April 4, 1944. W. R. HARRIMAN 2,345,813

NOZZLE

Filed Aug. 15, 1942

Fig. 1.

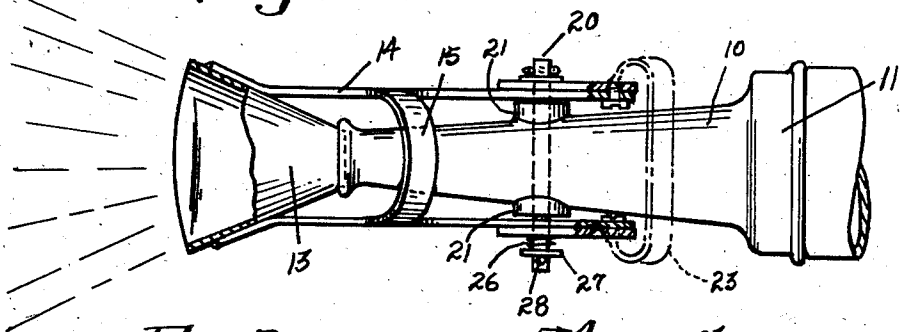


Fig. 2.

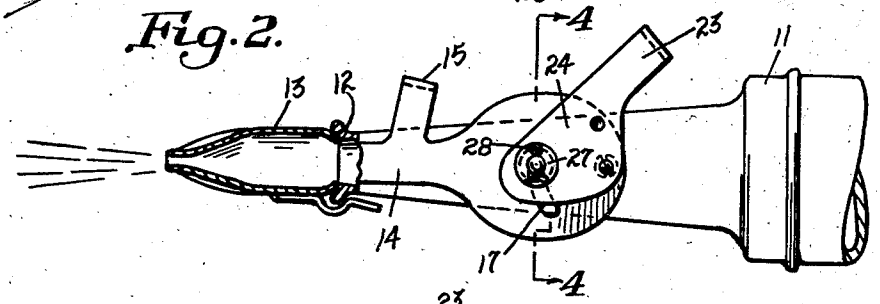


Fig. 3.

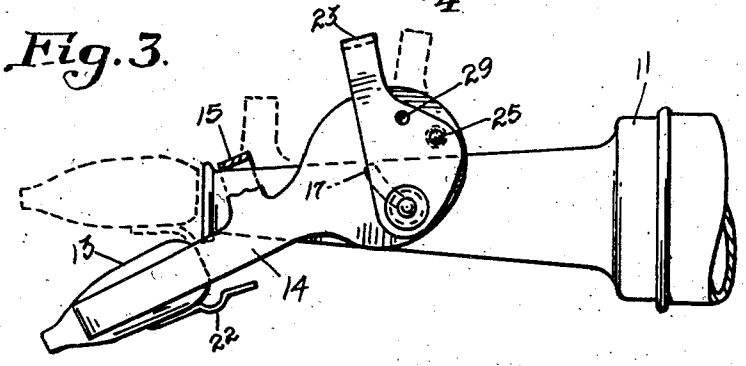


Fig. 4.

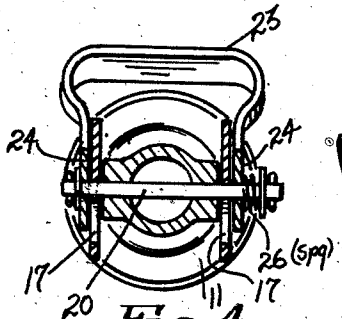
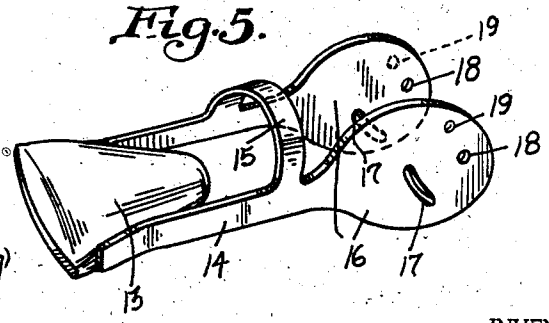


Fig. 5.



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NOZZLE

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Application August 15, 1942, Serial No. 454,959

7 Claims. (Cl. 299—135)

The present invention relates generally to hose nozzles such, for example, as those used in connection with fire hose which normally throw a solid cylindrical stream of water, and has for its primary object to provide a supplemental spray head so associated with the nozzle that it may be quickly shifted between active and inactive positions, and when in active position, will serve to convert the discharge from a stream to a spray for the effective control of incendiary bombs and other uses where a spray, rather than a solid stream, is desirable.

According to the invention, and without regard to the particular character or shape of the spray, a spray head is mounted to swing into and out of axial alignment with the discharge end of the nozzle, and to shift axially into and out of said nozzle end when alined therewith, it being a further object to provide a lever arrangement whereby the swinging and shifting movements, either to or from active position may be accomplished by a single continuous movement of a control handle.

The invention may be better understood and more thoroughly appreciated in the course of the following description in detail thereof, and by reference to the accompanying drawing, which illustrates the same and forms a part of this specification, and in which,

Fig. 1 is a top plan view of a nozzle equipped with my improved spray head and its control parts, certain portions being broken away and in section.

Fig. 2 is a side elevation thereof, partly broken away and in section, showing the spray head in active position.

Fig. 3 is a similar view, with the spray head in inactive position.

Fig. 4 is a cross sectional view taken substantially on line 4—4 of Fig. 2, and

Fig. 5 is a detail perspective view of the spray head and its supporting bracket, removed.

Referring now to the above described figures of the drawing, a cylindrical tapering nozzle 10 is plainly shown with a hose socket 11 at its larger end, and with an internal, annular groove 12 at its smaller or discharge end to receive the conformably shaped adjacent or inner end of a spray head 13.

The spray head 13 is, in the present instance, shown as of fan shape, with a curved, flattened discharge mouth. This shape is admirably suited to the spraying of magnesium and other incendiary bombs and for throwing a protective water wall between workers and adjacent flaming areas, but it is to be understood the spray head may be otherwise shaped for various specific purposes without departing from the spirit of the present invention.

The spray head 13 is plainly shown in Fig. 5 as supported by, and between, the forward ends of a pair of side arms 14 constituting parts of the supporting bracket of the head, and connected intermediate their ends by an upper curved yoke 15. At their rear ends, the side arms carry enlarged flat ears 16 in which are formed inclined, arcuate slots 17, the upper ends of which are approximately in line with the longitudinal centers of the arms 14. Rearwardly of the slots 17 the ears 16 have pivot openings 18, and above these openings the outer surfaces of the ears are provided with indentations 19.

Diametrically through the nozzle 10 intermediate its ends, a pivot shaft 20 is mounted so that its projecting ends extend, as trunnions, beyond side saddles 21 and through the arcuate slots 17 of the spray head bracket ears 16, it being noted that the relative distance between the spray head 13 and the slots 17 is such that when the shaft ends are at the upper ends of the slots the rear cylindrical end of the spray head 13 is seated in the internally grooved discharge end 12 of the nozzle as seen in Figure 2. When the ears 16 are shifted upwardly and the shaft ends are at the lower ends of the slots 17, the spray head 13 is shifted forwardly beyond the nozzle end, as seen in dotted lines in Figure 2, by reason of the inclination of the slots.

The spray head 13 and its bracket are swingable on the shaft ends between a position in axial alignment with the nozzle 10, as in Figures 1 and 2, and an inclined position sufficiently below the discharge end of the nozzle, as in Figure 3, to clear the latter for its normal discharge of a solid stream of water. The upper yoke 15 forms a limiting stop for downward swinging movement of the spray head, while the latter is preferably provided with a lower stop arm 22 to limit its upward swinging movement by engagement with the nozzle.

A bail handle 23 straddles the side ears 16 of the spray head bracket and is apertured at its lower side portions 24 to receive the ends of shaft 20 on which it swings forwardly and rearwardly above the nozzle 10. Pivot members 25 extend through said side portions 24 and through the ear apertures 18 so that as the handle 23 is swung forwardly from the rear position of Figure 2, its initial movement shifts the ears 16 upwardly, thrusting the spray head and its bracket for-

wardly and free of the nozzle end, until the lower ends of the slots 17 engage the shaft 20 whereupon the handle and spray head bracket swing as a unit to the position of Figure 3 until the yoke 15 moves downwardly into engagement with the nozzle.

The side portions 24 of the control handle 23 are in flatwise contact with the outer surfaces of the ears 16 and preferably tensioned in such contact by a small coil spring 26 on one or both ends of shaft 20 between its end fastenings and the handle sides 24. These end fastenings are here shown as washers 27 and cotter pins 28, but may obviously be nuts threaded on the shaft ends. Above the pivot members 25, the sides 24 of the control arm 23 have inwardly indented friction members 29 so positioned that when, in the foregoing movement to shift the spray head from the active position of Fig. 2 to the inactive position of Fig. 3, the lower ends of slots 17 engage shaft 20, the members 29 move into the indentations 19 of the bracket ears.

Thus the control arm 23 and bracket are frictionally engaged when the spray head is in the inactive position of Fig. 3 so that when it is to be shifted to active position the initial rearward swinging movement of control handle 23 causes the upward swing of the spray head and bracket with it until stop piece 22 contacts the nozzle 10. This arrests further upward swing of the bracket so that the further rearward swing of the handle causes downward shifting of the ears 16 and thus shifts the bracket rearwardly to enter the rear end of the spray head 13 within the nozzle groove 12.

It is obvious that through the foregoing operative connection and relation of the control handle and spray head bracket, the spray head may be shifted from active to inactive positions and vice versa, by continuous forward and rearward swinging movements of the control handle, and that both operations may be accomplished effectively and approximately instantaneously.

While I have illustrated and described what I now regard as the preferred embodiment of my invention, the construction is, of course, subject to modifications without departing from the spirit and scope of my invention. I, therefore, do not wish to restrict myself to the particular form of construction illustrated and described, but desire to avail myself of all modifications that may fall within the scope of the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In combination with a nozzle, a spray head therefor which, in its active position, seats in connection with the discharge end of the nozzle, a support for said head having side members at opposite sides of the nozzle, provided with inclined arcuate slots, pivot members extending diametrically from the nozzle through said slots, a bail handle having its side members pivotally swingable on said pivot members, and in frictional contact with the slotted portions of said support, and pivotal connections between said side members of the handle and the side members of the support at points spaced from the said pivot members.

2. In combination with a nozzle, a spray head therefor which, in its active position, seats in connection with the discharge end of the nozzle, a support for said head having side members at opposite sides of the nozzle, provided with inclined arcuate slots, pivot members extending diametrically from the nozzle through said slots, a bail handle having its side members pivotally swingable on said pivot members, pivotal means connecting the side members of the handle and the support at points substantially spaced from the pivot members, and means holding the pivoted side members in close frictional contact independently of said pivotal means.

3. In combination with a nozzle having a pivot shaft, a spray head for the discharge end of said nozzle, a support for said head having inclined arcuate slots receiving said shaft for constraining movements of the head swingably and axially relative to the nozzle, and a control handle pivoted on said shaft and having a pivotal connection with said support, spaced from said shaft, for swinging and shifting the support.

4. In combination with a nozzle having a pivot shaft, a spray head for the discharge end of said nozzle, a support for said head having inclined arcuate slots receiving said shaft for constraining movements of the head swingably and axially relative to the nozzle, a control handle pivoted on said shaft and having a pivotal connection with said support at a point spaced from the shaft, and means maintaining portions of said support and said handle in frictional engagement independent of said pivotal connection.

5. In combination with a nozzle having a discharge mouth, a spray head having a portion for movement into and out of said discharge mouth, means in connection with said spray nozzle having a pivot on the nozzle and movable relative to said pivot for constraining the head to swinging movements into, and out of line with the nozzle and axially shifting movements relative to the nozzle into, and out of, said discharge mouth, and a control handle swingably mounted on said spray head pivot and having a portion in frictional contact, and pivotal connection, with a portion of said spray head for swinging and axially shifting the latter relative to the nozzle.

6. In combination with a nozzle having a discharge mouth and also having laterally projecting pivot members, a spray head shiftable laterally and axially to and from an engaged position within the discharge mouth of the nozzle, a support carrying said head and having inclined arcuate slots receiving said pivot members, a control handle swingably mounted on said pivot members, and means creating frictional connection between the handle and the support, at points spaced from the said pivot members and arranged to aline with the latter axially of the nozzle when the spray head is in engaged position within the nozzle mouth to thus create a toggle locking action.

7. In combination with a nozzle having a discharge mouth, a spray head which, in active position aligns with, and seats within, the discharge mouth of the nozzle, a swinging and axially shiftable support for said spray head pivoted on the nozzle and also movable relative to its pivot, means for checking swinging movements of the said support, a control handle swingably mounted on said pivot of the support and in frictional engagement with the support constraining said handle and said support to swinging movement in unison within the limits of swinging movement of the support, and a pivotal connection between said handle and said support for moving the latter relative to its pivot during swinging movements of the handle beyond the limits of swinging movements of the support.

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