(No Model.)

C. W. BECK.

LAMP FOR GENERATING AND BURNING ACETYLENE GAS.

No. 590,941. Patented Sept. 28, 1897.

Fig. 1.

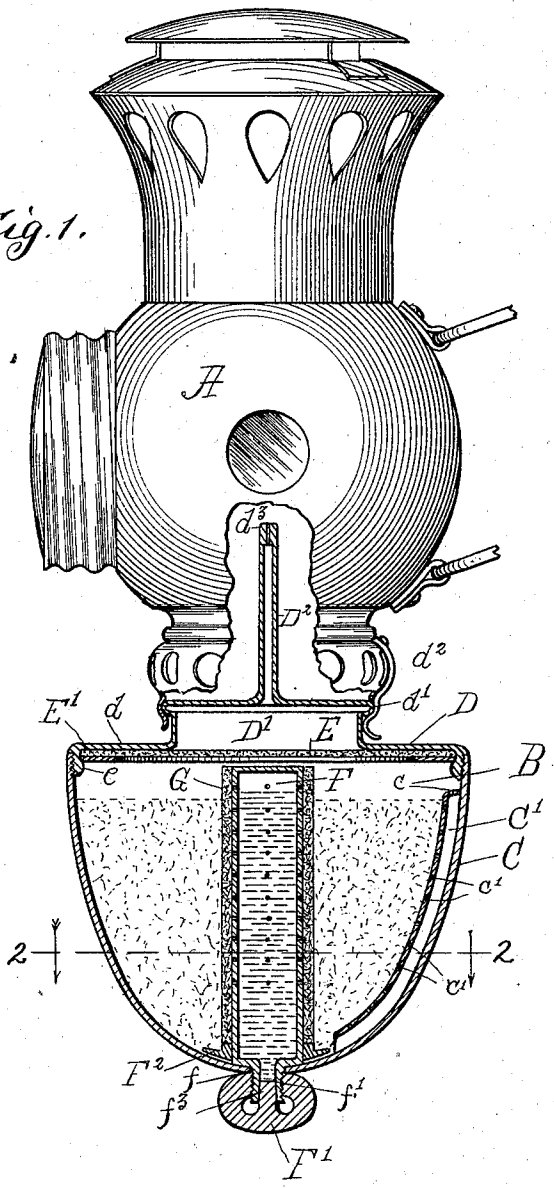


Fig. 3.

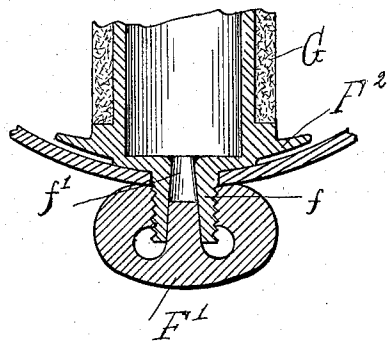
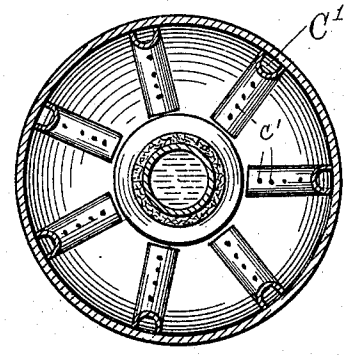


Fig. 2.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES W. BECK, OF CHICAGO, ILLINOIS.

LAMP FOR GENERATING AND BURNING ACETYLENE GAS.

SPECIFICATION forming part of Letters Patent No. 590,941, dated September 28, 1897.

Application filed July 27, 1896. Serial No. 600,613. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. BECK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Lamps for Generating and Burning Acetylene Gas, of which the following is a specification.

Calcic carbid is a substance which when subjected to the action of water forms a carbon vapor of high illuminating power by the combination of two atoms of carbon with two parts of hydrogen, this product being called "acetylene gas." An extremely small quantity of the carbid will furnish a large quantity of the gas, and said carbid is therefore particularly well adapted for use in portable lamps.

My invention has for its object to provide a lamp adapted to contain a charge of this compound and to bring water or watery vapor in contact therewith in such proportions and at such rate as to supply a steady flow of gas to the burner; and to this end the invention consists in the matters hereinafter described, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a side elevation, partly broken away and in section, of a bicycle-light embodying my invention in the best form now known to me. Fig. 2 is a horizontal section through the correspondingly-numbered line in the preceding figure. Fig. 3 is an enlarged detail of the lower part of said lamp, explanatory of the connection between the fluid-reservoir and the body of the lamp.

A represents an ordinary headlight or lantern for a bicycle, and B the improved lamp attached to the base thereof in position for use. The fount or body C of this lamp is of any suitable external outline to form a receptacle for the carbid and generating-chamber for the gas and is provided along the internal wall with a series of ascending hollow ribs or tubes C′, open at the bottom and practically closed at the top, except for the small perforation *c* to permit the escape of gas. These ribs have also a series of perforations *c′* along their length to admit gas into the channel along the interior, and they rise from adjacent to the base of the fount to near the upper edge thereof, bringing their closed upper ends above the contents with which it is charged.

The top of the fount or receptacle is hermetically closed by the screw-cap D, which first inturns horizontally to form a broad shoulder *d*, then rises vertically, providing an upper gas chamber or reservoir D′, is beaded, as at *d′*, to catch under the spring or other catches d^2 at the base of the lantern, and then closes over and terminates in the tube D^2, having a burner d^3 at its end. Inside the cap and extending beneath the gas-chamber thereof and dividing it off from the primary gas-chamber D^3 at the top of the generating-chamber is placed a sheet E of porous material, such as woven fabric, adapted to serve as a filter to the generated gas, and this is held in place against the inturned shoulder of said cap by means of an annular ring or grating of metal E′, sprung into place and held by the bulging cheeks *e* of the screw-threaded rim of the cap. Any other suitable means may be employed for applying and securing the filter in place.

The bottom of the fount is bored to receive the screw-threaded reduced end *f* of the perforated tube F, constituting the receptacle for the slaking agent and that rises vertically through the center of the fount to a point just beneath the filter-diaphragm, is closed at its top, which latter portion may be of greater capacity than its lower body, and has an opening *f′*, preferably of slightly conical outline, as shown, through its screw-threaded lower end for the introduction of water or other fluid. The foot of the tube is shouldered, as at f^2, above the screw-thread to sit upon the internal wall of the fount and form one member of a clamping device, the opposing member of which is furnished by a nut F′, taking over said threads, and provided with a centrally-insetting conical plug f^3 to fit the inlet into said tube and binding against the external wall of the tank, so as to make a leak-proof joint. Just above the shoulder the tube is provided with an outsetting annular wing F^2, the purpose of which is to break up

or loosen the contents of the exterior receptacle formed by the surrounding walls of the fount, and above the wing the wall of the tube is covered with porous material G, which is sufficiently compact to permit the fluid contents of the tube or inner receptacle to seep but slowly through into contact with the carbid with which the outer receptacle will be charged. The porous envelop may be omitted and the tube packed with porous or spongy material and the latter saturated with water to a sufficient degree to promote infiltration through the interstices *g* of the surrounding casing and into the adjacent carbid, or the apertures in the casing may be made sufficiently small or few in number to properly retard the escape of fluid. The lower of these apertures *g* are near the bottom of the fluid chamber or tube, so as to insure water passing through them and into the charge of carbid. One or more of said apertures, as at *g'*, will, however, open into the generating-chamber above the level of said charge—that is, into the primary gas-chamber D^3—so that as fluid is exhausted from the tube and consumed in the chemical reaction going on in said generating-chamber sufficient of the gas generated thereby may enter the top of the tube above its fluid charge to equalize pressure in both chambers. In assembling the parts the tube is first put in place. The outer compartment is next charged with the calcic carbid and the cap, with its filtering-diaphragm, applied and screwed on. Then the tube is charged with water, its nut turned into place, clamping it in position and at the same time closing the feed-orifice by means of the plug, and the lamp is ready for use.

In operation the fluid contained in the tube or central compartment or in its spongy packing will seep through into the carbid. The humectation thereof will at once initiate a chemical reaction, setting free acetylene gas, which will rise through the body of the carbid or through the semitubular channels along the sides of the tank, pass through the filter-diaphragm into the gas-chamber, and from thence reach the burner. When one charge of the calcic carbid has been exhausted, the cap will be removed. The fluid tube or receptacle will then be unfastened and drawn out, and the wing at the foot thereof will drag upon the exhausted charge, which will usually be somewhat caked, and assist in clearing and ejecting it. Then the lamp will be filled as before.

I do not intend to limit myself to the precise features of construction or arrangement of parts hereinbefore described, considering that the construction is susceptible of various developments and modifications without departing from the principle of my invention. Neither do I confine myself to the use of calcic carbid as a charge for the lamp, since I may use in place of calcic carbid any equivalent therefor; but

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

1. In a lamp the combination of a gas-generating chamber, a gas-jet communicating therewith, a liquid-receptacle smaller in cross-section than the interior of the generating-chamber and arranged to project freely within the latter, so as to be exposed to the contents of the generating-chamber at its sides, pores in the side wall of the liquid-receptacle, and a compact absorbent body covering said porous wall, constructed to permit a slow seepage of the liquid therethrough.

2. In a lamp, the combination of a gas-generating chamber, a gas-jet communicating therewith, a liquid-receptacle of less capacity than the generating-chamber and centrally disposed within the latter, the walls of said liquid-chamber being perforated throughout its height, and a tubular wick surrounding said liquid-receptacle, with the outer surface of which the carbid rests in contact.

3. The combination to form a lamp for generating and burning acetylene gas, of a compartment to hold carbid, ascending conduits in said chamber extending from points within the body of carbid upwardly above the surface thereof, to direct the gas, and a communicating compartment to hold the slaking agent separated from the carbid-compartment by a perforated wall, provided with a porous covering.

4. The combination to form a self-contained lamp-fount for generating and burning acetylene gas, of an exterior compartment to hold the carbid, a central compartment to hold the slaking agent, means to cause the seepage of said agents into the carbid, a gas-chamber above said compartments and a filter interposed between the gas-chamber and said compartments.

5. The combination to form a lamp, of the fount for the reception of carbid, the ascending tubular ribs along the internal wall thereof, perforated for the admission of gas, the central tube or compartment for the reception of the slaking agent, the porous envelop therefor, the gas-chamber, and the burner.

6. The combination of the fount, the fluid-tube shouldered and screw-threaded at its foot and having an inlet along the axis of the screw-threaded extension, and the nut with its insetting plug.

7. The combination of the fount, the removable fluid-tube, and the outsetting wing near the foot of said tube.

8. The combination with the fount and the removable fluid-tube, of the removable cap and the filtering-diaphragm removable with said cap.

9. The combination to form a lamp for generating and burning acetylene gas, of a receptacle to hold the slaking agent, a generating-compartment to hold carbid, a gas-jet communicating with the generating-compartment and means for controlling the flow of

liquid to the carbid comprising an elongated support arranged to project within the mass of carbid and a wick or covering of absorbent material upon said support, freely exposed to the carbid, said wick being supplied with liquid from the liquid-receptacle.

In testimony that I claim the foregoing as my invention I affix my signature, in the presence of two witnesses, this 25th day of July, A. D. 1896.

CHARLES W. BECK.

Witnesses:
ALBERT H. GRAVES,
OWEN WILLIAMS.