

May 26, 1942.

J. W. GRANT ET AL

2,283,985

SHUT-OFF NOZZLE

Filed March 12, 1941

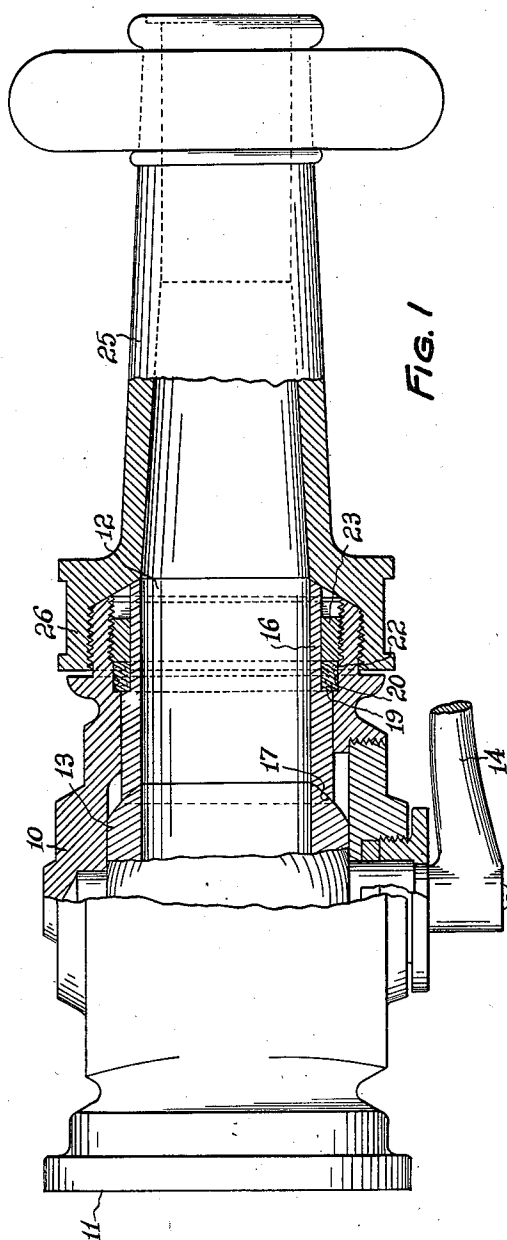


FIG. 1

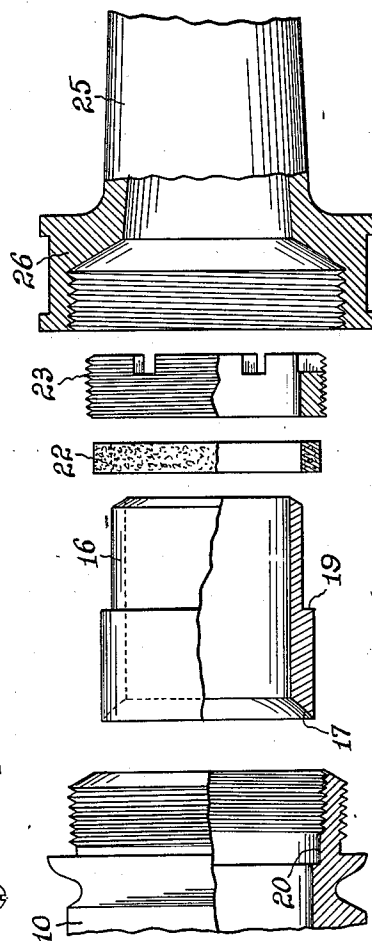


FIG. 2

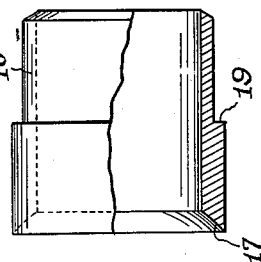


FIG. 3



FIG. 4

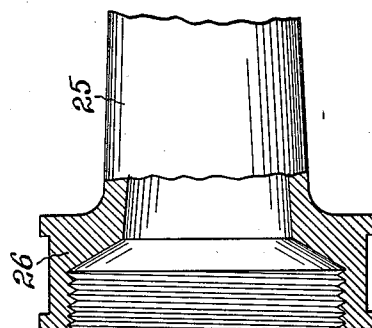


FIG. 5

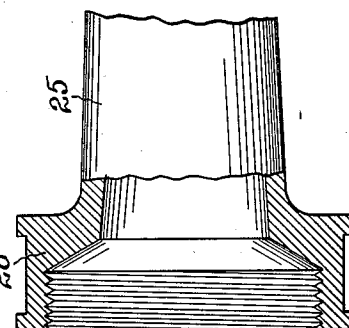


FIG. 6

INVENTORS:
JORDAN W. GRANT
& HENRY M. HUNT
BY *Richy & Watts*
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,283,985

SHUTOFF NOZZLE

Jordan W. Grant, Portsmouth, Va., and Henry M. Hunt, Wooster, Ohio, assignors to Akron Brass Manufacturing Company, Inc., Wooster, Ohio, a corporation of Ohio

Application March 12, 1941, Serial No. 382,956

2 Claims. (Cl. 251—113)

This invention relates to improvements in nozzles and more particularly to shut-off nozzles of the type commonly employed with a fire hose.

It is essential in fire fighting equipment to eliminate the disturbance in the stream caused by the formation of annular recesses or projections within the discharge end of the nozzle. When the stream flows over the recesses or projections within the nozzle the column of water discharged therefrom is characterized with spent drops, spray or spindrift. On the other hand if the inner surface of the nozzle is uninterrupted a sharply defined column free from spray may be discharged therefrom with the result that such column may be directed upon the objective with greater force and less danger of cross wind deflection.

One of the objects of the present invention is to construct a shut-off nozzle comprising a plurality of adjustable parts arranged in seated relation with each other to provide a smooth and uninterrupted surface therethrough irrespective of adjustments therebetween.

Another object of the invention is to provide a shut-off nozzle having a sleeve disposed in the discharge end thereof with a conical nozzle tip engaging the outer end of the sleeve and nozzle to facilitate the discharge of a fluid stream free from spindrift.

Further objects of the invention are to provide a shut-off nozzle which is reliable and efficient in service, economic of manufacture, simple of construction and leakproof.

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 drawing, sets forth the preferred embodiment of the invention.

Referring to the drawing wherein the preferred embodiment of the invention is illustrated:

Fig. 1 is a side view of the shut-off nozzle and nozzle tip embodying the present invention, a portion of the nozzle and nozzle tip being broken away and shown in section in the interest of clarity;

Fig. 2 is an elevational view of a fragmentary portion of the nozzle casing with a portion thereof shown in section to illustrate the construction thereof;

Fig. 3 is an elevational view of a sleeve with a portion thereof shown in section;

Fig. 4 is an elevational view of a packing ring with a portion thereof shown in section;

Fig. 5 is an elevational view of a collar for retaining the packing ring in place, a portion of the collar being shown in section; and

Fig. 6 is an elevational view of a fragmentary portion of the nozzle tip with a portion thereof shown in section.

Referring to Fig. 1, there is shown a shut-off hose nozzle comprising a casing 10 having axially aligned inlet and outlet ports 11 and 12 with a ball valve 13 interposed therebetween. The valve is secured to a shaft which has a handle 14 affixed to one end thereof for rotating the ball valve to its open or closed position. The ball valve employed herein is of the form disclosed in Patent No. 1,746,609 to John C. Schellin. A detailed description thereof is, therefore, deemed unnecessary apart from such general reference as may be necessary for a complete understanding of the invention.

The outlet port 12 has a sleeve 16 disposed therein with the inner end 17 of the sleeve formed for intimate engagement with the globular surface of the ball valve 13. The inner end 17 of the sleeve is ground to fit snugly upon the ball valve 13 so as to prevent the leakage of fluid therebetween when the valve is in either its open or closed position. The internal diameter of the sleeve 16 is equal to the diameter of the fluid port through the ball valve 13 to provide a smooth and uninterrupted surface for a stream flowing through the nozzle. The external diameter of the outer end portion of the sleeve 16 is slightly less than the external diameter of the valve engaging end portion of the sleeve to provide a ledge 19 on the peripheral surface thereof intermediate its ends. The ledge 19 is disposed contiguous to and in alignment with a shoulder 20 formed within the casing 10 and is adapted to support, in conjunction with the shoulder 20, a resilient packing ring 22. A collar 23 encircling the reduced end portion of the sleeve 16 is threaded within the casing 10 for compressively urging the ring 22 towards the ledge 19 and shoulder 20 to seal the nozzle against the leakage of any fluid therethrough or seepage between the ball valve 13 and end 17 of the sleeve resulting from wear.

A tapered nozzle tip 25 formed with an enlarged end 26 is threaded on the casing 10. The enlarged end 26 is provided with a beveled inner surface which is adapted to engage a surface of complementary configuration machined in the end of the sleeve 16 and the casing 10 to provide a fluid seal between the shut-off hose nozzle and nozzle tip. The threaded adjustment of the nozzle

zle tip 25 upon the casing 10 urges the end 17 of the sleeve 16 into engagement with the surface of the ball valve 13 and prevents the escape of fluid therebetween. The internal diameter of the nozzle tip 25, at its juncture with the beveled end of the sleeve 16, is equal to the internal diameter of the sleeve so that a smooth, continuous and uninterrupted fluid passageway is provided through the shut-off nozzle and nozzle tip.

In the assembly of the shut-off hose nozzle the ball valve 13 is mounted within the casing 10 in a manner similar to that described in the patent to John C. Schellin No. 1,746,609. The sleeve 16 is inserted within the outlet port 12 of the casing 10 with the end 17 thereof engaging the spherical surface of the ball valve 13. Subsequent the insertion of the sleeve 16 within the outlet port 12, the resilient packing ring 22 is positioned upon the ledge 19 and the shoulder 20, whereupon the collar 23 is threaded within the casing 10 for compressing the packing ring against the casing and sleeve to provide a fluid tight seal therebetween. The enlarged end 26 of the nozzle tip 25 is then threaded upon the external surface of the casing 10 with the beveled inner surface engaging the outer end of the sleeve 16 for retaining the end portion 17 thereof in intimate engagement with the spherical surface of the ball valve to prevent the leakage of fluid therebetween. The ball valve 13 may be rotated to either its open or closed position upon the actuation of the handle 14 for controlling the passage of fluid through the shut-off nozzle and nozzle tip.

The provision of a sleeve or lining having a bore equal to that of the fluid port in the ball valve provides a smooth, continuous and uninterrupted conduit through the shut-off nozzle for the passage of a fluid stream. The smooth and uninterrupted passageway extending through the shut-off nozzle overcomes any tendency of the stream to become agitated and insures the discharge of the fluid stream without any spindrift or tangential jets or spray. Furthermore, the

seating of the beveled inner surface of the nozzle tip upon the complementary surface of the end of the sleeve provides a smooth, close fit therebetween, thus causing the fluid stream to flow through the shut-off nozzle and nozzle tip without disruption or agitation.

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 the detail may be resorted to without departing from the scope or spirit of the invention as herein claimed.

We claim:

1. In a shut-off hose nozzle embodying a casing having a bore therethrough, a ball valve mounted therein, a cylindrical tubular member engaging said ball valve and terminating at one end of said bore, a ledge formed on the periphery of said cylindrical member intermediate its ends, a shoulder on said bore adjacent said ledge, a ring encircling said member and seated on said ledge and shoulder, and means within said bore engaging said ring to seal said bore with respect to said member.

2. In a shut-off valve embodying a casing having a bore therethrough, a ball valve mounted therein, a cylindrical tubular member in said bore having one end seated on said ball valve with the other end terminating at an end of said bore, a ledge formed on the periphery of said tubular member intermediate its ends, a shoulder on said bore adjacent said ledge, a packing ring seated on said ledge and shoulder, a collar encircling said tubular member and threaded within said bore, said collar engageable with said ring to seal said bore with respect to said tubular member.

JORDAN W. GRANT.
HENRY M. HUNT.