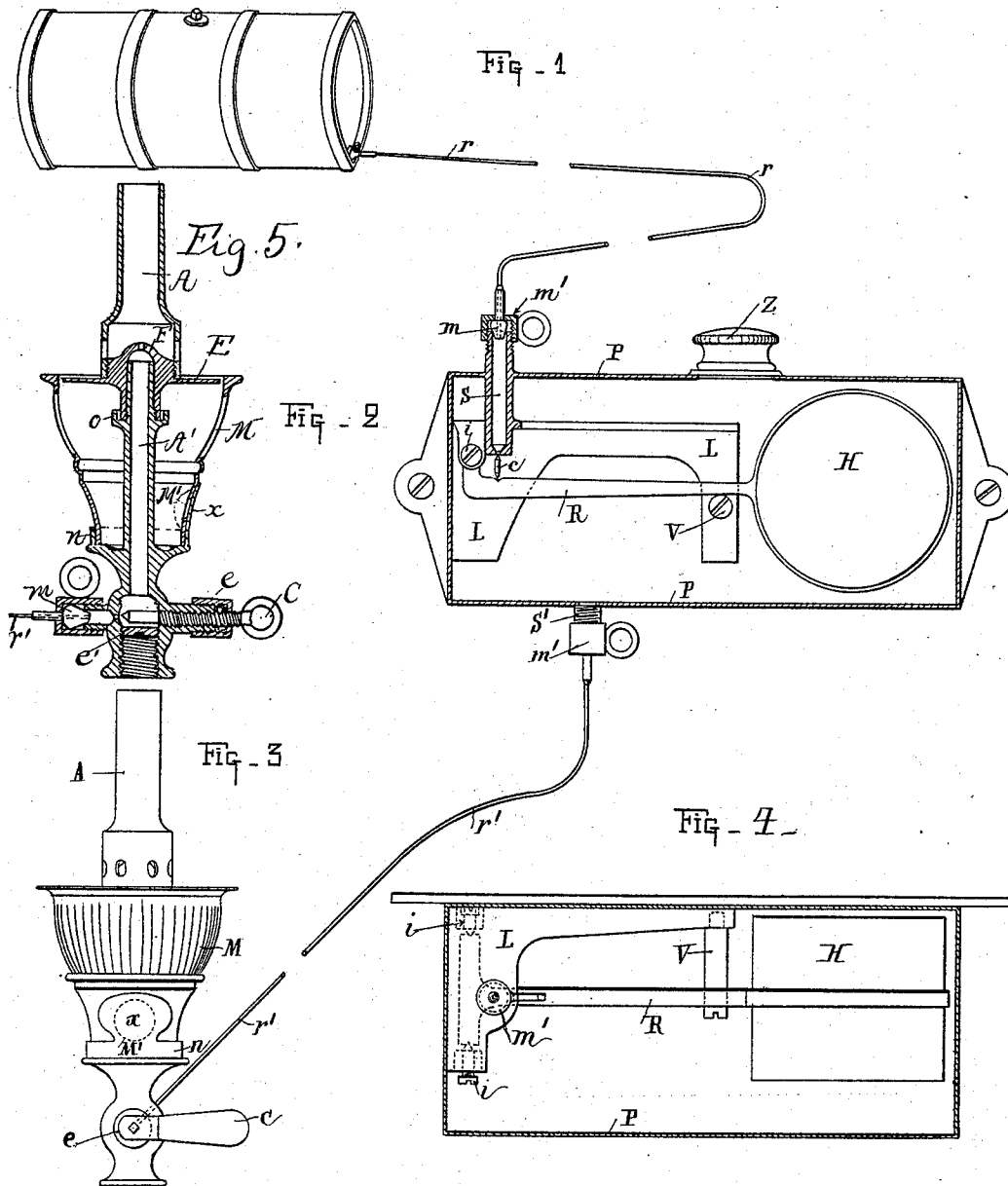


(No Model.)

P. J. CARMEN.
LIGHTING DEVICE.

No. 578,914.

Patented Mar. 16, 1897.



Witnesses.
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LIGHTING DEVICE.

SPECIFICATION forming part of Letters Patent No. 578,914, dated March 16, 1897.

Application filed August 8, 1896. Serial No. 602,124. (No model.) Patented in France January 16, 1894, No. 235,498, and in England May 6, 1896, No. 10,568.

To all whom it may concern:

Be it known that I, PIERRE JACQUES CARMEN, a citizen of the French Republic, residing at Montbéliard, France, have invented certain new and useful Improvements in Lighting Devices, (for which I have obtained Letters Patent in France, No. 235,498, dated January 16, 1894, and in Great Britain, No. 10,568, dated May 6, 1896,) of which the following is a specification.

My invention relates to a lighting device wherein benzin or any other hydrocarbon is gasified and burned in this form without the use of a wick by means of burners of the same character as those used for coal-gas.

The essential features of my lighting device are the constant and regular feeding of the liquid from the receptacle to the burner by means of a capillary tube of brass or other suitable metal of one to two millimeters in section and of any desired length and the gasification of the benzin in the burner hereinafter described which is adapted to be constantly heated.

In the accompanying drawings, Figure 1 is a perspective of a receptacle for the benzin. Fig. 2 is a vertical longitudinal section through a pressure-regulator used with my invention. Fig. 3 shows a side elevation of a burner adapted for use with this invention; Fig. 4, a top plan view of the pressure-regulator with the top of the casing removed, and Fig. 5 is a vertical section through the burner shown in Fig. 3.

The lighting device when assembled consists of the receptacle for the benzin or lighting liquid, the pressure-regulator, the burner for gasifying the liquid, and the capillary tube connecting the several parts.

The capillary tube is one of the most essential parts of the device, as by means of the same I obtain a uniform feeding of the benzin, and it allows of a very quick installation of the device in view of its flexibility. The tube (indicated at *r* and *r'*) is provided at its ends with a cone *m*, of soft metal, so as to assure a tight joint with the other parts to which it is connected by means of a nut *m'*.

The receptacle for the benzin may be of

any desired shape. If it is for a large plant, I may use an iron barrel, such as used in the trade for shipping benzin. If, on the other hand, the apparatus is only adapted to light a single room, a can containing one to five liters will be sufficient.

It is well understood that in all cases the receptacle feeding the burner must be placed at least ten to fifteen centimeters higher than the burner. It may be placed in the upper story of a building or in the cellar and communication with the burner and regulator established through the capillary tubes described. If located in the cellar, suitable means will be employed to cause the benzin to rise to the regulators.

The pressure-regulator is located between the receptacle and the burners in plants where the burners are arranged at different heights, as, for instance, where a receptacle placed in the attic feeds the burners for an entire house with several floors.

The regulator is contained within a suitable casing *P*, which is provided with a supporting-piece *L*, secured thereto. Upon this support *L* the lever *R* is pivoted by means of two set-screws *i* and is provided at one end with a float *H*. The downward-swinging movement of the lever is limited by a stop-screw *V*. The support *L* is provided with a feed-tube *S*, through which the benzin is fed, and said tube is provided with a tapered outlet at its lower end, which is adapted to be closed by a valve *c* when the liquid in the casing has raised the lever *R* by means of the float *H*. The capillary tube *r*, connecting the receptacle and regulator, is joined to the tube *S* by means of a soft-metal cone *m*, tightened by means of the nut *m'*. The casing *P* is provided at its upper part with an entrance-aperture *Z*, through which the liquid is introduced for the first operation after the installation of the plant. The regulator is provided with a discharge-tube *S'*, also provided with a tapered outflow-opening, to which is jointed a second capillary tube *r'*, conveying the liquid to the burners, which will be hereinafter described. By passing the liquid from the receptacle through the regulator it is fed

with a uniform pressure to all the burners connected with the regulator by means of the tube *r'*.

The burner for the liquid is composed of a
 5 vertical tube A, provided with air-openings, and is provided with the disk E. This tube is screwed upon an interiorly and exteriorly screw-threaded burner-cap F, which is provided with a central opening and is screwed
 10 upon a supply-tube A', which is of sufficient diameter to prevent the complete gasification of the liquid contained therein. This supply-tube is provided at its upper portion with an annular gutter *o*, and the burner-cap screwed
 15 upon the supply-tube is adapted to be adjusted in its relation to the bottom of the gutter. Suitable means are provided for establishing communication between the supply-tube and gutter, so that the lighting liquid
 20 may flow to the gutter and be there ignited to form a heating-flame. As a means for this purpose the screw-threads between the supply-tube and burner-cap may be formed so as to allow the liquid to flow down the same into
 25 the gutter and the supply of liquid regulated by adjusting the burner-cap in its relation to the gutter. The supply-tube A' is formed in one piece with the cock and is also provided with a gallery *n*, upon which rests the mantle
 30 M, in which is arranged an aperture M', which is closed by a plate *x*, formed in one piece with the gallery *n*. The liquid is conveyed to the cock through the tube *r'*, the influx being regulated by a screw-threaded cone manipulated by means of a key C. A tight connection of the parts is obtained by means of
 35 the joint *m* and *m'*, previously described, and by means of a nut *e*, and at the lower end by means of a plug *e'*. In this burner the disk
 40 E is the heating means, which is heated from the flame at the gutter *o*, and the space between the supply-tube A' and the mantle M constitutes a heat-chamber, so as to retain the parts constantly in a heated condition
 45 when the burner is lighted.

To light the burner, the feeding-cock is opened until the benzin rises to the burner-hole. The cock is then closed and the part F slightly unscrewed. The benzin thus enters
 50 into the circular gutter *o* by passing around the screw-threads of the parts A' and F and is there ignited. When the disk E is sufficiently heated, the feeding-cock is again opened and the gasified benzin at the burner-hole is lighted. The feeding of the benzin into
 55 the gutter *o* is then regulated by adjusting the base of the part F in its relation to the bottom of the gutter, so as to keep up a small flame for the constant heating of the disk E.
 60 I have described with particularity one

form of burner, but it is obvious that the capillary tube may be connected to any suitable form of burner which will properly gasify the liquid, so as to burn the same. With
 65 the use of a capillary tube the danger of fire and explosion in case of the breaking of the tube is avoided, as if the liquid becomes ignited at the break it would burn as in an ordinary burner. This tube also forms a constant and regular feed and the difficulty of
 70 air-bubbles forcing the feed is avoided.

It will be evident that this system presents, among other advantages, great cheapness of installation as compared with the ordinary gas-plant and an absolute safety hitherto not
 75 attained in the use of hydrocarbon-burning devices.

Having described this invention and set forth its merits, what I claim, and desire to secure by Letters Patent, is—

1. In a vapor-burner, the combination with a receptacle for the lighting liquid, of a flexible capillary tube extending from the receptacle to the burner to feed the liquid constantly and regularly to the burner, substantially as described.

2. In a lighting device, the combination with a receptacle for the lighting liquid and means for feeding the liquid to a burner, of a burner provided with a supply-tube, a casing
 90 surrounding said supply-tube to form a heating-chamber, an annular gutter located upon said supply-tube within said casing, and means establishing communication between said supply-tube and gutter to supply
 95 the lighting liquid to said gutter, substantially as described.

3. In a lighting device, the combination with a receptacle for the lighting liquid and means for feeding the liquid to a burner, of
 100 a burner provided with a supply-tube having a screw-threaded upper end, a casing surrounding said supply-tube to form a heat-chamber, a heating-disk located at the upper
 105 portion of said casing, an annular gutter located upon said supply-tube adjacent to said heating-disk, means for establishing communication between said supply-tube and gutter to supply the lighting liquid to said gutter, and a screw-threaded burner-cap adjustable in its relation to said gutter, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 27th day of July, 1896.

PIERRE JACQUES CARMEN.

Witnesses:

E. LECOUTWEIER,
 L. TOURINS.