

March 24, 1959

C. K. HUTHSING, SR., ET AL

2,878,683

FIRE EXTINGUISHER HEAD ASSEMBLY

Filed Dec. 5, 1956

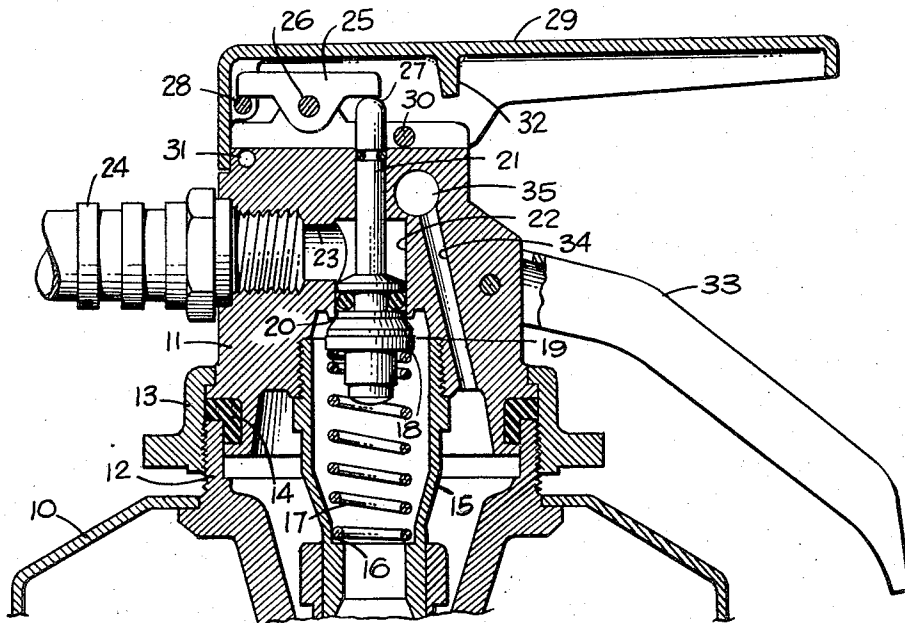


Fig. 1.

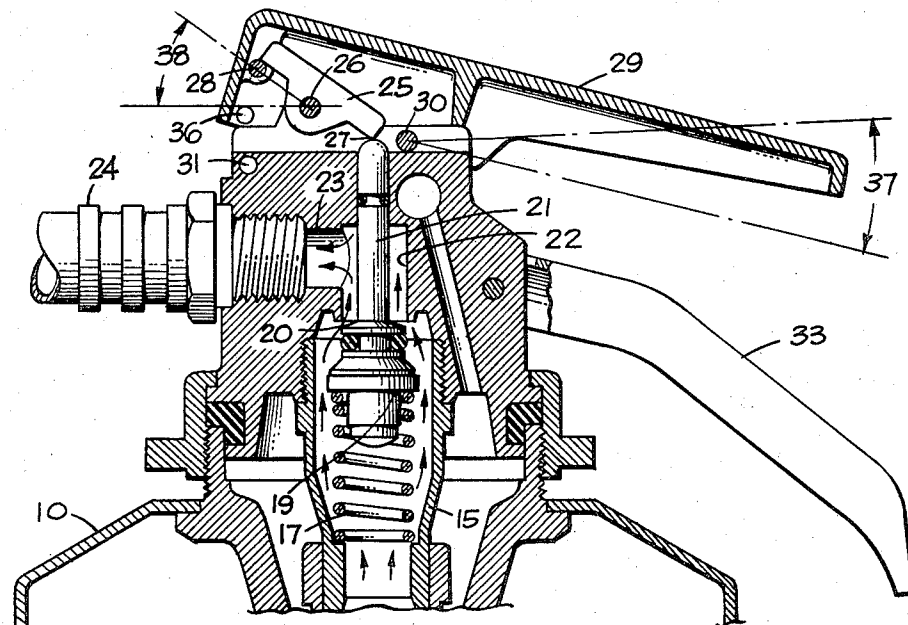


Fig. 2.

INVENTORS
CHARLES K. HUTHSING SR. AND
IRA J. BILLINGS
BY *Elliott & Pastoriza*
ATTORNEYS.

1

2,878,683

FIRE EXTINGUISHER HEAD ASSEMBLY

Charles K. Huthsing, Sr., Culver City, and Ira J. Billings, Los Angeles, Calif., assignors to General Pacific Corporation, a corporation of California

Application December 5, 1956, Serial No. 626,336

3 Claims. (Cl. 74-101)

This invention relates generally to fire extinguishers and more particularly to an improved head assembly for portable type fire extinguishers.

Chemical fire extinguishers of the type under consideration basically consist of a pressure tank containing a chemical under extremely high pressure. A valve mechanism is provided in the head assembly of the tank for releasing the extinguishing agent through a suitable nozzle whereby any fire may be readily blanketed by the discharge. Since the effectiveness of the extinguisher depends in large part upon the maintenance of a predetermined pressure within the tank at all times, it is extremely important that the valving arrangement for releasing the extinguishing agent provide an absolutely pressure tight seal when the extinguisher is not in use. On the other hand, it is important that the valve opening be relatively large when the extinguisher is actuated in order to discharge a volume of the extinguishing agent sufficient to effectively combat a fire.

Conventional valving mechanisms usually include a lever pivoted to the head assembly of the extinguisher and adapted to be rotated to depress a valve stem. This valve stem connects to a valve body normally biased against a valve seat by a relatively strong spring. Depression of the stem in an axial direction upon pivoting movement of the lever serves to unseat the valve and permit the extinguishing agent under pressure to escape. The extent of this longitudinal movement determines, in large part, the degree of opening effected between the valve member and seat. When this stem movement is effected directly by the lever, it is necessarily limited by the arcuate extent through which the lever may be moved. For rapid and efficient operation, however, it is desirable that only a small movement of the lever be necessary to provide a maximum opening through the valve structure.

Bearing the above in mind, it is a primary object of the present invention to provide an improved valve actuating mechanism in a fire extinguisher head assembly in which maximum opening of the valve may be accomplished with a minimum movement of the lever or other actuating means.

More particularly, it is an object of this invention to provide an improved valve stem actuating mechanism which will insure positive and maximum opening of a valve so that a sufficient volume of extinguishing agent may be discharged to effectively combat a fire.

Briefly, these and other objects and advantages of the present invention are attained by providing a novel head assembly including a first actuating lever pivoted to the head assembly intermediate its ends at a point adjacent the valve stem. Rather than have any portion of this lever engage the valve stem directly, there is additionally provided an elongated second lever also pivoted to the head assembly adjacent an opposite side of the valve stem. The forward portion of the first lever is dimensioned to extend beyond the valve stem and also beyond the pivoting point of the second lever and is provided

2

with an engaging means for engaging one end of the second lever. The other end of the second lever is arranged to in turn engage the valve stem. The arrangement is such that angular movement of the first lever will effect a greater angular movement of the second lever which in turn depresses the valve stem through a given distance. This given distance is multiplied over the given distance the stem could be depressed by direct engagement of the operating first lever through the mechanical arrangement and dimensioning of the first and second levers.

A better understanding of this valving arrangement in accordance with the invention will be had by referring to the accompanying drawings in which:

Figure 1 is an elevational view partly in cross section of the improved valve actuating mechanism as incorporated in a fire extinguisher head assembly in accordance with the invention; and

Figure 2 is a view similar to Figure 1 illustrating the actuating mechanism in operated position.

Referring first to Figure 1, there is illustrated the upper portion of a conventional fire extinguisher tank 10. This tank is arranged to be coupled to a fire extinguisher head assembly 11 through the medium of a threaded fitting 12 arranged to mate with an annular collar 13 positioned about the lower end of the head assembly 11. The fitting 12 and collar 13 engage a portion of an annular sealing gasket 14, as shown, to insure a gas tight seal between the head assembly 11 and the tank 10.

A tube coupling 15 forming the upper end of an elongated tube passing up within the tank 10 is threadedly secured to the underside of the head assembly 11. Coupling 15 defines in part a valve chamber having a lower annular shoulder 16 for seating one end of a compression spring 17. The other upper end of the spring 17 rests on an annular shoulder 18 of a valve member 19. The compression spring 17 will serve to bias the valve member 19 against an annular seat 20 in the head assembly 11.

The upper end of the valve member 19 is rigidly secured to a valve stem 21 passing through a small chamber 22 to protrude from the upper end of the head assembly as shown. The chamber 22 is placed in communication with the interior of the coupling 15 when the valve member 19 and stem 21 are depressed against the biasing force of the spring 17 as illustrated in Figure 2. An outlet passage 23 passes from the chamber 22 through a flexible nozzle coupling 24 to the extinguisher hose nozzle (not shown).

Referring again to Figure 1, there is provided a second lever element 25 pivoted to the head assembly at 26 and having one end arranged to engage the upper end of the valve stem 21 as at 27. The opposite end of the second lever element is in turn arranged to be engaged by a lift cam pin 28 constituting an engaging means at the nose or forward portion of a first actuating lever 29. The first lever 29 is in turn pivoted at 30 to the head assembly for arcuate movement.

In the arrangement of Figure 1, the pivoting of the first lever 29 is immediately adjacent one side of the valve stem 21 while the pivoting point 26 for the second lever 25 is adjacent an opposite side of the stem 21. The forward portion of the first lever 29 extends beyond the stem 21 to the far end of the second lever 25 passing thereover and downwardly such that the engaging means in the form of the pin 28 may lift against this other end of the second lever.

Adjacent the nose portion of the operating or first lever 29 there is provided a simple pull pin 31 adapted to pass through registered openings in the valve head assembly and nose of the lever in order to lock the

3

lever in its inoperative position when the extinguisher is not in use. The lever 29 may also include a downwardly depending partition 32 to prevent tampering of the valve actuating mechanism. A conventional handle 33 is riveted to the head assembly for convenient carrying purposes and for co-operation with the lever 29 in operating the same.

In extinguishers of the type illustrated in Figure 1, it is desirable to provide a pressure gauge for indicating the pressure within the tank 10 at all times. To this end, there may be provided a small passage 34 in the head assembly 11 communicating with the tank 10 and passing up to a central outlet 35 to which a pressure gauge (not shown) is attached.

Referring now to Figure 2, the operation of the valve actuating mechanism will be described. When it is desired to operate the extinguisher, the pull pin 31 is removed to free the registered opening 36 at the nose portion of the lever 29. The handle 33 is then grasped by the user and the first lever manually pivoted about the pivot point 30 in a clockwise direction as shown in Figure 2. Arcuate movement of the lever 29 about the pivot point 30 cams the far end of the cam element 25 upwardly to arcuately rotate the second lever also in a clockwise direction about the pivot point 26. As a result of this latter rotation, the end of the second lever 25 engaging the valve stem 21 at 27 moves arcuately downwardly to depress the valve stem 21 and valve member 19 thereby opening the valve and permitting the extinguishing agent under high pressure to escape through the nozzle coupling 24 as indicated by the arrows. Upon release of the lever 29, the biasing spring 17 urges the valve member 19 and valve stem 21 upwardly to rotate the second lever 25 in a counter-clockwise direction to thereby depress the nose portion of the first lever 29 through engagement of the second lever with the lift pin 28.

The dimensioning of the first lever 29, second lever 25 and positioning of the pivot points 30 and 26 are such that there is a multiplication in the degree of arcuate movement between that of the first lever 29 and the second lever 25. Thus, as clearly illustrated in Figure 2, movement of the lever 29 through an angle as indicated at 37 results in a corresponding greater angular movement of the second lever 25 as indicated at 38. This latter angular movement represents an increase in movement over that of the lever itself whereby the valve stem 21 is moved a greater distance than would be the case were the lever to bear directly against the valve stem. In such latter case when the first lever 29 is used alone, it would have to be pivoted forward of the stem 21 and the distance that the stem 21 could be moved would be extremely limited. Thus, with the use of the second lever, complete opening of the valve is assured even though the lever 29 is only moved through a small arc; there-

4

fore, more rapid, positive, and reliable operation of the extinguisher is attained.

Minor modifications within the scope and spirit of the present invention will occur to those skilled in the art. The valve actuating mechanism is, therefore, not to be thought of as limited to the exact structure shown for illustrative purposes.

What is claimed is:

1. In a fire extinguisher head assembly including a valve and a valve stem adapted to open a valve means within said head assembly upon movement of said stem, means for effecting said movement of said stem comprising, in combination: a first lever; means for pivoting said first lever to said head assembly for arcuate movement about a first axis passing adjacent one side of said valve stem; a second lever; means for pivoting said second lever to said head assembly for arcuate movement about a second axis passing adjacent the opposite side of said valve stem, said second lever having one portion positioned to engage said stem, a portion of said first lever extending beyond said second axis; and an engagement means at said portion adapted to engage another portion of said lever whereby pivoting movement of said first lever pivots said second lever.

2. In a fire extinguisher head assembly including a valve stem adapted to be moved a given distance to operate said extinguisher, means for effecting movement of said valve stem through said given distance comprising, in combination: a first lever; means for pivoting said first lever intermediate its ends to said head assembly adjacent said valve stem, said first lever having a rearwardly extending portion adapted to be manually depressed and a forward portion adapted to extend past said valve stem; a second lever; means for pivoting said second lever intermediate its ends to said head assembly between the end of said forward portion and said valve stem, one end of said second lever being positioned to engage said stem; and means at said forward portion of said first lever engaging the other end of said second lever whereby pivotal movement of said first lever through a given arc rotates said one end of said second lever through a larger arc whereby movement of said valve stem through said given distance can be effected.

3. The subject matter of claim 2, including a downwardly directed partition intermediate the rearwardly extending portion of said first lever and the pivoting means therefor adapted to abut against said head assembly upon movement of said first lever through said given arc.

References Cited in the file of this patent

UNITED STATES PATENTS

66,360	King	July 2, 1867
910,223	Norling	Jan. 19, 1909
2,644,313	Griggs	July 7, 1953