Feb. 27, 1968 A. RODGERS 3,370,826

VALVE ASSEMBLY FOR FIRE EXTINGUISHER

Filed May 18, 1965

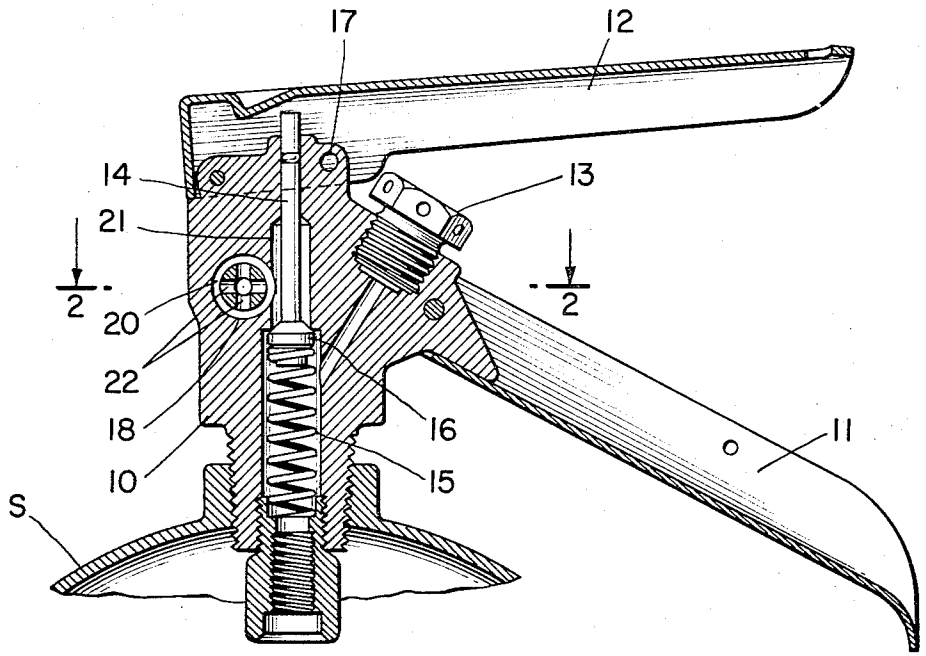

FIG. 1.

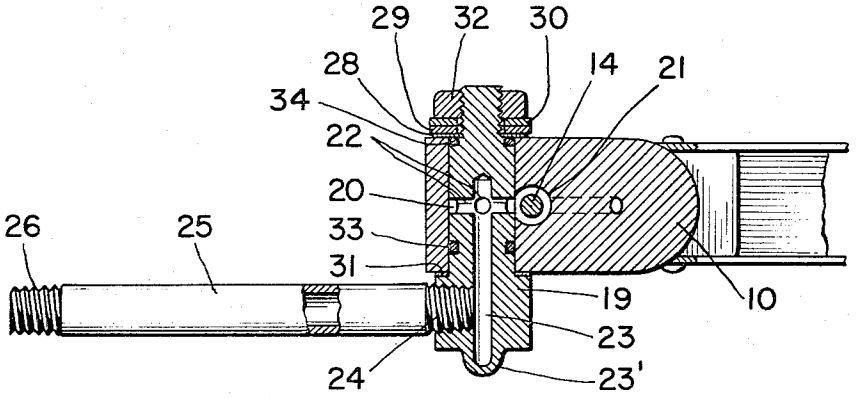

FIG. 2.

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3,370,826

Patented Feb. 27, 1968

3,370,826

VALVE ASSEMBLY FOR FIRE EXTINGUISHER

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Filed May 18, 1965, Ser. No. 456,753

6 Claims. (Cl. 251—148)

ABSTRACT OF THE DISCLOSURE

A valve assembly for a fire extinguisher cooperating with a swivel type discharge pipe in which the fluid connection between the valve outlet passage and the discharge pipe is integral with the valve body.

This invention generally relates to portable type fire extinguishers, and more particularly concerns an improved valve assembly particularly adaptable for use with pressurized fire extinguishers of the type in which, for example, carbon dioxide or freon is used as the extinguishing agent.

It is, of course, important with extinguishers of the aforementioned type that the extinguishing gas be directed properly at the source of the fire. In consequence, it is usual practice to provide a swivel type discharge pipe and attached horn which may be rotated relative to the extinguisher as a whole and directed towards the most desirable area for quickly extinguishing the fire.

In the usual extinguisher construction, the swivel unit is mounted on a discharge fitting which protrudes from the front of the valve body. In other words, the swivel unit is interposed between the discharge pipe and the valve body, the latter being coupled to the opening in the neck of the fire extinguisher shell or tank. In alternate constructions, the swivel assembly is mounted so as to communicate through one sidewall of the valve body with an elbow-like arrangement.

The present invention has several objectives.

A most important object of the present invention is to provide a swivel assembly for portable fire extinguishers which may be more economically manufactured with a fewer number of parts, and yet which provides a construction which is maintenance-free, rugged, and easy to operate.

Another object of the present invention is to provide an improved swivel assembly for portable fire extinguishers using, for example, pressurized gases as the extinguishing agent, in which the swivel assembly may be removed while the extinguisher is in a pressurized condition without any danger of unidirectional escape of pressurized gases in the event of any malfunction in the valve unit which might cause a dangerous recoil of the extinguisher.

Still a further object of the present invention is to provide an improved swivel assembly for a portable fire extinguisher in which some savings in space is effected by the reduction in number of parts and in which certain parts are given dual functions.

These and other objects and advantages of the present invention are generally achieved by providing in a portable type fire extinguisher, the combination of a valve body which defines an internal plunger passage designed to communicate with the neck opening in the fire extinguisher shell, together with a plunger slidably disposed in said valve body and biased towards a position such that a valve carried thereby is designed to close off the passage until actuated, for example, by a conventional operating lever to an open position. This combination, as thus far described, is well known in the art.

Applicant's improved features designed to co-function

with this combination include providing a laterally extending bore communicating with the passage and being designed to receive the swivel assembly forming an important feature of the present invention. The swivel assembly includes a swivel shaft dimensioned to be sealably journaled within the bore, and the shaft as such includes passage means communicating with the plunger internal passage in the valve body.

The swivel shaft embodies a protruding portion at one end which extends beyond the valve body, and a discharge pipe is designed to be coupled to the protruding portion and to communicate with the passage means therein.

In this manner, the bore within the valve body actually acts as a means of journalling the swivel unit instead of the swivel unit being coupled to a discharge fitting, for example, on the front of the valve body, as has been conventional in at least one prior art construction. Thus, in this instance, the valve body actually is the swivel mounting, whereas in the prior constructions, a separate mounting member was employed.

A better understanding of the present invention will be had by reference to the drawings, disclosing merely one illustrative embodiment, and in which:

FIGURE 1 is a sectional view of a valve body including the improved swivel assembly therein; and,

FIGURE 2 is a view taken in the direction of the arrows 2—2 of FIGURE 1 illustrating more clearly the features of the swivel assembly embodied in the valve body of the present invention.

Referring now to the drawings, there is shown in FIGURE 1, a valve body **10** designed to be threadingly coupled to a fire extinguisher shell S in the usual manner. The valve body **10** has, in accordance with conventional practice, a carrying handle **11** coupled thereto as well as an operating lever **12** pivotably connected to its upper portion. The valve body **10** may further incorporate a safety disc nut **13**.

Also, in conformance with usual practice, the valve body **10** has mounted therein for slidable movement, a plunger unit **14** which is biased towards its upper position by a spring member **15** so that a valve **16** carried at the lower end of the plunger is normally in a closed position. The plunger **14** is operated by downward actuation of the operating lever **12** after a pull-pin normally inserted through the opening **17** in the valve body (aligned with a similar opening in the operating lever **12**) is removed. This combination, as thus far described, of and by itself, forms no part of the present invention and is known in the art.

In accordance with a feature of the present invention, a laterally extending bore **18** is provided in the valve body to receive a swivel shaft member **19**, as more clearly seen in the view of FIGURE 2.

Referring now to the view of FIGURE 2, it will be seen that the swivel shaft member **19** is provided near its center portion with an annular groove **20** around its periphery which is designed to communicate with a passage **21** encircling the plunger **14**. The annular groove, as such, communicates with cross-drilled, diametrically extending passages **22**.

The passages **22** in turn communicate with an axially extending passage **23** bored in the swivel shaft **19**. In order to form passage **23**, a collar **23'** is provided at the end of the shaft **19**. After the passage **23** is drilled, the collar **23'** is spun over into the construction shown.

The axial passage **23** communicates at its lower end, as viewed in FIGURE 2, through a threaded opening **24** with a discharge pipe **25** of the usual construction.

The discharge pipe **25** may be provided with threading at its end **26** for connection to a horn for the final discharge of the gases from the extinguisher.

Considering now the mounting of the swivel shaft **19** within the valve body **10**, it will be noted from FIGURE 2, at the upper portion thereof, that the shaft is fitted with a fiber washer **28**, a steel washer **29**, and a lock washer **30**, while near its other end it may be provided with a washer **31**. Over the washer **30** is provided a nut **32**. The fiber washer **28** is provided to control friction, while the steel washer is provided for a backing to the fiber washer. In certain circumstances, the steel washer may not be necessary. The shaft may be appropriately provided with O-rings **33** and **34** in order to prevent any possibility of leakage. Of course, the particular manner in which the swivel shaft **19** is mounted in the bore **18** and coupled thereto may be varied in mechanical details.

In operation, after removal of the pull-pin from the opening **17**, the operating lever **12** is actuated downwardly to open the valve **16** and allow the pressurized gases from the extinguisher to escape upwardly through the plunger passage **21**, into the annular groove **20**, and thereafter through the cross-drilled passages **22**, through the axial passage **23**, into the discharge pipe **25** and out the threaded end **26** thereof to be directed towards the fire. It will be appreciated, in consequence of the annular groove **20**, that swivelling movement of the swivel shaft **19** and attached discharge pipe **25** will always maintain fluid communication between these members.

With this type of construction, it will be evident that the valve body **10**, as such, is used as a means of retaining the swivel shaft **19** and of journaling same for rotation. Thus, no need is required for a fitting extending from the valve body to which must additionally be attached another member for holding the swivel shaft **19** with the resultant additional expense in parts and production.

It should also be noted that during manufacture of the extinguisher, it is the usual practice to charge the extinguisher before the swivel unit is mounted therein. With the construction as heretofore described, in the event of any leakage past the valve **16**, it will be seen that the gaseous extinguishing agent will be expelled from both ends of the bore **18** so that no recoil occurs with respect to the extinguisher. Thus, as contrasting certain prior art devices, in which the swivel member is coupled to an opening with an elbow type arrangement wherein no bore extends through the valve body, no possibility of dangerous movement of the extinguisher occurs with this construction.

It will be further appreciated that by not providing an additional fitting, but using the valve body as a means of mounting the swivel shaft that considerable savings in space may be obtained.

Those skilled in the art, however, will realize that certain minor changes and modifications may be made in the improved valve assembly of the present invention without departing from the spirit and scope of the invention as set forth in the following claims.

I claim:

1. In a fire extinguisher, including a shell having a neck opening therein, the combination comprising: a valve body defining an internal passage communicating with said opening of said fire extinguisher shell; a plunger slidably disposed in said valve body; a valve carried by said plunger designed in a first position to close off said passage and in a second position to open up said passage; a bore extending laterally through said valve body, said bore communicating with said passage upstream of said valve; a swivel shaft sealably journaled in said bore, said swivel shaft defining passage means communicating with said internal passage, said swivel shaft having a protruding portion at one end extending beyond said valve body; and, a discharge pipe coupled to said protruding portion and communicating with said latter mentioned passage means.

2. In a fire extinguisher, including a shell having a neck opening therein, the combination comprising: a valve body defining first passage means designed to communicate with said opening in said fire extinguisher shell; a plunger slidably disposed in said valve body; a valve carried by said plunger designed in a first position to close off said first passage means and in a second position to open up said first passage means; a bore extending laterally through said valve body, said bore communicating with said passage upstream of said valve; a swivel shaft sealably journaled in said bore, said swivel shaft defining second passage means communicating with said first passage means, said swivel shaft being designed for swivelling movement in said bore; a discharge pipe coupled to one end of said swivel shaft, said discharge pipe sealably communicating with said second passage means.

3. The combination according to claim **2**, in which said swivel shaft is provided with a protruding portion at one end extending beyond said valve body; and in which said discharge pipe is coupled to said protruding portion with said discharge pipe communicating with said second passage means.

4. In a fire extinguisher, including a shell having a neck opening therein, the combination comprising: a valve body defining first passage means designed to communicate with said opening in said fire extinguisher shell; a plunger slidably disposed in said valve body; a valve carried by said plunger designed in a first position to close off said first passage means and in a second position to open up said first passage means; a bore extending laterally through said valve body, said bore communicating with said passage upstream of said valve; a swivel shaft sealably journaled in said bore, said swivel shaft defining second passage means communicating with said first passage means, said swivel shaft having a protruding portion at one end extending beyond said valve body; a nut retaining said swivel shaft at its other end for rotatable movement within said valve body; a discharge pipe coupled to said protruding portion communicating with said second passage means.

5. In a fire extinguisher, including a shell having a neck opening therein, the combination comprising: a valve body defining first passage means designed to communicate with said opening in said fire extinguisher shell; a plunger slidably disposed in said valve body; a valve carried by said plunger designed in a first position to close off said first passage means and in a second position to open up said first passage means; a bore extending laterally through said valve body, said bore communicating with said passage upstream of said valve; a swivel shaft sealably journaled in said bore, said swivel shaft defining second passage means communicating with said first passage means, said swivel shaft having a protruding portion at one end extending beyond said valve body; said second passage means including an annular groove about said swivel shaft designed to be maintained in constant communication with said first passage means regardless of the rotative position of said swivel shaft; a discharge pipe coupled to said protruding portion and communicating with said second passage means.

6. The combination according to claim **5**, and cross-drilled passages communicating with said annular groove as a part of said second passage means; and, an axially drilled passage in said swivel shaft communicating with said cross-drilled passages and said discharge pipe.

References Cited

UNITED STATES PATENTS

3,101,188 8/1963 Newmiller ..... 251—148

FOREIGN PATENTS

713,689 8/1931 France.

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