RELEASE DEVICE FOR FLUIDS UNDER PRESSURE

Daniel Mapes, Upper Montclair, N. J., assignor to

Application May 1, 1933, Serial No. 668,702

5 Claims. (Cl. 169—11)

The present invention relates broadly to fluid release devices for use with containers in which the fluid is retained under pressure by means of fragile sealing means and from which the fluid is released by operation of fragile seal type fluid release devices, such as are now extensively employed in fire extinguishing apparatus, and embodies more specifically improved means for locking such fluid release devices against accidental and/or premature operation.

In apparatus of this type, in which the fluid release device usually comprises a body member, fragile seal penetrating means mounted therein, an operating spindle extending exteriorly of the body member, and operating means mounted on the spindle likewise exteriorly of the valve body, the practice has been to wedge or otherwise securely interpose a locking member between the operating means and the adjacent exterior surface of the body member, so as to prevent accidental and/or premature operation of the fluid release device. This practice, however, has involved two undesirable features. In the first place, it has been found difficult to remove such locking members sufficiently quickly in an emergency, while in the second place, because of the first difficulty, the practice has developed of removing the locking members between the time of shipment and installation of the apparatus and the time of use, so that in the interim there has been no protection against accidental and premature operation of the apparatus.

The present invention contemplates the provision of locking means of a type overcoming the above-mentioned difficulties, and it is accordingly an object of the present invention to provide easily releasable locking means adapted to be left in locking position up to the time that the apparatus is to be used.

It is a further object of the invention to provide locking means which is permanently secured to the fluid release device, so as to be always available when needed.

It is a further object to provide locking means permanently secured to fluid release device operating means and adapted to be swung into and out of locking relation with the fluid release device proper.

These, and further objects of the invention not specifically enumerated above, will be apparent as the invention is described in greater detail in connection with the accompanying drawings, wherein:

Figure 1 is a view in elevation of a fluid release device embodying one form of locking means in accordance with the present invention, a portion of the fluid medium container being also shown.

Figure 2 is a view in section, taken through the axis of the fluid release device and container shown in Figure 1.

Figure 3 is an end view of the combined operating means and locking means shown in Figures 1 and 2, the view being taken the right-hand side of Figure 2.

Figure 4 is a top view of the operating and locking means of Figure 3.

Referring first of all to Figure 2, the reference numeral 1 represents a portion of a container for a fluid medium under pressure, the mouth of the container being adapted to receive the body member 2 of a fluid release device. A passage 3 extends through the body member, and is adapted to receive at its lower end a dip tube 4 for siphoning off the liquid portion of the fluid pressure medium. The upper end of the passage 3 is 20 formed with a seat 5 and is normally rendered gas-tight by means of a fragile sealing disc 6 and a sealing gasket 7, both of which are adapted to be carried by a thimble 8, having a screw-threaded engagement with the interior of the body member 2, by reason of which arrangement the sealing disc and sealing gasket can be raised and lowered with respect to the seat 5. The body member 2 is provided with a passage 9 communicating with the outlet passage 10, the passage 9 terminating in recog preventing means 11 forming no part of the present invention, said recoil preventing means comprising an arrangement of diametrically opposed discharge openings 12 designed to discharge the fluid pressure medium substantially at right angles to the axis of the passage 10. The outlet nipple 13 is provided with suitable threads, as shown, for connection to any suitable fluid medium conducting means.

Across the upper end of the body member 2 is 40 arranged a bonnet 14, which is held in gas-tight relation with the body member by means of a coupling member 15, which engages a shoulder 16 on the bonnet and threads 17 on the body member. Mounted within the bonnet 14 and extending exteriorly thereof is a spindle 18 carried at its inner end a hollow tubular cutter 19 for penetrating the fragile sealing disc 6, the hollow tubular cutter being provided with openings 20 for establishing communication between the interior of the cutter and the outlet passages 9 and 10. The spindle 18 is provided with a screw-threaded portion 21 adapted to engage a corresponding screw-threaded portion of the bonnet, so that rotation of the spindle 18 causes the 55
hollow tubular cutter 19 to be advanced and retracted. The upper end of the bonnet is closed by a packing washer 22, packing nut 23 and a packing nut 24. The packing washer 22 also serving to limit the upward motion of the spindle 18 by reason of engagement with the screw-threaded portion 21.

Referring now to Figures 1, 2 and 3, it will be seen that the upper portion of the spindle 18 is provided with opposed flat surfaces 25, adapted to be spanned by projecting lugs 26 on the combined operating handle and locking means 27. A pin 28 is provided to secure the member 27 to the spindle 18, so that the member 27 is freely rotatable on the pin.

The essential features of the present invention, now about to be described, comprise depending lugs 29 on the member 27, formed with substantially flat opposed surfaces 30, adapted to span substantially flat cooperating surfaces 31 on the bonnet 14, the pivoted engagement of the member 27 with the spindle 18 permitting the depending lugs 29 to be swung into and out of cooperating engagement with the surfaces 31 on the bonnet, the normal inoperative position of the cooperating operating handle and locking means 27 being as shown in Figure 1, in which position the spindle 18 cannot be rotated to advance the hollow tubular cutter through the frangible sealing disc, because of the locking engagement between the cooperating surfaces 30 and 31. As an additional safeguard, and in order to give visible indication of the apparatus having been tampered with, the member 27 is sealed in the position shown in Figure 1 by means of a commercial sealing wire 32 and lead seal 33, the sealing wire being passed through a hole in one of the depending lugs 29 of the member 27 and through a hole in a projection 34 on the body member 2.

When it is desired to operate the fluid release device, the combined operating handle and locking means 27 is rotated from its position as shown in Figure 1 to its position as shown in Figure 2, breaking the sealing wire 32 and disengaging the locking means, so that the spindle 18 can be rotated to advance the hollow tubular cutter 19 through the frangible sealing disc 6, whereby the frangible sealing disc is ruptured and the fluid medium is permitted to escape through the passages provided.

In order to facilitate the disengagement of the locking means, the member 27 may be provided, as shown more clearly in Figure 4, with a tongue 35, which need simply be lifted to break the sealing wire 32 and to effect disengagement of the locking means. As is also shown in Figure 4, the member 27 may be provided with suitable operating directions, the nature of which can be clearly seen from the drawing without further description.

Referring again to Figure 2, it will be noted that the bonnet 14 can be secured to the body member 2 in any desired position with respect to the outlet nipple 13, so that the member 27, the position of which is determined by its association with the bonnet 14, can likewise be positioned 24, the packing washer 22 also serving in connection with the member 27 to prevent rotation of the member 27 with respect to the outlet nipple 13 of the body member 2. A set-screw 38 is provided for preventing any possible disturbance of the position of the bonnet 14 after it has been secured to the body member 2 by means of the coupling 18.

From the foregoing description it will be seen that I have provided improved locking means for fluid release devices of a type which is easily releasable and which is adapted to be left in locking position up to the time that the apparatus is to be used. It will be noted, however, that while the invention has been described with specific reference to the single embodiment of the invention shown in the drawing, wherein the locking means and operating handle are combined in a single structure, the invention is capable of being put into practice in other forms without departure from the spirit and scope of the invention, and I therefore do not wish to be strictly limited to the disclosure, but rather to the scope of the appended claims.

I claim:

1. A release device for containers of a medium under pressure comprising a body member securely to a container, a closure for confining the medium within the container, a bonnet member rotatably mounted on the body member, means to secure against rotation said bonnet member to said body member, a spindle passing through said bonnet member and adapted to effect opening of the closure, means to effect inward and outward rotary movement of the spindle with respect to the bonnet member, an operating handle pivoted on the spindle for rotating the spindle, at least one projection extending below said operating handle and having a substantially flat-sided surface and substantially paralleling the axis of the spindle, and a substantially flat surface formed on the bonnet member and substantially paralleling the axis of the spindle, said pivotal mounting of the operating handle on the spindle enabling the operating handle to be rotated to permit the flat surface of the projection on the handle to normally engage the flat surface on the bonnet member to normally prevent rotation of the operating handle with respect to the bonnet member, the handle and the bonnet member being rotatable together with respect to the body member without moving said spindle with respect to the bonnet member when said securing means is released.

2. A release device for containers of a medium under pressure comprising a body member secured to the container, a frangible closure member carried by the body member and confining the medium within the container, means adapted to penetrate said closure member constructed to provide free discharge through said closure member, a bonnet member rotatably mounted on the body member, means to secure against rotation said bonnet member to said body member, a spindle passing through said bonnet member upon which the penetrating means is mounted to move with respect to the closure member, a screw threaded engagement between the spindle and the bonnet member to cause the spindle to advance the penetrating means to penetrate the frangible closure member, an operating handle pivoted on the spindle for rotating the spindle, at least one projection extending below said operating handle and having a substantially flat-sided surface adjacent to and substantially paralleling the axis of the spindle, and a substantially flat surface formed on the bonnet member and substantially paralleling the axis of the spindle, said pivotal mounting of the operating handle on the spindle enabling the operating handle to be rotated to permit the flat surface of the projection on the handle to normally engage the flat surface on the bonnet member to normally prevent rotation of the operating handle with respect to the bonnet member.
the handle and the bonnet member being rotatable together with respect to the body member without advancing said spindle and said penetration means when said securing means is released.

3. A release device for containers of a medium under pressure comprising a body member secured to the container, a frangible closure member carried by the body member and confining the medium within the container, penetrating means adapted to penetrate said closure member constructed to provide free discharge through said closure member, a bonnet member rotatably mounted on the body member, means to secure against rotation said bonnet member to said body member, a spindle passing through said bonnet member upon which the penetrating means is mounted to move with respect to the closure member, a screw threaded engagement between the spindle and the bonnet member to cause the spindle to advance the penetrating means to penetrate the frangible closure member, an operating handle pivoted on the spindle for rotating the spindle, at least one projection extending below said operating handle and having a substantially flat-sided surface adjacent to and substantially parallel to the axis of the spindle, and a plurality of substantially flat surfaces formed on the bonnet member and substantially parallel to the axis of the spindle, said pivotal mounting of the operating handle on the spindle enabling the operating handle to be rotated to permit the flat surface of the projection on the handle to normally engage a flat surface on the bonnet member to normally prevent rotation of the operating handle with respect to the bonnet member, the handle and the bonnet member being rotatable together with respect to the body member without advancing said spindle and said penetrating means when said securing means is released.

4. A fluid release device comprising a body member, means rotatably mounted on the body member, engaging means on the mounted means to secure the mounted means to said body member, releasing means rotatably mounted in the mounted means and operable upon rotation with respect to said mounted means, means pivoted on the releasing means to operate said releasing means and adapted to be swung toward and away from the mounted means, and at least one projection on said pivoted means adapted to engage the engaging means on the mounted means when the pivoted means is swung toward the mounted means, said engaging means being constructed to prevent relative rotation between the pivoted means and the mounted means upon engagement of a projection with engaging means whereby rotation of the releasing means with respect to the mounted means is prevented but rotation with respect to the body member is permitted when said securing means is released.

5. A fluid release device comprising a body member, a bonnet member rotatably mounted on the body member, a surface on said bonnet member, means to secure said bonnet member to said body member, releasing means rotatably mounted in the bonnet member and operable on rotation with respect to said bonnet member, a handle pivoted to said releasing means arranged to be swung toward and away from the bonnet member and adapted to operate said releasing means, and at least one projection on said handle adapted to engage said surface of the bonnet member when the handle is swung toward the bonnet member, said surface being constructed to prevent rotation of the releasing means with respect to said bonnet member upon engagement of a projection with the surface but adapted to permit rotation with respect to the body member when said securing means is released.

6. In a fluid release device, a member, means rotatably mounted on the member having a substantially flat-sided surface formed thereon, means to secure against rotation said mounted means to said member, releasing means rotatably mounted in the first named member and operable upon rotation with respect to the first named member, a handle pivoted on said releasing means adapted to operate the releasing means, and at least one projection having a substantially flat-sided surface on the handle extending below the handle, said pivotal connection of the handle enabling the handle to be swung toward the mounted means to permit the substantially flat-sided surface on the projection to engage the substantially flat-sided surface on the mounted means, said engagement preventing the rotation of the handle with respect to the mounted means and operation of the releasing means but permitting joint rotation of the handle, the releasing means and the mounted means about an axis of the member when the securing means is released.

7. In a fluid release device, a member, means rotatably mounted on the member having a substantially flat-sided surface and capable of rotation about an axis of the member, means to secure against rotation said mounted means to said member, releasing means rotatably mounted in said mounted means and operable upon rotation with respect to said mounted means, a handle pivotally connected to said releasing means and having an operative and a non-operative position relative to the member, and at least one projection having a substantially flat-sided surface on said handle and extending below said handle, the substantially flat-sided surface on a projection of the handle being normally permitted to engage the substantially flat-sided surface on the mounted means upon pivoting of the handle into a non-operative position with respect to the member to prevent rotation of the handle with respect to said mounted means and operation of the releasing means, said handle and said mounted means being capable of rotation in conjunction about an axis of the member without operation of the releasing means when said securing means is released.

8. In a fluid release device, a member, means rotatably mounted on the member having a plurality of substantially flat-sided surfaces formed thereon and adapted to be rotated about an axis of the member, means to secure against rotation said mounted means to said member, releasing means rotatably mounted in said mounted means and operable upon rotation with respect to said mounted means, a handle pivotally engaging said releasing means, the pivotal mounting of the handle enabling the handle to be rotated with respect to the member to permit an operative and a non-operative position of the handle, said handle having at least two projections extending below said handle each having a substantially flat-sided surface, said handle being rotatable with respect to said mounted means, said releasing means, the pivotal mounting of the handle permitting normal engagement of the substantially flat-sided surfaces of the projections on the handle with the substantially flat-sided surf-
faces on the mounted means, said engagement preventing rotation of the handle relative to said mounted means and consequent operation of the releasing means when the handle is in a non-operative position but permitting joint rotation of the handle and the mounted means about an axis of the member without operation of the releasing means when said securing means is released.

9. In a fluid release device, a member, means having a substantially flat-sided surface rotatably mounted thereon, means to secure said means to the member, releasing means rotatably mounted in the first named means and operable upon rotation with respect to the first named means, and means pivoted to said releasing means adapted to rotate the releasing means with respect to the first named means, and at least one projection on said pivoted means adapted to engage the flat-sided surface on said first named means whereby the joint rotation of said releasing means, said pivoted means and said first named means without operation of said releasing means is permitted when said securing means is released.

DANIEL MAPES.