No. 702,594. Patented June 17, 1902.

E. M. ROSENBLUTH.

CARBID CARTRIDGE.

(Application filed Dec. 18, 1899.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1.

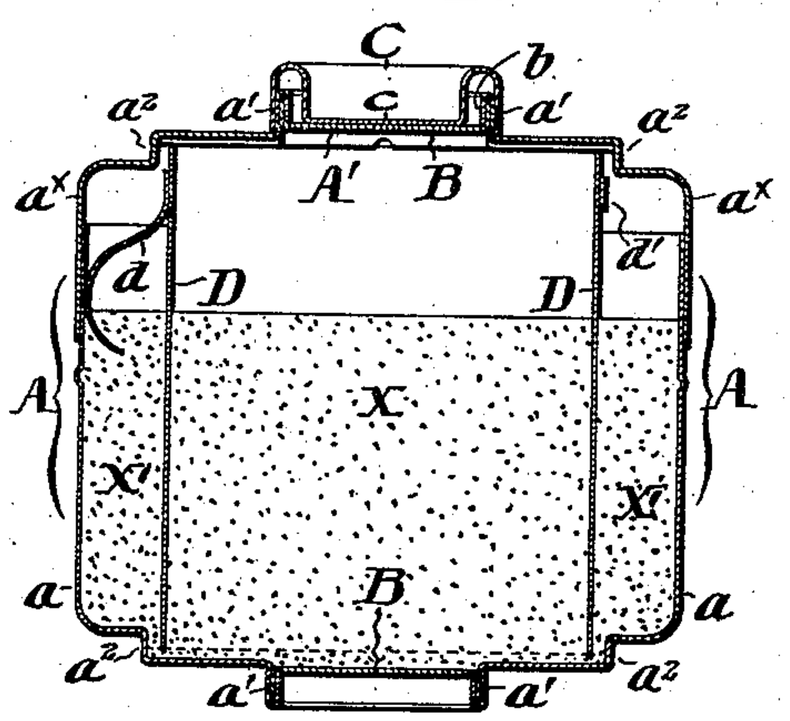


FIG. 2.

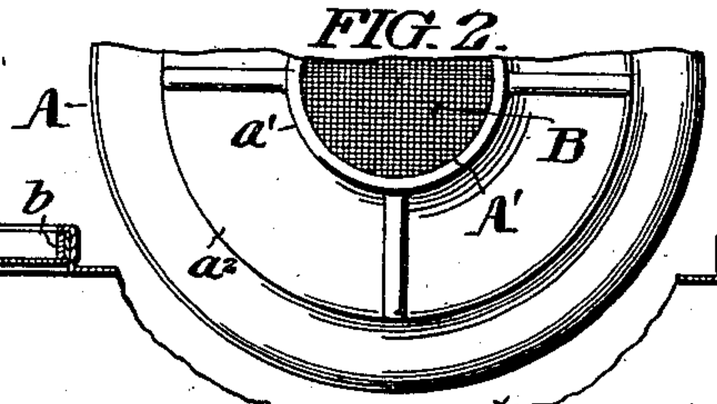


FIG. 3.

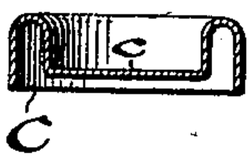


FIG. 4.

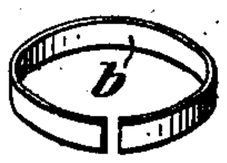


FIG. 5.

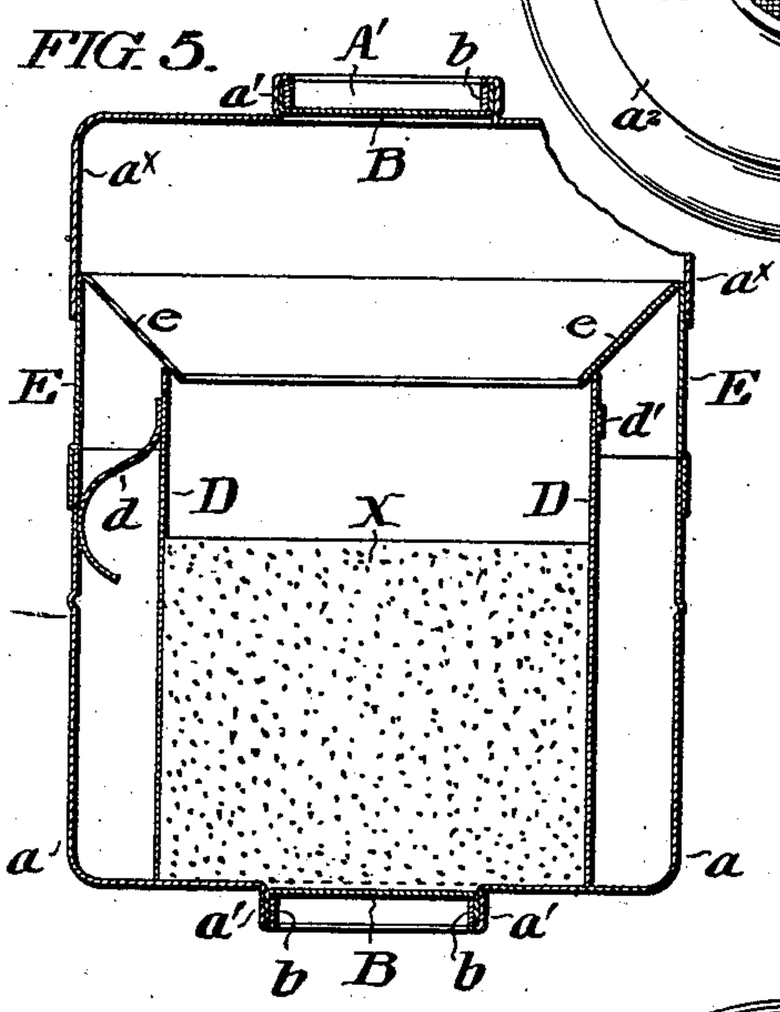


FIG. 6.

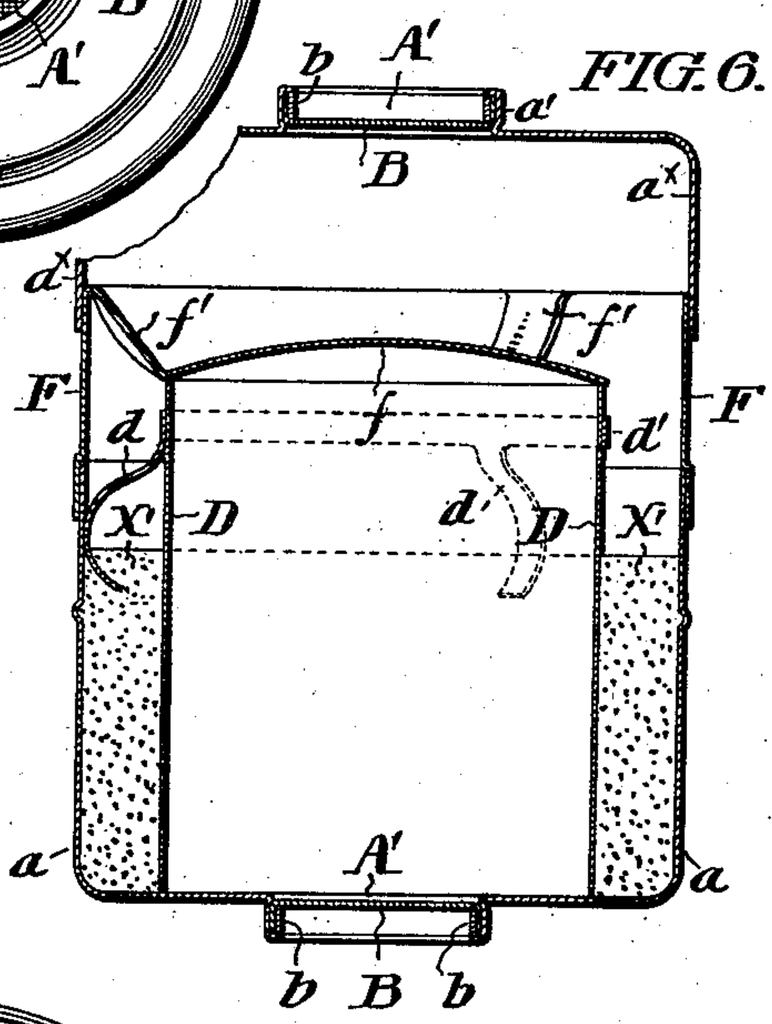
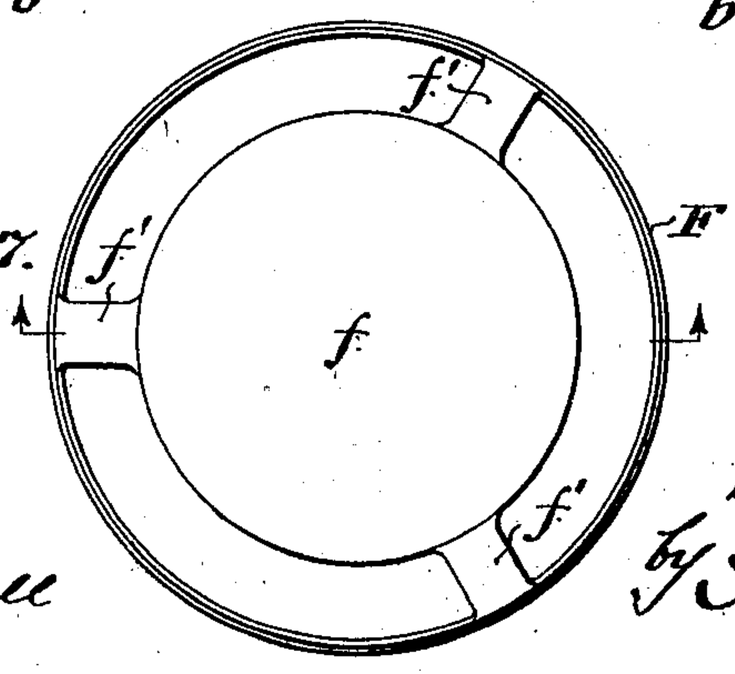


FIG. 7.



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2 Sheets—Sheet 2.

FIG. 8.

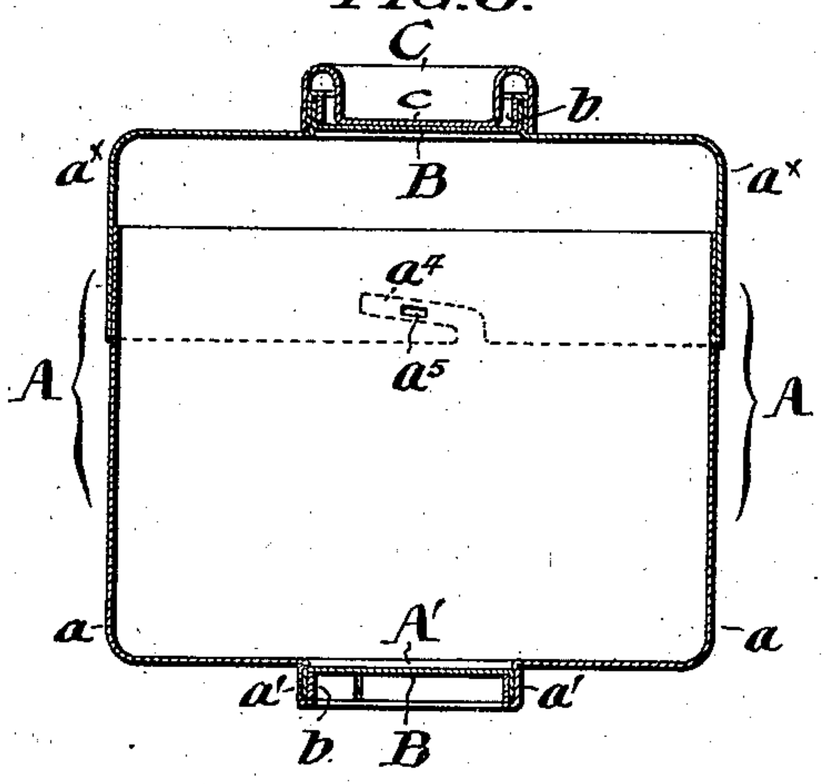


FIG. 10

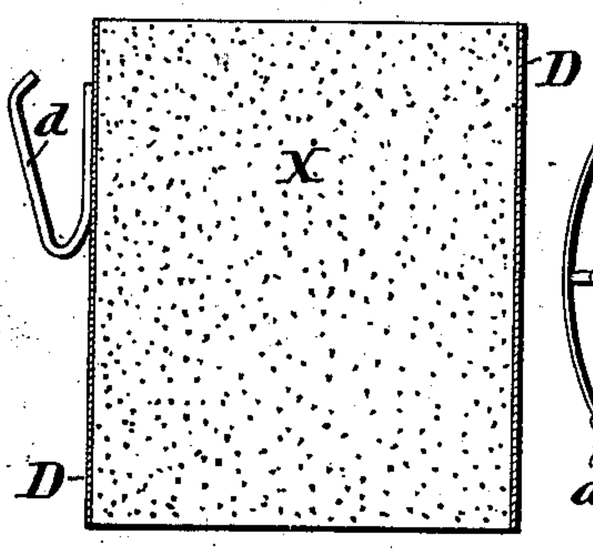


FIG. 9.

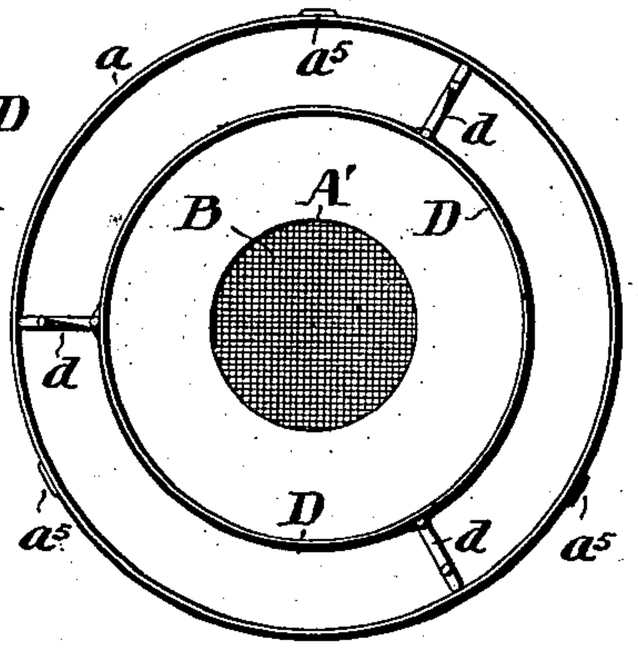


FIG. 11.

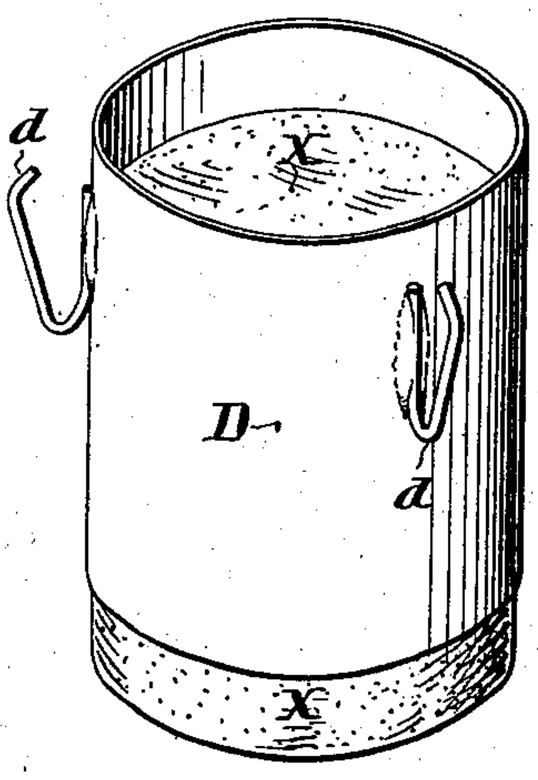
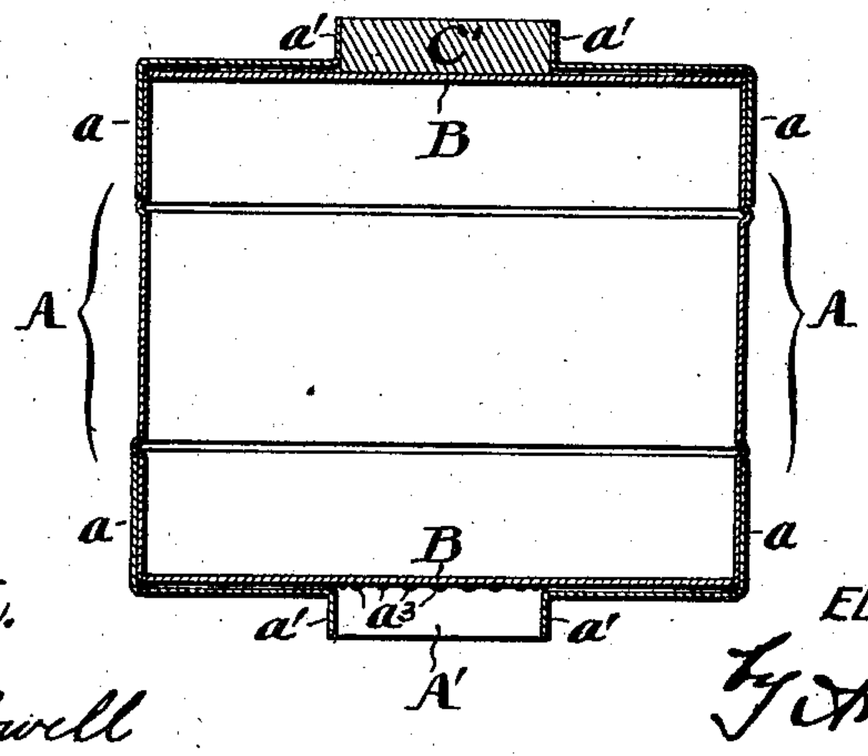


FIG. 12.



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UNITED STATES PATENT OFFICE.

EDWIN M. ROSENBLUTH, OF PHILADELPHIA, PENNSYLVANIA.

CARBID-CARTRIDGE.

SPECIFICATION forming part of Letters Patent No. 702,594, dated June 17, 1902.

Original application filed February 4, 1899, Serial No. 704,482. Divided and this application filed December 18, 1899. Serial No. 740,652. (No model.)

To all whom it may concern:

Be it known that I, EDWIN M. ROSENBLUTH, of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Carbid-Cartridges, whereof the following is a specification, reference being had to the accompanying drawings.

This application comprises subject-matter divided from my application, No. 704,482, dated February 4, 1899, and the present invention is particularly designed for use in connection with small acetylene-gas generators, such as vehicle-lamps.

The cartridges hitherto provided for generators of the class specified are of two general types, the first comprising a carbid-inclosing shell having apertures for the admission of moisture and frangible means to temporarily seal said apertures, arranged so that when the seal is broken and the cartridge contents decomposed said shell cannot be recharged, but is destroyed and wasted. The second, of the ordinary forms of cartridges aforesaid, comprises a shell which is adapted to be repeatedly charged, but is so arranged as not to be at any time sealed. The first form of cartridges aforesaid is advantageous in that a single charge of carbid may be preserved in readiness for immediate use. It is disadvantageous, however, in that the use of said single charge necessitates the loss of the shell which incloses it. The second form of cartridge aforesaid is more economical than said first form, but is inconvenient to use, inasmuch as the carbid must be preserved in a separate receptacle provided with means to exclude atmospheric air and moisture, for as soon as the cartridge is charged with carbid the latter begins to decompose from exposure. Moreover, both the frangible sealed cartridge and the unsealed cartridge aforesaid are objectionable in that their contents are maintained in a single compartment, and when moisture is admitted to a portion thereof all of said contents are of necessity decomposed, whether required or not.

Therefore it is the object of my invention to provide a cartridge which is not only arranged to be repeatedly charged, but is also provided with removable and replaceable means, whereby it may be sealed and its contents preserved when not in use. By such an arrangement certain advantages of both of the types of cartridges aforesaid are secured.

A further object of my invention is to provide a cartridge with a plurality of distinct compartment inclosed within an outer shell, adapted to be sealed, as aforesaid, and forming, in fact, a magazine of separate charges of carbid. The latter arrangement is obviously advantageous in that only so much of the contents of a cartridge as are required for immediate use need be moistened and decomposed, the remainder thereof being preserved until required.

My invention comprehends means whereby the aforesaid objects are attained, means whereby separate compartments of the aforesaid magazine-cartridge may be separately charged with carbid, and means whereby successive portions of the contents of such a cartridge may be conveniently discharged when decomposed, as hereinafter more particularly set forth.

In the accompanying drawings, Figure 1 is a central sectional view of a cartridge having two separate compartments charged with carbid. Fig. 2 is a fragmentary inverted plan view of the form of my invention shown in Fig. 1. Fig. 3 is a sectional view of the cartridge-neck cap. Fig. 4 is a perspective view of the diaphragm-retaining ring. Figs. 5 and 6 are sectional views of a cartridge, showing means for separately charging respective compartments thereof. Fig. 7 is a top plan view of the hopper-cap shown in section in Fig. 5. Fig. 8 is a sectional view of a cartridge, showing modified details of construction. Fig. 9 is a top plan view of the cartridge shown in Fig. 8 minus its upper member. Fig. 10 is a sectional view of a cylindrical partition as removed from the cartridge filled with decomposed carbid. Fig. 11 is a perspective view of the cylindrical partition shown in section in Fig. 10. Fig. 12 is a central sectional view showing a modified form of cartridge.

In said figures, A is the outer shell of the cartridge, comprising telescoping members a $a^{\times}$, and A′ are openings through which moisture may be admitted to the cartridge. Said openings A′ are surrounded by necks a'

and are provided with porous diaphragms B, which extend across the same, and in the form of my invention shown in Figs. 1 and 8 comprise sheets or films of textile material secured in position by means of respective retaining-rings *b*. Said necked openings A′ are provided exterior to the porous diaphragms B with removable means to seal said necks *a*′, preferably caps C, of the form shown in Figs. 1, 3, and 8, comprising recessed portions *c*, which when in the position shown in said figures serve to support said diaphragms B and prevent the displacement of the latter by the jolting or expansion of the inclosed carbid.

Referring particularly to Figs. 1, 5, and 6, the cartridge-shell A is shown to be divided by the cylindrical partition D into two separate carbid-containing compartments, whereof the inner circular compartment is in registry with the openings A′ and the outer annular compartment is excluded from communication with said openings. The effect of the arrangement aforesaid is that the carbid within the partition D is maintained in readiness for immediate generation of gas upon the admission of moisture at either one of the openings A′, and the carbid in the compartment exterior to said partition D is reserved and preserved intact for subsequent use. The cubical capacity of the two compartments of the cartridge is substantially the same, the supply of carbid reserved in the outer compartment being sufficient to recharge the inner compartment to the level indicated in said Fig. 1, the space above the charge being allowed for the expansion incident to decomposition of the carbid. Both of the openings A′ being sealed by the caps C, the carbid may be preserved in both the inner and outer compartments until required for use. When, however, it is desired to employ the cartridge in a gas-generator, one of said caps C is removed and the cartridge placed in operative relation with a supply of moisture which percolates through the uncovered diaphragm B to within the inner compartment, and decomposition of the carbid contained therein of course ensues. As the carbid is decomposed it becomes less pervious to moisture, and the evolution of gas is somewhat retarded if moisture is admitted only upon one side of the carbid mass, so that although decomposition of the carbid may be effected by the admission of moisture through an opening A′ at but one end of the cartridge I find it convenient to provide openings A′ upon both ends of the cartridge, so that the latter may be reversed and the carbid in the central compartment thereof be thus decomposed successively at its opposite ends with a substantially uniform evolution of gas.

It may be here noted that the reversible arrangement of the cartridge above described is particularly advantageous in a vehicle-lamp when it is desired to illuminate the latter for a certain length of time, to extinguish it for an interval, and then to relight it, with corresponding intermission in the generation of gas. If the carbid contained in the cartridge is moistened at one end and the supply of moisture is cut off during the intermission aforesaid, some delay is experienced in reëstablishing the flow of moisture through the decomposed carbid to the undecomposed carbid at the opposite extremity of the cartridge, and therefore considerable saving of time is effected by having the second opening A′ at the opposite extremity of the cartridge, so that the undecomposed portion of its contents may be placed in immediate connection with the supply of moisture and an evolution of gas sufficient to illuminate the lamp at once secured.

In the form of my invention shown in Fig. 1 the separable telescoping members of the cartridge-shell are respectively provided with opposed seats a^2 for the opposite extremities of the partition D to prevent displacement of the latter. However, said seats may be omitted, as shown in Figs. 5, 6, and 8, and the parts be maintained in proper relation by other means, such as the arms *d*, the latter being preferably resilient. As shown in Figs. 1, 5, and 6, said arms *d* are connected by a band *d*′, which encircles the partition D and is fixed thereto. It is obvious, however, that greater flexibility of the partition D may be secured by omitting said connecting-band *d*′, and in Figs. 9, 10, and 11 I have shown said arms *d* as composed of cylindrical wires separately fixed upon said partition.

Both of the carbid-compartments of the cartridge-shell being empty, said compartments may be conveniently charged separately, as follows: The upper member $a^\times$ of the cartridge-shell is removed; the hopper-cap E is fitted upon the lower member *a* thereof, as shown in Fig. 5; a quantity of carbid *x* is measured in the upper member $a^\times$ of the cartridge-shell, and the shell member *a*, together with the hopper E, is then inverted and fitted within the member $a^\times$. With the parts thus in the relation shown in Fig. 5 the charge of carbid in the member $a^\times$ may be shaken into the central compartment, the continuous conical flange *e* of said cap E serving to exclude the carbid from the outer compartment. The hopper-cap F being then substituted for the cap E, as shown in Fig. 6, a predetermined quantity of carbid X′ is deposited from the member $a^\times$ within the outer compartment, the circular central portion *f* of the cap F, connected with the vertical flange thereof by the radial arms *f*′, serving to exclude the carbid from the inner compartment. Thereupon the upper member $a^\times$ of the shell A is placed in position, as shown in Fig. 1. Neck-caps C are fitted to both of the necks *a*′ and the cartridge thereby sealed until required. When the carbid in the inner compartment of the cartridge has been decomposed by the admission of moisture thereto, following the removal of the sealing-cap C, the contents of said inner com-

partment are discharged and the latter recharged with the reserve carbid from the outer compartment. Such manipulation of the carbid may be effected if the partition D is fixed within the shell A. However, it is far more convenient to arrange said partition D in removable relation with the cartridge, so that it may be bodily removed, as shown in Fig. 10, together with its decomposed contents, and the latter be ejected, as shown in Fig. 11. I find that the operation of ejecting the decomposed carbid, which is of putty-like consistency, is facilitated if the partition D is flexible or susceptible of slight deformation in the hands of the operator. The withdrawal of the partition D and its caked refuse contents of course permits the reserve carbid X′ from the outer compartment to gravitate to the bottom of the cartridge member *a*, and in order that the emptied cylinder D may be conveniently recharged therewith I find it convenient to manipulate the parts as follows: The emptied cylinder D, being open at both ends, as shown in Figs. 10 and 11, the cartridge member $a^{\times}$ is slipped upon one end thereof in engagement with the spring-arms *d* and the cylinder D upturned as a cup-like receptacle, having said member $a^{\times}$ as its bottom. The reserve supply of carbid being then poured therein from the member *a* when the member *a* is refitted within the member $a^{\times}$, the cartridge is ready for operation with the outer compartment empty and the inner compartment recharged with the carbid therefrom. The reserve charge of carbid being thus placed in position for immediate use may be consumed from either end through the respective openings A′, as above described, and upon being decomposed may be removed, together with said partition D, as previously described and illustrated in Figs. 10 and 11.

I prefer to form the diaphragms B of textile material, such as ordinary cotton cloth, and to extend each of said diaphragms from side to side of its respective opening A′ by means of a split ring *b* (best shown in Fig. 4,) said ring being seated within the neck *a*′, surrounding said opening, as shown in the several figures. However, as shown in Fig. 12, said diaphragms B may consist of comparatively rigid porous material, such as blotting-paper, maintained in position by contact with the sides of the cartridge-shell and resting upon corrugations a^3 in the end walls of the latter.

As shown in Fig. 12, the necked openings in the cartridge-shell may be simply sealed by means of removable plugs C′, of material such as cork. I prefer, however, to employ the caps C, (shown in the other figures of the drawings,) for the reason that they may be more conveniently manipulated. It is to be noted that the parts are so related that the recessed portion *c* of the cap C serves to support and protect the diaphragm B when the cap is in position to seal the opening A′, so that accidental displacement or rupture of the diaphragms B is thereby prevented.

Although the respective telescoping members of the cartridge-shell A may be retained in proper relation merely by frictional engagement of their overlapping portions, I find it convenient under some circumstances to provide means to positively engage the same—such, for instance, as the bayonet-joint shown in Figs. 8 and 9, wherein a^4 indicates recesses in one of said members adapted to engage lugs a^5 upon the other of said members.

I am aware that is not broadly new to render a carbid-cartridge reversible with respect to a gas-generator by the provision of apertures for the ingress of moisture at opposite ends of the cartridge. I believe it to be new, however, to construct and arrange a carbid-cartridge as herein set forth, and therefore do not desire to limit myself to the precise details of construction which I have shown and described, as it is obvious that various modifications may be made therein without departing from the spirit of my invention.

I claim—

1. A carbid-cartridge, comprising an outer shell, a removable partition, forming separate carbid-compartments within said shell, and means arranged to retain said partition in normal relation with said shell, substantially as set forth.

2. A carbid-cartridge, comprising an outer shell, a removable partition, forming separate carbid-compartments within said shell, and removable means arranged to retain said partition in normal relation with said shell, substantially as set forth.

3. A carbid-cartridge, comprising an outer shell, a removable partition, forming separate carbid-compartments within said shell, and resilient means arranged to retain said partition in normal relation with said shell, substantially as set forth.

4. A carbid-cartridge, comprising an outer cylindrical shell, a removable cylindrical partition, forming separate carbid-containing compartments within said shell, and resilient means, attached to said partition, arranged to maintain the same in normal relation with said shell, substantially as set forth.

5. A carbid-cartridge, comprising an outer cylindrical shell, a removable cylindrical partition, forming separate concentric carbid-containing compartments within said shell, and resilient means, attached to said partition, arranged to normally maintain the same in concentric relation with said shell, substantially as set forth.

6. A carbid-cartridge, comprising an outer shell, formed of separable telescoping members, opposed seats in said respective members, a partition fitted at its opposite extremities to said seats and arranged to form a plurality of compartments within said shell, an opening in said shell in communication with one of said compartments, a porous diaphragm

extending across said opening, and removable means to seal said opening, substantially as set forth.

7. A carbid-cartridge, comprising an outer shell, an opening in said shell provided with a neck, corrugations in said shell, adjoining said neck, a porous diaphragm resting upon said corrugations, and extending across said neck, and removable means to seal said neck, substantially as set forth.

8. In a carbid-cartridge, comprising an outer shell; inclosing a plurality of compartments; a hopper fitted concentrically to said shell and arranged to deliver carbid to a predetermined one of said compartments, substantially as set forth.

9. In a carbid-cartridge, comprising an outer shell; an opening in said shell provided with a neck in integral relation with said shell; a porous diaphragm secured across said neck; a removable cap arranged to seal said neck exterior to said diaphragm; and a recessed portion of said cap, arranged to support said diaphragm, substantially as set forth.

10. In a reversible carbid-cartridge, comprising an outer shell; openings in opposite extremities of said shell respectively provided with necks in integral relation with said shell; a partition intermediate of the necked extremities of said shell; and removable means to seal said necks, substantially as set forth.

EDWIN M. ROSENBLUTH.

Witnesses:
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ARTHUR E. PAIGE.