

Dec. 17, 1957

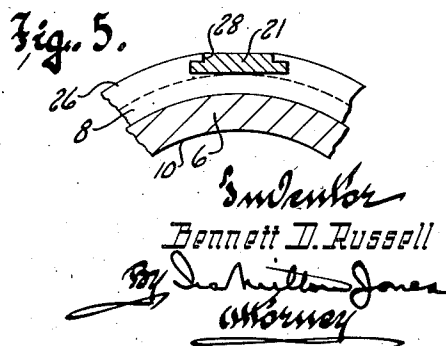
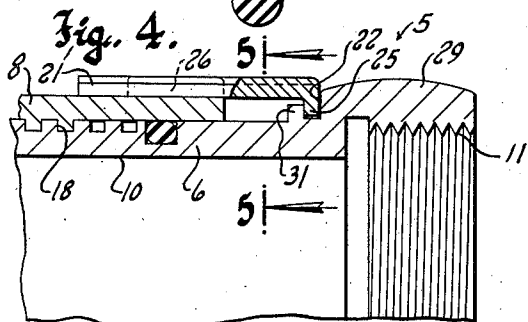
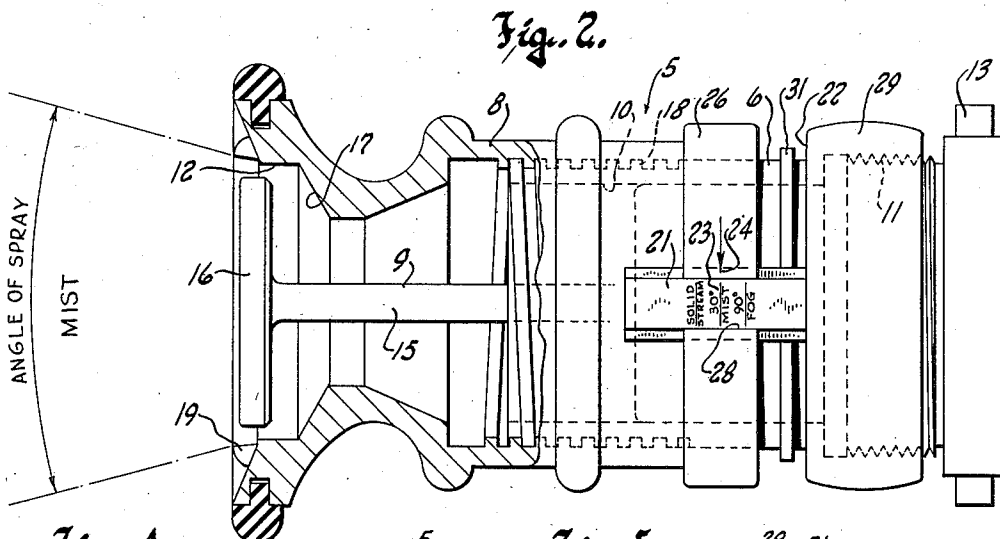
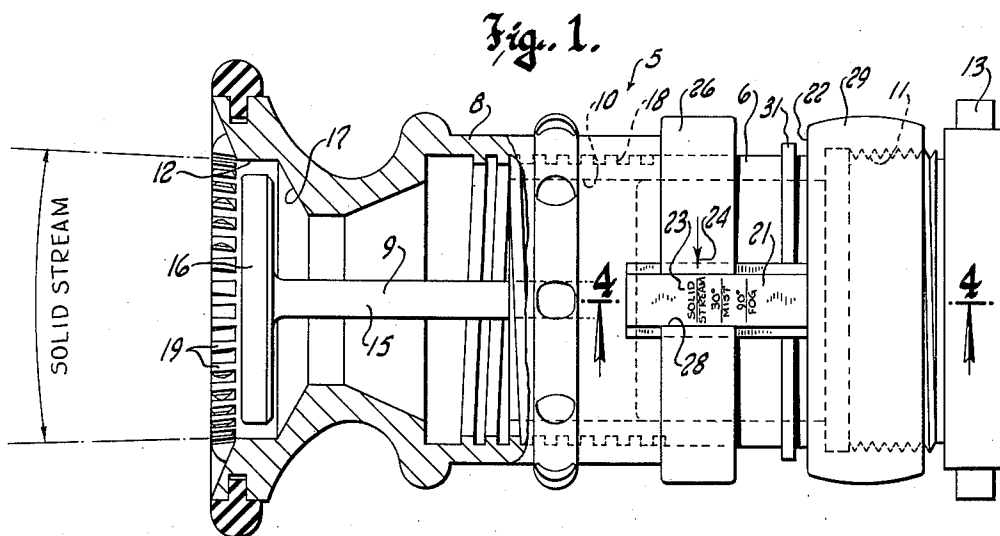
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ADJUSTMENT INDICATOR FOR FIRE HOSE NOZZLE

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2 Sheets-Sheet 1



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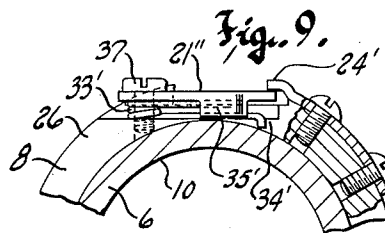
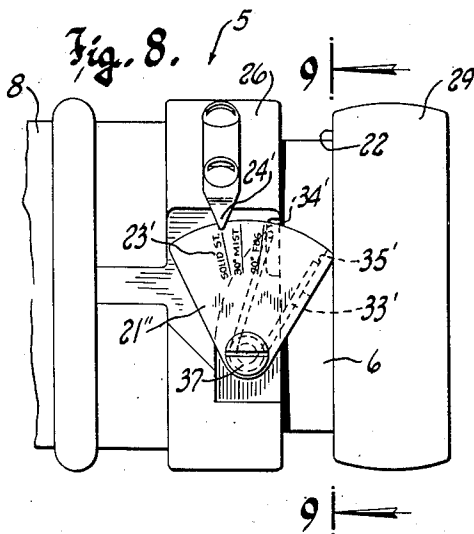
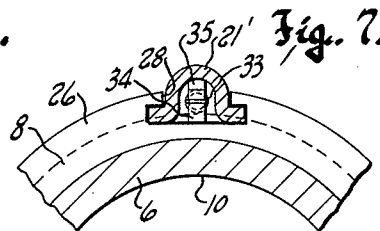
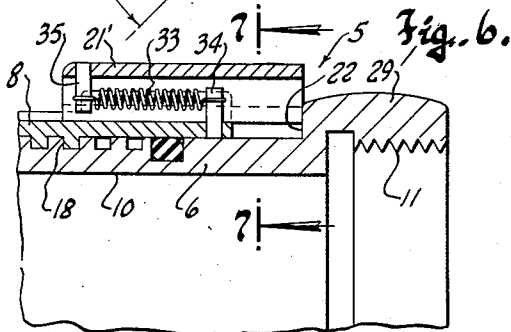
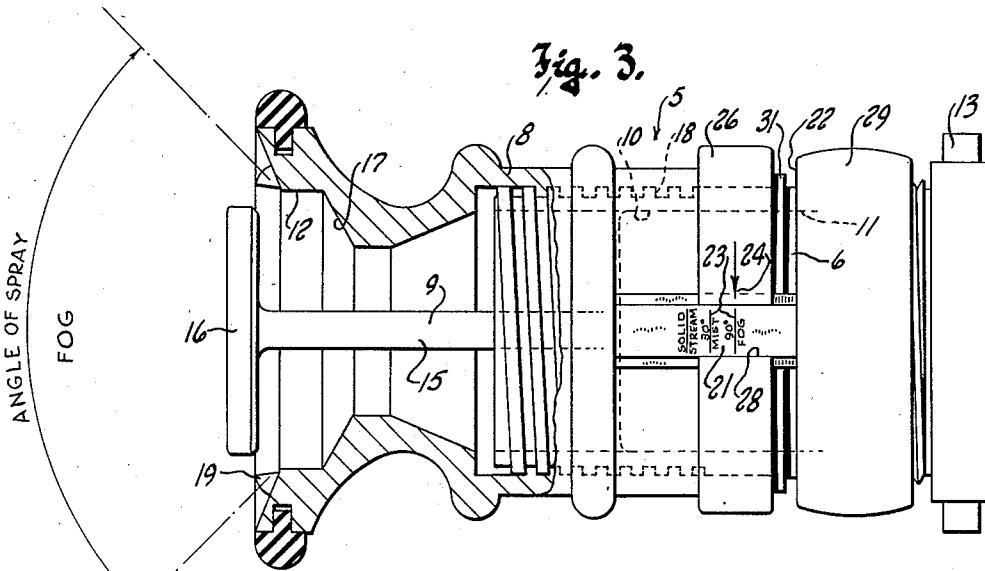
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ADJUSTMENT INDICATOR FOR FIRE HOSE NOZZLE

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2 Sheets-Sheet 2



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ADJUSTMENT INDICATOR FOR FIRE HOSE
NOZZLE

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1 Claim. (Cl. 299—136)

This invention relates to nozzles for fire hoses, aerial towers and the like and refers more particularly to so-called fog nozzles which may be adjusted to produce a finely divided spray or mist of water. Such nozzles are coming into widespread use in fire fighting because of their effectiveness. The spray which such a nozzle produces when it is adjusted to its "fog" position covers a relatively wide area and quickly lowers the ambient temperature in the neighborhood of a fire, permitting firemen to work close to the source of the fire. At the same time, the dispersal of water in a fine mist affords an effective wetting action which prevents the fire from spreading and rapidly lowers the temperature of the less intensely burning portions below the kindling point, thus exerting a definite quenching effect.

Since substantial diffusion of such "fog" spray is desirable for maximum fire fighting efficiency, the fog nozzle must usually be raised well above ground level when it is in use, and for that reason fog nozzles are frequently mounted on aerial towers and aerial ladders.

However, when the nozzle is thus raised, it cannot be directly attended and adjusted, since, in most municipalities, personnel are forbidden by local regulations from being present on an aerial ladder to which a fog nozzle has been attached. It is therefore essential that a fireman operating a fog nozzle have some positive indication of the type of spray or stream which will issue from the nozzle before the water pressure is applied thereto, so that the nozzle can be raised on an aerial tower or aerial ladder with advance assurance that it will have the proper setting to produce the desired type of output and that it will not be necessary to bring the nozzle back down for readjustment.

The purpose and object of this invention is to provide a simple, practical indication for fog nozzles by which the type or character of the stream or spray that will issue from the nozzle will be reliably indicated.

Fog nozzles comprise, in general, telescoped inlet and outlet nozzle sections having a threaded connection with one another. Adjustment of the type of spray or stream issuing from the nozzle is effected by relative rotation between the nozzle sections, whereby a valve element carried by the inlet nozzle section is moved to different axial positions relative to the outlet nozzle section, in each of which positions the valve element cooperates with the outlet nozzle section to produce a different type of output. While the type of flow issuing from the nozzle is thus a function of the relative rotational position of the nozzle sections, indicia of rotational position placed directly on the nozzle sections would be unsatisfactory because the nozzle sections are rotatable through substantially more than a complete turn in moving through the full range of nozzle adjustments, and certain of the indicia would therefore correspond to two quite different settings.

With this in mind it is another object of the present invention to provide a simple, inexpensive and effective indicator, in a fog nozzle of the character described, for

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providing accurate visual indication of the character of the stream or spray which will issue from the nozzle at each of a number of predetermined settings thereof, and wherein the relative axial movement of the nozzle sections is utilized to actuate the indicator.

With the above and other objects in view, which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claim, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claim.

The accompanying drawings illustrate several complete examples of the physical embodiments of the invention constructed according to the best modes so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a view, partially in side elevation and partially in longitudinal section, of a nozzle embodying the principles of this invention, shown in its position of adjustment to produce a solid stream;

Figure 2 is a view similar to Figure 1 but showing the nozzle adjusted to a position in which it produces a finely divided divergent spray or mist;

Figure 3 is a view similar to Figure 1 but showing the nozzle in a position of adjustment in which it produces a very finely divided spray or "fog" that diverges more widely from the nozzle;

Figure 4 is a fragmentary longitudinal sectional view taken on the plane of the line 4—4 in Figure 1;

Figure 5 is a fragmentary cross sectional view taken on the plane of the line 5—5 in Figure 4;

Figure 6 is a view similar to Figure 4 but showing a modified embodiment of the invention;

Figure 7 is a fragmentary cross sectional view taken on the plane of the line 7—7 in Figure 6;

Figure 8 is a fragmentary elevational view showing another modification of the invention; and

Figure 9 is a fragmentary sectional view taken on the plane of the line 9—9 in Figure 8.

Referring now more particularly to the accompanying drawings, in which like numerals designate like parts throughout the several views, the numeral 5 designates generally a nozzle of the type used with fire equipment and comprising, in general, an inlet nozzle section 6, an outlet nozzle section 8, and an elongated valve member 9 fixed in the inlet nozzle section and extending forwardly therefrom through the outlet nozzle section.

The inlet and outlet sections of the nozzle cooperate to define a fluid passage 10 communicating an inlet 11 at the rear of the nozzle with an outlet 12 at its front. The inlet section may be provided with a coupling 13 for connecting a fire hose or the like thereto.

The elongated valve member 9 has a stem 15, the rear end of which is concentrically anchored in the inlet nozzle section, as by means of a web or spider (not shown), and which carries at its front end an enlarged head 16. The outlet 12 at the front of the outlet section is a counterbore, the bottom of which converges inwardly to provide a seat 17 for the head of the valve member. As the outlet section is rotated on its threaded connection 18 with the inlet section, the valve seat 17 is carried back and forth relative to the enlarged head on the valve member and cooperates therewith in providing for adjustment of the character of the stream or spray issuing from the nozzle.

When the outlet nozzle section is moved to its most forward position the head of the valve member engages the seat 17 to define an "off" position of the nozzle, and as the outlet nozzle section is moved rearwardly from the "off" position, in consequence of rotation of

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the outlet nozzle section in one direction relative to the inlet section, water will be permitted to issue from the nozzle outlet in the form of a steady, substantially solid stream, as shown in Figure 1, being guided for such flow by its passage through the annular orifice jointly defined by the valve head and the wall of the outlet section counterbore. Upon further relative rotation of the outlet section in the same direction the valve head is disposed about half way out of the counterbore, as shown in Figure 2, so that the emerging water is somewhat dispersed and issues from the outlet in a slightly divergent spray. Continued relative rotation of the outlet nozzle section in the same direction, to the limit of its travel, disposes the valve element in its forwardmost position relative to the outlet nozzle section, as shown in Figure 3, and in this position of adjustment the wall of the counterbore provides practically no guidance for the expelled water, and the valve head tends to deflect all parts of the stream laterally, creating a fine, widely dispersed spray or "fog." As is customary, a number of small ribs or lands 19 on the front of the outlet nozzle section, disposed at circumferentially spaced intervals around the mouth of the outlet, deflect portions of the spray stream inwardly so that the "fog" has a relatively uniform intensity throughout the area which it covers.

While the several positions of adjustment of the nozzle correspond to different relative rotational positions of the nozzle body sections, such rotational settings are ordinarily difficult to ascertain by mere visual inspection of the nozzle, particularly since such a nozzle is usually made symmetrical about its center line and requires substantially more than a complete turn of the rotatable nozzle section for its full range of adjustment. The present invention provides a simple indicator, easily seen and clear and positive in its indications, for denoting the several settings to which the nozzle may be adjusted and by means of which indicator the nozzle may be quickly set to provide any desired type of output, with assurance that the desired character of flow will issue from the nozzle when the water is turned on.

To this end the nozzle is provided with an indicator member 21 movably mounted on the exterior of the outlet nozzle section, a circumferential forwardly facing shoulder 22 on the inlet nozzle section slidably engaging the rear of the indicator member to cause it to move relative to the outlet nozzle section in unison with relative movement of the inlet nozzle section, and cooperating indicia 23, 24 on the indicator member and the outlet nozzle section.

More specifically, in the embodiment of the invention shown in Figures 1 through 5, the indicator member comprises an elongated bar having a flat T-shaped cross-section and a downwardly turned finger 25 at its rear. The outlet nozzle is provided with a circumferential flange or collar 26 at the rear thereof, and the indicator member is axially slidably mounted in a slot 28 in this collar, the slot having a shape corresponding to the cross section of the indicator, as best seen in Figure 5. The inlet nozzle section also has a collar portion 29 at its rear which provides the forwardly facing circumferential shoulder 22, and spaced a short distance forwardly of this shoulder is an annular flange 31. The downwardly turned finger 25 on the indicator is confined between the shoulder 22 and the flange 31, as best seen in Figure 4, and the indicator member is thus constrained to move back and forth in unison with back and forth adjustment of the inlet nozzle section relative to the outlet nozzle section. Hence the axial position of the indicator member along the outlet nozzle section will correspond to the axial position of the valve head relative thereto, and the indicia 23, 24 can be presented directly in terms of the type of stream or spray issuing from the nozzle at each setting thereof.

In the embodiment of the invention shown in Figures 6 and 7 the elongated indicator member 21' is substan-

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tially U-shaped in cross section and accommodates between its legs a coiled tension spring 33 the ends of which are anchored to pins 34 and 35 that are respectively fixed to the outlet nozzle section and to the indicator member.

The tension spring yieldingly biases the rear end of the indicator member into sliding abutment with a forwardly facing circumferential shoulder 22 on the inlet nozzle section and thus serves the same function as the flange 31 in the embodiment of the invention illustrated in Figures 1 through 5. As best seen in Figure 7, the elongated indicator member 21' is endwise slidably mounted in a substantially T-shaped slot in the outlet nozzle section in the same manner as the bar-like indicator in the Figures 1 through 5 embodiment, and it will be understood that the channel shaped indicator member 21' bears indicia which may be the same as those on its bar-like counterpart.

In the embodiment of the invention shown in Figures 8 and 9 the indicator member 21'' is substantially quadrant shaped and is pivotally mounted on the rear portion of the outlet nozzle section, as by means of a screw pintle 37. A substantially U-shaped compression spring 33' has its legs engaged with abutments 34' and 35' on the outlet nozzle section and the quadrant-like indicator member to yieldingly bias the latter toward a position in which its rearmost portion slidably abuts the forwardly facing shoulder 22 on the inlet nozzle member. A loop in the spring, at the bight thereof, encircles the pivot screw to hold the spring in place. Indicia 23', delineated along the arcuate edge of the quadrant-like indicator member cooperates with a stationary pointer 24' fixed on the outlet nozzle section, adjacent to the indicator member, to designate the setting of the nozzle.

From the foregoing description taken together with the accompanying drawings it will be apparent that this invention provides means in a nozzle for use with fire equipment for providing accurate, easily seen visual indication of the type of flow which will issue from the nozzle at any given setting thereof so that the nozzle may be adjusted to provide any desired type of output before water begins to flow therethrough.

What is claimed as my invention is:

A nozzle for a fire hose or the like comprising: a tubular inlet section threaded into the rear end of an outlet section so that relative rotation of said nozzle sections moves them axially relatively to one another; cooperating means carried by the inlet and outlet sections and operable by relative axial movement thereof to adjust the type of flow issuing from the nozzle; an internally threaded annulus on the rear end of the inlet section by which the nozzle is connectible to a hose, said annulus providing a forwardly facing annular shoulder; a collar on the rear end of the inlet section, said collar having a slot extending longitudinally across its peripheral portion, the opposite sides of the slot being undercut; an indicator bar slidably fitting in said slot and constrained thereby to axial movement with respect to the outlet section, the outer face of the indicator bar being substantially flush with the outer circumferential surface of the collar; an annular flange on the outer section spaced a short distance forwardly of the shoulder provided by the annulus on the rear end of the inlet section and coaxing with said shoulder to define an annular groove, said annular flange being smaller in diameter than the collar on the rear end of the outlet section, and the indicator bar extending from the rear end of the outlet section, across the annular flange and abutting the shoulder on the inlet section; a finger extending from the underside of the indicator bar into said annular groove to thereby connect

the indicator bar with the inlet section in a manner to shift the bar longitudinally in the slot upon relative rotation of the inlet and outlet sections; and cooperating indicia on the indicator bar and the collar to identify the type of flow which will issue from the nozzle at different positions of adjustment thereof.

141,839
2,089,304
2,568,515

References Cited in the file of this patent

UNITED STATES PATENTS

Walsh	-----	Aug. 12, 1873
Stein	-----	Aug. 10, 1937
Scheiwer	-----	Sept. 18, 1951