mechanism being operable from outside of the cover and container and having a single movable detent constructed and arranged for outward movement into engagement with the inturned portion of said container rim and for clamping said bracket to the rim.

2. A protective device for a gas container having cylindrical side walls with an upper inwardly turned annular rim, said device comprising a cover having a downwardly directed peripheral

edge of larger diameter than said rim; and a clamping mechanism for securing said cover in position on the container, said mechanism including: a clamp-bracket secured to the inside of the cover adjacent its rim and having a seating portion extending inward of said cover edge for engagement on said container rim, a rigid downwardly extending apron member constructed to engage with the outer side wall surface of the gas container below said rim and below the edge of the cover for preventing the tilting of the cover, and an upwardly extending portion which is secured to the inside of said cover; a swingable detent having an upper portion pivotally secured to the upwardly extending portion of the clamp-bracket and a lower portion formed to engage with the inturned portion of said rim; and operating means extending from a point outside of the cover edge and operably connecting the detent and said bracket for swinging said detent to and holding it in engagement with said rim.

3. A protective device for a gas container according to claim 2 in which said operating means is a rotatable shaft having a threaded portion cooperating with mating threads of the operable connection between the detent and said bracket and having a perforated handwheel at its outer end; and a locking member extending outwardly from said clamp-bracket and having an outer end portion with an opening positioned so that one of the perforations of the handwheel may be aligned therewith for engagement of a lock device.

4. A protective device for a gas container having cylindrical side walls with an upper inwardly turned rim, said device comprising a cover supported on said rim and having a downwardly directed peripheral edge flange outside of and of larger diameter than said rim, and a locking device secured to said cover and including a rigid downwardly extending apron member secured to said cover inside its peripheral edge flange, said apron member being constructed to extend between a container outer surface and said cover edge flange and to engage the outer side wall surface of the gas container below its rim and below the cover edge flange for preventing raising an edge of the cover opposite said apron member, said locking device also including a swingable locking detent secured to and beneath said cover, said locking detent having a lower portion formed to engage beneath the inturned portion of the container rim in locked position adjacent said apron member, said locking detent being on an inner side of a gas container side wall from said apron member and in general radial alinement with at least a portion of said apron member, and said locking device including means for swinging said locking detent into and out of locking position beneath a container rim from outside said cover edge flange and for holding it in engagement with said rim.

5. A protective device according to claim 4 in which said cover is provided on its under and inner side with a plurality of angularly spaced projections having bottom portions thereof shaped to rest on the inturned rim of a cylinder and support said cover above the container rim higher than it would be if these supporting projections were absent.

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