

June 26, 1951

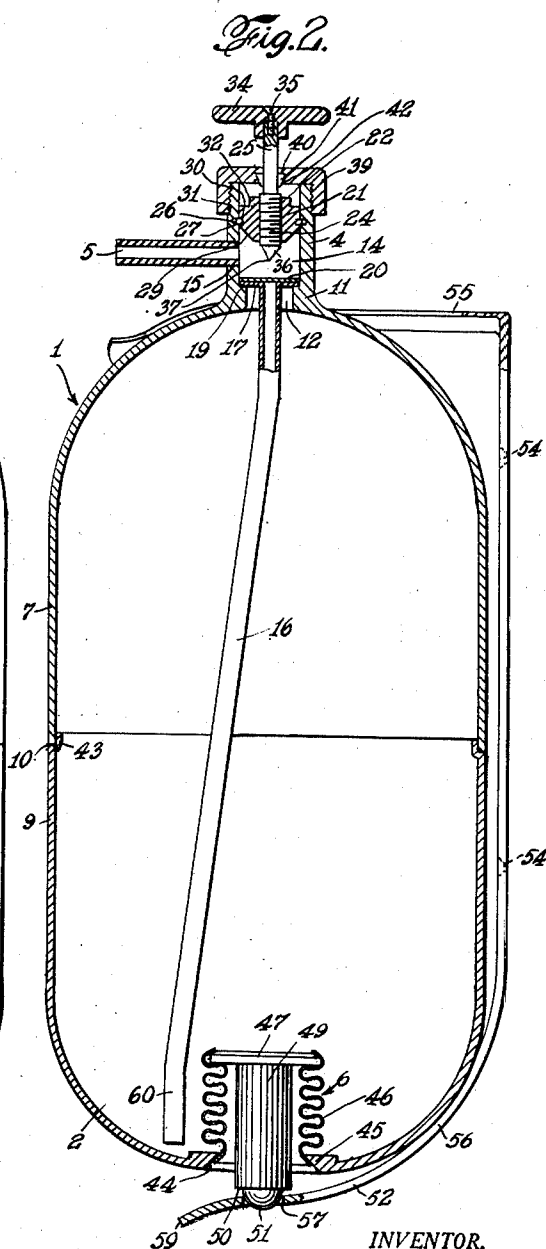
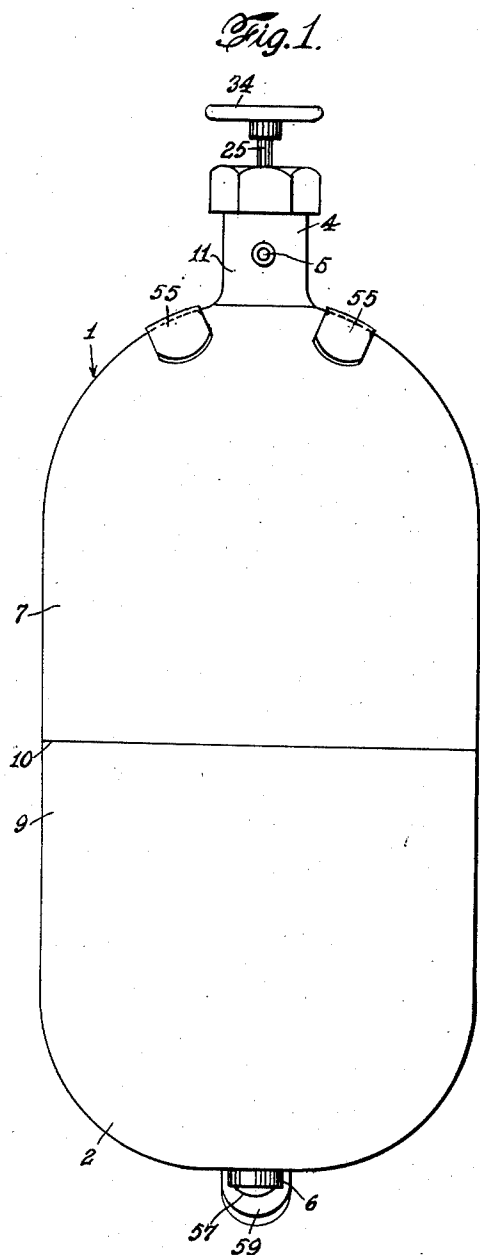
S. E. ALLEN

2,558,409

DISCHARGE HEAD FOR FIRE EXTINGUISHERS

Filed March 2, 1948

2 Sheets-Sheet 1



INVENTOR.
SCOTT E. ALLEN

BY *Edward T. Connor*

ATTORNEY

June 26, 1951

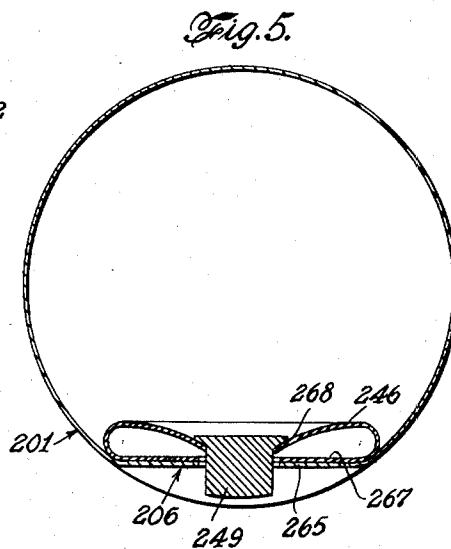
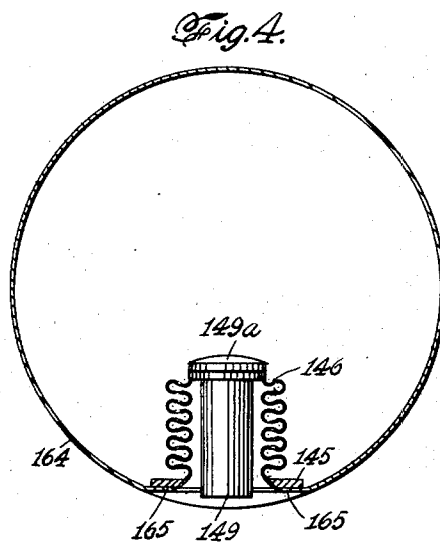
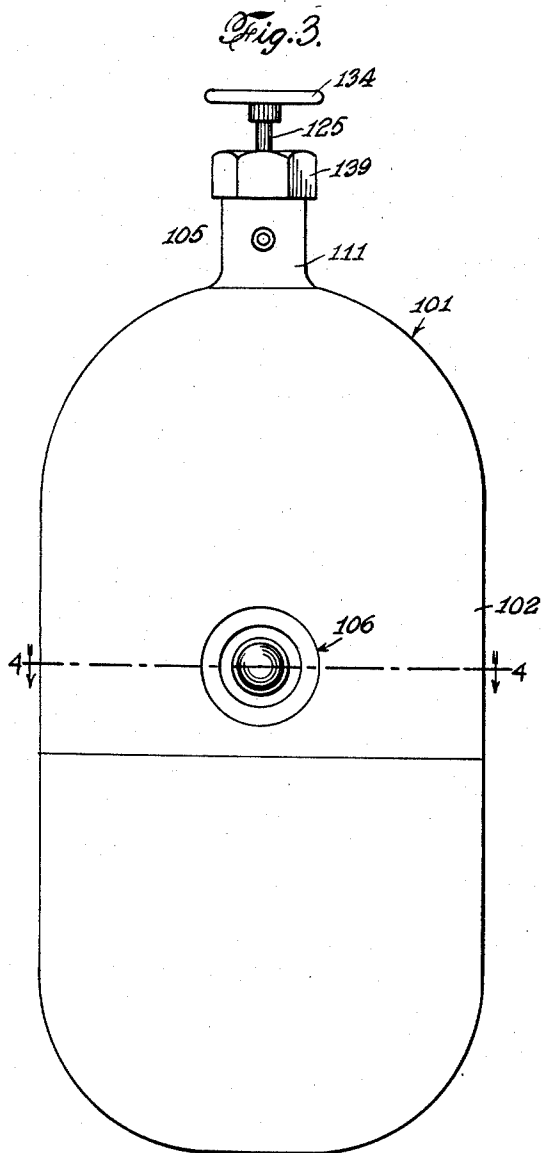
S. E. ALLEN

2,558,409

DISCHARGE HEAD FOR FIRE EXTINGUISHERS

Filed March 2, 1948

2 Sheets-Sheet 2



INVENTOR.
SCOTT E. ALLEN

BY

Edward T. Connors

ATTORNEY.

UNITED STATES PATENT OFFICE

2,558,409

DISCHARGE HEAD FOR FIRE
EXTINGUISHERS

Scott E. Allen, Verona, N. J., assignor to C-O-Two
Fire Equipment Company, Newark, N. J., a cor-
poration of Delaware

Application March 2, 1948, Serial No. 12,567

5 Claims. (Cl. 169—31)

1

The present invention relates to pressure indicating means particularly for indicating the pressure of the fire extinguishing fluid in an extinguisher.

Fire extinguishers have been provided adapted to use fire extinguishing fluids such as carbon tetrachloride in which the vapor pressure of the fluid is insufficient to expel the fluid from the extinguisher at a desired pressure. It has been customary in such extinguishers to supercharge the container of fire extinguishing fluid with another fluid such as carbon dioxide or nitrogen to produce the desired pressure. A disadvantage of the supercharged fire extinguisher is that it is difficult to ascertain whether or not it has leaked releasing the pressure and thus becoming ineffective.

The present invention aims to provide a fire extinguisher having means adapted to indicate that the pressure in the extinguisher is above a predetermined minimum amount.

Another object of the invention is to provide a fire extinguisher having pressure indicating means and which is simple to manufacture, efficient in operation and durable in use.

In accordance with the invention, the foregoing objects are accomplished by providing a fire extinguisher in which expansible means is positioned within the container and adapted to be actuated by pressure therein to cause a member to project from the container to indicate the presence of sufficient pressure to expel the fire extinguishing fluid at a desired rate.

The construction of the fire extinguisher in accordance with the invention is advantageous in that the projecting member may be used to retain the extinguisher in position in a wall bracket or other supporting means. Upon the dropping of the pressure within the container below a predetermined amount, the extinguisher will slip out of its supporting means and thus readily indicate that it is defective.

Other objects and advantages of the invention will be apparent from the following description and from the accompanying drawings which show, by way of example, embodiments of the invention.

In the drawings:

Fig. 1 shows a front view of a fire extinguisher in accordance with the invention.

Fig. 2 shows a vertical sectional view of the fire extinguisher and a mounting bracket.

Fig. 3 shows another embodiment of the invention in which indicating means is positioned on the front of the side wall of the container for the fire extinguishing fluid.

2

Fig. 4 is a horizontal sectional view of the fire extinguisher shown in Fig. 3 taken along the line 4—4 thereof.

Fig. 5 is a horizontal sectional view of a fire extinguisher similar to that shown in Fig. 3 in which the indicating means is made with a different construction.

Referring to the drawings, there is shown in Figs. 1 and 2 a fire extinguisher 1 in accordance with the invention. The extinguisher comprises a container 2 for fire extinguishing fluid, a closure means or valve 4 for the container, the valve having a discharge outlet 5 to direct fire extinguishing fluid to a fire. An indicating means 6 is incorporated in the container for indicating the pressure therein. The extinguisher is adapted to be charged with a fluid of low vapor pressure such as carbon tetrachloride and a gas such as nitrogen or carbon dioxide is supercharged into the container in order to pressurize the fluid to cause it to be discharged upon the opening of the closure means.

The container 2 may be made of any suitable material to withstand the desired pressure of the fire extinguishing fluid and is preferably cylindrical shaped and made of steel and may be formed of an upper portion 7 and a lower portion 9 which may be welded together as indicated at 10. The upper portion 7 is formed with a neck 11 having a passage 12 therein. A valve chamber 14 is formed by enlarging the outer portion of the passage 12. The outlet 5 is formed of a tube threadedly engaged in an aperture 15 opening into the valve chamber 14. A syphon tube 16 having a flared upper end 17 is adapted to be inserted into the container through the valve chamber 14 and retained in position by electrically welding the edge of the flared portion 17 of the tube to a shoulder 19 in the valve chamber 14. A rupturable disc 20 is adapted to be positioned over the end of the syphon tube 16 to seal the container as will hereinafter appear. The rupturable disc 20 may be secured in position by electrically welding it to the top surface of the flared end 17 of the syphon tube.

In order that the rupturable disc may be punctured and to provide means for thereafter closing the opening therein, a valve assembly is provided within the valve chamber 14 including a sliding member 21 having a threaded aperture 22 to receive the threaded end 24 of a valve rod 25. The sliding member 21 is positioned in the valve chamber 14 and is secured by a spring ring 26 received in a groove 27 on the inside of the wall of the valve chamber. The lower end of the sliding member 21 is tapered as indicated at 29.

3

Adjacent the base of the tapered portion is a shallow groove 30. The sliding member 21 is formed of a diameter so that it will freely reciprocate within the valve chamber 14, the side wall 31 of the sliding member providing a bearing surface against the inner wall of the valve chamber. A shoulder 32 is formed at the upper end of the side wall 31 so that as the sliding member 21 is moved downwardly, the spring ring 26 will be moved out of the shallow groove 30 allowing the sliding member to move downwardly carrying with it the valve rod 25. The spring ring 26 is adapted to slip into the space in back of the shoulder 32 to hold the sliding member in the downward position. The valve rod 25 is adapted to be rotated by a handle 34 secured to the end of the rod by a screw 35 or by other suitable means. The lower end of the valve rod 25 is formed with a tapered surface 36 terminating in a pointed tip 37. A screw cap 39 is adapted to be threadedly engaged over the end of the neck 11 to close the valve chamber 14. An aperture 40 is provided therein for the valve rod 25 which is sealed by an O-ring washer 41 positioned in a gasket recess 42 on the under side of the screw cap about the aperture 40.

The lower portion 9 of the container is formed to correspond with the upper portion 7, the edge of the lower portion 9 being rolled inwardly as indicated at 43 to receive the edge of the upper portion 7, and, upon the assembly of the container, to be welded thereto, the inwardly rolled edge providing a smooth outer surface for the container. An opening 44 is made in the center of the bottom of the lower portion 9 for the indicating means 6.

The indicating means 6 is comprised of a ring 45 adapted to be secured about the opening 44 by welding or other suitable means. A bellows 46 is attached to the ring 45 at one end and at its other end to a disc-shaped member 47. The bellows 46 may be made of any suitable material and is constructed so as to normally extend within the container and adapted to be resiliently urged in the compressed position by fluid pressure within the container. An indicating rod 49 is attached to the underside of the disc-shaped member 47 and is adapted to project through the bellows and extend outwardly from the container when the bellows is in the compressed position. The outward end of the rod 49 is formed with a shoulder 50 and a spherically-shaped tip 51 for engagement with a bracket 52.

The bracket 52 is adapted to be secured to a wall or other surface by screws or the like inserted through openings 54 therein. The upper end of the bracket is formed with an outwardly extending U-shaped end 55 adapted to engage the top of the container 2, the spacing of the legs of the end 55 being sufficient to allow the closure means 4 to slip therethrough. The lower end 56 of the bracket 52 is shaped to conform to the lower end of the container 2 and is formed with an opening 57 adapted to receive the spherically-shaped tip 51 of the indicating rod 49. End 59 of the bracket is flared downwardly so that the spherical tip 51 will readily slide over the end thereof to engage in the opening 57.

In assembling the fire extinguisher, the indicating means 6 is positioned in the lower portion 9 of the container 2 and attached in position. The upper portion 7 is then secured in place. The syphon tube 16 is formed with a bent lower portion 60 so that it will by-pass the indicating means 6. The syphon tube is then secured in

4

position by welding its flared upper end 17 to the shoulder 19. The container 2 is then filled with the proper amount of fire extinguishing fluid. The container is then placed in a pressure chamber which is filled with the supercharging fluid to the desired pressure and the rupturable disc 20 is welded into position while the supercharging pressure is maintained. The spring ring 26 is placed in its groove 27 and the sliding member 21 inserted in position, its tapered end 29 expanding the spring ring 26 which becomes seated in the shallow groove 30 of the sliding member. The screw cap 39 is attached closing the valve chamber 14. The valve handle 34 is fastened to the end of the valve rod 25 by the screw 35. By reason of the pressure within the container, the bellows 46 is compressed causing the indicating rod 49 to protrude from the bottom of the cylinder. The container may then be mounted in the bracket 52 the U-shaped end 55 of the bracket engaging the top of the container and the indicating rod 49 engaging in the opening 54 of the bottom of the bracket. In the event the container is not properly supercharged, the spherically-shaped tip will not protrude from the container and it will be impossible to mount the extinguisher in the bracket 52. The construction of the bracket member is such that in the event the pressure in the container should drop below a predetermined safe amount, the spherically-shaped tip 51 will be withdrawn from the opening 57 of the bracket member allowing the extinguisher to drop from the bracket thus giving an indication that the extinguisher is unsafe for use.

In Fig. 3 of the drawings, another embodiment of the invention is illustrated in which corresponding parts are designated by the same reference numerals as in Figs. 1 and 2 with the addition of 100. In Fig. 3 there is shown a fire extinguisher 101 similar in construction to the fire extinguisher previously described excepting that the indicating means 106 is attached to the side wall of the container 102. As may be seen in Fig. 4, the construction of the indicating means 106 is similar to that of the indicating means 6, excepting that the indicating rod 149 is provided with a head 149a and the bellows 146 is attached to the shoulder of the flanged surface of the head 149a by welding, soldering or other suitable means.

The side wall 164 of the container 102 is perforated to provide an opening for the indicating rod 149. In order that the ring 145 may be attached to the side wall 164, the edge of the side wall is flattened as indicated at 165 on the drawing. This construction is advantageous in that the usual form of the mounting bracket may be used. The indication of the pressure in the container is readily visible without removing the extinguisher from its bracket.

In Fig. 5 another embodiment of the indicating means is illustrated in which corresponding parts are designated by the same reference numerals as in Figs. 1 and 2 with the addition of 200. In Fig. 5, there is shown a sectional view of a fire extinguisher 201 in which the indicating means 206 is positioned on the side wall of the container as shown in Figure 3. The indicating means 206 differs from the indicating means previously described in that it is formed of a flexible member 246 having a disc-like or doughnut shape section. One side 267 of the member 246 is attached to the flattened portion 265 of the side wall 264, and the other side 268 is attached to the end of the in-

dicating rod or plug 249 by welding, soldering or other suitable attachment means.

The flexible member 246 is inherently resilient and tends normally to take up a position withdrawing the indicating rod 249 within the container 202. Under pressure, the flexible member 246 is compressed and the inner wall of the leg 268 contacts the end of the leg 267 and is supported thereby thus permitting the use of a material which is more flexible for the construction of the flexible member 246.

From the preceding description, it will be seen that a fire extinguisher has been provided having means indicating a loss in pressure in the container above a predetermined amount. The extinguisher is simple to manufacture, efficient in operation and durable in use.

While the invention has been described and illustrated with reference to specific embodiments thereof, it will be understood that other embodiments may be resorted to without departing from the invention and modifications of the invention as shown may be made. For example, the indicating means shown in Fig. 5 may be substituted in Fig. 1 and vice versa. Therefore the forms of the invention set out above should be considered as illustrative and not as limiting the scope of the following claims.

I claim:

1. A closure member comprising a housing having an inlet passage and an outlet passage, a frangible member adapted to close the inlet passage, a sliding member positioned within the housing, a rupturing member carried by the sliding member in threaded engagement therewith, the housing and the sliding member having complementary grooves therein, a locking ring normally positioned in the groove to hold the sliding and rupturing members spaced from the frangible member and adapted to be recessed into the housing groove to permit the sliding member to carry the rupturing member into contact with the frangible disc, the sliding member having a shoulder adapted to be engaged by the locking ring upon relative movement therebetween so that the rupturing member is positioned adjacent the frangible member.

2. A discharge head for a container comprising a housing having a passage therethrough, frangible means adapted to close one end of the passage into the housing, a member slideable within at least a portion of the passage, means closing the upper end of the passage, a discharge outlet in the housing in fluid communication with the passage, rupturing means carried by the slideable member in threaded engagement therewith and movable with respect thereto, latching means releasably retaining the rupturing member spaced from the frangible means at one distance for one position of the slideable member and when released adapted to hold the slideable member at another lesser distance for a second position of the slideable member adjacent but spaced from the frangible means after the slideable member has been moved adjacent thereto, the rupturing member adapted to be extended and retracted from the slideable member to open and close an opening in the frangible means, whereby the rupturing means may be moved to open a fluid passage in the frangible means and may be thereafter actuated as a valve member to open and close said fluid passage.

3. A discharge head for a container comprising

a housing having an inlet and an outlet and a fluid passage therebetween, frangible means adapted to close the inlet of the housing, a member slideable within the housing, rupturing means carried by the slideable member in threaded engagement therewith and movable with respect thereto, latching means releasably retaining the rupturing member spaced from the frangible means at one distance for one position of the slideable member and at another lesser distance for a second position of the slideable member, and means extending from the housing to actuate the slideable member and the rupturing member towards the frangible member to cause its rupture, the rupturing member thereafter adapted to be actuated away from and towards the frangible member as a valve member to open and close the fluid passage.

4. A discharge head for a container comprising a housing having an inlet and an outlet with a fluid passage therebetween, a sealing disc adapted to close the inlet of the housing, a member slideable within the housing, a puncturing member for the disc carried by the slideable member in threaded engagement therewith and movable with the slideable member, latching means releasably retaining the puncturing member spaced from the sealing disc at one distance for one position of the slideable member and at another lesser distance for a second position of the slideable member, and operating means extending from the housing to actuate the slideable member and the puncturing member towards the disc to cause its rupture, the puncturing member thereafter adapted to be actuated away from and towards the frangible member as a valve member to open and close the fluid passage.

5. A discharge head for a container comprising a housing having an inlet and an outlet with a fluid passage therebetween, a sealing disc adapted to close the inlet of the housing, a member slideable within the housing towards the disc, a puncturing member for the disc carried by the slideable member in threaded engagement therewith and movable with the slideable member, latching means releasably retaining the puncturing member spaced from the sealing disc at one distance for one position of the slideable member and at another lesser distance for a second position of the slideable member, and an operating handle extending from the housing and adapted to be moved inwardly to actuate the slideable member and the puncturing member towards the disc to cause its rupture, the puncturing member thereafter adapted to be actuated away from and towards the frangible member as a valve member by rotating the operating handle to open and close the fluid passage.

SCOTT E. ALLEN.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,168,015	Lawrence	Jan. 11, 1916
1,329,831	Evleth	Feb. 3, 1920
1,454,662	Wilbur	May 8, 1923
2,017,319	McMullen	Oct. 15, 1935
2,187,980	Martin	Jan. 23, 1940
2,391,582	Martin	Dec. 25, 1945
2,391,583	Martin	Dec. 25, 1945