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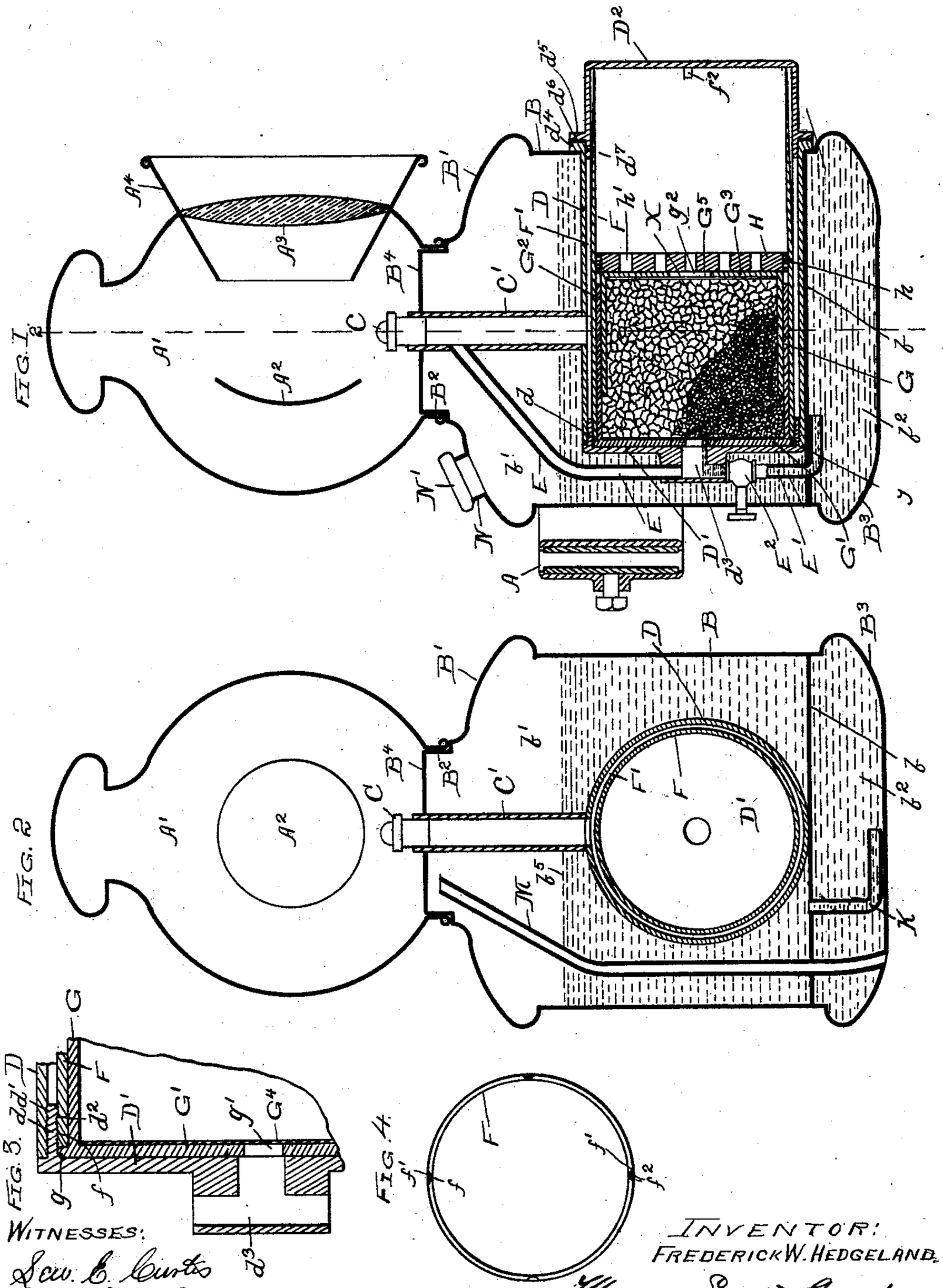
F. W. HEDGELAND.

ACETYLENE BICYCLE LAMP.

(Application filed Oct. 9, 1897.)

(No Model.)



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ACETYLENE BICYCLE-LAMP.

SPECIFICATION forming part of Letters Patent No. 608,403, dated August 2, 1898.

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To all whom it may concern:

Be it known that I, FREDERICK W. HEDGELAND, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Acetylene Bicycle-Lamps, of which the following is a specification.

My invention relates to bicycle-lamps, and more particularly to acetylene-gas bicycle-lamps.

The object of my invention is to provide an acetylene bicycle-lamp of a simple, cheap, light, and durable construction which will be efficient, economical, and safe in operation and which will burn with a uniform and steady flame notwithstanding the continually-varying vibrations and jars to which it is constantly subjected in use.

My invention consists in the means I employ to accomplish this object—that is to say, it consists in the novel construction of parts and devices and in the novel combinations of parts and devices herein shown and described, and specified in the claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is a central vertical section of a bicycle-lamp embodying my invention. Fig. 2 is a vertical cross-section on the line 2 2 of Fig. 1. Fig. 3 is an enlarged detail sectional view, and Fig. 4 is an end view of the cartridge-shell.

In the drawings, A represents the frame or bracket by which the lamp is attached to the bicycle; A′, the hood; A^2, the reflector; A^3, the lens, and A^4 the flaring lens-holder tube or shell, the parts being of any ordinary or suitable construction.

B is a vessel or shell constituting the body of the lamp and preferably of cylindrical form. The lamp-body or vessel B is preferably provided with a raised or dome-shaped top B′, terminating in a cylindrical neck B^2, and the lower end of the body B is preferably given a dished form B^3 to give the lamp a more symmetrical appearance. The body B is divided by a longitudinal partition *b* near its lower end into a water-chamber *b′* and an equalizing-chamber b^2 below the water-chamber.

C is the gas-burner, and C′ the gas-supply tube leading from the gas-chamber or shell D to the burner and projecting up through the flat head B^4 of the neck B^2.

D is a cylindrical shell projecting horizontally into the water-chamber *b′* and constituting the gas-chamber of the lamp. The gas-chamber or shell has an inner head D′, which is provided with a flange *d*, having external screw-threads *d′*, uniting it to the cylindrical portion of the said shell D, and with interior screw-threads d^2, by which the cartridge-holder F is united to said head D′. The head D′ is further provided with a hollow hub or boss d^3, which communicates by a pipe E with the gas-burner tube C′ and by a pipe E′ with the equalizing-chamber b^2. The tube E′ is provided with a valve E^2 for opening and closing the same. The horizontal gas holder or chamber D is provided at its outer end with a flange d^4, by which it is soldered, brazed, or otherwise securely connected to the body or vessel B of the lamp by a water-tight joint. At its outer end the horizontal gas-holder shell D is provided with a removable cap D^2, having a flange or shoulder d^5 to compress the packing d^6 and furnished with screw-threads d^7 to unite it with the main portion of the shell D.

The cartridge-holder F is a cylindrical shell open at both ends and provided at its inner end with screw-threads *f* to engage the interior screw-threads on the flange *d*. The cartridge-holder F is somewhat smaller in diameter than the gas-chamber shell or holder D, in which it fits, thus leaving a horizontally-extending annular space F′ for the gas between itself and the shell D. The cartridge-holder shell F is further provided on its outer periphery, extending from about its middle to its outer end, with a number of longitudinal grooves *f′* and openings f^2 at its extreme outer end to facilitate the passage of the gas around the end of the shell F and between it and the shell D and its cap D^2.

G is the cartridge-shell, which may be preferably made of waterproof paper or paper-board and in which the calcium carbid X, from which the gas is generated, is contained. The cartridge-shell G fits closely inside the cartridge-holder F, and it is provided with an externally-projecting annular flange *g*, which is engaged by the inner end of the car-

tridge-holder shell F, so that when the said shell F is screwed home in the shell D the inner head G′ of the cartridge-shell will be firmly clamped against the inner head D′ of the gas-holder shell or chamber, and thus prevent the water which enters through the hollow hub or boss d^3 from running down between the two. The inner head G′ of the cartridge-shell G is provided with an opening g', registering with the opening or passage of the hollow hub or boss d^3, so that the water may enter the cartridge and come in contact with the carbid X therein. The cartridge-shell G is preferably made in two parts, having an inner telescopic section G^2, and its outer head or end G^3 is furnished with an opening g^2 to permit the escape or passage of the gas from the carbid. Disks of linen or other fabric G^4 G^5 cover the openings g' g^2 and prevent the carbid from falling into or through said openings.

H is a follower disk or piston fitting inside the cartridge-holder shell F and provided with a spring-band h on its periphery to hold it frictionally in place while permitting it to slide in the shell F, as the bulk of the carbid expands after being acted upon by the water. This disk or piston H is provided with a number of openings h' for the passage of the gas.

The water-chamber b' communicates with the equalizing-chamber b^2 below by means of a pipe K, the lower end of which extends to near the bottom of the equalizing-chamber b^2.

The water-supply pipe E′ terminates at its lower end near the top of the equalizing-chamber b^2, so that the water cannot feed any to the carbid except when the pressure of the gas through the equalizing-pipe E and the connecting-pipe E′ permits the water to fill the equalizing-chamber.

M is a vent-pipe leading from the air-space above the water-line b^5 out through the bottom of the body or vessel B, so that if any gas should accumulate above the water it may escape at the lower end of the lamp or far away from the burner.

N is the nozzle or opening into the chamber b' for pouring in the water, the same being closed by a cap or plug N′.

Having now described the construction of the various parts or devices which are combined together to produce my new lamp, I will now describe the principle and mode of operation of my invention.

As the equalizing-chamber b^2 is comparatively small in size, and as the water enters it from the water-chamber b' through a small tube or pipe K, and as this equalizing-chamber in the normal operation of the lamp is maintained constantly full of water, owing to the pressure of the water in the chamber b' above it, the tilting, jostling, jarring, and vibratory movements to which the lamp is subjected in use will not tend to produce any splashing effect in this small equalizing-chamber b', and, moreover, no splashing effect can reach the carbid through the small feed-tube E′, which might injuriously affect the operation of the lamp or its steady and uniform burning, and as the water feed or supply pipe E′ is a small tube and rising vertically from the equalizing-chamber b^2 to the tubular hub or opening d^3, and as the pressure of the gas in the gas-holder D and burner-tube C′ acts directly through the equalizing-tube E against the small column of water rising in the water-feed tube E′, it will be seen that the feed of the water to the carbid is automatically regulated and very delicately governed or controlled, because there is only a very small volume of water in the feed-tube E′ near the carbid, and the instant the pressure of the gas rises above the normal or proper amount the pressure of the gas from the equalizing-tube E will force the water down the feed-tube E′ and away from the carbid, and the instant the gas-pressure, on the other hand, falls below its normal or proper degree the water rises in the feed-tube E′ and again comes in contact with the carbid, thus restoring the pressure. This very delicate and sensitive regulation or self-adjustment of the generation of the gas also affords a perfect safeguard against danger of explosion and renders the lamp safe as well as economical. As in my lamp the cartridge-holder occupies a horizontal position, and as the water is fed into it horizontally or at one end, and as the gas generated passes horizontally through the carbid in the cartridge, it thus prevents the deposit or accumulation of spent or acted-upon carbid from interfering with the proper passage of the water into the carbid or of the gas generated out of or from the cartridge, and whatever irregularity of action might otherwise arise from the accumulation of the deposit of spent carbid in the cartridge is fully compensated for by the delicate automatic regulation of the water-feed to the carbid before explained, and as in my invention the cartridge-holder F is firmly screwed into the shell D the water being fed into the cartridge at the end is prevented from entering the gas-chamber or accumulating in the space between the cartridge-holder F and shell D, and as in my invention the gas-holder shell D is provided with a movable cap projecting outside the body of the lamp the cartridge-shell and its contents may be very readily removed from the lamp without disconnecting the head or other parts therefrom.

While my improved lamp is specially designed for use as a bicycle-lamp, it may also be used for other purposes.

I claim—

1. In an acetylene-gas bicycle-lamp, the combination with a lamp-body or vessel having a small closed equalizing-chamber at its lower end and a water-chamber above said equalizing-chamber, and a connecting tube or passage between said chambers, of a horizontal cartridge-holder open at both ends pro-

vided with a cartridge, a gas-holder shell in said water-chamber and surrounding said cartridge-holder, and a water feed or supply pipe or tube leading from said equalizing-chamber and communicating with the cartridge at one end thereof through an opening in the head or end of said gas-holder or shell, substantially as specified.

2. In an acetylene-gas bicycle-lamp, the combination with a lamp-body or vessel having a small closed equalizing-chamber at its lower end and a water-chamber above said equalizing-chamber, and a connecting tube or passage between said chambers, of a horizontal cartridge-holder open at both ends provided with a cartridge, a gas-holder shell in said water-chamber and surrounding said cartridge-holder, a water feed or supply pipe or tube leading from said equalizing-chamber and communicating with the cartridge at one end thereof through an opening in the head or end of said gas-holder or shell, and an equalizing pipe or tube communicating at one end with the gas-supply and at the other end with the water feed or supply pipe, substantially as specified.

3. In an acetylene-lamp, the combination with the burner and gas-burner tube, of a horizontal cylindrical gas-holder or shell having a removable cap, a horizontal cartridge-holder in said shell, a water-feed tube or passage at one end of said shell, a lamp-body or vessel having a water-chamber, and an equalizing-chamber below communicating with the water-chamber and with said water-feed tube or passage, and an equalizing-pipe communicating with the gas-supply and with said water-feed passage at or near its entrance to the cartridge, substantially as specified.

4. In an acetylene-lamp, the combination with the lamp-body or vessel having a water-chamber and an equalizing-chamber below, a small water-passage connecting said equalizing-chamber and water-chamber, a generator-chamber located above the equalizing-chamber and having a carbid-holder, and a small water-feed tube or pipe leading upwardly from said equalizing-chamber and communicating with said generator-chamber above its bottom, substantially as specified.

5. In an acetylene-lamp, the combination with a gas-holder shell, of a cartridge-holder shell screw-threaded thereto, a cartridge having a telescopic section, and a follower-disk, substantially as specified.

6. In an acetylene-lamp, the combination with the lamp-body or vessel, of a gas-holder shell projecting horizontally into the lamp-body and having an open outer end, a removable screw-threaded cap closing the outer end of said shell, a cartridge-holder shell fitting inside said gas-holder shell, and a cartridge having a telescopic section, and a follower-disk provided with a spring friction-ring fitting inside said cartridge-holder shell, substantially as specified.

7. The combination with the burner and generator of an acetylene-lamp, of a horizontal passage opening into the generator and serving as a means of admitting water to the carbid, and a gas-passage admitting gas to said water-feed passage at its junction with the generator, whereby the gas is enabled when its pressure becomes preponderating to force all the water away from the carbid, substantially as specified.

8. In an acetylene-lamp, a generating-chamber having an opening above its bottom whereby water may be fed to the side of the carbid, an equalizing-chamber communicating with the water-supply of the lamp and located in a plane lower than the plane of said water-opening in the generating-chamber, an upward passage for the water connecting the equalizing-chamber to said water-opening, and a passage or duct conducting the gas to said connecting-passage in immediate proximity to said opening into the generating-chamber, whereby all the water in said connecting-passage is quickly forced back from the carbid when the pressure becomes excessive, substantially as specified.

9. In an acetylene-lamp, the combination with the generating-chamber containing the carbid, of an equalizing-chamber connected to a source of water-supply, an upward water-feed passage from the equalizing-chamber to the generating-chamber, and a second passage connected to the gas-holding parts of the lamp and communicating with said water-passage at its junction with the generating-chamber, whereby the gas is enabled to quickly force the water away from the carbid, substantially as specified.

10. In an acetylene-gas-generating lamp, the combination with the carbid-holding shell or chamber, having an opening in its end for the admission of water to the carbid, and the equalizing-chamber below the generating-chamber, of the tube E E′ open to the gas at its upper end and to the water in the equalizing-chamber at its lower end, and having an opening in its side wall whereby it communicates with the carbid-holding shell or chamber, substantially as specified.

11. In an acetylene-gas-generating lamp, the combination with the carbid-holding shell or chamber having an opening in its end for the admission of water to the carbid, and the equalizing-chamber below the generating-chamber, of the tube E E′ open to the gas at its upper end and to the water in the equalizing-chamber at its lower end, and having an opening in its side wall whereby it communicates with the carbid-holding shell or chamber, said tube being provided with a valve located between said side opening and the equalizing-chamber, substantially as specified.

12. The combination in a generating gas-lamp with the gas-feed passage leading to the burner, the carbid-holding chamber or shell,

and the equalizing-chamber, the latter being in communication with a water-reservoir, of a single tube E E′ establishing communication between said passage and said chambers, substantially as specified.

13. In an acetylene-lamp, the combination with the generator and the burner, of a short horizontal passage or chamber opening into the generator through the side wall of the latter, said passage receiving water from below and also receiving gas under pressure above the water, whereby the gas is enabled to quickly force the water back from the carbid without being itself imprisoned between the water-supply and the carbid, substantially as specified.

14. In an acetylene-lamp, the combination with the generator and the burner, of a short horizontal passage or chamber opening into the generator through the side wall of the latter, said passage receiving water through an opening in its bottom, and also receiving gas under pressure through an opening in its top, substantially as specified.

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