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ALL-PURPOSE FIRE HOSE NOZZLE

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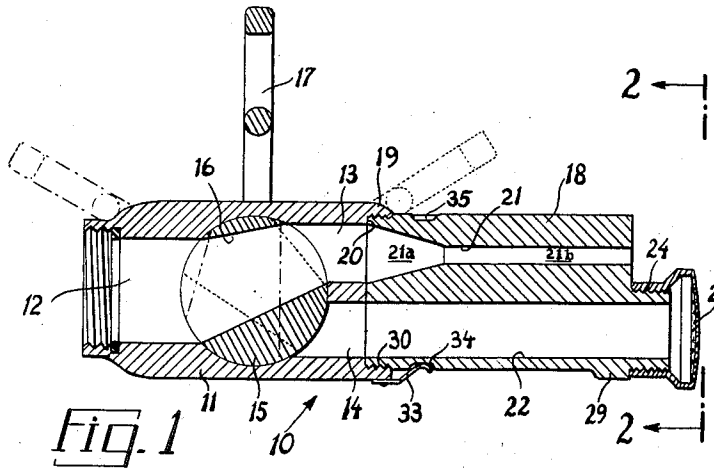


Fig. 1

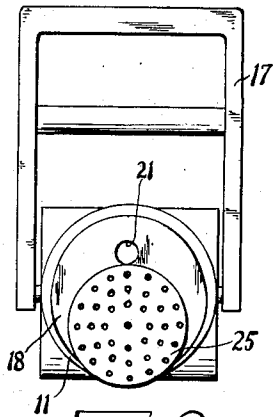


Fig. 2

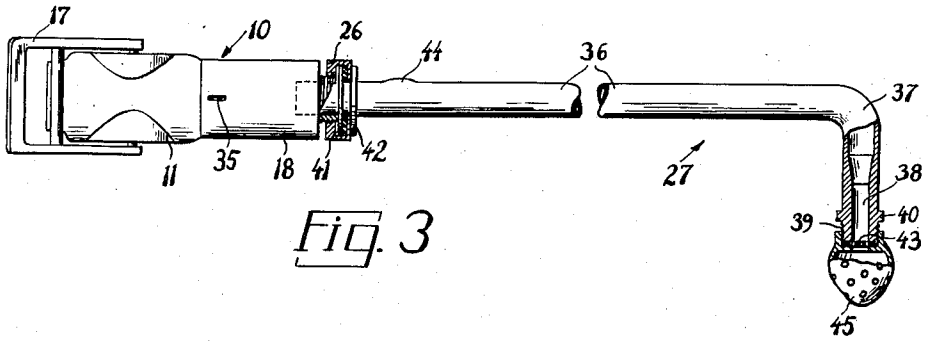


Fig. 3

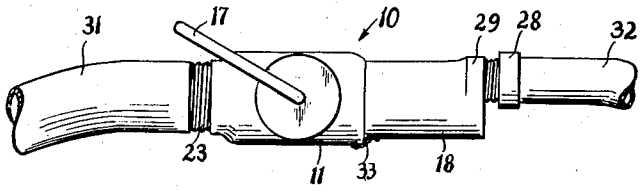


Fig. 4

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ALL-PURPOSE FIRE HOSE NOZZLE

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3 Claims. (Cl. 137—270)

My present invention relates to nozzles for fire hoses and, more particularly, to nozzles having means for changing the character of the discharged stream.

The general object of my invention is to provide an improved nozzle of the type set forth, having means for switching between solid streams of different calibers and, in addition, for replacing at least one of these solid streams by a spray or fog.

Another, more particular object of my invention is to provide a nozzle of the above character having coupling means enabling a variety of attachments to be connected to at least one of its outlets.

A further object of my invention is to provide, in a nozzle having a three-position valve for shutting off the flow of water or directing same selectively to either of two outlets, means enabling the stream from either outlet to be alternately turned on and off without letting the valve pass through a position in which a discharge would occur at the other outlet.

The above and other objects, features and advantages of my invention will become more clearly apparent from the following detailed description, reference being had to the accompanying drawing in which:

Fig. 1 is a longitudinal section through a nozzle representing an embodiment of my invention;

Fig. 2 is an end view on the line 2—2 of Fig. 1;

Fig. 3 is a top plan view of the nozzle of Figs. 1 and 2 on a reduced scale, showing a special attachment connected thereto; and

Fig. 4 is a side elevation of the nozzle drawn to the same scale as in Fig. 3, illustrating its use for interconnecting two hoses of different size.

The nozzle 10 shown in the drawing comprises a body 11 provided with an inlet port 12 and a pair of outlet ports 13, 14. A valve barrel 15, having a conical bore 16, is adapted to assume any of three different positions indicated, respectively, in full, chain-dotted and point-dotted lines; the setting of this valve barrel is controlled by a handle 17 adapted to occupy indicated, respectively, in full, chain-dotted and point-dotted lines. In an intermediate position of handle 17 (full lines in Fig. 1) the inlet port 12 communicates with outlet port 13; in its extreme left-hand or retracted position (chain-dotted lines) the inlet port is shut off; and in its extreme right-hand or forward position (point-dotted lines) port 12 communicates with the outlet port 14.

A swivel extension 18 of nozzle body 11, rotatably held in a flange 19 of the latter against a shoulder 20, is traversed by a relatively narrow bore 21 and by a relatively wide bore 22. Bore 21 has a tapering portion 21*a* and a cylindrical portion 21*b*, the cross section of taper 21*a* decreasing from a diameter equal to that of ports 13, 14 to a diameter equal to that of portion 21*b*. Bore 22 is cylindrical throughout. It may be mentioned that the length of cylindrical portion 21*b* should be at least equal to two-and-one-half times its diameter, in order to insure a smoothly flowing stream of liquid, and that, if desired, the entrance portion of bore 22 may also be conical for

the purpose of initially compacting the water stream, so long as a cylindrical, smooth-walled portion of the above-indicated length remains from the discharge opening inward.

Inlet port 12 is provided with female threads adapted to receive a male hose coupling 23 (Fig. 4). Nozzle extension 18 is formed with a flange 24 which surrounds the discharge end of bore 22 and carries male threads adapted to receive various attachments with corresponding female threads, such as a perforated cap or fog button 25 (Figs. 1 and 2), a coupling flange 26 of a spray applicator 27 (Fig. 3) or a hose coupling 28 (Fig. 4). A shoulder 29 serves to protect the threads on flange 24 against accidental damage when hitting against other objects.

The geometrical center of annular flange 19 is located midway between the outlet ports 13 and 14 which are of equal diameter, whereby extension 18 may be rotated therein to align bores 21 and 22 with ports 13 and 14 or vice versa. To enable such rotation without leakage, the parts 11 and 18 are provided with a so-called labyrinth coupling 30 comprising mating annular ridges and grooves, the female coupling part 11 having been shrunk upon the male coupling part 18.

Fig. 4 illustrates, by way of example, a position of extension 18 which is diametrically opposite to that of Fig. 1; in this position, bore 22 registers with port 13 to form a discharge passage of large cross-sectional area throughout so that water coming from a hose 31, having been initially compacted in bore 16 (which together with port 13 and bore 22 constitutes a stream shaper similar to that formed by passages 21*a*, 21*b*), will emerge from bore 22 in a large-caliber solid stream or may continue through a second, somewhat smaller hose 32. The position of Fig. 4 will also also be useful when it is desired to alternate between a large-caliber stream from bore 22 and a small-caliber stream from bore 21, since in the forward position of handle 17 the port 12 will be in partial register with bore 16 and will allow enough liquid to reach the passage 14, 21 of materially smaller cross-sectional area to afford a smooth flow therethrough. Sufficient water will also reach bore 22 in the swivel position of Fig. 1 (with handle 17 at the extreme right) to feed either the fog button 25 or the applicator 27. A spring member 33, adapted to fall into either of two diametrically opposite grooved 34, 35 in extension 18, serves to index this extension in one or the other of its two operative positions illustrated.

The applicator 27, Fig. 3, comprises an elongated tube 36 having an elbow at 37 and terminating in a stream shaper 38 provided with external male threads 39, a protective shoulder 40 ahead of the threads and a perforated fog head 45 detachably screwed on the latter. The other end of tube 36 extends partly into bore 22, as indicated in dotted lines, with a snug fit. Tube 36 is rotatably fixed, by means of two disks 41, 42 secured to it, to coupling cap 26 which mates with flange 24 on swivel extension 18. A screen 43 at the entrance of head 45 serves to intercept solid particles entrained by the water stream and so prevents clogging of its apertures.

The applicator 27, whose outlet 38 may be of slightly larger diameter than bore 21, constitutes a source of water stream or spray adapted to be introduced into chimneys and other inconveniently accessible locations; a suitable mark, such as a boss 44, may be provided on tube 36 to indicate the position of elbow 37 when the latter is obsecured from the operator of the nozzle.

From the foregoing description it will be apparent that I have provided an improved all-purpose nozzle which can be used to turn on and off a relatively narrow stream (swivel in position of Fig. 1) or a relatively wide stream (swivel in position of Fig. 4), to play alternately a narrow and a wide stream (Fig. 4), or to alternate between a

solid stream and a spray (Figs. 1 and 4 with cap **25** in place); which can cooperate with an applicator **27**, or its equivalent, for the generation of a solid stream or a spray in relatively inaccessible places, and which may serve as a step-down coupling between hoses **31**, **32** of different diameters. Because only a partial alignment is needed between bore **16** and ports **12**, **14** when narrow bore **21** is at the bottom (Fig. 4) or when either the cap **25** or the applicator **27** is placed on the flange **24** positioned as in Fig. 1, the body **11** of nozzle **10** may be made less bulky and of lighter weight than has been the case with conventional nozzles using three-position valves.

It may be mentioned that some of the advantages afforded by my invention will be realizable also with simplified constructions, as will be readily apparent from the foregoing. Thus, the swivel **30** could be eliminated and parts **11**, **18** made integral with each other in the position shown in Fig. 4, which would enable substantially the same diversity of operation except that the small-caliber stream (through bore **21**) could not be turned on and off without passing through the intermediate handle position in which some water could escape through the larger bore (**22**). Also, one of the three positions of handle **17** could be eliminated and the port **14** omitted, in which case the bores **21** and **22** would be effective only in opposite swivel positions as illustrated in Figs. 1 and 4, respectively. Numerous other adaptations and modifications will occur equally readily to persons skilled in the art and are deemed to be encompassed by the spirit and scope of the invention as defined in the objects and in the appended claims.

I claim:

1. In a fire hose nozzle, in combination, a body having an inlet port, a first discharge passage of large cross-sectional area throughout and a second discharge passage of materially smaller cross-sectional area, and rotatable valve means in said body provided with a tapering bore having an entrance end substantially of the size of said inlet port and a smaller exit end substantially of the size of said large discharge opening, said bore being so dimensioned and located with respect to said port and said opening that said valve means has a first operative position interconnecting said port with said first discharge passage, a second operative position interconnecting said port with said second discharge passage and an inoperative position in which said port is disconnected from both of said discharge passages, said entrance end of said bore registering substantially fully with said inlet port in said first operative position but being only in partial register therewith in said second operative position to an extent such that the exposed area of the entrance end approximates the area of the second discharge passage.

2. The combination according to claim 1, wherein said valve means comprises a cylindrical barrel, said bore having an axis skew to the axis of said barrel.

3. The combination according to claim 1, wherein said body comprises a main portion provided with said inlet port and an extension provided with a large bore and with a small bore constituting the discharge ends of said first and second passages, respectively, said valve means being located in said main portion, further comprising swivel means interconnecting said main portion and said extension in a relatively rotatable manner for reversing the position of said large and small bores relative to said valve means.

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