Aug. 23, 1955 C. K. HUTHSING ET AL 2,715,908

FIRE EXTINGUISHER DISCHARGE VALVE

Filed Aug. 19, 1950

Fig. 1

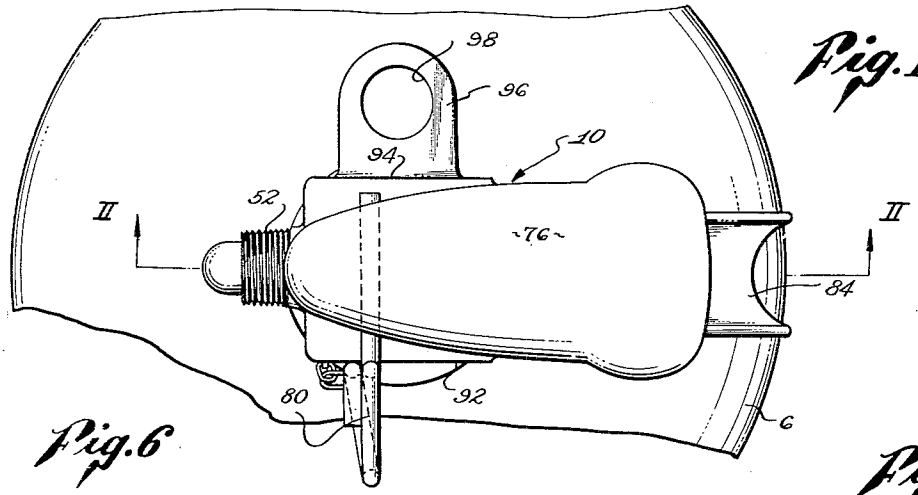


Fig. 6

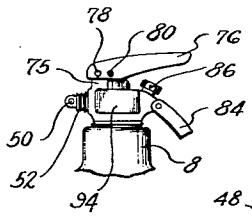


Fig. 4

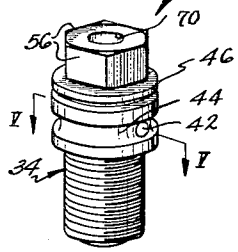


Fig. 2

Fig. 3

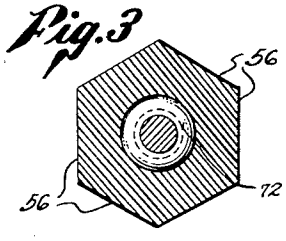
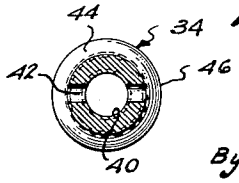


Fig. 5



INVENTORS
CHARLES K. HUTHSING
JOHN W. HOWARD
By Wm. Edward Hann
Attorney

United States Patent Office 2,715,908 Patented Aug. 23, 1955

2,715,908

FIRE EXTINGUISHER DISCHARGE VALVE

Charles K. Huthsing, Los Angeles, and John W. Howard, Temple City, Calif.; said Howard assignor to said Huthsing

Application August 19, 1950, Serial No. 180,353

4 Claims. (Cl. 137—68)

This invention relates to improvements in a discharge head to be used in connection with high pressure fluid containers and particularly fire extinguishers employing carbon dioxide.

An object of the present invention is to provide a discharge head of lighter weight and more compact design than heretofore, thereby effecting an economic saving; to provide a discharge head having a lower overall height than heretofore; to provide a discharge head of such construction and design as to reduce the liability of being broken off of the container upon which it is mounted, during shipment and handling of the containers; to provide a discharge head of this character in which the safety plug is located in a protected position with respect to the valve operating and lift handles which are mounted on said head; to provide a discharge head of this character in which the main discharge valve and its cooperating spring are located within that portion of the body which is surrounded by the container on which it is mounted, thereby giving maximum protection for the operating parts; to provide an improved construction of valve body, core and valve stem construction in which all of the operating parts may be removed for service, repair or replacement without removing the valve body from the container in which it is mounted.

An illustrative embodiment of this invention is shown in the accompanying drawings, in which:

Fig. 1 is a fragmentary top plan view of a high pressure container having the improved discharge valve mounted therein.

Fig. 2 is a vertical medial sectional view taken on the line II—II of Fig. 1 looking in the direction indicated by the arrows and showing the lift handle or carrying handle in its two positions.

Fig. 3 is an enlarged sectional view taken on the line III—III of Fig. 2 looking in the direction indicated by the arrows.

Fig. 4 is a view in perspective of the valve core.

Fig. 5 is a sectional view taken on the line V—V of Fig. 4.

Fig. 6 is a fragmentary view in elevation showing the top end of a high pressure container with the improved valve threaded therein and showing particularly how the valve operating handle is positioned outwardly or above the turning nut of the valve.

In the construction shown in the drawings a high pressure drawn steel container or bottle 6 is shown provided with an interiorly threaded neck 8 for receiving a discharge valve generally designated 10. The discharge valve 10 comprises a body portion 12 having an annular exteriorly threaded neck portion 14 adapted to be screwed into the bottle neck 8 in the usual manner of discharge valves for containers of this character. The body 12 is provided with a straight through bore of different diameters which provide annular shoulders at the different points of changing size of the bore.

The inner end of the valve body housed within the bottle or container 6 is provided with a bore 16 adapted

to slidably receive a syphon tube 18 and terminating at its upper end in a shoulder 20 which limits the upward movement of the syphon tube 18 by abutting thereagainst, the shoulder 20 being substantially the same width as the thickness of the tube wall 18. An O-ring 22 is mounted in an annular groove adjacent the lower end of the bore 16 and snugly surrounds the tube 18 for sealing the same to the valve body.

Adjacent the bore 16 and adjacent the shoulder 20 is provided a bore 24 substantially the same size as the interior of the tube 18 and which leads to and communicates with a larger bore 26. At the juncture of the bores 24 and 26 there is formed an annular shoulder 28 which serves as a spring seat for helical compression spring 30 loosely housed within the bore 26 with its inner end seated upon and bearing against the shoulder 28.

The bore 26 is interiorly threaded at its outer end as shown at 32 to receive the exteriorly threaded inner end of a valve core 34.

Outward of the threaded portion 32 the bore is enlarged as shown at 36, and an annular shoulder 38 is formed at the juncture of the bore portion 36 and threaded portion 32 so as to provide an annular seat for a gasket, if so desired.

The core 34 is provided with an axially extending passageway 40 therethrough and diametrically aligned transverse passageways 42, the inner ends of which communicate with and intersect the axial passageway 40 and the outer ends of which communicate with an annular groove 44 formed around the outer periphery of the enlarged portion 46 of the core 34. The two diameters of the core body form an annular shoulder adapted to seal against the shoulder 38 of the valve body.

The valve body is provided with a discharge passageway 48, the inner end of which communicates with the annular groove 44 and the outer end of which terminates in a closed dome-shaped nipple having transverse bores 50 in alignment therethrough which permits discharge without rebound or recoil. The portion of the valve body through which the discharge passageway 48 extends is exteriorly threaded as at 52 for attaching a hose, horn or other discharge device for directing the flow of the contents of the container 6.

The larger portion 46 of the core is provided with an annular groove to receive an O-ring seal 54 which seals against the inner surface of the bore 36 and prevents leakage or discharge of the fluid contents of the container at around the core member. The outer end of the core beyond the enlarged portion 46 is of reduced size with a periphery of flattened sides 56 so as to serve as a nut for threading the core into the valve body tightly against the shoulder 38.

The axial passageway 40 through the core 34 houses a valve stem 58 of smaller size than the passageway 40 so as to permit free flow of fluid therebetween. The inner end of the valve stem 58 is provided with an integrally formed shoulder 60 against which is secured a valve element comprising a washer 62 of fibre or other composition housed within an inverted acorn or cup-shaped nut 64 which is threaded onto the lower end or extremity of the valve stem, as shown at 66.

The outer end of the valve stem 58 is provided with an integrally formed annular piston portion 68 which slidably fits the upper finished end 70 of the bore 40. The enlarged or piston portion 68 is provided with an annular groove about its periphery in which is housed an O-ring seal 72 for sealing the passageway 70 against the leakage of fluid within the passageway 40. The top or outer end of the valve stem 58 protrudes beyond the outer end of the core 34 and is positioned to be engaged on its axial

face by a lug 74 integrally formed on the under side of a valve operating handle 76.

The handle 76 is pivoted to the top end of a lug 75 integrally formed on the valve body 12 by a pin 78 and extends a considerable distance beyond the lug 74 so as to provide suitable leverage for engagement by the operator's hand for squeezing down on the handle 76 and thereby moving the valve stem 58 inwardly against the high pressure of fluid within the container 6.

As shown most clearly in Fig. 1, the valve operating handle 76 is relatively broad and is widened out at its free end so as to make a good fit with the hand of the user when the handle is engaged between the thumb and first finger in a natural position. A locking pin 80 is provided as usual in devices of this character for preventing accidental depression of the handle 76 without first withdrawing the locking pin which passes through the inverted channel-shaped side walls or flanges of the handle 76 and rests upon the top end of the core 34, as shown most clearly in Fig. 2 of the drawings.

The valve body is provided with a laterally projecting lug portion 82 upon which is pivoted a lifting or carrying handle 84, although it will be understood that the handle 84 may be rigidly mounted on the lug 82 and not movably mounted as shown.

The handle 84 is in alignment with the valve operating handle 76, and the valve body 12 at a point in alignment with the handles and at a location beneath the valve operating handle 76, is provided with a threaded recess for receiving an anti-recoil plug 86 and safety disc 88.

The valve body 12 is provided with a diagonal or slanting blowoff passageway 90, the lower end of which communicates with the bore 26 inward of the valve seat formed on the inner end of the core 34 and the outer end of which communicates with the under side of the rupturable disc 88 in the usual manner.

Opposite sides of the valve body 12 are provided with rectangular parallel plane sides 92 and 94 which serve as a nut for receiving a wrench by which the valve body is tightly screwed into the container 6. It is to be noted that the valve seat, valve element and valve spring are all positioned inwardly of the nut portion formed by the sides 92 and 94 and that this construction results in a valve having an extremely low overall height and devoid of long slender necks which may be broken off in handling and shipping of the containers. The valve body is also provided with a laterally extending lug 96 having an aperture 98 therethrough by which the extinguisher may be hung on a hook or the like. It is also to be noted that the lug 75 extends outwardly from the turning nut formed by the surfaces 92 and 94.

In the use of this valve body the entire mechanism may be first assembled, including the core, valve, valve stem, and spring, safety disc and blowout plug, and thereafter screwed into the container or bottle 6. However, it is to be noted that by removing the pivot pin 78 for the valve operating handle 76, access is given to the nut end 56 of the valve core and the core may be removed from the valve body by applying a wrench thereto, and both the core, valve and valve stem and valve spring 30 may all be removed from the bore of the valve body for service, repair, replacement or inspection.

After the core 34 is removed, the valve stem 58 with the valve element comprising the sealing disc 62 and nut 64, may be wtihdrawn from the core without dissembling the nut 64 from the threaded end 66 of valve stem 58. The portion of the axial bore 40 of the core 34 is of slightly larger diameter than the upper or outer portion 70, which outer portion is given a fine finish to its surface so as to provide a proper and effective surface for cooperating with the O-ring seal 72.

By finishing the bore 36 with a smooth finish, the O-ring seal 54 is effective at any point in its bore regardless of manufacturing tolerances and variations between the shoulder 38 and the O-ring 54.

By locating the safety plug 86 and safety disc 88 underneath the valve operating handle 76, it is protected against being broken off during shipping and handling and by providing the valve body 12 with a diagonal or inclined blowoff passageway 90, it is possible to provide communication with the interior of the container 6 at a point inward of the valve core 34 and valve element 62—64.

Attention is again called to the fact that this structure has a minimum overall height. This reduces shipping and storage space and minimizes chances of breakage of the discharge head.

Although but one specific embodiment of this invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

We claim:

1. A discharge head for a high pressure fluid container, including: a body having a threaded portion adapted to be threadedly connected to a container, said body having a bore therethrough the inner end of which is adapted to communicate with the interior of a container, said body having a discharge port extending outwardly from said bore to the exterior of said body above said threaded portion, and said body having a laterally-projecting lug portion with a recess on its upper surface; a valve assembly within said bore having a valve element located inwardly from the outer end of said threaded portion and below said discharge port; a valve operating handle pivoted to the upper portion of said body above and in alignment with said lug portion; a lift handle positioned beneath and in alignment with said valve operating handle and connected to said lug portion; and a pressure relief means positioned in said recess in said lug portion and between said handles, said body and lug portion having a slanting open-ended passageway extending therethrough and leading from the wall defining the bottom of said recess to said bore inwardly of said valve assembly.

2. A discharge head as defined in claim 1 wherein said passageway in its entirety lies in a plane at an angle not more than approximately 45° to the axis of said bore.

3. A discharge head as defined in claim 1 wherein the inner end of said passageway is located inwardly of the outer end of said threaded portion.

4. A discharge head for a high pressure fluid container, including: a body having a cylindrical threaded portion provided with external threads adapted to be screwed into a container, said body having a tubular neck below said threaded portion and adapted to extend into the container, said body having an axial bore through said threaded portion and said neck and adapted to communicate at its lower end with the interior of the container, said body having a pair of flat sides directly above said threaded portion to accommodate a wrench, said sides being substantially parallel to the axis of said bore, said body having a discharge port extending outwardly from said bore to the exterior of said body between said flat sides thereof, said body having a laterally-projecting lug portion approximately diametrically opposite said discharge port, said lug portion having a recess on its upper surface, said body and lug portion having an open-ended passageway extending from said bore below said discharge port and below the upper end of said threads upwardly and outwardly and terminating at the wall defining the bottom of said recess; valve seat means in said bore between said discharge port and the lower inner end of said passageway and below the upper end of said threads; main valve means in said bore and movable to and away from seating engagement with said seat to control fluid communication between the lower portion of said bore and said discharge port; resilient means in the bore of said neck adapted to normally bias said main valve means into engagement with said seat; pressure relief means positioned in said recess; an actuating handle

movably mounted on the upper portion of said body and substantially aligned with and above said laterally-projecting lug portion and the pressure relief means in the recess of said lug portion; actuating means interconnecting said handle and said main valve means whereby movement of said handle opens said main valve means; and a carrying handle secured to said lug portion and in alignment with said actuating handle, said lug portion and said pressure relief means being disposed between said actuating handle and said carrying handle.

References Cited in the file of this patent

UNITED STATES PATENTS

Re. 20,535 Hill ---------- Oct. 19, 1937
1,506,145
1,649,210
1,790,705
1,910,283
1,950,122
1,966,562
2,144,427
2,454,621
2,500,214
2,506,074
739,641

Willis ---------- Aug. 26, 1924
Bastian ---------- Nov. 15, 1927
Heywood ---------- Feb. 3, 1931
Fernholz ---------- May 23, 1933
Naue ---------- Mar. 6, 1934
Roach ---------- July 17, 1934
Longstreet ---------- Jan. 17, 1937
Allen ---------- Nov. 23, 1948
Stroop ---------- Mar. 14, 1950
Fawkes ---------- May 2, 1950

FOREIGN PATENTS

France ---------- Nov. 3, 1932