

UNITED STATES PATENT OFFICE.

JOHN CLIFFORD, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE L. WOLFF
MANUFACTURING COMPANY, OF SAME PLACE.

HOSE-NOZZLE.

SPECIFICATION forming part of Letters Patent No. 399,654, dated March 19, 1889.

Application filed November 22, 1887. Serial No. 255,844. (No model.)

To all whom it may concern:

Be it known that I, JOHN CLIFFORD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Hose-Nozzles, of which the following is a specification.

My invention relates to hose-nozzles designed to throw either a solid stream or a spray, and more particularly to certain improvements upon the hose-nozzle heretofore patented to John Gielow and myself in Letters Patent No. 191,934, dated June 12, 1877.

The object of my invention is to provide an efficient device of a simple and cheap construction for operating the movable valve and spraying-piston of the nozzle, and thus dispense with the handle and its spindle or plug, which have been heretofore employed for operating or adjusting the valve and spraying-piston.

To this end my invention consists in the novel devices and novel combinations of devices or parts herein shown and described, and more particularly pointed out in the claim.

Heretofore hose-nozzles have been made—such as shown and described in the Patent No. 319,148 to Tomlinson, wherein a conical-shaped spraying-head is reciprocated axially, so as to project slightly through the discharge-orifice and form a spray in conjunction with the flaring mouth of the nozzle, said head being provided with an enlarged shoulder, which operates as a valve to close the discharge-orifice through which the head projects. The difficulty in the operation of this Tomlinson nozzle is that the character or fineness of the spray produced depends upon the exact location of the conical head in respect to the discharge-orifice, so that the volume of water discharged cannot be varied without at the same time changing the character of the spray, thus rendering it impossible to produce a fine spray without very materially diminishing the amount of water discharged by the nozzle in a given time; and as the discharge-orifice is also the valve-seat, so to speak, the valve and spraying-head both operating in conjunction with one and the same orifice, the proper operation of the conical head in producing the

spray is interfered with by the valve contracting the exit-passage for the water. Owing, also, to the outwardly-flaring mouth of the Tomlinson nozzle, which is necessary to produce the spray, the efficiency of this device for throwing a solid stream to a distance is much impaired, as a tapering nozzle discharge or mouth is necessary to properly concentrate the solid stream. In my improvement these defects of the Tomlinson type of nozzle are all overcome, as well as the objections incident to the transverse plug construction of nozzle shown in said Patent No. 191,934. I employ a nozzle-tube having a discharge bore or orifice terminating in a tapering portion to properly concentrate the stream when a solid stream is being thrown. The rearward portion of this discharge bore or orifice, with which the spirally-grooved spraying-piston coacts, is preferably about cylindrical, so that the extent to which the spraying-piston enters the same will not be interfered with by the tapering bore. At the rear end of this nozzle-tube is the valve-seat, the valve-seat being separated from the discharge bore or orifice by the intermediate enlarged barrel portion of the tube. The spraying-piston and valve are connected by a stem, so that the valve may be still wide open and permit the full volume of water to flow, while at the same time the spraying-piston has entered the discharge orifice or bore, so as to coact therewith and produce a spray. The valve-stem is threaded to revolve in the rear section of the nozzle, while it reciprocates without revolving in the front or discharge section of the nozzle, so that the requisite movement may be given to the spraying-piston and valve by simply turning one section of the nozzle on the other.

In the accompanying drawings, which form a part of this specification, and in which similar letters of reference indicate like parts, Figure 1 is a central longitudinal section of a nozzle embodying my invention. Fig. 2 is a similar view showing the valve open and the spirally-grooved spraying-piston in position for throwing a solid stream. Figs. 3 and 4 are cross-sections on lines 3 3 and 4 4, respectively.

In said drawings, A represents the barrel

or tip portion of the nozzle, and B is the tube or base portion of the nozzle, which is connected to the hose or to the coupling on the end of the hose. The two parts A and B of the nozzle are connected together, so that the one may turn or revolve on the other, by a coupling ring or sleeve, C, having an inwardly-projecting flange, *c*, which abuts against an exterior shoulder, *a*, on the barrel A, and provided with internal screw-threads, *c'*, which engage screw-threads *b* on the base-tube B. A packing-ring, *c*², of leather or other suitable material, is inserted between the abutting end of the tube B and the shoulder or collar *a* on the barrel A, so as to make a water-tight joint. This packing ring or washer may be clamped with any desired pressure between the end of the tube B and the collar *a* of the barrel A by simply turning the screw-threaded coupling-sleeve C, and as the smooth end of the tube B abuts against the washer *c*² the parts A and B may be readily revolved on each other, and little resistance will be offered to their free revolution, however tightly the packing ring or washer *c*² may be clamped between them.

D is the spirally-grooved spraying-piston, D' the valve, and *d* the stem or connection between the two. The stem *d* is furnished with screw-threads *d'* at one end, which fit in a stationary nut, *b'*, secured in an axial position in the tube B by a bridge, *b*². The stem *d* is further provided with wings or guide-arms *d*², (preferably two in number,) which fit in longitudinal grooves or guides *a'*, cut in the interior of the barrel, so as to cause the piston-stem to revolve with the barrel A and to guide or hold the piston in an axial position in relation to the bore of said nozzle. In lieu of these wings and guide-grooves, the stem *d* and barrel A may of course be furnished with other suitable or equivalent bearing which will permit the stem to slide without revolving in the barrel A, and at the same time afford a passage for the water.

The nozzle or barrel A is furnished with an enlargement, *a*³, in its bore, into which the spirally-grooved piston D may be withdrawn by means of the threaded stem *d* and nut *b'* when it is desired to throw a solid stream from the nozzle. When it is desired to throw a spray from the nozzle, the grooved piston is advanced by the same means into the cylindri-

cal or contracted portion *a*⁴ of the bore, when the water issuing through the spiral grooves will be thrown in a fine spray from the mouth of the nozzle. By still further turning the part A in respect to the part B, the valve-stem *d* will be farther advanced into the part A until the valve D' abuts against the valve-seat *a*⁵ and the stream thus entirely shut off. The valve-seat *a*⁵ is simply the beveled projecting end of the barrel A.

In operation the valve-stem revolves in respect to the tube B and the axial nut carried thereby, while it reciprocates but does not revolve in respect to the barrel A. An obvious and equivalent construction would be simply to reverse this and locate the nut in the part A and the longitudinal guides in the part B. The preferable construction is that shown in the drawings. My invention, however, is equally present if the valve-stem should have a screw-threaded connection with the part A and a sliding non-revoluble bearing in or connection with the part B.

The valve D' is preferably made of rubber or other like material, and is secured in place on the piston-stem by collars *d*³ thereon.

The tube B is furnished with screw-threads *b*³ and a packing-ring, *b*⁴, for securing the same to the hose-coupling.

I hereby disclaim the devices shown and described in the patent, No. 319,148, to Tomlinson, and in the German patent, No. 13,495, of 1881; and I do not herein claim as of my present improvement the devices shown and described in Patents Nos. 191,934 and 229,521—the latter heretofore granted to me and the former to myself and Gielow.

I claim—

The combination, with the nozzle-tube B, having screw-threaded end *b* and axial nut *b'*, of revoluble barrel A, having collar *a* and internal grooves, *a'*, valve-seat *a*⁵, screw-threaded coupling-sleeve C, having flange *c*, packing-ring *c*², spirally-grooved spraying-piston D, valve D', and stem *d*, connecting said spraying-piston and valve, and having screw-threads *d'*, fitting in said axial nut *b'*, and provided with guide arms or wings *d*², fitting in said grooves *a'*, substantially as specified.

JOHN CLIFFORD.

Witnesses:

EDMUND ADCOCK,
H. M. MUNDAY.