

S. L. BERRY.  
NOZZLE.

APPLICATION FILED JAN. 31, 1911.

1,002,960.

Patented Sept. 12, 1911.

Fig. 3.

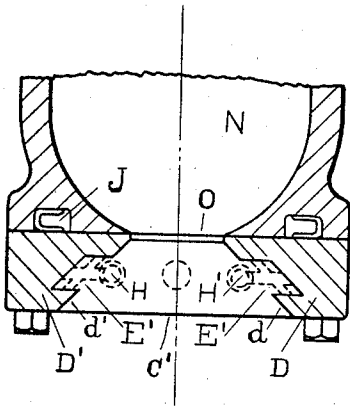


Fig. 4.

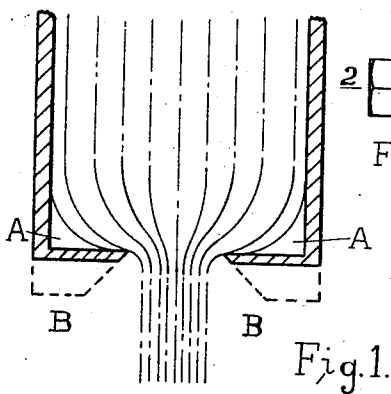
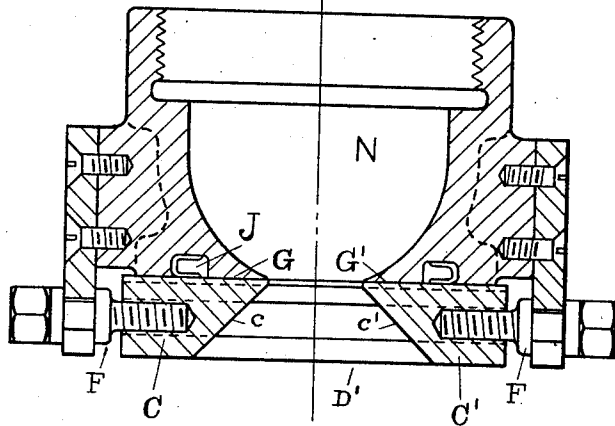


Fig. 1.

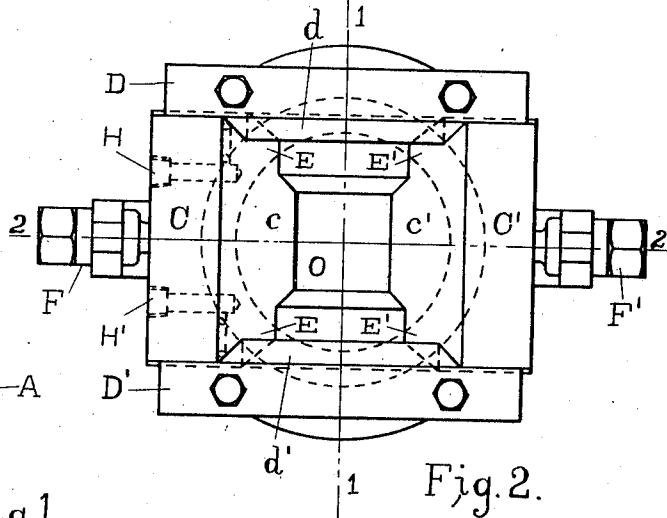


Fig. 2.

WITNESSES.

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# UNITED STATES PATENT OFFICE.

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## NOZZLE.

1,002,960.

Specification of Letters Patent. Patented Sept. 12, 1911.

Application filed January 31, 1911. Serial No. 605,829.

To all whom it may concern:

Be it known that I, SENECA LUCIEN BERRY, a citizen of the United States, residing at Sunnyvale, in the county of Santa Clara, State of California, have invented certain new and useful Improvements in Nozzles, of which the following is a specification.

My invention relates to that class of nozzles in which the area of discharge is made to increase and decrease in order to control the quantity of fluid flowing therefrom, and the object of my improvement is to provide such a nozzle of simple form, easily manipulated under high heads, having its sliding surfaces removed from the controlled fluid and therefore capable of being lubricated. This object is attained by the construction shown in the accompanying drawing, in which—

Figure 1 is a diagram showing the type of orifice from which my improved nozzle has been developed; Fig. 2, an end view as seen when looking in a direction contrary to the flow of the water; Fig. 3 a partial cross section on the line 1—1 of Fig. 2, and Fig. 4, a cross section on the line 2—2 of Fig. 2.

Similar letters refer to similar parts throughout the several views.

Fig. 1 shows the form of the jet which issues from an orifice in a plate which has the outer metal cut away to produce a more or less sharp edge. This type of orifice and the resultant jet are fully treated in all complete works on hydraulics, and it is shown that the amount of contraction of the jet depends upon the shape and proportions of the parts of the vessel and orifice. It is well known that replacing the water in the corners at A—A with metal produces a less contraction of the jet, and that thickening the plate, as shown by dotted lines at B—B, when done in a manner to permit free access of atmospheric pressure, produces no effect upon the jet. It will be seen that the water does not touch any part of the mechanism after it leaves the inner edge.

Referring to Figs. 2, 3, 4, the nozzle N is shown with the fixed plates D and D', and the movable plates C and C', which with their respective inclined faces  $d-d'-c$  and  $c'$  form the rectangular orifice O. The movable plates C and C' are provided with tongues E—E' fitting into corresponding grooves in the fixed plates D—D'. By advancing or receding the movable plates

C—C', either singly or together, the area of the orifice is correspondingly changed and the amount of the issuing water controlled. This movement of the plates C—C' is shown as accomplished by the screws F—F', but it may be by any appropriate means.

When the orifice is open to its fullest extent there is very little pressure on the movable plates C—C' and only slight tendency to leak along the surfaces G—G'. As the plates approach each other both the pressure on the plates and the tendency to leak increases, reaching maxima when the orifice is closed. Owing to the relatively small surfaces exposed to pressure, the movable plates are readily supported by the tongues E—E and E'—E' sliding in their corresponding grooves, the surfaces of which, being free from the flowing water, may be easily lubricated, as shown at H—H'.

The tendency to leak along the surfaces G—G' may be counteracted by the packing J placed in a groove in the nozzle N. When the static pressure to which the nozzle is to be subjected is high enough to necessitate the use of the packing J, the fixed plates D—D' are made separate from the main nozzle N and fastened thereto by means of screws or bolts.

Having thus described my invention, what I claim and desire to secure by Letters-Patent, is:

1. In a contractible nozzle, the combination of fixed plates having inner grooved edges spreading outwardly, and movable tongued plates fitted thereto and having their inner ends beveled outwardly, substantially as described.

2. In a contractible nozzle, the combination of fixed grooved plates having outwardly beveled inner edges, movable plates fitted thereto having tongues and outwardly beveled inner ends, and a packing placed between said fixed and movable plates and the main body of said nozzle, substantially as described.

3. In a contractible nozzle, the combination of fixed grooved plates having outwardly beveled inner edges, movable plates fitted thereto having tongues and outwardly beveled inner ends, and means for operating said movable plates singly or together, substantially as described.

4. In a contractible nozzle, the combination of fixed grooved plates having out-

wardly beveled inner edges, movable plates fitted thereto having tongues and outwardly beveled inner ends, and means for lubricating the contact surfaces of said tongues and  
5 grooves, substantially as described.

5. In a contractible nozzle, the combination of fixed grooved plates having outwardly beveled inner edges, movable plates fitted thereto having tongues and outwardly  
10 beveled inner ends, a packing placed between said fixed and movable plates and the main body of the nozzle, means for operat-

ing said movable plates singly or together, and means for lubricating the contact surfaces of said tongues and grooves, substantially as described. 15

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

SENECA LUCIEN BERRY.

Witnesses:

ANNA BERRY,  
JOHN FAULDS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."