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M. A. SANDGREN

2,780,389

SQUIB OPERATED GAS RELEASE DEVICE

Filed May 2, 1955

Fig. 1.

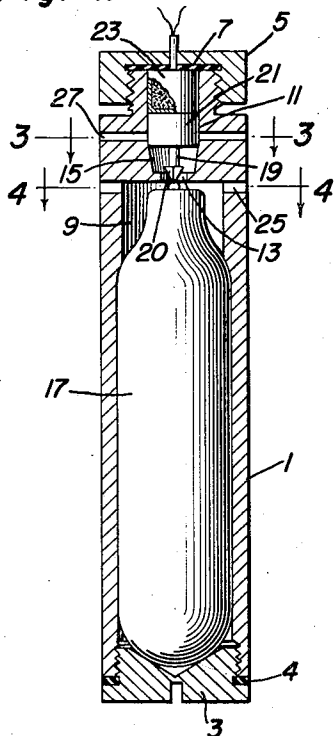


Fig. 2.

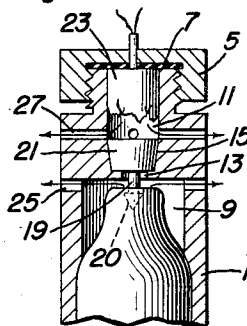


Fig. 3.

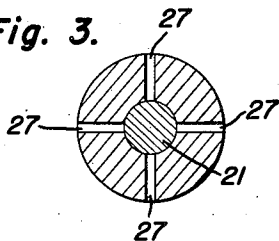


Fig. 4.

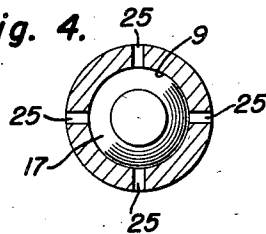
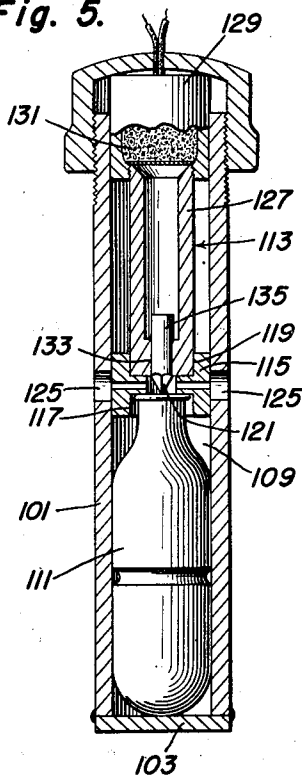


Fig. 5.



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2,780,389

SQUIB OPERATED GAS RELEASE DEVICE

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Application May 2, 1955, Serial No. 505,568

1 Claim. (Cl. 222—5)

This invention relates to a squib operated device for releasing fluids from containers in which they are stored under pressure. It provides a means by which fire extinguishing gases, insecticidal aerosols, toxic gases or vapors, or the like, may be effectively released by remote control.

An object of the invention is to provide an explosively actuated gas release device in which the explosion may be made of sufficient strength to effectively actuate a puncturing member without endangering the surroundings.

In the drawings, Fig. 1 is a longitudinal section through one modification of my invention.

Fig. 2 is a view corresponding to the upper portion of Fig. 1, showing the position of the parts after the explosion has taken place and showing the flow of the gases.

Fig. 3 is a transverse section taken on line 3—3 of Fig. 1.

Fig. 4 is a transverse section on the line 4—4 of Fig. 1.

Fig. 5 is a longitudinal section taken of a second modification.

The modification of Figures 1—4 will now be described.

The device includes a cylindrical body member 1 which is closed at its lower end by screw plug 3, having a gasket 4, and at its upper end by a screw cap 5, which is provided with a gasket 7. The body member 1 is provided in its lower portion with a main cavity 9 and in its upper portion with a bore 11. The two are connected by dart opening 13. The lower portion of bore 11 is tapered as shown at 15. The degree of taper is somewhat exaggerated in the drawing for clarity.

Within the cavity 9 is a gas cylinder 17 containing gas, volatile liquid, or a mixture of gas and liquid under pressure. Within bore 11 is a dart 19 having an enlarged point 20 and head 21. The latter has a sliding fit in the upper untapered portion of the bore. In the uppermost portion of bore 11 is electric squib 23.

Radial discharge passages 25 communicate with cavity 9. Explosive gas outlets 27 communicate with bore 11 and are so positioned that they are covered by dart head 21 in its initial position. The dart is normally held in the position shown in Fig. 1 by squib 23 and the taper 15.

When electric squib 23 is exploded the dart 19 is driven downwardly so that the enlarged point 20 passes through the top of cylinder 17, allowing gas to escape through discharge passages 25. When the dart moves downwardly, it uncovers explosive gas outlets 27, as shown in Fig. 2, allowing the explosive gas to escape without dan-

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ger of rupturing body member 1. At the same time, dart head 21 is jammed into tapered portion 15 of bore 11, stopping the dart.

A second modification is shown in Fig. 5. This modification comprises a body member 101 having at its lower end a closure 103 which may or may not be removable. Body member 101 is also provided with a screw cap 105 on its upper end and has a cavity 109 extending from the screw cap to the closure. Within cavity 109 are gas cylinder 111 and gun 113. Spacer 115 engages the cylinder and gun and holds them in the proper positions, being provided with recesses 117 and 119 which receive the cylinder end and the gun respectively. Spacer 115 also is formed with a central dart opening 4. It is also provided with outlet passages 123 which communicate with dart opening 121 and with holes 125 formed in body member 101.

Gun 113 comprises a barrel 127 and a squib chamber 129 in which is mounted an electric squib 131. At the lower end of the gun is a reduced bore 133. A dart 135 fits in this reduced bore sufficiently tightly to normally hold it in position.

When squib 131 is exploded, dart 135 is blown from bore 133 and passes completely through the upper end of cylinder 111. Both the explosive gases and the gas in the cylinder then escape through outlet passages 123.

While I have used the words "upper" and "lower" for convenience in describing the device with relation to the drawings, it will be understood that it may be used in any position. It will also be understood that various modifications are possible. I therefore wish my invention to be limited solely by the scope of the appended claim.

I claim:

35 A squib operated discharge device comprising a body member, a cavity in said body member, a container filled with an expansible fluid under pressure positioned in said cavity, a bore in said body member in open alignment with said container, a dart in said bore having an enlarged point adapted to pierce said container and an enlarged head having a sliding fit in said bore, an explosive squib in said bore adapted to drive said point through the wall of said container, at least one discharge passage communicating with said bore, means normally holding said dart in such a position that said dart head closes an explosive gas outlet, said bore and said dart being so proportioned that when said point has pierced the wall of said container said head uncovers said gas outlet, said bore comprising a cylindrical portion and a tapered portion, said tapered portion being at the end adjacent said container, said dart being normally positioned with its head in said cylindrical portion and having a sliding fit therein, said tapered portion being so proportioned that said squib may drive said head into said tapered portion sufficiently to uncover said explosive gas outlet and that said dart will then be stopped.

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