This invention relates to a fluid ejecting nozzle adapted primarily for discharging a comparatively fine stream of lubricant or other liquid under considerable pressure.

The general object of the invention is to provide a simple and efficient nozzle for the purpose stated, and preferably one having a pin-size orifice and a cleaning pin therefor. It is also desirable to provide means cooperating with the pin-size orifice to discharge the liquid in the form of a whirling spray.

The subject matter of the present application is similar to that divided from my earlier application, Serial No. 899,898, filed March 19, 1932, but embodies certain improvements thereon.

The invention will be more particularly described in connection with the accompanying drawings, in which:

Fig. 1 is a central longitudinal section of the improved nozzle attached to the outlet end of a liquid discharge tube;

Fig. 2 is a central longitudinal section taken substantially at right angles to the plane of Fig. 1;

Fig. 3 is a section taken on the line 3—3 of Fig. 1;

Fig. 4 is a section taken on the line 4—4 of Fig. 1;

Fig. 5 is an enlarged perspective view of the nozzle insert.

As illustrated in the drawing the invention is associated with the outlet end of a liquid discharge tube 7 to which there is secured an extension 8 formed with a cylindrical chamber.

Secured between the end of the tube 7 and the extension 8 is a spider-like member or disc 10 provided with openings 11 through which the fluid may pass into the chamber 9. The disc 10 is formed centrally with a forwardly projecting stem 12 in which a cleaning pin 13 is receivable. In mounting this pin, it is convenient to provide the stem 12 with a central bore to receive the end of the pin and to form the stem also with a transverse bore 14 within which the pin is bent, as shown at 15, to anchor the same.

The nozzle tip 16 is secured to a tubular connecting member 17 which is mounted for longitudinal reciprocatory movement in the front end of the extension 8 and is provided with a head 18 which is guided within the cylindrical chamber 9. The connecting member 17 and the nozzle tip 16 carried thereby, is normally impelled forwardly by a spring 19 seated between the head 18 and the disc 10 in the chamber 9.

The nozzle tip 16 has at its front end a conical conical face 20 and is formed with an interior cavity 21 in the shape of a cone, at the vertex of which is a pin-size orifice 22. Within the nozzle tip 16 at the base of the conical cavity 21 there is secured a substantially cylindrical insert 23 formed with spiral channels 24 leading into the cavity 21. The discharge end portions of these channels are in forwardly inclined tangential relation to the base of the conical face 20. The insert 23 is also preferably formed with a transverse channel 25 which affords communication between the interior of the tubular connecting member 17 and the channels 24.

In the operation of my improved nozzle, the fluid which is forced under pressure through the tube 7 passes through the tubular member 17 and into the spiral channels 24, whence it is discharged in streams which flow spirally along the surface of the cavity 21, whence they are discharged from the orifice 22 in the form of a fine spray. The pin 13 normally extends longitudinally through the insert 23 and is in a position to be projected through the orifice 22 when the front end of the nozzle tip 16 is brought against an object with sufficient force to move it rearwardly against the opposition of the spring 19. The pin, however, is not long enough to extend under any circumstances beyond the plane in which the front end of the nozzle terminates, so that there is no danger of bending or otherwise injuring the pin.

While I have described in detail the preferred construction and operation of my invention, it will be apparent that the same may be considerably modified without departing from the scope of the appended claim.

What I claim is:

The combination with a liquid discharge tube, of a nozzle having a forwardly convergent conical cavity with a restricted orifice at the vertex thereof, an insert secured within said nozzle in fixed relation thereto and formed with a spiral channel, the discharge end of which is in forwardly inclined tangential relation to the base of said conical cavity, a tubular connecting member secured to said nozzle and having a longitudinally reciprocable connection with said tube, said connecting member affording communication between the bore of said tube and the channel in said insert, a spring normally impelling said nozzle forwardly, and a cleaning pin fixed with relation to said tube and normally extending through said insert in position to enter said orifice as the nozzle is forced rearwardly in opposition to said spring.

HAROLD A. ROSELUND.