

(No Model.)

M. WARD.

PIPE NOZZLE.

No. 304,247.

Patented Aug. 26, 1884.

Fig. 1.

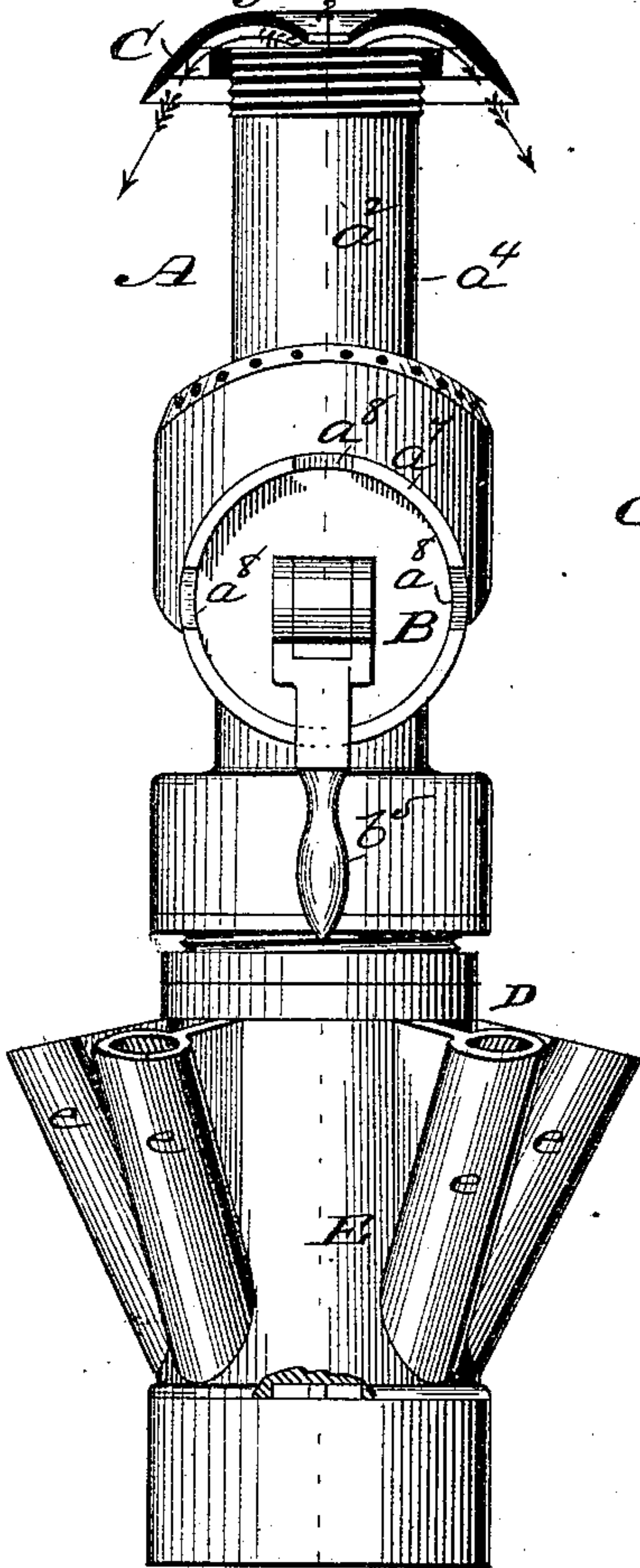


Fig. 2.

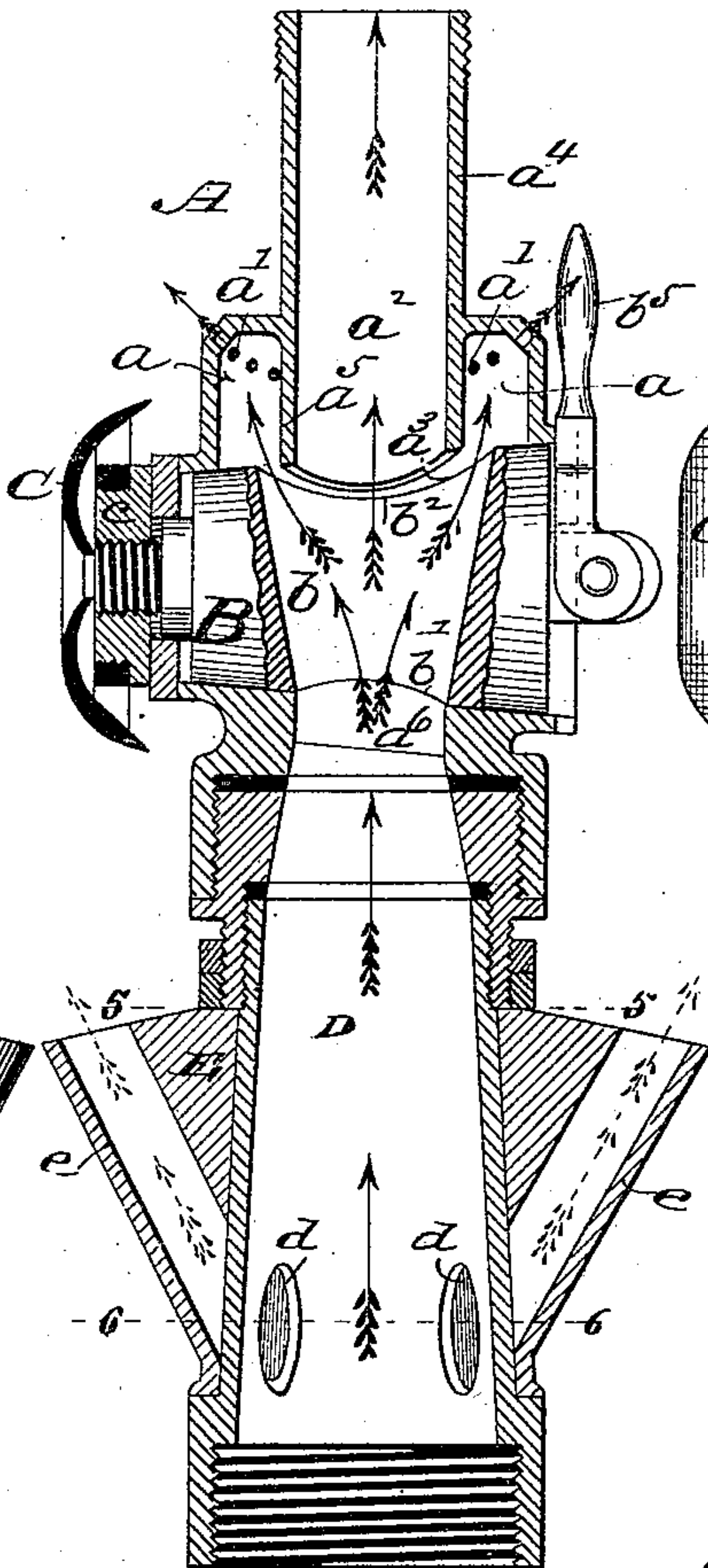


Fig. 3.

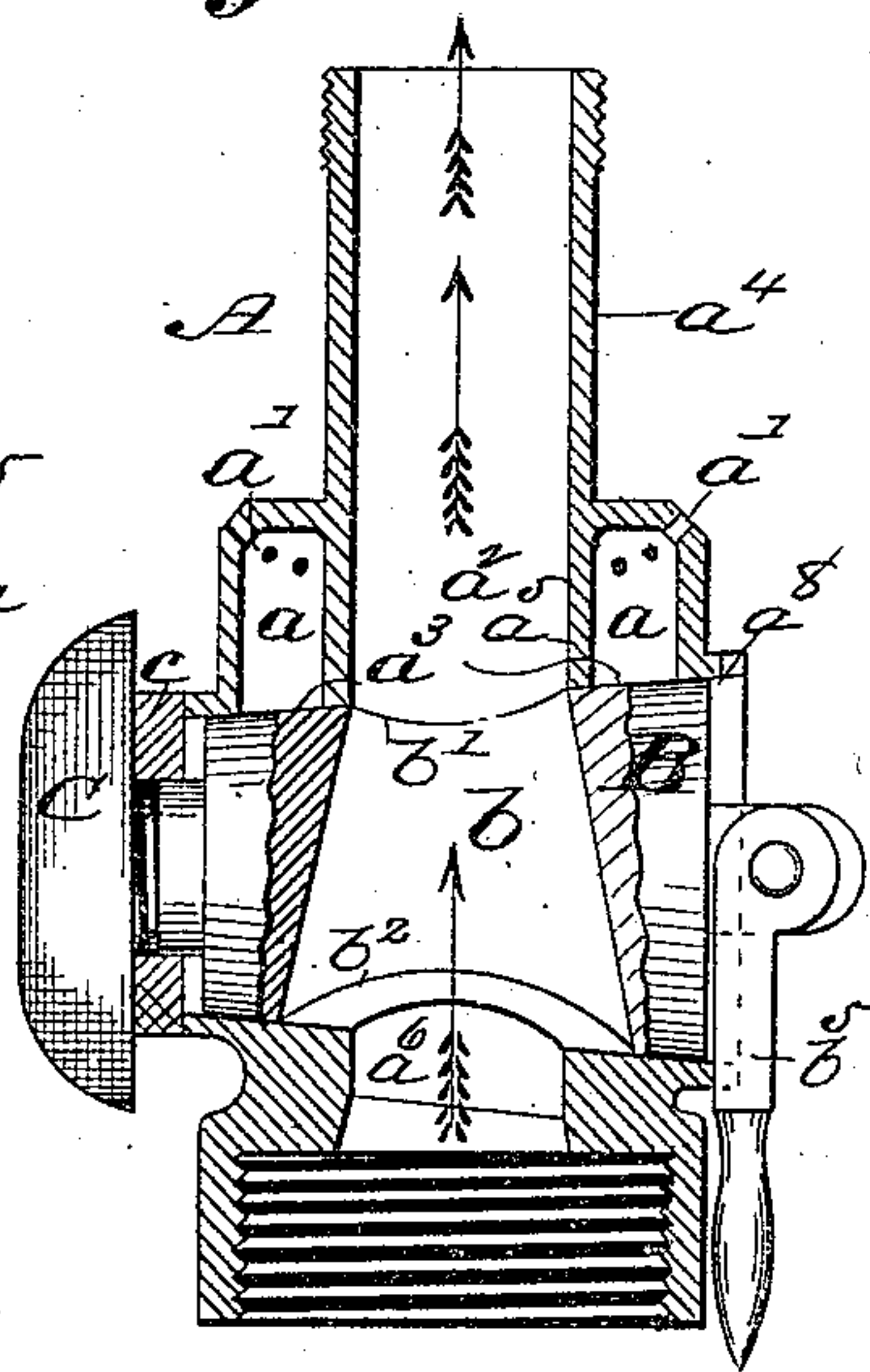


Fig. 4.

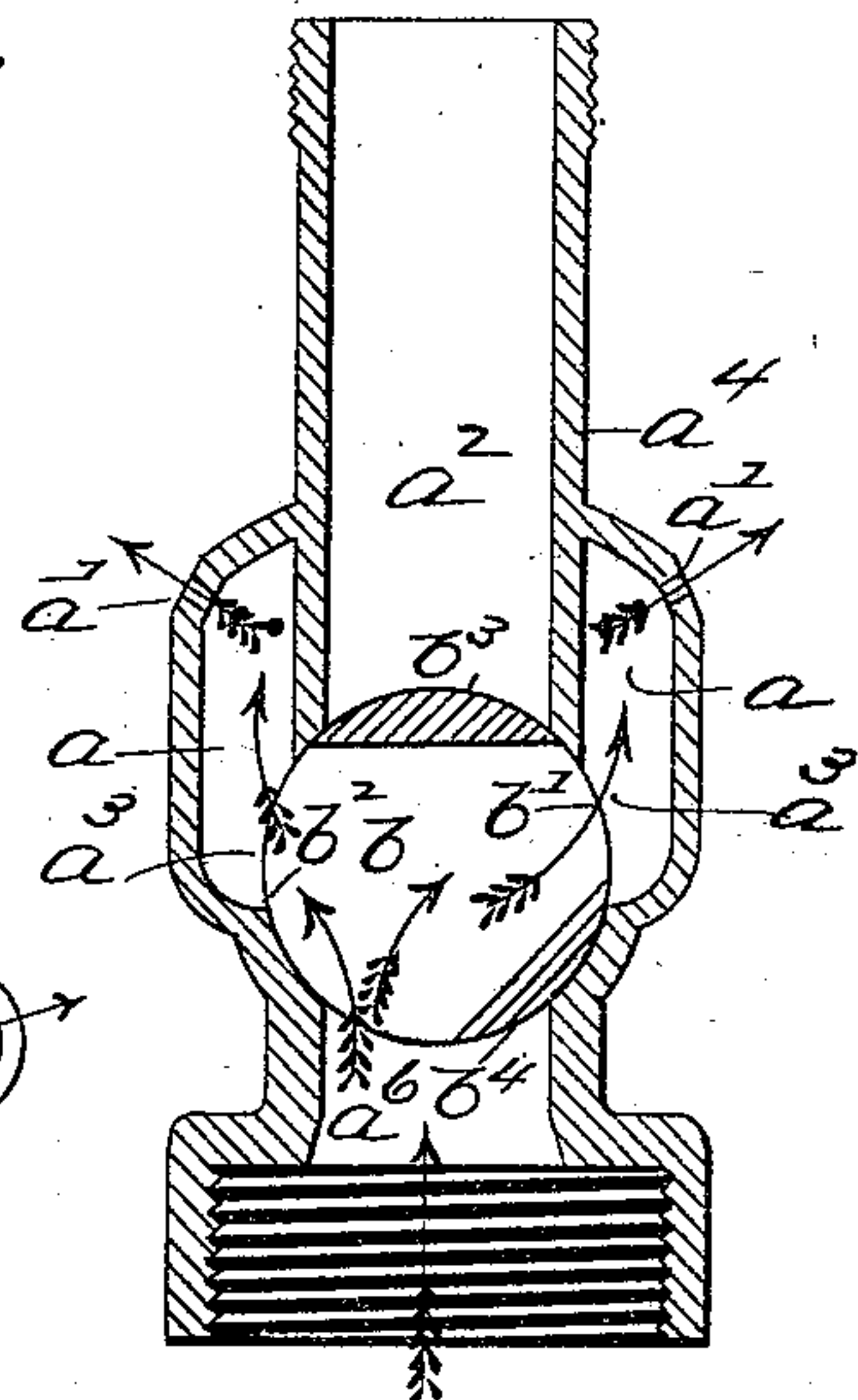


Fig. 5.

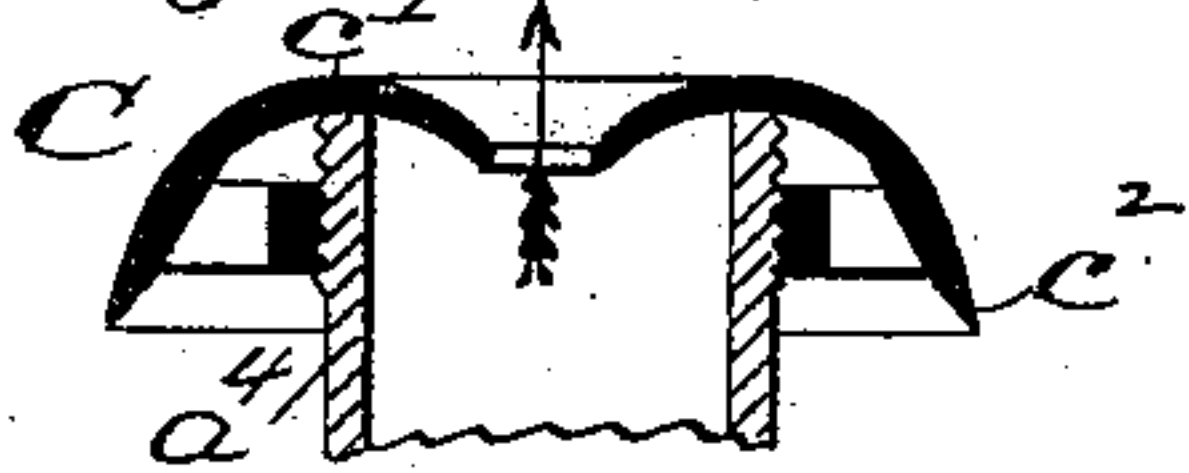


Fig. 6.

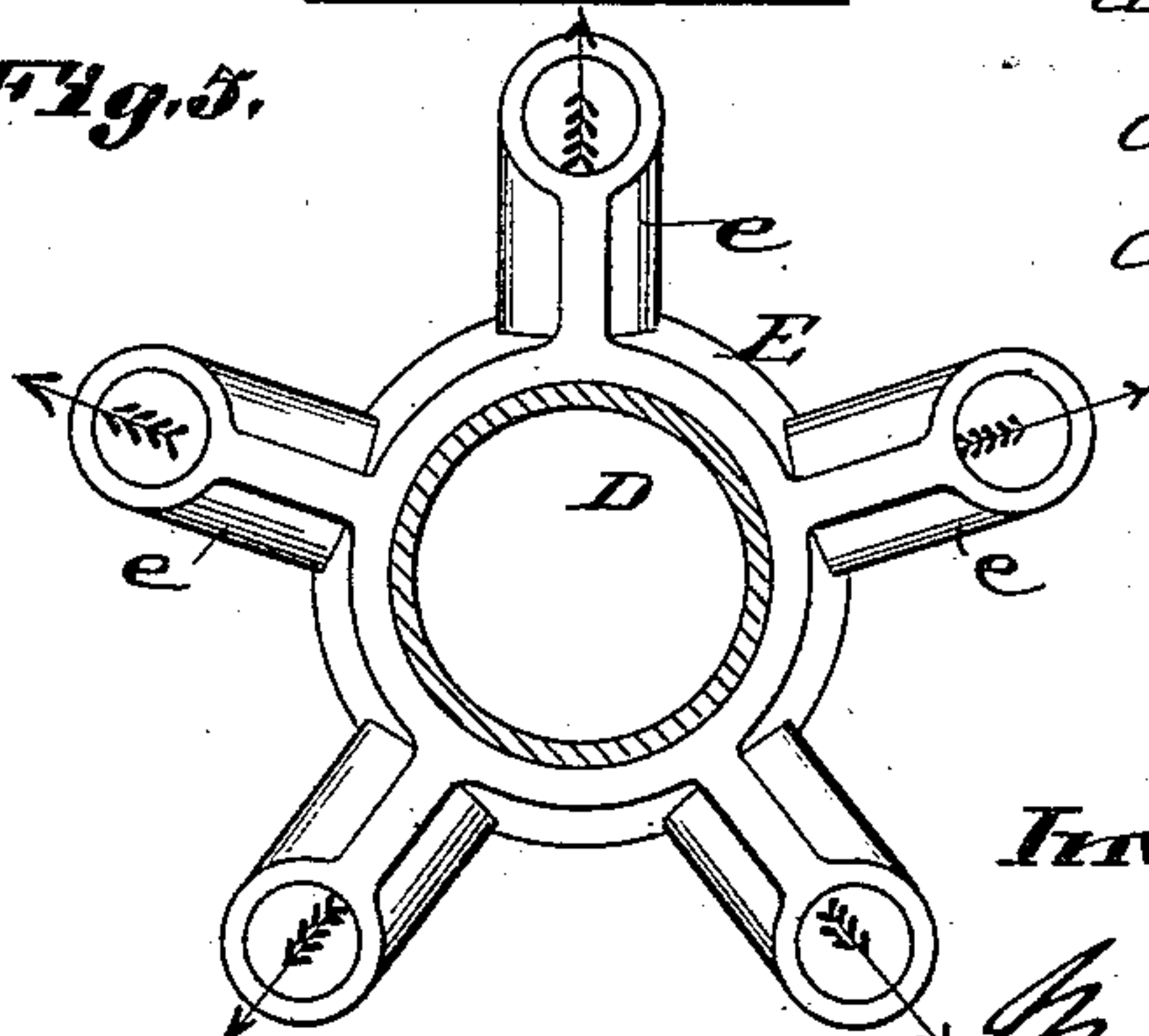
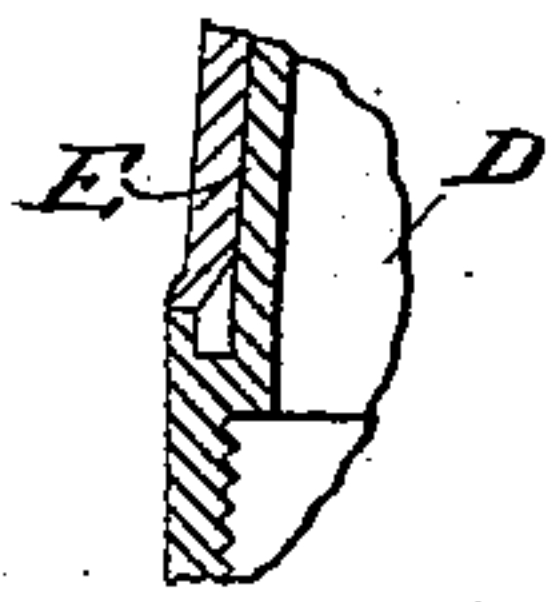


Fig. 7.

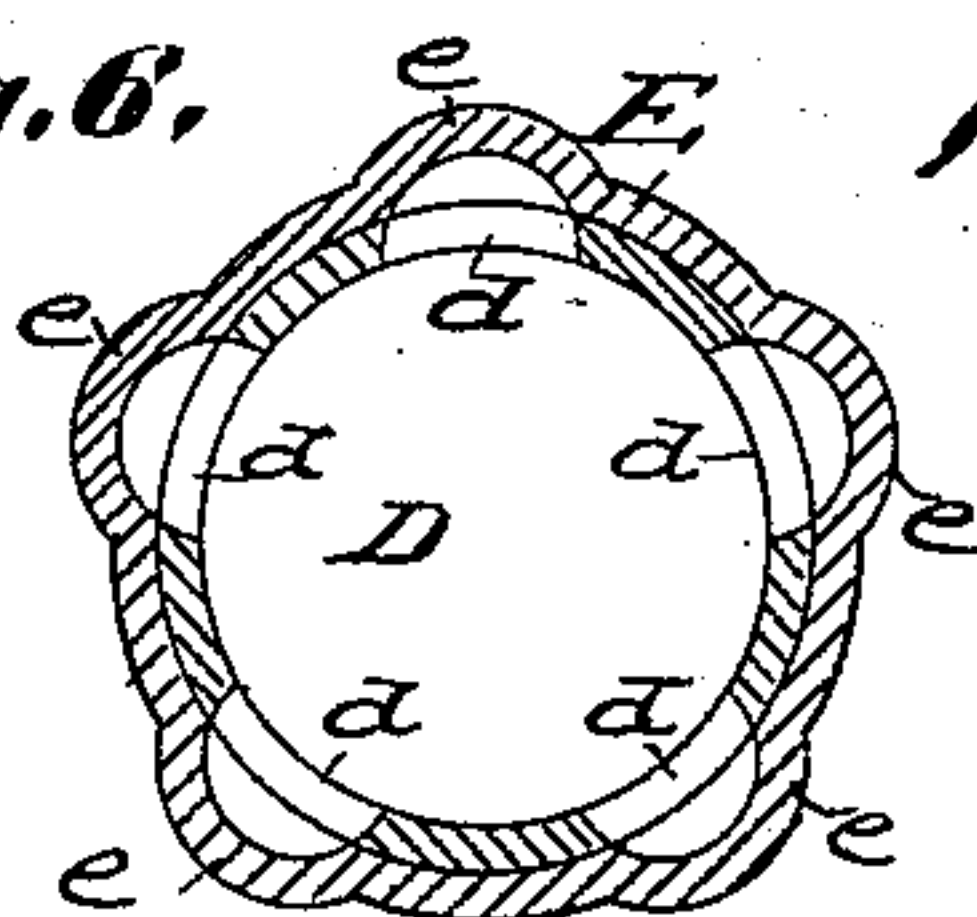


Attest:  
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att'y

Fig. 8.





# UNITED STATES PATENT OFFICE.

MATTHEW WARD, OF ST. LOUIS, MISSOURI.

## PIPE-NOZZLE.

SPECIFICATION forming part of Letters Patent No. 304,247, dated August 26, 1884.

Application filed September 19, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, MATTHEW WARD, of St. Louis, Missouri, have made a new and useful Improvement in Pipe-Nozzles, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a side elevation of the improved nozzle, the removable cap being shown in section upon the end of the nozzle; Fig. 2, a longitudinal section on the line 2 2 of Fig. 1, the valve being turned to throw both a full stream and a spray; Fig. 3, a similar section of the outer end of the nozzle, the valve being turned to throw a full stream; Fig. 4, a longitudinal section at right angles to that of Fig. 3, the valve being turned to throw a spray only; Fig. 5, a cross-section on the line 5 5 of Fig. 2; Fig. 6, a cross-section on the line 6 6 of Fig. 2; Fig. 7, a section of the cap, and Fig. 8 a detail.

The same letters denote the same parts.

This nozzle is intended more especially for a fireman's pipe, but it can be used upon other pipes. By means of it the water can not only be thrown forward in a single solid stream, but can also be delivered in the form of a spray. The spray and stream can be thrown separately or together. Several small streams can also be thrown, and, if desired, in conjunction with the main stream or spray or with both the main stream and spray. The water can also, as it escapes from the main orifice, be turned backward or laterally or forward in the form of a small stream.

A represents the nozzle proper. It is substantially tubular, and it is provided with the plug-valve B, by means of which the stream can be cut off or be discharged in the form of a solid stream or spray, as desired. In front of the valve at  $a$  the nozzle is chambered out, and when the water is discharged as a spray it passes into the chamber  $a$ , and thence is delivered through the perforations  $a'$   $a'$ , as indicated by the arrows in Figs. 2, 4. The chamber  $a$  surrounds the passage  $a^2$ , through which the main stream is delivered, and when it is desired to throw only the main stream the valve B is turned, as shown in Fig. 3, to close the entrance  $a^3$  into the chamber  $a$  and to open

the passage  $a^2$ , and when it is desired to cut off the main stream and deliver a spray the valve is turned into the position shown in Fig. 4. To this end the passage  $b$  through the valve B is larger at one side of the plug than at the other, and the tube  $a^4$ , which incloses the passage  $a^2$  is extended inward at  $a^5$  to meet the side of the valve B. One end  $b'$  of the valve-passage  $b$  coincides in size with the passage  $a^2$ , and when that end is brought opposite the tube  $a^4$ , as in Fig. 4, the inlet  $a^3$  is closed, and when the opposite end,  $b^2$ , of the valve-passage is opposite the tube  $a^4$  the inlet  $a^3$  is opened, as shown in Fig. 2, and by turning the valve so as to bring the part or side  $b^3$  opposite the tube  $a^4$  that tube is closed, but the inlet  $a^3$  is still open, as shown in Fig. 4. To close the nozzle, the valve must be turned to bring its side  $b^4$  opposite to and thereby to close the passage  $a^6$ , leading to the valve. The valve can be readily turned by means of the handle  $b^5$ .

To enable the valve to be secured in any of the various positions named, so that it shall not be accidentally displaced, the handle  $b^5$  is pivoted to the valve; and the flange  $a^7$ , with which the nozzle is provided, is notched at the four points  $a^8$   $a^8$   $a^8$   $a^8$ , and the handle is secured by turning it down into the notches, as shown in Figs. 1, 2, 3. The perforations  $a'$   $a'$  may be in the form of narrow slits, and they, as well as when in the form of perforations, may be extended through the nozzle-shell, so as to direct the jets forward, laterally, or backward. The cap C may, when it is desired to turn the stream backward, be unscrewed from the bearing  $c$ , Figs. 2, 3, and screwed onto the outer end of the tube  $a^4$ , as in Fig. 1. The stream is then spread and turned backward, as indicated by the arrows in Fig. 1. By screwing the cap C farther down onto the tube  $a^4$ , so that the cap at  $c'$  shall touch the end of the tube, as shown in Fig. 7, the water is prevented from being turned backward, but can escape through the center of the cap in the form of a small stream, as indicated by the arrow in the last-named figure. The edge  $c^2$  of the cap can be scalloped to enable the water to be spread laterally as well as backward. If desired, the nozzle A need not be screwed directly onto the pipe, but may be attached to an interme-



mediate tube, D, as shown in Figs. 1, 2, and this intermediate tube, when used, is at its inner end attached to the pipe. A sleeve, E, is attached to the tube D and adapted to be rotated thereon. The tube D is perforated at various places, *d d d d*, and the sleeve is provided with a corresponding number of tubular passages, *e e e*. By turning the sleeve upon the tube so as to bring the apertures *d* and passages *e* into coincidence, the water is enabled to escape from the pipe in the form of small streams. By rotating the sleeve so as to bring the apertures *d* out of coincidence with the passages *e*, the small streams are cut off.

15 The present nozzle, as well as the one patented to me December 26, 1882, can be used for signaling to the engineer. If the nozzle is suddenly adjusted to deliver a larger quantity of water, the pressure at the engine immediately decreases, and if to deliver a smaller quantity of water, the pressure immediately increases. These changes in pressure are indicated by a suitable pressure-gage at the engine, and by means of a suitable signal-code 25 the pipe-man can signal his wishes to the engineer.

I claim—

1. The combination of the nozzle A, con-

sisting of a tube, *a*<sup>4</sup>, the valve B, and the removable and adjustable centrally-perforated 30 dish cap C, substantially as described.

2. The combination of the tube *a*<sup>4</sup>, the extension *a*<sup>5</sup> thereof, the enlarged perforated chamber *a*, and the valve B, bearing against the end of said extension *a*<sup>5</sup>, substantially as 35 described.

3. The nozzle A, having a valve, B, constructed with a tapered passage, *b*, and located between the rear contracted passage, *a*<sup>6</sup>, the inner extended portion of the tube *a*<sup>4</sup>, and a 40 perforated chamber, *a*, substantially as described.

4. A tapered valve, B, having a flaring passage transversely through it, and applied in a perforated chamber, *a*, in combination with 45 the tube *a*<sup>4</sup>, having an extension which is fitted snugly against the perimeter of said valve, and surrounded by said perforated chamber, all constructed and adapted to operate substantially as described.

Witness my hand.

MATTHEW WARD.

Witnesses:

C. D. MOODY,  
THOS. L. JONES.