Dec. 8, 1931. F. E. HANSEN 1,835,865

NOZZLE

Filed March 6, 1930

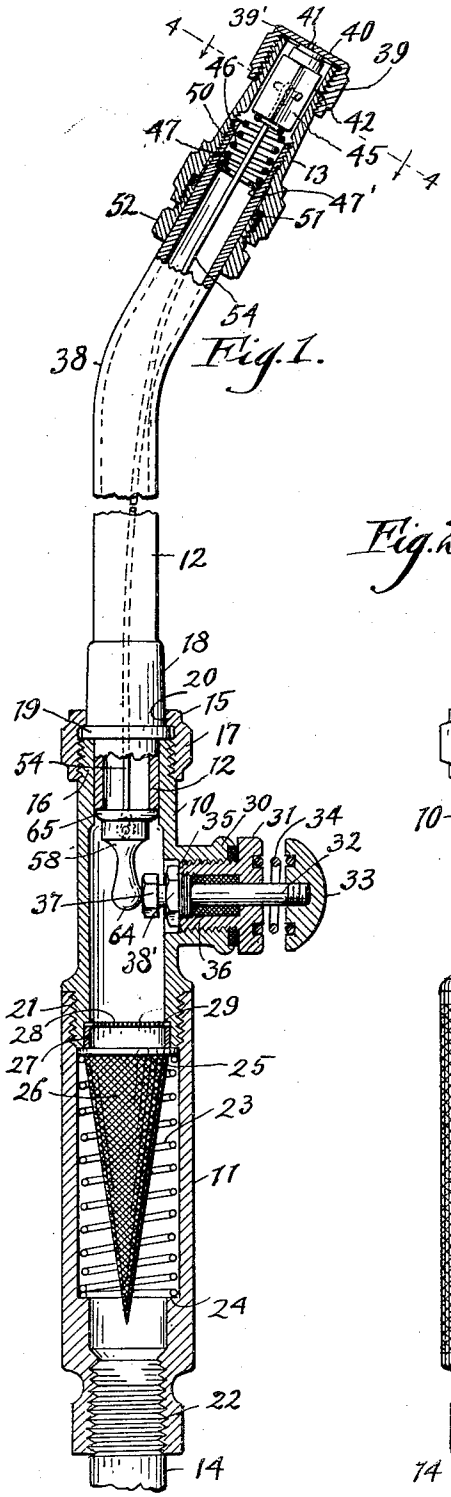

Fig. 1.

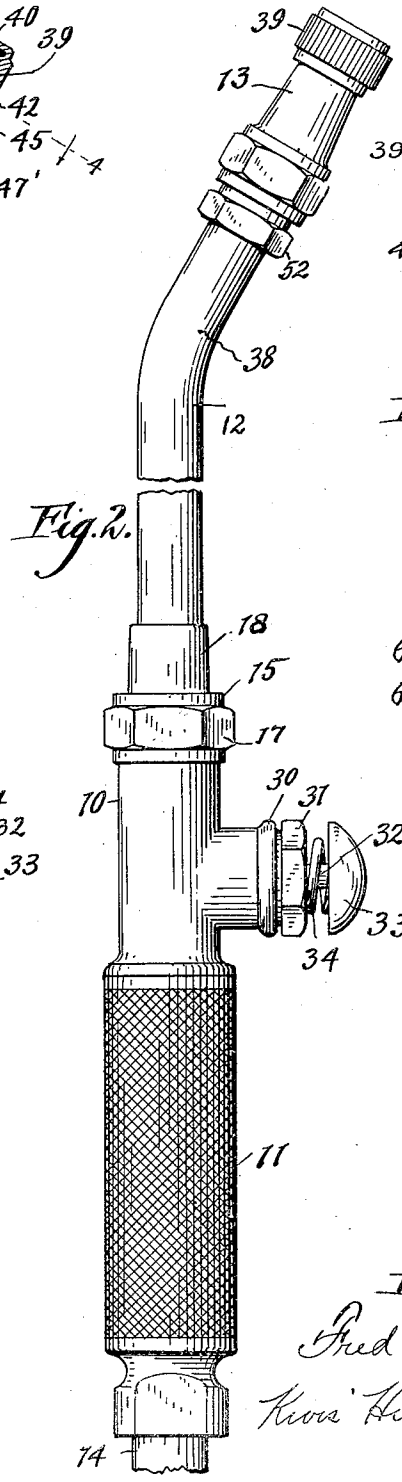

Fig. 2.

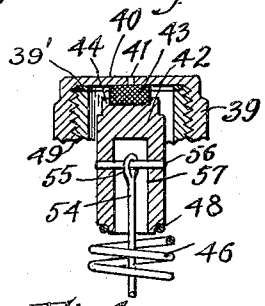

Fig. 3.

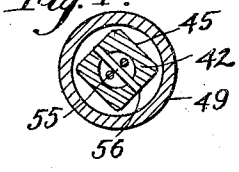

Fig. 4.

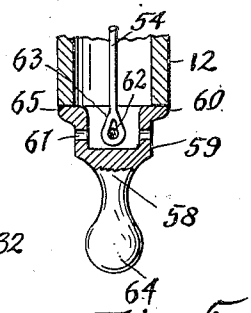

Fig. 5.

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UNITED STATES PATENT OFFICE

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NOZZLE

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This invention relates to nozzles and more particularly to a device that is adapted to be used for spraying lubricant on vehicle springs, and for other analogous uses.

It is an object of the invention to provide an efficient and comparatively inexpensive device for the purpose specified, and that will be convenient to use and easy to operate.

In a device heretofore used for this purpose, a valve has been provided, with a passage leading therefrom to the discharge aperture but this arrangement has been unsatisfactory because there was no pressure in the passage and after the valve was opened, the fluid had to traverse the passage to the aperture before any fluid could be discharged. Furthermore, when the valve was closed, fluid remained in the passage, which could drip out and waste, as well as spread over the surface of the device to interfere with handling thereof.

It is therefore an object of the present invention to provide a device of this character with a valve at the extreme end of the discharge passage, whereby the passage may be full of fluid under pressure, resulting in instantaneous flow when the valve is opened, and no passage is left beyond the valve to contain fluid and cause undesirable dripping when the valve is closed.

Another object is to provide a simple and convenient remote control means for the nozzle valve.

A further object is to provide a swiveled nozzle having an angularly disposed discharge end, with means for operating the valve in any position of the angularly disposed end.

Other objects of the invention and features of novelty will be apparent from the following description as taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a longitudinal section through a nozzle of the character described, according to the preferred embodiment of the present invention;

Fig. 2 is an elevation of the structure shown in Fig. 1;

Fig. 3 is an enlarged longitudinal section of the tip portion of the structure;

Fig. 4 is a transverse section taken along the line 4—4 of Fig. 1; and

Fig. 5 is an enlarged detail of parts of the remote control mechanism for the nozzle valve.

Referring more particularly to the drawings, the nozzle comprises a body member 10, a handle 11, a conduit member 12 and a nozzle tip 13. The body member 10 and handle 11 serve to connect the conduit member 12 with a source of fluid under pressure, such as the flexible supply hose 14. The handle 11 forms a grip by which the jet from the nozzle trip 13 may be directed.

The body member 10 is preferably a hollow T-shaped casting swivelly connected as at 15 to the conduit member 12. One branch of the T is threadedly connected as at 16 with a collar 17. A flanged member 18 is carried by the conduit 12, the flange 19 thereof being rotatably received between the end of the threaded portion 16 and the flange 20 of the collar 17, thus forming the desired swivel.

The opposite branch of the member 10 is threadedly connected as at 21 with the hollow cylindrical handle 11, the outer end of which has a threaded connection 22 to receive the coupling for the hose 14.

One end of a helical spring 23 abuts a shoulder 24 in the bore of the handle 11, and the other end thereof urges a ring member 25 against the end of the threaded portion 21. The ring member 25 carries a conical screen 26, the apex of which is directed toward the source of a fluid supply under pressure. On the other side of the ring 25 there is a ring 27 which engages a disc screen 28, and the spring 23 also serves to hold the disc screen 28 between the flange 27 and an internal shoulder 29 of the bore in the body portion 10.

A lateral branch 30 of the T member is threaded to receive a bored plug 31, the bore of which slidably receives a stem 32 having an operating head 33, a spring 34 being interposed between the plug 31 and the head 33. The inner end of the bore is enlarged and tapped as at 35 to receive a packing 36 and nut 38′, thus forming a stuffing box for the slidable stem 32. The inner end of the

stem 32 has a head 37 which co-operates with a part of the control mechanism to be later described.

The liquid conduit member 12 comprises a pipe which is bent intermediate its ends as at 38 and, by virtue of the swivel 15, the member 12 may be rotated relative to the body 10 to project the liquid jet in different directions from the end of the nozzle and thus permitting the member 12 to be so positioned as to enable the device to be held in a convenient position in directing the jet into parts or regions which might otherwise be difficult of access. Beyond the bent portion 38 the conduit member 12 terminates in the tip 13 hereinbefore referred to. The tip comprises a threaded cap 39 having a thin outer wall 40 in which is provided a very small aperture 41, which forms the orifice through which the jet is projected.

A valve member 42 is mounted inside the wall 40 and is provided with a washer 43 adapted to engage the inner surface of the wall 40 and completely close the aperture 41. The washer 43 is received within a recess formed by the flange 44 on the valve member 42. The member 42 is of polygonal cross section as shown at 45, to afford passages for the fluid around the valve member.

A helical spring 46 normally urges the valve member 42 into position to close the aperture 41. The inner end of the spring 46 is supported by a disk 47 which is carried by an internal shoulder 47′ in the bore of the member 12, and the other end of the spring engages a boss 48 formed on the valve member 42.

The outer end of the tip 13 is threaded to receive the cap 39 and a gasket 39′ is provided to make a tight joint. The inner end of this tip 13 is adjustably secured to the member 12 by a threaded connection 50 and is enlarged to receive a packing 51 and a gland nut 52 which is sleeved on the member 12 and has a threaded engagement with the tip 13.

For operating the valve 42 by means of the control head 33, a preferably flexible element 54 carries a loop 55 at its outer end which is arranged in a bore 57 in the valve 42 and attached to a pin 56 carried by the valve 42. The flexible element 54 extends through the member 12 and the swivel connection 15 and into the body member 10.

The inner end of the flexible element 54 is connected to a trigger member 58 by means of which the same may be operated from the control head 33. The member 58 comprises a cup portion 59 having a flange 60 of slightly smaller diameter than the internal bore of the member 10, and adapted to rest against the inner end of the member 12. The cup portion 59 is provided with a plurality of holes 61, and a pin 62, which receives a loop end 63 of the flexible control element 54. Integral with the cup portion 59 is an arm 64 which is formed as a surface of revolution and engages the head 37.

In operation, assuming that the threaded connection 22 has been made with the source of fluid under pressure in the hose 14, the liquid will fill the bore of the handle 11, passing through the conical screen 26 and the secondary disc screen 28, and will also fill the interior of the body member 10. The holes 61 permit the liquid to fill the member 12, and the space around the valve 42, being prevented from escaping through the orifice 41 by the valve. The device being grasped by the handle 11, the same may be directed as desired and by virtue of the swivel 15 the bent outer end of the conduit member 12 may be turned to direct the jet in the desired direction. The head 33 may be depressed by the thumb of the hand grasping the handle 11, causing the trigger 58 to be tipped about the point 65 on the flange 60, which fulcrums on the shoulder formed by the inner end of the member 12. Thus a pull is exerted on the flexible element 54 which will draw the valve 42 away from the cap 39 and permit the liquid to flow through the orifice 41. By virtue of the surface of revolution provided on the arm 64 this action will be the same for all positions of adjustment of the member 12.

Release of the head 33 will permit the spring 46 to effect reverse operation of the parts and close the valve 42, the spring 34 serving to restore the head 33 to its original position. The tip 13 may be rotated to accurately position the wall 40 in engagement with the washer 43, and locked, in any position to which it is adjusted, by means of the nut 52.

From the foregoing description it will be apparent that the present invention permits the entire device to be filled with liquid under pressure, and causes instantaneous projection of a full jet as soon as the valve is opened, inasmuch as the valve for controlling the fluid is located at the orifice of the nozzle tip. It is also apparent for the same reasons that when the valve is closed, the jet is cut off instantaneously, and there are no passages beyond the valve to retard or delay the jet, or accumulate fluid and cause undesirable dripping.

While one embodiment of the invention has been illustrated and described in sufficient detail to enable any one skilled in the art to practice the invention, it is to be understood that the invention is not limited to any of the details disclosed, other than as necessitated by the development of the prior art, but instead the invention includes such embodiments of the broad idea as fall within the scope of the subjoined claims, it being obvious that various changes and mod-

ifications may be resorted to without departing from the spirit of the invention.

Having thus described my invention, I claim:

1. In a device of the character described, the combination of a conduit member, a nozzle tip at the discharge end of said conduit member and having a discharge aperture disposed at an angle to the swivel axis, a valve for controlling said aperture, means for swivelly supporting said conduit member whereby rotation thereof may change the direction of said aperture, and means for operating said valve including a lever carried by said member and a flexible member extending through the swivel support and having its opposite ends connected with said valve and said lever, respectively, and said lever and said flexible member being rotatable with said conduit member independently of the first mentioned means.

2. In a device of the character described, the combination of a body member, a conduit member swiveled to said body member, a nozzle tip at the discharge end of said conduit member and having a discharge aperture disposed at an angle to the swivel axis, a valve for controlling said aperture, a control member carried by said body member, and means carried by said conduit member independently of said control member and operable in any position of said angularly disposed aperture for transmitting movement of said control member to said valve.

3. In a device of the character described, the combination of a body member, a conduit member swiveled to said body member, said members having intercommunicating passages, a manually operable member having a stem slidable transversely of said body member passage, means for preventing leakage from said passage around said stem, said conduit member having a discharge end disposed at an angle to the swivel axis, a nozzle tip carried by said discharge end, and provided with a discharge aperture, a valve in the passage of said conduit member for controlling said aperture, and means carried by said conduit member independently of said manually operable member in said intercommunicating passages for transmitting movement from said slidable stem to said valve for opening said discharge aperture.

4. In a device of the character described, the combination of a conduit member, a nozzle tip at the discharge end of said conduit member and having a discharge aperture, a valve for controlling said aperture, a flexible connecting member secured to said valve and extending through said conduit member, a shoulder in said conduit member, an internally located trigger member engaging said shoulder and secured to said connecting member, means normally urging said valve to close said aperture and normally urging said trigger member against said shoulder, and manually operated means independent of but cooperating with said trigger member to rock the trigger member about a portion of said shoulder and thereby move said valve to open said aperture.

5. In a device of the character described, the combination of a body member, a conduit member swiveled to said body member, communicating passages in said body member and said conduit member, a nozzle tip at the discharge end of said conduit member and having a discharge aperture disposed at an angle to the swivel axis, a valve for controlling said aperture, and means for operating said valve in any position of said discharge aperture, comprising a reciprocable member mounted on said body member and projecting into the passage thereof, a stuffing box for said member, and means carried by said conduit member independently of said reciprocable member in said communicating passages for transmitting movement of said slidable member to said valve.

6. In a device of the character described, the combination of a body member, a conduit member swiveled to said body member, said conduit member and said body member having communicating passages therein, a nozzle tip at the discharge end of said conduit member having a discharge aperture, a valve slidably mounted in said conduit member for controlling said aperture, a trigger engaging a shoulder on said conduit member and arranged to be rocked thereon, a flexible member extending through said conduit member having its ends connected with said valve and said trigger, a spring for urging said valve toward said aperture, and a reciprocable control member movable on said body member and projecting to the exterior thereof and having its inner end arranged to cooperate with said trigger to actuate the latter.

In testimony whereof, I hereunto affix my signature.

FRED E. HANSEN.