Jan. 1, 1952 H. E. HEIGIS 2,580,426

WARNING MEANS FOR SAFETY DISCHARGE OUTLETS

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Fig. 1

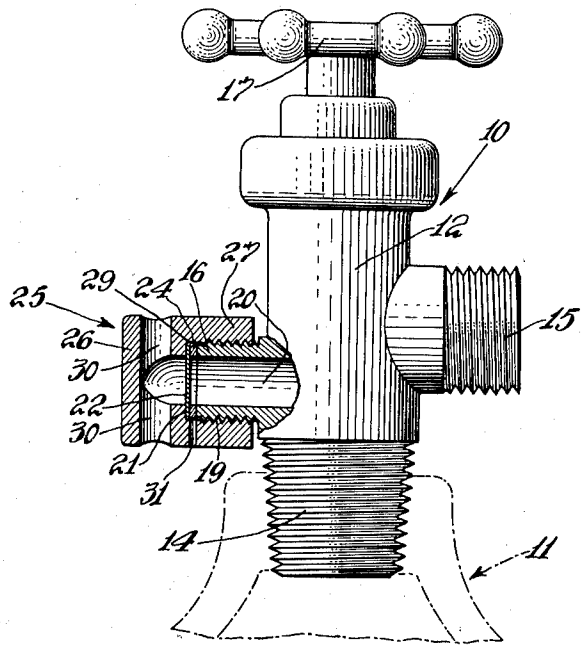
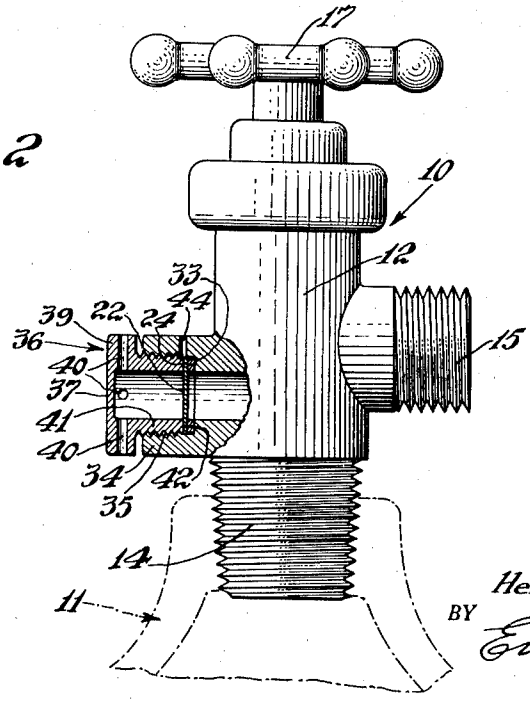



Fig. 2




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## WARNING MEANS FOR SAFETY DISCHARGE OUTLETS

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The present invention relates to valves and the like for fluid medium under pressure, and, more particularly, to warning means for safety discharge outlets associated with such valves and the like.

Metallic receptacles, such as cylinders and the like for storing normally gaseous material in gaseous or liquefied condition under relatively high pressure, usually are equipped with a discharge valve or control head which is provided with safety discharge means including a disc adapted to burst when the pressure within the receptacle exceeds a safe value. Such an arrangement, as illustrated in United States Patent Number 2,414,113, generally comprises a safety discharge opening in communication with the interior of the cylinder and surrounded by a seat, a safety disc on the seat for closing the opening, and a member screw threadedly secured to the valve body for retaining the disc on the seat. The member is formed with radially extending safety discharge passages for releasing the pressure medium from the cylinder and minimizing recoil of the cylinder in the event the safety disc bursts.

One of the difficulties heretofore encountered is that frequently attempts are made to remove the retainer member while the cylinder contains pressure medium whereby the member, when disengaged from the valve body, may be projected through space with great force by pressure within the cylinder and may cause personal injury or property damage. In addition, when the pressure medium is suddenly released due to removal of the safety disc retainer, the cylinder recoils violently or may be converted into a jet-like propelled missile.

The foregoing difficulties often occur while cylinders are being inspected or prepared for refilling. Such cylinders supposedly are empty but may still contain sufficient pressure medium to cause trouble. Also, careless or curious persons, unaware of the dangers involved, often attempt to remove the retainer member while pressure medium is stored in the cylinders, the consequence being that such unauthorized removal of the retainer member results in serious accidents.

Accordingly, an object of the present invention is to eliminate the foregoing difficulties by providing means for safety discharge outlets which are adapted to give a warning that a cylinder contains pressure medium when an attempt is made to remove the safety disc retainer.

Another object is to provide such means which give an audible warning serving to advise persons

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familiar with the dangers involved that a cylinder contains pressure medium and which likewise serve to frighten persons tampering with the safety discharge means into abandoning removal of the retainer and reapplying the same.

A further object is to provide such warning means in a simple, practical manner without any material increase in cost of the valves or the like to which they are applied.

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.

In accordance with the invention, the foregoing objects may be accomplished by providing safety discharge outlet means formed with an opening and a seat surrounding the opening, a safety disc on the seat for closing the opening, and means removably secured to the outlet means for retaining the disc on the seat, one of the means having a passageway extending from the seat to the exterior thereof for permitting fluid medium confined by the disc to escape therethrough and to serve as a warning vent when an attempt is made to remove the retainer means while pressure medium is confined by the disc.

In one embodiment of the inventon, the retainer means may be in the form of a cap-like member having a skirt which is formed with the passageway and is secured over a discharge outlet nipple.

In another embodiment of the invention, the retainer means may be in the form of a plug-like member secured within a safety discharge outlet spud which is formed with the passageway.

In the drawing:

Figure 1 is an elevational view, partly in section, of a valve, illustrating one embodiment of the invention.

Figure 2 is a similar view, illustrating another embodiment of the invention.

Referring to the drawing, and, more particularly, to Figure 1 thereof, there is shown a valve 10, by way of example, for a container 11 or the like (shown in broken lines) adapted for storing fluid medium under pressure. The valve generally comprises a body 12 formed with an inlet 14 secured to the container, an outlet 15 and a safety discharge nipple 16 in communication with the inlet; an internal valve structure between the inlet and outlet, which is not shown

because it is not deemed essential in understanding the present invention; and means, such as a hand wheel 17, for operating elements of the internal structure to control the release of fluid medium from the container.

The nipple 16 is exteriorly threaded at 19 and is formed with an axially extending bore or opening 20 surrounded by an annular surface 21 serving as a seat for a safety discharge disc 22 adapted to close the opening 20. Preferably, the seat includes a gasket or washer 24 adapted to provide a fluid pressure tight seal between the surface 21 and the disc 22.

The disc 22 is held on its seat by a retainer member 25 herein shown as a cap-like structure comprising an end wall 26, an interiorly threaded skirt 27 removably secured over the nipple 16, an annular internal shoulder 29 for holding the disc on its seat, and conventional radial ports 30 for releasing pressure medium from the cylinder and minimizing recoil or lateral reaction of the cylinder in the event the safety disc bursts.

In order to provide warning means adapted to indicate that the cylinder contains pressure medium, when an attempt is made to remove the retainer member 25 from the nipple 16, the member 25 is formed with a passageway extending from the seat to the atmosphere, that is, to the exterior of the member 25. This passageway includes one or more apertures 31 (one being shown by way of example) extending radially outwardly through the skirt 27 from a point adjacent the seat or between the seat and the shoulder 29 to the exterior, whereby, when the retainer member 25 is unscrewed slightly, pressure medium confined by the disc 22 is adapted to escape through the aperture to produce an audible warning.

Such a warning to a skilled person indicates that the cylinder still contains pressure medium. The cylinder should then be weighed to determine the exact content of pressure medium, which if not sufficient to warrant salvaging, may be released by opening the valve. The retainer may then be safely removed. In the event a careless or curious person perceives the warning, such person will be frightened into abandoning the attempt to unscrew the disc retainer or will be urged to screw the disc retainer in place again lest his tampering be detected.

In Figure 2, a valve is shown which is similar to the valve 10 shown in Figure 1, except that the safety discharge means are in accordance with another embodiment of the invention.

In this embodiment, the safety discharge means includes a spud 34 formed on the valve body 12. The spud has an interiorly threaded bore 35 and an annular shoulder 33 within the bore which, together with a gasket or washer 24, provides a seat for a safety disc 22 adapted to be held thereon by a retainer member 36.

The retainer member 36 is in the form of a hollow plug-like structure comprising an end wall 37, an outer flange-like section 39 formed with a plurality of radial recoil minimizing ports 40, and an inner threaded section 41 screwed into the bore of the spud and having an annular inner end surface 42 for engaging the disc 22 to hold the same on its seat.

The warning means in this embodiment of the invention are provided by a passageway extending from the seat to the exterior of the spud which includes one or more apertures 44 extending radially outwardly through the wall of the spud from the bore thereof at a point adjacent the seat from the disc 22 to the exterior of the spud.



When the retainer member 36 is unscrewed slightly, pressure medium confined by the disc 22 is adapted to escape through the aperture 44 to produce an audible warning as described in connection with the embodiment of the invention illustrated in Figure 1.

From the foregoing description, it will be seen that the present invention provides a simple, practical and effective warning means for safety discharge outlets associated with valves, control heads, fittings and the like. The warning means can be provided without material increase in cost of the devices to which they are applied, simply by the formation of an aperture 31 or 44 properly located with respect to the seat for the safety disc 22.

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.

I claim:

1. In a valve or the like for fluid medium under pressure, the combination of safety discharge outlet means formed with an opening and a seat surrounding said opening, a safety disc on said seat for closing said opening, and means removably secured to said outlet means for normally retaining said disc on said seat to form a pressure-tight seal, one of said means having a passageway extending from said seat to the exterior thereof for permitting fluid medium confined by said disc to escape therethrough and to serve as a warning vent only when an attempt is made to remove said disc retaining means while pressure medium is confined by said disc whereby the seal is broken.

2. In a valve or the like for fluid medium under pressure, the combination of safety discharge outlet means formed with an opening and a seat surrounding said opening, a safety disc on said seat for closing said opening, and means removably secured to said outlet means for normally retaining said disc on said seat to form a pressure-tight seal, one of said means having an aperture extending outwardly therethrough from a point adjacent said seat to the exterior thereof for permitting fluid medium confined by said disc to escape therethrough and to serve as a warning vent only when an attempt is made to remove said disc retaining means while pressure medium is confined by said disc whereby the seal is broken.

3. In a valve or the like for fluid medium under pressure, the combination of safety discharge outlet means having a tubular section formed with an opening and a seat surrounding said opening, a safety disc on said seat for closing said opening, and means having a tubular section removably secured to said first mentioned tubular section in telescoping relation and having a surface for normally retaining said disc on said seat to form a pressure-tight seal, one of said means having an aperture extending radially through the tubular section thereof from a point adjacent said surface to the exterior thereof for permitting fluid medium confined by said disc to escape therethrough and to serve as a warning vent only when an attempt is made to remove said disc retaining means while pressure medium is confined by said disc whereby the seal is broken.

4. In a valve or the like for fluid medium under pressure, the combination of safety discharge out-

let means including a nipple formed with an opening and a seat surrounding said opening, a safety disc on said seat for closing said opening, and a cap-like structure removably secured over said nipple for normally retaining said disc on said seat to form a pressure-tight seal, said structure having an aperture extending outwardly therethrough from a point adjacent said seat to the exterior thereof for permitting fluid medium confined by said disc to escape therethrough and to serve as a warning vent only when an attempt is made to remove said structure while pressure medium is confined by said disc whereby the seal is broken.

5. In a valve or the like for fluid medium under pressure, the combination of safety discharge outlet means including a tubular nipple formed with an opening and a seat surrounding said opening, a safety disc on said seat for closing said opening, and a cap-like structure having a tubular section removably secured over said nipple and having a surface at the interior thereof for normally retaining said disc on said seat to form a pressure-tight seal, said tubular section having an aperture extending radially outwardly therethrough from a point between said surface and said seat to the exterior thereof for permitting fluid medium confined by said disc to escape therethrough and to serve as a warning vent only when an attempt is made to remove said structure while pressure medium is confined by said disc whereby the seal is broken.



6. In a valve or the like for fluid medium under pressure, the combination of safety discharge outlet means including a spud formed with a threaded opening and a seat within said opening, a safety disc on said seat for closing said opening, and a plug-like structure removably secured in said opening and normally retaining said disc on said seat to form a pressure-tight seal, said spud having an aperture extending radially outwardly therethrough from a point adjacent said seat to the exterior thereof for permitting fluid medium confined by said disc to escape therethrough and to serve as a warning vent only when an attempt is made to remove said structure while pressure medium is confined by said disc whereby the seal is broken.

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## REFERENCES CITED

The following references are of record in the file of this patent:

### UNITED STATES PATENTS

| Number | Name | Date |
|---|---|---|
| 568,680 | Henderson | Sept. 29, 1896 |
| 1,068,675 | Lightfoot | July 29, 1913 |
| 2,106,176 | Huffman et al. | Jan. 25, 1938 |
| 2,414,113 | Mapes | Jan. 14, 1947 |
| 2,521,773 | Bierman | Sept. 12, 1950 |