Nov. 12, 1946. S. C. MARSH 2,410,830

FLUID PRESSURE MEDIA DISPENSING DEVICE

Filed Dec. 6, 1944 2 Sheets-Sheet 1

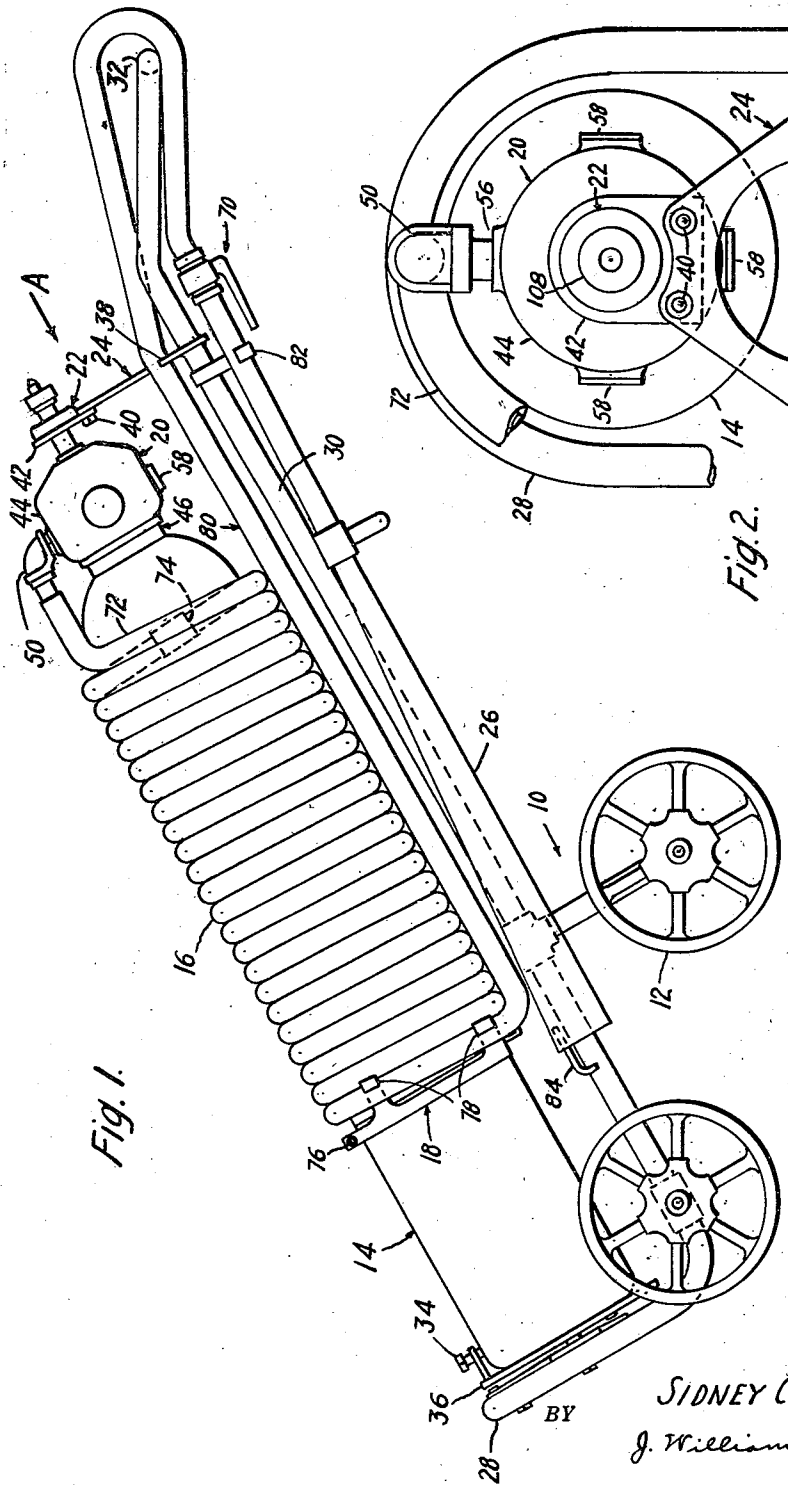


Fig. 1.

Fig. 2.

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Fig. 3.

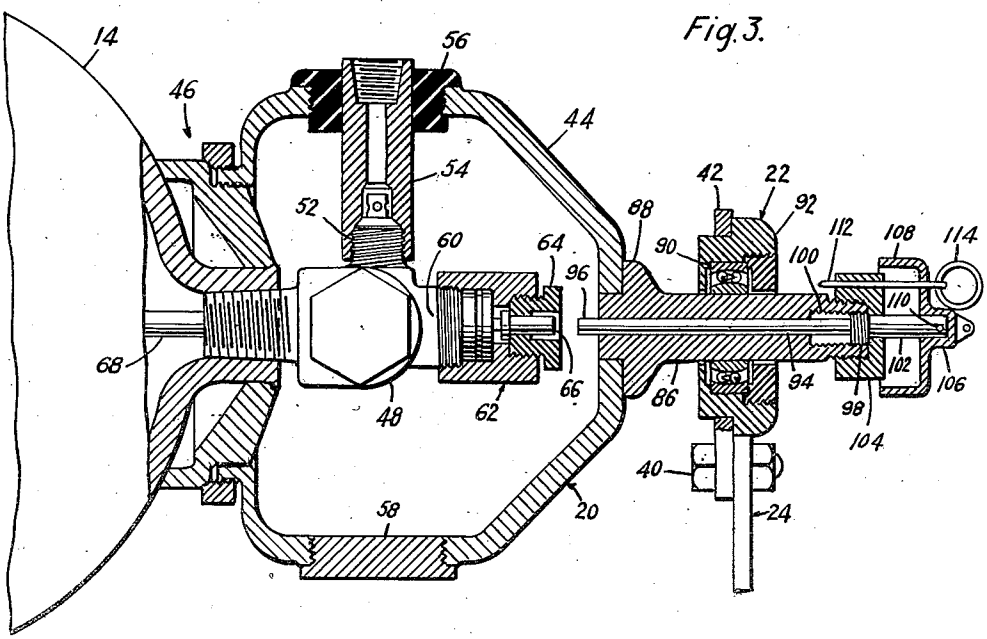


Fig. 4.

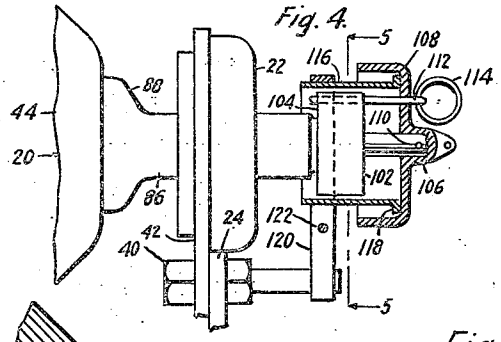


Fig. 5

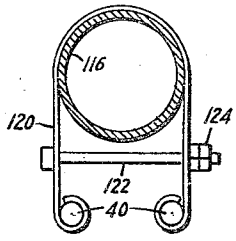


Fig. 6.

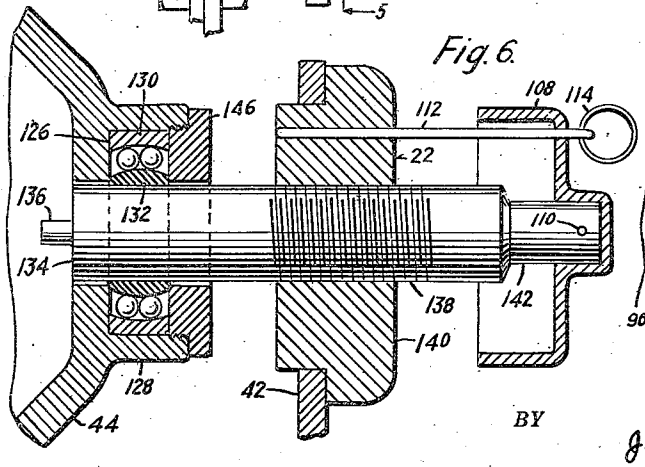
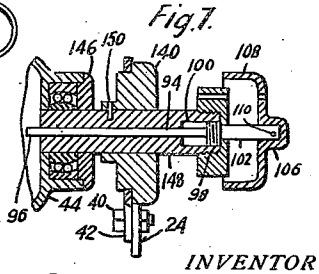


Fig. 7.



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FLUID PRESSURE MEDIA DISPENSING DEVICE

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Application December 6, 1944, Serial No. 566,927

14 Claims. (Cl. 299—79)

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This invention relates to devices for dispensing fluid pressure media, and particularly to such devices employed in connection with fire extinguishers.

More particularly, the present invention is concerned with hose reels or similar apparatus, including a rotatable valve with a reel, for controlling the release of high pressure fluid media, such as carbon dioxide adapted to be used for fire extinguishing purposes. The hose reel may comprise a rotatably mounted cylindrical container for storing the pressure medium and about which the hose is wound or reeled, and a valve rotatable with, and secured to, the container having one end of the hose attached to its discharge outlet.

An object of the present invention is to provide a hose reel of the foregoing character wherein the valve is readily operable during rotation of the reel.

Another object is to provide means for effecting operation of the valve in response to rotation of the reel.

A further object is to provide a device of the above indicated character that is simple and durable in construction, is economical to manufacture, and is effective in its operation.

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 drawings, forming a part of the specification, wherein:

Figure 1 is a side elevational view, of a fire extiguisher unit embodying the invention.

Figure 2 is an end view, slightly enlarged, parts omitted, of the structure of Figure 1, as viewed in the direction of an arrow A.

Figure 3 is a further enlarged view, partially in elevation and partially in section, of parts as shown near the upper right of Figure 1.

Figure 4 is a view partially in elevation and partially in section and similar to the portion at the right of Figure 3, of a modified form of the structure thereof.

Figure 5 is a detail sectional view of an element, taken substantially along the line 5—5 of Figure 4.

Figure 6 is an enlarged sectional view, similar

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to a portion at the right of Figure 3, of a further modified form of the structure thereof.

Figure 7 is a sectional view, on a reduced scale and similar to Figure 6, of a modified form of the structure of Figure 6.

Referring to Figure 1, the device as therein shown, comprises, in general, a chassis or frame 10, having two wheels 12 at each side of the frame, a container or cylinder tank 14 for a fire extinguishing pressure fluid medium, such as carbon dioxide, a flexible conduit or hose 16 reeled about the cylinder 14, a device 18 for positioning the bottom coil of the hose 16, a head structure 20 on the tank, a device 22 adjacent to the head structure 20 to be hereinafter more specifically set forth, a support 24 mounted on the frame 10 for the device 22, and a discharge horn 26 supported on the frame 10.

The chassis or frame 10 is constructed of metal tubing having a front or lower end 28 of inverted substantially U-shape (Figure 2), the bottom ends of which turn at right angles to the end 28 and continue obliquely upwardly and rearwardly as parallel side portions 30 joined transversely at the rear upper ends by a portion constituting a handle 32. The cylinder 14 is detachably secured, as by screws 34, to a bearing plate 36 which is rotatably mounted on the chassis.

As better shown in Figure 2, the support 24 is constituted as an apertured metal plate having a side pocket or recess 38 for the hose 16, and holes in which the frame side portions 30 are disposed and welded or brazed to the support 24. The latter also has holes for the reception of bolts 40 by which it is secured to a plate 42 fixed to the device 22.

As better shown in Figure 3, the head structure 20 comprises a member 44, constructed, in this instance, as a cap of substantially bowl-shape having a neck by which it is secured in position on the cylinder 14 by means 46. The member 44 instead of being a cap, as shown, may be constructed as a spider which may normally be protected, as by a tarpaulin or casing covering the head or the apparatus generally.

A valve or discharge head 48 is disposed in the cap 44 and connected to an elbow 50, Figures 1 and 2, through a nipple 52 and a metal conduit connector 54 which extends through a gasket 56 in an aperture through the cap. Other similar openings, to provide a selection of positions for the connector 54, are normally closed by plugs 58.

The valve head 48 has a pilot valve chamber portion 60 for the reception of a control head

or flood valve 62 including a guide stem 64 for a plunger 66. The latter operates, when pushed to the left as viewed in the drawings, to similarly push a second plunger which, in turn, unseats a pilot valve body member in the pilot valve chamber portion 60 of the valve head 48. Unseating of the pilot valve body releases the pressure fluid through a syphon tube 68 from the container 14 to a by-pass in the valve head 48 and, from the by-pass, to a pressure responsive device or piston in the control head for opening the main discharge valve of the latter leading to the nipple 52. Opening of the main discharge valve releases the fluid medium, which travels through the hose 16 toward the discharge horn 26, and through a manually operated valve 70 at the inlet end of the horn (Figure 1) for controlling the discharge thereof.

The elbow 50, Figure 1, is connected to the upper end of the hose 16 through a rigid metal tube or coil member 72 and a coupling 74 for directing the winding of the hose counter-clockwise around the tank 14, as viewed in the direction of the arrow A, Figure 1, and indicated by a portion of the coil member 72 in Figure 2, for a purpose which will later appear.

The hose continues around the tank 14 from the coupling 74 toward the lower end of the tank which functions as a reel where it is held by the device 18. The latter is a flexible split metal ring clamped around the tank, as by a bolt 76, and having resilient clips 78 from which the hose is instantly releasable, but which anchor the lower end of a portion 80 of the hose extending through the pocket 38 of the support 24 to a bend around the handle 32 and, from the latter, to the valve 70. The horn 26, loosely rests in a bracket 82 on the frame side portion 30. The open end at the horn is normally supported on a pin 84, on the frame portion 30.

Referring to Figure 3, a tubular journal member 86 has an enlarged inner end 88 secured, as by welding, to the outer end of the cap 44, and extends as a journal, in axial alignment with the tank 14 and the lower bearing 36 thereof, through an upper bearing 90 constituting part of the device 22. The bearing 90 is of the self-aligning ball-bearing type having inner and outer ball race members secured, respectively, in fixed relation to the tubular journal member 86 and to a member 92 constituting a part of the device 22 and secured, as by welding in the plate 42. A flange portion of the member 92, at the left of the bearing 90, as shown in Figure 3, and a nut in the member 92, at the right of the bearing, hold the bearing in place.

A rod 94 in the tubular journal member 86, in alignment with the plunger 66, and having an inner end 96 normally spaced from this plunger as shown, also has an enlarged right hand screw threaded portion 98 in a cooperatively enlarged screw threaded recess portion 100 of the tubular journal member 86. A portion 102 of the rod 94, of larger diameter than the rod body proper and smaller diameter than the screw threaded rod portion 98, extends through a member 104, on the outer end of the tubular journal member 86, and into a socket portion 106 of a handwheel 108 of substantially cup shape, to which socket portion the rod portion 102 is fixed, as by a pin 110.

The member 104 operates as a limit stop for movement of the rod 94 to the right, as viewed in the drawing, by engagement with the screw threaded portion 98, and has an aperture for

register with an aperture in the handwheel 108 for the reception of a lock pin 112 having a ring handle 114.

In operation, to actuate the handwheel 108, it is necessary to withdraw the locking pin 112, after which the handwheel 108 is turned clockwise, as viewed in Figure 2, according to the right hand screw thread of the portion 98, Figure 3, to advance the rod 94 to the left so that its inner end 96 may engage and operate the plunger 66. This action releases the pressure fluid from the tank 14 to travel to the valve 70 where it may be stopped, as mentioned hereinabove.

Thus, the first thing an operator may do is to operate the handwheel 108 by turning it clockwise, as above stated, to have the fluid instantly available at the valve 70, depending somewhat upon the location of the fire to be extinguished or on other circumstances.

However, when the hose 16 is being unwound, during which the tank 14 is turned counter-clockwise, the hand wheel 108 may be operated by merely grasping and holding it against counter-clockwise movement with the tank, thus, in certain cases where seconds, even fractions of seconds of time may be critical, the manipulations necessary to get the apparatus to the point where the fluid medium is actually applied on the fire, may be further facilitated.

After unreeling the hose and emptying the tank during a fire, it is important, after the tank has been refilled, to have the hose wound in the proper direction, as provided for by the conduit portion 72, to effect subsequent operation of the handwheel by holding it against rotation with the tank as above described.

Referring to Figures 4 and 5, in which corresponding parts are designated by corresponding reference characters, the modification of the invention shown by these figures automatically effects the above mentioned operation of the handwheel by retarding or holding it against rotation of the tank.

In this modification, the handwheel 108 is slightly larger in diameter and provided with a drum or cylinder 116 having a flange 118 fixed to the wheel with the cylinder extending inwardly from the wheel to a position over and beyond the member 104. The bolts 40 are extended to the right, as viewed in Figure 4, and provided at the outer ends with a friction or brake band element 120, the ends of which are fixed to the bolts 40. The band 120 supports a screw 122 which is provided with an adjustable lock nut device 124 for adjusting the pressure of the band on the drum 116.

By such means, given by way of example, the handwheel 108 may be operated either by hand or automatically in response to turning of the tank 14, or by a combination of hand and automatic action. In the automatic operation, the drum 116 and the band 120 operate as slip release means for limiting the operating movement of the handwheel to its full opening position, after which, where rotation of the tank continues, the drum will slip relative to the band.

Referring to Figure 6, in which corresponding parts are also designated by corresponding reference characters, instead of having the upper bearing 90 in the device 22, this bearing is replaced by a bearing 126 in a modified end 128 of the cap 44. Also, in this case, the bearing 126 has an outer ball race member 130 fixed to the end 128, and an inner ball race member 132, in which a member 134 is adapted to move axially. The tu-

bular journal member 86 and the rod 94, of the above described figures, are omitted, and replaced by the single member 134 which comprises both a support for the inner ball race member 132 of the bearing 126 and an operating member for the pilot valve of the discharge head 48 by the above mentioned axial movement. The member 134 has an end 136 of reduced diameter for engaging the plunger 66, and a screw threaded portion 138 in a threaded portion of a stationary member 140, substituted in the device 22 for the member 92, and an end portion 142 secured to the handwheel 108 by the pin 110. The lock pin 112 extends between the handwheel 108 and the member 140.

In this form, with the parts as shown in full lines, the valve operating member 134 and the handwheel 108 do not rotate with the tank 14. They require the normal hand operation of actually turning the handle, instead of merely holding it against the rotation of the tank 14, as in the above described structure. However, the member 134 and the handwheel 108 may be adapted for the automatic operation above set forth. Also, in this form the hose 16 is wound around the tank 14 in direction opposite to that of Figure 1, in which case the rigid coil member 72, for directing and reeling of the hose, is changed accordingly.

Referring to Figure 7 in which corresponding parts are designated by corresponding reference characters, the structure is similar to that of Figure 6, but with the combined bearing and valve operating member 134 replaced by a tubular journal member 148 fixed to the member 140, as by a pin 150. The rod 94, of Figure 3, is placed in the member 148 of Figure 7 for operating the valve in a similar manner, except that here also, as in the device of Figure 6, the handwheel 108 and the rod 94, do not rotate with the tank 14.

Thus, the invention has, as shown in Figure 3, a bearing 90 on a fixed support 24, a journal represented by the tubular member 86, which rotates with the tank 14 and carries with it the handwheel 108 and associated valve operating parts. In Figure 6, the invention has a structure in which the handwheel 108 does not rotate with the tank, but operates a stationary journal as a means for actuating the valve; and, as shown in Figure 7, the invention provides a structure which embodies features of the structures of both Figure 3 and Figure 6, in that the handwheel 108 and associated parts are like those of Figure 3 in construction and operation, but, as in the structure of Figure 6, do not rotate with the tank.

From the foregoing description, it is apparent that a simple and effective device of novel construction and operation has been provided, for a rotating wheel drum or tank unit, for flexible conduits in the services indicated, that facilitates the rapid use in the emergencies set forth.

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.

It is also to be understood that the following claims are intended to cover all the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

I claim:

1. The combination of a support, rotatable means mounted on said support, a valve rotatable with said rotatable means and operable to release a fluid medium under pressure, a hose adapted for reeling on and unreeling from said rotatable means and being connected to said valve to receive the fluid medium released by said valve, said rotatable means including a journal, a bearing on said support for said journal, and means extending through said journal for operating said valve.

2. The combination of a support, rotatable means mounted on said support, a valve rotatable with said rotatable means and operable to release a fluid medium under pressure, a hose adapted for reeling on and unreeling from said rotatable means and being connected to said valve to receive the fluid medium released by said valve, a journal mounted on said support on which said rotatable means is rotatably mounted, and means extending through said journal for operating said valve.

3. The combination of a support, rotatable means mounted on said support, a valve rotatable with said rotatable means and operable to release a fluid medium under pressure, a hose adapted for reeling on and unreeling from said rotatable means and being connected to said valve to receive the fluid medium released by said valve, said rotatable means including a bearing adjacent to said valve and rotatable therewith, a member having a bearing portion in, and a portion projecting from, said rotatable bearing, and means on said support for supporting said bearing member by said projecting portion.

4. The combination of a support, rotatable means mounted on said support, a valve rotatable with said rotatable means and operable to release a fluid medium under pressure, a hose adapted for reeling on and unreeling from said rotatable means and being connected to said valve to receive the fluid medium released by said valve, and means having movement for operating said valve in response to a predetermined partial unreeling of said hose and responsive to further unreeling of the hose to discontinue said movement.

5. The combination of a support, rotatable means mounted on said support, a valve rotatable with said rotatable means and operable to release a fluid medium under pressure, a hose adapted for reeling on and unreeling from said rotatable means and being connected to said valve to receive the fluid medium released by said valve, means for manually operating said valve, and means providing for movement of said manual means in response to a predetermined partial unreeling of said hose for operating said valve and responsive to further unreeling of the hose to discontinue said movement.

6. The combination of a support, rotatable means mounted on said support, a valve rotatable with said rotatable means and operable to release a fluid medium under pressure, a hose adapted for reeling on and unreeling from said rotatable means and to receive the fluid medium released by said valve, means for determining a direction of reeling said hose on said rotatable means, and means for operating said valve.

7. The combination of a support, rotatable means mounted on said support, a valve rotatable with said rotatable means and operable to release a fluid medium under pressure, a hose adapted for reeling on and unreeling from said rotatable means and to receive the fluid medium released by said valve, means for connecting said hose to said valve including a rigid conduit between said

hose and said valve extending about said rotatable means in direction determining a direction for reeling said hose on said rotatable means, and means for operating said valve.

8. The combination of a support, rotatable means mounted on said support, a valve rotatable with said rotatable means and operable to release a fluid medium under pressure, a hose adapted for reeling on and unreeling from said rotatable means and being connected to said valve adjacent to one end turn of the wound hose to receive the fluid medium released by said valve, means for operating said valve, and means for positioning the opposite end turn of the wound hose relative to said rotatable means.

9. The combination of a support, rotatable means mounted on said support, a valve rotatable with said rotatable means and operable to release a fluid medium under pressure, a hose adapted for reeling on and unreeling from said rotatable means and to receive the fluid medium released by said valve, means having movement for operating said valve in response to a predetermined partial unreeling of said hose and responsive to further unreeling of said hose to discontinue said movement, and means for determining the direction of reeling said hose on said rotatable means to effect said movement.

10. The combination of a support, rotatable means mounted on said support, a valve rotatable with said rotatable means and operable to release a fluid medium under pressure, a hose adapted for reeling on and unreeling from said rotatable means and to receive the fluid medium released by said valve, manually operated means including a handle for actuating said valve by direct hand manipulated rotation of said handle and adapted for rotation by holding the handle stationary during unreeling of said hose; and means for determining the direction of reeling said hose on said rotatable means.

11. The combination of a support, hose reeling means rotatably mounted on said support, a valve disposed outside said reeling means axially adjacent one end thereof rotatable therewith and operable to release a fluid medium under pressure, a hose adapted for reeling on and unreeling from said reeling means and being connected to said valve to receive the fluid medium released by said valve, and means providing a bearing for said reeling means axially outwardly from said end beyond said valve and including means for operating said valve.

12. The combination of a support, a hose reeling drum rotatably mounted on said support, a valve separate from and disposed outside said drum but connected thereto for rotation therewith and operable to release a fluid medium under pressure, a hose adapted for reeling on and unreeling from said drum and being connected to said valve to receive the fluid medium released by said valve, means including a journal for said drum and means for operating said valve, and a bearing on said support for said journal.

13. The combination with a support, a container for a fluid medium under pressure and adapted to serve as a hose reel rotatably mounted on said support, a valve rotatable with said container and operable to release the fluid medium therefrom, a hose adapted for reeling on and unreeling from said container and being connected to said valve to receive the fluid medium released by said valve, a bearing rotatable with said container, and means on said support providing a journal for said rotatable bearing and operating through said rotatable bearing for operating said valve.

14. The combination of a support, rotatable means mounted on said support, a valve head on said rotatable means at the exterior of one end thereof and being rotatable therewith, a valve in said valve head, valve operating means operable about the axis of rotation of said rotatable means to release a fluid medium under pressure, and a hose adapted for reeling on and unreeling from said rotatable means and being connected to said valve head to receive the fluid medium.

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