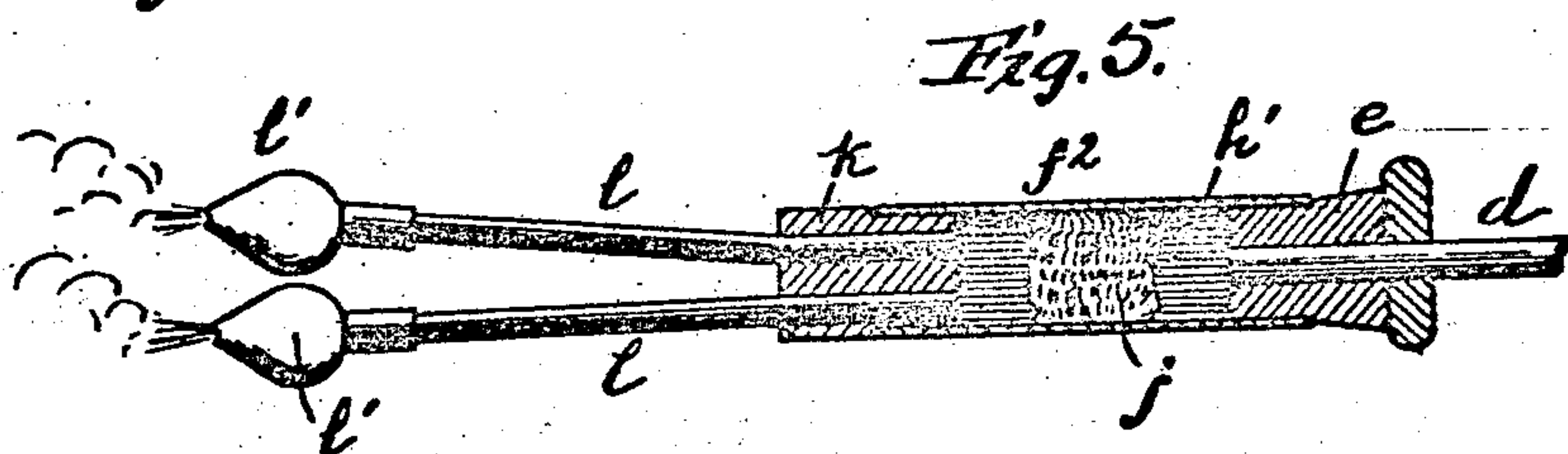
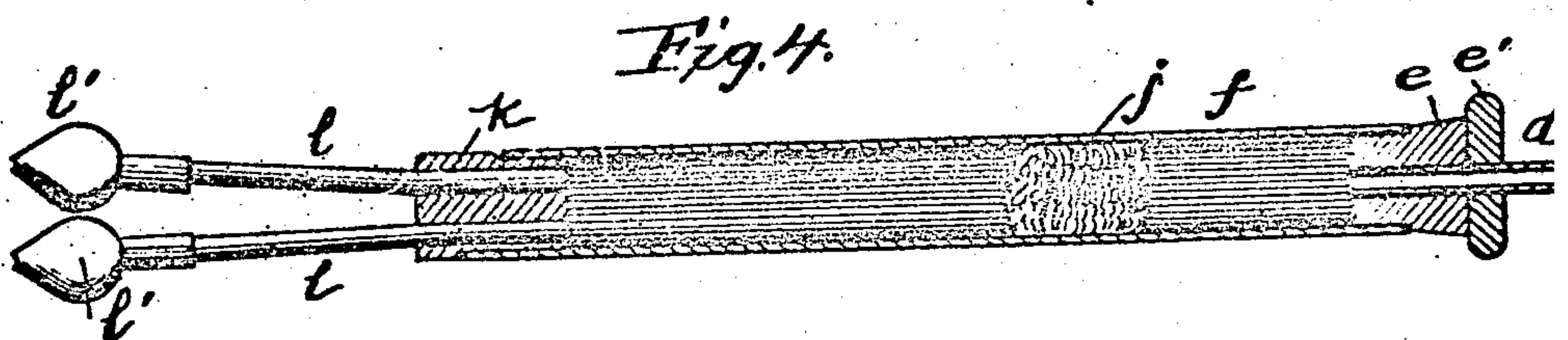
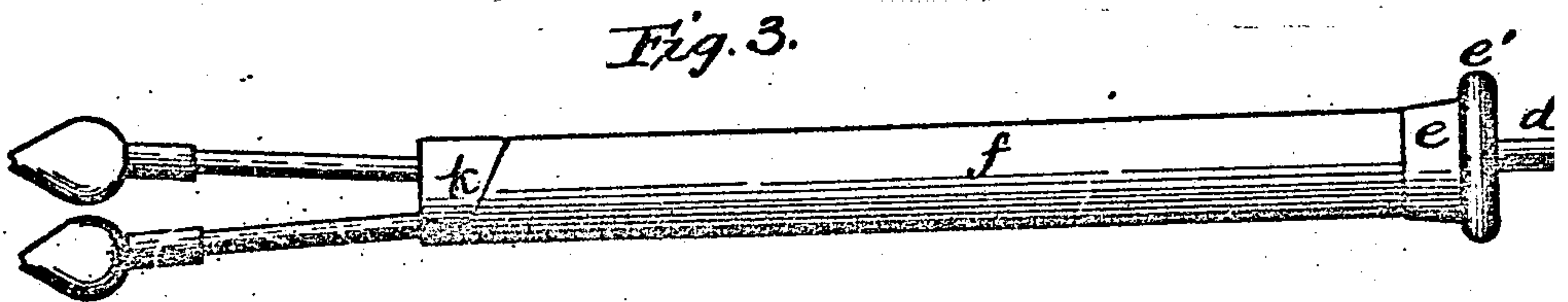
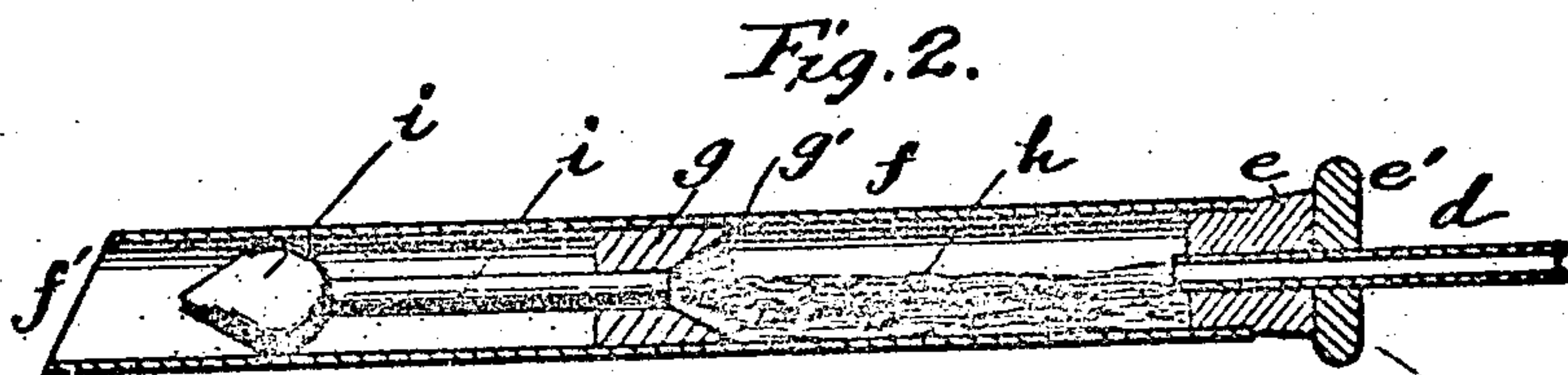
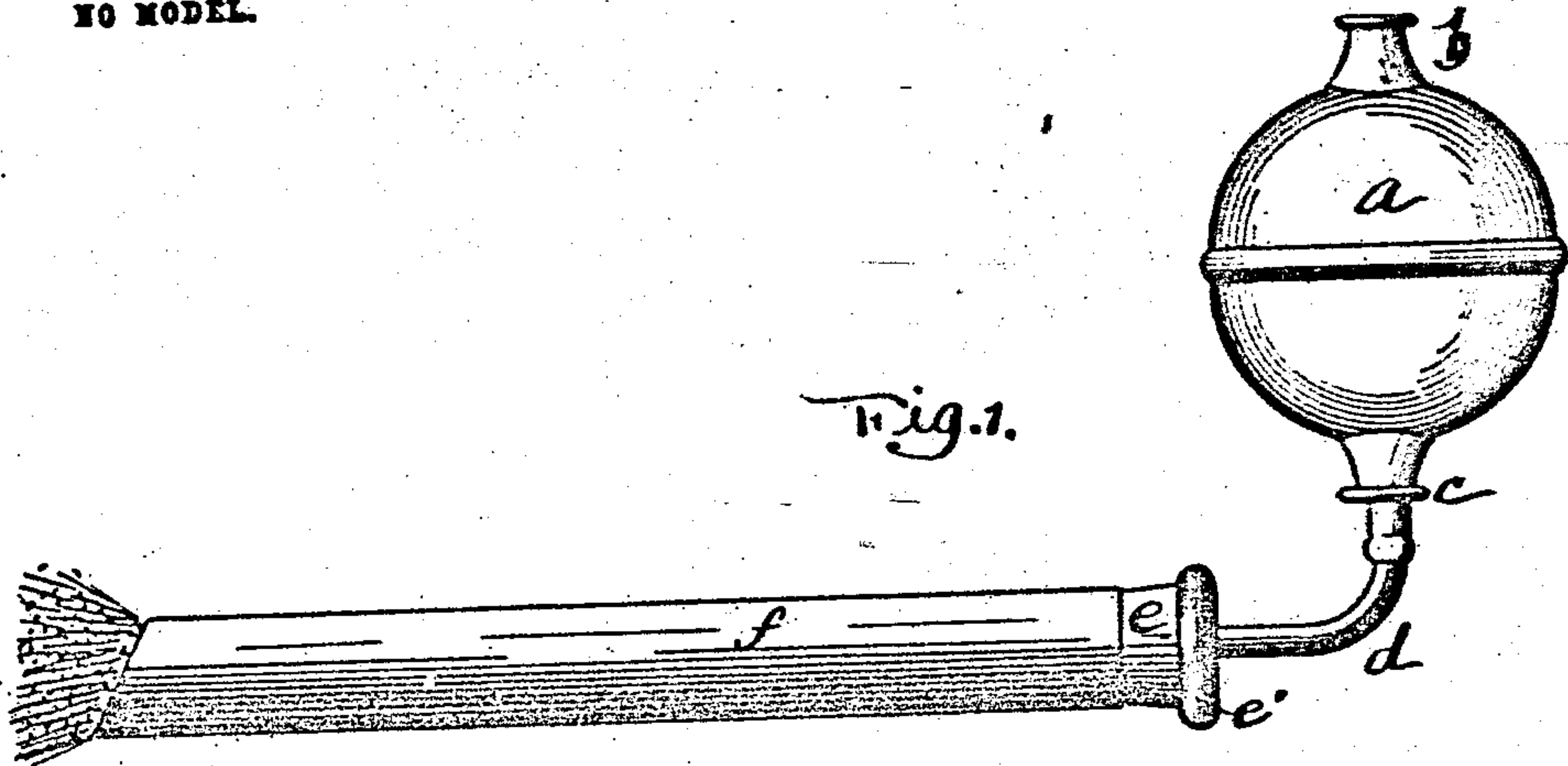


No. 742,635.

PATENTED OCT. 27, 1903.

T. E. HALL.
MEDICAMENT INJECTOR.
APPLICATION FILED DEC. 29, 1902.

NO MODEL.



Witnesses
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UNITED STATES PATENT OFFICE.

THOMAS E. HALL, OF CHICAGO, ILLINOIS.

MEDICAMENT-INJECTOR.

SPECIFICATION forming part of Letters Patent No. 742,635, dated October 27, 1903.

Application filed December 29, 1902. Serial No. 137,053. (No model.)

To all whom it may concern:

Be it known that I, THOMAS E. HALL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Medicament-Injectors, of which the following is a specification.

This invention has for its primary object the construction of an injector by the use of which the application of medicament either in the form of dry powder, vapor, or liquid can be attained in the passages of the human body and have such application made under the proper conditions and requirements for obtaining the most beneficial results and have the discharge of the medicament when in the form of powder insured without being lumpy or adhering together.

The invention consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation of the injector of the invention in the preferred form for use in applying medicament in the form of powder; Fig. 2, a central longitudinal section of the injector shown in Fig. 1 with the bulb removed; Fig. 3, a side elevation showing an arrangement of the injector for use with the nasal passages in the application of a liquid or vaporous medicament; Fig. 4, a central longitudinal section of the construction shown in Fig. 3, and Fig. 5 a central longitudinal section showing a modified form of the injector for use in applying a liquid or vapor medicament to the nasal passages. The bulb for producing the compression to eject the liquid is not shown in Figs. 2, 3, 4, and 5, but is the same construction as shown in Fig. 1.

The injector is constructed with a compressible bulb *a*, made of india-rubber or other suitable material and having at one end an inlet-port *b*, valve-controlled, and having at the other end an outlet-port *c*, likewise valve-controlled, as usual in the construction of compressible bulbs. A tube *d*, preferably rubber, is connected with the outlet *c* at one end and at its other end extends through a cork or stopper *e*, having, as shown, a rigid cap *e'*, and this stopper is entered into a tube *f*, made of any suitable rigid material, and,

as shown, the tube *f* in the construction shown in Figs. 1 and 2 preferably has its entering end *f'* on an incline, which is a preferred form for use in the passage of the vagina. The construction of Figs. 1 and 2 has located in the tube *f* a wall or plug *g*, the inner end of which, as shown, is of a funnel or inwardly depressed formation, and between this wall or plug *g* and the cork or stopper *e* is a chamber *h* for the reception of powdered medicament. The plug or wall *g* has entered there into so as to communicate with the funnel shaped opening a stem *i*, having at its end a discharge-nozzle *i'* of a pear shape with a fine perforation in its end. The pear-shaped bulb or enlargement of the discharge-stem by its conical shape forms a chamber against the wall of which the powdered medicament will be projected by the force of the discharge derived from the air forced from the compressible bulb for the impact of the powdered medicament against the wall of the chamber of the discharge nozzle to break up and destroy any lumps or the adhering of the particles, thereby insuring the discharge of the powdered medicament at the place of application in a spread-out or expanded condition and without being lumpy, thus avoiding any liability of causing irritation from any lumps or adhesion of the particles one to the other and in addition this breaking up of the lumps condition and spreading of the adhering particles prevent the stoppage of the discharge orifice or perforation by lumps or adhering particles, making the operation of the injector in discharging the particles properly and the application of the powdered medicament to the to-be-treated part a finished and reliable one.

The construction shown in Figs. 3, 4, and 5 in place of the solid wall or plug *g* employ a stop *j*, preferably of sponge or other suitable porous material, and between this stop and the cork or stopper *e* a chamber similar to chamber *h* is formed, in which chamber liquid will be placed. The construction of Figs. 3, 4, and 5 has inserted in the discharge end of the tube *f* a cork or plug *k*, and through this cork is entered the end of two stems *l*, preferably of flexible material, like india-rubber, and each tube *l* at its outer end

free end has affixed thereto a discharge-nozzle *l*, preferably of a pear shape, for the same reason and for the same purpose as described for the discharge-nozzle *l* in the construction of Figs. 1 and 2. The tube *f*² in the construction shown in Fig. 5 is foreshortened; but otherwise the construction and arrangement are the same as shown and described for Figs. 3 and 4.

- 10 The powdered medicament in the construction of injector shown in Figs. 1 and 2 is placed in the chamber *h* by removing the cork or stopper *e*, and when the required amount of powdered medicament is in the
- 15 chamber the cork or stopper is replaced and the injector or instrument is ready for use. In use the tube *f* is entered into the vagina-passage or other passage of the body where the treatment is to be applied, and when in-
- 20 serted to the extent required the bulb *a* is compressed, forcing the air therefrom through the tube *d* for the pressure of the air to act on the powdered medicament in the chamber *h* and force such medicament into the stem *i*
- 25 to be discharged in a sprayed form at the discharge end of the nozzle *l* into the chamber of the tube *f* forward of the nozzle and passed therefrom on to the part to be treated by the medicament. If more than one discharge of
- 30 the medicament is required at one operation, the cork or stopper can be removed and a new charge of the powdered medicament placed in the chamber *h* and the cork or stopper replaced for another compression of the
- 35 bulb to eject the powdered medicament in a spray or sprayed-out form at the discharge end of the tube *f* directly at the point where the application of the medicament is to be made. A single compression of the bulb
- 40 will ordinarily be sufficient to project the charge entered in the chamber *h*; but it will be understood that if a single compression is not sufficient for the purpose the bulb can be compressed as many times as may be re-
- 45 quired.

The operation of the injector for use in treating the nasal passages is essentially the same as described for treating other passages of the human body, except that the liquid or

- 50 vaporous mixture is placed in the chamber of the tube *f*, and this liquid or vaporous mixture is forced through the porous material forming the abutment in the tube by the pressure of the air and is injected into the
- 55 discharge-nozzle *l* to be projected therefrom, it being understood that a discharge-nozzle is entered in each of the nasal passages. It will be understood, also, that either form of construction can be used for treating the various passages of the human body with either
- 60 a powdered medicament or a liquid or vaporous mixture; the powdered medicament being preferably used in connection with a solid plug or abutment and the liquid or vaporous mixture for use in connection with a porous wall or abutment.

It will be seen that by means of the injector or instrument of the present invention application of powder or liquid medicament within the passage or passages to be treated at the precise point of application of medicament is reliably assured, that from lumps or adhering particles is come, that the distributing or applying *f* opens the passage of the vagina or passage for the reception of the medicament and the end of such tube can be properly located in relation to the place of treatment that the powdered medicament and the or vaporous mixture are both discharged a vaporized, showered, or sprayed directly on the diseased part, and that operation of the injector or instrument do not require any special skill, except in locating the diseased part and properly directing the distributing or applying tube to discharge thereon or inserting the discharge-nozzle for the proper discharge, all of which make the injector or instrument very desirable construction shown specially in Fig. 2 for use in treating diseases of the nose for which purpose this form of construction is especially designed, and for internal treatment of other passages, and the construction shown in Figs. 3, 4, and 5 is specially adapted for the treatment of the nasal passages.

What I regard as new, and desire to secure by Letters Patent, is—

1. In a medicament-injector, the combination of a compressible bulb, a flexible tube leading from the compressible bulb having a rigid body and into one end of the flexible tube is entered, a division across the interior of the rigid tube which wall and the receiving end of a chamber for containing a medicament, a cone-shaped discharge-nozzle forming communication with the chamber, the rigid tube, and means for forcing the medicament under pressure into the discharge-nozzle to be projected therefrom in a vapor or spray, substantially as described.

2. In a medicament-injector, the combination of a compressible bulb, a flexible tube leading from the compressible bulb having a rigid body, a cork entered in the receiving end of the rigid body through which the flexible tube passes and has communication with the interior of the rigid tube or abutment across the interior of the tube and between which and the cork a chamber is formed for containing a medicament and a discharge-stem for the medicament forming a cone-shaped delivery end, for projecting the medicament in a vapor or spray, substantially as described.

3. In a medicament-injector, the combination of a compressible bulb, a flexible tube leading from the compressible bulb into a tubular chamber, a cork entered in the receiving end of the rigid tubular chamber which the flexible tube is entered

communication with the interior of the tubular body, a wall or abutment across the interior of the tubular body and between which and the cork a chamber is formed for containing a medicament, and a discharge-stem for the medicament having a cone-shaped delivery end, and located entirely within and

surrounded by the tubular body for discharging the medicament in a vapor shower or spray, substantially as described.

THOMAS E. HALL.

Witnesses:

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WALKER BANNING.