



No. 657,936.

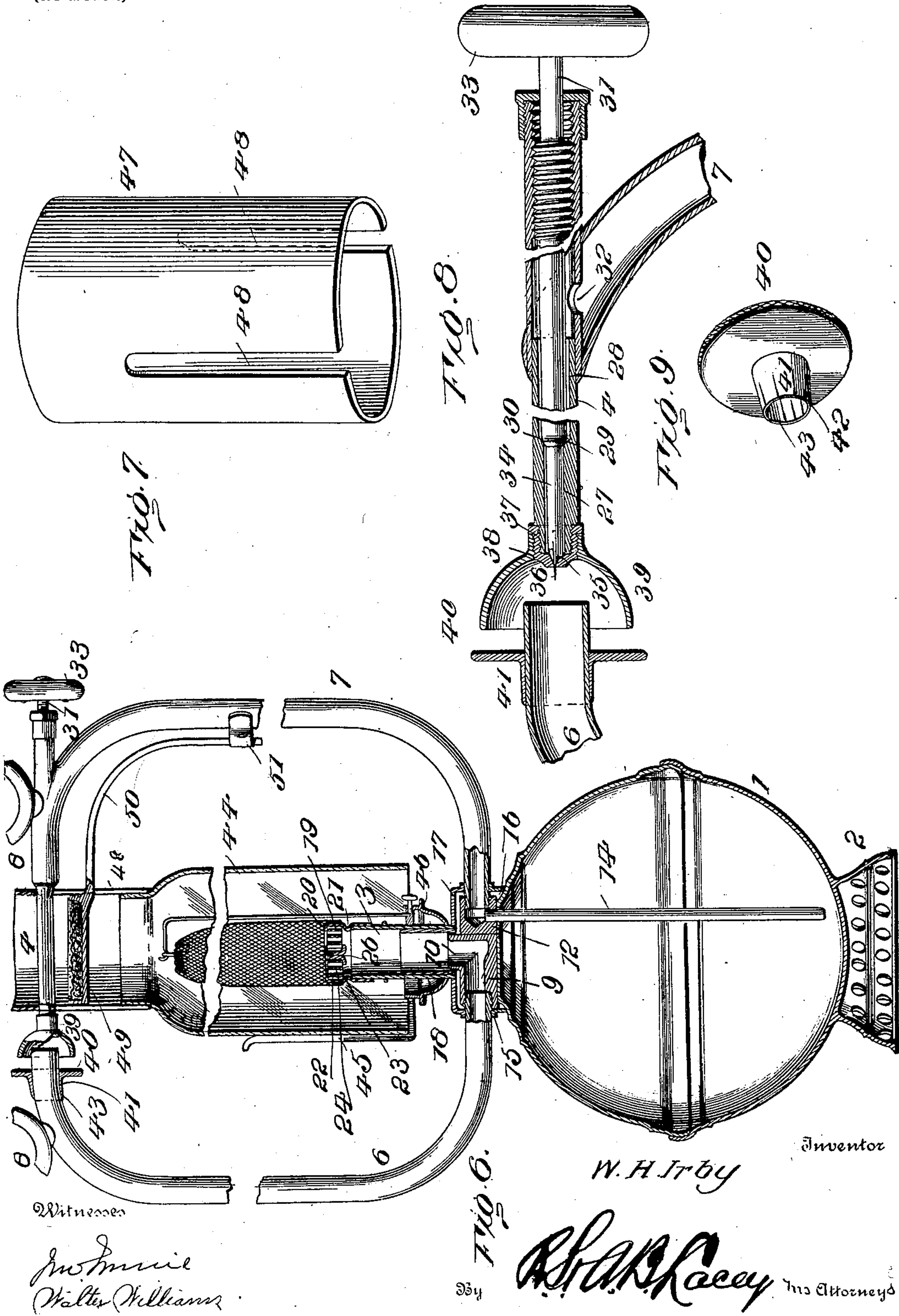
Patented Sept. 18, 1900.

W. H. IRBY.  
VAPOR LAMP.

(Application filed Apr. 28, 1900.)

(No Model.)

2 Sheets—Sheet 2.





# UNITED STATES PATENT OFFICE.

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## VAPOR-LAMP.

SPECIFICATION forming part of Letters Patent No. 657,936, dated September 18, 1900.

Application filed April 28, 1900. Serial No. 14,747. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. IRBY, a citizen of the United States, residing at Memphis, in the county of Shelby and State of Tennessee, have invented certain new and useful Improvements in Vapor-Lamps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to lamps of the wickless type and which convert a volatile hydrocarbon into vapor and combine with such vapor air in proper proportion so as to produce a gaseous mixture which will burn without giving off free carbon and produce a highly-illuminating effect.

The object of the invention is to improve the general construction of lamps of the variety aforesaid, whereby provision is had for the better assembling of the parts, a more certain control of the vapor and air, and the burner and accessory elements rendered more accessible for cleaning, priming, or any desired purpose.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and drawings hereto attached.

While the essential and characteristic features of the invention are necessarily susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a view in elevation of a vapor-burning lamp constructed in accordance with and embodying the vital features of this invention. Fig. 2 is a perspective view of the lower portion of the arm for supplying hydrocarbon to the generator. Fig. 3 is a view similar to Fig. 2 of the arm for conveying the gaseous mixture to the burner. Fig. 4 is a detail view, in plan elevation, of the top portion of the fount or reservoir, showing the relation of the arms and their fastening means. Fig. 5 is a top plan view of the burner-tip. Fig. 6 is a vertical central section of the lamp on a larger scale, parts being broken away. Fig. 7 is a perspective view of the telescoping chimney extension. Fig. 8 is a longitudinal

section of the generator on a larger scale, the intermediate portion being broken away. Fig. 9 is a perspective view of the regulator for controlling the admission of air into the mixing-chamber.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The fount, reservoir, or body 1 of the lamp may be of any size, pattern, or design and as illustrated is approximately globular in shape and provided with a base 2, constituting a stand to give a finished appearance and provide a support when it is desired to rest the lamp upon a table, shelf, or the like. The burner 3 is arranged above the lamp-body and below the generator 4, and the hydrocarbon is supplied to the generator by air forced into the upper portion of the reservoir by means of an air-pump or like contrivance (not shown) adapted to be connected with the valve 5, applied to a side of the lamp-body and normally closing an opening through which the fount is supplied with hydrocarbon when required.

The lamp illustrated is of the hanging variety and is suspended by means of arms 6 and 7 and connected brackets 8. The arms 6 and 7 are tubular and curve in opposite directions and constitute ducts for supplying the gaseous mixture to the burner and the hydrocarbon to the generator. The lower ends of each of the arms are provided with castings, which are soldered or similarly attached to the top side of the body or fount 1. The casting 9, fitted to the lower end of the arm 6, is of elbow shape and its vertical branch 10 is in direct line with the lamp-burner. A basal flange 11 of segmental form constitutes a part of the casting 9 and rests upon the upper flattened portion of the fount 1 and is secured thereto. The casting 12, attached to the lower end of the arm 7, is provided with oppositely-extending wings 13, forming basal extensions and adapted to rest upon the top side of the body 1, to which they are attached by solder or in any desired manner. The wings 13 are supplementary to the basal flange 11 and unitedly therewith form a circular basal support for the arms of the suspending structure. The arm 6 con-



veys the gas to the burner for consumption and the arm 7 supplies the hydrocarbon to the generator to be vaporized. The tube 14 connects at its upper end with the casting 12 and passes through an opening in the top side of the fount and extends within the latter and terminates a short distance from the bottom.

A housing 15 incloses the castings 9 and 12 and their basal supports and is composed of upper and lower parts horizontally jointed, the lower part 16 being in the nature of a band and the upper part 17 in the form of a cap. A collar 18 rises centrally from the top portion of the housing 15 in line with the vertical extension 10 of the casting 9, and the burner 3 is fitted thereto. The burner-tip comprises a body 19, having an inner flange 20 at its upper end and an inner rib 21, formed by creasing the body parallel with the flange 20. A filling 22 is applied to the upper end of the burner-tip and is secured between the flange 20 and rib 21 and is composed of ribbons 23 and 24, placed side by side and spirally wound. The ribbon 23 is straight, whereas the ribbon 24 is fluted, and by winding the two ribbons spirally a series of orifices are formed for the escape of the gaseous mixture at the base of the flame. The central portion of the ribbons is secured by a button 25, which likewise answers as a spreader to cause a lateral deflection of the flame. The spreader 25 is essentially a rivet, having a split shank 26, whose members are oppositely deflected to cooperate with the head 25, so as to confine the interposed parts.

The generator 4 consists of a tube of uniform external diameter and having differential bores 27 and 28, the latter being of greater diameter than the part 27. A seat 29 is formed at the juncture of the bores 27 and 28 and is of tapering formation conformable to the valve 30 of the stem 31. This tube 4 is fitted to the upper end of the arm 7 and is in communication therewith by means of an opening 32. The valve-stem 31 is threaded in the outer end of the tube 4 in the ordinary manner and is adapted to be operated by means of a button or thumb-wheel 33, fitted thereto. The inner end of the valve-stem is reduced, as shown at 34, and the extremity is made tapering to provide a valve 35, from which projects the needle 36. A cap 37 is fitted to the end of the tube 4 and is provided centrally with a minute opening for the escape of the vapor and the reception of the needle 36. The inner end of the cap is formed with a tapering recess to form a seat for the valve 35. The two valves 35 and 30 in the length of the valve-stem 31 provide means for gradually controlling the vapor either when turning on or off the vapor, so as to regulate the flame, thereby preventing flaring and excessive noise.

The mixing-chamber 39 is in the form of a cup and is fitted to the inner end of the generator, preferably by means of a screw-thread

connection, so as to be relatively adjustable toward and from the induction end of the arm 6. The receiving end of the arm 6 is in line with the generator and is spaced therefrom a short distance, so as to admit air into the arm 6 to combine with the vapor and secure the best illuminating results. A regulator is adjustably mounted upon the induction end of the arm 6 and consists of a disk 40 and a sleeve 41, the latter having slits 42 extending inward for a short distance from its end to provide spring portions 43, which grip the sides of the arm with sufficient force to hold the regulator in an adjusted position. The disk 40 is of greater diameter than the receiving end of the mixing-chamber and is adjustable toward and from the open end of said mixing-chamber to control the admission of air therein for admixture with the vaporized hydrocarbon.

The lamp-chimney 44 is retained in place by holders 45, secured at their lower ends to the gallery 46, and its upper end makes telescopic connection with a cylinder 47, which constitutes an extension thereof and is mounted upon the generator 4. This cylinder or chimney extension 47 is provided in opposite sides with slots 48 to receive the generator and is movable vertically to admit of displacement of the chimney 44 for any purpose and the turning of the receptacle 49 into position for priming the lamp prior to lighting. This extension or cylinder 47 serves to concentrate the heat upon the generator, which is of material advantage when the light is burning low, and also prevents sudden drafts from cooling the generator when the heat is just sufficient to vaporize the hydrocarbon.

The receptacle 49 is of oblong formation and contains a suitable absorbent to take up a small quantity of alcohol for consumption when it is required to heat the generator sufficiently to vaporize the hydrocarbon when it is required to light the lamp. This receptacle 49 is attached to the outer end of a swinging arm 50, having its lower end rotatably fitted in a sleeve 51, applied to one of the arms of the suspending structure. When the lamp is lighted, the arm 50 is turned so as to swing the receptacle 49 to one side, as shown in Fig. 1, and when it is required to start the lamp the arm 50 is swung to bring the receptacle 49 directly under the generator, as shown most clearly in Fig. 6. When initially heating the generator, it is to be understood that the cylinder or chimney extension 47 is elevated so as to be out of the way.

After the lamp has been charged by supplying a suitable hydrocarbon to the reservoir in desired quantity pressure is created within said reservoir by forcing air therein through the valve 5, and after the generator has been heated to the requisite degree for vaporizing the hydrocarbon the valve is opened and the hydrocarbon passing into the generator is converted into vapor and escapes from the generator into the arm 6 and passes from thence



to the burner and is ignited. The hot air passing upward through the chimney maintains the generator at a temperature sufficient to convert the hydrocarbon into vapor and keep the lamp in operation as long as required or so long as the hydrocarbon is supplied from the reservoir to the generator. The proper admixture of air with the vapor is determined by adjusting the regulator 40. It is noted that the supply-tube 14 is of smaller diameter than the duct 7, and this has been found to be of material advantage in the successful operation of the lamp, since the flow of the oil from the fount is retarded, the small diameter of the tube 14 enabling it to act in the capacity of a reducer. By having the air-regulator constructed in the manner set forth the roaring and hissing noise common to lamps of this type is avoided or modified to such a degree as not to be perceptible.

Having thus described the invention, what is claimed as new is--

1. In a lamp of the character described, and in combination with the burner, generator and lamp-body, oppositely-disposed tubular arms for conveying the gaseous mixture to the burner and hydrocarbon to the generator, castings fitted to the lower ends of said arms and formed with matching basal extensions secured to the top portion of the lamp-body, one of the castings having a vertical extension in line with the burner, and a tube extending from the other casting and passed within the lamp-body and terminating a short distance from the bottom thereof, substantially as set forth.

2. In a lamp of the type specified, and in combination with the lamp-body, the burner and the generator, oppositely-disposed tubular arms serving, respectively, to convey the hydrocarbon to the generator and the gaseous mixture to the burner, castings fitted to the lower ends of said arms and having offstanding basal portions which overlap and are secured to the top side of the said lamp-body, one of the castings having a vertical extension in line with the burner, and the other

casting having a tube pendent therefrom and entering the lamp-body and terminating a short distance from the bottom thereof, substantially as set forth.

3. In a lamp of the character substantially as described, and in combination with the lamp-body, burner and generator, oppositely-disposed tubular arms in communication with, respectively, the burner and generator, castings fitted to the lower ends of the said arms and formed with complementary basal extensions unitedly constituting a support overlapping and secured to the top side of the lamp-body, one of the castings having a vertical extension in line with the burner, and a tube pendent from the other casting and extending within the lamp-body and terminating a short distance from the bottom thereof, substantially as specified.

4. In a lamp of the class set forth, a lamp-body, a burner and a generator, in combination with oppositely-disposed tubular arms in communication with, respectively, the burner and lamp-body, castings fitted to the lower ends of the arms and having offstanding basal portions overlapping and secured to the top side of the lamp-body and unitedly forming a basal support, a housing inclosing the castings and the basal portions thereof, and a tube pendent from one of the castings and extending within the lamp-body and terminating a short distance from its bottom, substantially as described.

5. In combination with a vapor-burner, a tip, a filler for the tip composed of a straight and a fluted metallic ribbon placed side by side and spirally wound, and a spreader securing the central portion of the spirally-formed filler and consisting of a headed fastening, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM H. IRBY. [L. S.]

Witnesses:

GLADYS L. THOMPSON,  
GENEVIEVE MATTHEWS.