Sept. 2, 1941. R. P. PARADISE 2,254,751

HEAD FOR FIRE HOSES AND THE LIKE

Filed July 5, 1938 2 Sheets-Sheet 1

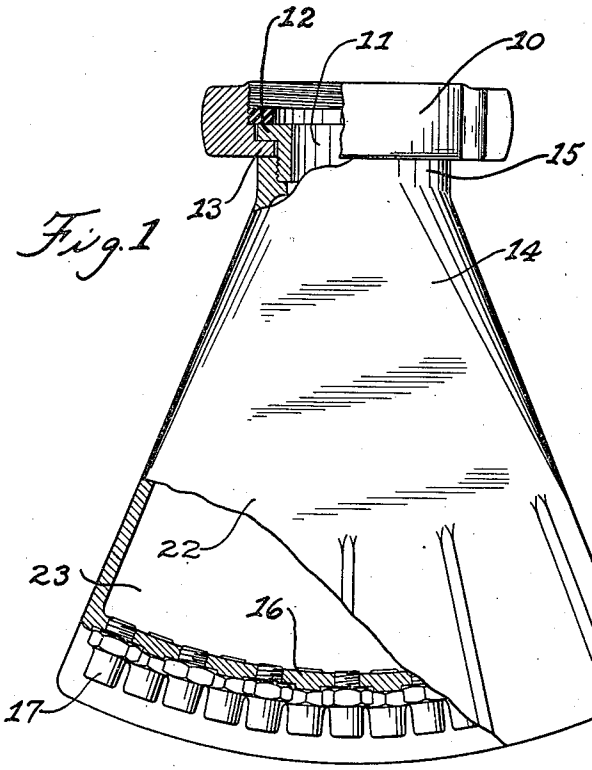


Fig. 1

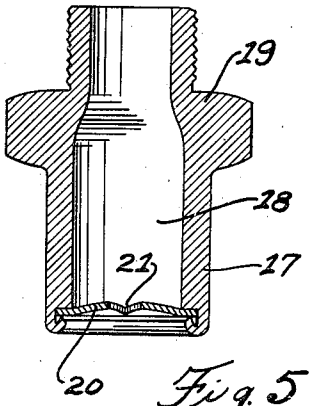


Fig. 5

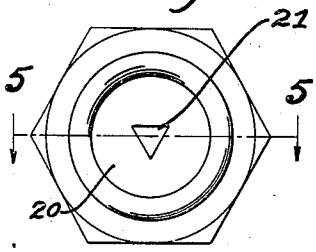


Fig. 4

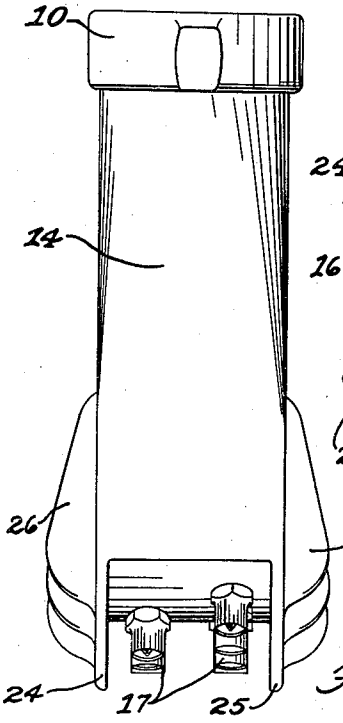


Fig. 2

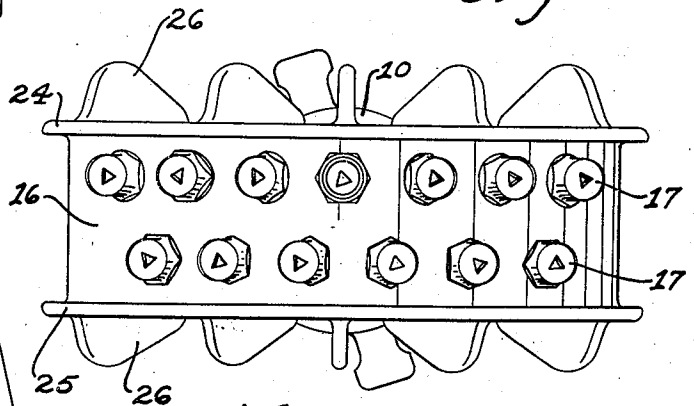


Fig. 3

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HEAD FOR FIRE HOSES AND THE LIKE

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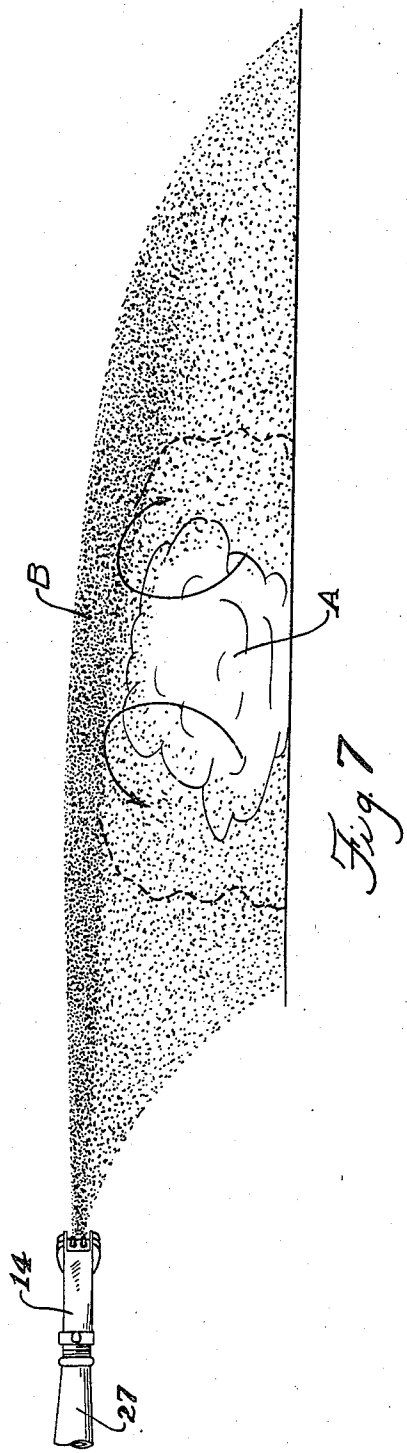


Fig. 7

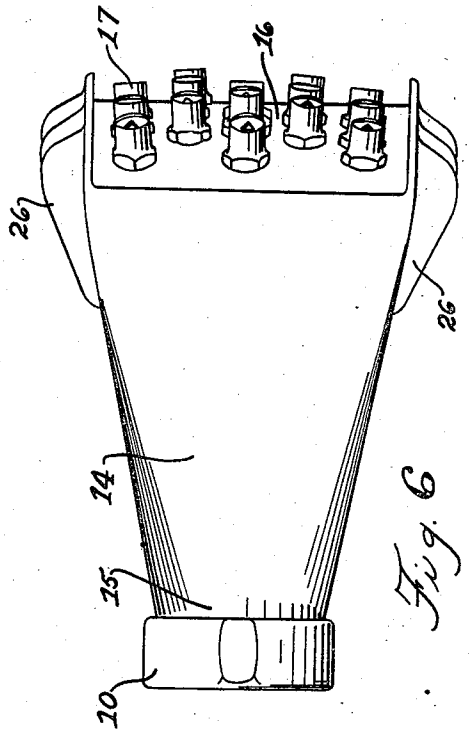


Fig. 6

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HEAD FOR FIRE HOSES AND THE LIKE

Raymond P. Paradise, Indianapolis, Ind.

Application July 5, 1938, Serial No. 217,328

3 Claims. (Cl. 299—141)

This invention relates to a method and means for extinguishing fires resulting from burning oils, tars and the like which preclude the use of a direct stream of water on them.

It is a primary object of the invention to provide a nozzle which will atomize a flow of water under pressure to permit setting up over the fire of a blanket of water of sufficient density as will cut off the natural up draft produced by the heat of the fire but at the same time will not cause any stream of water to come into contact directly with the burning material.

A further important object of the invention is to maintain such a bank or cloud of moisture immediately above the blaze as will permit the heat therefrom to vaporize the moisture from the under-side of that bank to produce a sufficient cloud that will extend down and around the blaze so as to shut off the supply of oxygen and thereby smother out the blaze.

A still further important object of the invention is to provide a very simple nozzle or head which may be easily manipulated to accomplish the above indicated results and be so shaped that a blaze covering a considerable area may be handled and thereby quickly extinguished.

These and many other objects and advantages of the invention will become apparent to those versed in the art in the following description of the invention as illustrated by the accompanying drawings, in which

Fig. 1 is a top plan view of a head in partial section;

Fig. 2, a side elevation;

Fig. 3, a front end elevation;

Fig. 4, a front end elevation on an enlarged scale of a single nozzle;

Fig. 5, a transverse section on the line 5—5 in Fig. 4;

Fig. 6, a side elevation of a slightly modified form of head; and

Fig. 7, a diagrammatic representation of the method of extinguishing a blaze.

Like characters of reference indicate like parts throughout the several views in the drawings.

Referring to Figs. 1–5, a hollow head is formed to have a hose connecting collar 10 swivelly secured to the rear end of the head by any suitable means, herein shown as a bushing 11 screw-threadedly entered within the head and having a flange 12 engaging over the flange 13 of the collar 10.

This rear end of the head, generally designated by the numeral 14, consists of a short cylindrical neck 15 from which the head flares outwardly in a fan-shape to terminate in an outer arcuate wall 16 convexly presented from the outside of the head. The interior of the head 14 has a rectangular cross section at any point between this outer wall and the rear round neck 15.

This curved wall 16 is provided with a plurality of orifices, herein shown as being provided in nipples 17 screw-threadedly entered in holes provided in the wall 16. In the form shown in Figs. 1–5, there are two rows of these nipples 17 and the nipples of one row are staggered in relation to those in the other row. Each of these nipples 17, Figs. 4 and 5, consist of a body having a cylindrical bore 18 therethrough of a major diameter in the outer length and a reduced diameter in the portion which extends through the wall 16. A shoulder 19 is provided around the nipple in each instance to provide a seat against the outer side of the wall 16 and the outer periphery of this shoulder is preferably formed to receive a wrench as a means for positioning and removing the nipples.

In the outer end of each nipple 17 is secured a metal diaphragm 20 relatively thin and cupped to have a concave face presented outwardly. This diaphragm is secured in position across the bore 18 by any suitable means such as by seating the peripheral portion of it against a shoulder and then spinning the outer end of the nipple around against the diaphragm.

A triangular orifice 21 is provided in the center of the diaphragm 20 and the entire nipple, and particularly this type of orifice, conforms exactly with the construction as shown and described in my U. S. Letters Patent No. Re. 19,913, issued March 31, 1936.

Since these nipples 17 project outwardly from the wall 16, and also since the head 14 may be subject to severe usage when in operation, the top and bottom walls 22, 23 respectively of the head 14 are extended beyond the wall 16 to form the protecting aprons 24 and 25 respectively, these aprons terminating a slight distance beyond the outer ends of the nipples 17, as indicated in the drawings. Preferably, although not necessarily, the head is provided with top and bottom reenforcing radial flanges 26 to further reenforce the aprons 24 and 25. The primary purpose of these aprons 24 and 25 is to prevent damage to the nipples 17 should the head be dropped or thrown about.

Referring now to Fig. 7, the head 14 is connected to any suitable pipe or hose line outlet

21 to receive a supply of water or any fire extinguishing material under pressure. The ordinary city pumping pressure is sufficient in most cases to accomplish the desired results. The flow of the fluid through the head 14 carries the fluid through the various orifices 21 in a uniformly distributed manner as relating to the separate nipples 17. As the fluid leaves these orifices 21, it passes therefrom in a very finely divided state in the nature of a fog rather than large drops or solid streams. This fog, as it may be termed, becomes a solid bank by reason of the close proximity of one nipple to the other in one row and this fog bank further takes on a considerable thickness by reason of the second row of nipples. One of the peculiar features resulting from the structure above indicated is that the fluid in the form of the fog will be carried an unbelievably far distance under high velocity from the head without dropping in the form of drops or the like.

Assuming that there is a blaze as represented by the letter A, Fig. 7, the head 14 is so directed that the fog stream is carried in an appreciable thickness over the top of the blaze to have an appreciable amount of the fog drop out beyond the blaze. Of course, this fog is continually settling from the under-side of the heavy moving body of the fog so that the atmosphere all around the blaze A becomes charged with moisture but at the same time does not have any solid streams or visible drops of water in that zone. By reason of the fact that there is a body of the fog of appreciable thickness above the blaze A, the first noticeable result is that the blaze will tend to turn and spread outwardly along the underside of the heavy top zone of fog as indicated by the arrows. This top zone being in lateral motion and also being of appreciable thickness is sufficient to cut off the up draft produced by the heat of the blaze. As the blaze tends to spread out under this top zone designated by the letter B, the heat will tend to vaporize the fog and convert it into steam which will billow outwardly and downwardly around the periphery of the blaze and thereby quickly shut off the supply of oxygen from the outside atmosphere. Of course, the thinner fog appearing around the blaze will further aid in shutting off this oxygen as it is initially drawn in toward the blaze by the flow of air theretoward. This encircling enclosure of steam is indicated by the dash lines surrounding the blaze A in Fig. 7.

The great area of coverage produced by the head 14 results from the fact that the jets 17 have their bores 18 radically disposed to produce a fan-shaped fog spreading quickly horizontally as it leaves the head. This widespread coverage is absolutely essential in order that the heat of the blaze will not cause an up draft to shoot around the outer edges of the heavy upper fog layer. The essential feature of this layer is that it have sufficient density and sufficient motion and still be without any solid water streams that the up draft movement will be effectively cut off and at the same time the water particles be fine enough to be practically instantaneously converted into steam, this steam converting process, of course, reducing the temperature of the medium at the heavy fog layer to further aid in cutting down the up draft.

Referring now to that form of the invention as shown in Fig. 6, the same type of head is formed with the exception that it is provided with a greater vertical depth to carry a greater number of the nipples 17. Where the number of rows of the nipples 17 exceed two, it is preferable that the upper and lower rows at least be directed radially upwardly and downwardly so as to give an increased thickness in the heavy top fog layer, this being the primary purpose of adding rows of nipples as indicated.

While I have herein shown and described my invention in the one best form as now known to me, it is obvious that structural changes may be employed without departing from the spirit of the invention, and I, therefore, do not desire to be limited to that precise form beyond the limitations as may be imposed by the following claims.

I claim:

1. A fire nozzle comprising a body having an internal distributing cavity increasing in horizontal width from an intake end of the body toward its front end; a front wall across said body curving convexly outwardly and provided with a plurality of orifices arranged in two straight line rows horizontally therearound, the orifices in one row being staggered in relation to the orifices in the other row; a nipple secured in each of said orifices and extending outwardly therefrom each on a radial line of the curvature of said front wall to have the axes of the nipples of one row in a horizontal plane parallel to the plane of the axes of the nipples of the other row, said nipples being spaced one from another over said front wall a distance not substantially greater than the diameters of the nipples, each of said nipples being formed to have an initial internal diameter at its inlet end less than its internal diameter therebeyond; and a closure across the outer end of each nipple having a central, axially aligned discharge orifice, the edges of which orifice define an area less than the internal transverse cross-sectional area of the major diameter part of the nipple.

2. A fire nozzle comprising a body having an internal distributing cavity increasing in horizontal width from an intake end of the body toward its front end; a front wall across said body curving convexly outwardly and provided with a plurality of orifices arranged in two straight line lows horizontally therearound, the orifices in one row being staggered in relation to the orifices in the other row; a nipple secured in each of said orifices and extending outwardly therefrom each on a radial line of the curvature of said front wall to have the axes of the nipples of one row in a horizontal plane parallel to the plane of the axes of the nipples of the other row, said nipples being spaced one from another over said front wall a distance not substantially greater than the diameters of the nipples, each of said nipples being formed to have an initial internal diameter at its inlet end less than its internal diameter therebeyond; and a closure across the outer end of each nipple having a central, axially aligned discharge orifice, the edges of which orifice define an area less than the internal transverse cross-sectional area of the major diameter part of the nipple; and a top and bottom lip each extending forwardly of said front wall, and spaced above and below said nipples sufficiently to be removed from contact with flow from said nipples.

3. A fire nozzle comprising in combination a fan-shaped head having an intake at its smaller end entering into a chamber in the head diverging horizontally outwardly and forwardly of the intake end; a front wall defining the forward

enclosing end of said chamber curving by its inner and outer faces convexly outwardly, a plurality of orifices in said wall spaced horizontally in line around the wall to have the orifice axes on lines radial of the wall curvature, a plurality of orifices on a line below the line of the first orifices and having their axes also on lines radial of said wall curvature, the axes of the orifices in one row being parallel to the axes of the orifices in the other row, the orifices in one row further being staggered between orifices in the other row, and a nipple in each of said orifices having the nipple axis aligned with its orifice axis, said nipple having a bore expanded in cross-sectional area toward its outer end in comparison to its inlet end, and each nipple having a discharge end, concavely curved wall through which is an axially aligned triangular orifice defining an opening less in area than said expanded area in the nipple.

RAYMOND P. PARADISE.