No. 635,296. Patented Oct. 24, 1899.

L. S. BUFFINGTON.

CARBID CARTRIDGE.

(Application filed Dec. 27, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

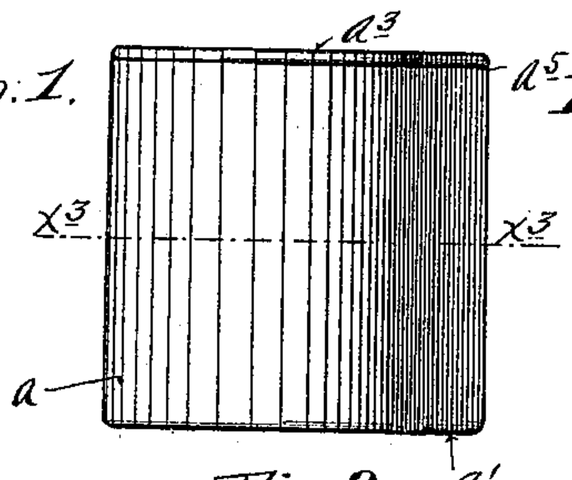


Fig. 2.

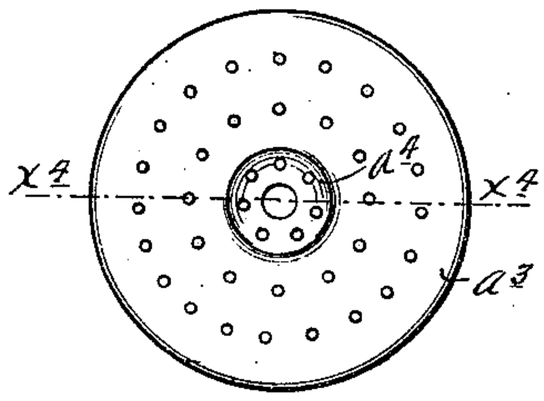


Fig. 3.

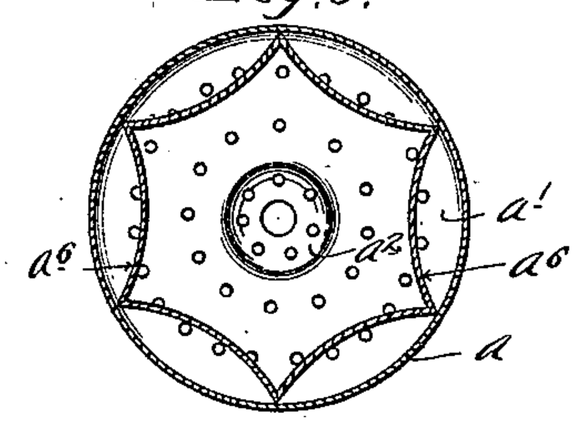


Fig. 4.

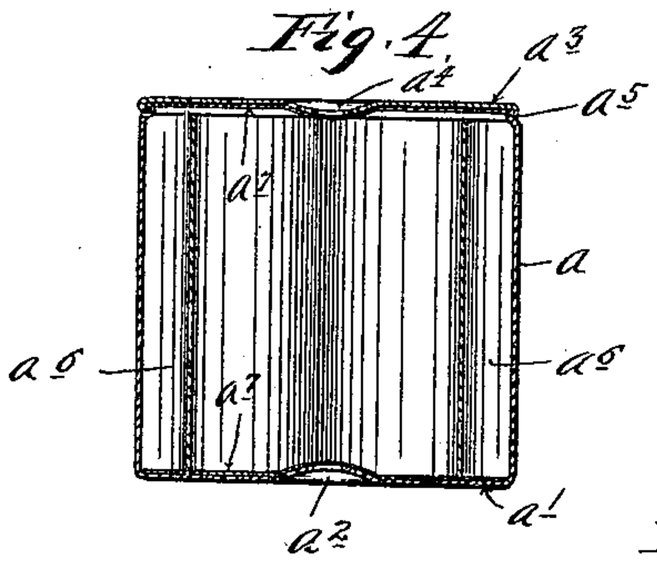


Fig. 5.

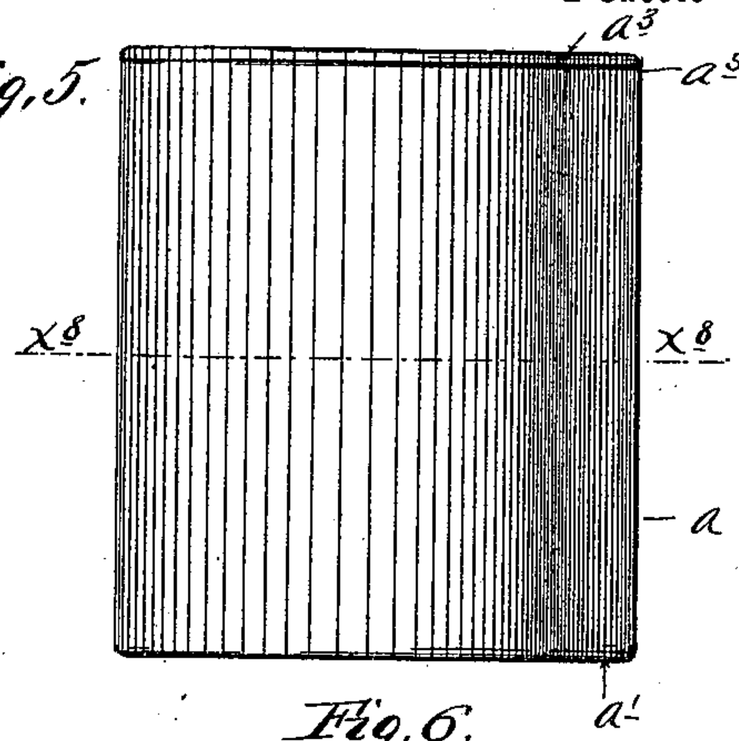


Fig. 6.

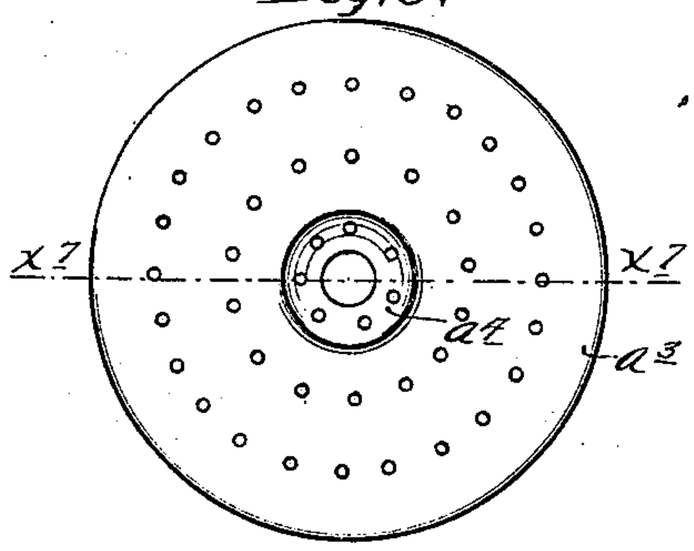


Fig. 7.

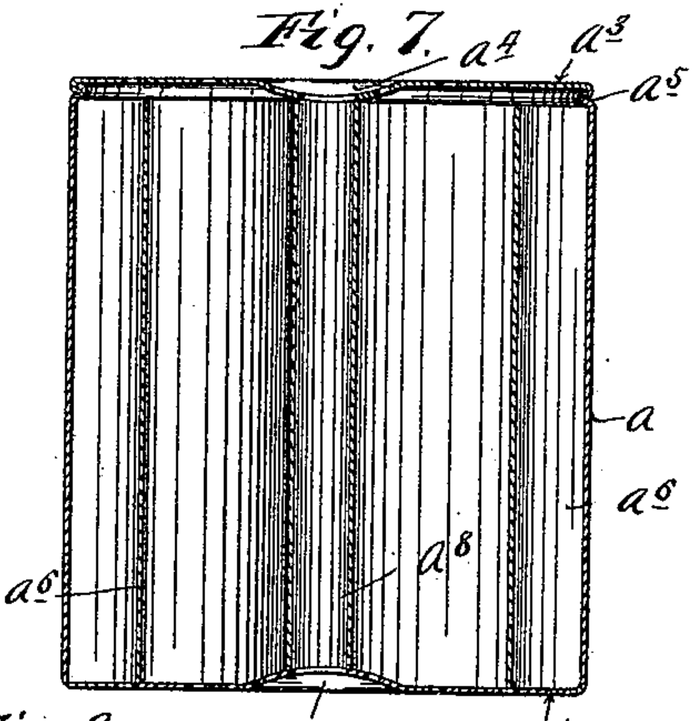
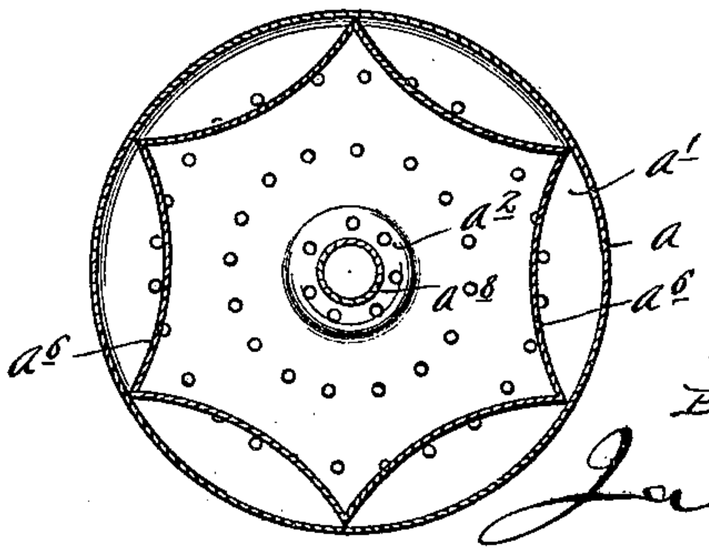


Fig. 8.



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By his Attorney.
Jas. F. Williams

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(No Model.) 2 Sheets—Sheet 2.

Fig. 9.

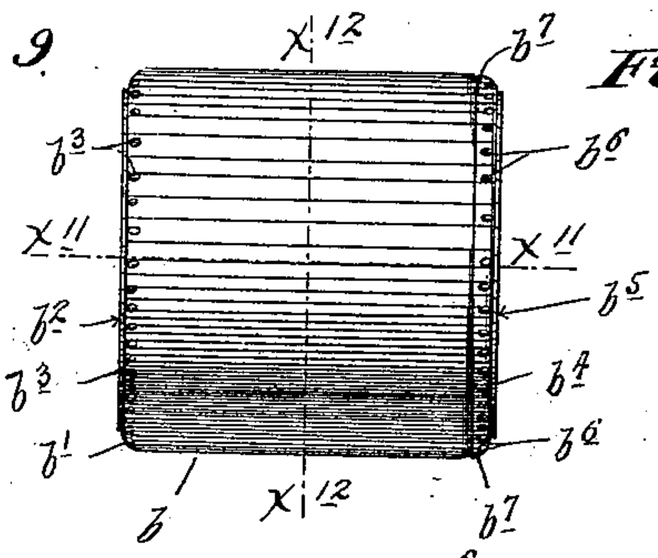


Fig. 13.

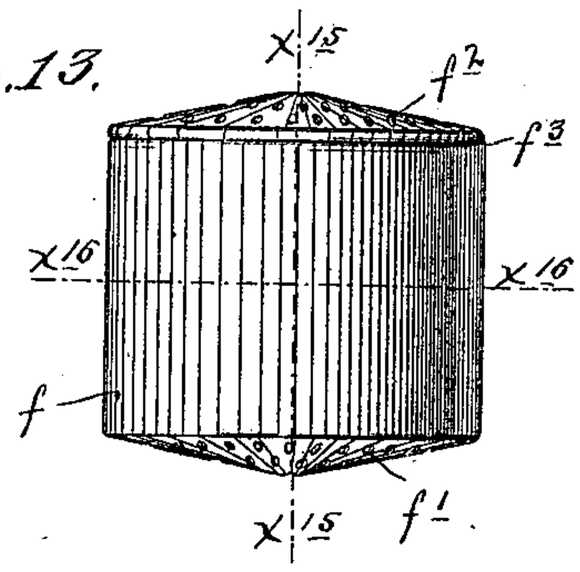


Fig. 10.

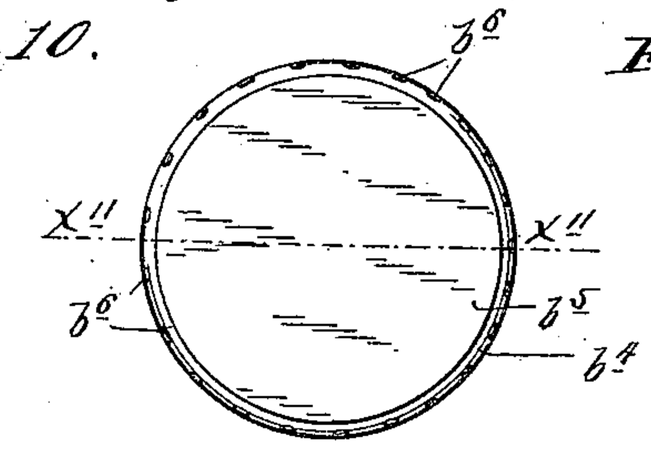


Fig. 14.

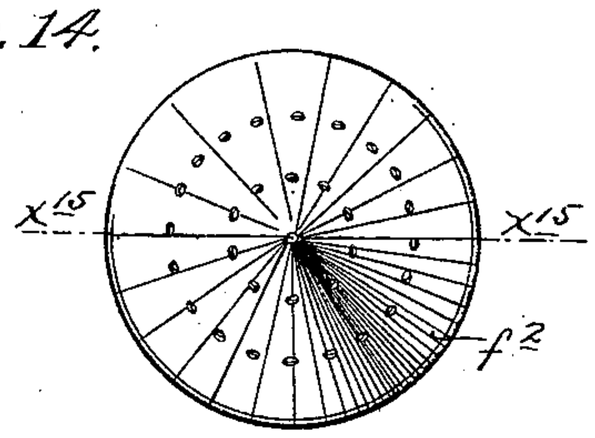


Fig. 11.

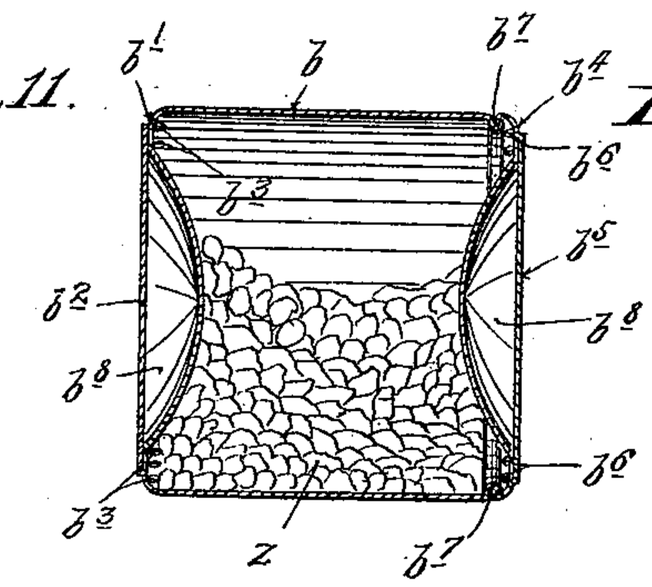


Fig. 15.

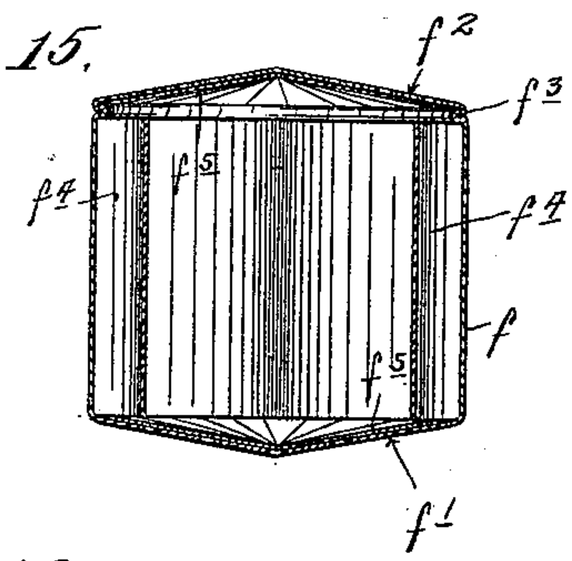


Fig. 12.

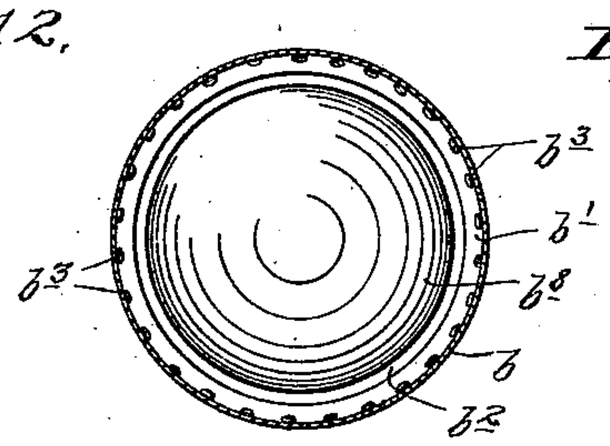
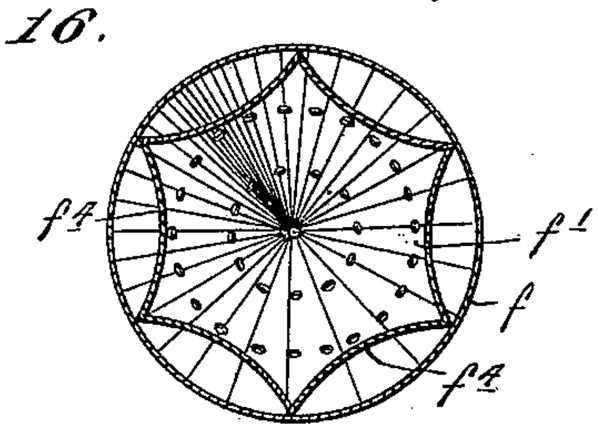


Fig. 16.



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Inventor:
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UNITED STATES PATENT OFFICE.

LEROY S. BUFFINGTON, OF MINNEAPOLIS, MINNESOTA.

CARBID-CARTRIDGE.

SPECIFICATION forming part of Letters Patent No. 635,296, dated October 24, 1899.

Application filed December 27, 1898. Serial No. 700,414. (No model.)

To all whom it may concern.

Be it known that I, LEROY S. BUFFINGTON, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Carbid Cartridges or Holders; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention has for its object to provide an improved charge-holder for containing carbid, and is intended for use in connection with acetylene-gas generators, whether in the form of house plants or gas-lamps.

To the above ends my invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

My invention is illustrated in the accompanying drawings, wherein several forms, all embodying the generic features of my invention, but varying somewhat in detail, are shown.

In the said drawings like characters indicate like parts throughout the several views.

Figure 1 is a side elevation of one of the forms of my carbid cartridge or holder. Fig. 2 is a plan view of the same. Fig. 3 is a horizontal section taken on the line x^3 x^3 of Fig. 1. Fig. 4 is a vertical section taken on the line x^4 x^4 of Fig. 2. Fig. 5 is a side elevation of a larger form of the holder or cartridge. Fig. 6 is a plan view of the cartridge shown in Fig. 5. Fig. 7 is a vertical section taken on the line x^7 x^7 of Fig. 6. Fig. 8 is a horizontal section taken on the line x^8 x^8 of Fig. 5. Fig. 9 is a side elevation of another form of my improved carbid holder or cartridge. Fig. 10 is an end elevation of the cartridge or holder shown in Fig. 9. Fig. 11 is a horizontal section taken on the line x^{11} x^{11} of Figs. 9 and 10. Fig. 12 is a vertical section taken on the line x^{12} x^{12} of Fig. 9. Fig. 13 is a side elevation of still another form of my improved carbid cartridge or holder. Fig. 14 is a plan view of the cartridge or holder shown in Fig. 13. Fig. 15 is a vertical section taken on the lines x^{15} x^{15} of Figs. 13 and 14, and Fig. 16 is a horizontal section taken on the line x^{16} x^{16} of Fig. 13.

Referring first to the construction illustrated in Figs. 1, 2, 3, and 4, a indicates the main section of a non-expansible case or shell, which in this construction is of cup-like cylindrical form and has a perforated bottom a', the center of which is pressed or bulged inward, as shown at a^2. The top or opposite end of this body-section a is provided with a perforated disk-like top a^3, which is preferably also depressed at its central portion, as shown at a^4, and is secured to the adjacent edge of the said body-section a by a rolled joint a^5. As will later appear, this top or end a^3 will be secured to the body-section a after the carbid and other parts are placed within said body-section a. Within the body-section a a collapsible lining-strip a^6 is placed, as best shown in Fig. 3. This collapsible lining a^6 is preferably constructed of paper-board or similar material cut in a strip of the proper length and bent upon itself at intervals, so that when it is placed in working position its angles or projecting edges will bear against the interior of the body-section a and its intervening portions will form a series of inward bulges that leave a corresponding series of spaces between the said lining-strip and the inner cylindrical surface of the said cup-like section a. The carbid is placed in the space formed within the collapsible lining a^6 between the ends of the holder or shell, and in this manner the carbid is held in compact form and is confined to a space which is less than the holding capacity of the interior of the non-expansible case or shell formed by the sections a and a^3. Hence it is obvious that in the act of generation of gas as water is brought into contact with the carbid contained within the cartridge or shell the increasing bulk of the products of decomposition will gradually collapse the lining-section a^6 and force the same outward closer to or into contact with the non-expansible exterior case or shell. However, the carbid before the cartridge has been used and the mixed carbid and products of decomposition after the carbid has been acted upon will always be held in compact form, so that they cannot move within the cartridge or holder. Of course in

practice the amount of space left between the exterior case or shell and the collapsible lining or section will be determined by the amount of expansion or swell which will take place when the carbid contained within the holder or cartridge is entirely decomposed or transformed into the lime residue.

With the form of cartridge just described it is intended to drop water onto the upper perforated end of the cartridge or holder either while it is standing in the position indicated in Fig. 1 or in a similar position other end up. The purpose of perforating both ends of the cartridge or holder is to make it reversible, so that after the carbid has been partially decomposed, preferably about one-half decomposed, the fresh end of the cartridge—that is, the end having the fresh carbid—may be turned upward, where it will be acted upon more directly by the water dropped thereon. It is intended to drop the water directly into the perforated depressions a^2 or a^4, according to which end up the cartridge or holder is turned. These depressions serve to properly direct the water into the interior of the holder or cartridge and onto the carbid. The perforations in the ends of the cartridge or holder also serve to permit of the ready escape of the gas therefrom. More or less carbid-dust will necessarily be contained in the holder. To prevent the escape and the consequent loss of this dust, I place disks or films of thin paper or similar material within the cartridge or holder and over the perforated ends of the same. These paper disks or films are indicated in Fig. 4 at a^7. When water is brought into contact with these disks or films a^7, they will be quickly decomposed, the same being composed of such paper or other material as is soluble or which will be disintegrated by the action of water.

In the construction illustrated in Figs. 5, 6, 7, and 8 the parts are identical with those already described in connection with Figs. 1 to 4, inclusive, except that they are larger and except for one feature to be hereinafter noted. Hence the same character letters used in Figs. 1 to 4, inclusive, are applied to like parts in Figs. 5 to 8, inclusive. The sole point of variation, except as to size, in this latter-noted construction consists in passing a collapsible tube or hollow section a^8 centrally through the interior of the cartridge or holder from end to end of the same. With this construction the said tube a^8 will also be collapsed under the expansion or swelling action of the products of decomposition. The illustration of this modification makes evident the fact that the collapsible body may be placed at the central portion of the cartridge or holder, from which it follows that if this centrally-located collapsible section is of sufficient size to permit of the complete swelling or expanding action of the lime residue the marginal collapsible lining might be dispensed with. However, with the large cartridge easier expansion is permitted, and the expanding products of decomposition are put under evener tension throughout with the collapsible devices located both at the interior and the exterior of the body of carbid.

In Figs. 9, 10, 11, and 12 I have illustrated a cylindrical cartridge or carbid-holder, which when in use is intended to be laid with its axis horizontal or approximately horizontal, although it could be set with its axis vertical. b indicates the cylindrical body of the cartridge or holder, which is provided at one end with an inturned annular flange b', to which an imperforate disk-like end b^2 is rigidly secured. On the line where the body b is turned to form the flange b' said body is provided with a series of small perforations b^3. b^4 b^5 indicate the sealing-cap of end cover, of which parts b^4 is of annular form, while the part b^5 is of disk-like form and is rigidly secured to the said part b^4. The annular section b^4 is provided with a series of perforations b^6, and after the cartridge or holder is loaded with carbid and the collapsible parts it is secured to the open end of the body-section b, as shown, by means of a rolled joint b^7. It will be noted that annular ledges are formed where the disk-like end b^2 is connected to the flange b' and where the disk b^5 is connected to the annular section b^4. These annular ledges form seats against which the peripheral edges of concavo-convex collapsible disks b^8 are seated. The collapsible section b^8, like the other collapsible parts previously described, is preferably constructed of paper-board or heavy paper material. z indicates carbid with which the cartridge or holder is shown as partially filled. It will of course be understood that in practice the space within the cartridge or holder between the collapsible disks b^8 will be entirely filled with carbid. As previously indicated, the cartridge when placed in a generator or lamp will stand as shown in Fig. 9. It is intended in this case that the water coming in contact with the lower portion of same will soak upward under the action of capillary attraction through the perforations b' and b^6. With this construction the cartridge or holder may be reversed by rotating it on its axis, and it is of course evident that it may at any time be given any desired amount of axial rotation, so as to bring the fresh carbid into more direct contact with the water. It will of course be understood that with the cartridge just described the concave disks b^8 when collapsed will be flattened out and forced against the ends of the cartridge.

In the construction illustrated in Figs. 13, 14, 15, and 16, f indicates the cylindrical body of the cartridge or shell. At one end this cylindrical body is provided with a perforated head f', of conical form, positioned apex outward, and at its other end it is provided with a similar perforated and conical end or head f^2, which is secured thereto after the cartridge is loaded, preferably by means of a rolled joint f^3. f^4 indicates a collapsi-

ble lining-section, which is placed within the cylindrical cartridge or shell in the same manner as described in connection with the constructions illustrated in Figs. 1 to 8, inclusive. f^5 indicates the thin films for holding the cartridge-dust within the shell. The cartridge just described is intended to be used while standing within its axle vertical, or as shown in Fig. 13, and it is further intended that the water be delivered to the carbid therein contained by absorption from its bottom upward. In this case the water will first attack the carbid adjacent to the apex of the down-turned conical head and will soak upward therefrom. It is of course evident that this form of cartridge is also reversible end for end.

A non-expansible carbid-holder or cartridge-shell with a collapsible interior section or sections has advantages over a holder or cartridge-shell constructed with telescopically movable or expansible sections, for the cartridge is always of the same size or bulk and has no parts that can possibly become stuck together, so as to interfere with the expanding or swelling action of the carbid under decomposition. Furthermore, the sections of the shell may be rigidly and permanently secured together in the process of manufacture, thus rendering it impossible for the sections of the carbid holder or shell to become accidentally separated or otherwise moved.

From the foregoing description and the statements made it is evident that my invention is capable of quite a large range of modification as to detail of construction.

The charge-holder above described is in practice usually charged with carbid, as above indicated, and the entire device supplied to the trade in the form of a complete carbid-cartridge. The paper disks or films for preventing the loss of the carbid-dust may be applied to any or all of the forms of cartridge-shell above illustrated.

In explanation of the use of the expressions "collapsible body" and "collapsible lining-sections" it may be stated that the former is used generically, while the latter is used more specifically to indicate sections which are collapsed by being forced outward and caused to fall or move against the exterior shell of the cartridge.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. A charge-holder for carbid or similar material, comprising an exterior shell, and a collapsible body within said shell, coöperating therewith, to normally hold the carbid in compact form within space less than the interior capacity of the said shell, substantially as and for the purposes set forth.

2. A charge-holder for carbid or similar material, comprising an exterior shell, and a collapsible side or lining-section, normally bulging inward from the adjacent wall of said shell, and coöperating with the said shell to confine the carbid in compact form within space less than the interior capacity of the said shell, substantially as and for the purposes set forth.

3. A charge-holder for carbid or similar material, comprising an exterior shell, and a collapsible lining, having contact with said shell at a plurality of points and bulged inward therefrom and coöperating therewith, to confine the carbid in compact form within space less than the interior capacity of the said shell, substantially as and for the purposes set forth.

4. A cartridge for carbid or similar material, having its shell perforated at its opposite sides, whereby it may be reversed side for side, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

LEROY S. BUFFINGTON.

Witnesses:
HARRY KILGORE,
F. D. MERCHANT.