

Oct. 15, 1935.

L. R. LOOMIS

2,017,467

SPRAY NOZZLE

Filed Nov. 23, 1934

Fig. 1.

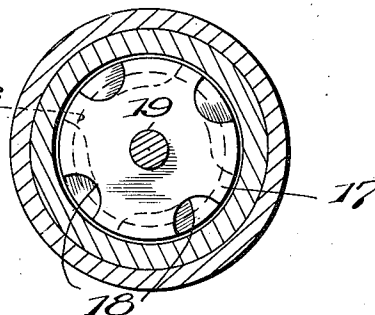
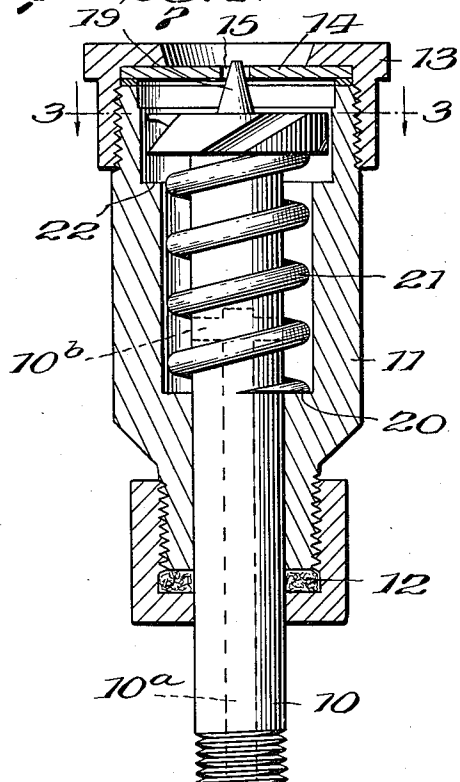


Fig. 3.

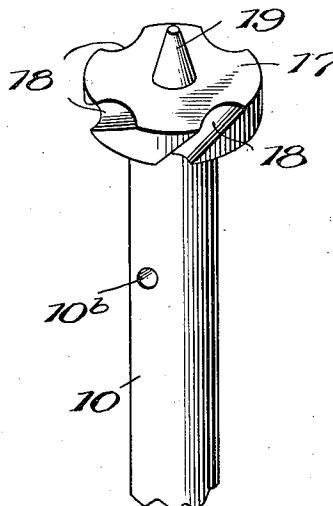


Fig. 4.

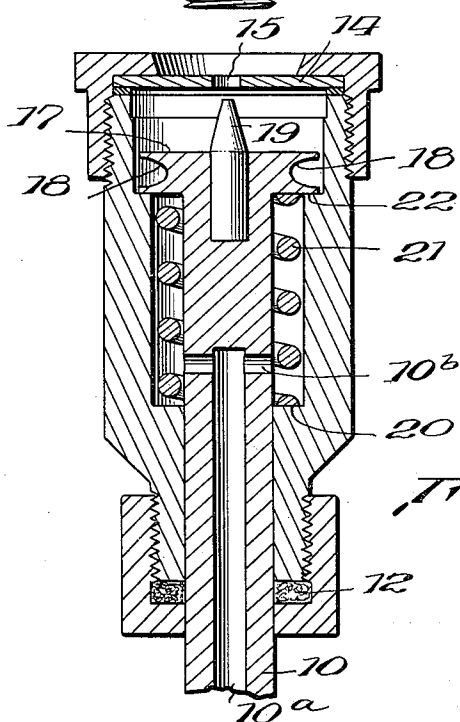


Fig. 2.

Inventor

Leavitt R. Loomis,

By *Chubb & Chubb*
His Attorneys

UNITED STATES PATENT OFFICE

2,017,467

SPRAY NOZZLE

Leavitt R. Loomis, Claverack, N. Y.

Application November 23, 1934, Serial No. 754,543

4 Claims. (Cl. 299—59)

This invention relates to improvements in spray nozzles and particularly to nozzles that are adapted to be used in multiple on a common supply pipe.

One object of the invention is to provide a nozzle wherein maximum atomization of the fluid will be obtained.

A further object is to provide a nozzle with means for clearing or cleaning the spray orifice which will function automatically when the supply of spray fluid is cut off.

More specifically, the invention contemplates a nozzle comprising a fixed fluid supply pipe with a nozzle barrel slidable thereon, the fluid from said pipe passing through a chamber in the interior of the barrel and through one or more passages in a disk on said pipe before issuing from the spray orifice of the nozzle. A spring interposed between the disk and a shoulder on the interior of the barrel tends to move the barrel on the pipe so as to project a clearing or cleaning pin on the disk through said spray orifice. The pressure of the spring, however, is less than the pressure under which the fluid is supplied, so that the latter will cause the pin to be retracted from the orifice when the nozzle is in use, but upon the supply being cut off the spring will again cause the pin to move into the orifice.

The passages in said disk are so disposed as to impart a whirling motion to the fluid passing therethrough. In addition, the spring above mentioned is in the form of a coil spring located in said chamber through which the fluid flows from the pipe to the whirling passages. As a consequence, the convolutions of the spring impart a preliminary whirling motion to the fluid so that, by the conjoint action of the spring and said passages maximum atomization of the fluid is obtained.

With these and other objects in view, the invention consists in certain details of construction and combinations and arrangements of parts, all as will hereinafter be more fully described and the novel features thereof particularly pointed out in the appended claims.

In the accompanying drawing,—

Figure 1 is a sectional view taken longitudinally of the present nozzle, the clearing pin being shown positioned in the spray orifice under the influence of the spring.

Fig. 2 is a similar view showing the pin retracted, this being the position it occupies under the influence of fluid flowing through the nozzle;

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

Fig. 4 is a perspective view of the fluid conduit and whirler disk.

As at present mentioned, the present nozzle is specially designed for use in apparatus wherein a plurality of nozzles are connected to a common supply pipe. In the present illustration the branch supply pipe 10 is adapted to be connected to the main or common supply pipe (not shown), each nozzle having its individual branch pipe. The pipe 10 is substantially fixed or stationary and slidable thereon is the nozzle barrel 11, one end of said barrel being provided with suitable packing 12 and the opposite end being open, but provided with a closure cap 13 threaded thereon. Said cap comprises a disk 14 formed with the spray orifice 15. The disk may, if desired, be simply clamped between the cap 13 and the end of the barrel.

A supply passage 10^a in pipe 10, terminates in one or more transverse ports or outlets 10^b which communicate with an annular chamber 16 between the pipe and a portion of the interior surface of the barrel. The extremity of the pipe within the barrel is preferably solid and has formed thereon an enlarged disk 17 in which there are a plurality of spiral passages 18, preferably in its periphery. Mounted in said disk, in registry with orifice 15 is a pin 19 and interposed between said disk and a shoulder 20 on the interior of barrel 11 is a spring 21 which, when expanded, will cause the barrel to occupy the position in which it is shown in Fig. 1, i. e., with pin 19 projecting into or through orifice 15. However, during the flow of fluid through the nozzle, the pressure of the fluid against the cap or cap disk is sufficient to overcome and compress said spring and move the barrel to the position in which it is shown in Fig. 2, i. e., with pin 19 withdrawn from the orifice. This movement of the barrel is preferably limited by engagement of a shoulder 22 on the barrel with the whirler disk 17.

With the construction described, it will be apparent that if the spray orifice should become clogged or closed it is only necessary to cut off the supply of spraying fluid to relieve the pressure thereof against the barrel disk 14, whereupon the spring 21 will move the barrel inwardly of the pipe 10, so to speak, and project pin 19 through the spray orifice, cleaning or clearing the latter.

In order to obtain maximum atomization of the spraying fluid, the whirling action imparted thereto by passages 18 in whirler disk 17 is augmented by having spring 21 of coil type and locating it in chamber 16 between the outlets

10^b and said passages 18. By means of this arrangement, the spiral convolutions of the spring impart a whirling motion to the fluid before the latter reaches said passages. As a result of this preliminary or supplemental action of the spring, the fluid meets with less resistance in flowing through the passages and the combined action of the spring and passages produces maximum atomization.

10 What I claim is:—

1. In a spray nozzle, a fluid conduit having an outlet in the side thereof and a closed end, a nozzle barrel slidable on said conduit, said barrel having a spray orifice in the end thereof, a disk on said conduit, said disk having a plurality of passages therein for imparting a whirling motion to fluid passing therethrough, a portion of the inner surface of said barrel being spaced from said conduit and forming an annular chamber connecting said outlet and said passages, a clearing pin on said disk, and a coil spring in said chamber for moving said barrel on the conduit to project said pin through the orifice and for preliminarily imparting a whirling motion to fluid flowing from said conduit outlet toward said passages.

2. In a spray nozzle, a fluid conduit having an outlet therein, a nozzle barrel slidable on said conduit, said barrel having a spray orifice therein, a shoulder on the interior of said barrel, a disk on said conduit, said disk having passages therein for imparting a whirling motion to fluid flowing from said outlet to said orifice, a clearing pin projecting from said disk, and a coil spring interposed between said disk and said shoulder urging said barrel longitudinally of the

conduit to position said pin in said orifice, said spring being located between said conduit outlet and said disk and forming in conjunction with the walls of the barrel and conduit a spiral passage through which fluid flows prior to passing through the disk passages.

3. In a spray nozzle, a fluid conduit having an outlet therein, a nozzle barrel slidable on said conduit and having a spray orifice therein, there being a chamber between said conduit and a portion of said barrel, longitudinally spaced shoulders on the interior of said barrel, a disk on said conduit intermediate said outlet and orifice, said disk having a plurality of passages therein for imparting a whirling motion to fluid passing therethrough, and said disk forming a stop engaging one of said barrel shoulders to limit movement of the barrel in one direction on said conduit, a clearing pin for said orifice mounted in said disk, and a spring interposed between said disk and the other of said barrel shoulders for yieldingly moving the barrel longitudinally of the conduit to position said clearing pin in said orifice.

4. In a spray nozzle, a fluid conduit having an outlet therein, a nozzle barrel slidable on said conduit, said barrel having a spray orifice therein, a shoulder on the interior of said barrel, a disk on said conduit, said disk having a plurality of passages therein through which fluid from said outlet passes to the orifice, a clearing pin mounted in said disk, and a spring interposed between said disk and shoulder for moving said barrel on the conduit to project said pin through the orifice.

LEAVITT R. LOOMIS.