

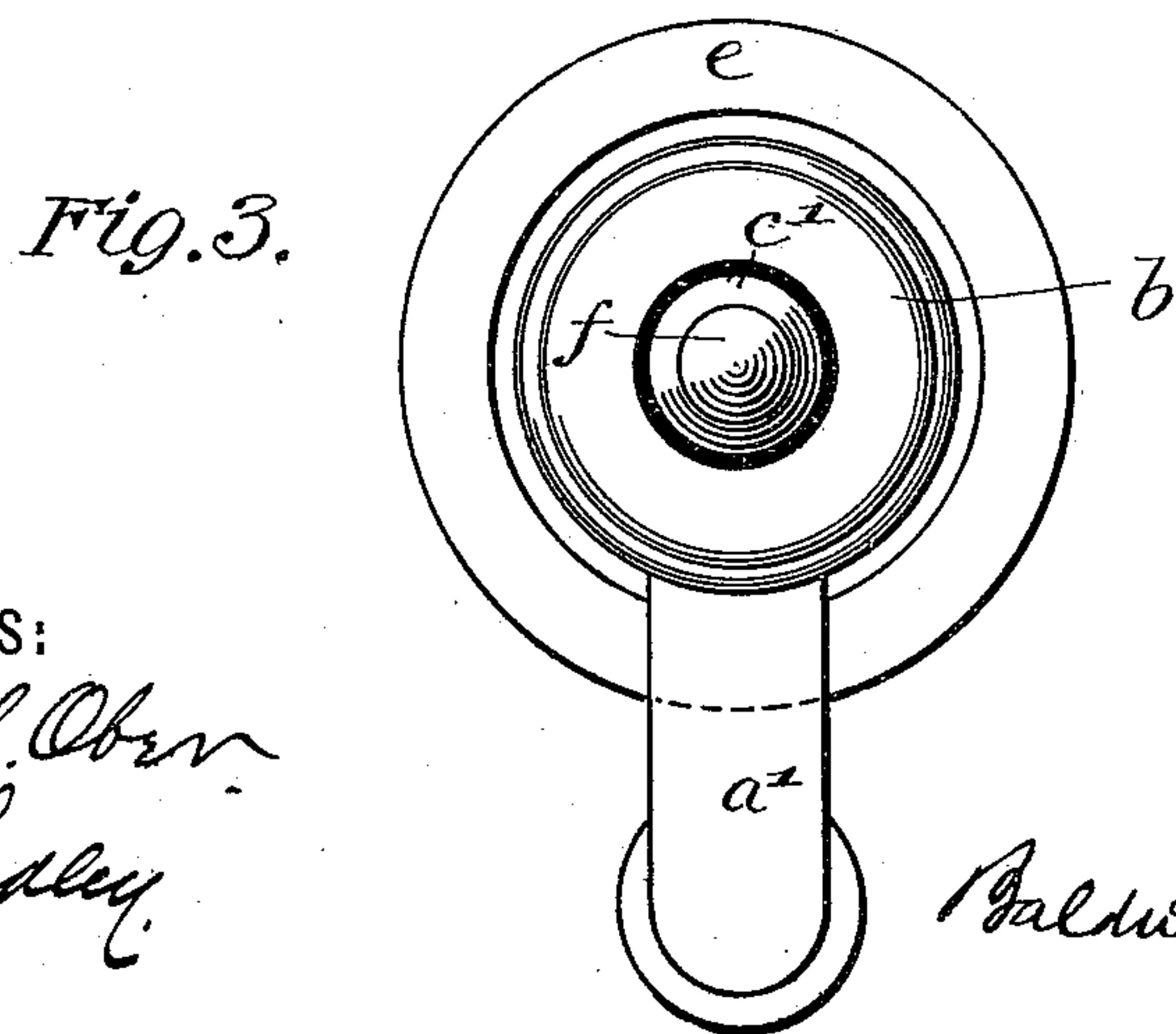
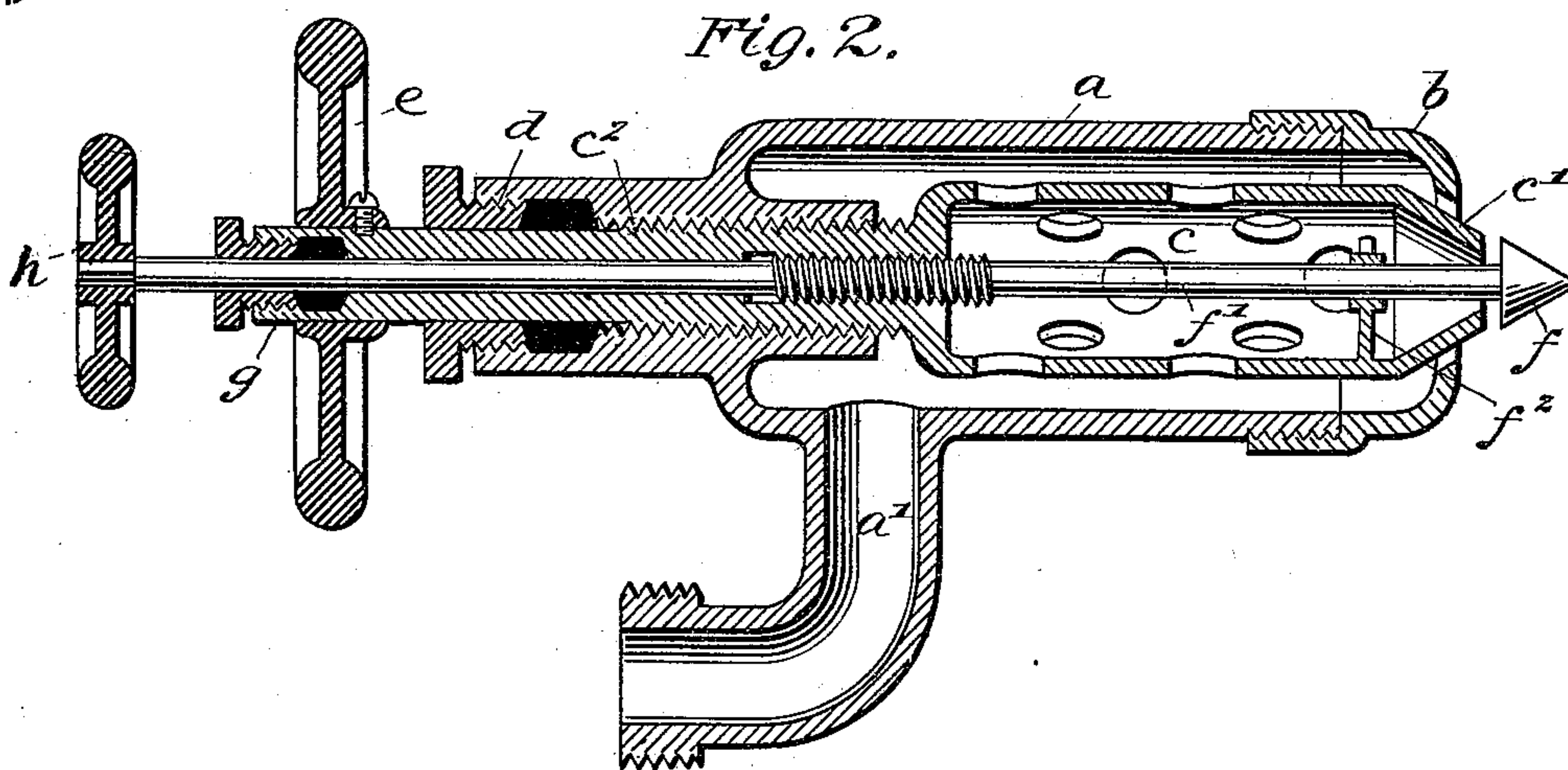
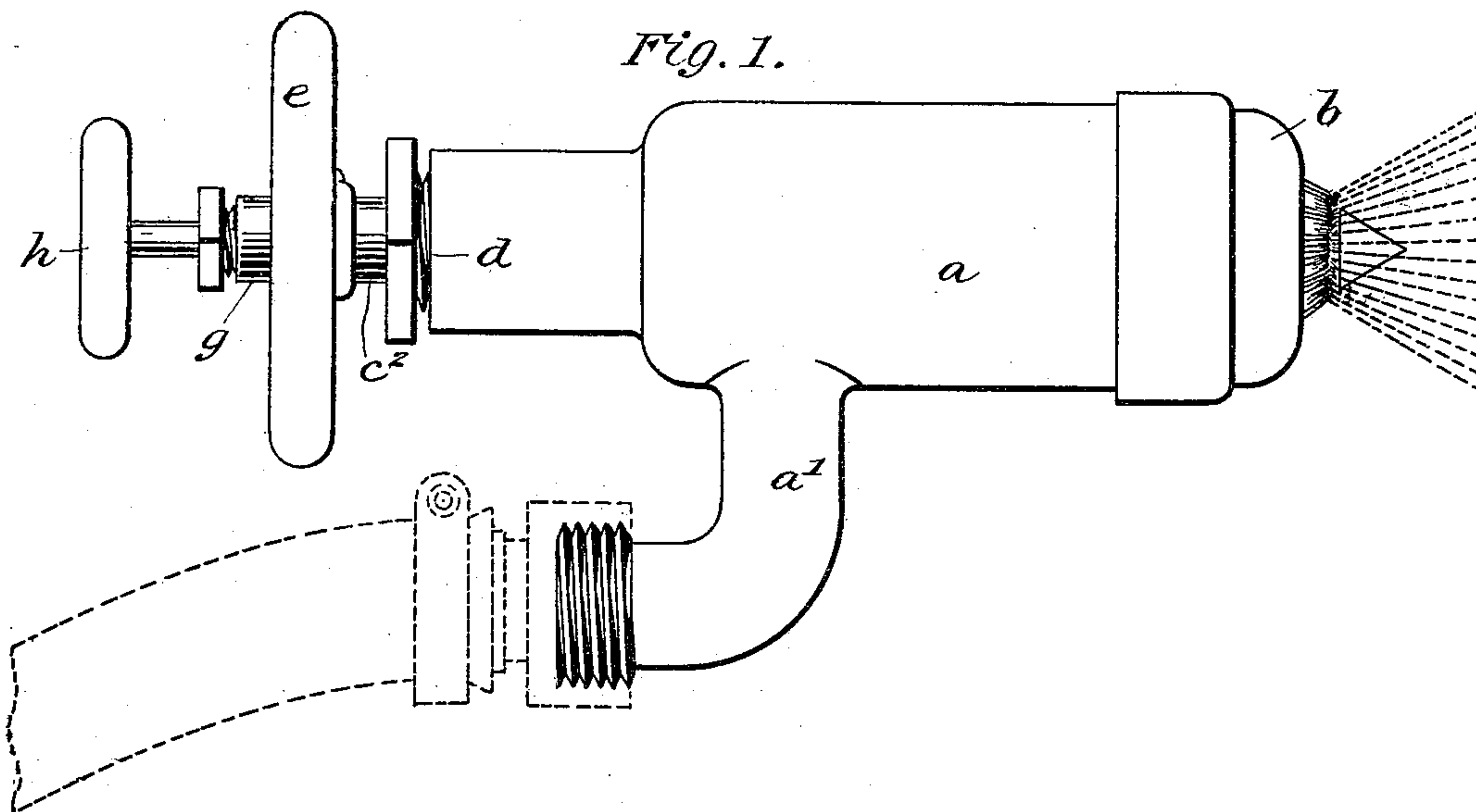
(No Model.)

2 Sheets—Sheet 1.

I. J. TURNER.  
NOZZLE FOR HOSE OR SPRINKLERS.

No. 556,291.

Patented Mar. 10, 1896.



WITNESSES:

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his ATTORNEYS

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Fig. 4.

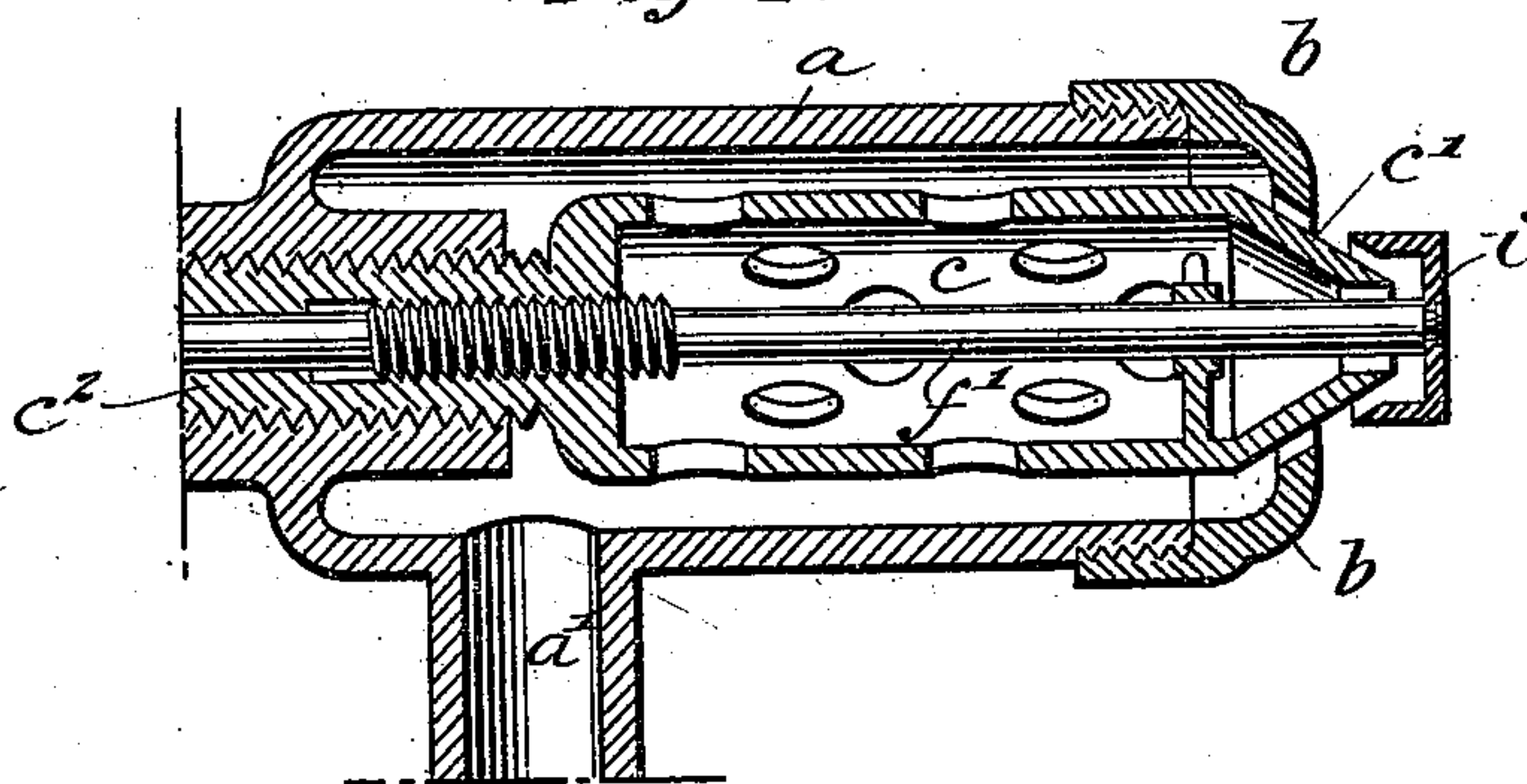


Fig. 5.

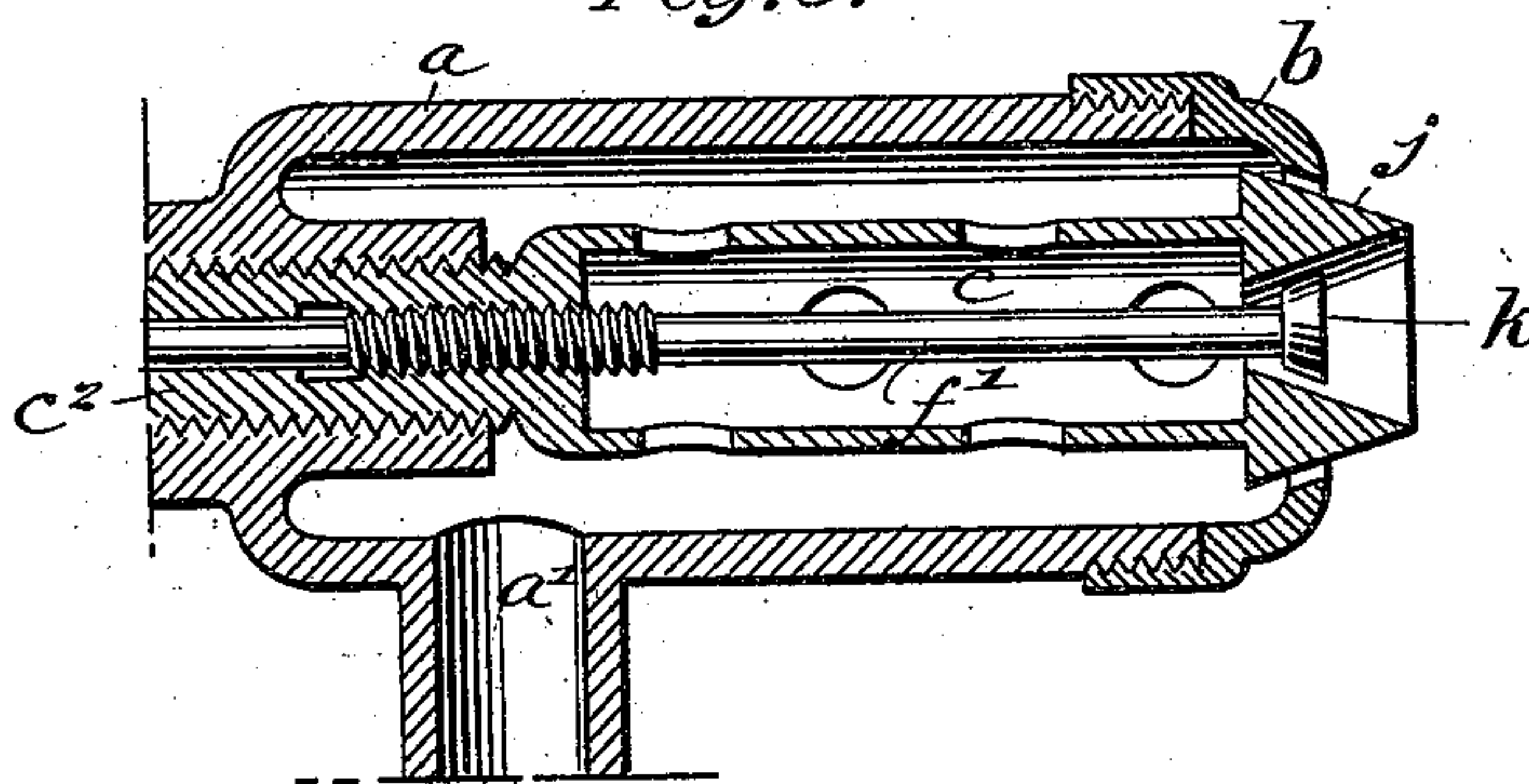


Fig. 6.

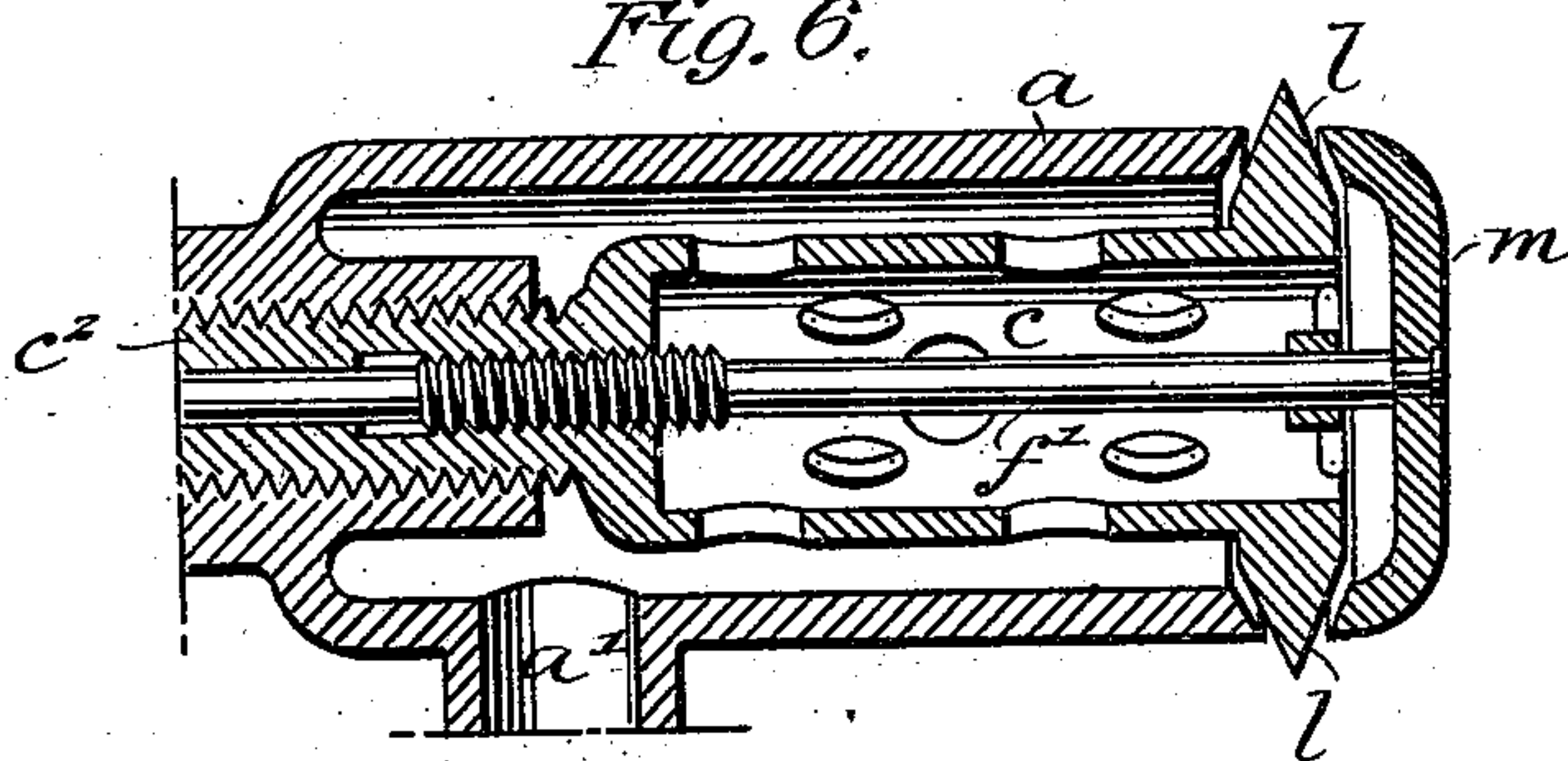
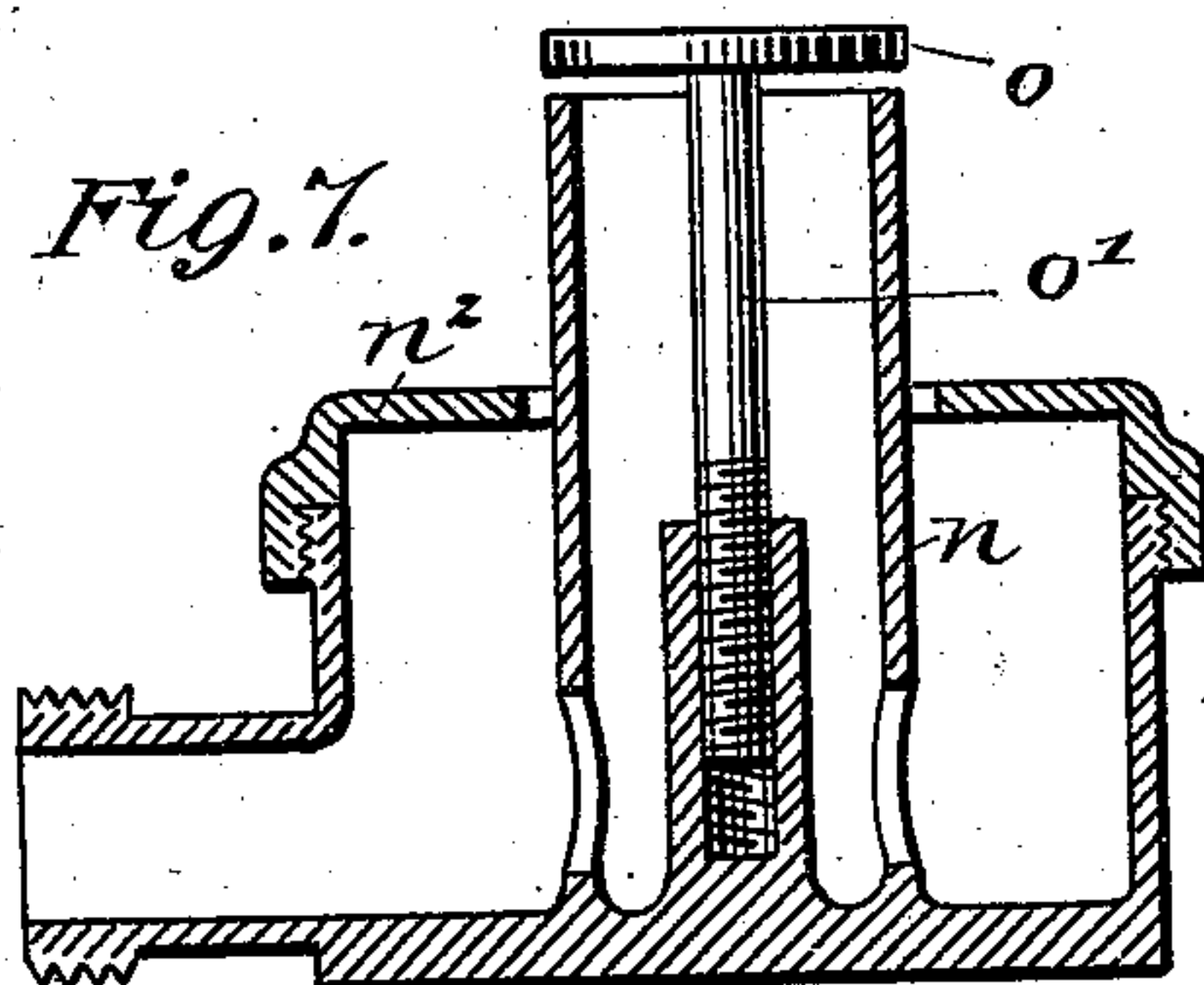


Fig. 7.



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# UNITED STATES PATENT OFFICE.

ISAAC J. TURNER, OF VICTORIA, NORTH CAROLINA.

## NOZZLE FOR HOSE OR SPRINKLERS.

SPECIFICATION forming part of Letters Patent No. 556,291, dated March 10, 1896.

Application filed November 20, 1895. Serial No. 569,567. (No model.)

*To all whom it may concern:*

Be it known that I, ISAAC J. TURNER, a subject of the Queen of Great Britain, residing at Victoria, in the county of Buncombe and State of North Carolina, have invented certain new and useful Improvements in Nozzles for Hose or Sprinklers, of which the following is a specification.

The spraying device forming the subject of this invention involves the principle of action of two streams of water meeting, whereby their impact causes a mutual spraying, and in the application of this principle for useful and ornamental purposes I have designed a spraying device having two converging orifices, preferably circular in form and concentric, or annular nozzles formed to discharge two streams in such direction as to meet close to but outside of the device. Many different combinations of the two streams may be had by slight changes in the construction of the spraying device. One of the streams may radiate from a center in a flat plane and the other stream issue from an annular nozzle and be directed against it; or both streams may be conical in form, one moving from the larger to the smaller part of the cone and the other one in the opposite direction, so as to meet; or one stream may radiate in a flat plane and the other one be a hollow cylindrical stream; or both the streams may be conical and hollow, one issuing outwardly and the other issuing inwardly from the end of the device, the two streams meeting at an angle; or the two streams may issue from the perimeter of a cylindrical end of the device in such direction as to meet, the two streams being similar in form—that is, both may be conical, or one conical and the other one flat. In general, in construction my spraying device consists of a main piece or body having a circular opening, a hollow valve or stream-guide open at its outer end, located in the body and extending through its opening and with it constituting an annular nozzle, means for adjusting this hollow valve, a cap or stream-guide located over the open outer end of the valve and with said open end constituting the other nozzle, and means for adjusting this cap.

The drawings show some of the forms in which my invention may be applied to useful and ornamental purposes and to which I will now refer.

Figure 1 is a side elevation of a spraying device in which a radiating flat stream meets a conical stream. Fig. 2 is a longitudinal section, and Fig. 3 is an end view, of the same. Fig. 4 shows in section the nozzle end of a spraying device in which two conical streams meet moving in opposite directions. Fig. 5 is a similar view in which an outwardly-moving conical stream will meet an inwardly-moving conical stream. Fig. 6 is a similar view in which two conical streams will issue from the side of the device and meet to form a spray, and Fig. 7 is a sectional view of a spraying device constructed to produce a radiating flat stream and a cylindrical stream.

The body *a* is preferably cylindrical in form and has at its side the water-inlet pipe *a'*, provided with the usual pipe or hose connection. The front end of the body is covered by the screw-cap *b*, having a central circular opening, and in the body is located the hollow valve *c*, the conical end *c'* of which extends through the opening of the cap *b*, and the stem *c<sup>2</sup>* of the valve is screw-threaded and held in the other end of the body, a packing-box *d* being provided to embrace the stem beyond the screw-thread. On the projecting end of the stem of the valve *c* is secured the hand-wheel *e*, by means of which the conical end *c'* of the valve may be set in different positions relative to the opening of the body or cap *b* of the body, or said opening may be entirely closed.

The outer end of the conical part *c'* of the valve is open, and over this opening is held the cap *f*, which with the said end of the valve constitutes the other stream-producing nozzle. This cap *f* is carried on the rod *f'*, which extends entirely through the valve *c* and its stem, said rod being held and guided near its outer end by the spider-bearing *f<sup>2</sup>* located in the valve. A part of this rod *f'* is screw-threaded where it fits in the stem *c<sup>2</sup>* of the valve, and the outer end of the stem is provided with a packing-box *g*, surrounding the rod *f'*. The projecting end of the rod



$f'$  has secured to it the hand-wheel  $h$ . By this arrangement the cap  $f$  may be adjusted relative to the end of the valve  $c'$  and the opening at the end of the valve entirely closed when desired. The valve  $c$  is perforated, as shown, to permit water from the body  $a$  to flow out of the end of the valve. Now from this construction and arrangement of parts it will be seen that a flat radiating stream will issue from under the cap  $f$  and a conical stream along the conical end  $c'$  of the valve, the meeting of the two streams causing a disintegration or spraying of them, the spread of resultant angular field of said spray being determined by the relative volumes and forces of the two streams, which may be readily adjusted by the manipulation of the hand-wheels  $e$  and  $h$ . This controlling of the spray-field by the adjustment of the two stream-nozzles applies to all of the devices shown, except that shown at Fig. 7, and need not be repeated in describing the other views.

The construction of Fig. 4 is the same as that just described, with the exception of the cap, and the corresponding parts, as well as the corresponding parts of the other views, are similarly lettered. For the cap  $f$  is here substituted a hollow cap  $i$ , the edge of which extends over the conical end  $c'$  of the valve, thus causing a stream to issue down the conical end  $c'$  to meet the stream formed by the valve and the cap  $b$ , resulting in a spray more or less spread out according to the adjustment of the parts of the device.

At Fig. 5 the conical end  $j$  of the valve has its inner part formed with a reverse conical surface, and in this reverse inner cone is located the cap  $k$ , about in the plane with the cap  $b$ . By means of this arrangement and construction of parts it will be seen that the resultant spray of the two conical streams will be confined in a more or less restricted field and will generally be of a more solid character than the spray from the other devices, this form of my invention being thought best for use for extinguishing fires and where large volumes of water are needed.

In the device shown in Fig. 6 the cap  $b$  or end of the body is omitted. The streams-controlling valves consist of the flanged-shaped head  $l$ , having inclined sides, so as to form a sharp edge, said head extending beyond the end of the body  $a$  and forming one of the stream-nozzles with said end of the body, as shown. The cap  $m$  on the rod  $f'$  is the same size as the body  $a$  and with the outer side of the head  $l$  constitutes the other stream-nozzle. The resultant spray of such a device will be practically in a flat plane and would probably be most suitable for ornamental purposes.

At Fig. 7 my invention is shown applied in a device adapted to be used as a lawn-sprinkler. In this form the part  $n$  corresponds to the valves in the other forms and is here shown as a part of the body  $n'$ , and is shown

cylindrical instead of conical at its outer end, one of the discharge-orifices being the annular opening between the outside of  $n$  and the hole in the cover  $n^2$  of the body. The cap  $o$ , which with the outer end of the part  $n$  constitutes the other stream-nozzle, is carried by the stem  $o'$ , which screws into the lug formed on the bottom of the body  $n'$ , and this cap  $o$  is the only part that is adjustable. When once the parts are adjusted for the water-pressure of any particular locality, they can remain so, the device then being always in condition for use.

Besides the uses here mentioned, my invention may be applied to all other uses where a spraying of fluid is required.

I claim as my invention—

1. In a spraying device, the combination of a hollow body having an opening at one end, a hollow open-end valve located in the body, extending through the opening in its end, thus constituting an annular nozzle for the passage of a stream, and a cap located over the open end of the valve, thus constituting a nozzle adapted to discharge a stream across the path of the other stream.

2. In a spraying device, the combination of a hollow body having an opening at one end, a hollow open-end valve located in the body, having a conical end, extending through the opening in its end, thus constituting an annular nozzle for the passage of a conical stream, and a cap located over the open end of the valve, thus constituting a nozzle adapted to discharge a stream across the path of the other stream.

3. In a spraying device, the combination of a hollow body having an opening at one end, a hollow open-end valve located in the body, extending through the opening in its end, thus constituting an annular nozzle for the passage of a stream, and a flat cap located over the open end of the valve, thus constituting a nozzle adapted to discharge a radiating flat stream across the path of the other stream.

4. In a spraying device, the combination of a hollow body having an opening at one end, a hollow open-end valve located in the body, having a conical end, extending through the opening in its end, thus constituting an annular nozzle for the passage of a conical stream, and a flat cap located over the open end of the valve, thus constituting a nozzle adapted to discharge a radiating flat stream across the path of the other stream.

5. In a spraying device, the combination of a hollow body having an opening at one end and an internal screw-thread and packing-box at the other end, a hollow valve in the body having an open end extending through the open end of the body, and a screw-threaded stem fitting in the other end of the body, a hand-wheel on the stem of the valve, and a cap located over the open end of the valve.

6. In a spraying device, the combination of a hollow body having an opening at one end



and an internal screw-thread and packing-  
box at the other end, a hollow valve in the  
body having an open end extending through  
the open end of the body, a screw-threaded  
5 stem fitting in the other end of the body, a  
hand-wheel on the stem of the valve, a cap  
located over the open end of the valve, a rod  
carrying said cap and passing through the  
stem of the valve, being partly screw-thread-  
ed therein, and a handle on the end of the rod. 10

In testimony whereof I have hereunto sub-  
scribed my name.

ISAAC J. TURNER.

Witnesses:

E. D. WILLIAMS,  
D. C. WADDELL, Jr.