

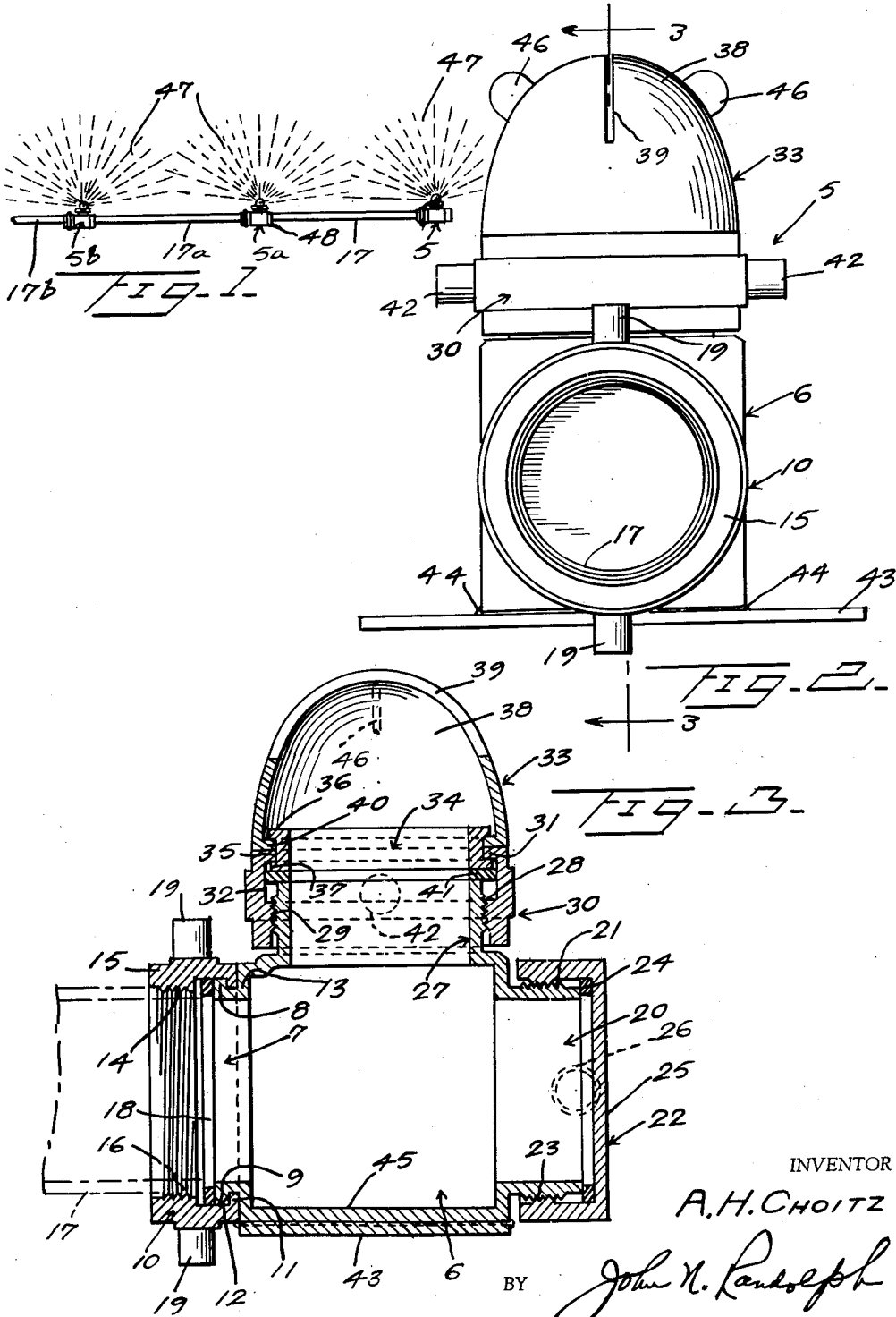
May 8, 1962

A. H. CHOITZ

3,033,470

WATER CURTAIN FORMING SPRAY NOZZLE

Filed Feb. 17, 1961



INVENTOR

A. H. CHOITZ

BY *John N. Landseph*
ATTORNEY

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3,033,470

WATER CURTAIN FORMING SPRAY NOZZLE

Arthur H. Choitz, Ellsworth, Kans.
(2400 Cheyenne Drive, Great Bend, Kans.)
Filed Feb. 17, 1961, Ser. No. 90,055
1 Claim. (Cl. 239—267)

This invention relates to a spray nozzle primarily adapted for use in fighting fires to protect firemen from the heat and smoke of a fire, to prevent spreading of a fire to adjacent structures and to protect such adjacent structures from the heat of the fire, and for confining a fire.

More particularly, it is an object of the present invention to provide a nozzle capable of being attached to a water hose for creating a substantially semicircular spray or water curtain, and which is so constructed that the nozzle may be used singularly or in series.

Still a further object of the invention is to provide a spray nozzle the head of which can be adjusted so that a water curtain or spray emitted therefrom may be disposed in a plane substantially parallel to the hose, supplying water to the nozzle, crosswise of the hose or at any other desired angle relative thereto.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawing, illustrating a presently preferred embodiment thereof, and wherein:

FIGURE 1 is a side elevational view on a reduced scale showing a plurality of nozzles connected in series to sections of hose to form an elongated water curtain;

FIGURE 2 is an enlarged end elevation view of the nozzle, looking toward the inlet end thereof, and

FIGURE 3 is a vertical sectional view taken substantially along the line 3—3 of FIGURE 2.

Referring more specifically to the drawing, the water curtain forming spray nozzle in its entirety is designated generally 5 and includes a hollow body 6 of inverted T-shape, as seen in FIGURE 3. The body 6 has a nipple at one end thereof constituting the inlet of the nozzle 5. The nipple 7 has an outturned annular flange 8 at its outer end which engages in the inner end of an annular internal groove 9 of a coupling nut 10. The nut 10 has an annular inwardly projecting flange 11 at its inner end which forms the inner end wall of the groove 9 and which fits turnably in an annular outwardly opening groove 12 of the body 6. The groove 12 is formed in the nipple 7 between the flange 8 and an annular wall 13 of the body 6 which surrounds the inner end of the nipple 7.

The nut 10 has an internally threaded portion 14, located between its outer end 15 and the groove 9, to receive an externally threaded nipple 16 on the outlet end of a length of hose 17. The flange 8 fits turnably in the inner end of the groove 9, which groove is substantially wider than the flange to accommodate a washer or annular sealing gasket 18 which is clamped between the flange 8 and the end of the hose nipple 16, as seen in FIGURE 3, when the nut 10 is rotated relative to the body 6 for advancing and tightening the hose nipple 16 therein. The nut 10 is preferably provided with outwardly projecting lugs 19 which may be engaged by a conventional turning tool, not shown, for tightening the nut on the nipple 16.

The other end of the nozzle body 6 is provided with an outwardly projecting male nipple 20 which is disposed in alignment with the inlet nipple 7 and which is externally threaded, as seen at 21. As seen in FIGURE 3, the male nipple 20, which constitutes one discharge nipple of the body 6, may be closed and sealed by an internally threaded cap 22, the threaded portion 23 of which threadedly engages the nipple thread 21. The cap 22 has a washer or sealing gasket 24 which is clamped be-

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tween the outer end of the nipple 20 and the end wall 25 of the cap 22, when the cap is tightened on said nipple 20. The cap 22 may be provided with radially projecting lugs 26, corresponding to the lugs 19, only one of which is shown, and for the same purpose as said lugs 19, as previously described.

The body 6 includes an upstanding discharge nipple 27, located between the nipples 7 and 20 and having an externally threaded portion 28 engaged by an internally threaded portion 29 of a nut 30, which substantially corresponds to the nut 10. The nut 30 has a flange 31 at its outer end, corresponding to the flange 11, and an annular internal groove 32, corresponding to the groove 9, and which groove 32 is located between the flange 31 and threaded portion 29.

A substantially dome-shaped spray head 33 is mounted on and swivelly connected to the nut 30 by a collar 34 having an annular outwardly opening groove 35 located between annular outwardly projecting end flanges 36 and 37. The spray head 33 is hollow and includes a substantially hemispherical outer or upper portion 38 which is provided with a substantially semicircular slot 39. The open inner or lower end of the spray head 33 is defined by an annular inturned flange 40 which fits tightly in the upper portion of the groove 35 above the flange 31 which also engages said groove. The flange 40 may be turned inwardly to engage under the upper collar flange 36 and the lower collar flange 37 can be turned outwardly and thus formed, after the flange 31 is positioned around the collar 34 and against the underside of the flange 40. A sealing washer or gasket 41 is disposed in the groove 32 below the collar 34 and is clamped between said collar and the outer end of the nipple 27 when the nut 30 is tightened on said nipple. The nut 30 has lugs 42 for the same purpose as the lugs 19. The dome portion 38 has outwardly projecting lugs or ears 46, located on opposite sides of and spaced from the slot 39 and forming finger holds for turning the head 33 with the collar 34 and relative to the nut 30, when said nut is loosened on the nipple 27. The flange 31 fits loosely in the groove 35 so that this can be accomplished; however, when the nut 30 is tightened to clamp the washer 41 between the nipple 27 and collar 34, the collar 34 is held from turning relative to the nut and nipple and thus retains the spray head 33 against rotation.

A substantially flat base plate 43 is secured as by welding, as seen at 44, to the flat bottom portion 45 of the body 6, between the nipples 7 and 20, and extends outwardly from opposite sides of said body 6 and is adapted to rest on a supporting surface and to prevent overturning of the nozzle.

The nozzle 5 may be attached to the discharge end of a length of hose 17, as seen in FIGURE 3, which hose at its opposite end is connected to a source of water supply under pressure, not shown. The slot 39 may be positioned longitudinally of the hose 17, as seen in FIGURE 3, or at any desired angle relative thereto, depending upon the disposition of the hose relative to a fire and where it is desired to locate a protective water curtain. When water is supplied under pressure to the nozzle 5 through the hose 17, a substantially semicircular or fan-shaped curtain of water, designated 47, and as seen in FIGURE 1, will be emitted through the slot 39. The nozzle 5 may be made in various sizes to fit hoses of different diameters, and the height and length of the water curtain will vary depending upon the size of the hose and nozzle and the pressure of the water. The length of the water curtain or spray 47 will be approximately two and one-half times the height thereof at its vertical center.

FIGURE 1 shows a plurality of the nozzles utilized in series to form a continuous water curtain and with sections of hose interposed between the nozzles. When thus utilized, the nozzle most remote from the water source

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will have the cap 22 applied, whereas the caps 22 will be removed from the nipples 20 of the other nozzles which will then receive a conventional female hose coupler. For example, a nozzle 5a is shown attached to the other end of the hose 17 by the female coupler 48 thereof engaging the discharge nipple 20 of the nozzle 5a for connecting the nozzle 5 to the nozzle 5a through the hose 17. The nozzle 5a is similarly connected to a nozzle 5b by a hose 17a, and a hose 17b, leading to the nozzle 5b, may be connected to a source of water supply under pressure or to another nozzle, not shown. The hose sections 17 and 17a are each of a length approximately equal to the length of the sprays 47 emitted from each nozzle, so that the three nozzles will provide a substantially continuous water curtain which can be located alongside of a fire and in close proximity thereto, to enable firemen to fight the fire from behind the water curtain and to be protected thereby from the heat, flames and smoke. The water curtain can also be utilized in this manner to protect an adjacent building or structure by locating the water curtain formed by the nozzles between the fire and the structure to be protected. Additionally, two series of nozzles with their connecting hoses may be positioned parallel to one another so as to straddle a fire, such as a truck carrying an inflammable material and which is on fire, for confining the fire between the two parallel water curtains. By locating the water curtains parallel to the direction of the wind, the smoke and heat will be forced to move only downwind of the fire between the water curtains or substantially vertically upward.

Various modifications and changes are contemplated and may be resorted to, without departing from the function or scope of the invention as hereinafter defined by the appended claim.

I claim as my invention:

A water curtain forming spray nozzle comprising a hollow body portion having an inlet, means connected to said inlet for detachably fastening the discharge end

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of a water conduit thereto and with the inlet disposed in alignment with said discharge end, said nozzle body having an upstanding discharge nipple disposed at an angle to said inlet, a nut threadedly connected to said discharge nipple, a hollow spray head having a dome-shaped outer portion provided with a substantially semicircular slot and an inner portion having an inturned annular flange, a collar having an annular outwardly opening groove in which said flange is nondetachably secured for anchoring the collar to the spray head, said nut having an outer end provided with an annular inturned flange disposed beyond the discharge nipple and turnably fitting in said groove for swivelly and nondetachably connecting the collar and spray head to the nut for rotatively adjusting the spray head relative to the nipple, a washer disposed within the nut and clamped between the collar and discharge nipple when the nut is tightened for sealing the joint between the nut and collar and for securing the collar nonrotatively to the nut, said slot constituting the outlet of the nozzle for emitting a substantially semicircular or fan-shaped spray forming a water curtain when water is supplied under pressure to the nozzle, and said body portion having a substantially flat base adapted to rest on a substantially horizontal supporting surface for positioning the spray head in an upright position with the slot thereof disposed in a vertical plane and facing upwardly, said nut being internally enlarged adjacent the inturned flange thereof to define a chamber in which said washer is detachably confined.

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