

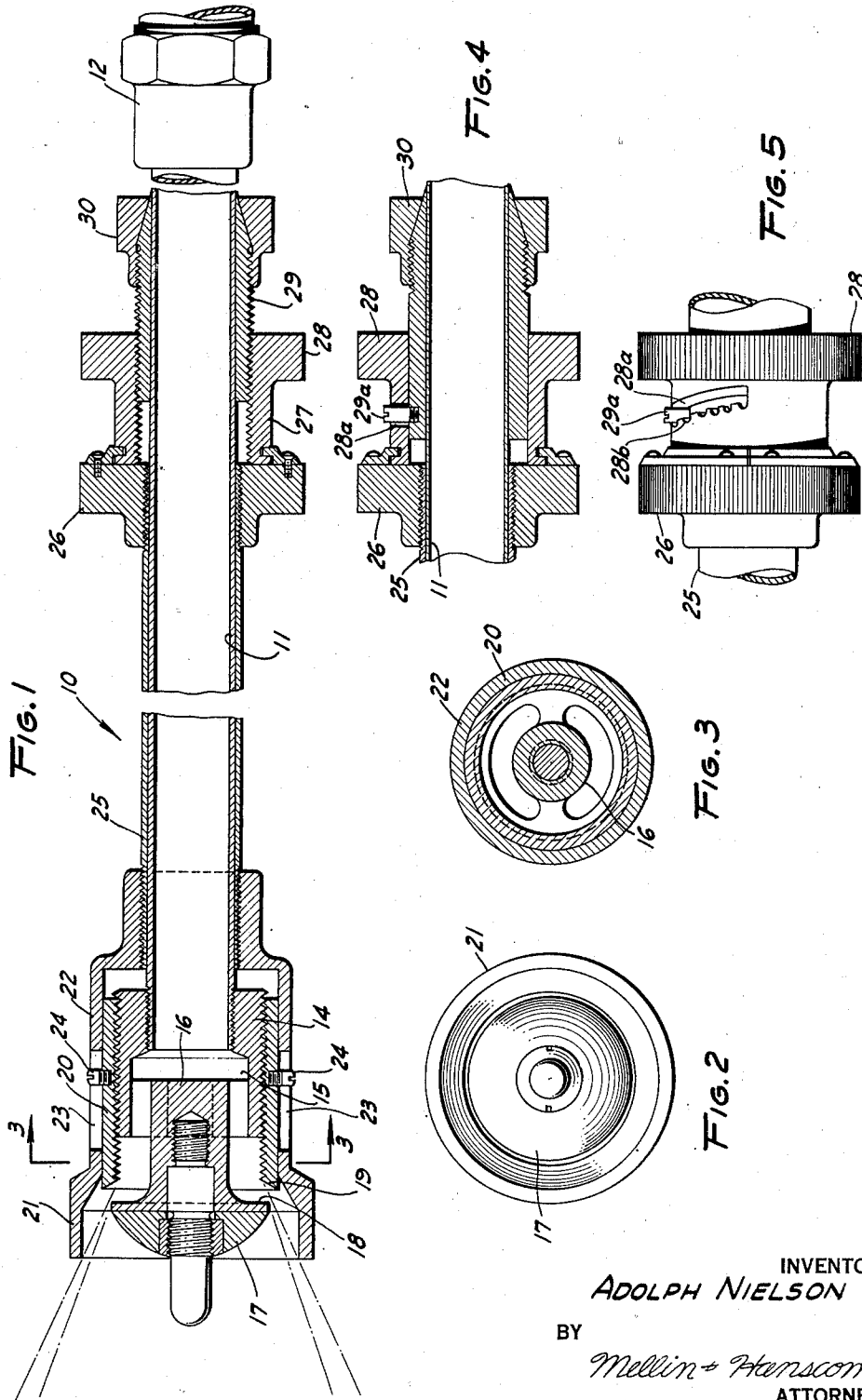
May 8, 1951

A. NIELSEN
HOSE NOZZLE

2,552,444

Filed Jan. 26, 1946

2 Sheets-Sheet 1



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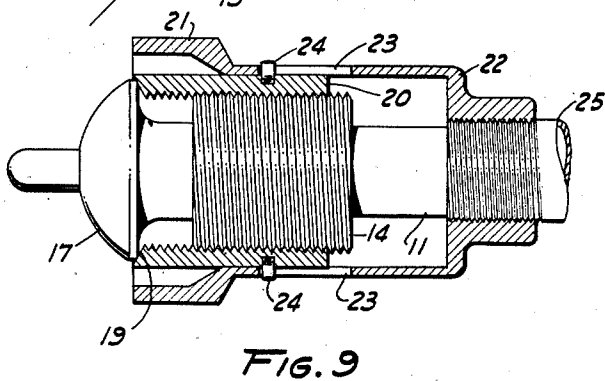
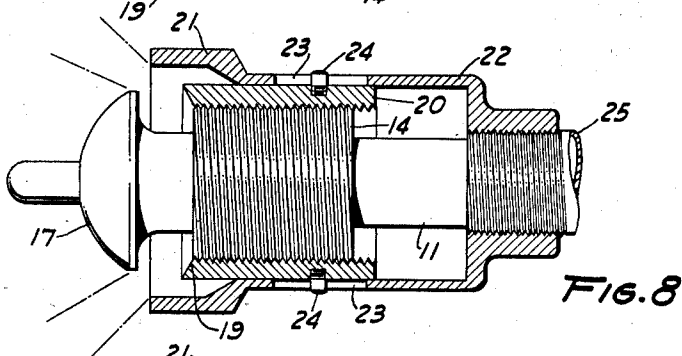
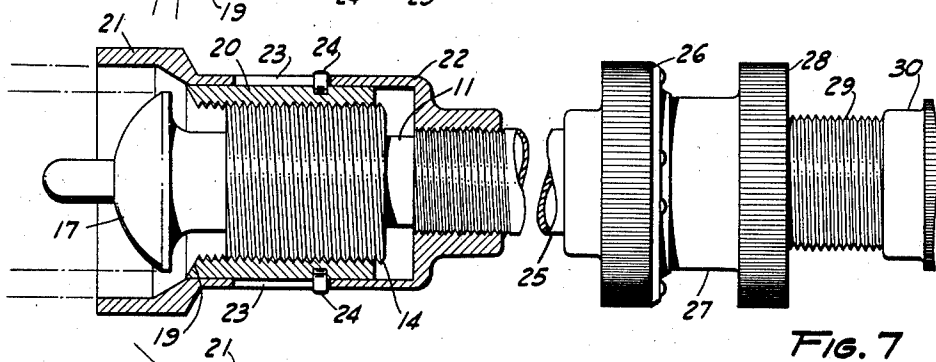
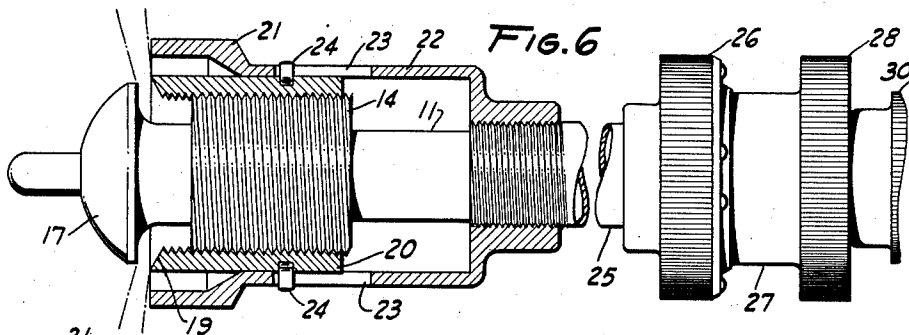
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UNITED STATES PATENT OFFICE

2,552,444

HOSE NOZZLE

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4 Claims. (Cl. 299—131)

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This invention relates to hose nozzles of the type employed to extinguish fires.

It is the principal object of my invention to provide an improved and simplified nozzle for fire extinguishing purposes in which the character as well as the pattern of the fluid discharge may be quickly and easily varied by the operator during use so as to obtain a fluid discharge of characteristics suitable to meet different conditions.

One form which the invention may assume is exemplified in the following description and illustrated by way of example in the accompanying drawings, in which:

Fig. 1 is a view in central longitudinal section through a hose nozzle embodying the preferred form of my invention.

Fig. 2 is an end view of the discharge end of the nozzle.

Fig. 3 is a transverse sectional view taken on line 3—3 of Fig. 1.

Fig. 4 is a fragmentary view in central longitudinal section, showing a slightly modified form of connection between the valve adjuster and the nozzle.

Fig. 5 is a fragmentary view in elevation of the modified form of the structure shown in Fig. 4.

Figs. 6 to 9, inclusive, are fragmentary views, showing the spray head end of the nozzle in longitudinal section and showing it in various conditions of adjustment.

Referring more particularly to the accompanying drawings, 19 indicates a hose nozzle for fire extinguishing purposes. This nozzle is adapted not only for the purpose of directing an extinguishing fluid on the fire, but also to provide a water spray curtain which in addition to extinguishing uses may be employed to enable a fireman to closely approach the fire for various purposes.

The nozzle comprises a rigid fluid conductor tube 11 which may be of any desired length. In some instances this tube may be as long as six or eight feet, and in other instances it may be comparatively short, depending upon the use to which the nozzle is to be put. One end of this conductor tube 11 is fitted with a connector 12 by means of which it may be detachably attached to the end of a fire hose. At its opposite end the conductor tube 11 is fitted with a cylindrical head 14 which is fixed on the tube, as illustrated. This head 14 is of an external diameter considerably greater than the diameter of the conductor tube 11, as illustrated, and likewise is

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formed with a cylindrical chamber 15 extending inwardly from its outer end, which likewise is of a diameter greater than the diameter of the tube.

Extending transversely of the chamber 15 and formed as an integral part of the head 14 is a spider 16 to which is rigidly fixed a valve disk 17, so fixed to the spider 16 that it is arranged concentrically with respect to the head 14 and the conductor tube 11. The valve seating face 18 of the valve disk 17 is disposed perpendicularly to the axis of the tube 11 and at a spaced axial distance from the outermost end of the head 14, as illustrated.

The diameter of the valve seating face 18 of the valve disk 17 is just slightly greater than the external diameter of the head 14. This is so that when fluid under pressure is conducted through the conductor tube 11, it will pass outwardly through the chamber 15 and then be deflected outwardly by the valve seating face 18.

The valve seating face 18 of the valve disk 17 is adapted to cooperate with a valve seat 19 formed at the outer end of a cylindrical sleeve valve 20. The inner periphery of the valve sleeve 20 is threaded complementary to the threads on the external perimeter of the head member 14 so that it may be threaded thereon. I intend that the valve seat 19 be moved toward and away from the valve face 18 of the valve disk 17 by longitudinal movement of the valve sleeve 20 relative to the head 14 and the valve disk 17.

It will be seen that when the fluid is conducted along the conductor tube 11, that it will discharge through the chamber 15 of the head 14 and pass through an annular valve opening between the valve face 18 of the valve disk 17 and the valve seat 19. The amount of water discharged and the character of the spray, that is, whether it is in finely comminuted form or not, will be determined by the amount of annular opening between the valve member 17 and the valve seat 19.

I also provide means for controlling the pattern of the spray which is discharged, as previously referred to. That is to say, the stream as it discharges will be naturally conical, and I provide a deflector means, as will be described, to change the angularity of this conical spray from a point where it is almost a disk to a point where it is substantially a cylinder of a diameter just slightly larger than the external diameter of the valve disk 17.

I wish to point out here that to make the spray

in the form of a disk is highly desirable in that in addition to having extinguishing characteristics, it enables the fireman to approach the fire behind a curtain of water spray or fog. However, the pattern of the spray can be readily adjusted by the fireman from the disk form to a straight stream form, or any intermediate point, to suit the conditions which are met.

I accomplish this by providing a circumscribing cylindrical deflector cuff 21 of an internal diameter somewhat larger than the external diameter of the valve disk 17 and valve sleeve 20. This deflector cuff 21 is rigidly fixed at the forward end of a deflector sleeve 22 reciprocally fitting the external periphery of the valve sleeve 20. By adjusting the axial position of the sleeve 22 relative to the valve sleeve 20, the position of the outer extremity of the cuff 21 relative to the valve opening between the valve disk 17 and the valve seat 19 is adjusted. In other words, by adjusting the extremity of the inner periphery of the cuff relative to this valve opening, the character of the spray is adjusted, as most clearly illustrated in Figs. 6 to 8, inclusive. In Fig. 6 the spray is shown as assuming an almost disk-like form, while in Fig. 7 it is shown as assuming almost a cylindrical form of a diameter comparable to the internal diameter of the cuff 21 of the deflector.

I intend utilizing the deflector sleeve 22 as the medium for adjusting the amount of valve opening between the valve face 18 and the valve seat 19. This is accomplished, as will be described, by rotation of the deflector sleeve 22. As previously described, this deflector sleeve 22 is reciprocally mounted on the valve sleeve 20. Formed at diametrically opposite points in the deflector sleeve 22 are longitudinal slots 23 which are engaged by radially extending keys 24 fixed to the valve sleeve 20. The engagement of the keys 24 in the slots 23 permits relative axial movement between the deflector sleeve 22 and the valve sleeve 20, but prevents relative rotative movement. Consequently, by rotating the deflector sleeve 22, the valve sleeve 20 will be revolved in unison therewith, such revolving of the valve sleeve 20 causing it to move axially relative to the deflector sleeve 22 and the head 14 due to the threaded engagement between the valve sleeve 20 and the head 14. The direction of axial movement of the sleeve 20 will, of course, be determined by the direction of rotation of the deflector sleeve 22. Thus, by rotating the deflector sleeve 22, the valve sleeve 20 may be moved axially toward and away from the valve face 18 of the valve disk 17, thus regulating the amount of valve opening through which the water may discharge.

To change the pattern of the spray, it is only necessary to move the deflector sleeve 22 axially relative to the fixed valve face 18 and thereby change the pattern of the spray, as previously described.

I provide means for rotating the deflector sleeve 22, which means comprises an adjuster tube 25 concentrically mounted on the conductor tube 11 but rotatable and reciprocable with respect thereto. At the forward end this adjusted tube 25 is fixed, as illustrated, to the innermost end of the deflector sleeve 22. At its opposite end the adjuster tube is fixed to a valve adjuster 26. The valve adjuster is rotatably connected or collared to the hub 27 of a deflector adjuster 28. The collar connection between the valve adjuster 26 and the deflector adjuster 28 is such that the two are relatively immovable axially but are relatively ro-

tatable. The deflector adjuster 28 is threaded on a sleeve 29 relatively fixed on the conductor tube 11 by means of a chuck 30.

By rotating the deflector adjuster 28, it will move axially along the sleeve 29 and relative to the conductor tube 11, causing endwise movement of the valve adjuster 26, the adjuster tube 25 and the deflector sleeve 22, thereby adjusting the axial position of the deflector cuff 21 relative to the valve disk 17. This changes the pattern of the spray as previously described.

To change the valve opening, it is merely necessary to rotate the valve adjuster 26, which will be collared in a stationary position due to its connection with the deflector adjuster 28, so that it is held against axial movement. Such rotation, however, rotates the deflector sleeve 22 which will rotate the valve sleeve 20 through the medium of the engagement of the keys 24 with the slots 23. Such rotation, because of the threaded connection between the valve sleeve and the head, will move the valve sleeve 20 axially toward or away from the valve disk 17, depending upon the direction of rotation. This enables either opening or closing of the valve and, of course, adjusts the degree of opening.

By simultaneously rotating the members 26 and 28, the deflector sleeve may be adjusted to vary the pattern of the spray and at the same time the valve opening will be adjusted to vary the quantity of water permitted to discharge through the nozzle end.

In Figs. 4 and 5 I have shown a slightly different form of connection between the deflector adjuster 28 and the sleeve 29. In the form shown in these two figures, a key 29a and a notched cam slot 28a are substituted for the threaded connection between the adjuster 28 and the sleeve 29. This cam slot, however, serves the same function in that turning movement of the adjuster relative to the sleeve 29 effects endwise or axial movement of the adjuster 28 relative to the sleeve 29. The key 29a may be latched in any position along the cam slot 28a in that the latter is notched, as at 28b, to effect latching of the adjuster 28 in any set position.

From the foregoing it is obvious that I have provided a relatively simple hose nozzle construction by means of which the character of the spray and the pattern of the spray discharged may be quickly adjusted, while the device is in operation.

I desire to point out that when the valve is but slightly open and the deflector cuff 21 is positioned so as to provide a substantially disk-like spray with the water discharging substantially radially from the end of the nozzle, a fog or spray screen is provided for protection of the holder of the equipment. When the valve is more widely open and the deflector cuff 21 projected forwardly, a strong impinging stream of water may be projected from the forward end of the nozzle. The operator of the device can, at his option, adjust the spray, not only for the quantity of the water discharged and its character, but for the pattern of the spray likewise.

While I have shown the preferred form of my invention, it is to be understood that various changes may be made in its construction by those skilled in the art without departing from the spirit of the invention as defined in the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A nozzle comprising a conductor tube, a valve

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fixed to one end thereof, a valve sleeve threadedly mounted on said tube such that said sleeve can be screwed toward and away from said valve in response to relative rotation between said sleeve and said tube, a cuff slidably mounted on said sleeve for sliding movement independent of said sleeve, means for rotating said cuff and sleeve with respect to said tube, means connecting said cuff and sleeve for simultaneous rotation, and means for sliding said cuff independently of rotation thereof.

2. A nozzle comprising a conductor tube, a valve fixed to one end thereof, a valve sleeve threadedly mounted on said tube such that said sleeve can be screwed toward and away from said valve in response to relative rotation between said sleeve and tube, a cuff slidably mounted on said sleeve for slidable movement independently of said tube and sleeve, an adjustor tube slidably and rotatably mounted on said conductor tube and fixed with respect to said cuff, adjustor means fixed to said adjustor tube and spaced from said cuff and sleeve for rotating said sleeve, and means abutting said adjustor means and rotatable relatively thereto for sliding said adjustor tube.

3. A nozzle comprising a conductor tube, a valve fixed to one end thereof, a valve sleeve threadedly mounted on said tube such that said sleeve can be screwed toward and away from said valve in response to relative rotation between said sleeve and tube, a cuff slidably mounted on said sleeve for slidable movement independently of said sleeve, means for imparting rotation to said sleeve in response to rotation of said cuff, an adjustor tube slidably and rotatably mounted on said conductor tube and fixed with respect to said cuff, adjustor means fixed to said adjustor tube and spaced from said cuff and sleeve for rotating said

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sleeve, and screw means abutting said adjustor means and rotatable relatively thereto for threading axially of said tubes to slide said sleeve.

4. A nozzle comprising a connector tube, a valve fixed to one end thereof, a valve sleeve threadedly mounted on said tube such that said sleeve can be screwed toward and away from said valve in response to relative rotation between said sleeve and tube, a cuff slidably mounted on said sleeve for slidable movement independently of said sleeve and means for rotating said sleeve in response to rotation of said cuff, an adjustor tube slidably and rotatably mounted on said connector tube and fixed with respect to said cuff, adjustor means fixed to said adjustor tube and spaced from said cuff and sleeve for rotating said sleeve, and means abutting said adjustor means for sliding said adjustor tube and cuff, said means comprising an annular member circumscribing said connector tube, rotatable relatively thereto and to said adjustor means and abutting the latter and having a spiral slot formed therein, and a pin seated in said slot and fixed with respect to said connector tube.

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