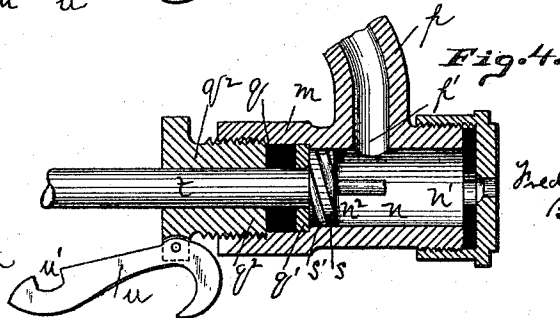
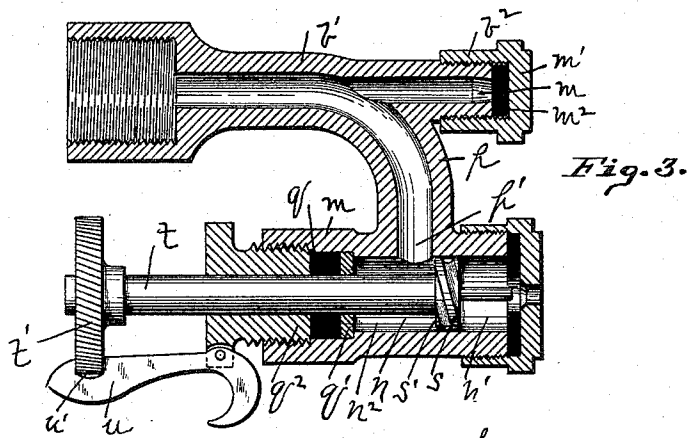
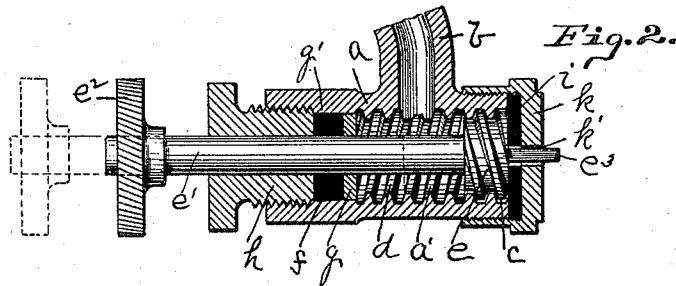
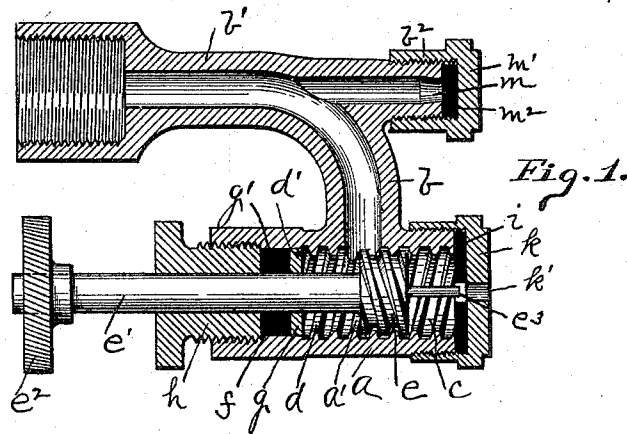


(No Model.)

F. W. ROBERTSHAW.
HOSE NOZZLE.

No. 579,409.

Patented Mar. 23, 1897.



Witnesses:

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UNITED STATES PATENT OFFICE.

FREDERICK W. ROBERTSHAW, OF PITTSBURG, PENNSYLVANIA.

HOSE-NOZZLE.

SPECIFICATION forming part of Letters Patent No. 579,409, dated March 23, 1897.

Application filed May 18, 1896. Serial No. 592,082. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. ROBERTSHAW, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Hose-Nozzles; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to hose-nozzles, its object being to provide a cheap and simple form of hose-nozzle, especially for the spraying of liquids containing chemicals, such as for the spraying of certain such liquids on bushes, fruits, &c., as is found necessary in connection with the killing of insects, though the nozzle has certain advantages when employed in connection with the spraying of any liquid. Its object is to provide for the formation of either a spiral spray or a straight stream, and in addition to that to provide for a stream of greater bulk from the same nozzle, such as where the nozzle is connected with a hand-pump and it is desired to employ it for the washing of vehicles or like purposes around an ordinary country stable or barn.

To these ends my invention consists, generally stated, in combining in a hose-nozzle a valve-case having a side entrance-pipe and a valve-space above and below the port of such pipe, a valve therein having a spiral face and providing a spiral stream when above the port and seating itself below the port, so as to form a straight stream.

It also consists in combining with such parts a cap for the case at the discharge end, having a central opening and having a washer fitting therein and forming a tight joint with the case and also forming a tight joint with the flat upper face of the valve when forced against the same.

It also consists in certain other improvements, which will be hereinafter more fully set forth and claimed.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view of the preferred form of hose-nozzle, showing the valve in full lines and being made of enlarged size, so as to fully illustrate the invention, the valve being indicated in the posi-

tion for forming a spiral stream. Fig. 2 is a like view showing the valve seated to close the nozzle and illustrating in dotted lines the lowest position, which provides for a straight stream. Figs. 3 and 4 are like views of another form of nozzle embodying the invention, Fig. 3 showing the valve in position for forming a spiral spray, while Fig. 4 shows it in the lowest position as forming a straight stream.

Like letters of reference indicate like parts in each of the figures.

As the form of the apparatus shown in Figs. 1 and 2 is the preferred form, I will first describe it.

Formed in a single casing are the valve-case *a* and the side or feeding pipe *b*, which communicates with the valve-case about midway of its valve-chamber *a'*, leaving, as above stated, a valve-space *c* above the pipe *b* and a valve-space *d* below the same, said valve-spaces being parts of the valve-chamber. The valve-chamber is threaded throughout, and the valve *e* fits this threaded chamber loosely, the outer surface of such valve being threaded and thus forming a spiral face, as above stated, the spiral face of the valve fitting the thread of the valve-chamber so loosely that there is space enough left to permit of the passage of the liquid between the same, which imparts the spiral motion thereto and give the spiral spraying-stream. The valve *e* has the valve-stem *e'*, which extends down through the packing-chamber, said packing-chamber being formed at the base of the valve-chamber and being part of the valve-case. It will be noticed that this packing-chamber *f* is of greater diameter than the valve-chamber, leaving a shoulder *d'* between them, against which a metal washer *g* fits, the washer being made of a loosely-fitting centrally-perforated plate dropping to the bottom of the packing-chamber against said shoulder and the packing surrounding the same and fitting within the packing-chamber *f*, as at *g'*, while the gland *h* screws into the chamber and compresses the packing against the washer *g*. By this construction a very simple and easy arrangement for cleaning the nozzle is provided, as it is only necessary to unscrew the gland *h* and then by means of the handle *e*² unscrew the valve and draw it out of the

valve-chamber, which leaves the valve-chamber entirely free for cleaning. To reinsert the same, the valve is screwed into the valve-chamber and the washer and packing dropped to place, and the gland is screwed to place, all of which can be done in a minute. To provide a tight joint and so close the valve of the nozzle, I provide the cap *k*, which cap screws onto the top of the valve-case *a* and, as shown in the drawings, has a rubber or like washer *i*, which forms a tight joint between the cap and the valve-case, so that when the flat face of the valve is forced against said washer a tight joint is formed between them which closes the nozzle. It will be noticed that the cap *k* has a central opening *k'*, this opening permitting the escape of the liquid, and it being found in practical use that though the spiral motion is given to the liquid by means of the valve and the liquid is then forced inwardly toward this central orifice *k'* it will escape therefrom in the form of a spiral spray on account of the motion given to the valve. The valve has the central stem *e*³, fitting in the orifice *k'*, which serves to prevent the clogging of such orifice, said stem fitting the same loosely and serving to aid in forming the spiral spray. It will of course be seen that a very small opening for spray is provided in this valve and for the general purposes for which it is intended, as above set forth, that is the most desirable, especially when it is employed for spraying chemicals over plants or flowers, as above stated. It is, however, very desirable that the same nozzle shall be capable of being employed for use in connection with other operations requiring a larger stream, and for this purpose the side or feeding pipe *b* has the straight independent nozzle-orifice *m*, which is formed in direct line with the body *b'* and the threaded socket *b*² of the feeding-pipe and which is closed by a solid or imperforate cap *m'*, which screws onto the same and has the rubber or like washer *m*² therein, by which a tight joint is formed. By removing this cap *m'* and by closing the valve against the cap *k* the pump can be used to throw a stream of greater diameter, such as for vehicle-washing or like purposes, the nozzle *m* having an orifice of sufficient size for such purpose.

When the valve above described is in use and it is intended to obtain a spiral spray from the same, the hose is connected to the socket *b*² and the valve is set at any suitable point between the inlet-port *b'* of the pipe *b*² and the exit of the nozzle, that is, in the valve-space *c*, and under a pumping action or any other way of obtaining pressure of the liquid it will pass into the valve-chamber below the valve *e* and will then pass around between the threaded or spiral face on the periphery of the valve and the inner face of the valve-chamber, a spiral motion being thus imparted to it, which will continue to govern the action of the liquid as it passes out through the orifice *k'* of the cap. As the valve is moved up

or down it will cover a greater or less part of the inlet-port *b'* and will in that way control the stream. When it is desired to provide a full or straight stream, the valve is screwed down into the valve-space *d* below the inlet-port *b'*, which permits the flow of the liquid into the valve-chamber and thence directly into the orifice *k'*, forming a straight stream, the force of which is governed by the pumping action. When it is desired to close the nozzle, the flat face of the valve-body can be forced against the washer *i* and so form a tight joint therewith which closes the same, the pressure of the liquid entering below the valve serving to hold it to place. In such case the auxiliary nozzle *m* can be uncovered and used for the purpose above indicated.

The modification of the nozzle shown in Figs. 3 and 4 is somewhat different, but has several features common to both, which will now be described. In the first place, as shown in the drawings, it has a valve-casing *m* with a feeding-pipe *p*, having an inlet-port *p'*, the valve-chamber having straight walls and having valve-spaces *n'* *n*² above and below the inlet-port *p'*. It also has a like packing-chamber *q* below the valve-chamber, containing a washer *q'* and closed by a gland *q*². The valve itself is made to fit the chamber *n* neatly, having straight outer walls, and it has on its face the spiral grooves *s'*, which permit the flow of the liquid spirally around the valve and so impart the spiral motion thereto, obtaining practically the same result as the construction shown in Figs. 1 and 2. The valve has the valve-stem *t*, extending through packing-chamber and stuffing-box, and is provided with the ring *t'*, by which it is operated, and it slides up and down within the chamber.

It is evident that as there is no special means between the valve and its chamber for holding it in any desired position, and as the pressure of the liquid would force it against the cap, some means must be provided to hold the valve in such position as to give a spiral stream, and for that purpose I pivot to the gland *q*² the lever *u*, having a notch *u'* therein, which engages with the hand-wheel *t'* of the valve and holds it in the proper position for such action. In case, therefore, the valve is to be used for forming the spiral spray above referred to it is simply drawn out into proper position and engaged by the lever *u*, which holds it firmly in that position, giving the desired spray. In case it is desired to form a straight stream it is drawn back below the entrance-pipe *p'* of the inlet-pipe and permits the flow of the liquid beyond it, and thence directly to the orifice in the cap. In case it is desired to close the nozzle the lever *u* is drawn out of the way and the valve is pushed forward against the cap, and the flat face of the valve fits around the flat face of the washer *i*, and the pressure of the liquid entering the supply-pipe below the valve braces it against the face of the washer and so forms a tight joint.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a hose-nozzle, the combination with a valve-case having a side feeding-pipe and valve-spaces above and below the same, of a valve having a spiral face and providing a spiral stream when above the port and seating itself below the port to form a straight stream, a cap screwed to the case at the discharge end, and having a central orifice and a washer fitting therein and forming a tight joint with the case, and extending inwardly so as to form a tight joint with the valve when forced against the same, substantially as set forth.

2. In a hose-nozzle, the combination with a valve-box having a feeding-pipe entering the side of the valve-case, of a valve within the valve-case and controlling the main discharge-orifice and an auxiliary nozzle-orifice

on the side pipe provided with a solid cap for closing the same, substantially as set forth.

3. In a hose-nozzle, the combination with a valve-case having a threaded valve-chamber and a feeding-pipe communicating with the side thereof, the valve-chamber having valve-spaces above and below such inlet-port, and a threaded valve fitting the valve-chamber loosely, so providing for the feeding of the valve and the forming of a spiral stream, substantially as and for the purposes set forth.

In testimony whereof I, the said FREDERICK W. ROBERTSHAW, have hereunto set my hand.

FREDERICK W. ROBERTSHAW.

Witnesses:

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ROBERT C. TOTTEN.