

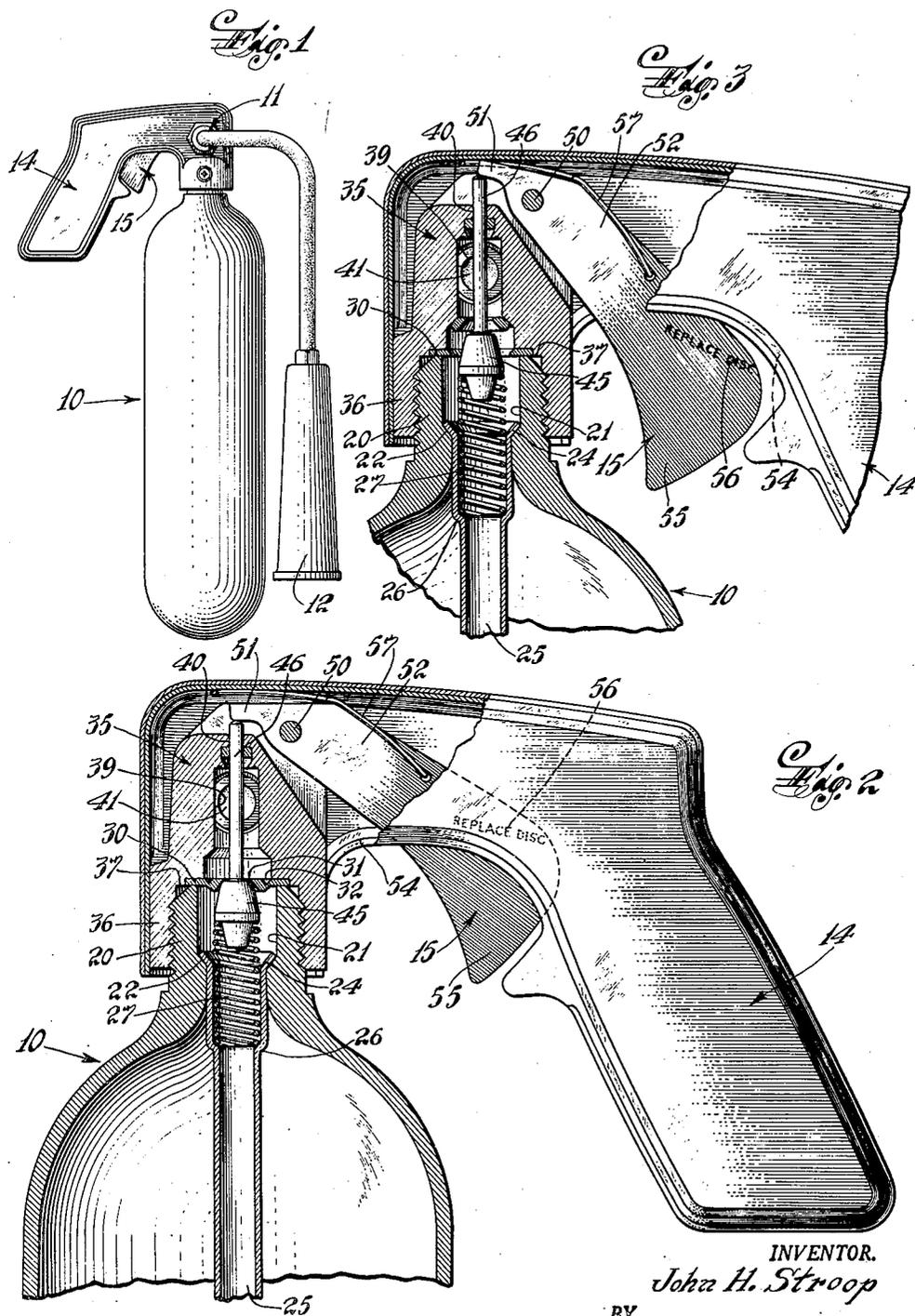
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INDICATOR

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## INDICATOR

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The present invention relates to indicators, and more particularly to indicators for indicating the discharge of fluid pressure medium.

The present invention is concerned with indicators for a device adapted to control the discharge of the medium wherein a displaceable member serves as a valve seat and as safety discharge means. Such a device is illustrated and described in my co-pending application Serial No. 667,902, filed May 7, 1946.

For example, the aforementioned discharge controlling device may be a valve associated with a portable fire extinguisher wherein carbon dioxide or other fire extinguishing medium is stored under relatively high pressure in a metallic container known as a cylinder. When the pressure of the medium in the container exceeds a valve which the container cannot safely withstand, the safety discharge means release the contents of the container to the atmosphere. In the event the container is emptied by way of its safety means without being noticed or promptly detected, the fire extinguisher is useless for its intended purpose should an emergency arise thereafter.

The present invention aims to overcome the foregoing difficulty by providing an indicator which gives a clear, visible, as well as legible indication, that the container has been discharged and emptied by way of safety means of the aforementioned type.

An object of the present invention is to provide an improved indicator for indicating discharge of fluid medium by way of safety means.

Another object is to provide an indicator which is simple in construction and can be embodied in valves of the aforementioned character without additional expense, and without increase in the number of parts or weight.

Another object is to provide an indicator which cannot be tampered with and is positive and reliable in operation.

A further object is to provide an indicator which is associated with the discharge controlling means.

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

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drawing, forming a part of the specification, wherein:

Figure 1 is an elevational view of a portable fire extinguisher embodying the present invention.

Figure 2 is an enlarged fragmentary view, partly in section and partly in elevation, illustrating the indicator in its non-indicating position.

Figure 3 is an enlarged fragmentary view similar to Figure 2, illustrating the indicator in its indicating position.

Referring to the drawing, and more particularly to Figure 1, there is shown a portable fire extinguisher comprising a metallic container or cylinder 10 adapted for storing liquefied carbon dioxide or the like, a discharge control head 11 at the upper end of the container, a horn or shield 12 connected to the head for forming carbon dioxide snow and directing the same to a fire, a handgrip 14 secured about the discharge control head, and a trigger 15 mounted on the handgrip for controlling the operation of carbon dioxide releasing means within the head and serving as an indicating member as described hereinafter.

As illustrated in Figure 2, the container has an externally threaded neck 20 provided with an opening 21 formed with a shoulder 22. The shoulder is adapted to support a flange 24 of a syphon tube 25 having an internal shoulder 26 beneath its flange for supporting a spring 27.

An apertured disc 30 is positioned across the opening 21 of the container which disc serves as both a valve seat and a safety disc. The disc 30 preferably is circular in shape and has a circular aperture 31 at the center thereof serving as a valve port. An annular groove 32 is stamped, machined, molded or otherwise formed on the disc between its outer periphery and its central aperture. This groove weakens the disc to enable the same to burst and be displaced in the event the pressure in the cylinder exceeds a predetermined safe value.

The disc 30 is secured in place by a valve body 35 having an internally threaded lower portion 36 adapted for securment to the externally threaded neck 20 of the container and having a shoulder 37 adapted to engage the peripheral zone of the disc and hold it against the lip of the container neck. In this manner the disc also serves as a seal between the container and the valve body. The valve body 35 further has an outlet bore 39 above the disc 30 which is provided with a valve stem opening 40 at its upper end

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and is provided with an outlet port or discharge opening 41 leading to the horn 12.

A valve member 45 is positioned below the disc 30 and is urged upwardly against the disc by the spring 27 to close the central aperture 31 of the disc. The valve member has a stem 46 extending through the aperture 31, the bore 39 and the opening 40 to facilitate operation of the valve by means of the trigger 15.

The trigger 15 is pivotally mounted on the valve body by a pin 50 and comprises an arm 51 for engaging the upper end of the valve stem 46 and a lever 52 at the opposite side of the pin. The handgrip 14 is secured to the valve body 35 and provides a casing for the trigger 15. At the underside of the handgrip, a slot 54 is formed through which a portion 55 of the lever extends to permit manual engagement thereof for moving the trigger about its pivot. Adjacent to the portion 55, the lever is provided with indicia 56 (Figure 3) normally concealed (Figure 2) by the handgrip but adapted to be exposed in the event the disc 30 is displaced (Figure 3). A relatively light spring 57 connected to the trigger serves to normally retain the trigger in a position to conceal the indicia.

In operation, to discharge the contents of the container, the portion 55 of the trigger is engaged by the operator and is moved upwardly. This causes the arm 51 of the trigger to move the valve stem 46 downwardly to effect unseating of the valve member, whereby the contents of the container pass through the aperture 31 of the disc 30 to the bore 39 and the opening 40 leading to the horn. When the trigger portion 55 is released by the operator, the pressure of the contents and the spring 27 effect reseating of the valve member and return of the trigger to the position shown in Figure 2.

In the event that the pressure of the contents exceeds a predetermined safe value, due to abnormal high temperature conditions, the disc 30 is adapted to burst and be displaced as shown in Figure 3. The contents then will be discharged through the disrupted valve seat to the outlet 40. The valve member 45 is then moved upwardly by the relatively strong spring 27 and the valve stem 46 pushes the arm 51 upwardly to overcome the force of the relatively weak spring 57, whereby the trigger is moved to a position in which the indicia 56 on the trigger lever is exposed and is clearly visible (Figure 3). It will then be apparent that the disc has functioned as safety means and that the container is empty and requires replacement of the disc as well as recharging.

From the foregoing description, it will be seen that the present invention provides an indicator for valves which is positive and reliable in operation. The indicator cannot be tampered with to give a false indication that the container must be refilled because its operation is dependent on the displacement of the disc. The indicator can be economically manufactured and assembled without material increase in the cost of the valve. The parts of the indicator are rugged in construction and can readily withstand any rough usage to which they may be subjected.

While the present invention has been described in connection with a portable fire extinguisher by way of example, it will be understood that the indicating features may be applied to valves associated with or installed in stationary systems or containers for discharging fluid medium under pressure, adapted to be used for fire ex-

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tinguishing, flotation, pressure operation or other purposes.

As various changes may be made in the form, construction and arrangement of the parts herein, without departing from the spirit or 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.

It is also to be understood that the following claims are intended to cover all the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

I claim:

1. In a valve, the combination of a housing having inlet and outlet ports, a valve seat between said ports which is displaceable when a fluid pressure medium acting from said inlet port exceeds a predetermined pressure, a valve member for said valve seat, spring means for urging said valve member against said valve seat, a valve stem for said valve member, a trigger having an arm, and spring means weaker than said first spring means for maintaining said arm in engagement with said valve stem whereby said trigger is adapted to be moved into an indicating position upon displacement of said valve seat.

2. In a valve, the combination of a housing having inlet and outlet ports, a valve seat between said ports which is displaceable when a fluid pressure medium acting from said inlet port exceeds a predetermined pressure, a valve member for said valve seat, a spring for urging said valve member against said valve seat, a valve stem for said valve member, a casing on said housing having a slot therein, a trigger pivotally mounted on said casing having a portion disposed in said slot provided with indicia normally concealed in said casing and having an arm engaging said valve stem, and a spring weaker than said first spring for maintaining said arm in engagement with said valve stem, whereby, upon displacement of said valve seat, said valve member through its stem is adapted to move said trigger into a position to expose said indicia.

3. In a valve, the combination of a valve housing having inlet and outlet ports, an apertured disc in said housing between said ports serving as a valve seat constructed and arranged to rupture when a fluid pressure medium acting from said inlet port exceeds a predetermined pressure, a valve member at the inlet port side of said disc, spring means for urging said valve member against said disc, and means operable for unseating said valve member including a member normally positioned in a non-indicating position and constructed and arranged to be moved into an indicating position upon rupture of said disc by movement of said valve member under the influence of said spring means.

4. In a valve, the combination of a valve housing having inlet and outlet ports, an apertured disc in said housing between said ports serving as a valve seat constructed and arranged to rupture when a fluid pressure medium acting from said inlet port exceeds a predetermined pressure, a valve member at the inlet port side of said disc, spring means for urging said valve member against said disc, a casing on said housing having an opening therein, and means operable for unseating said valve member including a member having indicia thereon normally positioned in

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a concealed non-indicating position in said casing and constructed and arranged to be moved through said opening into an indicating position upon rupture of said disc by movement of said valve member under the influence of said spring means.

5. In a valve, the combination of a housing having inlet and outlet ports, a valve seat member between said ports which is displaceable when a fluid pressure medium acting from said inlet port exceeds a predetermined pressure at the inlet port side of said seat, a valve member adapted to be urged against said valve seat member at the inlet port side thereof, and means operable for unseating said valve member including a member normally positioned in a non-indicating position and constructed and arranged to be moved into an indicating position by said valve member upon displacement of said valve seat member.

6. In a valve, the combination of a housing having inlet and outlet ports, a valve seat member between said ports which is displaceable when a fluid pressure medium acting from said inlet port exceeds a predetermined pressure, a valve member for said valve seat member, spring means for urging said valve member against said valve seat member at the inlet port side thereof, and means operable for unseating said valve member including a member normally positioned in a non-indicating position and constructed and arranged to be moved into an indicating position by said valve member under the influence of said spring means upon displacement of said valve seat member.

7. In a valve, the combination of a housing having inlet and outlet ports, a valve seat member between said ports which is displaceable when a fluid pressure medium acting from said inlet port exceeds a predetermined pressure, a valve member adapted to be urged against said valve seat member at the inlet port side thereof, a valve stem for said valve member, a lever having an arm positioned for engagement with said valve stem whereby said lever is adapted to be moved into an indicating position upon displacement of said valve seat member, and means cooperating with said lever to normally releasably house the same in a non-indicating position.

8. In a valve, the combination of a housing having inlet and outlet ports, a valve seat member between said ports which is displaceable when a fluid pressure medium acting from said inlet port exceeds a predetermined pressure, a valve member for said valve seat member, a valve stem for said valve member, spring means for urging said valve member against said valve seat member at the inlet port side thereof, a trigger having an arm positioned for engagement with said valve stem whereby said trigger is adapted to be moved into an indicating position upon displacement of said valve seat member, and means cooperating with said trigger to normally releasably house the same in a non-indicating position.

9. In a valve, the combination of a housing having inlet and outlet ports, a valve seat member between said ports which is displaceable when a fluid pressure medium acting from said inlet port exceeds a predetermined pressure, a valve member adapted to be urged against said valve seat member at the inlet port side thereof, a valve stem for said valve member, a lever having an arm positioned for engagement with said stem, whereby said lever is adapted to be moved into an indicating position upon displacement

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of said valve seat member, and means for normally retaining said lever in a non-indicating position.

10. In a valve, the combination of a housing having inlet and outlet ports, a valve seat member between said ports which is displaceable when a fluid pressure medium acting from said inlet port exceeds a predetermined pressure, a valve member for said valve seat member, spring means for urging said valve member against said valve seat member, a valve stem for said valve member, a trigger having an arm positioned for engaging with said stem, whereby said trigger is adapted to be moved into an indicating position upon displacement of said valve seat member, and spring means weaker than said first spring means for normally retaining said trigger in a non-indicating position.

11. In a valve, the combination of a housing having inlet and outlet ports, a valve seat member between said ports which is displaceable when a fluid pressure medium acting from said inlet port exceeds a predetermined pressure, a valve member adapted to be urged against said valve seat member at the inlet port side thereof, a casing on said housing, and means operable for unseating said valve member including a member normally positioned in a non-indicating position and partially concealed in said casing when in normal non-indicating position and being constructed and arranged to be moved into an indicating position with respect to said casing upon displacement of said valve seat member.

12. In a valve, the combination of a housing having inlet and outlet ports, a valve seat member between said ports which is displaceable when a fluid pressure medium acting from said inlet port exceeds a predetermined pressure, a valve member adapted to be urged against said valve seat member at the inlet port side thereof, a casing on said housing, and means operable for unseating said valve member including a member normally positioned in a non-indicating position and having indicia thereon concealed in said casing when in normal non-indicating position and being constructed and arranged to be moved into an indicating position to expose said indicia upon displacement of said valve seat member.

13. In a valve, the combination of a valve housing having inlet and outlet ports, a valve seat between said ports constructed and arranged to be displaced when a fluid pressure medium acting from said inlet port exceeds a predetermined pressure, a valve member for said valve seat, means for urging said valve member against said valve seat, a valve stem for said valve member, manually operable means positioned for engagement with said valve stem, said valve member through its stem, upon displacement of said valve seat, being adapted to move said manually operable means into an indicating position, and means for normally retaining said manually operable means in non-indicating position.

14. In a valve, the combination of a valve housing having inlet and outlet ports, a valve seat between said ports constructed and arranged to be displaced when a fluid pressure medium acting from said inlet port exceeds a predetermined pressure, a valve member for said valve seat, means for urging said valve member against said valve seat, a valve stem for said valve member, a casing on said housing having

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an opening therein, manually operable means positioned for engagement with said stem having a portion extending through said opening and having indicia thereon normally concealed in said casing, said valve member through its stem, upon displacement of said valve seat, being adapted to move said manually operable means into a position to expose said indicia, and means for normally retaining said manually operable means in a non-indicating position.

15. In a valve, the combination of a housing having inlet and outlet ports, a valve seat between said ports which is displaceable when a fluid pressure medium acting from said inlet port exceeds a predetermined pressure, a valve member for said valve seat member, a spring for urging said valve member against said valve seat, a valve stem for said valve member, a casing on said housing having a slot therein, a trigger pivotally mounted on said casing having a portion disposed in said slot provided with indicia

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normally concealed in said casing and having an arm positioned for engagement with said valve stem, and a spring weaker than said first spring for maintaining said arm in engagement with said valve stem, whereby, upon displacement of said valve seat member, said valve member through its stem is adapted to move said trigger into a position to expose said indicia and a spring weaker than said first spring for normally retaining said trigger in a position to conceal said indicia.

JOHN H. STROOP.

## REFERENCES CITED

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

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