No. 621,331. Patented Mar. 21, 1899.

E. J. DOLAN.

ACETYLENE GAS LAMP.

(Application filed Oct. 21, 1898.)

(No Model.)

Fig. 1.

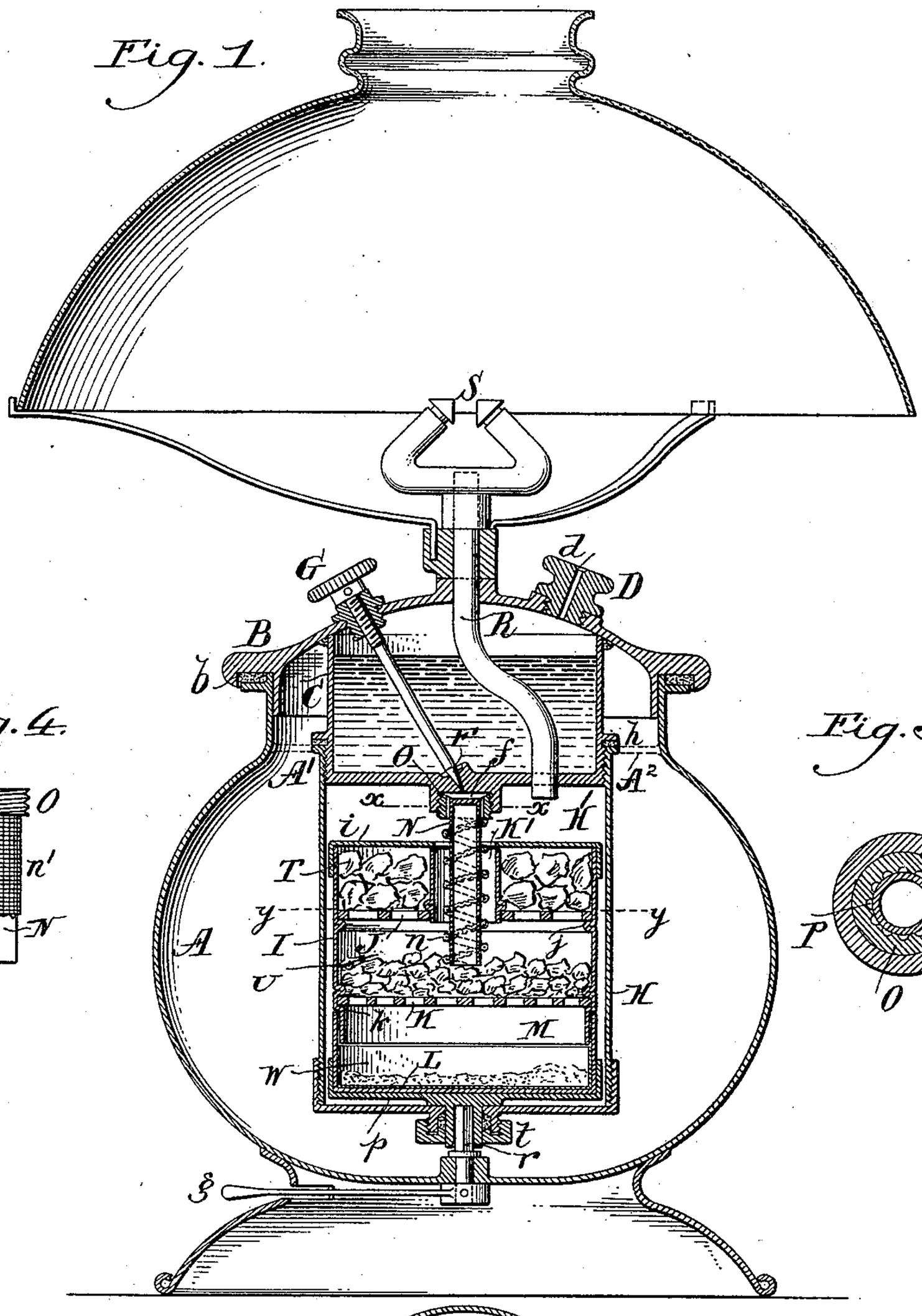
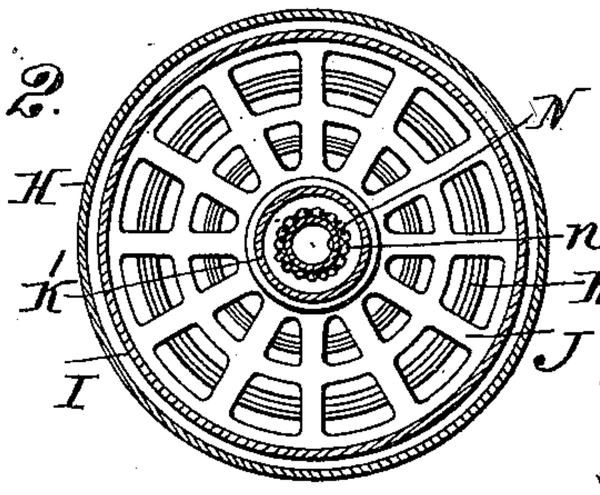


Fig. 4.

Fig. 3.

Fig. 2.



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UNITED STATES PATENT OFFICE.

EDWARD J. DOLAN, OF PHILADELPHIA, PENNSYLVANIA.

ACETYLENE-GAS LAMP.

SPECIFICATION forming part of Letters Patent No. 621,331, dated March 21, 1899.

Application filed October 21, 1898. Serial No. 694,161. (No model.)

To all whom it may concern:

Be it known that I, EDWARD J. DOLAN, of the city and county of Philadelphia, State of Pennsylvania, have invented an Improvement in Acetylene-Lamps, of which the following is a specification.

My invention has reference to acetylene-lamps; and it consists of certain improvements which are fully set forth in the following specification and shown in the accompanying drawings, which form a part thereof.

The object of my invention is to provide a suitable construction of lamp adapted to produce acetylene gas generated from carbid of calcium.

More specifically, my improvements comprehend the manner of feeding the water to the carbid of calcium whereby a uniform generation of gas is secured and the gas also preferably dried before passing to the burner.

My improvements consist of certain features of construction adapted to an ordinary standing lamp or bicycle or other type of lamp to be carried by a vehicle.

More specifically considered, these improvements consist of a water feed-conductor of an impervious or solid rod or body, about which is placed a conductor either in the form of a spirally-arranged wire chain or gauze which presents a meshed or obstructing surface for conducting the water slowly and uniformly to the carbid at a lower level, to prevent spasmodic generation of acetylene caused by intermittently dropping the water upon the carbid.

My improved conductor is easily cleaned, and being of metal or other hard substance is not apt to clog or become deteriorated by use.

To enable the lamp to be kept in a clean condition, I form the carbid-receptacle with an inner removable cartridge comprising three compartments, an upper or drying compartment separated from a middle compartment by a grate and a lower compartment separated also from the middle compartment by a second grate. The two upper compartments contain carbid, while the lower compartment is adapted to receive refuse or lime products from the decomposition of the carbid in the middle compartment. The lamp may also be provided with means to vibrate or impart a shaking motion to the cartridge, if so desired, to separate the lime products from the undecomposed carbid. The conductor for conveying the water from the carbid extends through a tubular aperture in the upper compartment and leads into the body of the middle compartment. If desired, the lower compartment might be dispensed with; but I prefer to employ the same and also to provide said compartment with a removable paper lining or box, which collects the mass of lime products and permits the same to be removed without excessive soiling of the cartridge. The cartridge is adapted to be recharged when the carbid becomes consumed, and the construction is such that upon removing the cartridge when the lamp is extinguished it may be shaken so as to dislodge the lime products from the upper compartments and cause them to be transferred into the lower compartment. This will, furthermore, cause the smaller particles of the carbid from the upper compartment to find their way into the middle compartment, where they may be decomposed in the further use of the lamp. The cartridge after being shaken in this manner may have the bottom taken off and the refuse removed and after inserting a new lining replaced and inserted once more into the lamp structure.

My improvements will be better understood by reference to the accompanying drawings, in which—

Figure 1 is a sectional elevation of a lamp embodying my improvements. Fig. 2 is a cross-section of a portion of same on line *y y*. Fig. 3 is a cross-section of a portion of same on line *x x*, and Fig. 4 is an elevation of a modified form of conductor.

A is the body of the lamp and may be of any suitable construction. B is the upper portion thereof and may be fitted to the lower portion by a suitable packed joint *b* to prevent any escape of acetylene gas or vapors that might by accident escape from the generating apparatus.

C is a water-chamber formed integral with the cap or upper part B and depending downward into the interior of the body A. The bottom of this water-chamber is provided with a valve-seat *f*, in which a needle-valve G operates, the said needle-valve being ar-

ranged obliquely and terminating in the upper part of the cap B in a handpiece, by which it may be screwed into or out of the valve-seat. The valve-seat F is arranged centrally or thereabout in the bottom of the water-chamber.

D is a plug in the upper part of the cap B, which may be removed and through the aperture of which water may be supplied to the chamber C. This plug is provided with an aperture *d* for the escape of any acetylene gas which might find its way into the water-chamber.

Screwed to the lower part of the water-chamber with a gas-tight joint *h* is a box H, in which is located the carbid-cartridge. This box H constitutes a gas-chamber H′, in which the acetylene is generated and which escapes by a pipe R, leading through the water-chamber and terminating in a burner S at the upper part of the lamp. The box H is adapted to conveniently hold the cartridge, which consists of a case I, having an upper cap *i* and a lower box portion L, the said case containing two grates J and K, separating it into three compartments—namely, an upper compartment T, a middle compartment U, and a lower compartment W. The grate J may be supported in any suitable manner, but as shown rests upon an annular flange *j* on the case. The lower grate is held by an inturned groove *k* of the case I. The grate K extends over the entire area of the case, whereas the grate J is open in the center and has an upwardly-extending tubular portion K′. The cap *i* fits over the top of the case I and is provided with a central aperture corresponding to the tubular part K′ of the upper grate. The meshes of the upper grate J are preferably considerably larger than the meshes of the lower grate, as they are intended to separate carbid in the compartment T of larger size than the carbid in the compartment U, since it is in the latter that the direct application of the water is made to secure the decomposition and production of acetylene gas. In this compartment all of the carbid is intended to be consumed and all of the refuse lime caused to descend to the lower compartment W and be received in the paper lining or box M.

The conductor which leads the water from the nozzle F down into the compartment U may be made in any suitable manner, or, broadly considered, the water may be permitted to drop through the tubular portion K′ directly upon the carbid in the chamber U. I prefer, however, to employ a suitable construction of conductor, such as herein set out, and comprises an elongated impervious body N, of metal or other material, preferably in the form of a tube closed at its upper end, for lightness and surrounded with a spiral or wire or a small chain, as at *n*. The body N need not be circular in cross-section. The upper end of the body N is secured to a plug O, having a series of small apertures P, through which the water may pass from the compartment *f*, below the valve, down to the chain or spiral conductor and by which it is led uniformly and with a constant flow into the compartment U. The plug O is screwed into a socket upon the under side of the water-chamber C immediately below the nozzle F, and by this means the conductor may at any time be detached for cleaning or other purposes. Furthermore, the valve itself is shielded from the compartment containing the carbid and there is less danger of its becoming clogged. In place of using a spirally-arranged conductor about the body portion N, I may employ a layer of woven wire, such as N′, Fig. 4, which will secure the meshed condition, such as in the chain, and cause a steady and constant downward flow of the water. It is immaterial to my invention what construction the outer layer shall be so long as it feeds the water down in a uniform manner and offers obstruction to direct falling; but I prefer a construction having meshes, so as to retard in a measure the downward flow.

For purposes of distributing the cartridge I arrange within the box H a cup *p*, in which the cartridge is placed. This cup has a downwardly-extending stud *r*, passing through a packing-box *t* in the bottom of the box H and having a square aperture in its under side. A lever *g*, journaled in the bottom of the lamp, has its rock-shaft adapted to the square aperture of stud *r*, so that it and the cartridge may be rotated by moving the lever *g*.

In the operation of my lamp it will be seen that the carbid in the compartment U becomes decomposed and the acetylene gas in rising becomes thoroughly dried in passing through or in contact with the carbid in the chamber T and escapes to the burner S in a dried condition and excellently adapted for imparting a brilliant and steady flame. The steam or vapor is also decomposed in this manner and converted into gas. In time the carbid in the compartment T becomes decomposed sufficiently to pass through the meshes of the grate J, in which case it falls to the grate K of the compartment U and is further decomposed. When the lamp has been out for some time, the lime in the compartments T and U will have dried and may be readily shaken into the compartment W, so that the carbid in the compartments T and U is again in condition for subsequent use. The carbid in the compartment T is not as quickly decomposed as in the compartment U, so that it will not require refilling as often. When the cartridge is removed from the box H, the middle compartment may be supplied with carbid through the tubular aperture K, if so desired.

It is of course evident that the cartridge might be supported in the bottom of the chamber A′, relying upon the joint *b* being gas-tight, in which case the body portion A of the lamp takes the place of the box portion H. It is also evident that, if desired, the box H may be formed integral with the body part, as indicated in dotted lines at A^2, to reduce

the amount of gas-space, so as to prevent the accumulation of too much acetylene. These changes will be readily apparent to any one skilled in the art of the manufacture and use of acetylene-lamps.

While I prefer the construction shown, I do not limit myself to the minor details, as they may be modified without departing from the spirit of the invention.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an acetylene-lamp the combination of a gas-chamber, a burner leading therefrom, a removable cartridge adapted to contain carbid of calcium located within the gas-chamber and having an aperture into its interior through the top, a water-chamber, a nozzle and valve to control the flow of water from the water-chamber and a conductor extending from the nozzle supported independent of the cartridge and having its lower end projecting into the interior thereof through the aperture in its top for conveying the water from the valve-nozzle into the central portion of the cartridge said conductor consisting of an impervious body having affixed to its outer surface an obstructing conducting-body extending from the upper portion of the impervious surface of the body to the lower portion thereof.

2. In a portable acetylene-lamp the combination of a gas-chamber, a burner leading therefrom, a removable cartridge constructed wholly independent of the structure of the gas-chamber and adapted to contain carbid of calcium located within the gas-chamber and having attached and movable therewith a refuse-chamber, a water-chamber, a valve to control the flow of water from the water-chamber into the cartridge, and means for shaking or disturbing the carbid-cartridge from the outside of the gas-chamber.

3. In a portable acetylene-lamp the combination of a gas-chamber, a burner leading therefrom, a removable cartridge adapted to contain carbid of calcium arranged within the gas-chamber consisting of a metallic case having a transverse grate upon which to support the carbid of calcium and a lower compartment for receiving the refuse and movable as a whole independent of the gas-chamber, a water-chamber, a valve to control the flow of water from the water-chamber, and means outside of the gas-chamber for bodily shaking the cartridge located within the same.

4. In a portable acetylene-lamp the combination of a gas-chamber, a burner leading therefrom, a removable cartridge adapted to contain carbid of calcium located within the gas-chamber consisting of a metallic case closed on the top except at the middle and having a transverse grate upon which to support the carbid of calcium and a lower compartment for receiving the refuse movable with the grate and independent of the gas-chamber, a water-chamber, a valve to control the flow of water from the water-chamber, means outside of the gas-chamber for bodily shaking the cartridge located within the same, and a suitable water-conductor extending from below the valve and its nozzle of the water-chamber downward through the central opening into the body of the cartridge below its upper edge and terminating above the grate thereof.

5. In an acetylene-lamp the combination of a gas-chamber, a burner leading therefrom, a removable cartridge adapted to contain carbid of calcium located within the gas-chamber consisting of a casing divided into three compartments by two transverse grates each adapted to support carbid of calcium, a water-chamber, a valve to control the flow of water from the water-chamber, and means for conveying water from the nozzle of the water-compartment into the cartridge between the two grates.

6. In an acetylene-lamp the combination of a gas-chamber, a burner leading therefrom, a removable cartridge adapted to contain carbid of calcium within the gas-chamber, consisting of a casing divided into three compartments by two transverse grates, each adapted to support carbid of calcium, a water-chamber, a valve to control the flow of water from the water-chamber, means for conveying water from the nozzle of the water-compartment into the cartridge between the two grates, and means extending to the outside of the lamp for shaking the cartridge without opening the gas-chamber.

7. In an acetylene-lamp the combination of the body part, with a removable cap or cover to which is attached the gas-generating structure whereby it may be removed from the body part, and a lever mechanism carried by the body part adapted to shake the carbid within the gas-generating structure carried by the cover or cap of the lamp.

8. In an acetylene-lamp the combination of the gas-chamber, a burner leading therefrom, a water-chamber arranged above the gas-chamber, a valve to control the flow of water from the bottom of the water-chamber into the gas-chamber, and a conductor for the water supported within the gas-chamber from a point below the valve consisting of a solid or impervious body portion having an externally-arranged downwardly-extending conductor secured to the outer surface thereof to cause the water to flow upon the outer surface of the impervious conductor and be retarded in its descent so as to produce a uniform flow at the place where it is delivered to the carbid within the gas-chamber.

9. In an acetylene-lamp the combination of the gas-chamber, a burner leading therefrom, a water-chamber arranged above the gas-chamber, a valve to control the flow of water from the bottom of the water-chamber into the gas-chamber, and a conductor for the water supported within the gas-chamber from a point below the valve consisting of a solid

or impervious body portion having an externally-arranged downwardly-extending conductor secured to the outer surface thereof composed of a meshed structure to cause the water to flow upon the outer surface of the impervious conductor and be retarded in its descent so as to produce a uniform flow at the place where it is delivered to the carbid within the gas-chamber.

10. In an acetylene-lamp the combination of the gas-chamber, a burner leading therefrom, a water-chamber arranged above the gas-chamber, a valve to control the flow of water from the bottom of the water-chamber into the gas-chamber, and a conductor for the water supported within the gas-chamber from a point below the valve consisting of a solid or impervious body portion having an externally-arranged shallow downwardly-extending conductor secured to the outer surface thereof composed of a spirally-arranged chain structure to cause the water to flow upon the outer surface of the impervious conductor and be retarded in its descent so as to produce a uniform flow at the place where it is delivered to the carbid within the gas-chamber.

11. As an article of manufacture a carbid-cartridge for an acetylene-lamp structure bodily removable therefrom comprising a case having a carbid-compartment provided with a water-aperture through the top, combined with a detachable refuse-compartment below and secured directly to the carbid-compartment, and a grate interposed between the compartments.

12. As an article of manufacture a carbid-cartridge for an acetylene-lamp structure bodily removable therefrom comprising a case having a carbid-compartment provided with a water-aperture through the top, combined with a detachable refuse-compartment below and secured directly to the carbid-compartment, a grate interposed between the compartments, and a removable bottom lining to the refuse-compartment formed of paper loosely fitted into the refuse-compartment below the grate.

13. In a cartridge for an acetylene-lamp structure an outer case having an upper annular chamber, and a middle chamber below the annular chamber, in combination with an annular grate arranged between the upper and middle chambers, a second grate arranged below the middle chamber, and a detachable lower cap to provide access to the lower chamber.

14. In a cartridge for an acetylene-lamp structure an outer case having an upper annular chamber and a middle chamber below the annular chamber, in combination with an annular grate arranged between the upper and middle chambers, a second grate arranged below the middle chamber, a detachable lower cap to provide access to the lower chamber, and a removable bottom lining for the lower chamber.

In testimony of which invention I have hereunto set my hand.

EDWARD J. DOLAN.

Witnesses:

JAMES FINLEY,

ANNIE M. FINLEY.