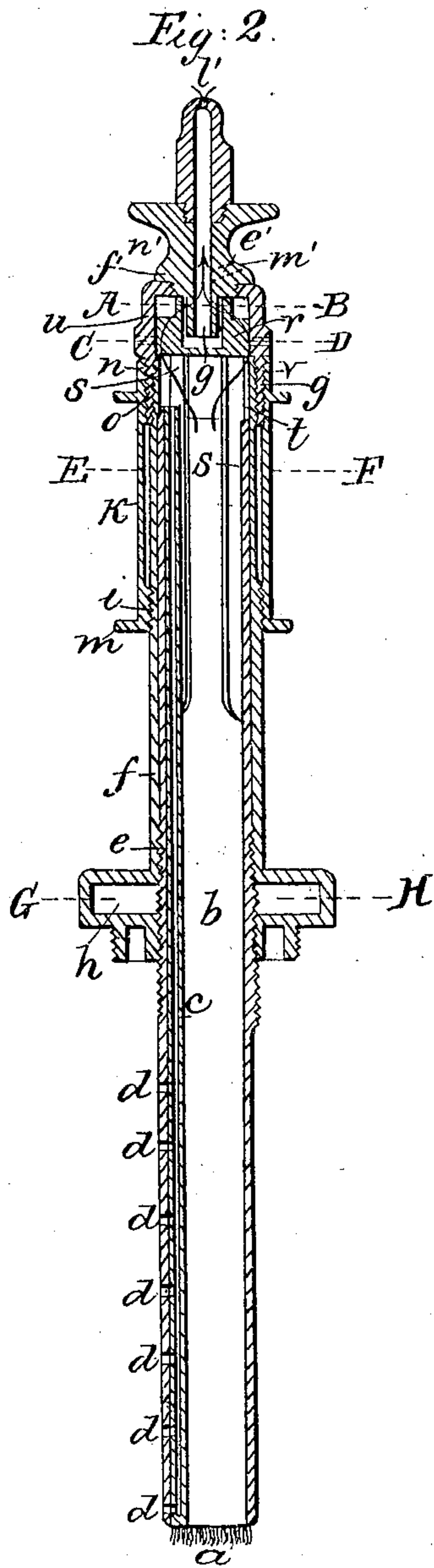
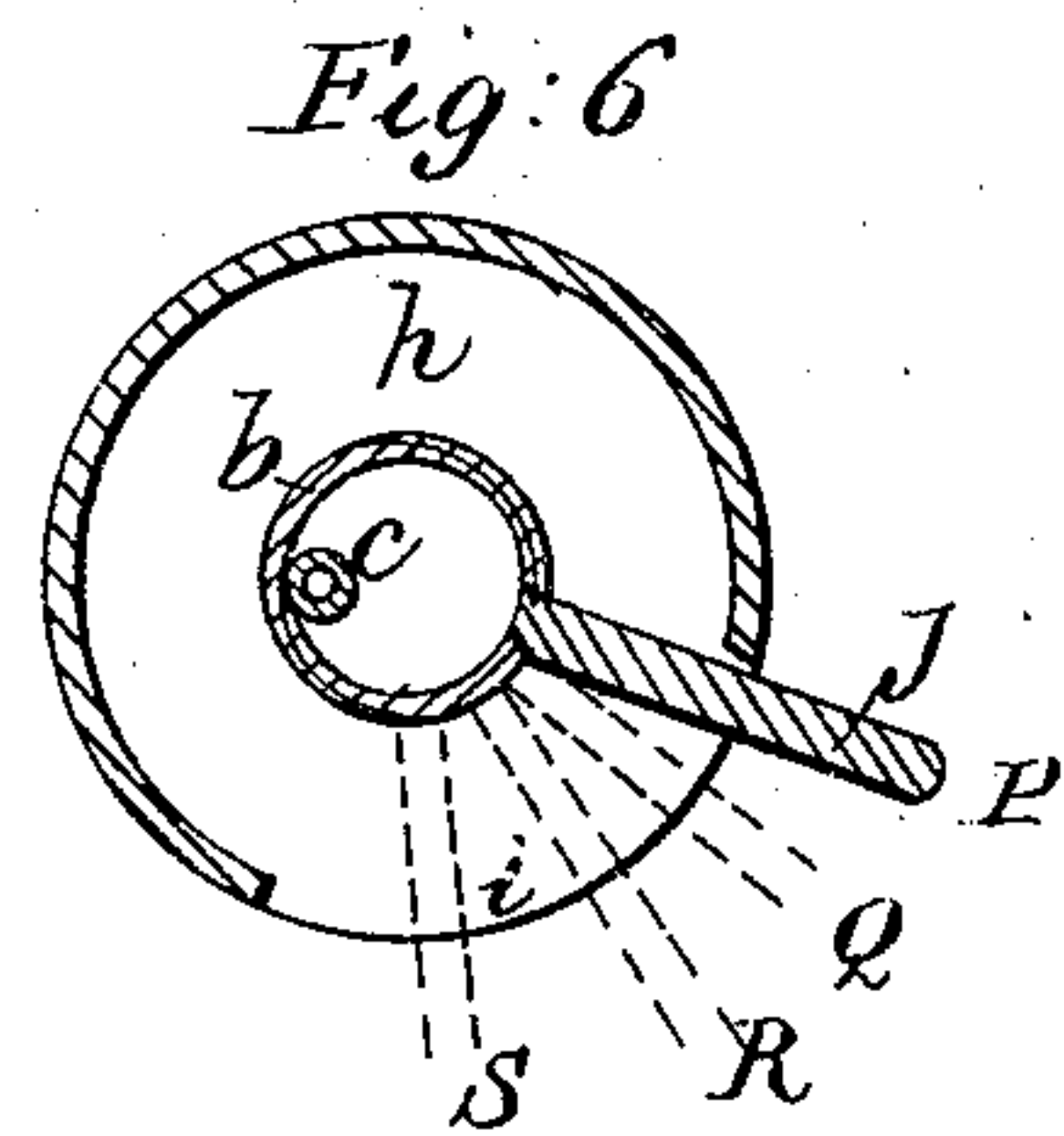
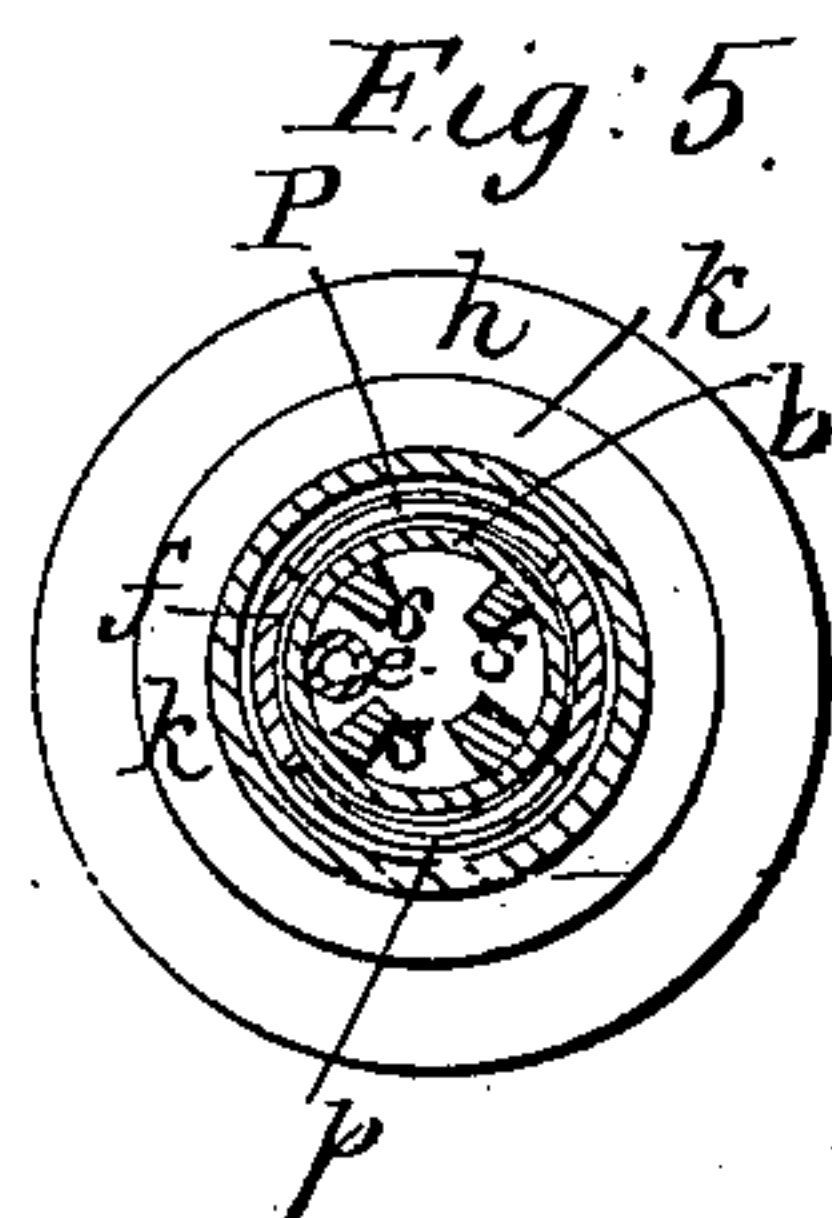
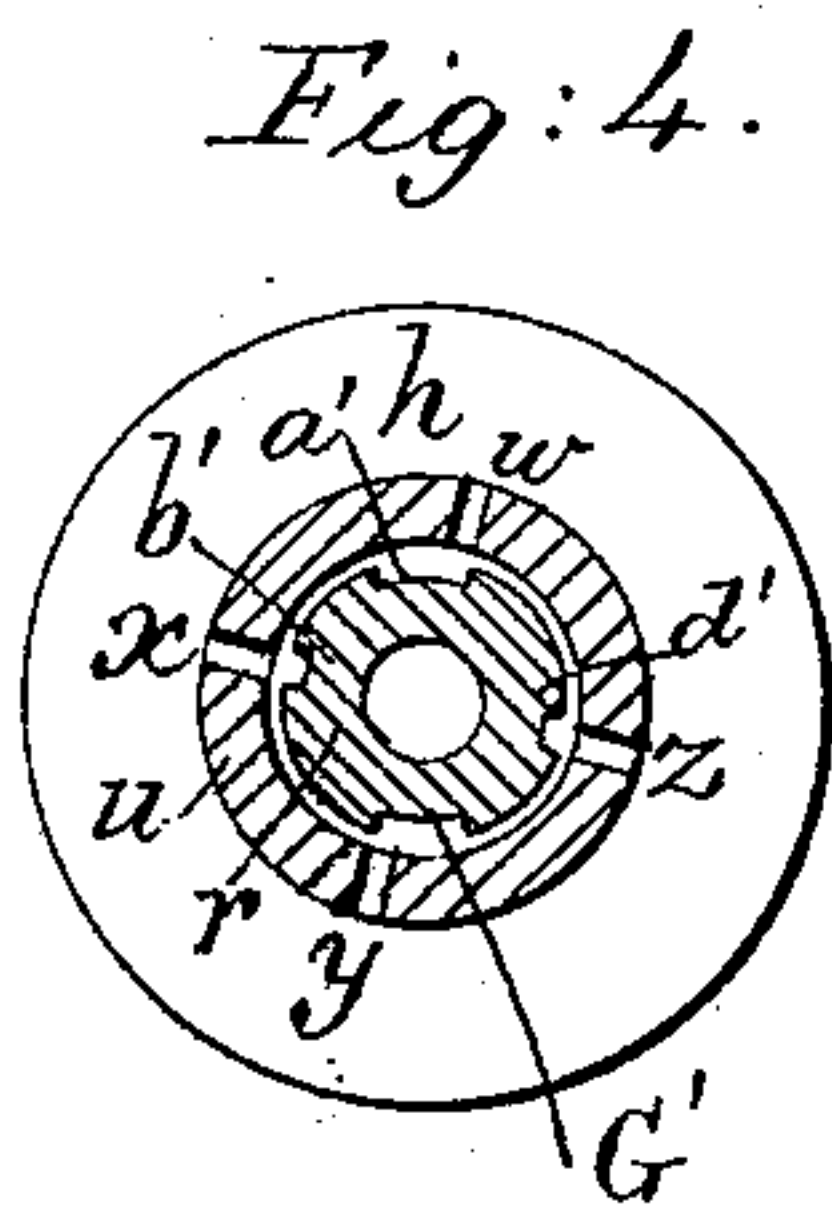
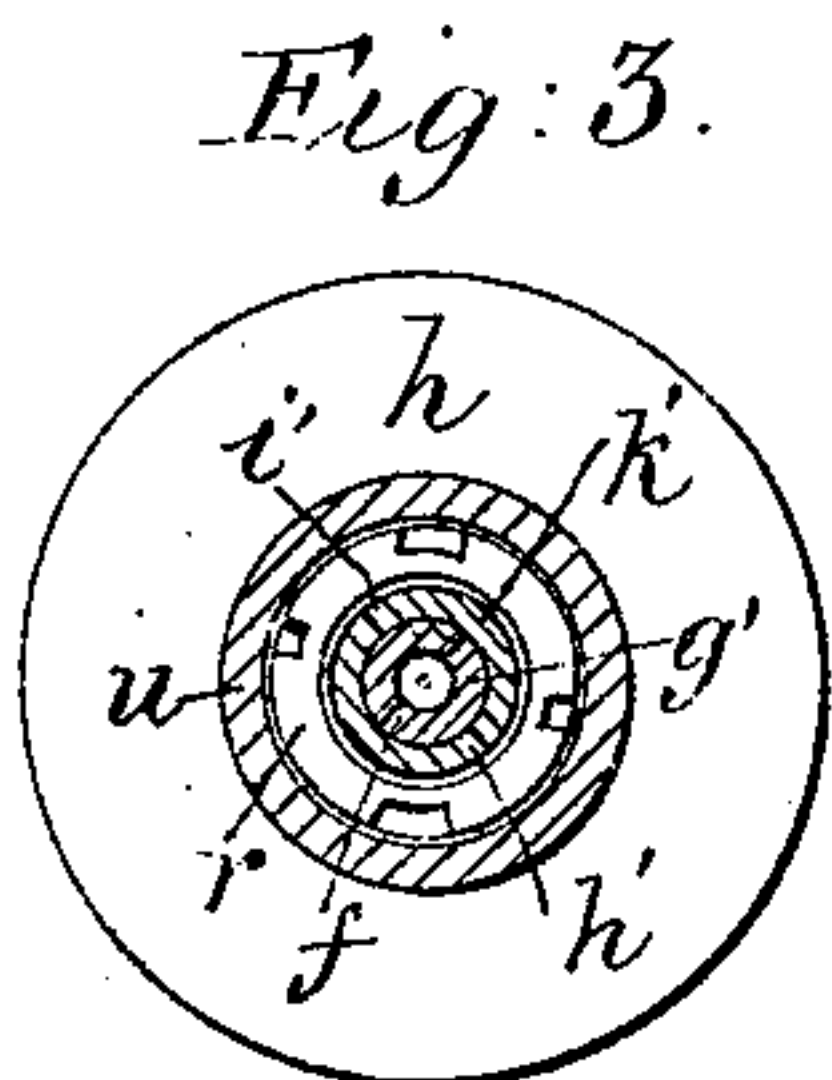
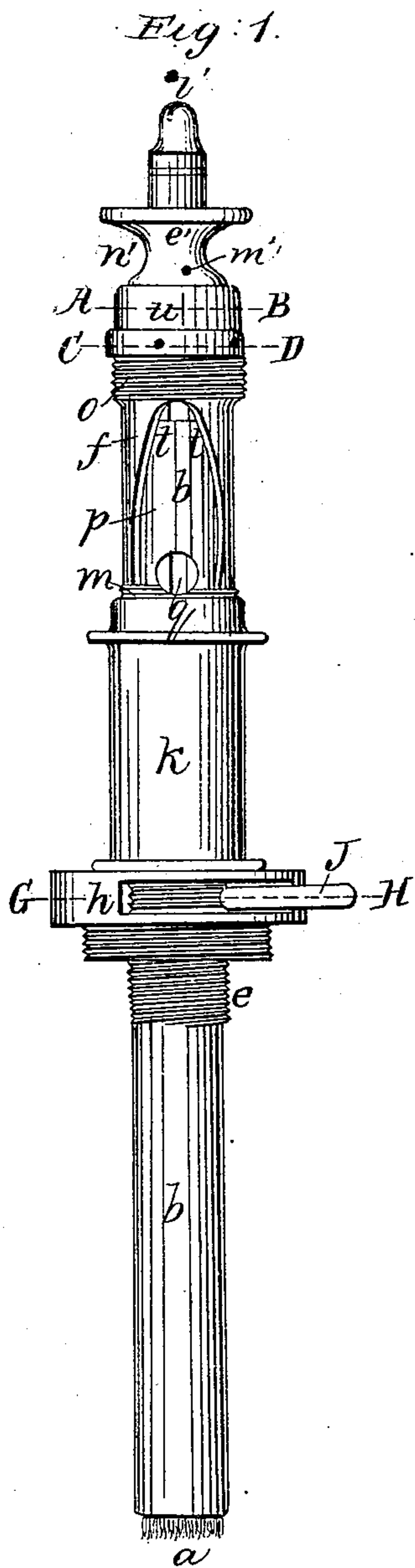


N. MASON.  
Vapor Burner.

No. 20,952.

Patented July 20, 1858.



Witnesses  
J. J. Gordon.  
Luther Briggs Jr

Inventor  
Nicholas Mason



# UNITED STATES PATENT OFFICE.

N. MASON, OF CHELSEA, MASSACHUSETTS.

## VAPOR-BURNING LAMP.

Specification of Letters Patent No. 20,952, dated July 20, 1858.

*To all whom it may concern:*

Be it known that I, NICHOLAS MASON, of Chelsea, county of Suffolk, and State of Massachusetts, have invented certain new and useful improvements in the burners of lamps intended for burning the gas generated from burning fluid camphene or other volatile combustible fluids, and that the following description, with the accompanying drawings, forms a full, clear, and exact specification thereof.

The essential features of my invention are my cylindrical sheath, whereby the lighting of the lamp is greatly facilitated, and my safety tube, whereby the gas generated in the lamp itself is conducted directly and without obstruction to the point of combustion, thus obviating all danger of its collection and explosion within the lamp, all of which with other minor points will be more particularly hereinafter described.

Figure 1 is an elevation of my improved burner with the cylindrical sheath lowered down ready for lighting the lamp. Fig. 2 is a vertical section with sheath raised as it is when the lamp is lighted and burning the gas. Fig. 3 is a horizontal section on line A B. Fig. 4 is a horizontal section on line C D. Fig. 5 is a horizontal section on line E F. Fig. 6 is a horizontal section on line G H.

Similar letters represent similar parts in all the views.

The wick *a* is inserted in the wick tube *b* (one wick will last a long time). Within the wick tube it will be observed that there is another small tube *c* which I call my safety tube, occupying a small portion of its area, and having an opening at its upper extremity at the top of the wick tube. This tube *c* extends down into the lamp, and has a number of small openings *d d d* &c. into the reservoir of the lamp. I find the practical necessity of a considerable number of these holes, extending at short intervals, nearly or quite, the whole length of that part of the wick tube within the lamp reservoir, as I find by experiment that the explosive gas lies in a comparative thin sheet or layer directly over the surface of the fluid, and therefore a hole into the safety tube, near the top of the lamp, will not answer the purpose as it will frequently be above the stratum of gas when the fluid is low, nor will one near the bottom, answer better, as it will be im-

mersed in fluid a greater part of the time. I find the perfect and practical operation of this small tube, or duct to be to convey any gas that may be generated in the reservoir of the lamp, directly to the point of combustion, and thus prevent all liability to its collection and explosion within the lamp. This part of my invention is equally as applicable and important to lamps intended for burning camphene or burning fluid in the ordinary way, as to fluid gas lamps.

It will be observed that the wick tube is inserted by a screw thread at *e* into a circumscribing cylinder *f*. This circumscribing cylinder *f* is inserted into the mouth piece of the lamp by a screw thread *g*; there is an enlarged chamber in this cylinder at *h* through a slot, in which *i* protrudes, the lever *j* which is used for turning the wick tube partially around for purposes hereafter described.

The wick tube is fitted tight in the cylinder *f* by means of a screw thread or ground joint, both above and below the chamber that contains the lever. The lower joint being to prevent the fluid from running out of the lamp, and the upper one, for preventing the air from passing up, into the gas chamber; another great advantage of the chamber *h* is, that it forms an air chamber, and thus prevents the heat of the burner from heating the fluid in the lamp.

The letter *k* represents the cylindrical sheath; the operation of which may be described as follows: It will be observed that there are two short screw threads cut on the inner surface of the sheath, the lower one of which *l* when the sheath is raised connects with a corresponding screw thread *m* on the circumscribing cylinder *f*, while the upper thread *n* connects with a screw thread *o* that is cut on the lower part of the exterior surface of the mouth piece, or piece of metal that contains the orifices for the gas, the peculiarities of which will be hereafter described. But continuing for the present the explanation of the sheath, it will be observed that when by turning the screw thread sufficiently the sheath is suffered to drop down as shown in Fig. 1, it leaves a portion of the wick *a* out and exposed to view through two large openings *p p* in the circumscribing cylinder *f* and corresponding openings *q q* in the wick tube through which the exposed portion of the wick, may be conveniently ignited in the same manner as an ordinary



fluid lamp. It will be observed that these openings are an inch or two below the top of the wick tube, and the tendency of igniting the wick at this place is to heat up that portion of the wick that remains above it, and thus facilitate the generation of gas, after two or three minutes which is required to heat the cap sufficiently to generate the first supply of gas, if it is desired to operate the lamp, as a gas lamp, the sheath may be raised, and the screw threads *l m* and *n o* being firmly connected, an air tight chamber is at once formed, and the gas, rushing out through the various openings in the mouth piece, or a portion of them, burns in streams of clear and steady light till all the fluid in the lamp reservoir is converted into gas and consumed.

The chief advantage of my cylindrical sheath is the facility it affords for lighting the lamp, as when the sheath is lowered so as to expose a portion of the wick through the opening, the wick itself can be conveniently lighted, without the intervention of any secondary cup or swab, of burning fluid or other combustible matter, which is necessary to start all other lamps of this species with which I am acquainted; an incidental, but by no means a small advantage of which is, that a light can be maintained in the room by the lamp itself during the whole time the operation of starting the lamp for gas is being carried on.

In the accompanying drawings, the upper part of the wick tube, (which I shall call the throat piece) is constructed separately, the shape of which, is shown in Figs. 2, and 5; the upper part of which *r* is made comparatively thick and solid, and has various holes and grooves, around and through it, as shown by the drawings, to allow the passage of the gas to the mouth piece. It will also be observed, that there are four forked shaped prongs *s, s, s, s*, attached to it, running down for a distance of an inch or two around the wick, inside the wick tube, and having small shoulders at *t t t t* which sit in to square steps or slots in the upper edge of the wick tube, so as to insure the turning of the throat piece with the wick tube; but I lay no particular stress on this precise method of construction, as the throat piece may be constructed solid with the wick tube, or secured to it by any other suitable method that may be preferred.

The construction of the mouth piece, and its connection with the throat piece is clearly shown in the sectional views, Figs. 2, 3, and 4, the currents of gas being represented by red arrows. The mouth piece is constructed as shown, in two pieces, the lower one, of which *u* is secured by a screw thread *v* to the cylinder *f* and has four small circular apertures for flame *w x y z* communicating by a ground joint directly with the four grooves

*a' b' c' d'* in the throat piece. The upper part of the mouth piece *e'* is secured to the lower part by a screw thread at *f'* and has a hollow teat or stem at *g'* which fits by a ground joint into an appropriate chamber or cup in the apex of the throat piece. There are two holes *h'* and *i'* opening from the chamber into the space around the throat piece, and two holes *j'* and *k'* in the teat or stem, opening into its internal chamber, as shown in Fig. 3; the external or flame orifices in the upper part of the mouth piece, will be observed to be one fan jet *l'* at the apex, and two small circular jets *m'* and *n'* on the sides.

By careful inspection of the drawings it will be observed that the effect of the combined connections of the mouth and throat pieces, with their ground joint surfaces, and the various perforations indicated, is to alternately close or cut off in a variety of permutations the different orifices in the mouth piece accordingly, as by means of the lever or handle *j* the wick tube and throat piece are set in different relative positions with the mouth piece—precisely on the principle of a steam engine with rolling valves, or even many gas and water cocks are constructed on this principle.

In particular it will be observed, that when the lever stands in position indicated by the letter P that the grooves *a' b' c' d'* will coincide with the apertures *w x y z*, while at the same time neither of the apertures *j'* or *k'* will coincide with the apertures *h'* or *i'* and thus in this position of the lever, all 4 of the flame holes in the lower part of the mouth piece will be open, and those in the upper part closed. By further examination, it will be observed, (without "unnecessary prolixity of explanations") that, when the lever stands at Q two of the holes in the lower piece will be open and those in the upper piece closed; and, again, when the lever stands at R two of the bottom holes will be open by coincidence of the slotted grooves *a'* and *c'* with the holes *w* and *y* while the apertures in the top piece will be open by the coincidence of the apertures *j'* and *k'* and when the lever stands at S all the holes in the lower piece will be closed, and those in the top piece open by the coincidence of the apertures *i'* and *k'* and still further changes might be made by constructing the various apertures in different relative positions.

Having thus described my improvements, what I claim as my invention, and desire to secure by Letters Patent, is:

1. I claim the two holes *q, q*, in the wick tube for the purposes set forth.
2. I claim my cylindrical sheath, arranged and operating substantially in the manner and for the purposes herein set forth and described.

3. I do not claim cutting off the gas by means of rolling valves as this is common in steam engines, and in gas and water cocks and other lamps; but I claim the double row  
5 or series of rolling valves contained within the mouth piece of the burner, arranged and operating in combination with each other

and with the throat piece of the wick tube, substantially in the manner herein set forth and described.

NICHOLAS MASON.

Witnesses:

S. J. GORDON,  
LUTHER BRIGGS, Jr.