Aug. 16, 1960 H. E. HEIGIS ET AL 2,949,274

CONTROL HEAD

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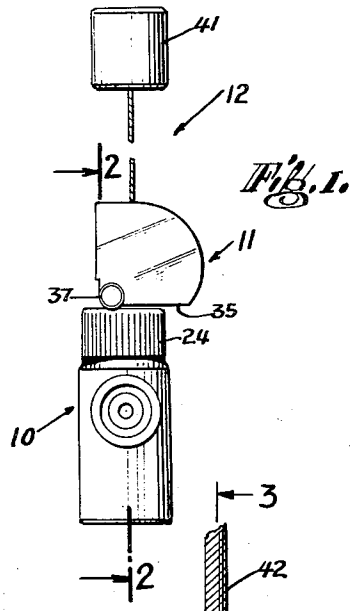


Fig. 1.

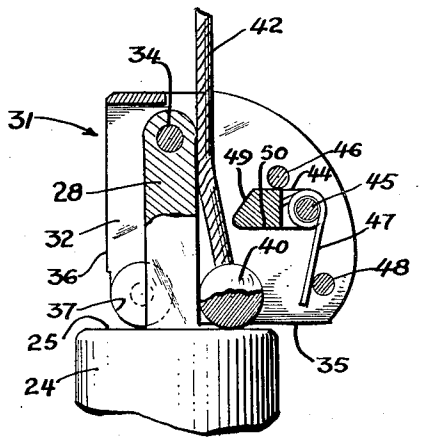


Fig. 3.

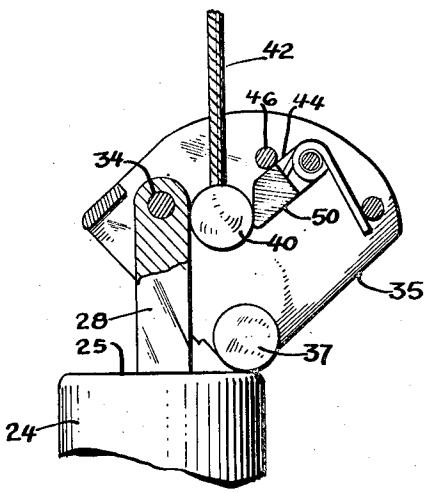


Fig. 4.

Fig. 2.

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CONTROL HEAD

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The present invention relates to control heads, and, more particularly, to pull cable actuated control heads for releasing fluid medium under pressure wherein the pull cable assembly is disconnected from the control head after it has been caused to actuate the control head.

The control head in accordance with the present invention is primarily adapted for use in connection with inflatable devices such as rafts, life vests and the like to open a valve which releases fluid medium under pressure and causes the same to be discharged into the inflatable device. It has been found that in a state of emergency the most reliable manner of operating such a control head is by means of a pull cable. This is because persons can be trained more readily to exert a pull under such conditions than to perform other manipulative operations. It has also been found that it is desirable to effect disconnection of the pull cable assembly from the control head after it has served its purpose, because such disconnection assures the operator that the control head has functioned and prevents entanglement of the pull cable assembly with the clothing or other gear of the operator.

While control heads of the foregoing type have been employed heretofore, they have not been satisfactory because of their complexity, bulk, weight or cost.

Accordingly, an object of the present invention is to provide a control head of the type indicated herein which is extremely simple and compact in construction and is economical to manufacture and assemble.

Another object is to provide such a control head which is reliable in operation.

A further object is to provide such a control head which is readily set and reset and facilitates attachment of a pull cable assembly thereto.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description, and is shown in the accompanying drawing, forming a part of the specification, wherein:

Fig. 1 is a side elevational view of a valve and a control head in accordance with the present invention.

Fig. 2 is an enlarged sectional view taken substantially along the line 2—2 on Fig. 1.

Fig. 3 is a sectional view taken substantially along the line 3—3 on Fig. 2.

Fig. 4 is a view similar to Fig. 3 with the parts shown in their operated position.

Referring to the drawing in detail, there is shown a combined control head and valve assembly **10**, a control head actuating assembly **11**, and a pull cable assembly **12**.

As shown in Fig. 2, the combined control head and valve assembly includes a body or housing **14** formed with an inlet **15** adapted for attachment to the outlet of

a container for storing fluid medium under pressure (not shown), an outlet **16** adapted for attachment to the inlet of the inflatable device (not shown), a valve seat **17** between the inlet **15** and the outlet **16**, and a bore **18** in longitudinal alignment with the inlet **15** but separated therefrom by a partition **19**.

A valve member **20** is normally held on the seat **17** by a spring **21** and has a stem **22** connected thereto which extends through an aperture in the partition **19** and into the bore **18**.

The open end of the bore **18** is closed by a cap **24** having a flat top or track **25** (the purpose of which will become apparent hereinafter) formed with a central aperture **26**. An actuating member has a plunger section **27** disposed in bore **18** and has a shaft section **28** extending through the aperture **26**.

A compression spring **29** positioned between a flange **30** on the plunger section **27** and the underside of the cap urges the actuating member downwardly to cause the plunger section to engage the stem **22** and effect unseating of the valve member **20**, but such movement of the actuating member under the influence of the spring **29** normally is prevented by the actuating assembly associated with the shaft section **28** as about to be described.

The actuating assembly **11**, as shown in Figs. 2 and 3, includes a member pivotally mounted on the shaft section **28** adjacent the outer end thereof. This member has portions transverse with respect to the pivotal axis thereof at both sides of the longitudinal axis of the shaft section which normally are in engagement with the top **25** of the cap **24**, whereby movement of the actuating member under the influence of the spring **29** is prevented. This member is further so constructed and arranged that, upon rocking the same in a direction to cause one of the portions to move past the longitudinal axis of the shaft section, the member is rendered ineffective to restrain the shaft section, whereby the plunger section **27** effects unseating of the valve member.

As illustrated herein, the foregoing can be accomplished by a hood-like member **31** which comprises a pair of connected side plates **32** each pivotally supported on the shaft section by a pin **34** and straddling the shaft section (Fig. 2). The plates each have a horizontal lower edge **35** in engagement with the top of the cap (Fig. 3). A portion of each edge **35** is located at opposite sides of the shaft section, with one portion being longer than the other. The plates each have a vertical side edge **36** adjacent the shorter lower edge portion. Thus, when the member **31** is rocked in a counterclockwise direction (as viewed in Figs. 3 and 4) to cause the edges **36** to engage the top of the cap, the distance between pivot axis and the edges in engagement with the top of the cap is greatly shorted to enable the plunger section **27** to move downwardly and unseat the valve member.

In order to facilitate such movement of the member **31**, suitable roller means **37** are carried by each of the plates at the corner where the edges **35** and **36** meet. These roller means ride on the flat top or track of the cap as the member **31** is rocked from the position shown in Fig. 3 to the position shown in Fig. 4 and thereby eliminate sliding friction.

The pull cable assembly **12** comprises a member such as a ball **40** adapted to be held captive and disconnected as about to be described, a knob or handle **41** (Fig. 1), and a pull cord or cable **42** connecting the ball **40** and the handle **41**.

The ball **40** is normally disposed between the side plates **32** and adjacent the shaft section **28** and the top **25** of the cap (Fig. 3), and is held captive in such position by a latch **44**. This latch is pivotally mounted on a pin **45** supported by the plates **32** and is normally urged against a projection or stop such as a pin **46**, also sup-

ported between the plates 32, by a torsion spring 47 coiled about the pin 45 and having one end engaging the latch 44 and having its other end engaging a pin 48, also supported between the plates 32.

As shown in Fig. 3, the linear dimension between the tip of the latch 44 and the shaft section 28 is smaller than the diameter of the ball 40, whereby, when the handle 41 is pulled, the ball engages the underside of the latch and rocks the member 31 in a counterclockwise direction about the pin 34 to the position shown in Fig. 4. The shaft section 28, upon being pulled downwardly into the housing, increases the aforementioned dimension to a value greater than the diameter of the ball, whereby the ball is freed and the pull cable assembly is disconnected. The foregoing elements are constructed and arranged so that the ball is not released until the plunger section 27 has become unlocked to render the spring 29 effective to operate the plunger section and cause the valve member to be unseated, thus assuring operation of the control head when the pull cable assembly becomes disconnected.

Upon subsequent use of the equipment with which the control head is associated, the member 31 is reset to the position shown in Fig. 3 and the ball 40 of a replacement pull cable assembly is placed in captive position by pressing the latch 44 downwardly with the ball against the force of the spring 47, whereby the ball passes under the latch. The latch then is moved up under the influence of its spring to arrest the ball (Fig. 3). Insertion of the ball in this manner is facilitated by providing the upper free end of the latch with an inclined surface or wedge 49. As shown, the latch has a flat underside 50 which locks the ball effectively until the control head has been fully operated.

From the foregoing description, it will be seen that the present invention provides a simple, and economical control head which is reliable in operation and is readily reset. The actuating assembly is light in weight and is very compact but yet is fully capable of withstanding such rough usage to which it may normally be subjected.

As various changes may be made in the form, construction and arrangement of the parts herein, without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in any limiting sense.

We claim:

1. A control head comprising a housing, an actuating shaft extending through said housing, a spring for urging said shaft into said housing, an upright member pivotally mounted on said shaft adjacent the outer end of said shaft and located at one side of said shaft for movement in a plane parallel to the longitudinal axis of said shaft and having portions at its lower end normally in engagement with the exterior of said housing adjacent said shaft whereby movement of said shaft under the influence of said spring is prevented, means for rocking said member in a direction to cause one of said portions to move past the longitudinal axis of said shaft, whereby said member is rendered ineffective to restrain said shaft and said member is actuated under the influence of said spring, said member having stop means thereon spaced from one side of said shaft and facing said housing, an element normally disposed and held captive between said stop means and said housing, and a pull cord attached to said element and extending through the space between said shaft and said stop means, which, upon being pulled rocks said first mentioned member and moves said stop means with respect to said shaft to widen the space therebetween and to release said element.

2. A control head according to claim 1, wherein said stop means include a projection, a latch pivotally mounted adjacent said projection and spring means for urging said latch against said projection to retain said captive element and being yielding to place said element in its captive position.

3. A control head comprising a housing having a flat upper surface, an actuating shaft extending through said housing, a spring for urging said shaft into said housing, a pair of connected plates straddling said shaft and being pivotally mounted on said shaft adjacent its outer end, said plates having lower edge portions transverse with respect to pivotal axis thereof at opposite sides of the longitudinal axis of said shaft normally in engagement with said housing surface adjacent said shaft whereby movement of said shaft under the influence of said spring is prevented, said lower portions being positioned with respect to the pivotal axis to load said spring, said plates having side edge portions located closer to the pivotal axis than said lower edge portions and adapted to engage said housing surface after said spring has been unloaded, and means for rocking said plates in a direction to cause said lower edge portions at one side of said shaft to move past the longitudinal axis of said shaft, whereby said plates are rendered ineffective to restrain said shaft and said member is actuated under the influence of said spring, said means for rocking said plates include upper and lower pins connected between said plates, a latch pivotally mounted on said lower pin, spring means for urging said latch against said upper pin, and an element on a pull cord between said plates normally held captive by said latch.

4. A valve operating device for gas cylinder valves wherein a valve stem and valve head are contained in a valve casing, a spring loaded actuating plunger extending through the valve casing for contacting the valve stem and unseating the valve head, means for restraining said plunger to a position out of contact with the valve stem, said means comprising a movable hood member pivoted to said plunger externally of the valve casing, a roller on said hood for supporting said hood when in plunger restraining position and augmenting a change of position of said hood, means for releasing said restraining means comprising a spring biased stop element pivoted in said hood, a ball attached to a lanyard and insertable past said spring biased stop element, said ball operating to move said hood to release the restraint on said plunger when a predetermined pulling force is applied to said lanyard.

5. A valve operating device and restraining means therefor comprising a hood positioned externally of a valve casing and in contacting and cooperating relationship with and movable with reference thereto, said hood having pivotal connection with a valve operating spring loaded plunger, said hood being adapted for setting in a position wherein said plunger is restrained from valve operating position, trigger means for moving said hood to a nonrestraining position, said means comprising a lanyard, a ball attached to said lanyard, a spring loaded stop, said ball being insertable behind said stop to be held captive until a predetermined pull is applied to said lanyard, said hood being moved to a nonrestraining position when sufficient force is applied to free said ball and lanyard.

6. A device for permanently opening a valve wherein a valve stem and valve head are enclosed in a valve casing, and wherein the valve head is normally biased to closed position, said valve opening device comprising a plunger for impinging upon the valve stem for permanently opening the valve, means for biasing said plunger to open the valve, means for setting and restraining said plunger in position against the force of said biasing means and out of contact with the valve stem, thereby maintaining the valve in closed position, said last named means comprising a hood, means for effecting pivotal connection between said hood and said plunger, a roller on said hood, said roller constituting a point of support for said hood when said plunger is in restrained position out of contact with the valve stem, means for rocking said hood

and moving said roller out of hood supporting position thereby releasing said plunger to cause permanent opening of the valve, said last named means comprising a spring pressed trigger pivoted in said hood, a ball secured to a lanyard and insertable behind said trigger for operating said trigger to rock said hood and release said plunger from restrained position when a predetermined force is exerted on said lanyard.

7. A device for permanently opening a valve wherein a valve stem is positioned in a valve casing, and wherein the valve is normally biased to closed position, said valve opening device comprising a plunger extending through an opening in said casing and adapted for impinging contact with the stem of the valve to open the valve, a plurality of springs of different phase resonance housed within said valve casing for biasing said plunger to valve stem contact, means for anchoring said plunger against the bias of said springs to hold said plunger out of contact with the valve stem, said means comprising a hood, a pivot connection between said hood and plunger externally of said valve casing, rollers on said hood, said casing providing a support for said rollers and a supporting contact for a portion of said hood, said pivot connection being located between the point of roller support and the point of hood contact when said plunger is in restrained position, means for rocking said hood to roll said rollers beyond dead center to release the restraint on said plunger and return it to the bias of said springs, said last named means comprising a pivot pin in said hood, a spring pressed latch pivoted to said pin, a free lanyard, a ball on said lanyard capable of being inserted in said hood and being restrained by said latch, said ball operating to rock said hood about said last named pivot to remove the support afforded said plunger by said roller and the contact between said casing and hood.

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