

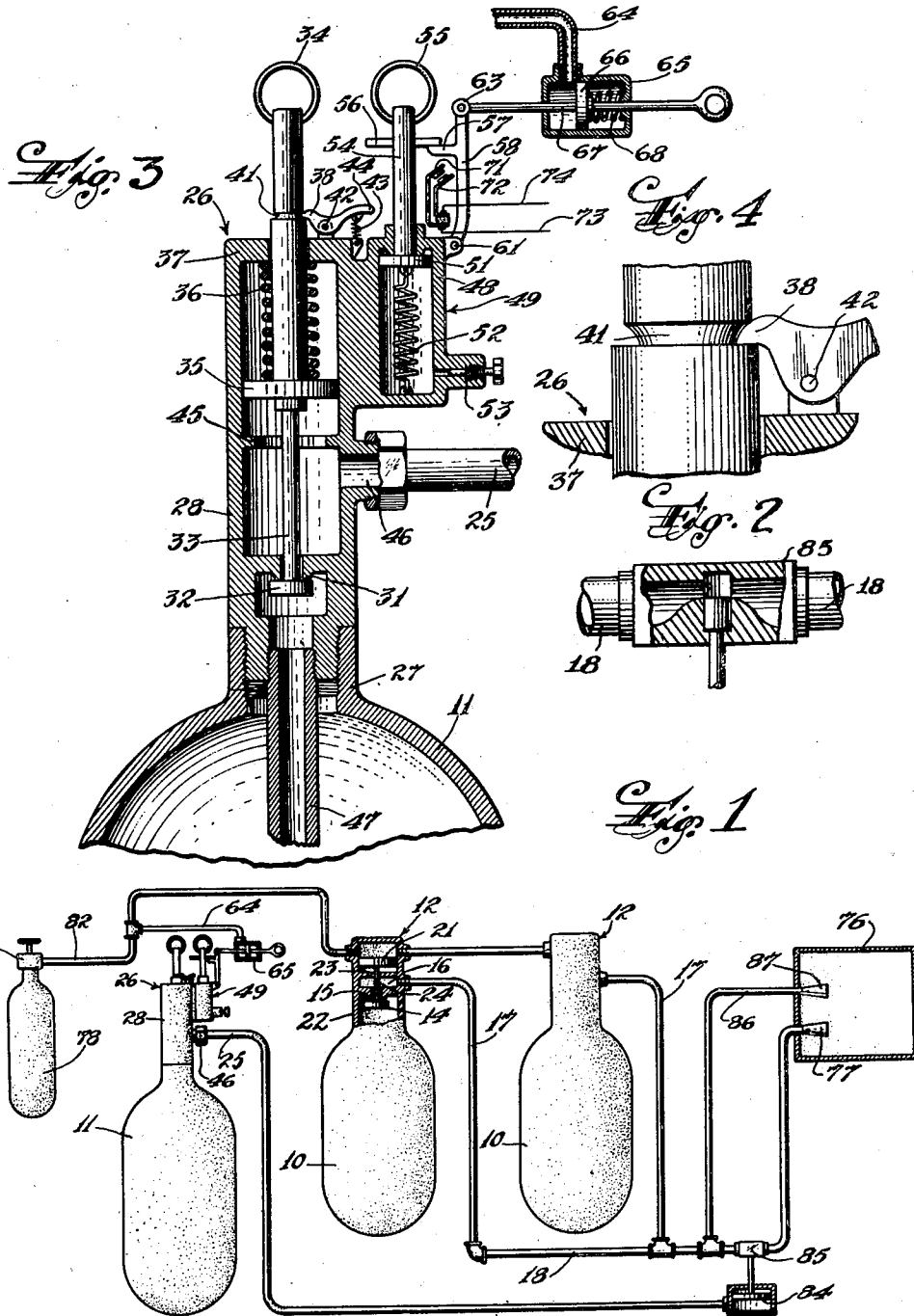
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FLUID DISPENSING SYSTEM

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FLUID DISPENSING SYSTEM

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4 Claims. (Cl. 169—11)

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The present invention relates to high pressure fluid medium dispensing systems, and more particularly, to apparatus employed in releasing and distributing carbon dioxide stored under high pressure and using the same for fire extinguishing purposes.

Fire extinguishing systems of this type generally comprise a battery of storage containers for the high pressure medium, distribution piping for the released medium, and release apparatus associated with the containers for the manual or automatic liberation of the medium into the distribution piping.

An object of the present invention is to provide an improved high pressure fluid medium dispensing system, as embodied in a fire extinguishing system of the type referred to.

Another object is to provide a system wherein an operating fluid medium is adapted to control a working fluid medium a given interval after the release of the working fluid medium.

A further object is to provide a system wherein a delayed action device controls means for reducing the rate of discharge of the working fluid medium after a given period of time.

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 drawing, forming a part of the specification, wherein:

Figure 1 is a schematic view of a system wherein the delayed release of the operating fluid medium serves to influence the discharge of the working fluid medium.

Figure 2 is an enlarged sectional view of a shut-off valve shown in Figure 1.

Figure 3 is a sectional view of a delayed release device and a container (shown in part) as used in the system shown in Figure 1.

Figure 4 is an enlarged fragmentary view of a detail of the device shown in Figure 1.

In Figure 1 of the drawing a system is shown comprising a plurality of primary or working fluid medium storage containers, reservoirs, or receptacles 10 and a secondary or operating fluid medium container 11. The number of working fluid medium containers 10 is shown to be two, but may, of course, be any number from one upward, depending on the type of system used and the

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size of the individual container which may vary from a capacity of a few pounds of the fluid up to those able to hold perhaps a ton or more. It is to be understood that the terms "container," "reservoir," "receptacle," "source" or "battery" are used to designate a supply of fluid medium rather than a structure.

All the primary containers are provided with fluid retaining and release control means 12. The control means 12 of the working fluid containers may comprise a main valve member 14 which controls the discharge of the fluid medium from the containers 10 by way of a valve seat 15 and a chamber 16 into discharge tubing 17. Tubing 17 may lead to a common discharge conduit 18, as shown, or to individual points of discharge, as may be desired. The valve member 14 is adapted to be operated by pressure operable means comprising a piston 21 reciprocally movable in a cylinder 22 which is separated from the chamber 16 by means of a partitioning wall 23. The piston 21 and the valve member 14 are operatively joined by a connecting rod 24 which passes through a suitable aperture in the wall 23. The upper portions of the cylinders 22 of the respective containers 10 may be interconnected by suitable tubing 20.

The secondary container 11 is provided with control means 26 which will now be described with reference to Figures 3 and 4. The container 11 is formed with a neck portion 27 into which a control body member 28 is threadedly secured. The body member is formed with a downwardly facing valve seat 31 on which a valve member 32 is adapted to seat. The valve member 32 is carried by a valve stem 33 which extends outside of the body 28 and terminates in a finger ring 34 or the like, by which the stem may be manually actuated. The stem has attached thereto a collar 35 which serves to support a relatively heavy expansion spring 36 telescoped about the upper portion of the stem and bearing against the top portion 37 of the body 28. A pawl member 38, secured to the outside of portion 37 in co-operation with a groove 41 in the stem 33, by holding the stem in the position shown, serves to hold the valve closed and the spring 36 in its energized condition. The pawl 38 is pivotally supported at 42 and is held in a groove engaging position by a compression spring 43 secured to the portion 37 and to a lever extension 44 of the pawl. It will be apparent that upon a rotation of the pawl in the clockwise direction, the stem 33 and the valve 32 will be free to move downwardly under the force of the spring 36. As the

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stem moves downwardly, it will be stopped by an annular projection 45 which engages the collar 35, thereby serving as a travel stop for the stem and the valve. An outlet 46 in the body 28 serves to conduct the escaping fluid into tubing 25 for the purpose described hereinafter. A syphon tube 47 may be secured into the lower part of the member 28 if the medium in the container 11 is a liquid under pressure.

In order to obtain a delayed release of the control means 26, a mechanism 49 is provided adjacent the body member 28. The mechanism 49 may comprise a cylinder 48 in which a piston 51 is movable downwardly under the force of a tension spring 52 disposed intermediate the piston and the bottom of the cylinder 48. The piston 51 moves against a cushion of air which it tends to expel at a slow rate through an adjustable needle valve 53, or the like. The piston 51 carries an extension 54 terminating outside the cylinder 48 in a finger ring 55, by means of which the piston may be operated. The extension 54 is formed with a horizontal projection 56, one part of which serves to engage the lever 44 and to rotate the pawl 38 upon downward movement of the piston 51. The piston 51 and the extension 54 are held in their energized position by engagement of the projection 56 with the horizontal portion 57 of a lever member 58 pivotally secured at 61 to the outside of the cylinder 48.

Rotation of the pivoted lever 58 to render the piston 51 and extension 54 free to move downwardly may be effected by means of fluid pressure which may be conducted through tubing 64 into a suitable cylinder 65 where it is adapted to move a piston 66 mounted on a link member 67. An expansion spring 68 arranged between the piston and the cylinder 65, as shown, serves to hold the lever 58 in the non-operated position, as illustrated. If desired, the projection 56, during the descent of the piston 51, may be made to engage and close a pair of electrical spring contacts 71 and 72 for actuating an electrical device within an electrical circuit represented by the wires 73 and 74.

A third source of fluid pressure medium 78 is provided with a release device 83 and suitable tubing 82 to connect the source 78 with the tubing 64 leading to the cylinder 65, and to connect the source 78 to the upper portion of the cylinders 22 to effect operation of the working fluid medium release control means 12.

As shown in Figures 1 and 2, the working fluid containers 10 and the control piston 51 of the delaying mechanism 49 are operated simultaneously from the source 78, the delayed release of the operating fluid from the container 11 by way of tubing 25 serving to operate a control piston 84 of a normally open shut-off valve 85 arranged in the main discharge conduit 18. Before the valve 85 is closed, the fluid will flow freely through a main discharge nozzle 77, a part of it being made to pass into an enclosure 76 by way of a branch conduit 86 which may be of such a reduced diameter as to permit only a very small stream of fluid therethrough, or may be provided with an auxiliary nozzle 87 adapted to reduce the jet of the discharging fluid to the desired proportions. When the valve 85 has closed a predetermined interval of time after the release of the main working fluid containers 10, the discharge from the containers 10 will continue at a reduced rate into the enclosure through the auxiliary nozzle 87. This is a condition sometimes required in fire extinguishing practice

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where an initially established predetermined extinguishing fluid concentration is to be maintained.

It is, of course, possible to control the rate of discharge by the valve 85 directly without resorting to the branch 86. In that case, the valve 85, instead of closing completely, is caused to reduce the rate of discharge through the conduit 18 by partial closure.

From the foregoing description it will be seen that the present invention provides an improved fire extinguishing system wherein time delay means control the rate of discharge of the extinguishing or working fluid medium, whereby the fluid medium first is discharged into an enclosure at a high rate to provide an atmosphere incapable of supporting combustion and thereafter fluid medium is discharged into the enclosure at a lower rate to maintain the condition of the atmosphere in the enclosure.

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

The present application is a division of our application Serial Number 464,162, filed November 2, 1942, now abandoned.

We claim:

1. In combination, a primary container for storing a fluid medium under pressure, a fluid medium release device for said container including an outlet, conduit means connected to said outlet for conducting the released medium to a point of use, control means associated with said conduit means normally positioned to control the delivery of the medium to the point of use at a predetermined rate and constructed and arranged to be operated to control the delivery of the medium at a reduced rate, fluid pressure operable means for positioning said control means to control the delivery of the medium at the reduced rate, a secondary container for storing a fluid medium under pressure, a fluid medium release device for said secondary container having an outlet and including means for delaying the same from becoming operative, conduit means connected to said last mentioned outlet for conducting the medium released from said secondary container to said fluid pressure operable means for said control means, and means for initiating operation of said primary and secondary container release devices.

2. In combination, a primary container for storing a fluid medium under pressure, a fluid medium release device for said container including an outlet, pressure operated means for operating said device to release the medium from said container, conduit means connected to said outlet for conducting the released medium to a point of use, control means associated with said conduit means normally positioned to control the delivery of the medium to the point of use at a predetermined rate and constructed and arranged to be operated to control the delivery of the medium at a reduced rate, fluid pressure operable means for positioning said control means to control the delivery of the medium at the reduced rate, a secondary container for storing a fluid medium under pressure, a fluid medium release device for said secondary container having an outlet and including means for delaying the same from becoming operative, pressure operated

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means for operating said last mentioned device to release the medium from said secondary container, conduit means connected to said last mentioned outlet for conducting the medium released from said secondary container to said fluid pressure operable means for said control means, and means including a source of fluid pressure for operating said pressure operated means of primary and secondary container release devices.

3. In combination, a primary container for storing a fluid medium under pressure, a fluid medium release device for said container including an outlet, conduit means connected to said outlet for conducting the released medium to a point of use including a main conduit for delivering the medium to the point of use at a predetermined rate and an auxiliary conduit for delivering the medium to the point of use at a reduced rate, a normally open valve in said main conduit, fluid pressure operable means for closing said valve, a secondary container for storing a fluid medium under pressure, a fluid medium release device for said secondary container having an outlet and including means for delaying the same from becoming operative, conduit means connected to said last mentioned outlet for conducting the medium released from said secondary container to said fluid pressure operable means for said valve, and means for initiating operation of said primary and secondary container release devices.

4. In combination, a primary container for storing a fluid medium under pressure, a fluid medium release device for said container including an outlet, pressure operated means for operating said device to release the medium from

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said container, conduit means connected to said outlet for conducting the released medium to a point of use including a main conduit for delivering the medium to the point of use at a predetermined rate and an auxiliary conduit for delivering the medium to the point of use at a reduced rate, a normally open valve in said main conduit, fluid pressure operable means for closing said valve, a secondary container for storing a fluid medium under pressure, a fluid medium release device for said secondary container having an outlet and including means for delaying the same from becoming operative, pressure operated means for operating said last mentioned device to release the medium from said secondary container, conduit means connected to said last mentioned outlet for conducting the medium released from said secondary container to said fluid pressure operable means for said valve, and means including a source of fluid pressure for simultaneously operating said pressure operated means of primary and secondary container release devices.

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