

J. ADAIR.

Lamp.

No. 29,347.

Patented July 31, 1860.

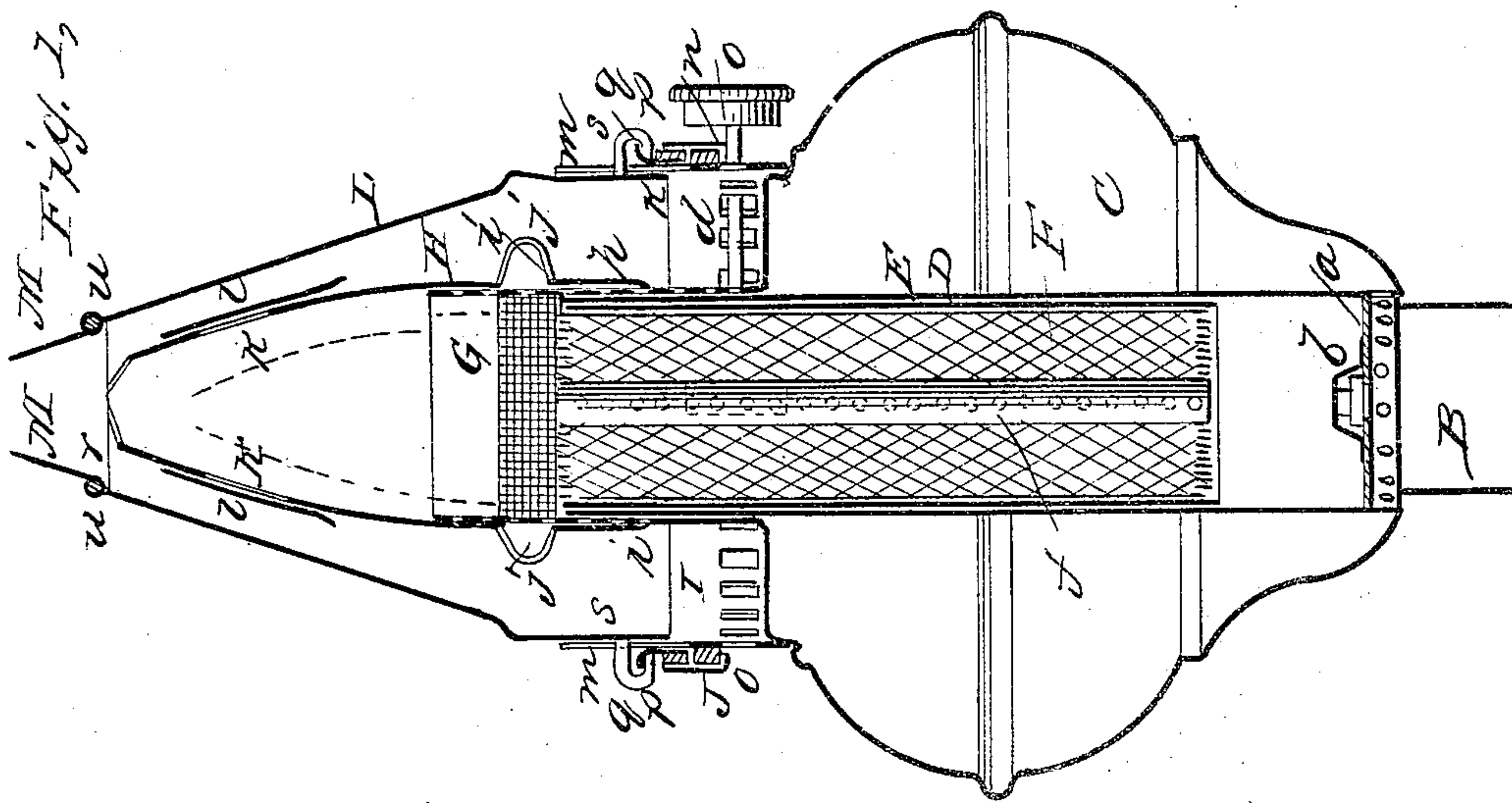
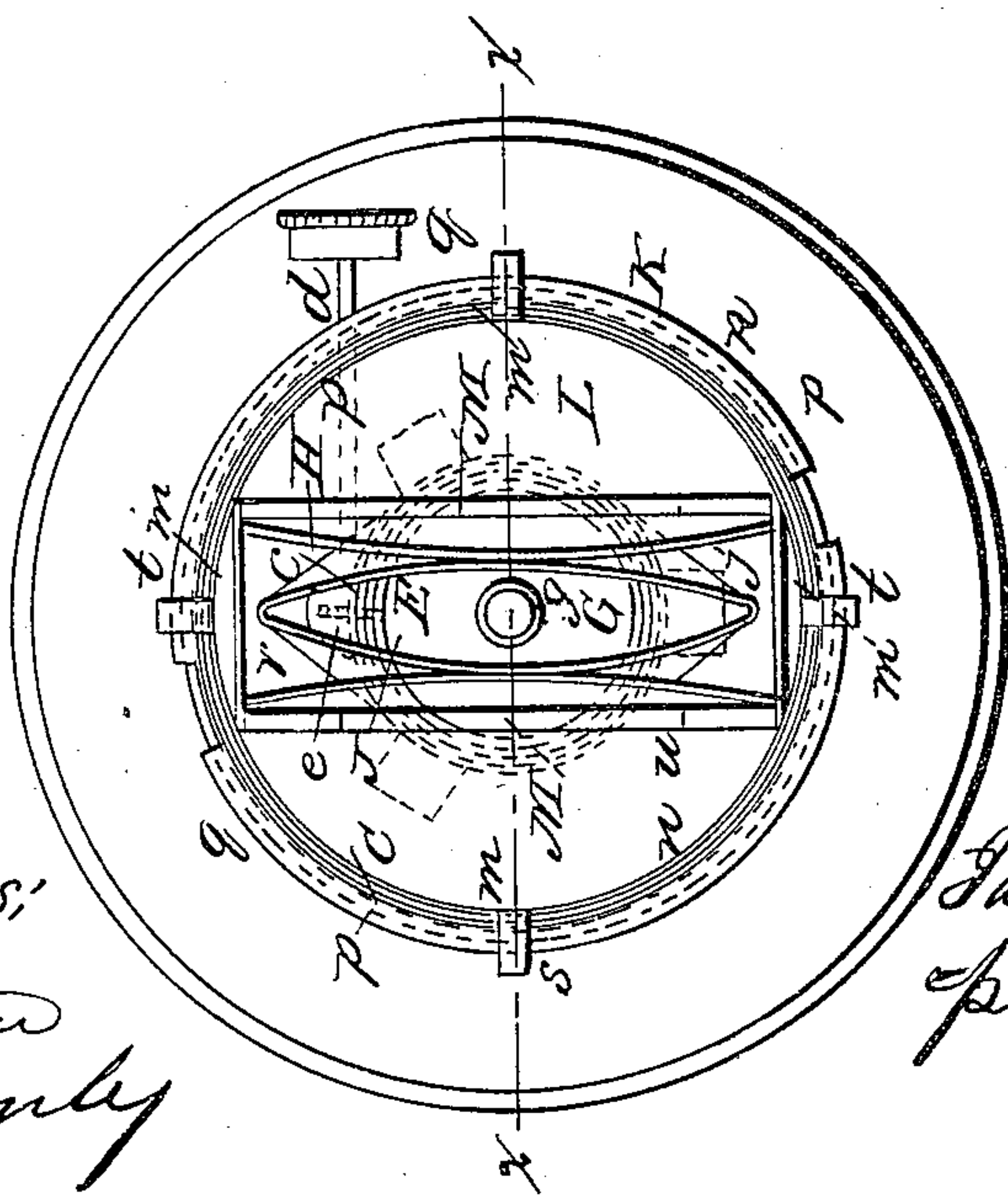


Fig. 2.



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UNITED STATES PATENT OFFICE.

JAMES ADAIR, OF PITTSBURG, PENNSYLVANIA.

LAMP.

Specification forming part of Letters Patent No. 29,347, dated July 31, 1860; Reissued October 6, 1863, No. 1,548.

To all whom it may concern:

Be it known that I, JAMES ADAIR, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and
5 Improved Lamp for Burning Coal-Oil and other Volatile Hydrocarbons; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings,
10 making a part of this specification, in which—

Figure 1 is a vertical section of my invention, taken in the line *x, x*, Fig. 2. Fig. 2
15 a plan or top view of the same.

Similar letters of reference indicate corresponding parts in the two figures.

The object of this invention is to obtain a lamp by which volatile hydro-carbons may be burned for illuminating purposes without a chimney.

The invention is more especially designed for burning coal oils—those of the heavier grades—which have not hitherto been successfully burned without a chimney, and in
25 fact which cannot well be burned with a chimney when capillary attraction is chiefly depended on for the supplying of the oil to the flame.

To enable those skilled in the art to fully understand and construct my invention I will proceed to describe it.

A represents the base, B, the pedestal and C, the body or fountain of a lamp, the above named parts may be of the usual construction, and therefore do not require a minute description.

D, is a tube which is placed centrally within the body or fountain C. This tube extends to the bottom of the body or fountain C, and projects a short distance above it. Inside of the tube D, just above its bottom there is secured a disk *a*, in which a valve *b*, is placed opening upward. The portion of the tube below the disk *a*, is perforated so as to admit the contents of the fountain to the valve *b*. In the upper part of the tube D, a slot or opening is made, in which a pinion *c*, is fitted and allowed to rotate, said pinion being on a shaft *d*, which
40 is placed in suitable bearings at the upper part of the fountain. This shaft *d*, may be fitted in shifting bearings to admit of the pinion being moved out from the tube D, at any time when required in order to admit

of the tube D, being readily removed from and fitted in the fountain. A hole *e*, is made in the top of the fountain to allow the pinion to work therein, and also to admit of the fountain being filled or supplied with the necessary burning material.

E, is a tube which is a little shorter than the tube D, and a trifle smaller in diameter so that the former may fit into and freely slide up and down within the latter. The tube E, has a series of holes made through it
65 in a vertical line to form a rack *f*, with which the pinion *c*, engages. The tube E receives the wick F, which may be composed of a roll of canton flannel, the fabric being wound around a tube *g*, of small diameter but extending the whole length of the tube E.

G, is a wire gauze open thimble which is fitted on the upper end of the tube D. This thimble has a ring or band *h*, on its lower part which rests on a flanch *i*, on the lower part of the thimble, and to the ring or band curved strips or arms *j*, are attached at equal distances apart. The strips or arms *j*, support a tube H, the lower end of which is a short distance above the ring or band *h*. The tube H, and ring or band *h*, may be made of one piece of metal, and the wire gauze thimble fills the space between the ring or band *h*, and the lower end of the tube H.
85 At a short distance from the top of the tube H, there are two holes *k*, *k*, at opposite points, each hole being provided with a cover *l*. The top of the tube H, is flattened so as to form a narrow elliptical orifice as shown clearly in Fig. 2, the tube at the ends of the opening may extend up a trifle higher than the central portion.

To the upper part of the fountain C, a perforated cylinder I, is secured permanently and on this cylinder a ring or band J, is placed and permanently fastened. The upper part of the cylinder I, has four vertical slots *m*, made in it at equal distances apart. On the cylinder I, a cylinder K, is placed. This cylinder K, has a ring *n*, attached to its lower end said ring resting on ring J, and having clamps *o*, which fit over the latter ring. The cylinder K, is allowed to turn freely on cylinder I, and its upper part is so cut as to form four inclined planes or edges *p*, of equal length said inclined planes or edges *p*, extending down to the

ring *n*. The inclined planes or edges *p*, are flanged outward at their upper edges as shown at *q*, Fig. 1.

L, is a hood or cap which is cylindrical at its bottom and tapering toward its upper end to form an oblong rectangular orifice *r*, as shown clearly in Fig. 2. To the lower part of the hood or cap L, there are attached small hooks *s, s*, at opposite points, and there are also attached to the lower part of this hood or cap at opposite points pins *t, t*. These hooks and pins are fitted in the slots *m*, of the cylinder I, and the flanches *q*, of two of the inclined edges work in the hooks *s, s*, of the hood while the pins *t, t*, rest on the other two flanches. By turning the cylinder K, the hood or cap L, is raised or lowered.

On the upper end of the hood or cap L, there are two deflecting lips or plates M. These lips or plates are attached by joints or hinges *u*, to the hood or cap. The outer edges of the lips or plates are of convex form. When the lips or plates are turned inward until they touch each other, they form quite an obtuse angle with the hood or cap.

The manner of operating the lamp is as follows. The hood or cap L, is first removed, then the oil is introduced to the lamp through the aperture *e*, or, by removing the tube H, and the wick tube E, and pouring the oil into the tube D. The tubes E, and H, are then replaced and the wick F, lighted. The holes *k*, in the upper part of the tube H, are uncovered and a light applied to the top of the tube. After burning a moment the holes *k*, are covered and the hood L, replaced, depressed or lowered and the deflecting lips M, adjusted to suit the flame, that is to say till the flame gives the best light with no smoke.

The adjustable wick tube E, permits of a greater or less amount of air to be supplied to the top of the wick by diminishing or increasing the distance between it and the tube or burner H, and also aids in condensing the gas which would otherwise pass off into the room after extinguishing the flame, the wick tube it will be remembered being raised or lowered by turning shaft *d*, in consequence of the pinion *c*, gearing into the rack *f*. The tube D, serves as a guide or socket for the wick tube E, and also aids in condensing the unconsumed gas. The disk *a*, containing the valve *b*, is for the same purpose as also is the small tube *g*, at the middle of the wick. The slit near the top of the tube D, besides serving the purpose of admitting the pinion *c*, to the wick admits of the oil which rises to condense the gas to pass back again into the fountain C, which operation is as follows. The wick tube E, and its wick F, being shorter than the tube D, in which they are placed, when the ends of these two tubes

are even at the top there is a space filled with oil between the disk *a*, and the bottom of the wick, and the valve *b* is the only opening below, therefore when the wick is depressed and the valve closes, the oil in the above named space is forced up through the tube *g*, in the middle of the wick, overflows at the top, condenses the gas and passes back into the lamp through the slit in the upper part of the tube D, as previously referred to. The burner or tube H, in connection with the wire gauze thimble G, restrains the admission of air to the wick, thereby causing imperfect combustion and conveying the gas not consumed there some distance above in order to supply it with air which is heated and caused to ascend by the heat from the top of the wick.

The three supporters J', of the burner or tube H, are made convex or curved in order to admit air to that part of the thimble hidden or covered by them. The thimble is made detachable from the burner or tube H, so that in case it becomes burned out, its place can be supplied by a new one without any difficulty. The holes *k*, in the upper part of the burner or tube H, aids in heating the burner immediately after lighting the wick. The tube being cold some of the first gas ascending is condensed and to stop this as soon as possible the holes are uncovered and the gas lighted, the flame burning inside the tube between the holes and top thus heating it up rapidly. After the tube H, becomes heated these holes are covered. The perforated cylinder I, admits air to the flame, and the cylinder K, which turns on it serves as a means to elevate and depress the hood or cap L, by which the air is thrown into the illuminating flame higher or lower, according to the amount of gas coming up and the amount of carbon the gas contains and to permit the flame to be almost covered when the lamp is carried about to protect the flame from currents of air. The hood or cap L, conducts the air, heated below, into the flame and the adjustable deflecting lips M, admit of being adjusted to suit the size of the flame and the degree of carbon it contains, the greater the amount of carbon the flame contains, the smaller the opening required at the top of the hood or cap L. The lamp also when carried about will be less liable to be extinguished by enlarging said opening. The curving of the edges of the lips causes a perfect mixture of the gas and air, and the concave form of the upper end of the burner or tube H, being reverse to the curvature at the ends of the lips M, the thickest part of the stream of gas strikes against the smallest part of the aperture between the lips, and the gas is sent right and left, thereby causing a perfect mixture of air. The object in making these lips form quite an obtuse angle with the hood, when they

touch each other is this: The upward movement of air is reflected from these lips at the angle of impinging, and this sends it right into the flame where the force is spent.

5 I do not claim broadly the burning, for illuminating purposes of coal oil and other volatile hydrocarbons, by first decomposing the same by imperfect combustion, the illuminating flame burning the escaping gas
10 for this has been previously done, but

I do claim as new and desire to secure by Letters Patent—

1. The arrangement and combination of the adjustable tube E, wick F, containing
15 the small central tube *g*, tube D, provided

with the disk *a*, and valve *b*, at its bottom, and perforated below the disk, to communicate with the fountain C, the thimble G, and burner or tube H, substantially as and for the purpose set forth.

2. The hood L, fitted to the perforated cylinder I, and rendered adjustable by means of the cylinder K, in connection with the deflecting lips M, and the peculiar shaped orifice of the burner or tube H for
25 the purpose specified.

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Witnesses:

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