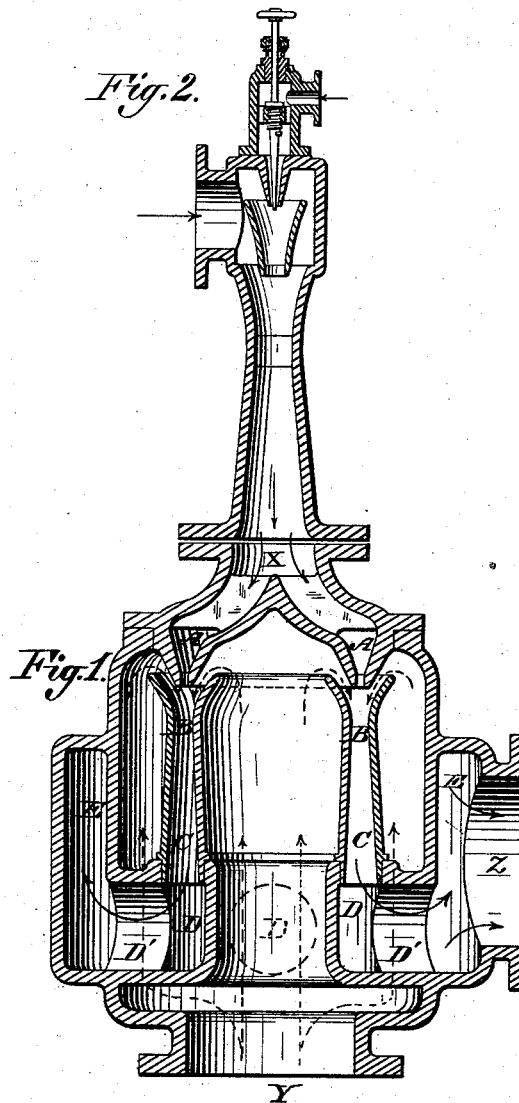


L. SCHUTTE.  
Injector.

No. 215,544.

Patented May 20, 1879.



Witnesses:  
William W. Dodge.  
Donn P. Twitchell.

Inventor:  
Louis Schutte  
By his Attys.  
Dodge & Son

# UNITED STATES PATENT OFFICE.

LOUIS SCHUTTE, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN INJECTORS.

Specification forming part of Letters Patent No. **215,544**, dated May 20, 1879; application filed April 9, 1879.

*To all whom it may concern:*

Be it known that I, LOUIS SCHUTTE, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain Improvements in Jet Apparatus, of which the following is a specification.

My invention relates to that class of apparatus which embraces, under the general name of "jet apparatus," injectors, ejectors, or condensers, employed for moving or forcing liquids or fluids, and which embody in their construction an actuating-nozzle, a combining-tube, and a discharge-tube; and the improvement consists in constructing the apparatus with an annular actuating-nozzle, combining-tube, and discharge-tube, concentric with each other, and so arranged that the liquid or fluid is admitted to the combining-tube both from the inside and outside.

In the accompanying drawings, Figure 1 represents a vertical central section of my improved apparatus, and Fig. 2 a similar view of a common form of jet apparatus which I sometimes use in connection with my improved apparatus.

As commonly constructed, the shape of the different nozzles and tubes has been such as to necessitate certain distances and lengths of the combining and discharge tubes, proportioned to the diameter of the apparatus, in order to insure a perfect mixing or condensation of the actuating liquid or fluid with the liquid or fluid to be moved, without which proportioning of parts a proper action of the apparatus could not be obtained; and for this reason the size of the apparatus when constructed in the usual manner is necessarily limited, for obvious theoretical and practical reasons.

Experience demonstrates that the less the diameter or thickness of the actuating-jet and that of the liquid or fluid to be moved is the quicker, more perfect, and effective will be

the condensation or mixing of the liquids or fluids.

With this fact in view, I construct my apparatus as represented in Fig. 1, consisting of an annular actuating-nozzle, A, an annular combining-tube, B, and an annular discharge-tube, C, combined in such manner that the liquid or fluid to be moved is admitted both from the inside and the outside into the combining-tube, as indicated by the dotted arrows.

X is the inlet for the actuating liquid or fluid; Y, the inlet or suction, and Z the outlet.

From the discharge-tube C the liquid enters the annular chamber D, which communicates, through the passages D', with the annular chamber E, from which it is discharged through the outlet Z.

Where the volume of the actuating-jet is very small in proportion to the volume to be moved, it may be necessary or advantageous, for practical reasons, to combine with this apparatus one of ordinary construction, such as represented in Fig. 2, or of any other well-known type, either with a single nozzle or a series of nozzles. In such case the discharge end of the apparatus shown in Fig. 2 would be arranged to connect with the inlet X of Fig. 1, through which the actuating liquid or fluid enters.

Having thus described my invention, what I claim is—

A jet apparatus containing an annular actuating-nozzle, an annular combining-tube, and an annular discharge-tube, arranged in such manner that the liquid or fluid is admitted into the combining-tube both from the inside and outside, substantially as shown.

LOUIS SCHUTTE.

Witnesses:

DAVID GROVE,  
JOHN GOEHRING.