July 10, 1951 L. M. BUTTON ET AL 2,559,592

VAPOR OR FOG NOZZLE

Filed Feb. 21, 1947

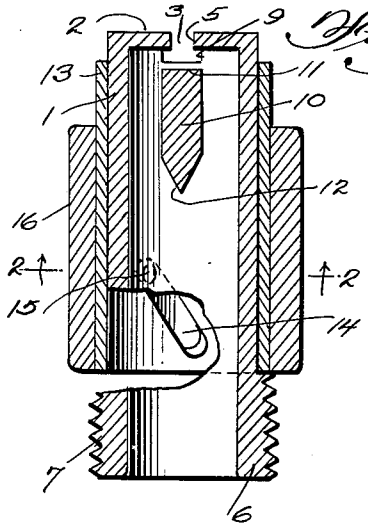


Fig. 1

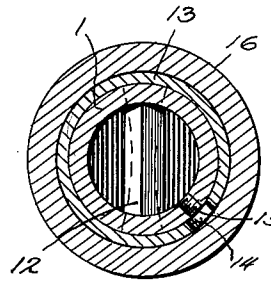


Fig. 2

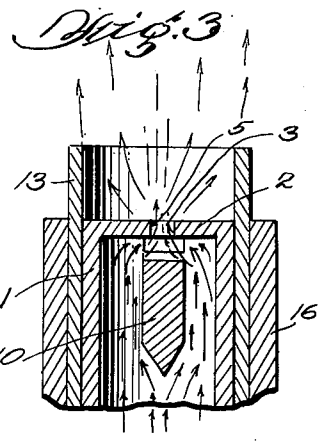


Fig. 3

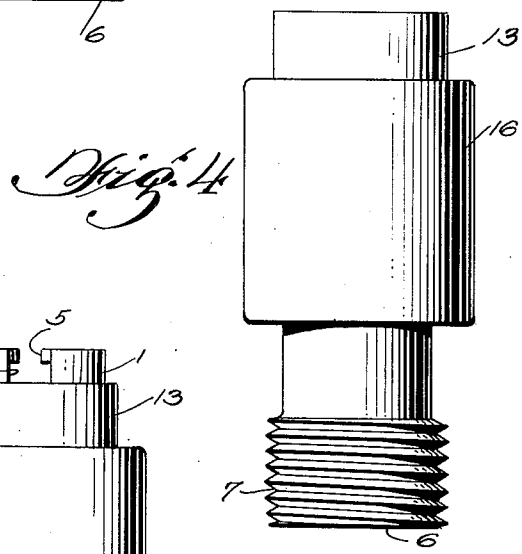


Fig. 4

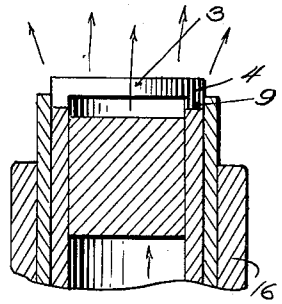


Fig. 5

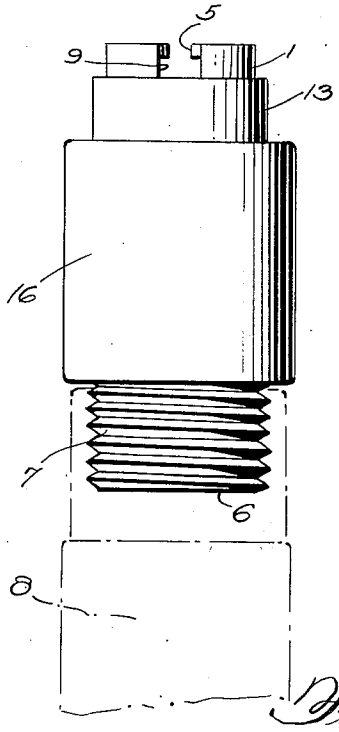


Fig. 8

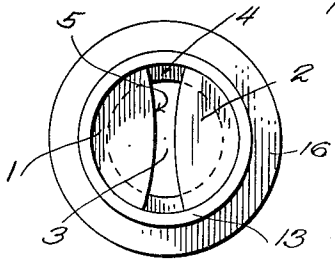


Fig. 7

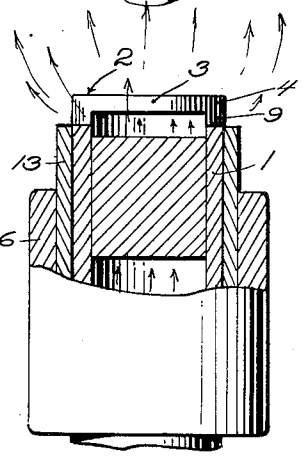


Fig. 6

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VAPOR OR FOG NOZZLE

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3 Claims. (Cl. 299—130)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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The invention described herein, if patented may be manufactured and used by or for the Government for governmental purposes, without the payment to us of any royalty thereon.

The present invention relates to vapor or fog nozzles for use on fire hose, monitors or fixed or semi-fixed nozzles, sprinkler systems, etc., for fire extinguishing and other purposes.

One object of the invention consists in the provision of a nozzle which is so constructed as to create a high turbulence in the liquid passing through the nozzle thereby breaking down the liquid into minute particles and ejecting the same in the form of fog or vapor.

Another object of the invention resides in the provision of a vapor or fog nozzle which is so designed as to eject the vapor in the form of a fan-like spray and which may be adjusted to gradually narrow the width of the stream or convert it into a circular form.

Other objects and advantages of the invention will be apparent from the following description when taken in connection with the accompanying drawings, in which,

Figure 1 is a vertical sectional view through the nozzle, with parts broken away.

Figure 2 is a horizontal sectional view taken on line 2—2 of Figure 1.

Figure 3 is a fragmentary vertical sectional view of the nozzle in one of its adjusted positions.

Figure 4 is a side elevational view of the nozzle adjusted to the position shown in Figure 3.

Figures 5 and 6 are fragmentary sectional views indicating different adjustments of the nozzle.

Figure 7 is a plan view of the nozzle, and

Figure 8 is a side elevational view of the nozzle adjusted to the position indicated in Figure 6, and showing the associated hose in dotted lines.

Referring to the drawings in more detail, the numeral 1 indicates a tubular body member closed at its outer end by a flat disk-like plate or head 2 provided with an elongated exit opening 3 having flared outer ends 4. The side walls 5 of the slot 3 are of arcuate formation so as to cause a gradual flaring of the slot from its mid-portion to the outer ends thereof. The opposite end of the tubular member 1 is thickened, as indicated by numeral 6 and has its outer surface threaded, as indicated by numeral 7, for attachment to a hose or the like 8.

The upper or outer end of the tube 1 is provided with cut-out portions 9 which communicate with the transverse slot 3 which facilitates the formation of a fan-like form of spray heretofore referred to.

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Disposed within the tubular member 1 and mounted slightly below the exit opening 3 is a longitudinally arranged partition or baffle plate 10, in this instance having a thickness of about one-third (⅓) the internal diameter of the tube 1. The outer portion 11 of the plate 10 is flat and cooperates with the discharge opening 3 in a manner which will appear hereinafter. The opposite end of the baffle plate is tapered as indicated by the numeral 12.

Mounted on the exterior of the tubular member 1 for longitudinal adjustment with respect thereto is a sleeve 13 provided with a diagonally arranged slot 14 for cooperation with a pin 15 mounted on and extending outwardly of the tubular member 1. A gripping member 16 is preferably secured to the sleeve 13 to provide a convenient means for adjusting the latter longitudinally of the tubular member 1, and the pitch and length of the slot 14 is such as to provide the desired longitudinal movement of the sleeve by turning the same through the angle of 90°.

In the operation of this nozzle the stream of water passing outwardly through the nozzle will be divided into two streams as it comes into contact with the beveled end 12 of the baffle 10. The divided streams will travel outwardly into contact with the inner surface of the flat plate 2 from whence they will be directed laterally into the space between the outer end 11 of the baffle plate 10 and the exit opening 3, and thence will travel through the opening. The impingement of the two streams against each other will cause little turbulence if the pressure is relatively slight; however, if the pressure on the stream is around 175 lbs. per square inch or greater, a partial vacuum approximating the form of an inverted V will be formed just above the outer end 11 of the baffle plate by reason of the suction caused by the water passing through the nozzle. This partial vacuum serves to pull parts of the divided streams inwardly toward the surface 11 of the partition and thus causes them to meet "head on." A high turbulence is caused by this meeting of the streams and is of course increased as the velocity of the streams is increased. As a result of this turbulence, the water is broken up into fine particles before leaving the nozzle in the form of a fog or vapor.

The flared ends 4 of the exit opening 3, together with the openings 9 which communicate with such ends, permit the stream of fog or vapor to assume a fan-like form of substantial area which is highly effective in smothering flames. However, if the nozzle is being manually operated and

it is desired to extend the effective length of the stream, this may be done to varying degrees by merely rotating the sleeve 13 to cause it to move outwardly of the tubular member 1. If the sleeve is moved to its extreme outer position, where it projects beyond the outer end of the tube (Figures 3 and 4), the stream of fog or vapor will be of tubular form and will be projected a considerably greater distance than would be the case if the sleeve is retracted to intermediate positions such as shown in Figures 5 and 6 where the stream will be of fan-like form as heretofore mentioned.

While the structure of the nozzle has been described in considerable detail, it will be understood that various minor changes may be made in the structural details without in any way departing from the spirit of the invention and it is intended that all such changes be included within the scope of the appended claims.

We claim:

1. A vaporizing nozzle comprising a tubular body portion, a plate closing the outer end of the body portion and provided with an exit slot, a fixed partition of substantial thickness spaced below said plate, said partition extending longitudinally of the tubular body portion and having a width corresponding to the diameter of said body portion and in substantially the vertical plane of said slot, whereby a stream of fluid passing through the nozzle will be divided into two streams and guided into head-on contact prior to passing through the exit slot.

2. A vaporizing nozzle comprising a tubular body portion, a plate closing the outer end of the body portion and provided with an exit slot, a fixed partition of substantial thickness spaced below said plate, said partition having a flat outer

end and a tapered inner end extending longitudinally of the tubular body portion and having a width corresponding to the diameter of said body portion and in substantially the vertical plane of said slot, whereby a stream of fluid passing through the nozzle will be divided into two streams and guided into head-on contact prior to passing through the exit slot.

3. A vaporizing nozzle comprising a tubular body portion, a plate closing the outer end of the body portion and provided with an exit slot flared at its outer ends, a fixed partition of substantial thickness spaced below said plate, said partition extending longitudinally of the tubular body portion and having a width corresponding to the diameter of said body portion and in substantially the vertical plane of said slot, whereby a stream of fluid passing through the nozzle will be divided into two streams and guided into head-on contact prior to passing through the exit slot.

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