No. 654,891. Patented July 31, 1900.

T. HALEY.

CONTROLLING NOZZLE.

(Application filed Dec. 13, 1899.)

(No Model.)

FIG. 1.

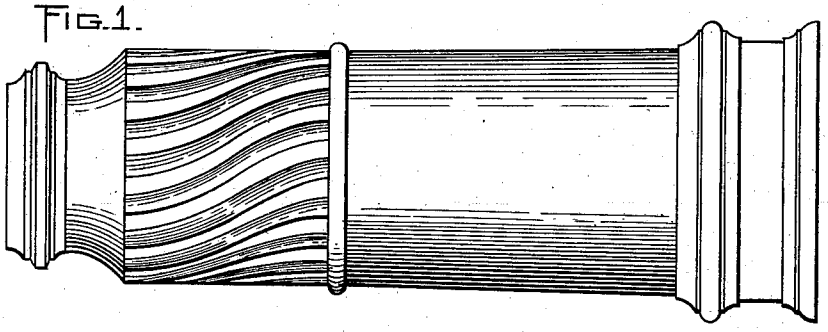


FIG. 2.

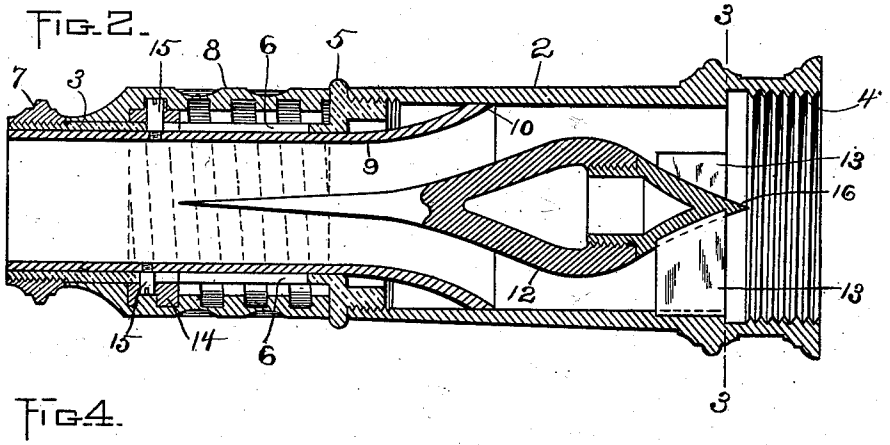



FIG. 4.

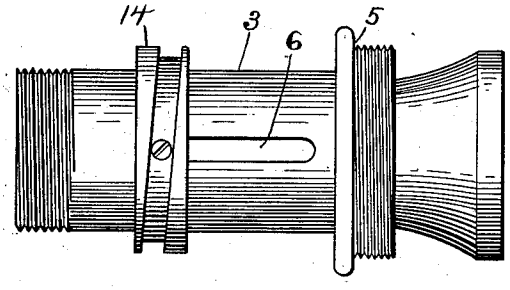



FIG. 3.

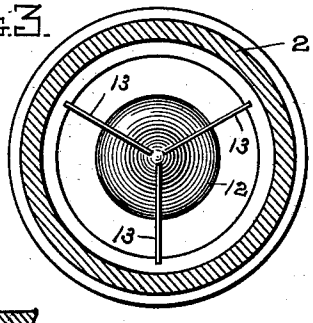
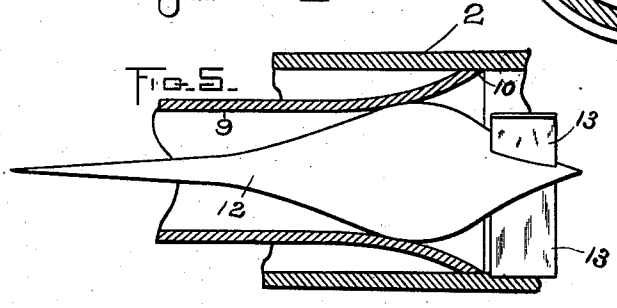



FIG. 5.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

THOMAS HALEY, OF BOSTON, MASSACHUSETTS.

## CONTROLLING-NOZZLE.

SPECIFICATION forming part of Letters Patent No. 654,891, dated July 31, 1900.

Application filed December 13, 1899. Serial No. 740,157. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS HALEY, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Controlling-Nozzles, of which the following is a specification.

This invention has for its object to provide a hose-nozzle for fire-engines, &c., adapted to increase or decrease the size of the stream while playing and to entirely shut off the stream.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of my improved hose-nozzle. Fig. 2 represents a longitudinal section of the same, showing the nozzle adjusted to give a stream of maximum diameter. Fig. 3 represents a section on line 3 3 of Fig. 2. Fig. 4 represents a side view of the adjustable inner member of the nozzle. Fig. 5 represents a view similar to a portion of Fig. 2, showing the inner member adjusted to entirely shut off the stream.

The same reference characters indicate the same parts in all the figures.

My improved hose-nozzle comprises an outer or guiding member, which, as here shown, is composed of two sections 2 and 3 of different diameters, the section 2 being of greater diameter than the section 3. The section 2 has at one end an internal thread 4 for engagement with a suitably-threaded terminal on a hose and is internally threaded at its opposite end to engage a threaded flange 5, formed on the section 3. The section 3 is externally threaded at its outer end to receive a stop-collar 7, which coöperates with the flange 5 in confining on the section 3 the rotary adjusting-nut 8, hereinafter referred to. Between the flange 5 and stop-collar 7 longitudinal slots 6 6 are formed in the section 3 for a purpose hereinafter described. The nozzle also comprises a movable inner member 9, which is fitted to slide in the section 3 and has a flaring end 10 projecting into the section 2 and having a sliding fit therein, said movable member 9 constituting the delivering end of the nozzle.

12 represents a cone which is supported by thin blades or wings 13, affixed to the cone and to the section 2, the cone being supported in a position concentric with the members of the nozzle and having an elongated apex projecting into the movable member 9, there being an annular space between the base of the cone and the interior of the section 2. The base of the cone and the flaring end of the movable member 9 are so proportioned that when the member 9 is in the position shown in Fig. 5 its flaring end constitutes a valve, which is seated on the face of the cone, the latter constituting a valve-seat, so that the flow of water through the nozzle is cut off.

Means are provided for adjusting the movable member 9 longitudinally toward and from the base of the cone, said means comprising an externally-threaded collar 14, surrounding the section 3 and engaged with internal threads formed in the sleeve 8, the latter constituting an elongated nut, which is rotatable on the section 3 and is confined against endwise movement thereon by the flange 5 and the stop-collar 7. The externally-threaded ring 14 is rigidly connected with the movable member 9 by means of studs 15 15, which pass through the slots 6 6 in the section 3 and are guided by said slots, the member 9 and threaded ring 14 being thus prevented from rotating when the sleeve or nut 8 is rotated.

It will be seen from the foregoing that the rotation of the sleeve 8 causes an endwise movement of the movable member 9, thus varying the position of the flaring end 10 of said member relatively to the face of the cone. The inner surface of the flaring end 10 and the external surface of the cone form an annular space or passage which converges toward the apex of the cone and is varied in width by adjustments of the member 9. When the member 9 is adjusted as shown in Fig. 2, a stream is formed which fills the interior of the movable member 9. Any adjustment of the movable member toward the base of the cone decreases the size of the stream, the stream being caused by the elongated apex of the cone to separate from the inner surface of the member 9 when the said member is adjusted from the position shown in Fig. 2 toward the base of the cone, so that the stream flows in a solid form from the apex of the cone without touching the inner sur-

face of the member 9, the size of the stream decreasing as the member 9 is adjusted toward the base of the cone. I am therefore enabled to produce a stream of any diameter from the internal diameter of the delivering end of the member 9 to an extremely-small stream—say one-fourth of an inch in diameter.

16 represents a water-spreading cone which is attached to the base of the cone 12 and projects toward the receiving end of the nozzle, said cone being formed to guide the stream outwardly with an easy curve to the base of the cone 12. The dividing-cone 16 is preferably somewhat concave in its longitudinal section, as shown in Fig. 2.

I claim—

1. A controlling-nozzle comprising an outer or guiding member, an inner member movable in the guiding member and having a flaring inner end, an elongated cone affixed to the interior of the guiding member and having an apex projecting into the inner member, the base of said cone coöperating with the flaring end of the inner member in forming an adjustable tapering annular channel converging toward the apex of the cone, and means for adjusting the inner member toward and from the base of the cone.

2. A controlling-nozzle comprising an outer or guiding member, an inner member movable in the guiding member and having a flaring inner end, an elongated cone affixed to the interior of the guiding member and having an apex projecting into the inner member, the base of the cone constituting a valve-seat, and the flaring end of the inner member a valve adapted to close on said seat and shut off the flow of water.

3. A controlling-nozzle comprising an outer or guiding member having an enlarged inner portion and a reduced longitudinally-slotted outer portion, an inner member movable in the reduced outer portion and having a flaring inner end which projects into the enlarged inner portion, a cone affixed to the inner portion of the guiding member, its apex projecting into the movable member, an externally-screw-threaded collar affixed to the movable member by studs passing through the longitudinal slots in the guiding member, and an internally-threaded sleeve or nut engaged with the said collar and compressed against endwise movement on the outer portion of the guiding member.

4. A controlling-nozzle comprising an outer or guiding member made in two sections 2 3 of different diameters, the larger section having an internal screw-thread at one end, while the smaller section has an externally-threaded flange engaged with said internal thread, said smaller section being horizontally slotted, an inner member movable in the smaller section and having a flaring inner end projecting into the larger section, a cone affixed to the inner section and having an apex projecting into the outer section, an externally-screw-threaded collar affixed to the movable member by studs passing through the slots in the guiding member, an internally-threaded sleeve or nut engaged with the said collar and bearing at one end against the said flange, and a detachable stop-collar bearing against the other end of the said nut.

In testimony whereof I have affixed my signature in presence of two witnesses.

THOMAS HALEY.

Witnesses:
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A. D. HARRISON.