March 5, 1935. S. E. ALLEN ET AL 1,993,697

RELEASING DEVICE FOR FLUID CONTAINERS

Original Filed March 22, 1929

Fig. 1

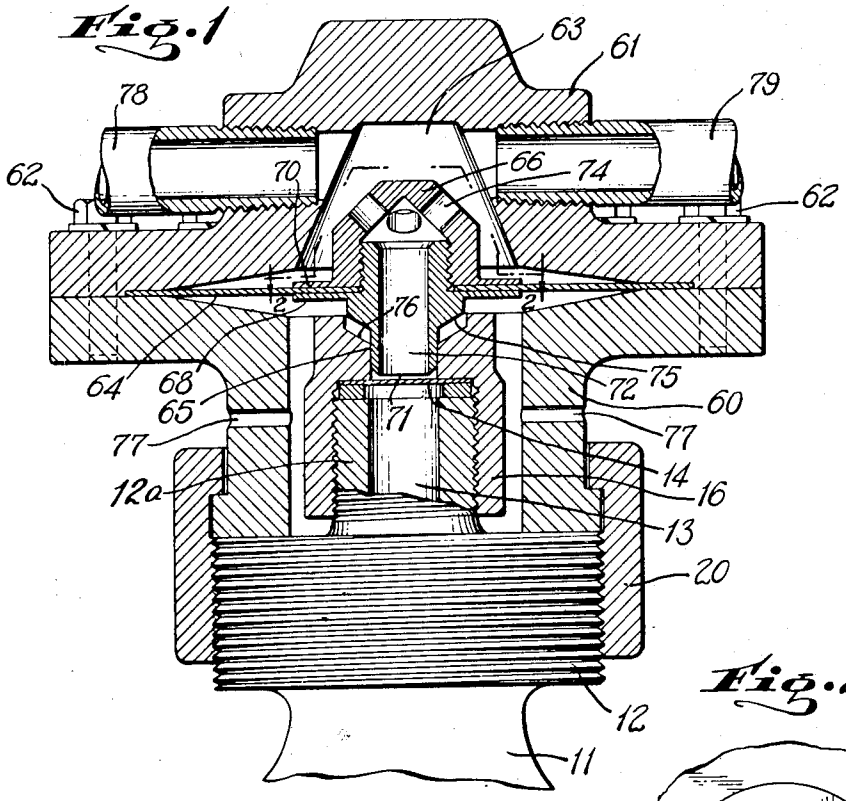


Fig. 2

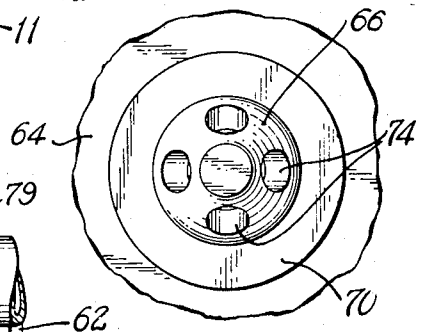
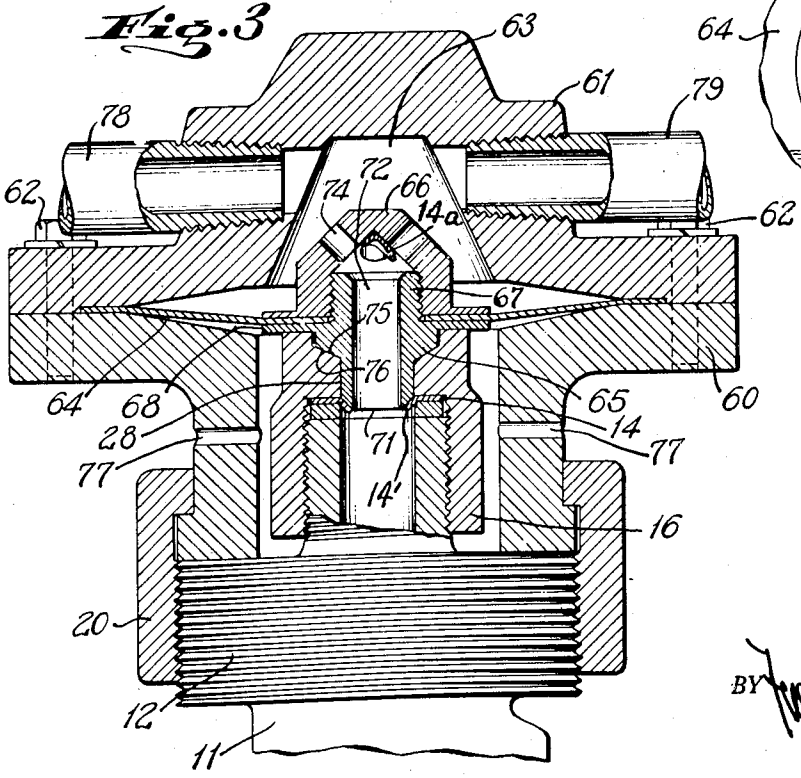


Fig. 3



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RELEASING DEVICE FOR FLUID CONTAINERS

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Original application March 22, 1929, Serial No. 349,150. Divided and this application December 5, 1933, Serial No. 700,948

4 Claims. (Cl. 169—11)

The present application is a division of our copending application Serial No. 349,150, filed March 22, 1929.

This invention relates to a device for releasing fluid from a container and the embodiment of the invention presented in this application is particularly adapted for releasing an extinguishing fluid from a container, it being understood, however, that the broader principles of the invention are not limited to the application or details herein set forth. Not only is the entire combination of the invention novel, but so far as we are informed certain parts comprising less than the whole are combinatively new.

In the art of extinguishing fires by the use of an extinguishing fluid such as CO_2, it is necessary to have a releasing device for the container, which contains the carbon dioxide gas, which is susceptible of quick and positive action, so that the carbon dioxide gas may be delivered to the area of the fire as quickly as possible after the releasing device is actuated.

It is an object of this invention to provide a releasing device in which the opening through which the gas passes from the container will be entirely opened when the device is operated, so that the carbon dioxide gas may escape as quickly as possible.

It sometimes occurs that the actuating force of the releasing device will not entirely puncture the closure member for the container, or open the exhaust passage of the container, and for this reason the fluid will flow slowly from the container and not pass as quickly as desirable to the area of the fire.

It is one of the objects of our invention to provide a releasing device for the general use specified, in which the pressure of the fluid released from the container is utilized to fully open the exhaust passage of the container.

It is a further object of the invention to provide a releasing device in which the puncturing member is caused to operate by an operating member, and in which the released fluid is directed against the operating member to assist in actuating it.

A still further object of the invention is to provide a releasing device of the character mentioned, in which a seal is formed around the puncturing member when it is in operated position, to prevent leakage around said puncturing member.

A more particular object of the present invention is to provide a puncturing member of such form that upon operating the same to puncture a closure disc a seal will be formed between the disc and the puncturing member.

With the above-named objects in view and others which will appear hereinafter we shall now describe a preferred embodiment of our invention and thereafter the novelty and scope of the invention will be pointed out in the claims.

In the accompanying drawing;

Figure 1 is a view in vertical section of a form of our non-stalling self-energizing head for puncturing a closure disc showing the parts in unactuated position;

Fig. 2 is a plan section taken on the line 2—2 of Fig. 1; and,

Fig. 3 is a view in section similar to Fig. 1 but showing the parts in operated position.

In the drawing the numeral 11 designates a container provided with a threaded projection 12. Formed through the threaded projection 12 is an outlet or exhaust opening 13 which is closed by a sealing disc 14. The disc 14 is secured in place to close the opening 13 by means of a plug or cap member 16 screwed upon an extension 12a of the projection 12. A body 60 is secured to the projection 12 by means of a union member 20. The body 60 includes a cover 61 which is attached thereto by means of machine screws 62.

The body 60 provides a chamber 63 in which an operating member in the form of a diaphram 64 is secured. This diaphragm 64 is secured between the lower part of the body 60 and the cover 61. Supported by the diaphragm 64 is a puncturing member 65, which is secured thereto by means of a nut 66, screwed on to a threaded portion 67 of the puncturing member 65 that projects upwardly through the center of the diaphragm. The puncturing member 65 has a flange 68 below the diaphragm 64 and the nut 66 has a flange 70 above the diaphragm 64. The flanges are tightly clamped against the diaphragm to prevent leakage. The lower end of the puncture member 65 extends into an opening 28 of the plug 16 and is provided with a knife edge 71 whereby the closure 14 may be punctured. An outlet passage 72 is provided vertically through the puncture member 65. The lower end of the passage 72 communicates with the lower end of the puncturing member and the upper end communicates with the chamber 63 by means of lateral openings 74 in the nut 66.

The puncturing member 65 is provided with a valve face 75, which engages the valve seat 76 when the parts are in operated position, as shown in Fig. 3. In order that the diaphragm 64 may

readily move into operative position, the body 60 is provided with vent openings 77, which prevent a pressure from being built up in the member 60 below the diaphragm.

Attached to the cover 61 and in communication with the chamber 63 are pipes 78 and 79. A fluid under pressure may be delivered to the chamber 63 through either of these pipes 78 or 79.

In operation, a pressure is built up in the chamber 63 by any suitable means. For example, fluid under pressure may be admitted to the chamber 63 from another cylinder or we may provide means for creating a fluid pressure, such, for example, as an explosion plug described in our copending application Serial No. 208,717, filed July 27, 1927. The pressure so built up in the chamber 63 will cause the diaphragm to move the puncturing member into the position shown in Fig. 3. When the closure disc 14 is punctured the fluid under pressure will pass through the exhaust opening 13 of the container 11 and through the outlet passage 72 into the chamber 63, where the pressure thereof will be utilized to force the diaphragm 64 and the puncturing member 65 into completely operated position, as shown in Fig. 3. The released fluid may pass from the chamber 63 through either of the pipes 78 or 79.

It will be noted that the cutting edge of the puncturing member is sharpened toward and coincides with the periphery of the passage 72 so that when the disc 14 is cut there will be a tight seal of the disc against the body of the cutter. In other words, since the body of the puncturing member is of greater diameter than this cutting edge it will bend the cut edge of the disc downwardly cupping said edge, as shown at 14', and then pressure of the fluid in the container acting on this cupped edge will insure a tight seal between the disc and the body of the cutter or puncturing member. Because of this tight seal, the valve face 75 and valve seat 76 may be dispensed with although they may be provided as a double precaution against leakage.

In this type of cutter a piece 14*a* is cut completely out of the disc 14 and such piece is carried by the fluid pressure upward against the nut 66. Here the openings 74 are of smaller diameter than the disc and they are directed laterally at such spacing that they cannot be clogged by the loose disc and at the same time will not permit the disc to pass out through them.

While we have described a preferred embodiment of our invention it will be understood that this is to be taken as illustrative and not limitative and we reserve the right to make such changes in form, construction and arrangement of parts as fall within the spirit and scope of the following claims.

We claim:

1. A releasing device for a fluid container having an opening and a sealing disk closing the opening, said device comprising a hollow body having a discharge port, and a tubular puncturing member operable in the body to puncture said disk and convey the fluid from the container to said port, said member being constructed and arranged to form a continuous down-turned substantially uniform lip on the disk completely surrounding the member and in sealing engagement therewith.

2. A releasing device for a fluid container having an opening and a sealing disk normally closing the opening, said device comprising a hollow body having a discharge port and a tubular cutter operable in the body to puncture the disk and convey the fluid thus released from the container to said port, the cutter being sharpened toward the inner periphery thereof so as to form a complete annular cutting edge coincident throughout with said inner periphery.

3. The combination of a container, a coupling member secured to the container and formed with a seat, a sealing disc, means to retain the sealing disc on said seat, a second coupling member formed with a chamber, a third coupling member secured to the second coupling member and formed with a delivery connection, a piston mounted in the chamber of the second member, means to prevent effective resistance to the operative movement of the piston, and a tubular cutter carried by the piston and adapted to rupture the disc in its forward movement with the piston, the tubular cutter having near its remote end from the disc a port to establish communication between the container and the delivery connection.

4. A releasing device for a fluid container having an opening and a sealing disk normally closing the opening, said device comprising a hollow body having a discharge port, and a tubular cutter operable in the body to puncture the disk and convey the fluid thus released from the container to said port, the cutter being sharpened toward the inner periphery thereof to form a complete annular cutting edge so that in operation it will cut out a piece of the disk of smaller diameter than the outside diameter of the cutter and form a down-turned lip on the disk completely surrounding the cutter and in sealing engagement therewith.

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