(No Model.)

C. W. BECK.

ACETYLENE GAS LAMP.

No. 590,955. Patented Oct. 5, 1897.

Fig. 1

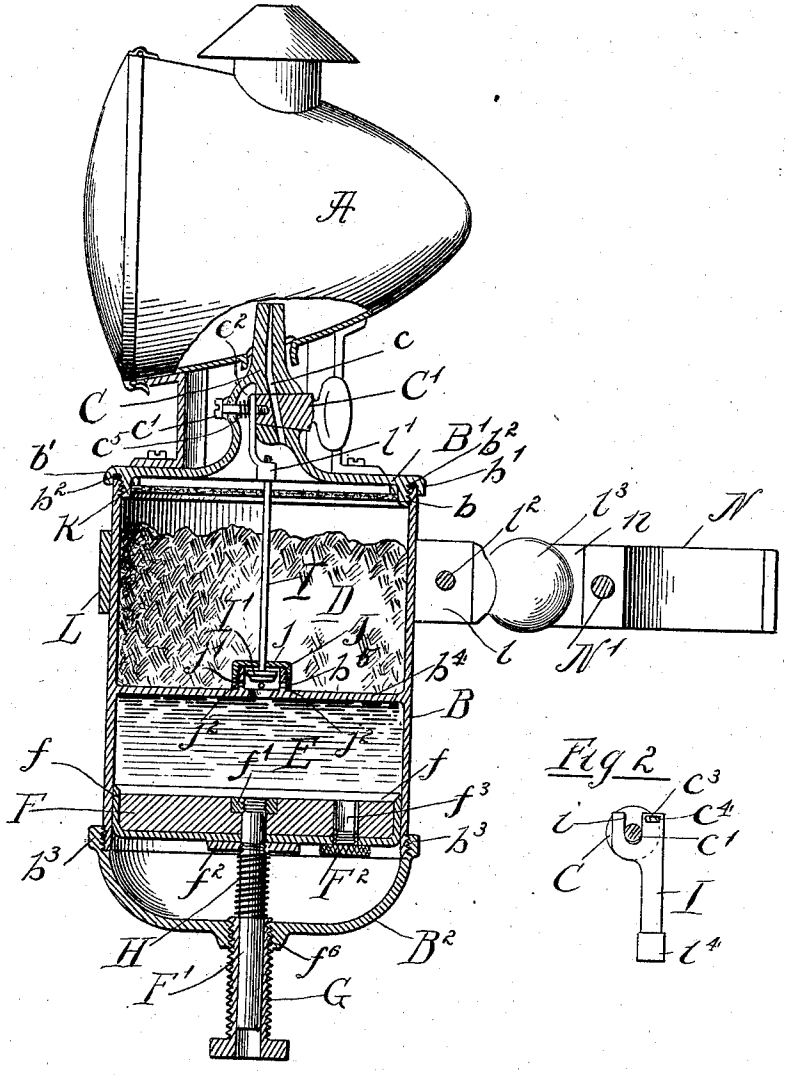

Fig 2

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

UNITED STATES PATENT OFFICE.

CHARLES W. BECK, OF CHICAGO, ILLINOIS.

ACETYLENE-GAS LAMP.

SPECIFICATION forming part of Letters Patent No. 590,955, dated October 5, 1897.

Application filed September 14, 1896. Serial No. 605,723. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. BECK, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Acetylene-Gas Lamps, of which the following is a specification.

This invention relates to improvements in lamps, and refers more specifically to an improved lamp especially designed for generating and burning ascetylene gas, the particular embodiment of the invention shown in the present instance consisting of a bicycle-lamp.

Among the objects of the invention are to provide a construction in which the liquid is supplied to the carbid by means of a forced feed, or, in other words, by pressure produced by mechanical means, which may be regulated to afford any desired degree of pressure within reasonable limits, in which the supply of liquid fed to the carbid may be checked or arrested altogether at any time, and in which said supply is positively cut off simultaneously with the shutting off of the burner.

The invention consists in the matters hereinafter described, and more particularly pointed out in the appended claims, and the same may be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is an axial sectional view of a lamp embodying my invention, the headlight or reflector being shown in side elevation. Fig. 2 is a detail view showing the truncated end of the burner-valve plug and the conformation of the actuating-rod connected therewith.

It is to be understood that my present invention is capable of embodiment in different forms and that the construction shown herein, wherein the pressure through the medium of which the feed of liquid to the carbid is effected is produced by the action of a spring and feed-screw, is but one form, and that a comparatively simple one, selected from many possible prototypes. In other words, I wish it to be understood that I do not confine myself to the employment of either spring or screw pressure or a combination of the two for effecting the feed, but may employ other mechanical means—as, for instance, a gas or air pump—for producing pressure for carrying out this feature of the invention. The construction shown herein is, however, deemed the best embodiment of the invention now known to me.

Referring to said drawings, A designates as a whole a reflector or headlight, which may be of any suitable construction. B designates as a whole the lamp-body, which is generally of cylindric form and is closed at each end by means of screw-caps B′ B^2, shown in the present instance as of the full diameter of the end of the cylinder and threaded directly to the end margins of the cylinder. The headlight is shown as bolted directly to the upper surface of the upper end cap, and the burner-nozzle C, which is shown as made integral with said cap, is arranged to rise centrally therefrom and to project at its top end through a suitable opening in the lower side of the reflector, so as to bring the jet approximately in the focus of the reflector.

In order to afford a perfect gas-tight union between the cap and the body of the lamp, said cap is shown as provided with an internal depending flange *b*, threaded to fit within the correspondingly-threaded end of the cylinder and with an overhanging flange *b*′, which depends outside of the said end margin. Between the two flanges is arranged a gasket b^2, made of lead or other soft yielding material, which is compressed between the screw-cap and the marginal end of the cylinder. The lower end cap, which, as will be hereinafter more fully explained, is not subject to internal gas-pressure, is shown as simply threaded to fit upon the lower end of the cylindric body, as indicated at b^3. The interior of the body is divided by means of a horizontal diaphragm or partition b^4 into two compartments D and E, the upper one of which is designed to contain the charge of calcic carbid and serve as a gas-generating chamber and the lower one of which is adapted to contain the supply of liquid and the movable piston F, by means of which the liquid is forced from the lower chamber to the upper through an aperture b^5, formed centrally through the diaphragm b^4.

The piston F is provided with the usual cup-leather *f*, arranged to prevent the flow

of water downwardly past the cylinder into the lower end of the lower chamber and is also provided with an axially-arranged stem or guide-rod F′, arranged to extend through the piston at its upper end and rigidly secured to the latter conveniently by means of nuts f' f^2, threaded thereon at opposite sides of the piston. The stem is arranged to extend at its lower end axially through a hollow screw-plug G, for convenience hereinafter termed the "feed-screw," which feed-screw is externally threaded and arranged to work through a correspondingly-threaded aperture f^6 in the center of the lower end cap.

In order to afford a continuous and yielding pressure of the piston against the liquid, a coiled spring H is shown as interposed between the inner end of the feed-screw and the approximate side of the piston, the expansive capacity of said spring being such as to cause it to move the piston a considerable distance after it has been compressed without further movement of the feed-screw.

The piston is shown as provided with a filling-aperture f^3, through which the liquid may be introduced and which is normally closed by a screw-plug F^2.

The burner-nozzle is provided with a valve-plug C′, by means of which the burner may be closed, and in order that the supply of liquid to the carbid may be shut off simultaneously with the closing of the burner means are provided as follows: The central part of the burner-nozzle is enlarged at that point through which the valve-plug is inserted and the gas-duct c is deflected to one side of the axis of said nozzle, as shown clearly in the drawings. The smaller end of the valve-plug terminates at a point within said enlargement and is cut off or truncated at right angles to the axis of the plug, said plug being held to its seat and supported at its said smaller end by means of a screw c', inserted through the opposite side wall of the burner and threaded axially within the end of the valve-plug.

The part of the burner-nozzle within which the end of the valve-plug terminates is recessed, as indicated at c^2, and upon the end of the valve-plug, located eccentrically of the axis thereof, is mounted a wrist or stud c^3, (see detail Fig. 2,) with which is connected the upper end of the actuating-rod I, which extends downwardly through the carbid-chamber and projects at its lower end within a small cylindric valve-chamber J, which surrounds and incloses the inlet-aperture b^5. In order to provide for the circular travel of the stud c^3 without oscillating the actuating-rod laterally, said rod is shown as provided with a transverse slot c^4, within which the stud plays, and also with a vertical arm i, between which and the side of the actuating-rod the screw c' is embraced, this construction obviously insuring a direct vertical reciprocation. The valve-chamber is closed at its upper end by means of a screw-cap j, through which the actuating-rod passes, and the cylindric side walls of said chamber are provided with a plurality of apertures j', through which the liquid may escape from the valve-chamber to the carbid. Upon the end of the actuating-rod within the valve-chamber is mounted a conical valve I′, which is adapted to be forced into engagement with the valve-seat formed around the margin of the inlet-aperture b^5.

Inasmuch as the upper screw-cap carrying the burner-nozzle must be removed in order to charge the carbid into its receptacle, it is obviously necessary that the actuating-rod be disconnected at the same point, and this is conveniently accomplished by making the rod in two sections, which are united by a screw-threaded connection i', arranged axially of the screw-cap, so that the actuating-rod may be disconnected and reëngaged simultaneously with the unscrewing and replacing of the cap, respectively. In order to hold the upper section of the actuating-rod in proper engagement with the stud upon the end of the valve-plug, a spiral spring c^5 is shown as interposed between the outer surface of the upper end of said arm and the opposing inner wall of the recess c^2 and surrounding the screw c'.

In order to prevent the entrance of pulverized carbid into the valve-chamber through the apertures j', a wrapping j^2, of porous material—as, for instance, felt—is shown as surrounding the exterior of the chamber below the cap thereof. In order to filter the gas and prevent the passage of supercharged hydrous gas to the burner, a diaphragm of porous material—such, for instance, as felt—is shown as arranged within the upper part of the carbid-chamber, said filter being conveniently held in place by means of an expansive ring K, sprung within the inner depending flange b of the cap.

The operation of the lamp thus described will be obvious, but may be briefly outlined as follows: The end closing-caps having been removed and suitable charges of carbid and liquid placed in their respective compartments, the caps are returned to place and the feed-screw turned inward until the coiled spring is compressed sufficiently to exert a considerable pressure upon the piston. If now the burner be opened, the cut-off valve will be raised simultaneously with the opening of the burner-outlet, and the liquid acted upon by the piston will be forced upwardly into the valve-chamber, and thence through the outlets therein to the carbid. Gas will immediately begin to generate and issue from the jet-nozzle, being filtered in its passage to the latter by means of the porous diaphragm. Should it be desired to increase the rate of generation, this may be effected by simply turning the feed-screw inward, so as to increase the pressure exerted by the spring. On the contrary, should it be desired to lessen the rate of generation or even to interrupt it entirely this will be accomplished by simply

turning the feed-screw in the opposite direction, whereupon the pressure upon the liquid will be lessened or may be entirely relieved. Obviously as soon as the feed-screw is turned outwardly, so that the spring no longer exerts pressure upon the piston, the feed of the liquid to the carbid will be interrupted. When the burner is closed, the movement of the valve-plug in closing the burner will simultaneously force the valve downward upon its seat, and thereby shut off the supply of liquid and thus arrest the generation of gas.

I claim as my invention—

1. In a lamp for generating and burning acetylene gas, the combination of a compartment for carbid, a liquid-compartment having communication with the carbid-compartment, a spring, means for tensioning the spring and means for transmitting to the liquid the mechanical pressure of the spring for effecting a feed of the liquid to the carbid.

2. In a lamp for generating and burning acetylene gas, the combination of a compartment for carbid, a liquid-compartment having communication with the carbid-compartment, a spring, an adjusting-screw for tensioning the spring, and means for transmitting to the liquid the mechanical pressure of the spring, for effecting a feed of the liquid to the carbid.

3. In a lamp for generating and burning acetylene gas, the combination of a compartment for carbid, a compartment for liquid having communication with the carbid-compartment, means for producing mechanical pressure and a spring arranged to transmit the mechanical pressure to the body of liquid whereby the latter is fed to the carbid in a continuous flow, and means for controlling the liquid-inlet to the carbid.

4. In a lamp for generating and burning acetylene gas, the combination of a compartment for carbid, a compartment for liquid having communication with the carbid-compartment, a piston arranged to act upon the body of liquid, a spring arranged to act upon the piston and a feed-screw arranged to act upon the spring.

5. In a lamp for generating and burning acetylene gas, the combination of a compartment for carbid, a compartment for liquid having communication with the carbid-compartment, a piston arranged to act upon the body of the liquid, a spring arranged to act upon the piston and a feed-screw arranged to act upon the spring and means for closing the communication between the compartments.

6. In a lamp for generating and burning acetylene gas, the combination of a lamp-body provided with upper and lower compartments adapted to contain carbid and liquid respectively, a communicating passage connecting said compartments, a spring-pressed piston arranged in the lower part of the liquid-compartment adapted to act upon the body of liquid therein, a jet-nozzle communicating with the carbid-compartment and a valve for closing the communicating passage between the two compartments.

7. In a lamp for generating and burning acetylene gas, the combination of a lamp-body provided with upper and lower compartments adapted to contain carbid and liquid respectively, a communicating passage connecting said compartments, a spring-pressed piston arranged in the lower part of the liquid-compartment and adapted to act upon the body of liquid therein, a jet-nozzle communicating with the carbid-compartment, a rotary valve-plug arranged to control the passage in said jet-nozzle and a valve adapted to close the communicating passage between the carbid and liquid compartment operatively connected with said valve-plug whereby the valve will be closed simultaneously with the closing of the jet-nozzle.

8. In a lamp for generating and burning acetylene gas, the combination of a lamp-body provided with upper and lower compartments adapted to contain carbid and liquid respectively, a communicating passage connecting said compartments, a spring-pressed piston arranged in the lower part of the liquid-compartment and adapted to act upon the body of liquid therein, a jet-nozzle communicating with the carbid-compartment, a rotary valve-plug arranged to control the passage in said jet-nozzle, a valve adapted to close the communicating passage between the carbid and liquid compartment operatively connected with said valve-plug whereby the valve will be closed simultaneously with the closing of the jet-nozzle and a filter arranged in the upper part of the carbid-receptacle through which the gas must pass in its passage to the jet-nozzle.

In testimony that I claim the foregoing as my invention I affix my signature, in the presence of two witnesses, this 12th day of September, A. D. 1896.

CHARLES W. BECK.

Witnesses:
WILLIS D. SHAFER,
ALBERT H. GRAVES.