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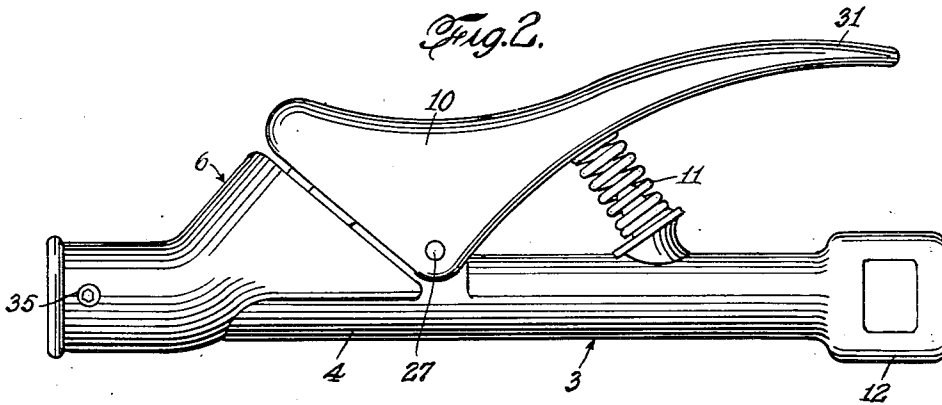
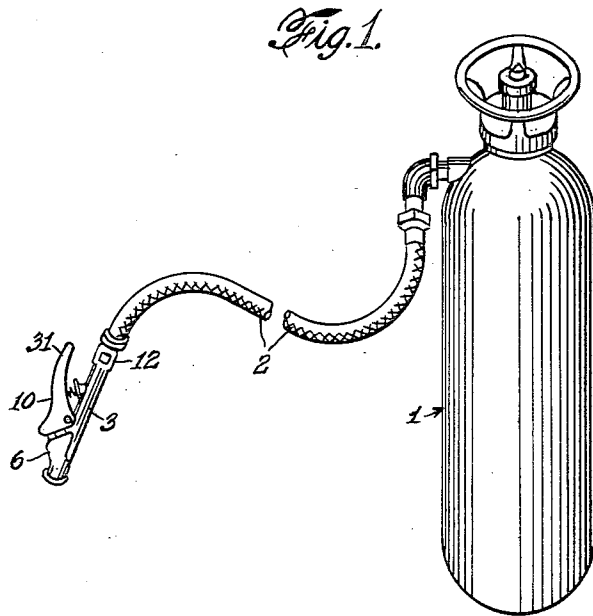
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2,781,101

NOZZLE FOR POWDER FIRE EXTINGUISHER

Filed Oct. 21, 1952

2 Sheets-Sheet 1



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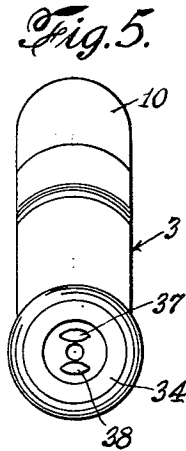
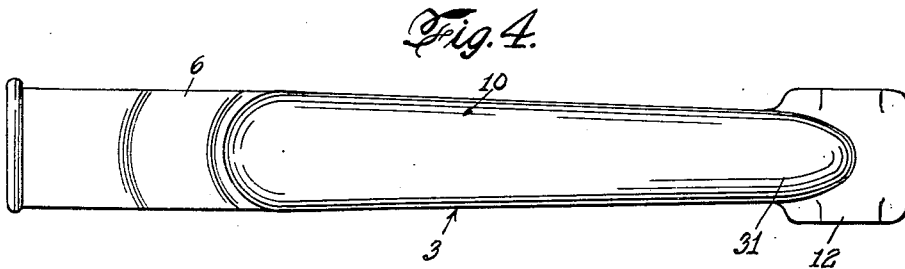
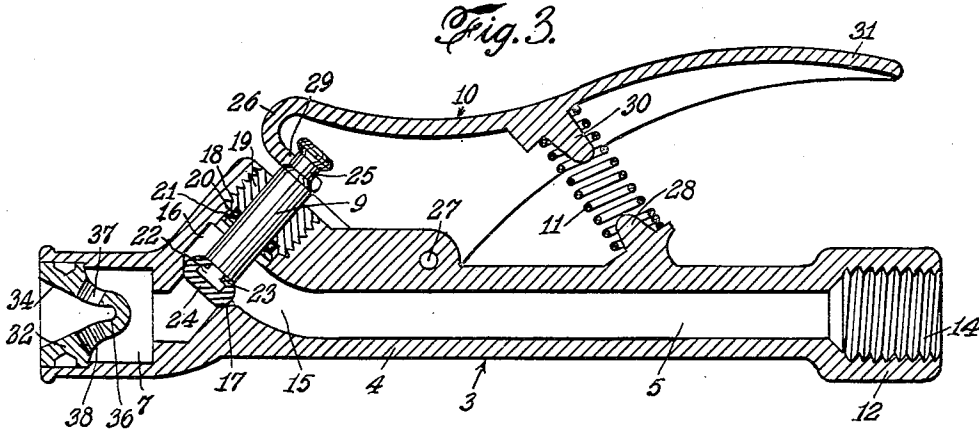
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NOZZLE FOR POWDER FIRE EXTINGUISHER

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2 Sheets-Sheet 2



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1

2,781,101

**NOZZLE FOR POWDER FIRE EXTINGUISHER**

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Application October 21, 1952, Serial No. 316,026

1 Claim. (Cl. 169—1)

The present invention relates to a fire extinguishing apparatus and particularly to a nozzle suitable to control the flow of a dry powder fire extinguishing agent.

It is important in a nozzle of this type that it be so designed as to allow the free flow of the fire extinguishing powder. It is also important that the valve member be so designed that the powder will not pile up and tend to block the discharge. Further, the valve member and its seat should be arranged as to be self-cleaning so that in the event any powder is deposited thereon during the discharge it will be automatically cleaned as the valve returns to its seat. Still further, the valve member should provide a good seal with its seat so as to prevent the entry of moisture into the powder container such as may result from temperature changes. In addition, it is desirable that the construction embody a valve operating means which is easily handled and which is compact in form.

The present invention aims to provide a nozzle for a fire extinguisher incorporating the foregoing requirements and which is simple and economical in manufacture, efficient in operation and durable in use.

In accordance with the invention these objects are accomplished by providing a nozzle having an inclined valve chamber intersecting the inlet and outlet passages and incorporating a valve member of cylindrical shape having a valve seating material at its inner end for engagement with the valve seat.

Other objects and advantages of the invention will be apparent from the following description and from the accompanying drawings which show, by way of example, an embodiment of the invention.

In the drawings:

Figure 1 is a perspective view of a dry powder fire extinguisher equipped with a nozzle in accordance with the invention.

Figure 2 is an enlarged side view of the nozzle in accordance with the invention.

Figure 3 is a vertical sectional view of the nozzle shown in Figure 2.

Figure 4 is a top view of the nozzle shown in Figure 2.

Figure 5 is an end view of the nozzle shown in Figure 2.

Referring to the drawings there is shown a fire extinguisher 1 having a hose line 2 terminating in a nozzle 3 in accordance with the invention. The fire extinguisher may be of the customary type retaining therein a charge of dry powder together with a charge of compressed gas which may be released to expel the powder by inverting the extinguisher and striking the top thereof against a surface, such as the ground. The powder is expelled by the gas charge through the hose 2 and may be intermittently discharged from the nozzle 3 as desired.

The nozzle 3 comprises a casing 4 having a horizontally extending inlet passage 5, an inclined valve chamber 6 and a discharge outlet passage 7. The cylindrical valve member 9 is reciprocable in the valve chamber 6 to close the outlet passage 7 and is actuated by means of a squeeze grip type operating handle 10 pivotally carried by the

2

housing and normally urged into the closed position by resilient means, such as the spring 11.

The nozzle casing 4 may be made of any suitable material, such as metal or plastic and has an enlarged portion 12 at the end of its inlet passage formed with a threaded inner surface 14 for connection to the hose 2. The other end of the inlet passage 5 is turned upwardly as indicated at 15 to intersect the valve chamber 6 which is formed with its lower end sloping toward the discharge passage 7 so as to cooperate with the inlet passage 5 to provide a free flow passage for the powder. It is preferred that the valve chamber have a somewhat enlarged portion as indicated at 16 so as to facilitate the flow of the powder about the valve member 9 when the valve is in the opened position.

About the lower end of the valve chamber 6 is a valve seat 17 positioned at the lower side of the intersection of the upwardly turned end 15 of the inlet passage 5. The valve seat surface is sharply beveled to provide an angle of approximately forty-five degrees with axis of the valve chamber. The upper end of the valve chamber 6 is enlarged and threaded as indicated at 18 to receive a bushing nut 19. A recess 20 is formed in the lower end of the bushing nut 19 to receive an O-ring gasket 21 to provide a seal against leakage past the upper end of the valve member 9. If desired, the lower edge of the bushing nut 19 may be turned in to hold the O-ring in position in a unitary assembly.

The valve member 9 is cylindrical in shape and has its lower end shaped to receive valve seating material. Preferably, the valve member 9 has its lower end 22 extended and reduced in diameter and made with a groove 23 to hold valve seating material or packing 24 in position. The valve packing 24 is made of any suitable resilient material such as rubber or nylon to provide a good seal with the valve seat 17. The outer end of the valve member 9 is formed with an annular reduced portion 25 for engagement with U-shaped end 26 of the grip handle 10.

The casing 4 is apertured and fitted with a pin 27 for the pivotal mounting of the grip handle 10. The casing also has an upwardly and forwardly extending projection 28 adapted to maintain in position the lower end of the spring 11.

The grip handle 10 is generally of channel cross-section and has its valve engaging end turned downwardly and inwardly, it being slotted as indicated at 29 to receive the reduced portion 25 of the valve operating member 9. The lower surface of the grip handle 10 has a downwardly and rearwardly extending portion 30 oppositely positioned to the projection 28 of the casing 4 so as to provide means for the engagement of the ends of the spring 11 therebetween. The outer end 31 of the grip handle 10 is given a hand conforming shape so that the nozzle may be readily carried by engaging the fingers about the valve casing 4, the valve being operated by squeezing the grip handle 10 with the palm of the same hand.

In certain forms of the construction it is preferred that the outlet passage 7 be equipped with a diffusion member 32 so as to straighten out the flow of the powder and provide a more equally distributed discharge. The rate of discharge of the extinguisher may be predetermined by the size of orifices in the diffusion member. The diffusion member 32 is formed with a circular outer end 34 adapted to be secured in the discharge passage 7 by a set screw 35, the inner end 36 of the diffusion member being generally cone-shaped, orifices 37 and 38 of the desired size being provided on the face of the cone-shaped portion.

The nozzle is operated by depressing the grip handle 10 to raise the valve member 9 in the valve chamber 6

3

and permit the flow of the dry powder and its expulsion gas past the valve seat 17. The mixture of gas and powder then flows through the orifices of the diffusion member 32 where it is discharged from the end of the outlet passage 7. As pressure is released on the grip handle 10, the spring 11 urges the outer end of the handle upwardly causing the valve member 9 to be returned to the closed position cutting off the flow of gas and powder, and as the valve packing 24 engages the beveled surface of the valve seat 17, the valve seat is cleared of powder.

This application is a continuation-in-part of a joint application, Serial No. 74,355, filed February 3, 1949, now abandoned, by Frank B. Allen, the inventor herein, and Norman H. Siebens.

While the invention has been described and illustrated with reference to specific embodiments thereof, it will be understood that other embodiments may be resorted to without departing from the invention. Therefore, the form of the invention set out above should be considered as illustrative and not as limiting the scope of the following claim.

I claim:

A shutoff nozzle for a dry powder fire extinguisher comprising a one-piece housing generally tubular in shape, the housing having a passage therethrough, one end of the passage being the inlet end, the other end of the passage being the outlet end, the inlet and outlet ends substantially in axial alignment, the inner portions of the

4

inlet and outlet passages turned upwardly to an intersection defining a valve chamber, the inner end of the inlet passage wall forming a valve seat, a valve member reciprocable in the valve chamber, a main raised extension on the upper surface of the housing forming a valve member guideway and having a lateral opening there-through forming pivotal mounting means, a squeeze grip operating handle carried by the pivotal mounting means on the upper surface of the housing, the handle having an inwardly turned and slotted valve member engaging end, a downwardly directed extension on the squeeze grip operating handle, an upwardly directed extension on the housing positioned rearwardly of the pivotal mounting means, a coiled spring positioned to receive the housing extension within one end and the handle extension within the other end, the end of the outlet of enlarged diameter, a diffusion member positioned in the outlet, both ends of the valve member grooved, the upper groove adapted to be received in the slotted end of the squeeze grip handle, and valve seating material molded over the other end of the valve member and engaged in the lower groove.

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