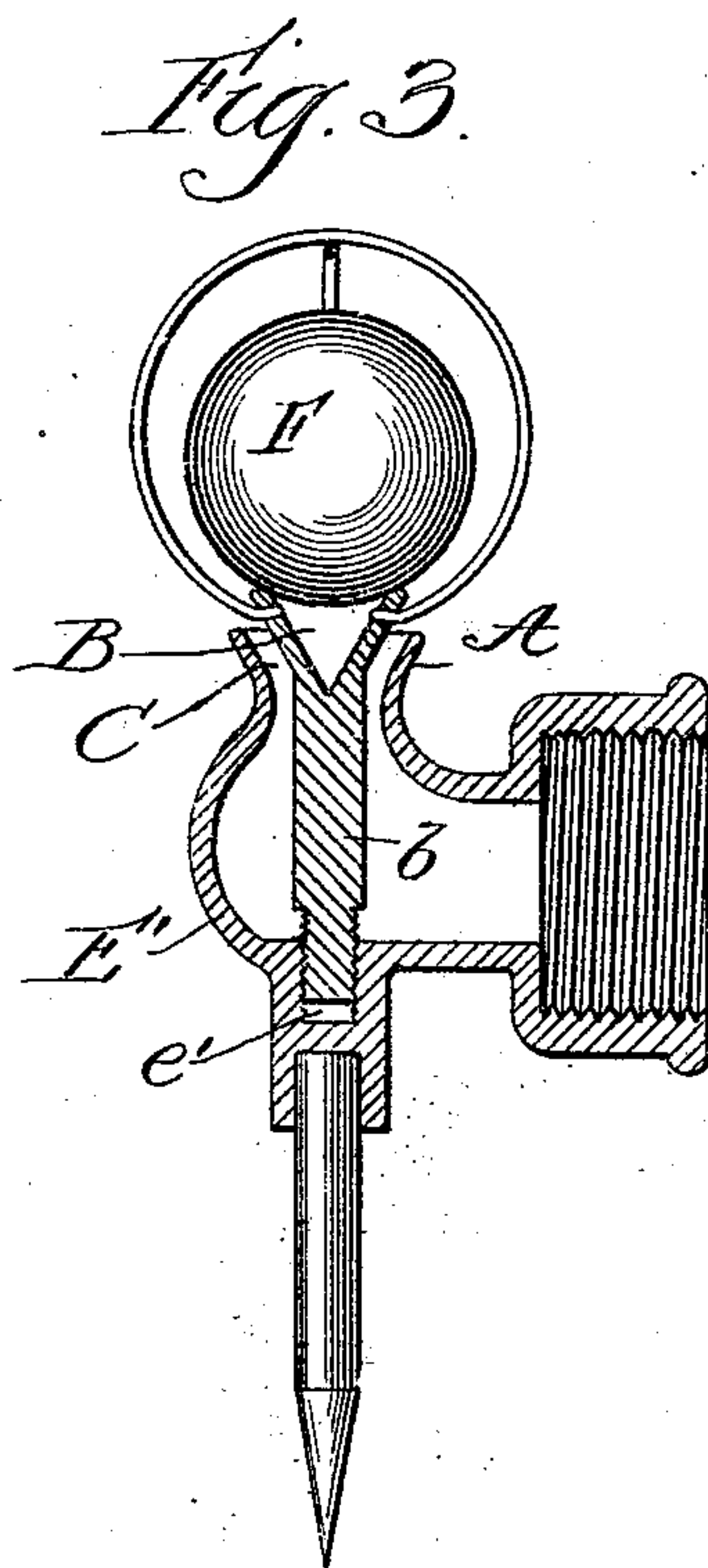
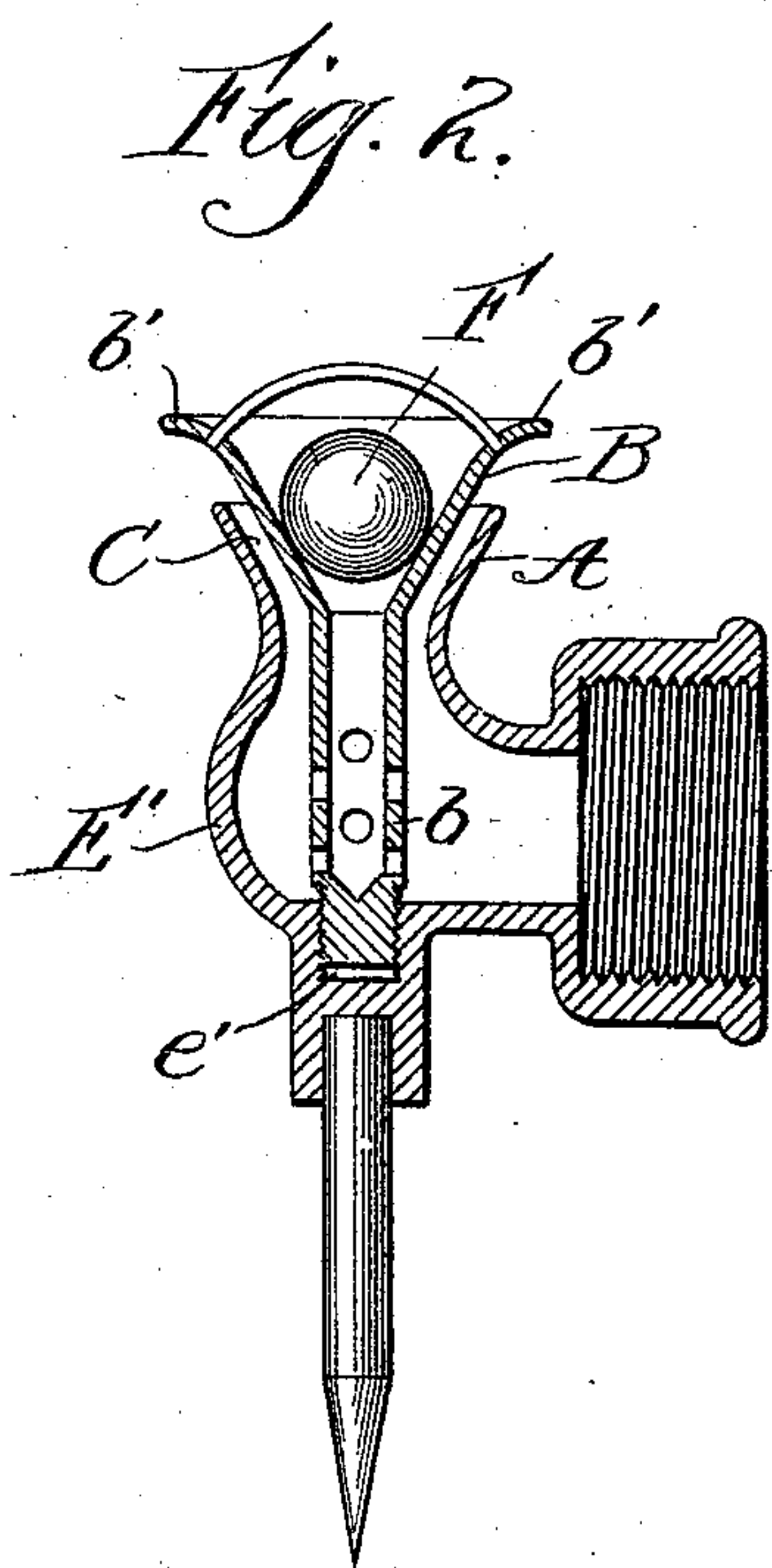
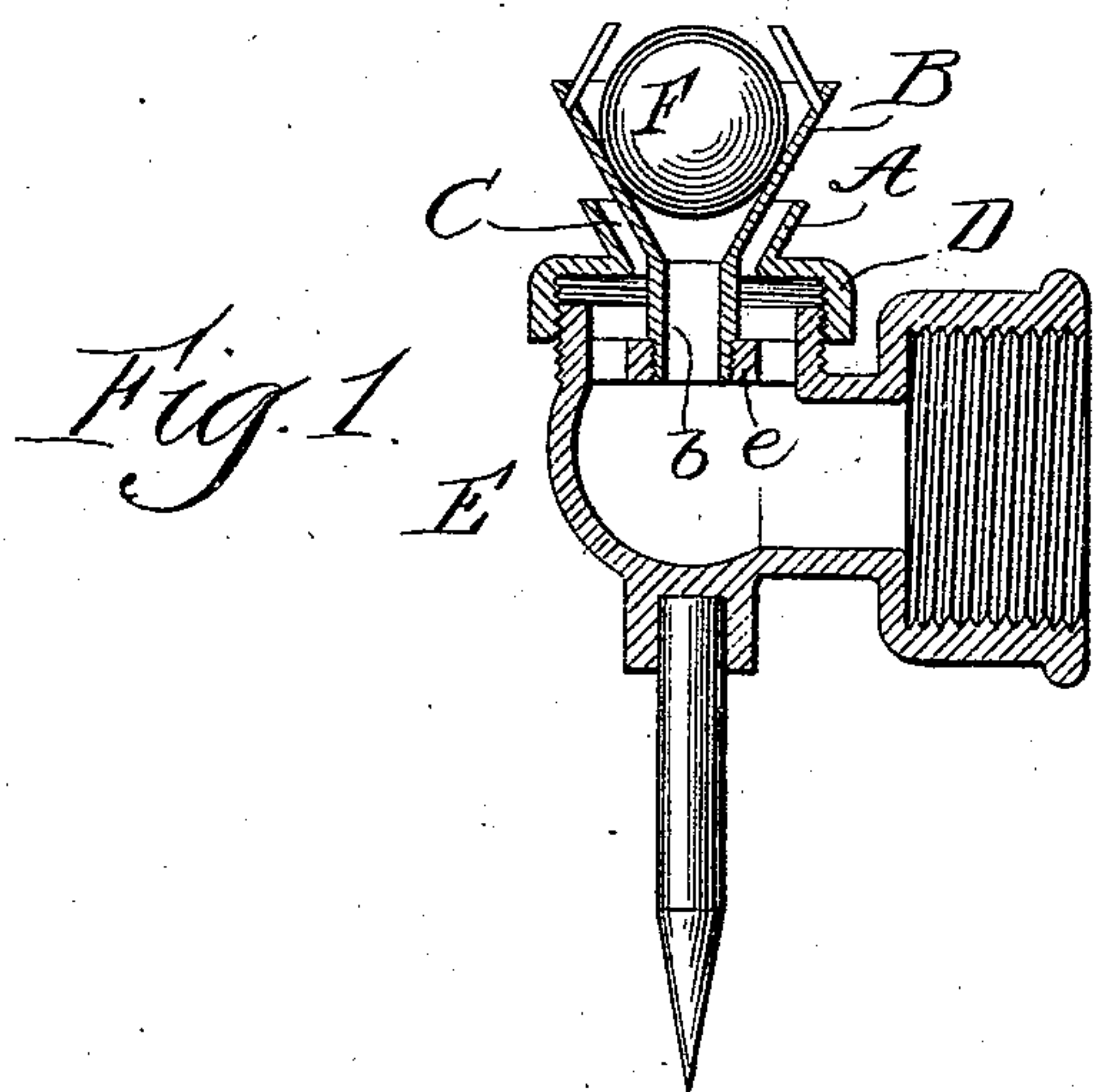


(No Model.)

F. GRAY.
SPRAYING NOZZLE.

No. 551,630.

Patented Dec. 17, 1895.



Witnesses
Wm. J. Fleming
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UNITED STATES PATENT OFFICE.

FRANK GRAY, OF CHICAGO, ILLINOIS.

SPRAYING-NOZZLE.

SPECIFICATION forming part of Letters Patent No. 551,630, dated December 17, 1895.

Application filed May 31, 1895. Serial No. 551,267. (No model.)

To all whom it may concern:

Be it known that I, FRANK GRAY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have
5 invented certain new and useful Improvements in Spraying-Nozzles, of which the following is a specification, reference being had to the accompanying drawings, which are made a part hereof, and in which—

10 Figures 1, 2, and 3 are vertical sections of lawn-sprinklers having nozzles embodying the invention in three different forms.

The present invention relates to that class of nozzles in which a ball is so arranged with
15 relation to the discharge-opening that the issuing liquid comes in contact with the ball and is by it broken up into spray and distributed.

The object of the invention is to provide a
20 nozzle of this class with means whereby the area of the discharge-opening may be adjusted; and to this end the invention consists in the features of novelty that are particularly pointed out in the claims hereinafter.

25 I have illustrated the invention in its application to a lawn-sprinkler; but it will be manifest to those skilled in the art that to apply the invention to nozzles for other purposes requires simply an alteration in the shape of
30 that portion of the nozzle which joins the hose.

In each of the several forms of the invention the nozzle has a bell-mouth A, preferably conical in shape, and fitting within this mouth is a cone D, the two being so related that an
35 annular opening C for the discharge of water is left between them, means being provided for adjusting them with relation to each other for the purpose of regulating the size of the opening.

40 In Fig. 1 the bell-mouth A is shown as being formed upon a ring D, having screw-threads adapted to engage corresponding threads cut upon the casting E, and the cone B is provided with a stem *b*, screwed or other-
45 wise secured to a spider *e*, arranged within the casting E. This arrangement is such that the part embracing the bell-mouth A and ring D may be adjusted with relation to the cone so as to leave between the bell-mouth and

cone an annular opening C of the desired ca- 50
pacity.

As shown in Figs. 2 and 3, the bell-mouth and the casting E' (which latter corresponds to the casting E of Fig. 1) are integral, and the adjustment is effected by providing the
55 stem *b* of the cone with screw-threads that are adapted to enter a correspondingly-threaded socket *e'*, formed in the bottom of the casting.

As shown in Figs. 1 and 2, the stem *b* is hollow, so that water is discharged not only
60 through the annular opening C, but also through the cone itself, passing between it and the ball F, located within it. The operation of this cone and ball is fully understood in the art and needs no further description. 65

In Fig. 3 the stem is solid, and the only discharge of water is through the annular opening C, the ball F being of sufficient diameter to project beyond the projected outer surface of the cone and into the path of the issuing
70 stream.

In Fig. 2 the margin of the cone is turned out, as shown at *b'*, in order to deflect the water issuing from the annular opening C and precipitated in the immediate vicinity of the
75 sprinkler.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. The combination with a nozzle having a
80 flaring discharge opening, of a cone located in the flaring discharge opening, said cone and nozzle being relatively adjustable, for the purpose of regulating the size of the annular space between them, and a loose ball located directly
85 in the path of the issuing stream of water, substantially as set forth.

2. The combination with a nozzle having a conical discharge opening, of a cone arranged in the discharge opening of the nozzle, the in-
90 side surface of the discharge opening of the nozzle and the outside surface of the cone being parallel, and the nozzle and cone being relatively adjustable for the purpose of regulating the capacity of the opening between
95 them, and a loose ball located in the path of the issuing stream of water and supported by the cone, substantially as set forth.

3. In a nozzle the combination with a suitable shell having a flaring discharge opening, of a hollow cone having a hollow stem communicating with the interior of the shell, said
5 cone being arranged within the flaring discharge opening so that the inner surface of said opening and the outer surface of the cone are substantially parallel, and a ball arranged

in the hollow cone, the cone and shell being relatively adjustable for the purpose of varying the capacity of the annular space between them, substantially as set forth.

FRANK GRAY.

Witnesses:

L. M. HOPKINS,
FRANK H. CHASE.