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HOSE NOZZLE

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2 Sheets-Sheet 2

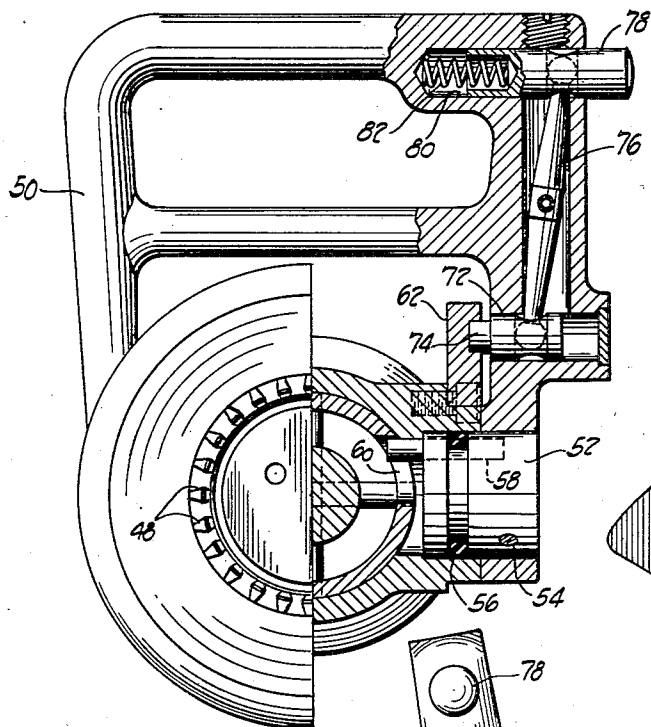


FIG. 3

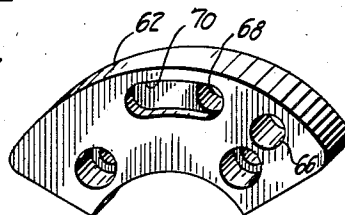


FIG. 5

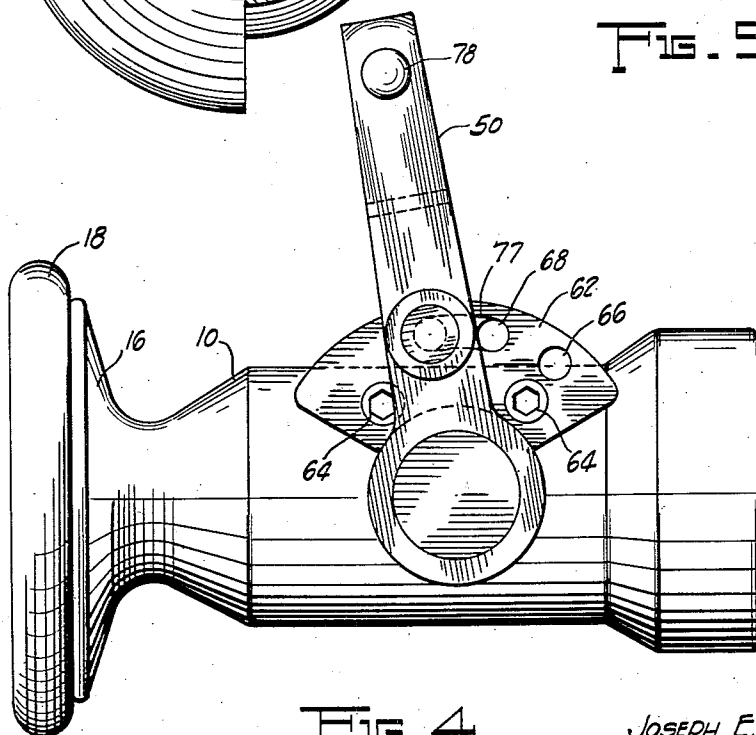


FIG. 4

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1

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HOSE NOZZLE

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This invention relates to fire hose nozzles and more particularly to an adjustable fire hose nozzle which produces different types of streams and has control means for maintaining the nozzle in a pre-selected condition.

One of the primary objects of this invention is to provide an adjustable stream nozzle having control features which prevent inadvertent use of a stream which might be hazardous under certain conditions.

Another important object of this invention is to provide an adjustable stream nozzle having control means for actuating the valve through all of its positions with a minimum motion in the control lever.

A still further object of this invention is to provide an adjustable stream nozzle wherein the components are simple and easy to manufacture with an arrangement thereof which provides maximum capacity with a minimum of weight.

A further object of the invention is to provide an adjustable stream nozzle having a handle locking device which controls the position of the handle and the type of stream being emitted from the nozzle.

Another object of the invention is to provide a handle lock for an adjustable stream nozzle which cooperates to prevent the operation of the selector means into one of several positions without conscious actuation by the operator of the nozzle.

Certain problems exist in the extinguishing of fires, particularly where flammable fluids are involved which are lighter than and float on water. A spray or fog stream is particularly effective in extinguishing such a fire, since the quantity of water is small and the effectiveness is high for the amount of water being used. Further, the use of a fog or spray stream does not agitate the surface of the burning liquid and thereby increase the rate of combustion and the intensity of the fire.

In order to be universally adaptable, a fog or spray nozzle should be capable of also producing a straight stream as required for certain conditions. However, it has been found that dangerous conditions have been produced by the inadvertent application of a straight stream to a highly combustible fluid and in order to prevent such an occurrence the preferred embodiment of my invention includes a handle lock and control device which allows the opening of the valve to either of the spray patterns without operation of the control but a definite actuation of the control means is necessary before the control valve can be moved into the straight stream position.

Other objects and advantages more or less ancillary to the foregoing, and the manner in which all the various objects are realized, will appear in the following description, which considered in connection with the accompanying drawings, sets forth the preferred embodiment of the invention.

In the drawings:

Fig. 1 is a plan view of the nozzle assembly.

Fig. 2 is a side view of the nozzle assembly with parts cut away for the purpose of clarity.

Fig. 3 is an end view of the nozzle assembly with parts cut away for the purpose of clarity.

Fig. 4 is a side view of the nozzle assembly; and

Fig. 5 is an enlarged detailed view of the lock segment.

In the drawings, Fig. 1 shows a variable stream nozzle assembly in which the body is designated by the numeral 10. The inlet 12 is threaded for receiving the male

2

threads of a coupling and for affixing the nozzle to the hose line which supplies the water thereto. A gasket 14 seals against the end of the coupling (not shown), and prevents leakage of water through the threads. The outlet end 16 of the nozzle is flared and has a rubber bumper ring 18 carried by a groove 20 formed in the end 16.

The body 10 is generally hollow and has a cylindrical bore 22 extending through a substantial portion of the body 10. A cylindrical sleeve 24 is slidably carried by the bore 22 and carries the movable portion of the valve mechanism in the nozzle. The inner wall of the sleeve 24 is cylindrical with end portions which taper to a relatively thin edge to reduce the turbulence and friction pressure losses in the water passing through the nozzle.

The sleeve 24 carries a spindle 26 for longitudinal movement in the nozzle body, the spindle 26 being maintained at the center line of the cylindrical section of the body 10 by a pair of pins 28. The pins 28 are disposed at right angles with each other and have their ends held in drilled openings 30 formed in the sleeve 24. The spindle 26 is cross-drilled to receive the pins 28 which holds the spindle 26 centrally of the sleeve 24 and the cylindrical bore 22.

At the forward end of the spindle 26, a valve is provided for shutting off the flow of water through the nozzle. A valve disc 32 is mounted on the end of the spindle 26 and removably affixed thereto by a threaded and shouldered shank 34 on a baffle member 36. A rubber gasket 38 is located between the valve disc 32 and the end of the spindle 26 for preventing leakage through the central opening in the valve disc 32. The valve disc 32 confronts a convergent wall 40 at the end of the cylindrical bore 22 and engages the wall 40 in water sealing relationship when the spindle has been moved forwardly by the operation of the control device. A flared end 42 on the baffle member directs the stream of water emitted from the nozzle in the pattern determined by the position thereof relative to the valve body 10. The flared end 42 of the baffle member 36 has a cylindrical external wall 44 which is spaced from a cylindrical inner wall 46 in the end of the valve body 10 when the spindle 26 has been moved to the straight stream position. The walls 44 and 46 cooperate to form an annular channel having parallel walls which delivers a forwardly directed straight stream.

When the spindle 26 has been moved to the spray stream positions the flared end 42 is moved beyond the end of the body and the water emitted from the nozzle is directed at an acute angle to the centerline of the nozzle. A series of teeth 48 are disposed annularly at the discharge opening of the body 10 and partially deflect portions of the stream directed by the baffle thereagainst and produce a more homogeneous cloud of spray droplets than would be achieved in their absence. Without the teeth 48, structure of this type generally produces a hollow cone spray pattern. However, the teeth 48 deflect part of the conical stream into the hollow portion to establish a solid cone of cloud-like spray.

When the spindle 26 has been moved forwardly into the valve closing position, the flared end 42 of the baffle member is beyond the outlet end of the valve body 10. As the spindle 26 is moved rearwardly and the valve disc 32 is drawn away from the wall 40, water flowing through the nozzle is deflected at an approximate angle of 60°. Further movement rearwardly of the spindle 26 reduces the approximate angle of discharge to 30°. When the spindle 26 has been moved to its most rearward point, the baffle is in the position which produces a straight stream. To close the valve the baffle member is moved through the spray positions before the closed position is reached.

A stirrup shaped handle 50 is mounted on the body

10 for pivotal movement. The handle 50 is carried on a pair of trunnions 52 which are journaled in the body 10 for rotation on a center line which intersects the axis of the body. The handle 50 is affixed to the trunnions 52 by pins 54. Leakage around the trunnion is prevented by an O-ring seal 56 which is carried in a groove in the trunnion and engages the wall of the journal.

A pin 58 is rigidly mounted in the trunnion 52 and projects therefrom in a direction parallel to the axis of rotation of the handle 50. The pin 58 extends into the hollow portion of the body 10 and engages a slot 60 formed in the sleeve 24, the pin 58 being located to one side of the axis of rotation of the handle. Any movement of the handle produces a component motion in the pin 58 longitudinally of the body 10. Since the slot 60 is aligned laterally of the sleeve 24, the above mentioned longitudinal component of movement of the pin 58 is transmitted to the sleeve 24 while the lateral component of movement of the pin 58 is accommodated by the slot 60. The pivotal movement of the handle therefore is transformed by the pin and slot arrangement into longitudinal movement of the sleeve 24.

A locking assembly is provided in the preferred embodiment of my invention for controlling the positioning of the valving mechanism in the four operating positions. A segment 62 is mounted on the side of the valve body 10 by screws 64. A drilled opening or perforation 66 is formed at one end of the segment. A second drilled opening or perforation 68 is spaced from the opening 66 in the segment 62. An arcuate groove 70 joining the opening 68 and extending in the direction opposite to the opening 66 has a depth of approximately a third of the thickness of the segment 62, thus presenting a stop shoulder or abutment at the end of the groove opposite to the opening 68. The centers of the openings 66 and 68 and the centerline of the groove 70 are radially equi-distant of the center of rotation of the trunnion 52.

A latch structure for the locking assembly is provided by a pin 72 which is slidably mounted in the handle 50 and has a portion 74 for engagement with the openings 66 and 68 and the groove 70. A lever 76 is pivotally mounted in the handle and has one end in engagement with the pin 72 and the other end in engagement with a pushbutton 78. The pushbutton 78 is slidably carried by a bore 80 formed in the handle at approximate right angles with the lever 76 and has a portion extending outside of the handle for engagement by the thumb of the operator. A compression spring 82 is located in the bore 80 and engages the end wall thereof at one end and the pushbutton at the other end, and biases the pushbutton into the outermost position. Since the lever 76 is pivoted at the center, the biasing effect of the spring 82 causes the pin 72 to be held in engagement with the segment, the groove 70 or the openings 68 and 66, depending on the position of the handle 50. When the valve is in the closed position the pin 72 rests against the segment 62 but is not in engagement with either the groove 70 or either of the openings 68 or 66.

Accordingly, if it is desired to open the valve it is not necessary to depress the release button 78 since the stop is not effective to restrain movement of the handle 50. However, should the handle be moved to the first spray position, the portion 74 of the pin 72 would drop into the end of the groove 70 and rest against the back wall thereof by virtue of the pressure applied through the linkage by the spring 82. At this point the handle cannot be moved to the valve closed position without depressing the button 78, however it can be moved to the second spray position without actuating the stop. In the second spray condition the portion 74 of the pin 72 engages the opening 68. The handle is held in that position positively until the release button 78 is operated. Hence, it is seen that the valve can be operated to either spray position from the closed position without manipulation of the control. In order to actuate the handle to move the

stream control assembly to the straight stream position, it is necessary to manually hold the button 78 in a depressed position until the pin has passed the opening 68. Upon release of the button 78 the pin will engage opening 66 and hold the handle in the straight stream position until it is released therefrom by again manipulating the stop assembly. The provision of the groove 70 and the openings 68 and 66 establishes a combination of control stops which makes immediate use of the nozzle as a spray device possible without actuation of the lock or stop mechanism. However, to establish a straight stream from the nozzle it is required that the operator perform the second operation of depressing the release button 78 while actuating the handle 50. This prevents inadvertent operation of the nozzle as a straight stream device. However, the straight stream is immediately available when the operator provides the extra operation of depressing release button 78.

Although the foregoing description is necessarily of a detailed character, in order that the invention may be completely set forth, it is to be understood that the specific terminology is not intended to be restrictive or confining, and that various rearrangements of parts and modifications of detail may be resorted to without departing from the scope or spirit of the invention as herein claimed.

What is claimed is:

1. An adjustable stream nozzle comprising an elongated perforate body, a handle pivotally mounted on the body, valve and deflector means shiftably mounted in the body and operatively connected to said handle for operation in at least three positions, a perforate segment on said body, an arcuate groove formed on the segment, each end of said groove forming an abutment and each abutment constituting an operating position on the valve, one end of said groove being an operating position and the other end of said groove being a second operating position, said segment having an opening contiguous to said other end of the groove, and a second opening spaced from the groove and corresponding to a third position of the valve, and shiftable latch means carried by the handle for engagement with the groove and openings whereby the handle is shiftable from the closed position without operating the latch means, is stopped and locked at the second position, and is locked at the third position.

2. An adjustable stream nozzle comprising an elongated perforate body, a handle pivotally mounted on the body, valve and deflector means shiftably mounted in the body and operatively connected to said handle for operation in at least three positions, a perforate segment on said body, an arcuate groove formed on the segment, each end of said groove forming an abutment and each abutment constituting an operating position of the valve, one end of said groove being an operating position and the other end of said groove being a second operating position, said segment having an opening contiguous to said other end of the groove and shiftable latch means carried by the handle for engagement with the groove and opening whereby the handle is shiftable from the first operating position without operating the latch means and is stopped and locked at the second operating position.

References Cited in the file of this patent

UNITED STATES PATENTS

Re. 21,469	Stein	May 28, 1940
677,687	Nagengast	July 2, 1901
943,838	Miller	Dec. 21, 1909
961,466	Shade	June 14, 1910
1,581,430	Edmunds	Apr. 20, 1926
1,980,460	White	Nov. 13, 1934
2,457,526	Brown	Dec. 28, 1948

FOREIGN PATENTS

42,432	Netherlands	Jan. 15, 1938
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