

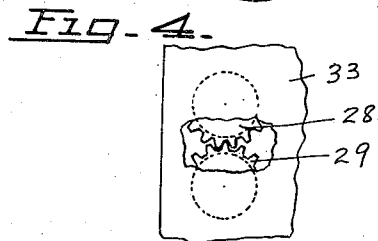
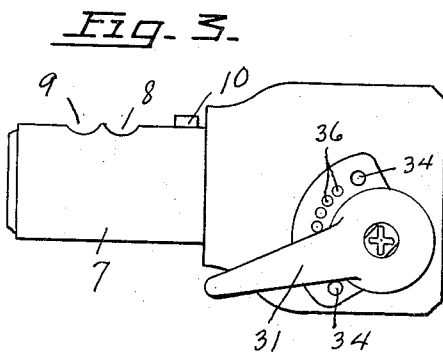
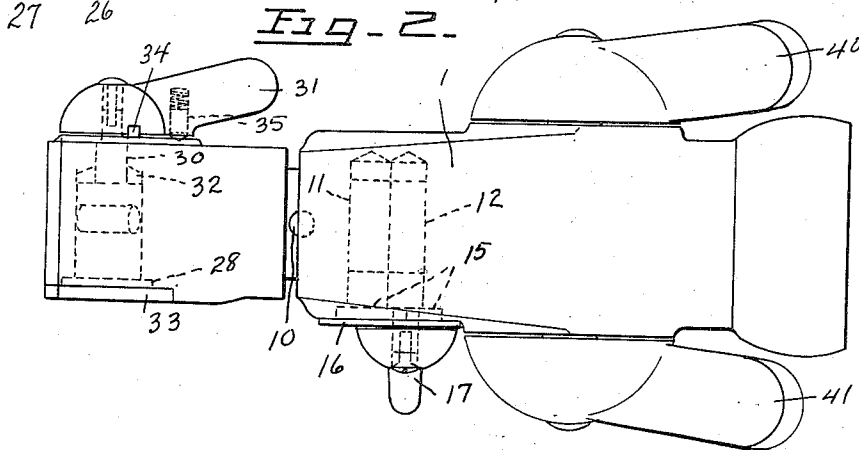
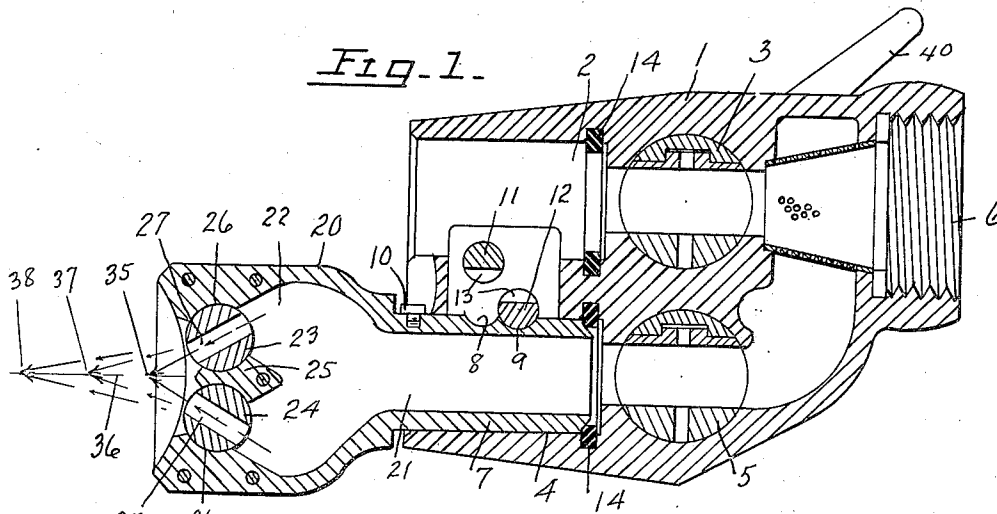
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2,364,848

FOG NOZZLE

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2,364,848

FOG NOZZLE

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7 Claims. (Cl. 299-144)

This invention relates generally to a nozzle for the purpose of extinguishing fires with a liquid such as water, and more specifically to a nozzle of the type in which the liquid or water leaves the nozzle in several streams that are so directed as to impinge against each other to break up the liquid.

One of the objects of this invention is to provide an improved nozzle that is adapted to provide various spray patterns from a wide fan-shaped fog or spray of limited relatively short projection to one in which the projection is materially increased and in which the pattern is narrower.

Another object of the invention is the provision of an improved fog forming nozzle adapted to cause different types of fog to be projected therefrom in which the shape, velocity, and density can be changed as desired, and which fogs or types of fogs are made up of substantially uniform sized evenly distributed particles of moisture.

Another object of the invention is the provision of an improved fog forming nozzle that is adapted to form different fog or spray patterns as desired by the operator without substantially changing the volume of water or liquid discharged from the nozzle.

An additional object is the provision of a nozzle holder and fog forming nozzle, and which holder is provided with a plurality of passageways having discharge openings in which said nozzle is adapted to be fitted and held by improved means independently of threads and the like.

Heretofore fog nozzles of various intricate kinds have been produced, some having elongated stems operating through discharge orifices, and others having fixed angularly directed orifices for causing impingement of streams of water at a fixed point. Apart from the relatively expensive structure required in the former of the above types, the fog patterns are not as satisfactory as is desirable, and the volume ordinarily changes with changes in fog patterns, and also debris or impurities in the water quickly impair their efficiency. Also their operation is relatively awkward and slow generally requiring the rotation of a substantial portion of the nozzle about the longitudinal axis thereof in one direction or the other.

The main objections to the nozzles having fixed angularly directed orifices is that the entire nozzle must be changed to produce desired changes in patterns. By the time such change

is effected the character of the fire may change and the substitution is no longer desirable.

With my nozzle structure the same nozzle is adapted to be quickly adjusted to meet any change in the character of the fire and is adapted to be used in fighting different types of fires with maximum efficiency in each instance.

Other objects and advantages will appear in the drawings and in the specification.

In the drawing, Fig. 1 is a sectional view through my improved nozzle showing it in position in a holder that is provided with controls.

Fig. 2 is a plan view of the nozzle of Fig. 1.

Fig. 3 is a side elevational view of the spray nozzle detached from the holder as seen from the far side of Fig. 1.

Fig. 4 is a fragmentary elevational view, partially broken away, showing the gear connection between the valve elements in the spray nozzle.

The fog nozzle of this invention is preferably separable from a control element such as a main nozzle, although it may be integral therewith as indicated in my co-pending application, Serial No. 452,581, filed July 22, 1943 which has matured into Patent Number 2,342,050.

In the drawing herein I disclose a main valve body, holder or connector 1 that has a passageway 2 therethrough controlled by a valve 3. Also the particular valve body shown herein has a second passageway 4 that communicates at one end thereof with the first. A valve 5 is in said second passageway, and both the first and second passageway have an internally threaded common inlet 6 for connection with a hose, or the like.

My fog nozzle may be formed to be directly connected with a water conduit, or it may have a cylindrical portion 7 adapted to removably fit in the outer end of either passageway 2 or 4. One outer side of said cylindrical portion may have a pair of outwardly opening grooves or concave recesses 8, 9 therein extending transversely across said portion. Also a locating pin 10 may project from one outer side of said cylindrical portion at a predetermined point relative to said recesses. A pair of parallel shafts 11, 12 are rotatable in said body 1 and extend transversely of passageways 2, 4 but between them. These shafts may be cut away at one side, as at 13, thus making them substantially half-rounds at the points where they cross the passageways. These half round portions are so positioned that the cylindrical portion 7 of my fog nozzle may be freely slipped longitudinally thereof into the outer ends of either of said passageways when the flat sides

of the shafts are facing said passageways. However once the said portion 7 is in place with its outer end in tight contact with a shoulder-supported gasket 14 in either passageway, a rotation of the shafts will result in the half round portion on shaft 11 or 12, as the case may be, rotating into recess 8 or 9. Thus the fog nozzle will be securely held in whichever passageway its cylindrical end 7 is positioned.

The shaft 11 is adapted to fit in recess 8 when portion 7 is in passageway 2, while shaft 12 is adapted to fit in recess 9 when portion 7 is in passageway 4, as is shown in Fig. 1.

The shafts 11, 12 may be connected at one of their ends by intermeshing gears 15 secured thereto respectively (Fig. 2) and one of said shafts may project through a gear retaining plate 16 secured to body 1 for carrying a manually actuatable handle 17 for rotating said shafts.

The cylindrical portion 7 of my fog nozzle is integral with a main body 20 and a passageway 21 extends through said portion 7 and body 20. In body 20 said passageway is enlarged as at 22 and it opens outwardly of body 20 at the side of said body opposite portion 7.

A pair of cylindrical members 23, 24 are rotatably supported in body 20 in position alongside each other with their axes parallel and extending across the discharge end of the enlarged portion 22 of passageway 21. A rib 25 integral with body 20 and concave on opposite sides for fitting against adjacent sides of members 23, 24 may extend between said members to space them and to form part of the bearings therefor, while the opposed sides of the main passageway may be concave, as at 26, for fitting against the opposite outwardly facing sides of said pair of members.

Each of the members 23, 24 is formed with a cylindrical bore 27 of the same size extending transversely therethrough, one end of each such bore communicating with the enlargement 22 in passageway 21, while their opposite ends open outwardly of body 20.

The opposite ends of members 23, 24 may be journaled in the body 20. A pair of intermeshing gears 28, 29 or gear segments (Fig. 4) are respectively secured to one of the corresponding ends of each member for rotation of said members simultaneously to the same degree upon rotation of either one of said members. The member 24 may have an axial extension 30 at its end opposite the gears, and which extension is secured to an operating handle 31 that is outwardly of body 20 but closely adjacent thereto. Suitable packing 32 (Fig. 2) may form a seal between said extension and the body to prevent leakage, and a gear plate 33 may be secured by any suitable means to body 20 in position covering gears and also preventing leakage. Of course either member 24 or 25 may be extended for carrying handle 31 according to which is found to be most convenient, but the one that is not so extended is fully enclosed within body 1 so that a single packing 32 together with plate 33 will be all that is required to form a tight seal at the ends of said members 23, 24.

The handle 31 is adapted to be moved in an arc between spaced pins 34 (Fig. 3) projecting from body 1. Friction means comprising a spring urged pin 35 (Fig. 2) carried by handle 31 and recesses 36 (Fig. 3) formed in the body 1 in the path of the outer end of said pin, is provided for holding said handle (and members 23, 24) in

any desired position as the handle is moved between pins 34.

The members 23, 24 may be substantially set in the positions shown in Fig. 1 when handle 31 is against one of the pins 34, and in which positions their axes will intersect at point 35 closely adjacent the body 20 and which point may be on a line 36 parallel with the longitudinal axis of passageway 21. In this position streams of water ejected from said bores will impinge at point 35 and a wide fan shaped fog or spray of limited projection is produced. As the handle 31 is moved toward the opposite pin 34 the axes of bores 27 will successively intersect at points on line 36 outwardly of body 20, as at points 37, 38, etc., and which points are substantially equally spaced from each of the members 23, 24. As the angles between the intersecting axes or impinging streams become more acute, the velocity of the spray produced is increased, hence its projection is greater. Likewise the pattern of the spray or fog is narrower. It will be seen that by continued rotation of members 23, 24 until their bores are substantially parallel, the density of the ejected streams becomes greater until practically a pair of solid streams is produced, and all through these changes there is no restriction in the volume of water conducted through bores 27 and discharged therefrom.

From the foregoing it will be seen that an operator can instantly procure any desired fog or spray pattern desired for the particular fire, or to meet changes in the characteristics of a fire, or to protect himself in an unexpected emergency.

The valves 3, 5 in the body 1, where such body is used, enables the operator to control the volume of flow to said bores 27, and by closing valve 5 and opening valve 3, a solid stream may be ejected from bore 2. Handles 40, 41 may be provided for manipulating valves 3, 5, respectively.

Having described the invention, I claim:

1. A fog nozzle comprising a hollow body provided with a passageway therein opening outwardly from said body at one end thereof for providing an inlet for water, a pair of rotary members in side by side relation supported in said body for rotation about parallel axes, each of said members being formed with a through bore extending transversely of its axis, one of the ends of each of said bores being in communication with the said passageway, the opposite ends of said bores opening outwardly from said body, means connecting said members for simultaneous rotation in opposite directions about their axes, and their said bores being positioned for intersection of their axes at points equally spaced from said parallel axes at various distances outwardly from said body upon said rotation of said members.

2. A fog nozzle comprising a hollow body provided with a passageway therein opening outwardly from said body at one end thereof for providing an inlet for water, a pair of rotary members in side by side relation supported in said body for rotation about parallel axes, each of said members being formed with a through bore extending transversely of its axis, one of the ends of each of said bores being in communication with the said passageway, the opposite ends of said bores opening outwardly from said body, means connecting said members for simultaneous rotation in opposite directions about their axes, and their said bores being positioned for intersection of their axes at points equally spaced from said parallel axes at various distances outwardly from said body upon said rotation of said mem-

bers, the said bores being of substantially the same diameter, and an enlargement in said passageway with which the said one of the ends of each bore communicates.

3. A fog nozzle comprising a hollow body provided with a passageway therein opening outwardly from said body at one end thereof for providing an inlet for water, a pair of rotary members in side by side relation supported in said body for rotation about parallel axes, each of said members being formed with a through bore extending transversely of its axis, one of the ends of each of said bores being in communication with the said passageway, the opposite ends of said bores opening outwardly from said body, means connecting said members for simultaneous rotation in opposite directions about their axes, and their said bores being positioned for intersection of their axes at points equally spaced from said parallel axes at various distances outwardly from said body upon said rotation of said members, the said members being cylindrical and their bores being cylindrical and of the same diameter.

4. A fog nozzle comprising a hollow body provided with a passageway therein opening outwardly from said body at one end thereof for providing an inlet for water, a pair of rotary members in side by side relation supported in said body for rotation about parallel axes, each of said members being formed with a through bore extending transversely of its axis, one of the ends of each of said bores being in communication with the said passageway, the opposite ends of said bores opening outwardly from said body, means connecting said members for simultaneous rotation in opposite directions about their axes, and their said bores being positioned for intersection of their axes at points equally spaced from said parallel axes at various distances outwardly from said body upon said rotation of said members, the means connecting said members being gears having intermeshing teeth, and means for rotating said members comprising a lever secured to one of said members outwardly from said body.

5. A fog nozzle comprising a hollow body provided with a passageway therein opening outwardly from said body at one end thereof for providing an inlet for water, a pair of rotary members in side by side relation supported in said body for rotation about parallel axes, each of said members being formed with a through bore extending transversely of its axis, one of the ends of each of said bores being in communication with the said passageway, the opposite ends of said bores opening outwardly from said body,

means connecting said members for simultaneous rotation in opposite directions about their axes, and their said bores being positioned for intersection of their axes at points equally spaced from said parallel axes at various distances outwardly from said body upon said rotation of said members, means for connecting said nozzle with a source of water under pressure for flow of water to said inlet and passageway, and means adjacent said inlet for controlling such flow of water thereto.

6. A fog nozzle comprising an elongated body provided with a passageway extending there-through longitudinally thereof providing an inlet at one end thereof and an outlet at the opposite end, a pair of cylindrical rotary members extending transversely across said passageway at said outlet and supported in said body in side by side relation with their axes parallel for rotation about the latter, each of said members being formed with a cylindrical bore of the same diameter extending transversely therethrough with one of their ends in communication with said passageway and with their opposite ends opening outwardly from said outlet, means securing said members together for simultaneous rotation with the axes of their bores intersecting each other at points spaced outwardly from said body and in a line parallel with the longitudinal axis of said passageway, and means for so rotating said members.

7. A fog nozzle comprising an elongated body provided with a passageway extending there-through longitudinally thereof providing an inlet at one end thereof and an outlet at the opposite end, a pair of cylindrical rotary members extending transversely across said passageway at said outlet and supported in said body in side by side relation with their axes parallel for rotation about the latter, each of said members being formed with a cylindrical bore of the same diameter extending transversely therethrough with one of the ends of said bore in communication with said passageway and with their opposite ends opening outwardly from said outlet, means securing said members together for simultaneous rotation with the axes of their bores intersecting each other at points spaced outwardly from said body and in a line parallel with the longitudinal axis of said passageway, and means for so rotating said members, said passageway being formed with an enlargement adjacent said members and with which the said one end of each of said bores communicates.

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