

No. 781,490.

PATENTED JAN. 31, 1905.

E. BOIVIN.  
RADIATION BURNER FOR SPIRIT LAMPS.

APPLICATION FILED DEC. 7, 1903,

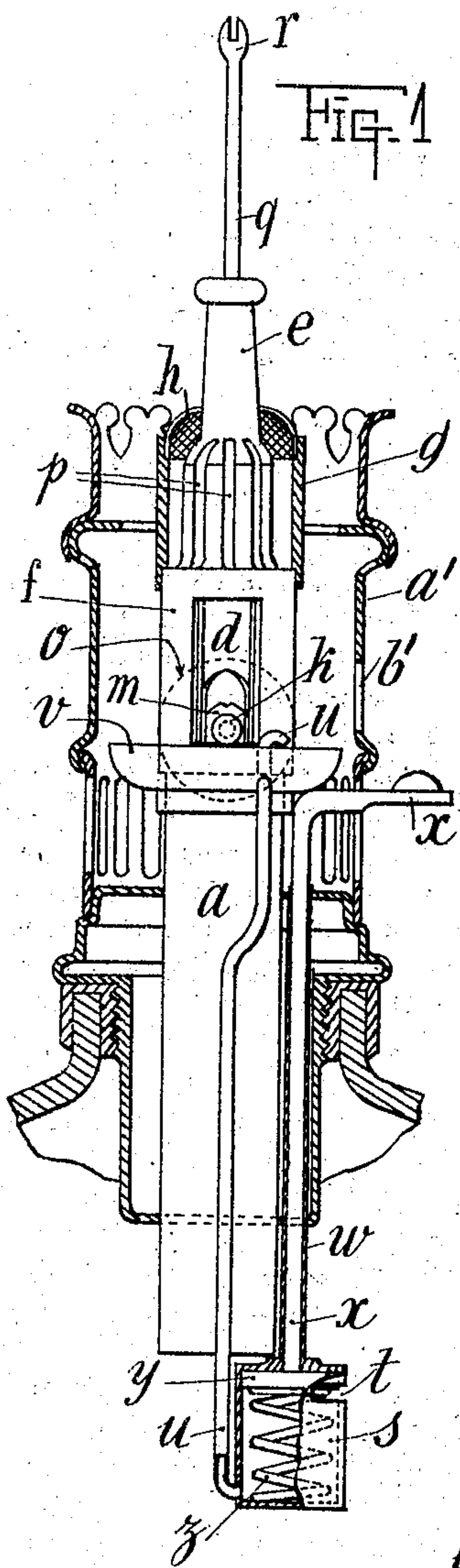


FIG. 1

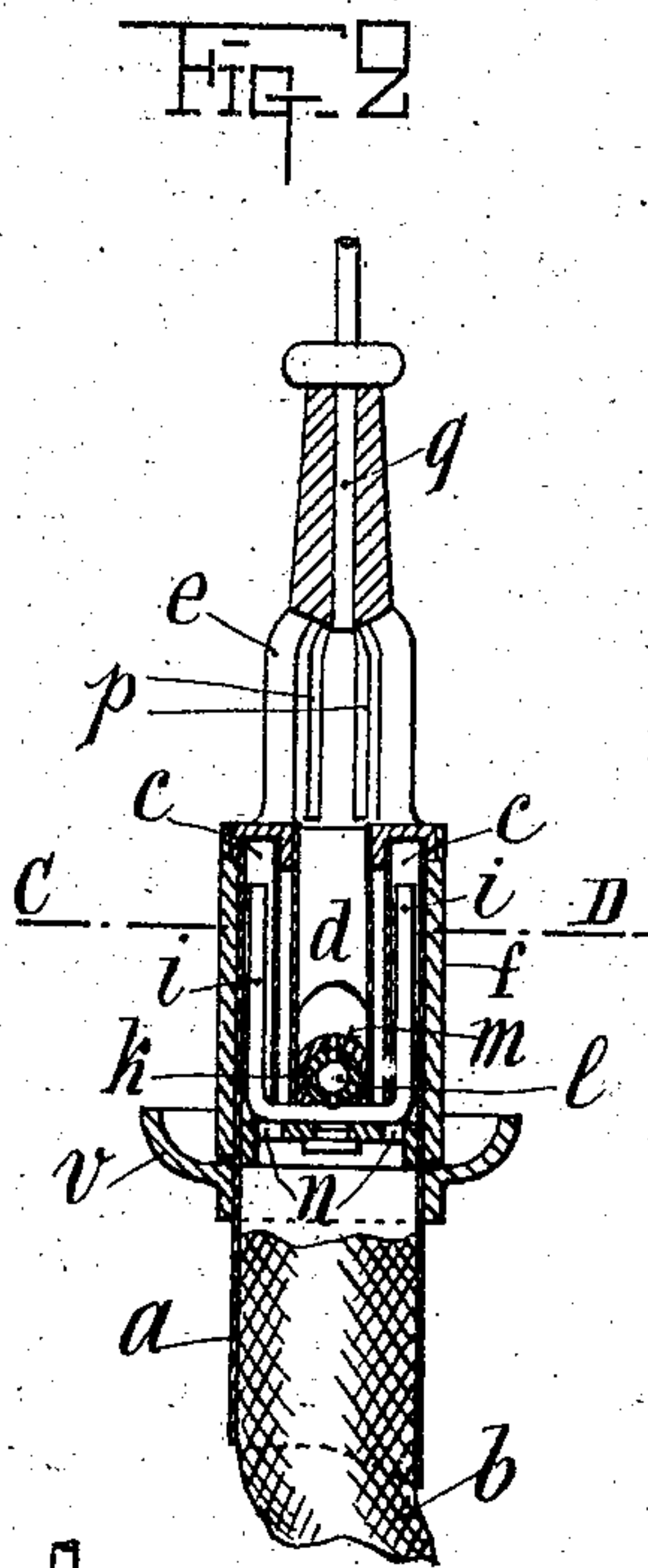


FIG. 2

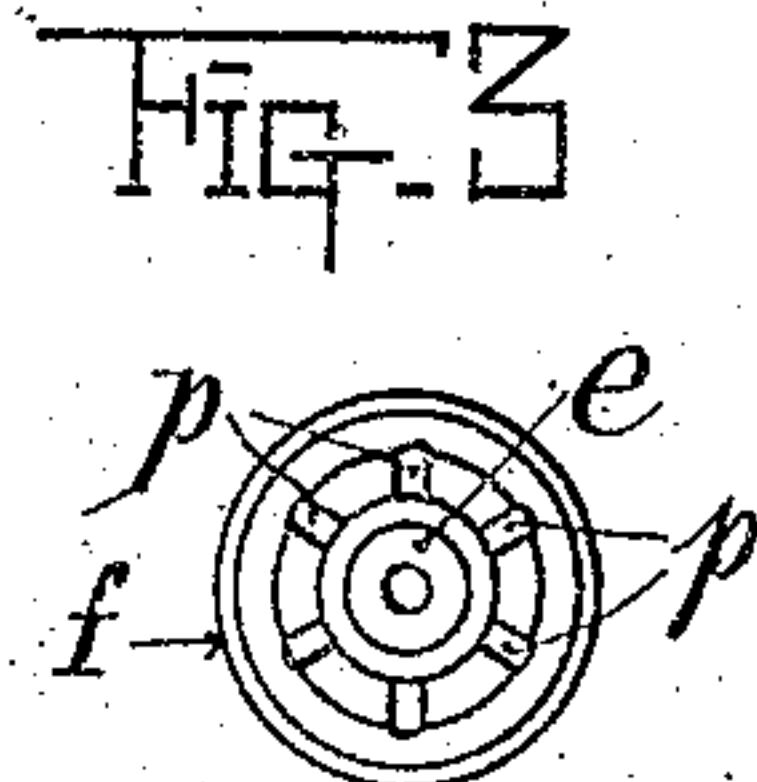


FIG. 3

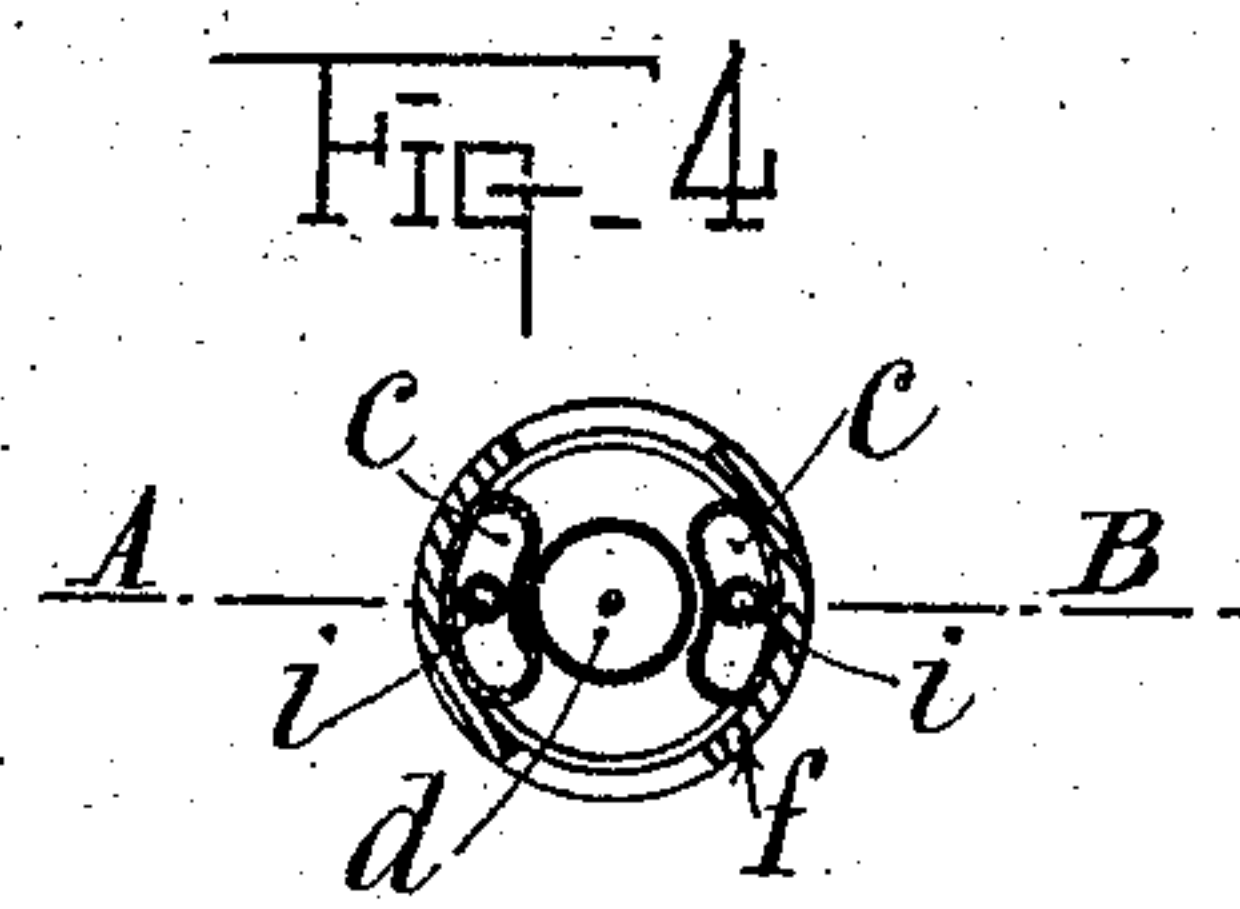


FIG. 4

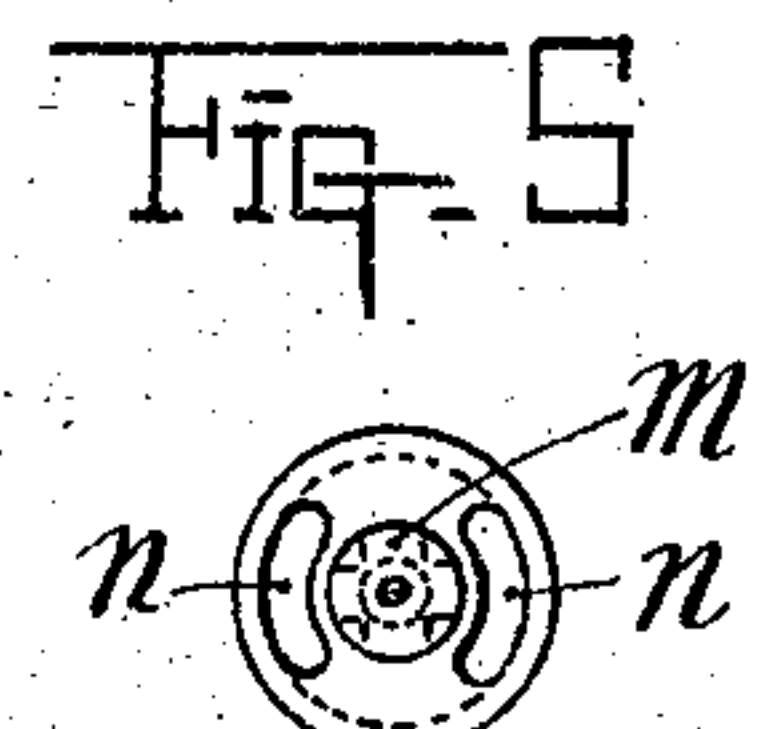


FIG. 5

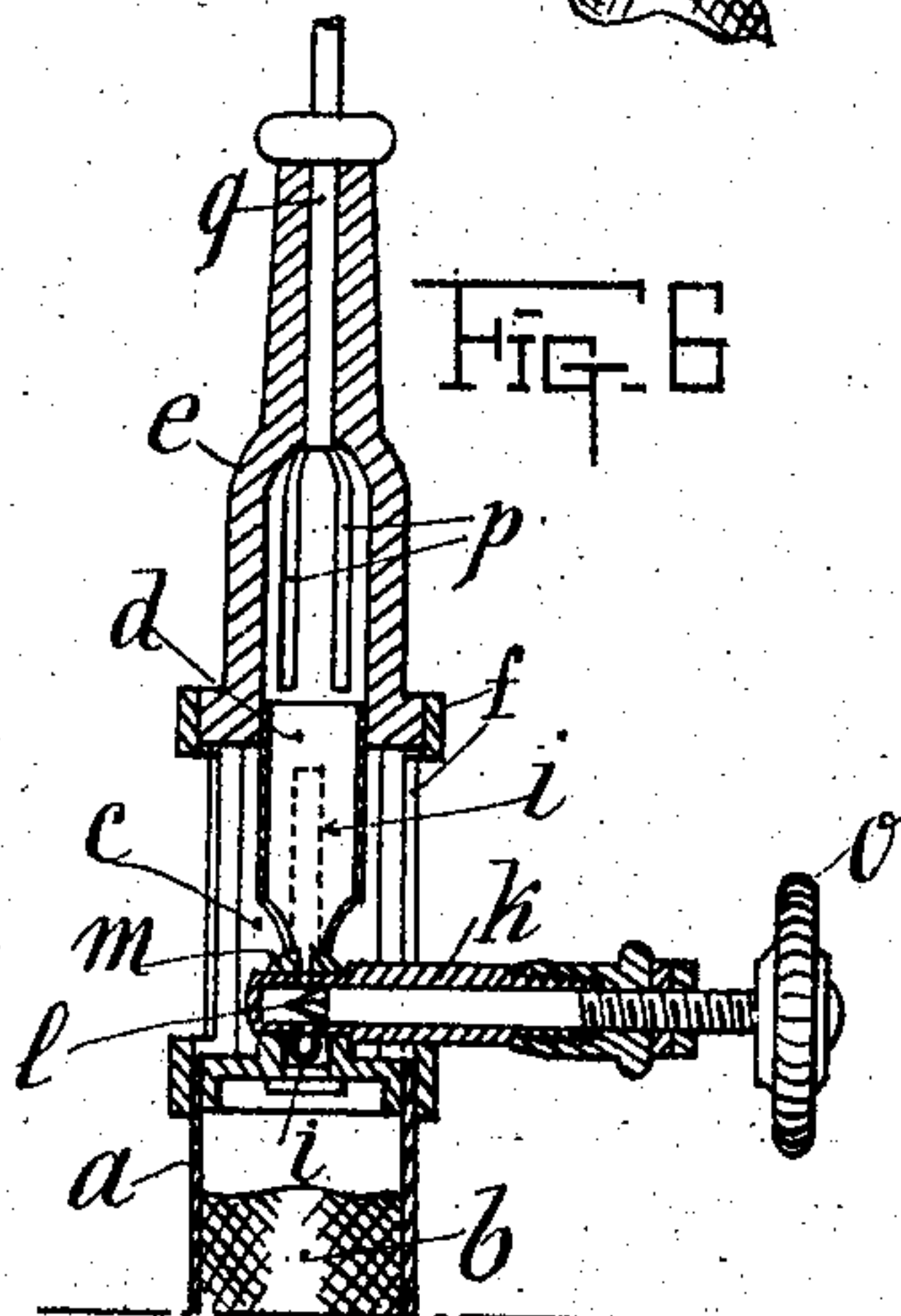


FIG. 6

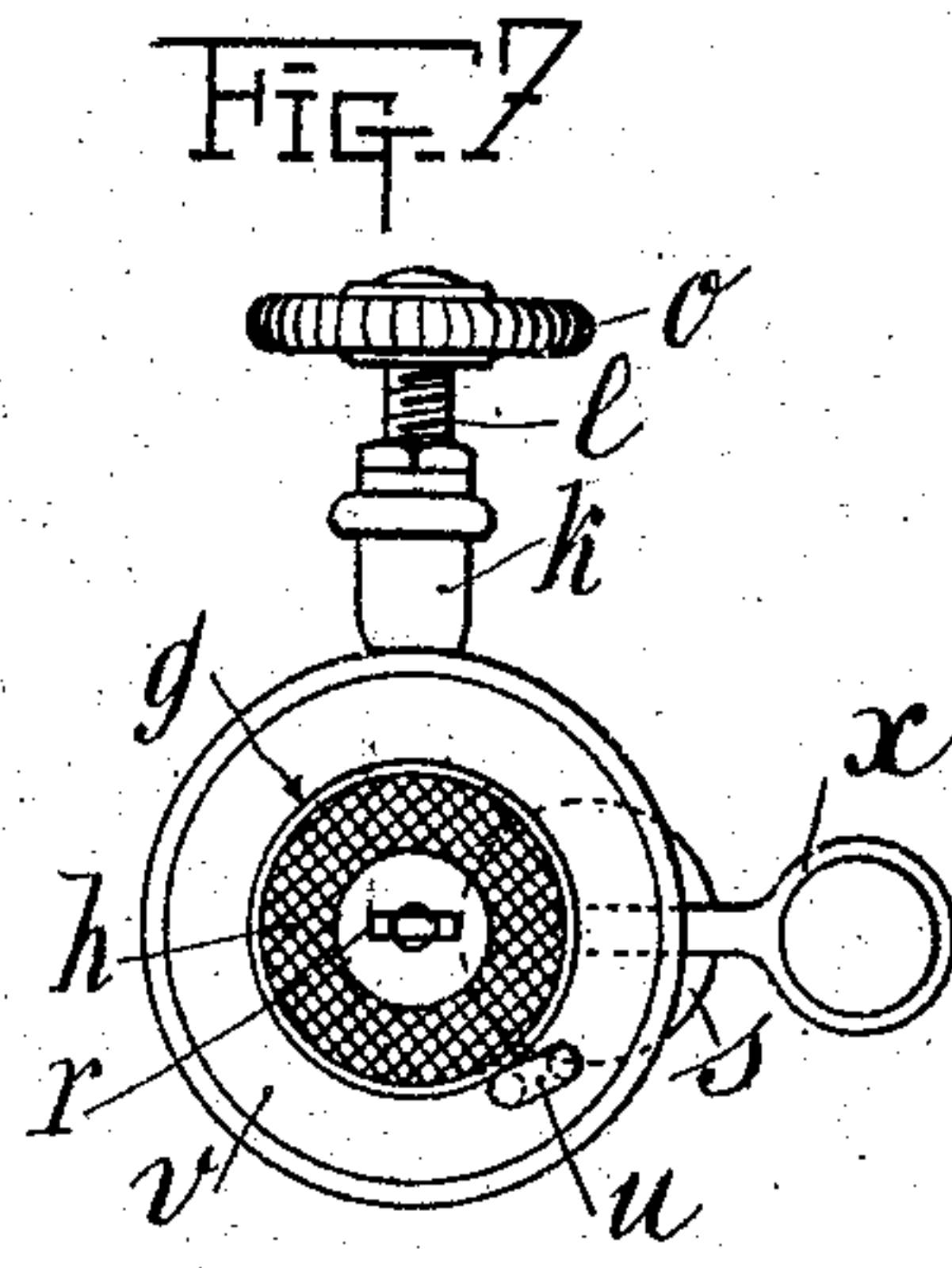


FIG. 7

Witnesses  
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# UNITED STATES PATENT OFFICE.

EMILE BOIVIN, OF PARIS, FRANCE.

## RADIATION-BURNER FOR SPIRIT-LAMPS.

SPECIFICATION forming part of Letters Patent No. 781,490, dated January 31, 1905.

Application filed December 7, 1903. Serial No. 184,135.

*To all whom it may concern:*

Be it known that I, EMILE BOIVIN, a citizen of the Republic of France, and a resident of Paris, France, have invented certain new and useful Improvements in Radiator-Burners for Spirit-Lamps, of which the following is a specification.

The spirit-lamp burner which forms the object of the present application is distinguished from other burners of the kind by the novel arrangement in the chamber for the mixture of gases of a heating-radiator, the object and advantage of which is to insure dry vapors and a suitable form for the flame—that is to say, the form of a candle-flame—which renders the mantle incandescent, and when the radiator and the parts dependent thereon are thoroughly heated the mantle furnishes and maintains its maximum illuminating power, while a great saving of spirit is effected.

The object and advantages of the radiator, which is the essential feature of the invention, are as follows:

First. After the lamp has been alight for some time this radiator becomes heated throughout and transmits this heat by contact to the interior of the tubes *c*, in which vaporization is effected. This transmission of heat is intended to dry the vapors thus produced and to render them suitable for partial and complete combustion.

Second. Independently of the form of the flame produced by the radiator as mentioned above the radiator proper, *e*, in consequence of its special form and the vertical slots formed in it promotes the movement of the dry vapors which come from the mixing-chamber *d*.

In order to make the invention quite clear, it is illustrated in the accompanying drawings.

Figure 1 is an elevation of the burner surmounted by the heating-radiator and the rod for supporting the mantle; Fig. 2, a vertical section through A B in Fig. 4; Fig. 3, a plan of the heating-radiator; Fig. 4, a horizontal section through C D in Fig. 2; Fig. 5, a plan of the ejector shown in Figs. 1, 2, and 6; Fig. 6, a vertical section of the burner, taken at right angles to Fig. 2; and Fig. 7, a plan of the burner.

As shown in Figs. 1 and 2, the burner consists of a central tube *a*, which dips into the reservoir or body of the lamp. This tube is furnished with a suitable internal wick *b*. At a certain height the tube *a* is surmounted by two flat tubes *c*, placed sufficiently apart for receiving between them a mixing tube or chamber *d*, Figs. 1, 2, and 4. The mixing-chamber *d* is brazed to the tube *c* and to the bottom of the radiator *e*, through which it runs. To the circumference of the base of the radiator *e* the heater *f* is likewise brazed, which is formed by a tube open at the two ends and having two diametrically opposite openings. On the top of the heater *f* is a head-piece formed by a ring *g*, closed at one end by wiregauze *h*, through which the upper part of the radiator extends. The two side tubes *c* are closed at the top by their abutments and by being held in a circular recess formed in the base of the radiator *e*. In the interior of each of these tubes is one arm of a U-shaped tube *i*, the junctional horizontal part of which tube *i* is drilled with a hole communicating with the holes in a pipe *k*, with an internal regulating-valve *l*, which passes across an ejector *m*, arranged on and brazed to the top of the tube *a*. The base of the ejector *m* is drilled with two holes *n* registering with the two flat tubes *c* and permitting the passage of the spirit-vapors from the wick up into said flat tubes. The regulating-valve *l*, by means of which the vaporizing operation can be started or the action of the burner be stopped, is operated from the outside by a milled nut *o*, Figs. 1, 6, and 7. The radiator *e* is slightly conical and hollowed out inside. In the sides thereof are a number of vertical slots *p*. The top of the radiator, which runs through the gauze-wire *h*, receives the rod *q* and mantle-holder *r*. The radiator is placed over the mixing-chamber and is intended to diffuse the vapors issuing from the ejector *m* in order to give them a desired form and heat them more and more until a complete diffusion thereof is effected. This heating is effected by conduction—that is to say, through the conductive power of the radiator to the heater and from the heater to the tubes *c* without any external action.



The igniting of the burner may be effected in any manner, but preferably by the device described in relation to Figs. 1 and 7 of the accompanying drawings. This device consists of a cylinder *s*, drilled near the top with an opening *t*, through which the spirit enters from the body of the lamp. To the bottom of this device an elevating-tube *u* is fitted, the top of which enters the igniting-pan *v* and is then bent toward the bottom of the vessel. The upper part of the cylinder *s* carries a tube *w*, which acts as a guide for the rod *x* of a piston *y*, arranged in the cylinder and the top of which is under the permanent action of a spring *z*. The upper part of the piston-rod is bent outside the gallery *a'* in order that it may be lowered when the ignition is effected. An orifice *b'* is formed in the gallery *a'* to allow of the introduction of a match and the igniting of the spirit which has been forced out of the cylinder *s* into the vessel *v* by means of the piston *y*. This arrangement is suitable where simple refined spirit is employed for lighting purposes; but when for any reason whatever carbureted spirit is employed this spirit would not be suitable for the ignition, and therefore I reserve the right of isolating the above-described pump device in a reservoir-tube which is immersed in the body of a lamp and into which spirit is poured suitable for several ignitions.

The burner thus described acts as follows: The lighting or priming is effected as stated. The spirit is drawn up by capillary action near to the ejector *m*. The vaporization begins in the central tube *a* and the vapors ascend to the side tube *c*, which they enter, thence escaping through the ejector and reaching the mixing-tube *d* become mixed, are diffused and heated by the radiator *e*, and finally

pass through the wire-gauze *h*, taking the form desired for the mantle.

What I claim, and desire to secure by Letters Patent, is—

1. In an incandescent-lamp burner, the combination with a mixing-chamber, of two upright vaporizing-tubes adjacent thereto, and a U-shaped pipe having a leg in each tube and provided with an aperture in its horizontal part in line with said mixing-chamber.

2. In an incandescent-lamp burner, the combination with a wick-tube, of two flat vaporizing-tubes extending up therefrom and closed at their upper ends, a mixing-chamber between said vaporizing-tubes, a U-shaped pipe having a leg in each flat tube and provided with an aperture in line with said mixing-chamber, and a radiator above said mixing-chamber.

3. The combination with a wick-tube, of an ejector having a base closing the top of said tube and provided with two holes, vaporizing-tubes registering with said holes, a heater having open sides and inclosing and supporting said tubes, a mixing-chamber between the vaporizing-tubes, a U-shaped pipe in said tubes having its horizontal portion extending across said ejector and provided with an aperture communicating with the ejector, a valve controlling said ejector, and a slotted radiator surmounting said heater above the mixing-chamber.

In testimony that I claim the foregoing I have hereunto set my hand this 23d day of November, 1903.

EMILE BOIVIN.

Witnesses:

EDMOND LECAUTWEIER,  
H. C. COXE.