

June 4, 1963

A. B. GUISE ETAL

3,092,183

FIRE EXTINGUISHER

Filed May 21, 1959

5 Sheets-Sheet 1

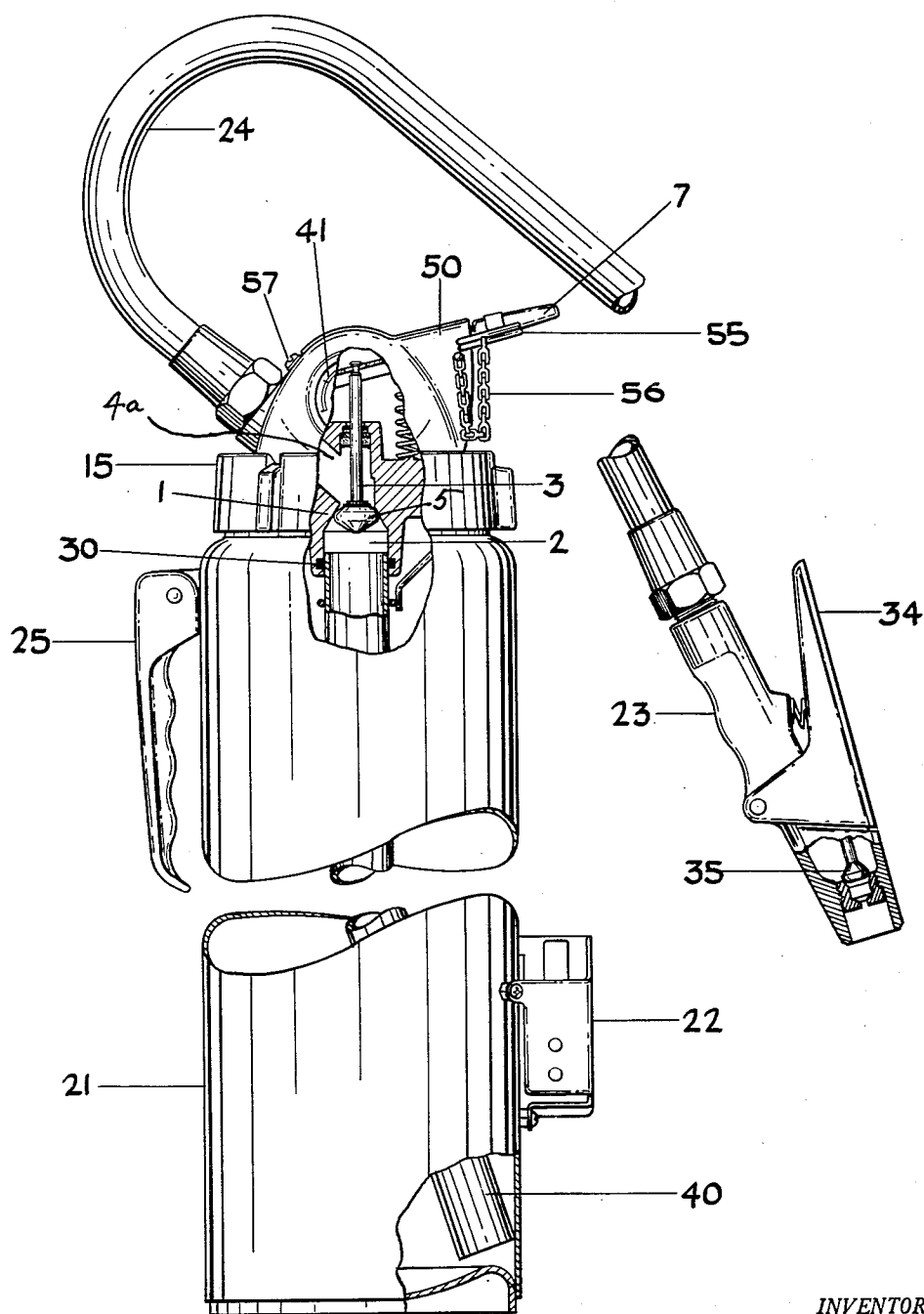


FIG. 1

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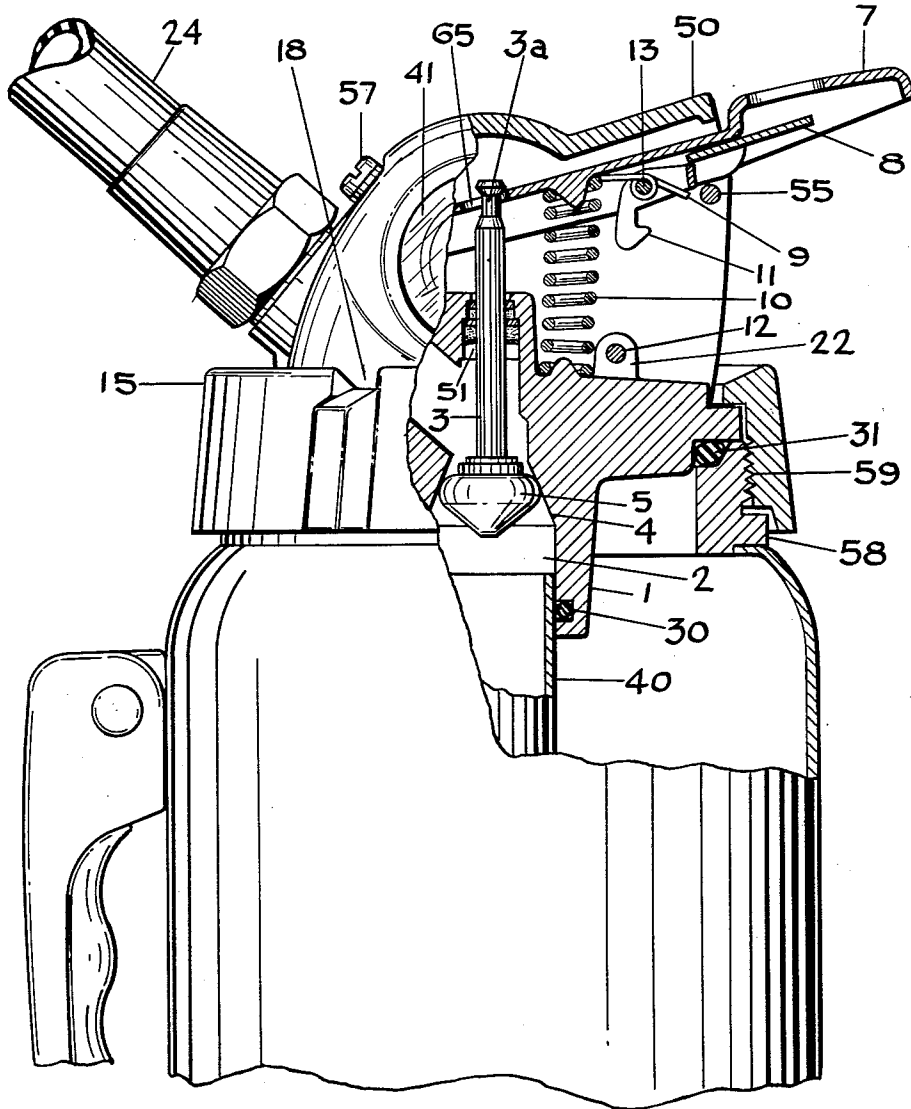


FIG. 2

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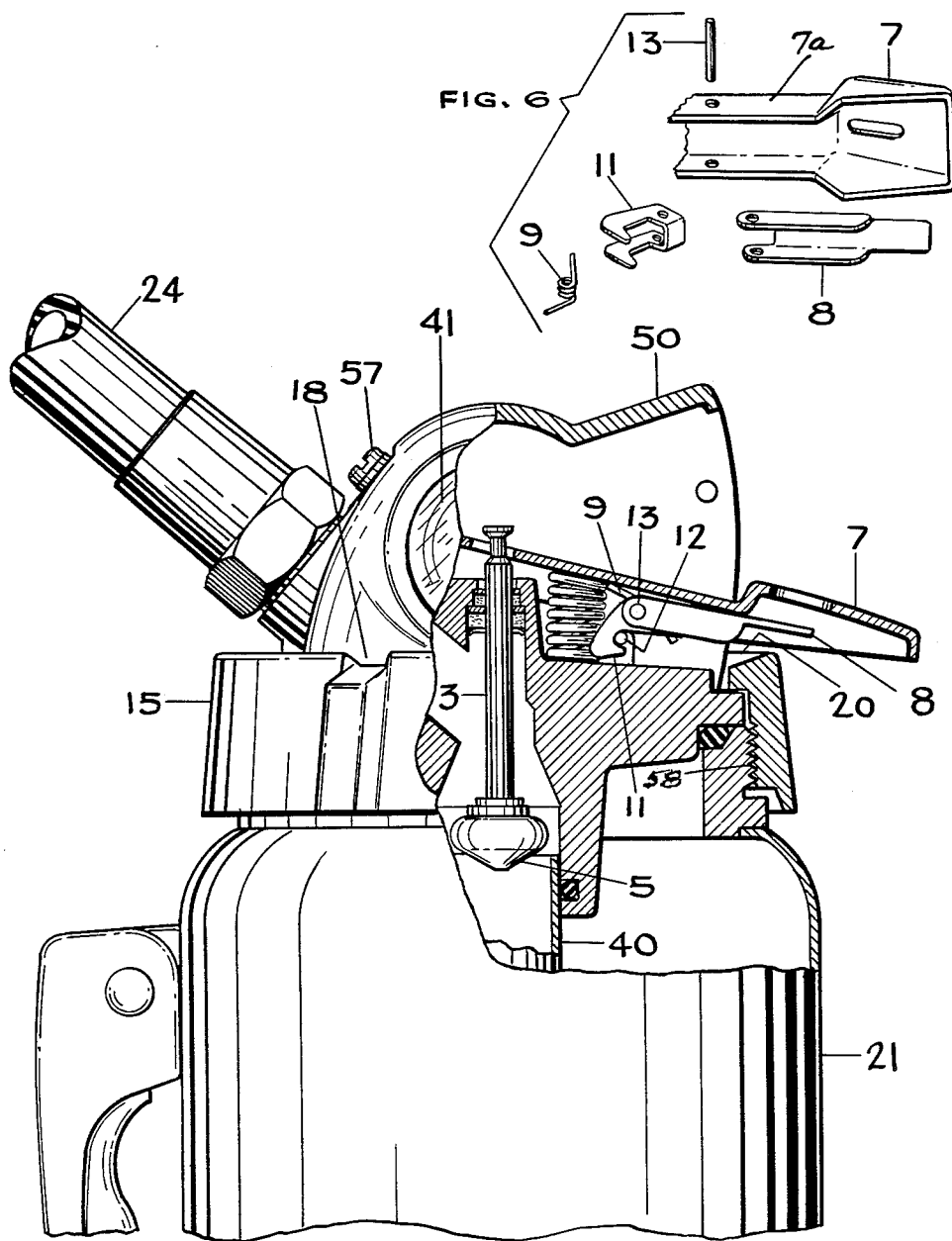


FIG. 3

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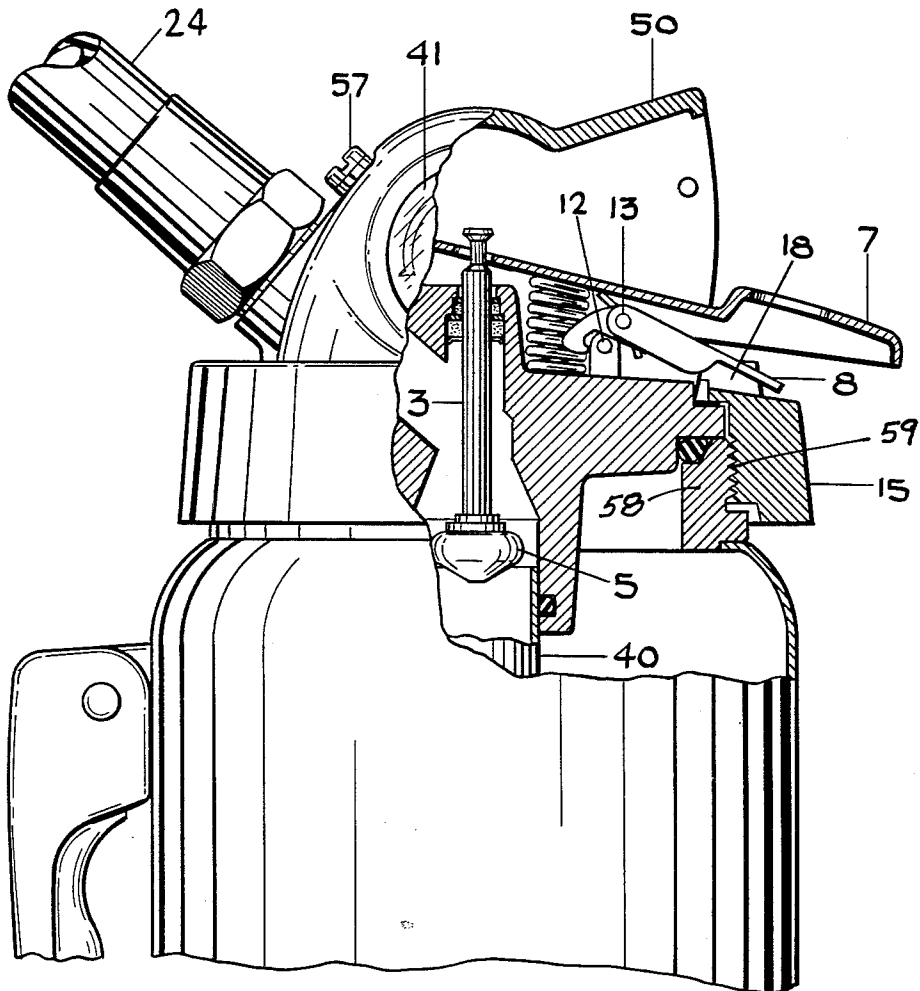


FIG. 4

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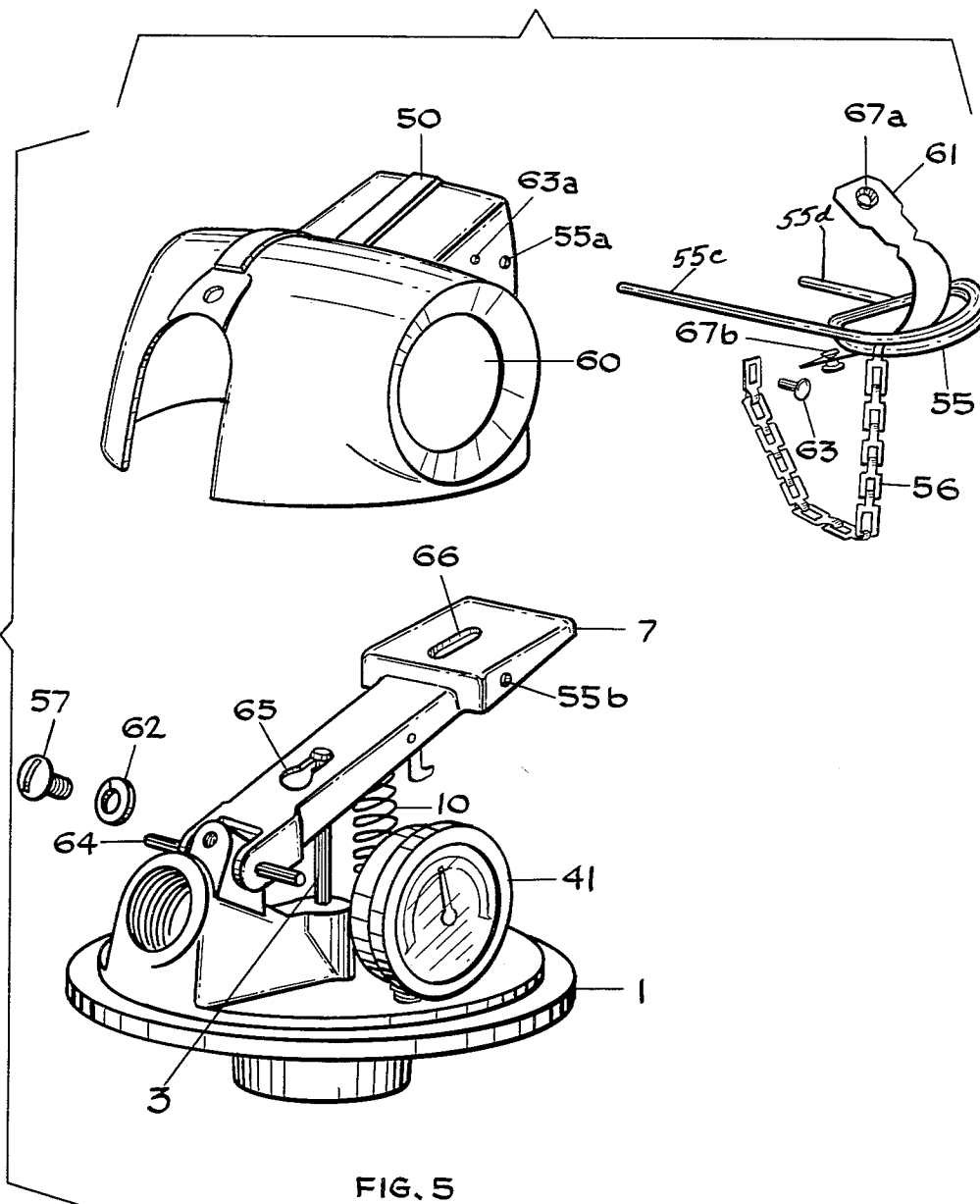
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5 Sheets-Sheet 5



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3,092,183

FIRE EXTINGUISHER

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4 Claims. (Cl. 169—31)

This invention relates to fire extinguishers and more particularly to portable, stored pressure dry chemical type fire extinguishers.

The usual type of stored pressure extinguisher comprises an extinguisher shell which contains the dry chemical extinguishing agent and air or some other gas under pressure for expelling the dry chemical agent. Thus, the extinguisher is under pressure at all times and gas leakage is a problem. In almost every case, discharge of such an extinguisher is initiated and controlled by one hand from a valve arranged in conjunction with the carrying handle on top of the extinguisher and the dry chemical stream is directed by a hose held in the other hand. This type of construction has been employed because it minimizes leakage possibilities even though it may not allow most effective use of the extinguishing agent.

Two-handed operation, that is, controlling the rate of flow of the dry chemical with one hand while directing the stream toward the fire with the other, oftentimes requires a degree of coordination not exhibited by an inexperienced operator in the excitement of extinguishing a fire. This type of construction also requires the hand which is bearing the total weight of the extinguisher to control the flow of the extinguishing agent. Under these circumstances, if the operator is not particularly careful, his grip will relax due to the weight of the extinguisher which results in unintentional and undesirable throttling of the extinguishing agent flow.

In the cartridge type extinguisher, leakage is not a serious problem since pressure is not applied to the interior of the dry chemical containing vessel until just prior to discharge. Consequently a type of construction has been adopted which allows nearly optimum operation during fire extinguishment and this type extinguisher almost universally employs a valve at the end of the hose to control the rate of flow of extinguishing agent so that only one hand both directs the stream and controls its rate of flow.

One-handed operation of an extinguisher permits the extinguisher to be carried by a shoulder strap and be operated from an awkward position, such as on a ladder. In cases where the fire is fed by fuel escaping under pressure, if the extinguisher can be controlled and directed with one hand, it is oftentimes possible to play the extinguishing agent on the flames with one hand while operating a valve to cut off the flow of fuel with the other.

Stored pressure type extinguishers generally are not suitably leak resistant for prolonged storage unless the valve seals are kept clear of dry chemical. This can be done by the pressurizing gas during the pressurizing operation after the extinguisher has been filled with agent. However, if this type of extinguisher is partially discharged and then replaced without being repressurized, the valve seats are contaminated with dry chemical, a leaky seal results and the extinguisher cannot be relied upon for satisfactory operation when next needed. This is a very real problem with present stored pressure units, since a fire frequently can be extinguished with so little agent that the pressure remaining is in the range indicated as "operable" by the gauge.

It is therefore the object of this invention to provide

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a stored pressure type extinguisher which, while maintaining all the leak resistant features of the prior art devices, provides for more efficient fire extinguishment by enabling the rate of discharge to be controlled with one hand which directs the stream towards the fire.

5 A further object of this invention is to provide a stored pressure type extinguisher which, having once been used, and not replaced in a condition for satisfactory prolonged storage, will automatically indicate this fact by more than an indicated reduction in pressure.

10 The objects of this invention are obtained by providing a stored pressure extinguisher in which the valve sealing the extinguisher in the usual fashion automatically latches in the open position upon actuation. From this point on, operation of the extinguisher during fire extinguishment is similar to the standard cartridge type extinguisher in which the fire extinguishing stream is directed and controlled with the valved nozzle by a one-hand operation. The latched position of the lever that operates the sealing valve clearly indicates that the extinguisher has been used.

20 The valve so latched is arranged so it cannot be restored to its initial sealing position until substantially all pressure within the extinguisher has been vented. After being returned to its sealing position the extinguisher is repressurized, which process frees the sealing valve of dry chemical and enables a reliable seal again to be obtained. This procedure of reducing the pressure to zero after each discharge also serves as a check on the pressure gauge operation. These gauges on occasion become plugged or inoperative through accidents.

Further details and advantages of the invention will be apparent from the following description and accompanying drawings, wherein

30 FIGURE 1 is an elevational view of the fire extinguisher construction, partly broken and partly in section, FIGURE 2 is an enlarged sectional view of the head assembly showing the valve in closed position during storage of the extinguisher,

40 FIGURE 3 is a similar view showing the valve in open and locked position during discharge,

FIGURE 4 is a similar view showing the valve lock mechanism being released,

45 FIGURE 5 is an exploded perspective view of the elements constituting the head assembly, and

FIGURE 6 is an exploded perspective view of the elements constituting the valve locking mechanism.

Referring to the drawings, FIGURE 1 is a view of the fire extinguishing apparatus comprising a steel cylindrical shell or receptacle 21 in which is stored a fire extinguishing agent under suitable gas pressure. The container is adapted to be closed by a head assembly or valve housing 1 secured in place with a union ring 15. The head assembly has a bore 2 which is sealed by a valve body 5 that is actuated by a plunger 3 connected to the actuating lever 7. Actuating lever 7 is pivoted on a manually removable pin 64 retained on the head 1 as shown in FIGURE 5. A riser tube 40, welded to the extinguisher shell at its lower end is provided to convey the dry chemical to the head assembly and is maintained in pressure tight engagement therewith by the O-ring 30. A flexible hose 24 is suitably connected to the head assembly and the hose is provided at its free end with a nozzle 23 provided with a valve 35 which is actuated by the lever 34. When not in use, the nozzle 23 is removably retained by the nozzle holster 22 fixed to the shell 21. The pressure within the extinguisher shell is displayed on the pressure gauge 41 which is in communication with the interior of the shell by suitable passageways. The cover 50 secured by the screw 57 affords protection to the pressure gauge and the other parts of the extinguisher head. Inadvertent movement of the actuating lever 7 is prevented by the ring pin

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55 which is flexibly attached to the cover 50 by the chain 56. The carrying handle 25 is suitably attached to the extinguisher shell.

As shown in FIGURE 2, the fire extinguisher head 1 has an internal bore 2 designed to accommodate an axially movable plunger 3. A pivotally mounted actuating lever 7 has a slot 65 which engages the upper end of the plunger 3a. Leakage around the plunger is prevented by sealing washers 51. The lower end of the plunger is fitted with a valve body 5 which seals against the valve seat 4. The helical spring 10 urges the actuating lever 7 to a position which holds the valve body in sealing engagement with the seat 4. A latch assembly consisting of hook member 11 connected to release lever 8, as shown in FIGURE 6, is positioned beneath release lever 8, as shown in FIGURES 3 and 4, which is pivoted on pivot pin 13 which passes through the release lever 8 and is retained in the sides 7a of actuating lever 7. The hook 11 and the release lever 8 are urged into contact with the actuating lever 7 by the torsion spring 9. The head 1 is retained on the extinguisher by the threads 59 of the union ring 15 engaging the collar 58 of the extinguisher. The union ring 15 has a slot 18 dimensioned to receive the release lever 8. The gasket 31 renders the assembly pressure tight.

FIGURE 5 further illustrates construction of the head assembly. Pressure within the extinguisher is displayed on the pressure gauge 41. The shroud or cover 50, held in place by the screw 57 and the lock washer 62, offers mechanical protection to the operating parts and the gauge, whose face is visible through the aligned opening 60. When the cover 50 is in place, it maintains the pivot 64 in its proper position and also forms a support for the ring pin 55 having extensions 55c and 55d which, when inserted in the holes 55a and 55b, respectively, restrains the movement of the actuating lever 7. The indicator 61 formed of a suitable frangible plastic strip is threaded through the ring pin 55 and the slot 66 in the actuating lever 7 and is secured by the snaps 67a and 67b. The ring pin is secured against loss by the chain 56 which is fastened to the cover 50 by the drive screw 63 being inserted in the hole 63a in cover 50.

To operate the extinguisher, the actuating lever 7 is depressed which opens the valve 5 releasing the dry chemical and its expellent gas through the discharge passage 4a into the hose 24 where its discharge is controlled by the nozzle valve 35. Depressing the actuating lever 7 also causes the hook 11 to engage the pin 12, which is mounted in an extension 32 of the head casting, to restrain or lock the actuating lever and the plunger in the depressed position which in turn maintains the valve 5 in the open position, as shown in FIGURE 3. In the act of latching, the hook 11 moves relative to the release lever 8 which enables the hook to deflect sufficiently to engage the pin 12 while the release lever 8 is restrained by the rim 20 of union ring 15.

After the fire has been extinguished and it is desired to replace the extinguisher in its designated storage spot, the depressed position of the actuating lever 7 indicates that the extinguisher has been used. The actuating lever 7 cannot be returned to its initial position unless the release lever 8 is depressed to remove the hook 11 from engagement with the pin 12, but this cannot be done since the release lever 8 is restrained by engagement with the rim 20 of the union ring 15. To depress the release lever, the union ring 15 must first be rotated so the slot 18 is in register with the release lever 8. However, the union ring 15 cannot be rotated until the pressure in the extinguisher has been almost completely released. This may be done by totally discharging the extinguisher or, if dry chemical is remaining, by inverting the extinguisher and venting the pressurizing gas through the nozzle on the end of the hose. This procedure has the advantage of clearing the hose of dry chemical after discharge. Once the pressure in the extinguisher has been relieved, the union ring 15 can be rotated to bring the slot 18 into register with the release lever 8, the release lever can be depressed, as shown in

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FIGURE 4, to disengage the hook 11 from the pin 12 which allows the actuating lever to return to the normally raised position.

The present construction may, of course, be applied to various types of extinguishing equipment besides the dry chemical type. The steps of latching the main extinguisher valve, conveying the extinguishing agent through a flexible hose, controlling as well as directing the extinguishing agent toward the fire with the nozzle at the end of the hose and preventing the return of the main extinguisher valve to its initial position as long as pressure remains in the extinguisher may also be implemented by other types of fire extinguisher constructions in addition to the specific construction herein described. It is therefore to be understood that changes and modifications may be made in the construction described which are intended to be included in the appended claims.

We claim:

1. A fire-extinguishing apparatus comprising a container for storing fire-extinguishing agent under pressure, a removable head for sealing the mouth of said container, a union ring for removably securing said head to said container, said union ring having at least one notch in its periphery, said head having a bore and a discharge passage connected thereto, a hose connected to said discharge passage, nozzle means attached to said hose for controlling the flow of fire-extinguishing agent from said hose, movable sealing means in said bore to seal the interior of said container from said discharge passage, an actuating lever pivoted on said head for actuating said sealing means, latching means positioned beneath said actuating lever for automatically retaining said actuating lever and said sealing means in open position upon depression of said actuating lever to permit continuous discharge of fire-extinguishing agent from said container, a release lever connected to said latching means, said release lever being adapted to abut said union ring to retain said latching means in locked position and being movable within said notch in the union ring to permit release of said latching means.

2. A fire extinguisher comprising: a container for storing fire extinguisher agent, a removable valve housing for sealing the mouth of said container, said valve housing having a passage therein for discharge of fire extinguisher agent, attaching means for removably attaching said valve housing to said container, valve means cooperating with said passage for controlling flow of fire extinguisher agent through said passage, actuating means cooperating with said valve housing for opening said valve means, latching means operating in response to movement of said actuating means for releasably locking said actuating means in a position whereby said valve means is releasably locked in an open position, and means on said attaching means cooperating with said latching means for preventing release of said latching means prior to a predetermined movement of said attaching means.

3. A fire-extinguishing apparatus comprising a container for storing a pressurized fire-extinguishing agent, a removable head for sealing the mouth of said container, said head having a bore and a discharge passage connected thereto, a hose connected to said discharge passage, nozzle means including a valve attached to said hose for controlling the flow of fire-extinguishing agent from said hose, movable sealing means located in said bore to seal the interior of the container from said discharge passage, actuating means operatively connected to said sealing means for moving said sealing means in said bore to permit fire-extinguishing agent to pass through said discharge passage and into said hose, pin means on said head, latching means including a hook member associated with said actuating means adapted to engage the pin means on said head in response to movement of said actuating means for latching said sealing means in the open position, and stop means mounted intermediate said head and said actuating means in a position whereby the stop means

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engages the actuating means to prevent release of said latching means when said sealing means is latched in the open position, said stop means being movable with respect to said latching means to a predetermined position wherein said latching means can be moved to a position of release and said sealing means moved to a closed position.

4. A fire-extinguisher apparatus comprising: a container for storing pressurized fire-extinguishing agent, a removable head for sealing the mouth of said container, said head having a bore and a discharge passage connected thereto, a hose connected to said discharge passage, nozzle means including a valve attached to said hose for controlling the flow of fire-extinguisher agent from said hose, movable sealing means in said bore to seal the interior of the container from said discharge passage, an actuating lever pivotably mounted on said head for actuating said sealing means, a pin means on said head, a spring biased hook mounted underneath said actuating lever and adapted to engage the pin means on said head for retaining said actuating lever and said sealing means

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in an open position upon depression of said actuating lever to permit continuous discharge of the fire-extinguishing agent from said container, a release lever mounted on said actuating lever and adapted to release said hook member from engagement with said pin means.

References Cited in the file of this patent

UNITED STATES PATENTS

428,031	Wood	May 13, 1890
1,725,778	Badger	Aug. 27, 1929
2,416,719	Stockdale	July 31, 1940
2,448,409	Barnes	Aug. 31, 1948
2,564,733	Sipkin	Aug. 21, 1951
2,580,419	Griggs	Jan. 1, 1952
2,667,225	Allen et al.	Jan. 26, 1954
2,710,658	Huthsing et al.	June 14, 1955
2,736,919	Nurkielwicz	Mar. 6, 1956
2,737,407	Matthews et al.	Mar. 6, 1956
2,856,010	Brill et al.	Oct. 14, 1958