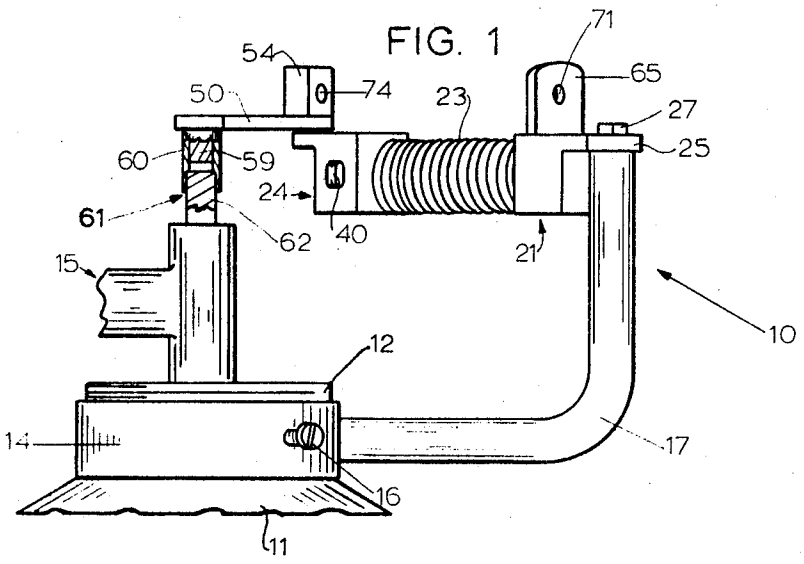
Sept. 2, 1969 F. L. PARNELL 3,464,278

SAFETY DEVICE FOR ACETYLENE CYLINDER

Filed Oct. 25, 1967 2 Sheets-Sheet 1

FIG. 1



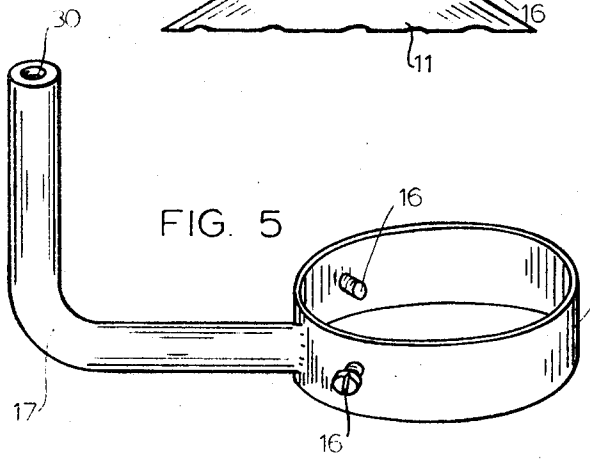


FIG. 5

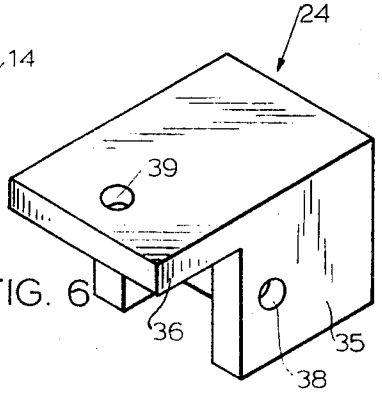


FIG. 6

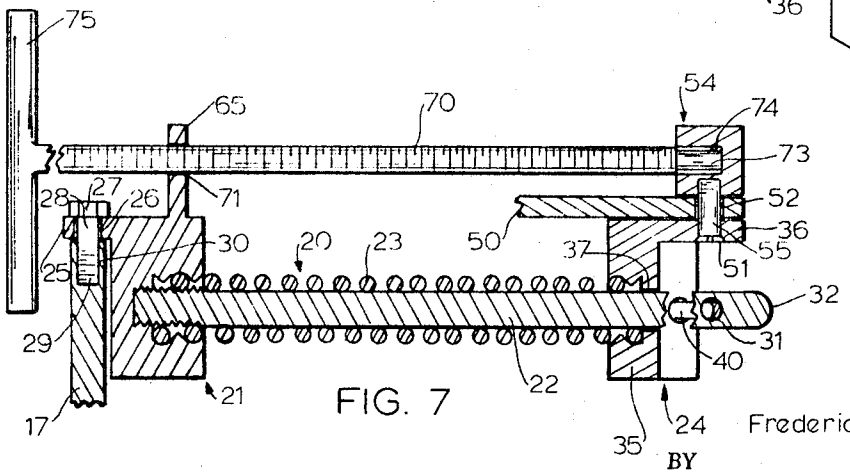


FIG. 7

INVENTOR.
Frederick L. Parnell

BY

B. B. Olive

ATTORNEY

Sept. 2, 1969 F. L. PARNELL 3,464,278

SAFETY DEVICE FOR ACETYLENE CYLINDER

Filed Oct. 25, 1967 2 Sheets-Sheet 2

FIG. 3

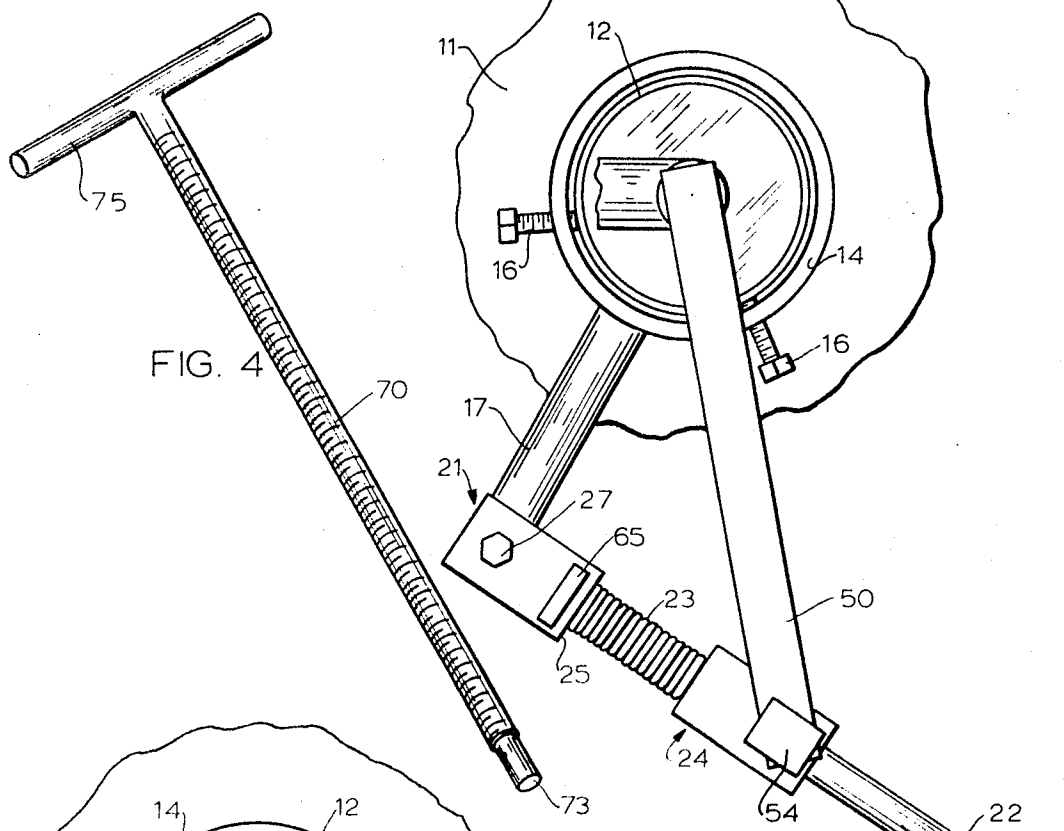


FIG. 4

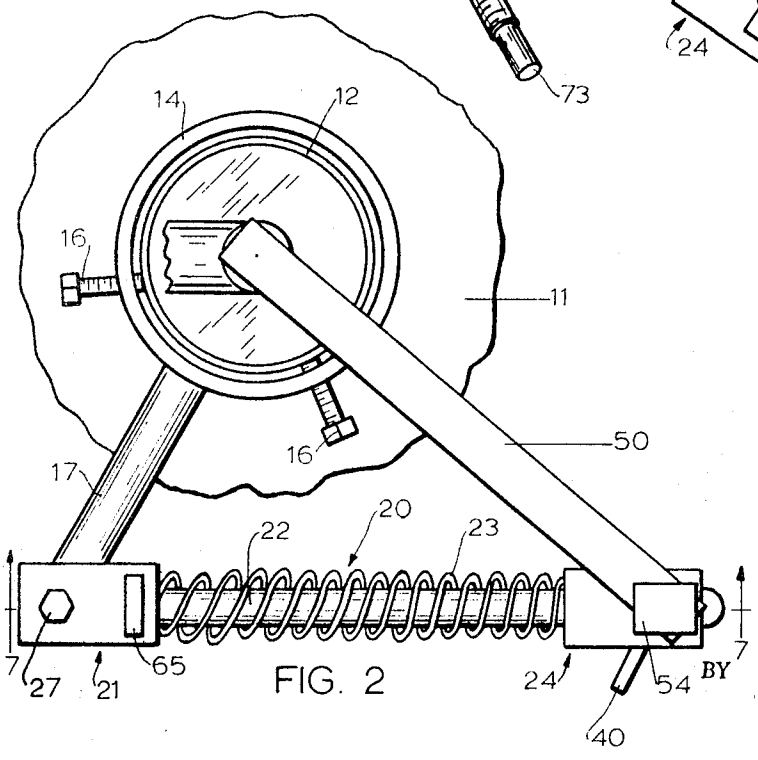


FIG. 2

INVENTOR.
Frederick L. Parnell

BY

B. B. Olive
ATTORNEY

United States Patent Office 3,464,278 Patented Sept. 2, 1969

3,464,278

SAFETY DEVICE FOR ACETYLENE CYLINDER

Frederick L. Parnell, 102 Stokely Road,
Wilmington, N.C. 28401

Filed Oct. 25, 1967, Ser. No. 677,888
Int. Cl. F16k 17/14; F16h 27/02
U.S. Cl. 74—89.15 4 Claims

ABSTRACT OF THE DISCLOSURE

An attachment for shutting off an acetylene cylinder in the event of fire utilizes a spring loaded lever which mounts on the cylinder regulator and a heat destructible pin which melts under the influence of heat and allows the lever to rotate and close the regulator.

BACKGROUND OF THE INVENTION

Field of the invention

The present invention relates generally to an automatically operating safety device for bottle gas cylinders and, more specifically, to a mechanical safety device which is adapted to be mounted as an attachment directly on top of a portable acetylene cylinder or the like and which is automatically actuated to close the cylinder regulator upon a significant rise in temperature in the area immediately surrounding the cylinder. Devices of this type are generally classified under safety cut-off valves having a destructible, deformable, element control under the general class of fluid handling.

Description of the prior art

The prior art which may generally be found is of the type which is incorporated in the acetylene cylinder or which is positioned somewhere along the line leading from the cylinder to the torch or blowpipe. In either case, the probability that the safety device will be effective to prevent a major conflagration is unlikely. Heat sensitive internally mounted devices are usually very expensive and have the main disadvantage of requiring the cylinder to heat up to a particular degree before the device becomes operable to close the regulator. It can be seen that by the time the entire acetylene cylinder is raised to a predetermined temperature, the chances of an explosion are considerable. The placement of a safety device along the gas supply line between the acetylene cylinder and the torch is for the most part ineffective because such a device does not shut off the supply regulator in case of an explosion adjacent the tank.

It can be seen that the art would be significantly advanced if a safety device were provided which is adapted to be easily mounted onto an acetylene cylinder or tank or the like as an attachment and which is adapted to mechanically close the acetylene supply regulator upon a conflagration in the area adjacent the cylinder.

Summary of the invention

The apparatus of this invention is comprised essentially of a series of spring-loaded linkages which are positioned by means of a heat destructible shear pin. More specifically, in the embodiment disclosed the linkage is comprised of a collar which is secured to the rim of the cylinder upon the removal of the cap protecting the cylinder and regulator, an upwardly curved arm which is integrally connected to the collar, a horizontally disposed intermediate arm which is pivotally connected to the curved arm, a tension spring which is helically wound around the intermediate arm and which is connected to a traveler which is slidably mounted on the intermediate

arm, a lever arm which is slidably connected at one end to the traveler and at the other end to the cylinder regulator valve and a heat destructible shear pin which normally maintains the traveler in an outward position on the intermediate arm and the spring under tension, Upon the melting or destruction of the pin, the traveler is released to slide on the intermediate arm and the spring pulls the traveler and the level arm in the direction of the curved arm at least one-quarter of a revolution to close the cylinder regulator and prevent the further flow of gas from the cylinder into the supply line.

Therefore an object of this invention is to provide an acetylene gas containing cylinder or the like with a mechanical safety device attachment which automatically closes the regulator controlling the flow of acetylene gas from the cylinder upon a substantial rise in temperature in the area immediately adjacent the cylinder.

Another object of this invention is to provide a safety device for acetylene cylinders and the like with a heat destructible shear pin and which normally maintains the device in a static position and upon being heated adapts the safety device to be actuated to close the regulator controlling the flow of acetylene gas from the cylinder.

A further object of this invention is to provide a safety device which automatically closes the regulator controlling the flow of acetylene gas from the cylinder with a spring loaded lever arm which is normally held in a static position by a heat destructible shear pin whereby upon a conflagration in the area immediately adjacent the cylinder, the shear pin melts and allows the spring loaded lever arm to close the mentioned regulator.

A still further object of this invention is to provide a spring loaded safety attachment which can be removably mounted onto an acetylene portable cylinder for automatically closing the regulator in the event of fire and with a resetting means which can be used to reset the attachment to a normal static position.

These and other objects of this invention will become apparent when the following claims and detailed description are read in conjunction with the appended drawings, in which:

Description of the drawings

FIGURE 1 is an elevation view of the safety device of the invention mounted on an acetylene cylinder;

FIGURE 2 is plan view of the safety device mounted on the cylinder in a cocked position;

FIGURE 3 is the plan view of FIGURE 2 and showing the device after having been triggered and having closed the acetylene cylinder regulator;

FIGURE 4 is a perspective view of a tool for resetting the traveler and spring;

FIGURE 5 is a perspective view of the collar and arm assembly;

FIGURE 6 is an enlarged perspective view of the traveler; and

FIGURE 7 is a section view taken in the direction of lines 7—7 of FIGURE 2 showing the traveler and spring in an extended position and also showing the tool for resetting the traveler and spring.

Detailed description of the preferred embodiment

Safety device **10** is mounted onto rim **12** of acetylene cylinder **11** by means of collar **14**. Rim **12** receives a protective cap (not shown) during storage for preventing damage being done to the conventional cylinder regulator or valve arrangement generally indicated at **15**. Collar **14** is secured to rim **12** by means of set screws **16** which are threadably mounted in collar **14** and which protrude inwardly to engage rim **12**. Collar **14** also includes an inte-

gral outwardly and upwardly extending curved arm **17** which acts to support the remander of the structure next to be described.

Intermediate arm assembly **20** is comprised of a pivotal mount **21**, a shaft **22** which is integrally secured to pivotal mount **21**, a tension spring **23** which is helically wound around shaft **22** and a traveler **24** which is slidably mounted on shaft **22** and which is secured to one end of spring **23**, the other end of spring **23** being connected to pivotal mount **21**. Any suitable means may be employed to secure the respective ends of spring **23**. Traveler **24** and mount **21** are preferably provided with threaded holes such that the ends of spring **23** may be secured by screwing them into place as best represented in FIGURE 7. Pivotal mount **21** includes a flange **25** having a vertical opening **26**. Flange **25** receives a bolt **27** which mounts in opening **26** and the body portion **28** of which is threadably secured in a corresponding threaded opening **30** in the end of arm **17**. Thus, pivotal mount **21** is adapted to swing about the body portion **28** of bolt **27**.

Traveler **24** includes a body portion **35** and a flange portion **36** which is integrally connected to and extends outwardly from body portion **35** and includes a vertical opening **39**. Body portion **35** further includes a longitudinal positioned opening **37** (see FIGURE 7) through which shaft **22** extends and a laterally positioned opening **38** the axis of which perpendicularly intersects opening **37**. Shaft **22** includes a lateral opening **31** at its unsecured end **32**. Opening **38** in traveler **24** and opening **31** in shaft **22** when aligned are adapted to receive a fusible, heat destructible pin or strap **40** which may be made of nylon or other suitable tough plastic designed to melt in the presence of fire and excess heat.

Lever arm **50** is pivotally connected at one end to traveler **24** by means of bolt **51** which is countersunk in flange portion **36** and extends upwardly therefrom through an opening **52** in lever arm **50** and is threadably received by reset block **54**. Bolt **51** has a smooth shaft portion which resides in and extends through opening **52** in lever arm **50** to adapt lever arm **50** to pivot above the same and is threadably secured to reset block **54** to secure the pivotal connection of lever arm **50** from losing its pivotal connection with flange portion **36** of traveler **24**. The other end of lever arm **50** is provided with a downwardly extending stub **59** which mounts a socket **60** (see FIGURE 1) which is provided with square opening **61** adapted to fit on the conventional square shaped regulator **62** of valve **15**. It should be understood that any turning of stem lever **50** will turn socket **60** and correspondingly will turn stem **62**.

In operation, collar **14** is loosely fitted onto rim **12** of cylinder **11** and socket **60** is arranged to engage regulator stem **62**. The whole assembly of the invention is then adjusted such that stem **62** is opened approximately ⅛ of a revolution to a normal gas supply position. With socket **60** still being connected to regulator stem **62**, set screws **16** are screwed inwardly so as to securely mount collar **14** on rim **12**. Prior to mounting the assembly for operation traveler **24** will have been set as later explained, by inserting the heat destructible pin **40** through the aligned openings **38**, in traveler **24**, and **31** in shaft **22**. Upon a fire in the area immediately surrounding cylinder **11**, heat destructible pin **40** is destroyed releasing traveler **24** for sliding on shaft **22** toward pivotal mount **21** by means of the tension of spring **23** and which is effective to pivot and turn lever arm **50**. The pivoting of lever arm **50** closes regulator **62** and shuts off the flow of gas to the supply line thus preventing opportunity for the gas in the cylinder to feed the fire.

In resetting traveler **24** to an operable position, reset plate **65** which is integrally secured to and which vertically extends upwardly from pivotal mount **21** receives a threaded shaft **70** through a threaded opening **71**. The end portion **73** of shaft **70** is loosely inserted into a mating opening **74** provided in reset block **54** and handle **75** is turned to move shaft **70** through opening **71** and force reset block **54** outwardly to realign opening **38** in traveler **24** with opening **31** of shaft **22**. Upon the alignment of the mentioned openings, a new heat destructible pin is inserted into the aligned openings and threaded shaft **70** is withdrawn from contact with both the reset block **54** and reset plate **65** which places the safety device of the invention back into its protective position.

In summary, it can be seen that the invention provides a unique safety device for gas cylinders in the event of fire. In particular the disclosed linkages provides a spring tensioned valve operator whose fusible member insures immediate response to fire and return of the valve to a safe and closed position.

What is claimed is:

1. An attachment for a bottled gas cylinder of the type having a valve controlled by a stem extending from the body of said cylinder, comprising in combination:

(a) an elongated lever;

(b) a socket mounted at one end of said lever and adapted to releasably engage the stem of a cylinder such that movement of said lever is effective to rotate said stem between open and closed positions;

(c) an elongated tension spring;

(d) a mounting frame including a clamp portion adapted to be releasably secured to the body of said cylinder adjacent said stem and a support portion adapted to receive and secure one end of said spring to said frame;

(e) a traveler block having a locking opening secured to the opposite end of said spring and to the other end of said lever adapting said lever to be placed under the tension of said spring when in said open position;

(f) guide means having a locking opening and slidably mounting said traveler block and adapting said block to move under the tension of said spring, and thereby move said lever between positions corresponding to said stem being open and closed; and

(g) fusible locking means effective to lock said traveler block on said guide means in a position wherein said openings in each are aligned with said lever in said open position and under the tension of said spring and adapted to melt in the presence of heat such that said traveler block is unlocked and under the influence of said spring tension moves said lever and thereby said stem to closed position.

2. An attachment as claimed in claim **1** wherein: said clamp portion comprises a circular band and tightening screws adapted to be secured to the cap end of an acetylene cylinder and the like, said support portion comprises a vertically curved arm integrally secured to said band, and a mounting block pivotally secured to said arm and adapted to secure one end of said spring, said traveler block is pivotally secured to said lever, said guide means comprises a shaft extending outwardly from said mounting block and within said spring, said shaft and mounting block being adapted to rotate around said arm simultaneous with said lever rotating around said stem upon melting of said locking means.

3. An attachment as claimed in claim **2** wherein said mounting and traveler blocks include opposed flanges and including a spreading tool adapted to mount on said flanges, said flanges and tool being arranged such that operation of said tool acts to spread said flanges and retention said spring following melting of said locking means and to realign said openings for receiving a replacement said fusible locking means.

4. An attachment for a bottled gas cylinder of the type having a valve controlled by a stem extending from the body of said cylinder, comprising in combination:

(a) a socket adapted to releasably engage the stem of a cylinder;

(b) rotatable valve operator means connected to said socket for rotating said stem between open and closed positions;

(c) a tension spring arranged so as to have one end secured to said cylinder at a position adjacent said stem and the other end secured to said valve operator means such that rotation of said valve operator means to open position places said spring under tension; and

(d) locking means including a fusible member arranged to lock said operator means in open position and in the presence of excess heat caused by fire and the like, said fusible member being designed to melt and unlock said locking means such that said operator means under the influence of said spring tension is

automatically rotated to closed position so as to shut off flow of gas from said cylinder.

References Cited

UNITED STATES PATENTS

2,637,333	5/1953	Houston et al.	137—75
2,841,018	7/1958	Dickson	74—89.15

FRED C. MATTERN, JR., Primary Examiner

W. S. RATLIFF, JR., Assistant Examiner

U.S. Cl. X.R.

137—75