

F. S. SEAGRAVE.  
NOZZLE.

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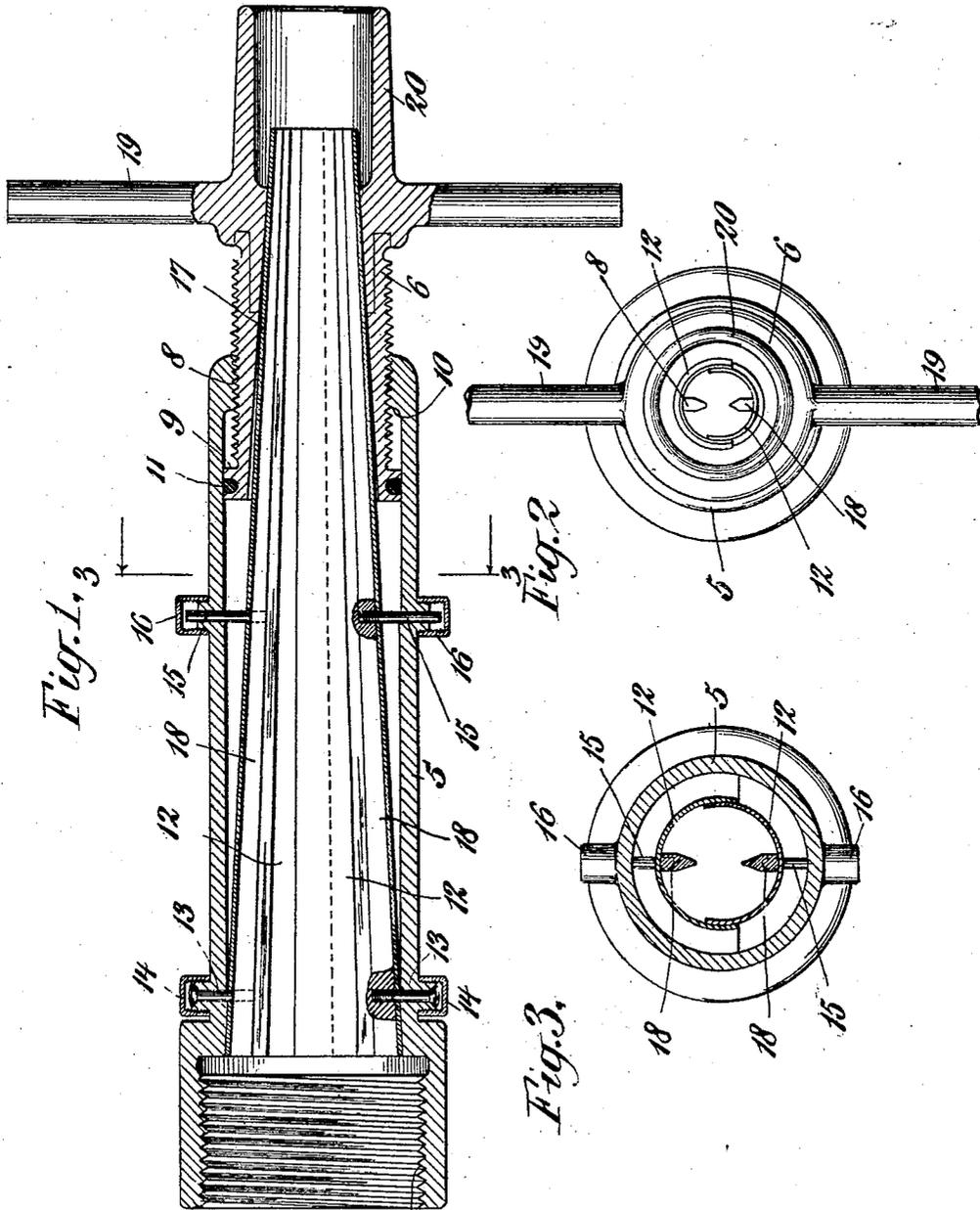


Fig. 1.

Fig. 2.

Fig. 3.

WITNESSES:

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## NOZZLE.

No. 930,095.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, FREDERIC S. SEAGRAVE, a citizen of the United States of America, and a resident of Detroit, county of Wayne, and State of Michigan, have invented certain new and useful Improvements in Nozzles, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to that class of nozzles known as variable nozzles and of the type particularly adapted for use in connection with fire hose.

The object of my invention is to provide a simple and effective means for varying the diameter of the stream projected through the nozzle, while at the same time producing and maintaining the stream in a compact and solid form. To these ends I provide the nozzle shell with a lining comprising a plurality of curved spring metal plates whose edges overlap in the direction of the length of the nozzle, and in connection therewith I provide means for increasing or decreasing the overlapping of the said plates in the direction of the discharge end of the nozzle. I also provide the spring plates with inwardly projecting longitudinal fins, the said fins being for the purpose of preventing any swirling action of the stream such as would bring about an undue spreading of the discharged stream.

In carrying out my invention I employ certain novel details of construction and combination of parts as will more fully appear hereinafter, and in order that my invention will be thoroughly understood, I will now proceed to describe a nozzle constituting an embodiment thereof, having reference to the accompanying drawings illustrating the same, and will then point out the novel features in claims.

In the drawings: Figure 1 is a view in central longitudinal section through a nozzle constructed in accordance with my invention. Fig. 2 is an end view thereof. Fig. 3 is a view in transverse section, the plane of section being upon the line 3—3 of Fig. 1.

The nozzle shell is divided, in the present instance, into two portions, a main body member 5 and an adjustable member 6. The body member 5 may be conveniently provided with a threaded and shouldered portion 7 by which it may be secured to a fire hose or other element with which it may be desired to be employed. The member 6 has

a screw threaded connection 8 with the said member 5, the said member 6 being preferably provided with a shouldered portion 9 which, in the operation of the said adjustable member in one direction, will engage a corresponding shouldered portion 10 at the end of the body member 5 to prevent the member 6 from being accidentally removed from the said member 5. A suitable packing 11 may also be employed between the members 5 and 6 to prevent any leakage between them. The nozzle shell is provided with a flexible lining throughout, comprising a plurality of curved spring plates 12 whose longitudinal edges overlap. In the present example of my invention there are two such plates and they are connected at their rear ends to the rear end of the nozzle shell by means of screws or pins 13 which pass through the walls of the shell and enter the said plates. Caps 14 may be conveniently employed to cover over the heads of the screws 13 for the double purpose of protecting and concealing them and to prevent any liquid which might leak past the screws from being discharged. As I preferably provide but a single screw or pin 13 for each plate, I provide, in addition thereto, guide pins 15 at points nearer the forward end of the nozzle, said guide pins being secured to the spring plates and permitted to slide freely through openings in the walls of the shell. Caps 16, similar to the caps 14, may conveniently be employed at these points for a similar purpose.

The forward ends of the curved spring plates are received within the tapered bore 17 of the member 6 as will be well understood by reference to Fig. 1, and it will also be understood that as the said member 6 is screwed backward and forward in the member 5 so as to adjust the same longitudinally with respect to the said member 5, the spring plates will be contracted or expanded toward the discharge end of the nozzle, whereby to reduce or enlarge the diameter of the stream discharged through the nozzle. This expansion and contraction of the spring plates will in no wise interfere with the smoothness of the lining of the nozzle so that the stream will not be interrupted in its passage through the nozzle nor with currents or eddies formed therein such as would affect the delivered stream.

In order to prevent any swirling action of the water, I have provided the plates 12

with inwardly projecting longitudinally disposed fins 18, the said fins tending, in a manner well known, to hold the stream true and prevent it from turning as it passes through the nozzle. The said fins are secured to the plates along neutral lines with respect thereto so that when the curvature of the plates is varied by the adjusting operation the fins will remain true and radial. The screws or pins 13 and 15 may conveniently extend into the said fins as is shown in the drawings, whereby to add to the rigidity of the structure. The member 6 may conveniently be provided with radial arms 19 for the purpose of readily performing the manual adjustment thereof and it may also conveniently be provided with a shield portion 20 for the purpose of protecting the ends of the lining plates. The length of the shield should be sufficient to inclose all the parts of the lining when the member 6 is adjusted to its innermost position.

Of course it will be understood that while my improved nozzle is particularly adapted for use in connection with fire hose, it may be used in any other desired connections, and it will also be understood that the usual or any form of cut off valve may be employed therewith as is common with nozzles.

What I claim is:

1. In a nozzle the combination with two shell members longitudinally adjustable lengthwise of the nozzle and having a tapered bore, of a flexible lining therefor comprising a plurality of overlapping curved spring plates secured at their rear ends to the rear end of one of the said nozzle members, and inwardly projecting longitudinally disposed fins carried by the said curved plates along a neutral line therein.

2. In a nozzle the combination with a shell comprising a main body member and an end member longitudinally adjustable with respect thereto, of a lining for the said nozzle, the said lining comprising a plurality of curved spring plates, a single screw or pin connecting each said plate to the body member of the shell at the rear end thereof, and guiding means for engaging the said plates at points toward their forward ends, for preventing the rotation of the said plates in the said shell.

3. In a nozzle the combination with a shell comprising a main body member and an end member longitudinally adjustable with respect thereto, of a lining for the said nozzle, the said lining comprising a plurality of curved spring plates, a single screw or pin connecting each said plate to the body member of the shell at the rear end thereof, and a radial projecting guide pin secured to each said plate toward the forward end thereof, the said main body portion of the shell being provided with openings for receiving and guiding the said pins.

4. In a nozzle the combination with a shell comprising a main body member and an end member longitudinally adjustable with respect thereto, of a lining for the said nozzle, the said lining comprising a plurality of curved spring plates, a single screw or pin connecting each said plate to the body member of the shell at the rear end thereof, a radial projecting guide pin secured to each said plate toward the forward end thereof, the said main body portion of the shell being provided with openings which extend through the walls thereof, for receiving and guiding the said pins, and caps for closing the said openings and the exposed ends of the said radial pins.

5. In a nozzle the combination with a substantially cylindrical body member having an internal shoulder at the front end, and a screw threaded portion between the shouldered portion and the end thereof, of an adjustable member exteriorly screw threaded and fitted to the said interiorly screw threaded portion of the body member, said adjustable member provided with an outwardly projecting shouldered portion fitted to the internal bore of the body member, the internal bore of the said adjustable member being tapered, a lining for the nozzle comprising a plurality of curved spring plates secured to the body member of the nozzle at the rear end thereof and engaged near their forward ends by the internal bore of the adjustable member, means for securing the lining plates at their rear ends to the rear end of the said body member, and means intermediate the ends thereof for guiding the said lining plates to prevent their rotation.

6. In a nozzle the combination with a substantially cylindrical body member having an internal shoulder at the front end, and a screw threaded portion between the shouldered portion and the end thereof, of an adjustable member exteriorly screw threaded and fitted to the said interiorly screw threaded portion of the body member, said adjustable member provided with an outwardly projecting shouldered portion fitted to the internal bore of the body member, the internal bore of the said adjustable member being tapered, a lining for the nozzle comprising a plurality of curved spring plates secured to the body member of the nozzle at the rear end thereof and engaged near their forward ends by the internal bore of the adjustable member, internally projecting longitudinal fins secured to and carried by the said lining plates, and means for securing the said lining plates to the body portion of the shell and for preventing their rotation therein.

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Witnesses:

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