

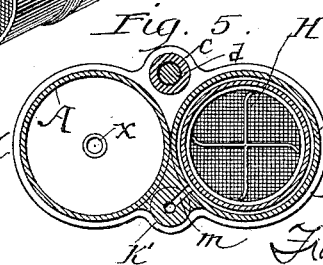
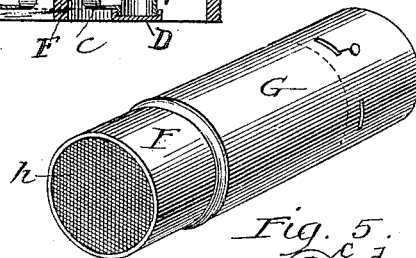
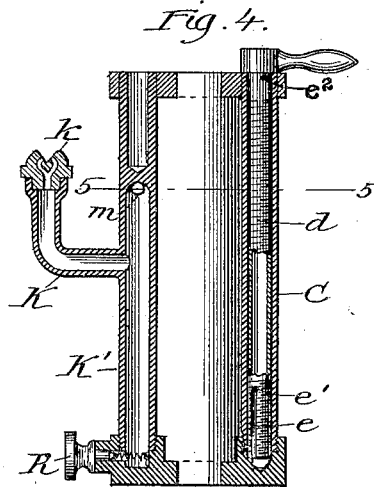
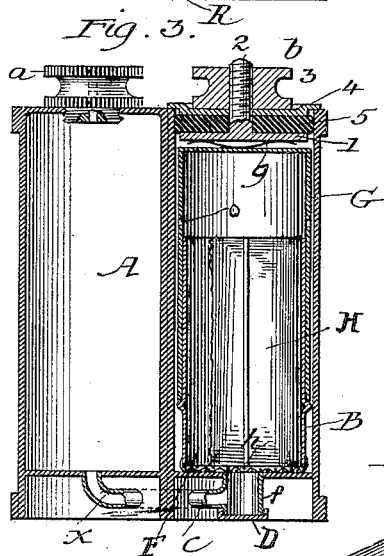
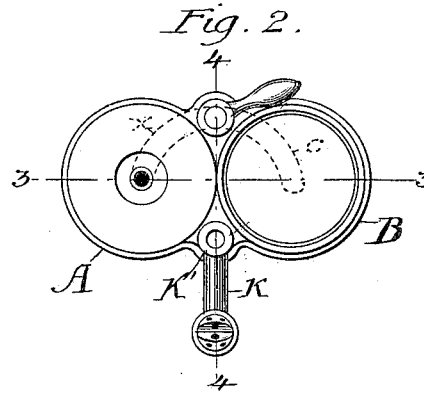
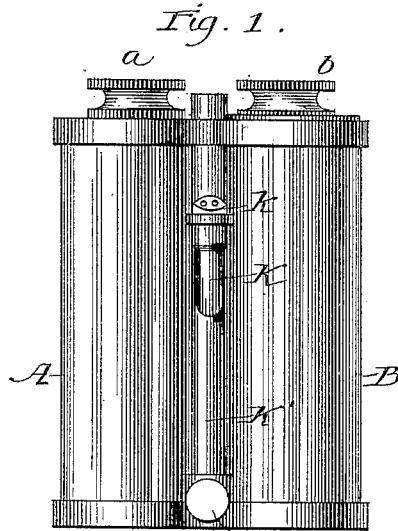
No. 649,880.

Patented May 15, 1900.

A. K. STEIN.
ACETYLENE GAS GENERATING LAMP.

(Application filed Aug. 12, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

AUGUST K. STEIN, OF CHICAGO, ILLINOIS.

ACETYLENE-GAS-GENERATING LAMP.

SPECIFICATION forming part of Letters Patent No. 649,880, dated May 15, 1900.

Application filed August 12, 1898. Serial No. 688,427. (No model.)

To all whom it may concern:

Be it known that I, AUGUST K. STEIN, a citizen of the United States, and a resident of Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Acetylene-Gas Lamps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings and to the letters and numerals of reference marked thereon.

My invention relates to that class of lamps in which the acetylene gas is generated by the application of water to calcic carbid.

The object of my invention is to provide a non-pressure lamp which can be easily and quickly charged either with water or carbid without these elements affecting each other, in which when it is desired to put out said lamp only the gas previously generated, and generated from such particles of carbid as the water has already attacked, will remain to be consumed, in which the generation of gas commences almost instantly when adjusted ready to be lighted, and which is of a very simple and cheap construction. This I accomplish by the mechanism hereinafter fully described and as particularly pointed out in the claims.

In the drawings, Figure 1 is a front elevation of my invention. Fig. 2 is a plan view of the same. Fig. 3 is a central vertical section taken on dotted line 3 3, Fig. 2. Fig. 4 is a vertical section taken on dotted line 4 4, Fig. 2. Fig. 5 is a horizontal section taken on dotted line 5 5, Fig. 4. Fig. 6 is a detail view showing a section of the lower end of the water-regulating valve and seat. Fig. 7 is a perspective view of the carbid-receptacle.

The case of my invention consists of two tubes or tubular receptacles A and B, one of which is designed to contain the water and the other of which forms the gas-generating chamber. Both the water-receptacle A and the gas-generating chamber are closed at the top and bottom; but the former is provided with an opening therein, through which the water is poured when it is desired to fill the same, which is closed by a suitable screw-cap *a*, that is provided with a small air-vent extending longitudinally through it.

The top of the gas-generating chamber is closed by a removable cover *b*, which consists

of a circular plate 1, having a central stud 2 projecting up therefrom, the upper portion of which is screw-threaded and is engaged by a suitable nut 3. Between this nut 3 and plate 1 I place a loose circular plate 4 on said stud, and between plate 4 and plate 1 I insert a soft-rubber washer 5. The diameters of the plate 1 and the rubber packing-washer correspond to the inner circumference of the upper end of the gas-generating chamber; but the diameter of the plate 4 is such that it can be seated on the top edges of said chamber. In closing the top of the gas-generating chamber with this cover I insert the cover down into the gas-generating chamber until plate 1 and the packing-washer are within the same, and then I screw the nut 3 so as to expand the washer between plates 1 and 4, thus securing the cover in place.

The water-chamber is connected at or near its bottom by a suitable water-passage with the bottom of the gas-generating chamber. I prefer to accomplish this by means of the vertically-arranged pipe C, which is of a comparatively-small diameter and fits snugly between the water-receptacle and gas-generating chamber, preferably at the rear of the lamp, and extends from the top of the water-chamber to nearly the bottom of the lamp. Near the lower end of this pipe, at a point where it is soldered or otherwise hermetically connected to the water-chamber, I provide the conduit *x*, communicating the interior of the water-receptacle with the bore of said pipe, and I connect the lower end of this pipe C by means of a lateral pipe *c*, extending therefrom through the lower edges of the gas-generating chamber (which latter extends below the bottom of said chamber) to a point about the center of the bottom of said gas-generating chamber, substantially as shown. The bore of the pipe C from a point near its closed bottom to a suitable point above the same is screw-threaded and is engaged by the screw-threaded lower end portion of a spindle-valve *d*. This spindle-valve *d* has its lower end made conical, and when screwed downward it closes the bore in the lower end of said pipe. The screw-threaded lower portion of the spindle-valve is provided with a longitudinal groove *e*, and the valve-spindle above this screw-threaded portion is made hollow

the remainder of its length. I provide this spindle just above the screw-threaded portion with an opening e' through its sides, which connects the groove e and the bore of the upper hollow portion thereof, so that any gas caused by back pressure in the gas-chamber can escape through the groove e , through the bore of the upper hollow portion of the spindle, and out through an opening or hole e^2 , made in its sides near the upper end of the spindle, which latter extends above the upper end of pipe C and is provided with a handle or finger-grasp with which to turn it. I do not wish to be confined to the exact construction of this valve controlling the flow of water from the water-receptacle to the gas-chamber, as it is evident that other forms of valves than that described could be employed for this purpose.

Instead of the pipe c opening direct into the bottom of the gas-generating chamber I prefer to make the same discharge into the cylindrical pocket f , depending centrally from the bottom of the gas-generating chamber. The lower end of this pocket is exteriorly screw-threaded and is closed by a suitable screw-cap D. In this gas-generating chamber I place a cylindrical cartridge, which consists of two telescoping sections F and G, that are made of thin sheet metal and are of such diameters, respectively, that one, F, telescopes into the other, G. The end of the section G farthest from section F is closed and preferably has radially-arranged springs g secured thereto and adapted to press against the cover b to prevent the parts from rattling. The end of section F farthest from section G is perforated or provided with a fine wire-gauze end h , and I prefer to place within section F a cleaner H, consisting of two strips of flat material in length and width corresponding with the interior length and diameter of said section F, which are united together their entire length at their centers of width at right angles to each other, forming a cross. The cleaner H is adapted to be manipulated by hand, and it operates when rotated to loosen the mass of spent carbid from the bottom and sides of the cylinder. The entire mass of spent carbid can then be lifted bodily out by withdrawing the cleaner, the particles of the residuum adhering to the blades of the cleaner and to each other with such tenacity that practically all of the spent material is removed, leaving the cartridge-section comparatively clean. I charge this cartridge by placing a sufficient quantity of, preferably, powdered carbon in section G and then placing the cleaner H lengthwise within section F until it touches the perforated or gauze end of the same and then telescope section F into section G. If it is desired to use the lamp immediately, I place the cartridge within the gas-generating chamber, so that the gauze or perforated end thereof will rest on the bottom of the chamber. I then close the gas-generating chamber with the cover b and move the spindle-valve so

as to permit the water to flow into the bottom of the gas-generating chamber from the water-chamber. The water coming in contact with the carbid through the perforated bottom of the cartridge immediately generates the gas, which escapes through the openings o and m into the gas-pipe K' and is burned by the lighting of the burner k , projecting from the gas-pipe K in the front of the lamp. When it is desired to stop the generation of the gas, the spindle-valve is moved so as to cut off the supply of water to the gas-generating chamber, and then the flame issuing from the burner k is blown out. Then the cover b of the gas-generating chamber is removed and the cartridge removed and inverted and replaced in said gas-generating chamber again in such position that the closed end of the cartridge rests on the bottom thereof. When removing the cartridge, care must be taken to prevent the water issuing from the top of the water-chamber through the air-vent in nut a by placing the finger over the same. This is particularly necessary when the lamp is inverted to facilitate the removal of the cartridge. When the cartridge is removed from, reversed, and replaced in the lamp, the spent carbid or residuum being of an adhesive nature remains in the inverted bottom of the cartridge, whereas the live carbid gravitates into the closed inverted top of the cartridge. Thus it will be observed that the lamp will only continue to generate gas so long as small particles of live carbid adhering to the spent adhesive mass of carbid is exhausted. This prevents the moisture remaining in the spent carbid affecting the live carbid in the least and solves one of the difficult problems heretofore attending the successful use of carbid in lamps of this character.

The burner k projects from a vertical pipe K', secured to and in space between the water-receptacle and the gas-generating chamber in front of the lamp. A suitable distance below its upper end is closed, and just below the plane of this closure I secure the pipe by solder or otherwise to the case of the generating-chamber and then connect the interior of the generating-chamber with the bore of said pipe by a lateral conduit or passage m , made through said solder or medium connecting the pipe of the generating-chamber. The gas generated in the gas-generating chamber is always free to flow through the passage m through pipe K and out through the burner. Should it be desired to put out the lamp, this may be done either by blowing it out or by opening the lower end of the gas-pipe K' either by means of a screw-plug tapped into the lower open end of the pipe or the spring-plug R, the contraction of a suitable coiled spring attached to which normally keeps the same closed.

What I claim as new is—

1. In an acetylene-gas generator, the combination of a water-receptacle, a gas-gener-

ating chamber, a water-passage connecting the two, and a reversible carbid-receptacle adapted, when in one position, to permit access of the water to the carbid, and when reversed to exclude the water therefrom, substantially as set forth.

2. In an acetylene-lamp, the combination with a water-receptacle, and a gas-generating chamber placed side by side and having their lower ends connected by a valve-controlled water-passage, of a carbid-cartridge consisting of two cylindrical sections telescoping into each other, and the one having one end closed, and the other having one end covered by a perforate head, as and for the purpose set forth.

3. In an acetylene-lamp, the combination with a water-receptacle, and a gas-generating chamber placed side by side and having their lower ends connected by a valve-controlled water-passage of a reversible carbid-receptacle placed within said gas-generating chamber having one end closed and the other end perforated, as and for the purpose set forth.

4. In an acetylene-gas generator, the combination with a water-receptacle and a gas-generating chamber having a removable top, of a removable and reversible carbid-receptacle having one end perforately and the other end imperforately closed, substantially as set forth.

5. In an acetylene-gas lamp, the combination with a water-receptacle, a gas-generating chamber, and connecting water-conduits, of a carbid-receptacle in said gas-generating chamber consisting of two separable telescopic sections, one of which has a perforately-closed end, a cleaner seated in said section and adapted when operated to loosen the mass of spent carbid from the perforated end and lift it bodily out of the section, substantially as set forth.

6. In an acetylene-gas lamp, the combination with a water-receptacle, a gas-generating chamber, connecting water-passages, and a carbid-receptacle consisting of two separable telescopic sections, one of which has one end

perforately closed, of a cleaner consisting of a strip of suitable material corresponding in length and width to the interior length and diameter of the said section, whereby when the sections are separated, access may be had to the cleaner to operate it, substantially as set forth.

7. In an acetylene-gas generator, the combination with a water-receptacle, a gas-generating chamber, and a water-pipe connecting the water-receptacle with the lower end of the gas-generating chamber, of a reversible carbid-receptacle located within said gas-generating chamber above the mouth of the water-pipe, having one end perforately and the other end imperforately closed, and having openings in its walls to permit the escape of the gas generated within such receptacle, substantially as set forth.

8. In an acetylene-gas lamp, the combination with a water-receptacle, a gas-generating chamber, and a water-pipe connecting the two, of a pipe C opening into the water-pipe and a hollow spindle fitting in said pipe C and provided with means whereby it may be raised and lowered to open and close the water-pipe, and also to permit the escape of backflow gas from the gas-chamber, substantially as set forth.

9. In an acetylene-lamp the combination of a water-receptacle having a suitably-closed ingress-opening, a gas-generating chamber placed side by side with said water-chamber, a water-pipe connecting the lower ends of said water-receptacle and gas-generating chamber and a spindle-valve having its lower end screw-threaded and having a longitudinal groove through said threaded portion, and being hollow above its lower end, and the bore thereof communicating through a suitable opening with said groove and open to the outer atmosphere at its upper end.

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