Sept. 29, 1964 G. E. SPECHT ETAL 3,150,829

FLUSH TYPE NOZZLE

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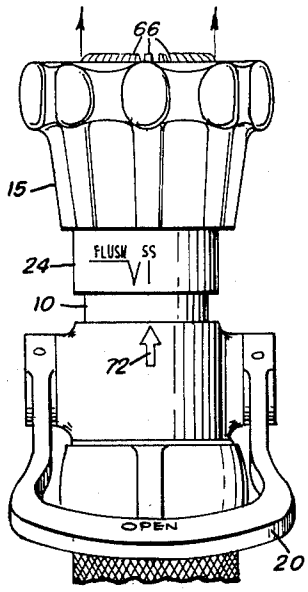

FIG. 1A

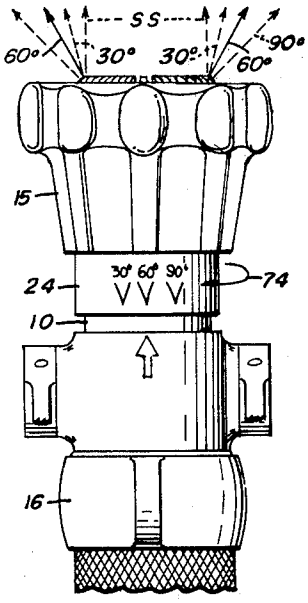

FIG. 1B

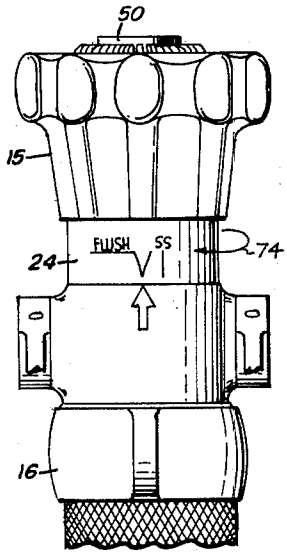

FIG. 1C

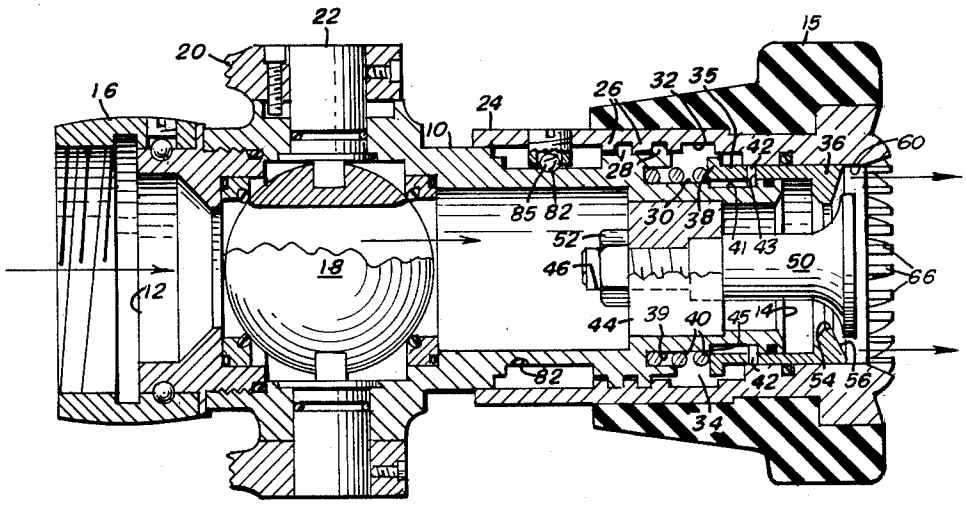

FIG. 2

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FIG. 3

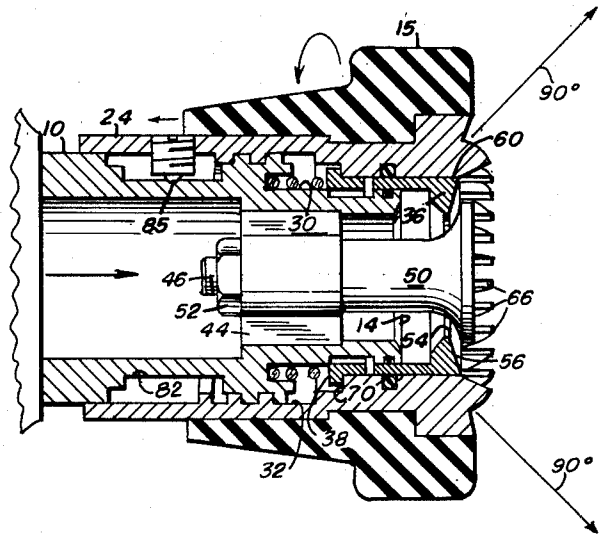
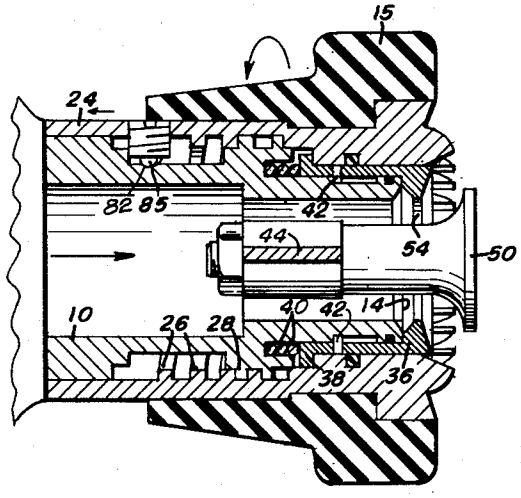


FIG. 4



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FLUSH TYPE NOZZLE

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This invention pertains to a fire fighting apparatus, and more specifically to a fire hose nozzle wherein selective stream shapes are available for appplication to a fire.

A principal objective of this invention is to provide a fire nozzle of the type described wherein the nozzle may be flushed of foreign matter by greatly increasing the outlet cross-section without removing the fluid power from the nozzle itself.

Another objective of the invention is to provide an adjustable stream nozzle of the type described wherein the same manual manipulation required to change the stream pattern is also used to manipulate the flushing apparatus.

In fire fighting apparatus of this type, it is conventional to have apparatus for adjusting the water stream from a straight stream position to a wide angle fog position by providing a baffle head which is a selected distance from the end of the nozzle body. This space is a restricting orifice which is determinative of the volume or rate of flow through the nozzle. The nozzle stream configuration or pattern is shaped by providing a slidable sleeve surrounding this restricting orifice. The invention described herein has, as another of its objectives, a fire fighting nozzle wherein the gallonage, or volume of water per time rate, remains constant during the period the nozzle is in use except for those periods when it is desired to flush the interior of the valve by opening the restricted orifice.

Since fire fighting equipment is oftentimes used with water supplies which include dirt, pebbles, and other foreign material which can lodge themselves within the interior of the nozzle, it is of prime consideration to provide means for quickly purging such a nozzle of this foreign material. An important objective of the invention, therefore, is to provide a means whereby the interior of the valves may be almost instantaneously flushed without interrupting the flow of water through the nozzle.

A still further objective of the invention is to provide a nozzle wherein the baffle head is maintained in fixed relationship with a flushing collar for determining gallonage during operation, used in combination with a contour control sleeve which is rotatably mounted to the nozzle body for longitudinal movement for shaping the stream pattern, and said rotative movement is effective to urge the flushing collar away from the baffle at one extreme of said adjustable movement.

Another objective of the invention is to provide a fire fighting nozzle having constant gallonage in all stream pattern positions, easy finger tip adjustment of the stream patterns at either low or high pressures which range from a type far reaching straight stream position to a dense ninety degree fine mist fog position, with further means where the efficient operation thereof is not interrupted by foreign materials since the interior of the nozzle can be flushed without interrupting the stream flow.

These and other important objectives and advantages of the invention will be more fully understood upon a reading of the following specifications taken in view of the attached drawings, wherein:

FIGURE 1*a* is a plan view of the invention showing the exterior thereof in the straight stream position;

FIGURE 1*b* is a plan view showing the nozzle elements in an intermediate stream pattern position;

FIGURE 1*c* is a plan view showing the nozzle in its extreme rotative or flush position;

FIGURE 2 is a cross-section through the interior of the nozzle showing the elements in their straight stream position;

FIGURE 3 is a partial cross-section showing the elements in their ninety degree fog position; and

FIGURE 4 is a partial cross-section showing the elements in their nozzle flush position.

Referring now to the drawings wherein like elements indicate like parts, the numeral 10 indicates a body housing having an inlet end 12 and an outlet end 14. The intake end is provided with a threaded swivel 16 which is adapted to be connected to a conventional threaded water supply hose. Intermediate its end the body 10 is also provided with a ball shut off valve 18 which is activated by the man sized handle 20. Ball valves and handles of this type are conventional in fire fighting apparatus.

Telescopically received about the outer end of the body 10 is a stream pattern forming sleeve 24 which is interiorally threaded intermediate its ends at 26 for mating with threads 28 on the exterior of the body 10. Sleeve 24 is provided with a rubber knurled knob 15 for easy finger tip control. The exterior of body 10 is formed with an annular recess 30 and an opposing recess 32 along the interior of sleeve 24 which together form a chamber 34 in which an inner portion 35 of a flush collar 36 is slidably received. The inner portion is formed with an outward flange 38 against which a biasing spring 40 is urged. A counterbore 39 formed in the body 10, and in communication with the recess 30, receives the other end of spring 40. The bottom of recess 30 is further reduced at 41 which reduced portion slidably receives a plurality of pins 42 carried by the flush collar 36. Forward and rearward movement of the collar relative to the nozzle body is limited by the pins as they abut forward shoulder 43 or rear shoulder 45.

Interiorally of the body housing is a spider support 44 which threadably receives a shaft 46 of a baffle head 50. The baffle head shaft 46 is secured to the spider by means of lock nut 52.

The forward end of flush collar 36 is formed with an inwardly directed gallonage control flange 54 which forms, with the baffle head 50, an annular outlet 56 of constant dimension while the hose is in operation. The fluid pattern is controlled by the relative relationship of the inner surface 60 of the stream forming sleeve 24 with the outlet 56. Referring to FIG. 2, it will be understood that fluid under pressure from the interior of the nozzle will pass through outlet 56, be deflected by the baffle head 50 and surface 60 and thus be directed to the straight stream position as indicated by the arrows. When sleeve 24 is retracted to the position shown in FIG. 3, the stream will be urged to a ninety degree (90°) fog position which is shown by the arrows in FIG. 3. This is true because the straight stream forming surface 60 of the sleeve 24 is not effective on the stream after it has been deflected by the baffle head. Teeth 66 on sleeve 24 are provided to further particulate the stream for a better fog pattern.

As seen in FIG. 4, the flange 54 of collar 36 can be moved rearwardly of the baffle head to greatly enlarge the orifice 56. Referring to FIG. 3, as the sleeve 24 is moved to the left, the step 70 forming the forward edge of the recess 32 engages the flange 38. Further rotative movement imparted to the sleeve causes the flush collar to move to the left against the bias of the spring 40. Thus the stream forming sleeve 24 carries the flush collar rearwardly to the position shown in FIG. 4. This greatly enlarges the outlet 56 and permits the fluid stream flowing from the interior of the nozzle to flush pebbles and other foreign particles. In order to place the valve back to one of the intermediate operative positions the stream

forming sleeve must merely be rotated clockwise away from the flushing position. It can, therefore, be seen that the flushing action takes place without stopping fluid flow.

Since operation of the flushing apparatus is accomplished by the same rotative movement to vary stream pattern, one operator can easily flush his nozzle by merely supporting the hose in one hand and rotating the sleeve to the flush position with his other hand.

As seen in FIGS. 1*a*, 1*b*, and 1*c*, the body **10** is marked with an arrow **72** which is directed toward a plurality of selected scored positions on sleeve **24** as indicated by the marks SS, 30°, 60°, 90° and Flush. Assuming that the SS position was the normal operating position, the elements of the nozzle assembly are arranged as seen in FIG. 2; that is, the stream forming sleeve is at its extreme outer position with surface **60** directing all flow forwardly in a straight line. By rotating the sleeve as indicated by the arrow **74** in FIG. 1*b* to the 60° position, the forming sleeve is positioned intermediate the arrangement shown in FIG. 2.

The 90° position is shown in FIG. 3. Continuing the counterclockwise movement approximately 360° turns the sleeve to the Flush position as indicated in FIG. 1*c*. In the Flush position the flush sleeve has been carried away from the baffle and the interior of the nozzle can be cleaned by the water pressure itself.

To enable the operator to feel the movement of sleeve **24**, the outer surface of the body **10** is formed with a plurality of circumferentially disposed detents **82** corresponding to, but offset from, the position markings. The sleeve **24** carries the spring urged detent ball **85** which is forced into one of the depressions when it is opposing same. The depressions therefore are spirally arranged in accordance with the angle of threads **26** and **28**.

In a general manner, while there has been disclosed an effective and efficient embodiment of the invention, it should be well understood that the invention is not limited to such an embodiment, as there might be changes made in the arrangement, disposition, and form of the parts without departing from the principle of the present invention as comprehended within the scope of the accompanying claims.

We claim:

1. A nozzle of the fire fighting type comprising a body forming a conduit having an inlet end and an outer end, a sleeve telescopically received about said body having a stream forming portion extending beyond said outer end and said sleeve and body forming a chamber therebetween, said body and sleeve including coacting means to cause relative longitudinal movement upon relative rotation thereof, a baffle carried by said body, a flush collar having a first part slidably received in said chamber and a second annular outer part forming an annular outlet with said baffle, a spring in said chamber biasing said flush collar toward said baffle, and second means for causing said flush collar to move away from said baffle when said stream forming sleeve is at one extreme of said coacting adjustment means, whereby the size of said annular outlet is increased.

2. A nozzle of the fire fighting type comprising a body forming a conduit having an inlet and an outer end, a sleeve telescopically received about said body having a stream forming portion extending beyond said outer end and said sleeve and body forming a chamber therebetween, said body and sleeve including coacting means to cause relative longitudinal movement upon relative rotation thereof between a first position and a second position, wherein said portion is closer to said outer end than in said first position, a baffle carried by said body, a flush sleeve having a first part slidably received in said chamber and a second annular outer part forming an annular outlet with said baffle, a spring in said chamber biasing said flush sleeve toward said baffle, and second means for causing said flush sleeve to move away from said baffle with said stream forming sleeve when said coacting means cause movement beyond said second position.

3. A nozzle of the fire fighting type comprising a body forming a conduit having an inlet end and an outer end, a sleeve telescopically received about said body having a stream forming portion extending beyond said outer end, said sleeve and body forming a chamber therebetween, a baffle carried by said body, said body and sleeve including coacting means to cause relative longitudinal movement upon relative rotation thereof to a first position wherein said sleeve surrounds said baffle to a second position wherein said sleeve is moved rearwardly of said baffle, a flush sleeve having a first part slidably received in said chamber and a second annular outer part extending beyond said outer end and forming an annular outlet with said baffle, a spring in said chamber biasing said flush sleeve toward said baffle, and second means for causing said flush sleeve to move away from said baffle when said stream forming sleeve is moved inwardly beyond said second position.

4. A nozzle of the fire fighting type comprising a body forming a conduit having an inlet end and an outer end, a sleeve telescopically received about said body having a stream forming portion extending beyond said outer end, said sleeve and body forming a chamber between their telescoping portions, a baffle carried by said body, said body and sleeve including coacting means to cause relative longitudinal movement upon relative rotation thereof to a first position wherein said stream forming portion surrounds the greatest diameter section of said baffle to a second position wherein said sleeve is moved rearwardly of said greatest diameter section, a flush sleeve having a rearward part slidably received in said chamber and a forward annular outer part extending beyond said outer end and forming an annular outlet with said baffle, a spring in said chamber biasing said flush sleeve toward said baffle, and second means for causing said flush sleeve to move away from said baffle when said stream forming sleeve is moved inwardly beyond said second position.

5. A nozzle of the fire fighting type comprising a body forming a conduit having an inlet end and an outer end, a sleeve telescopically received about said body having a stream forming portion extending beyond said outer end said sleeve and body forming a chamber therebetween, a baffle carried by said body, said body and sleeve including coacting means to cause relative longitudinal movement upon relative rotation thereof to a first position wherein said sleeve surrounds said baffle to a second rearward position wherein said sleeve is moved rearwardly of said baffle, a flush sleeve having a rear part slidably received in said chamber and a forward annular outer part extending beyond said outer end and forming an annular outlet for said nozzle with said baffle, a spring in said chamber biasing said flush sleeve toward said baffle, an outwardly directed flange on said rear part, a shoulder of said sleeve engageable with said flange as said sleeve is moved inwardly beyond said rearward position whereby said forward annular part is moved away from said baffle.

6. A nozzle of the fire fighting type comprising a body forming a conduit having an inlet end and an outer end, a sleeve telescopically received about said body having a stream forming portion extending beyond said outer end, said sleeve and body forming a chamber therebetween, a baffle carried by said body, said body and sleeve including coacting means to cause relative longitudinal movement upon relative rotation thereof to a first position wherein said sleeve surrounds said baffle to a second position wherein said sleeve is moved rearwardly of said baffle, a flush sleeve having a first part slidably received in said chamber and a second annular outer part extending beyond said outer end and forming an annular outlet for said nozzle with said baffle, a spring in said chamber biasing said flush sleeve toward said baffle, an outwardly

directed flange on said rear part, a shoulder of said sleeve engageable with said flange as said sleeve is moved inwardly beyond said rearward position whereby said forward annular part is moved away from said baffle, a recess in said chamber defined by forward and rearward ledges, at least one pin carried by said flush sleeve and extending into said recess such that the forward and rearward movement of said flush sleeve is limited by said pin engaging either of said ledges.

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