March 7, 1950 A. MANHARTSBERGER 2,499,402

VALVE CONTROL MEANS

Filed Dec. 30, 1944 2 Sheets-Sheet 1

Fig. 1.

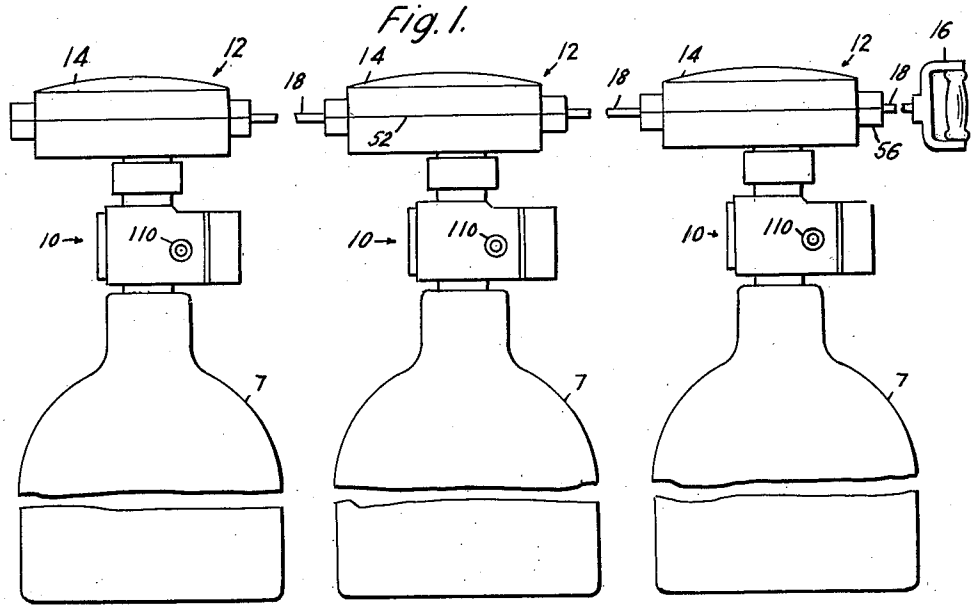


Fig. 2.

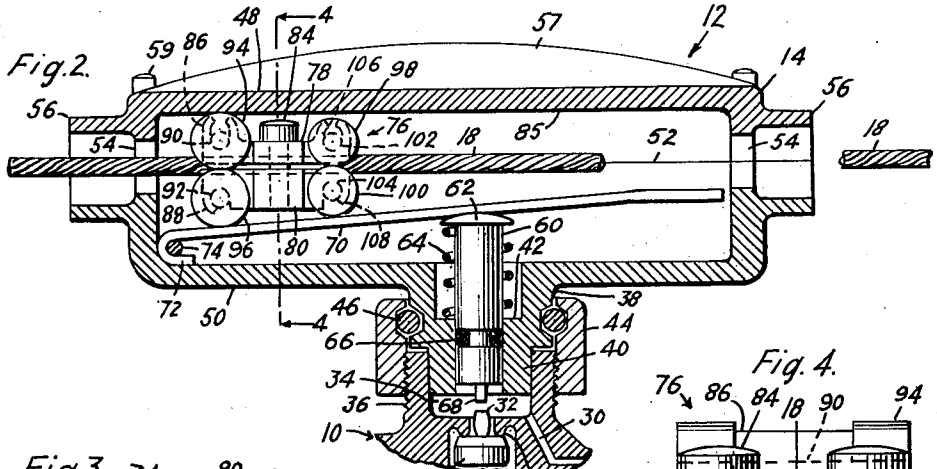


Fig. 3.

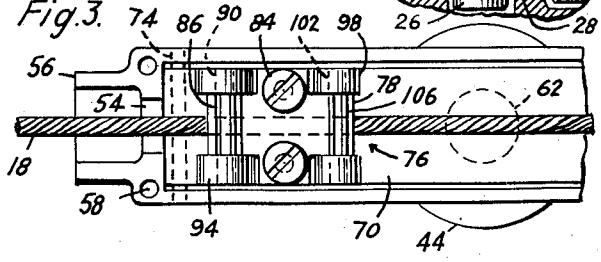
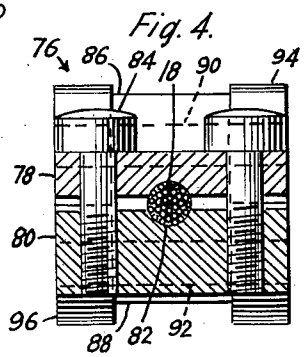


Fig. 4.



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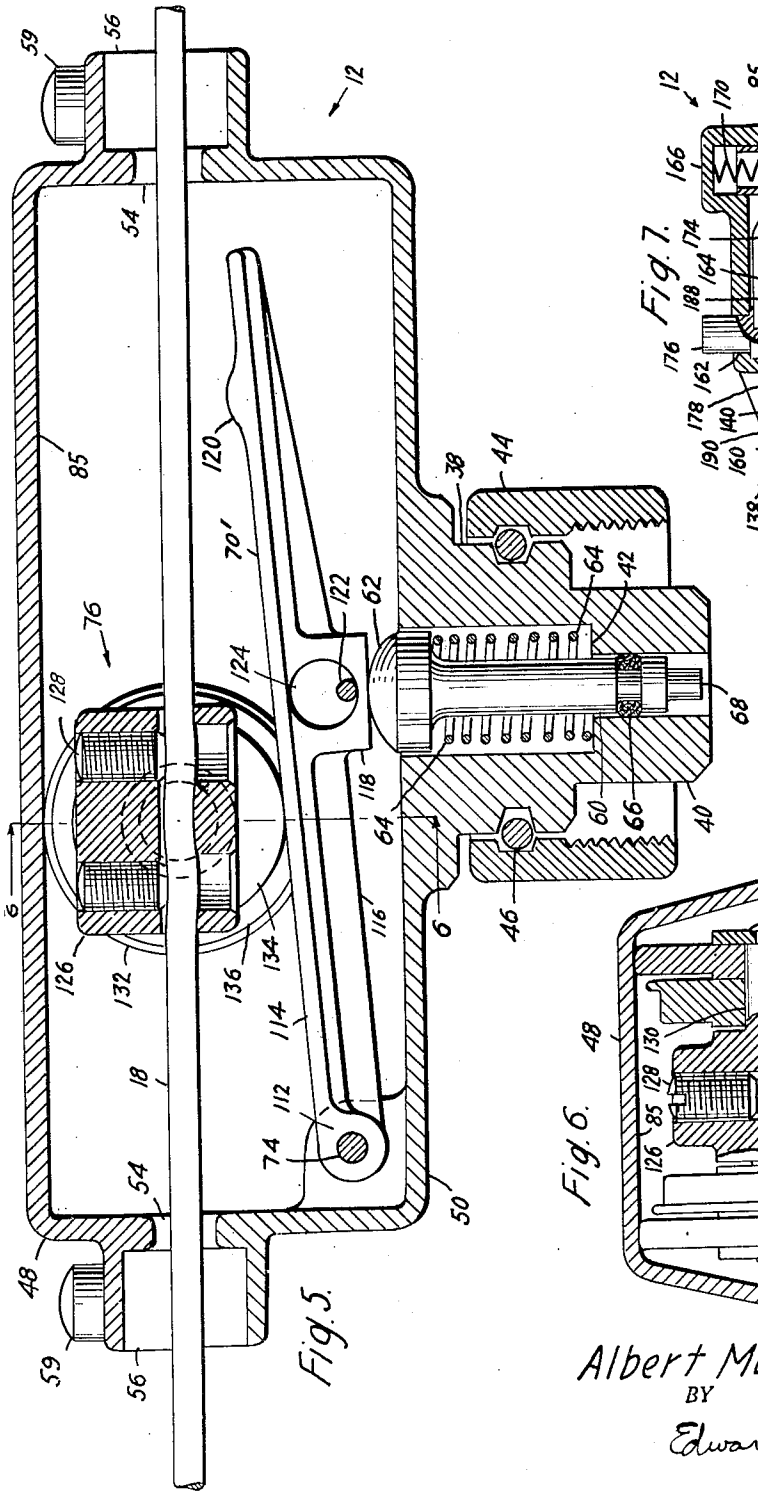


Fig. 5.

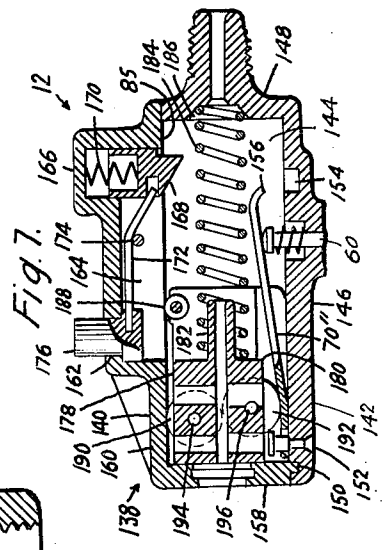


Fig. 7.

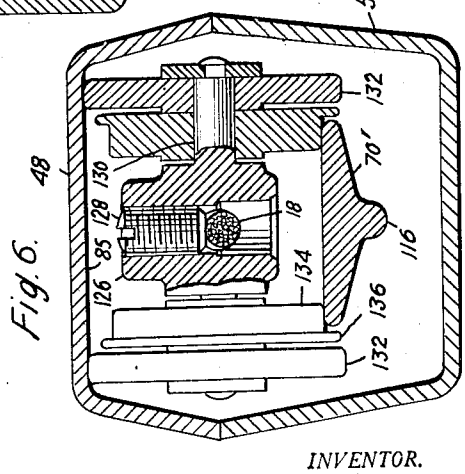


Fig. 6.

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Patented Mar. 7, 1950 2,499,402

UNITED STATES PATENT OFFICE

2,499,402

VALVE CONTROL MEANS

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Application December 30, 1944, Serial No. 570,608

3 Claims. (Cl. 169—11)

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This invention relates to valve control means, and particularly to means for controlling valves or groups of valves from an adjacent or remote location as by rods, cables or the like.

Systems for dispensing a fluid pressure medium, such as carbon dioxide, used for extinguishing fires or for other purposes usually comprise one or more containers or cylinders for storing the medium each equipped with a valve or the like for controlling the release of the medium. A valve for this purpose may comprise a spring seated piston operated valve controlled by a pilot valve which normally is maintained in closed position by the pressure of the medium in the cylinder and which is adapted to be unseated to direct pressure medium to the piston of the valve member. The control means of the present invention are primarily concerned with the operation of the pilot valve or the like.

An object of the present invention is to provide simple, inexpensive control means of the foregoing character.

Another obect is to provide valve control means having a housing adapted to have a cable or rod extend entirely therethrough for facilitating the series connection of the valve control means.

Another object is to expedite the mounting and adjustment of a cable or rod relative to a plurality of valve control means.

Another object is to provide means for remotely or adjacently controlling one or more fluid regulating valves and including novel housing means, novel force amplifying means and other improved elements.

A further object is to provide a device of the above indicated character that is simple and durable in construction, economical to manufacture and 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 diagrammatic view of group of pressure fluid medium containers each provided with control means of the invention.

Figure 2 is a side view on an enlarged scale and

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partially in section of one of the control means shown in Figure 1.

Figure 3 is a top plan view of a portion of the structure of Figure 2, the top or cover member being omitted.

Figure 4 is a sectional view on an enlarged scale taken substantially along the line 4—4 of Figure 2 of a traction means or carriage body of the invention.

Figure 5 is a view similar to Figure 2 of a modified form of the invention.

Figure 6 is a view taken substantially along the line 6—6 of Figure 5.

Figure 7 is a view similar to Figure 2 of a further modification of the invention.

Referring to Figure 1, the apparatus or system therein indicated comprises a plurality of containers 7, representative of any desired or necessary number for a given installation, adapted to hold a fluid medium under pressure, such as carbon dioxide. A valve head 10, in this instance of the pilot valve controlled type, is mounted on each of the containers 7. A control means 12, embodying a housing 14, is mounted on each of the valve heads 10, and an operating handle 16 is provided at one end of an elongated element 18, such as a cable or rod, extending entirely through the housings 14.

Referring to Figure 2, the valve head 10, for releasing the pressure medium from one of the containers or cylinders 7, includes a main valve operated by a piston (not shown) and controlled by a pilot valve member 26 normally held against a valve seat 28 to close a passage 30 through which the pressure medium may be conducted from the container and through the head 10 to the piston for operating the main valve. The pilot valve member 26 is provided with a short stem 32 projecting slightly into a compartment 34 formed by a cylindrical collar 36 on the head 10.

The housing 14 is of substantially T-shape having its depending tubular leg 38 provided with a constricted lower portion 40 closely fitted into the collar 36, and cooperating with the upper portion of the leg 38 to form a shoulder 42. A coupling nut 44 is screw threaded to the outer side of the collar 36, and a wire 46 in a recess of the nut and a recess of the leg 38 is provided for adjusting the housing 14 at any angle about the axis of the container 7.

The cross arm of the T-shaped housing 14 is constructed of separable upper and lower elements 48 and 50, respectively, of substantially channel or trough shape divided along a line 52 and together forming registering end apertures

54 and sleeve like protrusions 56 around the apertures. Tapped holes 58, as better seen in Figure 3, are adapted to receive screws 59 as the means for detachably securing the members 48 and 50 to each other. The upper element 48 is provided with a central longitudinal reinforcing rib 57.

A plunger 60 having a head 62 in the lower element 50 is normally held in the position shown by a spring 64 extending between the head 62 and the shoulder 42, and is provided with an intermediate groove carrying a packing gland or sealing ring 66, and with a reduced lower end tip 68 for engaging the stem 32 to unseat the pilot valve member 26.

A resilient elongated track member 70 is disposed in and along the lower element 50 at a slight angle thereto normally engaging the head 62 of the plunger 60, and has an angularly bent end 72 engaging the bottom wall of the element 50, and held in place by a dowel pin 74 extending between the upright side walls of the element 50. The track 70 may, of course, be otherwise constituted, such as being a simple pivoted arm held by a separate spring other than the end 72, or by the spring 64 alone, or by having the end 72 against the end wall of the channel and the arm 70 under the pin 74.

A carriage or traction means 76 has a body constructed of upper and lower parts 78 and 80, respectively, constituting complemental means having grooves 82, see Figure 4, fitting the cable 18 for clamping the latter therebetween, as by the use of screws 84.

At the left end of the carriage 76, as viewed in Figures 2 and 3, the upper and lower parts 78 and 80 are provided with integral vertical protrusions 86 and 88, respectively, forming journals for shafts 90 and 92 carrying wheels 94 and 96 respectively, the protrusions 86 and 88 being peened or bent inwardly at the tops and bottoms to retain the shafts and wheels in the assembly.

The diameters of the wheels 94 and 96 are such as to cause the wheels to always engage each other, and the wheel 94 to always move on a track surface 85 on the underside of the upper channel element 48, and the wheel 96 to always engage the lower track member 70. By this arrangement friction is reduced to a minimum.

Wheels 98 and 100 of smaller diameter, at the right hand end of the carriage are mounted on shafts 102 and 104 and held by similar journal and retaining means 106 and 108, respectively.

As shown in Figure 1, the handle 16 is disposed at some distance from the right hand control means 12 although it could be against and partially in the end sleeve 56 of this control means. Also, the cable 18 does not extend entirely through the left hand control means of the receiver, in which case the left hand control housing 14 need not be open at the left end. The cable 18 therefore may extend entirely through all of the housings, or entirely through at least one or two of them irrespective of the number thereof. Although the control means are shown as connected in series relation to each other and to the handle 16, parallel series and other arrangements may be effected and operated by one or more of the handles.

In operation of the arrangement just described, when the handle 16 is pulled to the right, all of the traction means or carriages 76 will be similarly pulled whereby, with the wheels 94 and 96 bearing against the upper and lower tracks 85 and 70, respectively, the track 70 will be sprung sufficiently against the spring effect at the end 72

and the pin 74, and against the bias of the spring 64 to depress the plunger 60. This action releases the fluid medium for actuating the pistons and main valves aforesaid through discharge ports 110 shown in Figure 1 which may be connected to a common conduit line.

By the arrangement whereby the carriage 76 is constructed of the upper and lower parts 78 and 80 detachably clamped to the cable 18 by the screws 84, the cable 18 may first be drawn taut or placed in any other desired condition and the carriage adjusted therealong to exact position relative to the track member 70. This adjustment and clamping may be effected with the carriage and cable outside the housing 14, so that irrespective of the positions, or discrepancies in the planned positioning, of the containers 7 and the handle 16, the proper positioning of the carriages may be quickly and accurately effected. By having the cable extend entirely through the housing or housings, the use of splices and other connections is avoided and the connection of the carriage to the cable is shielded.

In the form of the invention shown in Figures 5 and 6, in which corresponding parts are designated by corresponding reference numerals, the track 70', instead of being a resilient strip fixed to the pin 74 and the casing walls as above described, is in the form of a cast metal lever pivotally mounted by the pin 74. The track 70', in this instance has a portion 112 supported on the pin 74, a body 114, a lower central reinforcing rib 116, an underside boss 118 and an upper side hump or projecting portion 120 for holding the traction means 76 in the right forward or actuated position. A pin 122, supported by the side walls of the lower element 50 extends through an aperture 124 in the boss 118 for limiting upward movement of the track 70' by the spring 64 which, in this instance, is the only means biasing the track 70 upwardly.

The traction means 76 of Figures 5 and 6, comprises a one-piece body 126 secured to the cable 18 by set screws 128 and provided with trunnions 130 axially alined with each other across the tracks 70' and 85. One pair of wheels 132 is journaled on the trunnions 130 for riding on the track 85, and another pair of wheels 134 is separately journaled on the trunnions 130 for engagement with the track 70'. The wheels 134, in this instance, are provided with flanges 136 for centering the carriage.

In operation in the absence of opposing bias, when the carriage 76 is pulled to the right, to position where the wheels 134 ride over the hump 120, the carriage will remain in such position until the cable 18 is pulled in the reverse direction.

In the form of the invention illustrated in Figure 7, in which corresponding parts are designated by corresponding reference numerals, the control means 12 comprises a housing 138 including upper and lower elements 140 and 142, the latter of which has side walls 144 and a bottom wall 146 forming a channel, and one end wall 148 formed with a nipple-like protrusion constituting an inlet for the cable 18. The bottom wall 146 is provided with a rabbet groove 150, a pin 152 for holding the track 70'', and a recess 154 for receiving the downturned end 156 of the track 70''.

The upper element 140 includes an end wall 158 having a portion fitted into the groove 150 and a top wall 160 having an aperture 162, a recess 164 and a hollow dome or boss 166. A latch

member 168, positioned in the dome 166 and biased downwardly by a spring 170, has a recess for receiving one end of a lever arm 172 that is pivoted on a pin 174 secured to the side walls of the upper element 140. The other end of the arm 172 is disposed in a recess in a button 176 which extends through the aperture 162 to the exterior of the housing 138.

Traction or carriage means 178 are provided comprising a one-piece body 180 having a portion 182 for receiving the cable 18 and for centering a spring 184 which extends from the body 180 to a recess 186 in the end wall 148 of the lower element 142. A roller detent 188 carried by the carriage 178 is adapted to be held by the latch member 168.

Wheels 190 and 192 at opposite sides of the body 180 engage each other and the upper and lower track members 85 and 70'', respectively, and are journaled on shafts 194 and 196, respectively, which are offset from each other along the tracks. With the lower wheels 192 disposed in advance of the wheels 190 in the actuating direction to the right, as shown, the upward bias of the spring 64 tends to tilt the carriage upwardly at its right end, whereby the roller detent 188 is maintained in contact with the track 85 in position for effective cooperation with the latch member 168.

The latch member 168 positively locks the carriage 178 in valve actuated position against the bias of the spring 184 so that, when the button 176 is depressed to release the detent, the carriage will be returned to its off position shown.

From the foregoing description it is apparent that an extremely simple control means has been provided, the total number of parts having been reduced considerably, and the form of each part being such as to render it easy to manufacture and assemble. The parts are rugged and durable and are ideally suited to the service for which they are intended:

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. In cable-operated valve control means including a plunger, the combination of a track pivoted at one end thereof for movement to actuate the plunger, a stationary track opposite said pivoted track and spaced therefrom, carriage means between said tracks adapted for pulling by the cable, and wheel elements rotatably mounted on and carried by said carriage means for riding on said pivoted and stationary tracks, respectively, one of said tracks having a projection thereon for engagement by said wheel elements to lock said carriage in a position whereby said pivoted track is retained to hold the plunger in an operated position.

2. In valve control means including a plunger, the combination of a track pivoted at one end thereof for movement to actuate the plunger, a stationary track opposite said pivoted track and spaced therefrom, carriage means between said track adapted for pulling by an elongated element and having elements thereon for facilitating riding of said carriage on said pivoted and stationary tracks, respectively, one of said tracks having latching means thereon for engagement by said carriage elements to lock said carriage in a position whereby said pivoted track is retained to hold the plunger in an operated position.

3. In cable-operated valve control means including a plunger, the combination of a track pivoted at one end theerof for movement to actuate the plunger, a stationary track opposite said pivoted track and spaced therefrom, carriage means between said tracks adapted for pulling by the cable, and wheel elements rotatably mounted on and carried by said carriage means for riding on said pivoted and stationary tracks, respectively, said pivoted track having a projection thereon for engagement by said wheel elements to lock said carriage in a position whereby said pivoted track is retained to hold the plunger in an operated position.

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