No. 639,760. Patented Dec. 26, 1899.

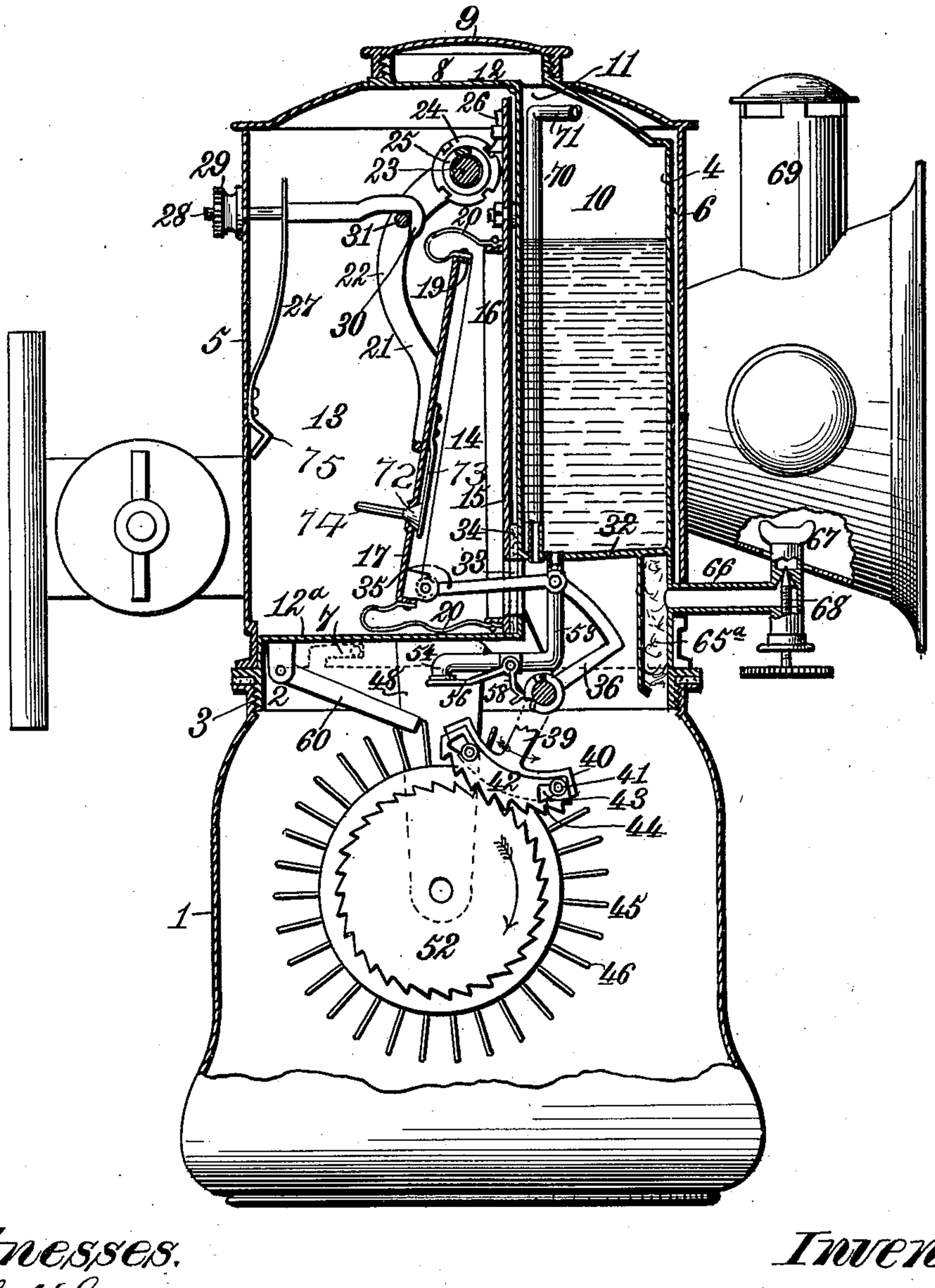
# W. O. NELSON.

## ACETYLENE GAS GENERATOR LAMP.

(Application filed Feb. 24, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.




Witnesses.
Robt Ewett.
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## ACETYLENE GAS GENERATOR LAMP.

(Application filed Feb. 24, 1899.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

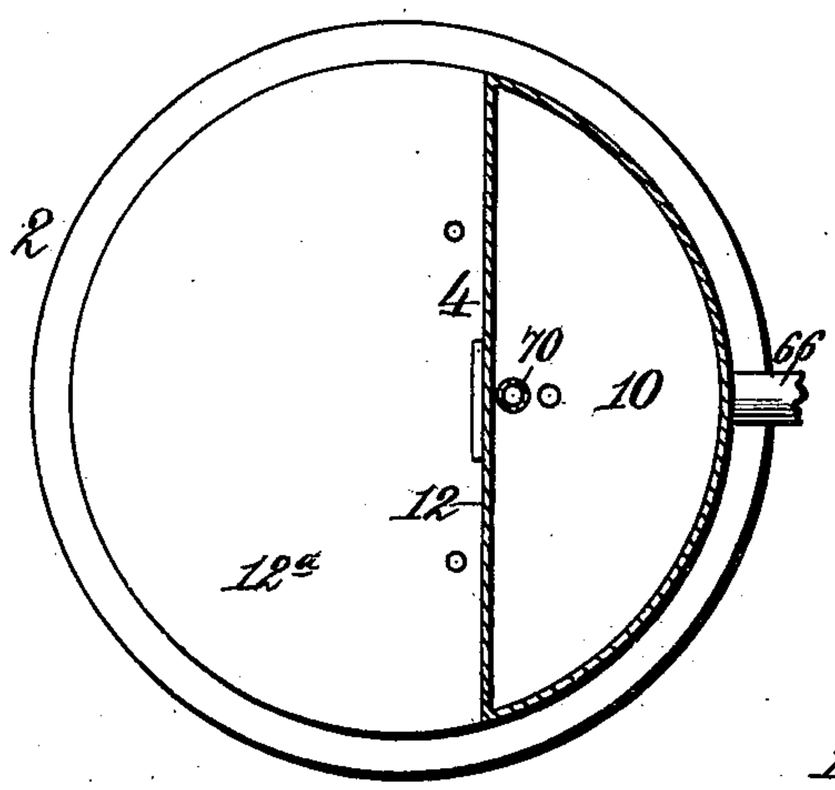



Fig. 3.

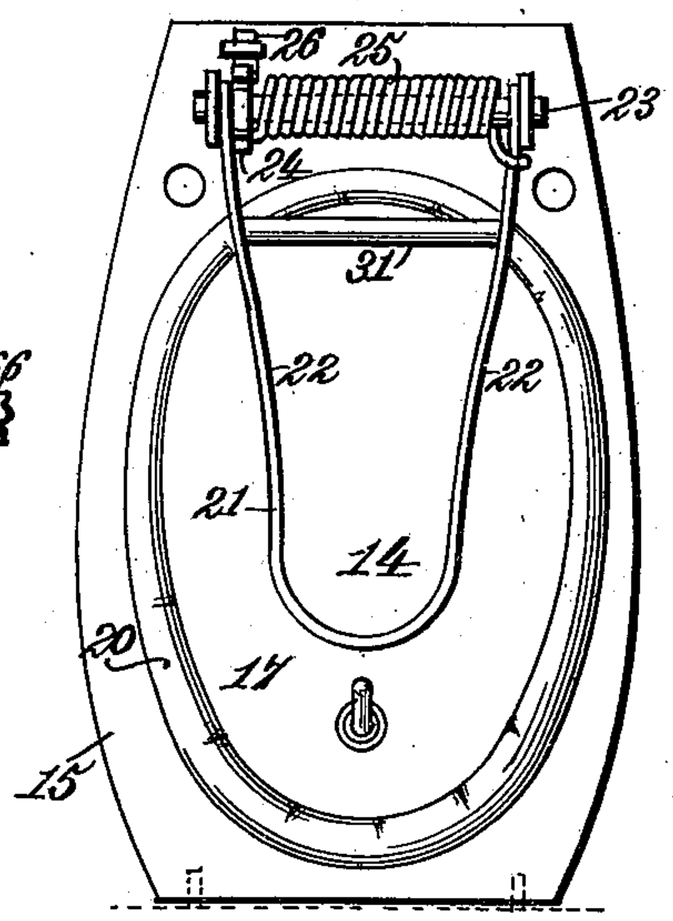



Fig. 4.

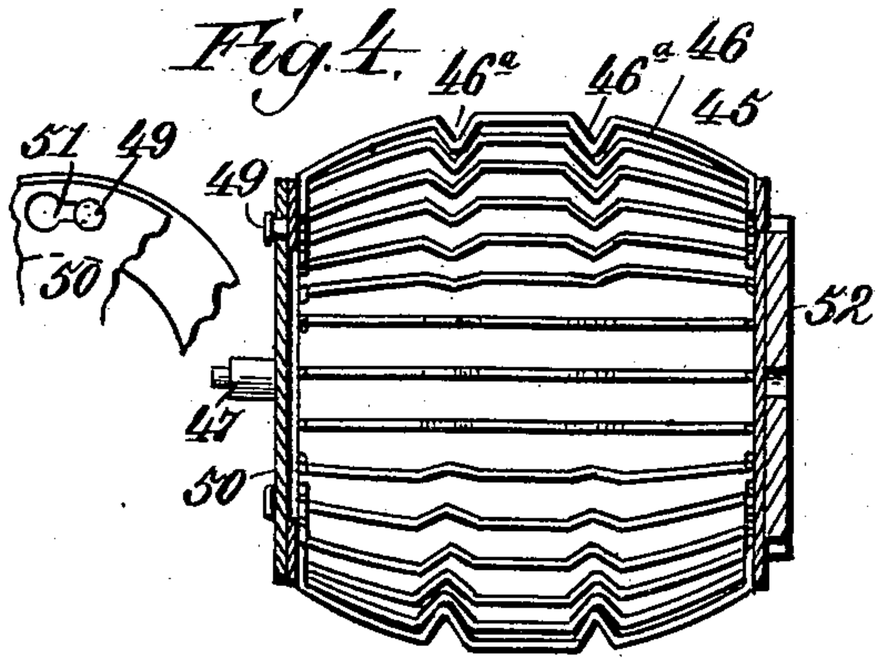



Fig. 5.

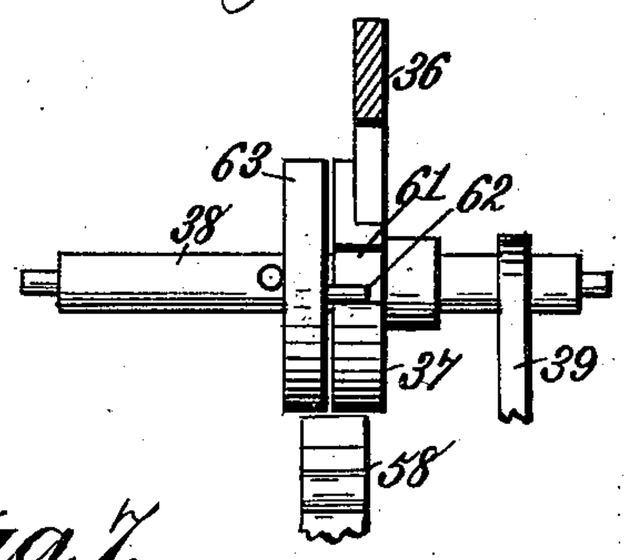
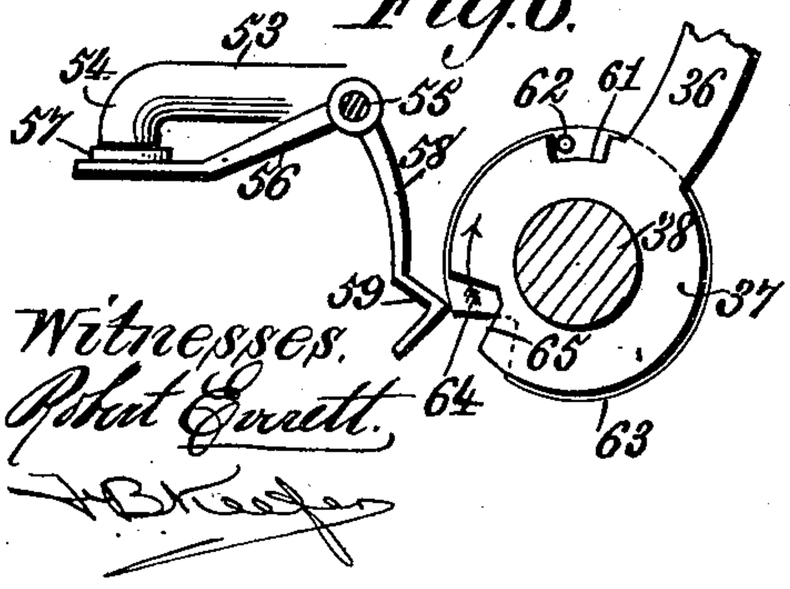
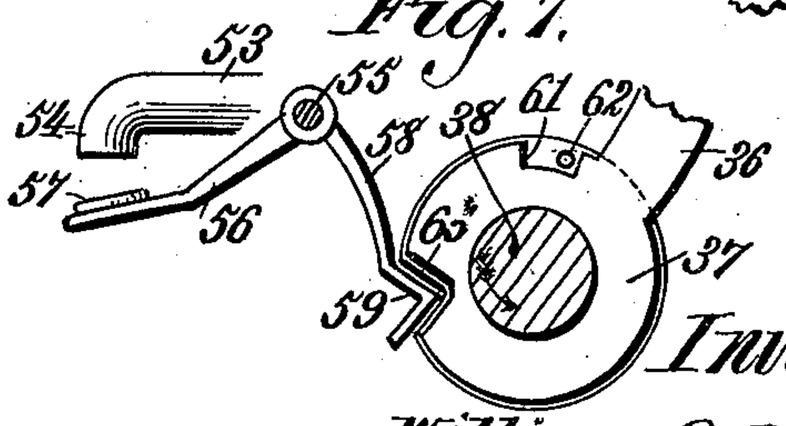



Fig. 6.




Witnesses.
Robt Ewett.
H B Keeler

Fig. 7.




Inventor.
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By James L. Norris.
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

WILLIAM O. NELSON, OF BALTIMORE, MARYLAND, ASSIGNOR OF ONE-HALF TO LOUIS S. HOUGHTON, OF SAME PLACE.

## ACETYLENE-GAS-GENERATOR LAMP.

SPECIFICATION forming part of Letters Patent No. 639,760, dated December 26, 1899.

Application filed February 24, 1899. Serial No. 706,726. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM O. NELSON, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented new and useful Improvements in Acetylene-Gas-Generator Lamps, of which the following is a specification.

My invention relates to an improved acetylene-gas-generator lamp.

It is an object of my invention to provide improved means for regulating the generation of the gas.

A further object of the invention relates to improvements in mechanism operated by a movable gas-holder for revolving a cylindrical screen or cage containing the carbid, whereby the lime may be sifted out of the holder and the water always contact with a fresh surface of carbid.

A still further object of the invention relates to an improved construction of gas-holder located within the lamp and in means for locking said gas-holder in a given position, whereby to prevent the possibility of gas being generated.

A still further object of the invention relates to a construction and arrangement of parts in a lamp of the character described whereby I am enabled to control the generation of the gas or to stop the generation thereof through the medium of the valve controlling the supply of gas to the burner.

The above constitute the broad or general objects of the invention.

Other objects of the invention relate to certain details of construction and operation of parts, which will more clearly appear from the detailed description of my invention hereinafter given.

I have illustrated my invention in the accompanying drawings, in which—

Figure 1 is a sectional view through a lamp constructed according to my invention. Fig. 2 is a sectional plan view through the water-reservoir. Fig. 3 is a front elevation of my improved collapsible gas-holder. Fig. 4 illustrates, partly in elevation and partly in section, my improved carbid container or cage and in a detached view a detail of a fastening device employed in connection therewith; and Figs. 5, 6, and 7 illustrate, in edge and side views, respectively, details of the mechanism for controlling the supply of water to the carbid.

Referring to the drawings, the numeral 1 indicates the bottom and 2 the top portion of a lamp constructed according to my invention, these parts having a screw-threaded connection, as indicated at 3. The top portion of the lamp is composed of an inner casing 4, semispherical in cross-section, surrounded by an outer casing 5 in such manner as to afford an air-space 6 between the curved walls of the two casings. This air-space is to prevent the water or the gas being unduly heated by the burner. The outer casing is attached at its bottom to an annular flange on the inner casing by means of bayonet-joints, as indicated at 7. The top of said outer casing is also provided with an opening through which projects an annular screw-threaded flange 8, secured to the top of the inner casing and having a screw-cap 9. The inner casing provides a water-compartment 10, having in its top a filling-orifice 11 located within the annular flange 8. By removing the cap 9 water may be supplied to the water-compartment through this filling-orifice, as will be understood. The flat side 12 of the inner casing and an extended bottom portion $12^a$ thereof form, in combination with the surrounding outer casing 5, a compartment 13, in which is located my improved gas-holder 14 and the mechanism for controlling the operation of the same. Said gas-holder comprises a flat metal plate 15, suitably secured in the compartment 13 in any preferred detachable manner to the flat side 12 of the water-compartment, said plate forming a stationary side of the holder. Secured upon said plate and extending around the same to form an oval is a flange or ledge 16.

The numeral 17 indicates the movable side of the gas-holder, which is in the form of a flat metal oval plate and of a size or circumference less than the oval formed by the flange 16. The plate 17 is provided around its edge with a flange 19.

The numeral 20 indicates flexible material which is wired or otherwise suitably connected at its edges about the respective flanges 16 19 in a manner to form a collapsible gas-tight holder of the bellows type. By forming the movable side 17 of the gas-holder smaller than the other, or that part bounded by the

flange 16, it will be seen that the flexible material connecting the two sides will tend to roll upon itself—that is, the shorter movable side will telescope, as it were, inside the flexible material—thus preventing angular folds in said material and consequent cracking and breaking of the same. The flexible material used is preferably thin rubber; but any suitable material that is gas-tight may be employed for this purpose.

The numeral 21 indicates a flat metal bar, which is bent to afford the two arms 22 and is secured at its lower curved end to the movable side 17 of the bellows, as by solder. The two arms 22 are pivotally mounted at their outer extremities upon a pin 23. Mounted upon this pin is a disk 24, having notches in its periphery, and coiled about the pin 23 is a spring 25, one end of which is connected with one of the arms 22 and the other end with the disk 24. A gravity or other pawl 26, mounted in an upper extension of the plate 15, engages the notches in the periphery of the said disk. By turning this disk the tension of spring 25 may be regulated, and the pawl 26 operates to hold the disk in the position to which it may be turned. The spring 25 tends normally to move the bent arm 21 and the movable side 17 inward toward the stationary side 15 as the gas escapes from the holder, and said movable side and arm are moved outward against the resistance of spring 25 by the pressure of the generated gas entering the holder. Secured at its lower end to the outer casing 5 is a leaf-spring 27, the outer free end of which is apertured. Passing through the aperture in this spring and through an aperture in the outer casing is a rod 28, having a reduced screw-threaded end to receive an adjusting-nut 29. By reducing the outer end of this rod I provide a shoulder on the rod 28, which bears against the leaf-spring 27, as shown in Fig. 1. At its other end the rod 28 has a hook 30, which is adapted to engage a bar 31, secured to the arm 22. The purpose of this construction will be presently set forth. The bottom 32 of the water-compartment 10 is relatively higher than that of the compartment 13. Extending through the side 12 of the inner casing below the bottom 32 and also through the plate 15 is an opening 33, a rubber or other gasket 34 being interposed between the side 12 and plate 15 and surrounding the opening 33 to form a gas-tight connection at this point. Pivotally secured to the lower inner side of the movable plate 17 is an arm 35, which extends through the opening 33 and at its outer extremity is pivotally connected to the upper end of a bent arm 36, which latter at its lower end is secured to a fixed collar 37 on a rock-shaft 38, mounted at opposite ends in suitable bearings. (Not shown.) Secured to the opposite end of the rock-shaft 38 and extending in a downward direction is a lever-arm 39, supporting at its lower end a segment-shaped plate 40, having studs 41, located, respectively, near opposite ends thereof and projecting at right angles to its outer side.

The numeral 42 indicates a curved or segment-shaped ratchet-plate which is mounted on the studs through the medium of apertures 43, formed in the ratchet-plate and located, respectively, near opposite ends thereof. These apertures are substantially triangular in shape—that is, they each have an inclined bottom 44 for a purpose to be presently described.

The numeral 45 indicates the carbid-holder, which is in the form of a cylindrical wire cage, the wires 46 thereof being spaced a suitable distance apart to permit the lime or spent carbid to be sifted out of the holder in the revolution thereof, as presently described. Each of said wires 46 is provided on opposite sides of a central point with an indentation $46^a$, the purpose of which is to prevent any water which may chance to fall upon a wire instead of in the space between two wires from running down the wire to either end of the cage. Said cage is provided at opposite ends with a journal 47, by which means it may be revolubly and removably mounted in the lower ends of spring-arms 48. One end of said cage is provided with a circular opening, at points around which are provided three or more headed studs 49. Said circular opening is closed by means of a plate 50, provided with slots 51, corresponding in number to those of the studs 49. Said slots are enlarged at one end to permit the heads of the studs passing through, after which the plate 50 is turned to cause the studs 49 to enter the narrow part of the slots, through which the heads of the studs cannot pass. By this means the plate 50 is removably secured on the carbid-cage and may be readily detached therefrom to permit carbid to be placed in the holder, as will be understood. Rigidly secured on the opposite end of the cage is a ratchet-wheel 52, the teeth of which engage with the teeth of the ratchet-plate 42.

The operation of this mechanism is as follows: As the gas-holder 14 fills with gas the plate or side 17 moves outward, carrying the arm 35 with it. This movement of arm 35, through the medium of bent arm 36, causes a part revolution of rock-shaft 38, which moves the lever-arm 39, carrying the plate 40, in the direction indicated by the arrow. In this movement the studs 41 ride up on the inclined edges 44 of the apertures 43, thus holding the teeth of the ratchet-plate 42 in engagement with the teeth of the ratchet-wheel 52, and thereby revolving the latter, and with it the carbid-holder, to sift the lime or spent carbid therefrom. As the gas is used, the spring 25, actuating the bent-arm 21, forces the movable side 17 inward, which movement will cause the lever-arm 39 and the plate 40 to be moved in the opposite direction to that indicated, whereby the studs 41 will be moved out of engagement with the inclined edges 44, and the ratchet-plate 42 will be permitted to ride over the teeth of the ratchet-wheel 52 to engage a

fresh set of teeth, as will be understood. By this construction and operation a fresh surface of the carbid is always presented to be attacked by the water.

The numeral 60 indicates a ratchet successively engaging the wires of the carbid-cage to prevent back-turning of the same.

I will now describe the mechanism for admitting water to the carbid.

The numeral 53 indicates a pipe communicating with the water-compartment through the bottom thereof, as shown. This pipe is bent at right angles to extend beneath the bottom of the compartment 13, and immediately above the carbid-cage 45 is provided with a downward-depending portion 54, affording a drop-orifice.

The numeral 55 indicates a short shaft mounted in suitable bearings, at one end of which is secured a bent arm 56, carrying at its outer end a rubber block 57, normally closing the drop-orifice in the pipe 53. From the opposite end of the shaft 55 depends an arm 58, the lower end of which is bent outward and then inward at right angles to itself to form one angular projection 59. The fixed collar 37 is provided with a peripheral slot 61, in which works a pin 62, carried by a collar 63, which is revolubly mounted on the shaft 38. In this loose collar 63 is provided an angular peripheral recess 64, and a similar but larger recess 65 is formed in the fixed collar 37, as clearly shown in Fig. 7, and these recesses may be brought opposite each other or to register to permit the projection 59 to enter same, as also clearly shown in Fig. 7.

The operation of these parts is as follows: The parts being in the position shown in Fig. 1, the projection 59 rests upon the peripheries of the collars 37 and 63, and thereby the rubber block 57 is held firmly against the drop-orifice of pipe 53. In this position the gas-holder 14 is in a more or less inflated condition. As gas is consumed the gas-holder gradually collapses, the movable side 17 moving inward toward the plate 15 in obedience to the force exerted by spring 25 and carrying with it arm 35, thereby through the medium of arm 36 turning the fixed collar 37 and rock-shaft 38. In this movement the pin 62 rides in the slot 61 and the movable collar 63 remains stationary, the projection 59 resting now on said movable collar only and holding the drop-orifice closed, this position of parts being clearly shown in Fig. 6. It will further be seen from this figure that the respective edges of recess 65 have been moved beyond the corresponding edges of recess 64 in a manner to bring these recesses partly out of register. As the deflating movement of the holder continues the radial edge of slot 61 will engage the pin 62 on the movable collar, and thereby move said collar so that the edge of recess 64 therein will be moved beyond the apex of the projection 59. Said projection will now start to enter the recess 64, owing to the force of gravity exerted upon the lever-arm 56, and in this movement the upper angular side of the projection 59, engaging the edge of recess 64, will operate to revolve quickly the movable collar 63 upon the rock-shaft 38, so that the recesses 64 and 65 will again be brought into register and the projection 59 can instantly enter same, thus permitting the lever-arm 56, with its stopper 57, to fall suddenly from the drop-orifice of the downwardly-extending end 54 of the water-pipe, this position of the parts being shown in Fig. 7. By permitting the rubber block or stopper 57 to drop suddenly from the end of the water-pipe I thereby insure that a sufficient quantity of water shall be discharged upon the carbid to generate the requisite volume of gas, as otherwise, if only the fixed collar 37 were employed, it is evident that the upper inclined side of the projection 59 would ride upon the edge of recess 65 instead of dropping suddenly into said recess, and a small amount of water being allowed to drop upon the carbid as the stopper gradually left the end of pipe 53 an amount of gas would be generated sufficient to distend the bellows to a greater or less degree, and the drop-orifice would be again closed before sufficient water had escaped therefrom to generate the amount of gas requisite to completely fill the gas-holder. Thus the partial inflation and deflation of the gas-holder would alternately occur in rapid succession, which would be undesirable as tending to cause an undue wearing of the parts and insufficient rotation of the carbid-cage to perfectly free the carbid from the lime. It is to be understood, however, that the disadvantages above enumerated as applying to a single stationary collar employing a recess are merely relative, as in actual practice I have constructed the rock-shaft 38 with a cam-surface to operate on the end of lever-arm 58 and have secured satisfactory results. It is evident, therefore, that I can dispense with the loose collar 63 and employ only the collar 37, or otherwise provide the rock-shaft 38 with a cam-surface to operate on the end of lever-arm 58, without departing from the spirit of my invention, and while the construction described is desirable I do not wish to be limited thereto. I have described the operation of these parts in the movement in one direction of the movable side of the gas-holder. Referring again to Fig. 7 it will be evident that as the gas generated as a result of the preceding operation enters the gas-holder the side 17 thereof will be moved outward or away from the plate 15, operating thereby through the mechanism described to revolve the rock-shaft 38 in the direction indicated by the arrow in Fig. 7. In this movement the edges of the recesses 64 65 will engage the upper inclined side of the projection 59 and through the lever mechanism described raise the stopper 57 into engagement with the drop-orifice and shut off the water-supply. By referring to Fig. 7 it will be seen that the peg 62 is not

in engagement with the radial edge of slot 61, and as the recess 65 is larger or wider than the recess 64 this arrangement permits a limited movement of the stationary collar, and consequently of the movable side of the gas-holder, before the projection 59 shall be again acted on to close the water-supply, thus further insuring that the proper amount of water shall be discharged before the drop-orifice is closed. Of course in the reverse movement the stationary collar will be turned a given distance, regulated by the length of the slot 61, before the loose collar 63 is acted upon to permit the lever-arm 56 to fall. By varying the length of slot 61 and the size of recess 65 relative thereto the distance the side 17 of the gas-holder can move in either direction without operating the water-supply either to open or close the same can be adjusted to suit the requirements of the case.

By providing an angular recess and an angular projection to coöperate therewith, as described, I secure an additional advantage in operation, which will now be described.

In the position of parts as shown in Fig. 7 the gas-holder will not be entirely deflated, as in the normal operation of the apparatus a new generation of gas will always ensue before the gas previously generated has been entirely consumed. Should the gas-holder from any cause become punctured, the movable side 17, under the pressure of spring 25, would be carried inward beyond the point it occupies in the normally-deflated condition of the gas-holder, or that point it occupies when the parts are in the position shown in Fig. 7, and as this inward movement of side 17 revolves the fixed collar 37 in the direction of the arrow in Fig. 6 the edge of the recess 65 will engage the under side of the angular projection 59, and thereby operate, through the mechanism described, to close the drop-orifice. Should the gas-holder be accidentally ruptured, therefore, only a slight amount of gas could escape as a result, and the generation of gas will be automatically stopped.

From the above description it will be observed that the arrangement of parts is such that the water can only be supplied to the carbid at a time when a fresh generation of gas is required. On the other hand, the carbid-holder is revolved only in the expanding movement of the gas-holder, so that a fresh surface of the carbid will be presented when next the water is permitted to drop on the same.

In order to admit gas to the water-compartment 10 to permit the water to pass freely therefrom, I secure along the vertical partition 12 a pipe 70, the pipe 70 extending through the bottom of the water-compartment and communicating with the generating-chamber just above the opening 33. At its upper end this pipe 70 is provided with a right-angular extension 71, which extends across the top of the water-compartment and has an outer opened end. The purpose of this construction is to provide against water passing through the pipe 70 to the generating-chamber in case of the accidental overturning of the lamp.

When it is desired to positively prevent the generation of gas, the adjusting-nut 29 is turned to draw the rod 28 outward. In this movement the hook 30 engages the bar 31 and draws the arms 22 and the movable plate 17 outward, which operates, through the mechanism described, to hold the rounded part of the collars 37 and 63 in engagement with the projection 59, whereby the rubber block 57 will be held firmly against the drop-orifice and prevent water from issuing therefrom. By turning the adjusting-nut 29 in the reverse direction the spring 27 will push the rod 28 inward until the hook 30 will cease to engage with the bar 31, and the operation of the apparatus may be resumed.

In the plate 17 is an aperture which is normally closed by a conical valve 72, carried by a spring-arm 73, secured to the plate 17. Said valve has a projection 74 extending through the aperture in the plate 17. The lower end of spring 27 is bent outward to afford a stop 75. Any undue generation of gas will cause the gas-holder to be distended beyond a given point, when the projection 74 will contact with the stop 75 and move the valve 72 away from the aperture to permit the surplus gas to escape therethrough. It will be seen that this safety-valve is positive and certain in its operation and that all danger of charging the gas-holder beyond the safety-point is prevented.

The bottom 2 of the lamp affords the generating-chamber, from which gas passes through the opening 33 to the gas-holder. From the generating-chamber the gas passes through a filter $65^a$ and pipe 66 to the burner 67, the opening to which is closed by a needle-valve 68. By turning this needle-valve to control the flow of gas to the burner it will be seen that I can thereby regulate the generation of the gas and that by shutting off the flow of gas to the burner the gas-holder will be held in a distended condition and the generation of gas prevented, as the wet lime is constantly sifted or shaken out of the cage in the revolution thereof, so that after the flow of gas to the burner is cut off there will be practically no after generation.

While I have illustrated my invention as applied to a bicycle-lamp, it is evident that the same may be applied equally well to other forms of lamp, and such application is contemplated herein. Other parts of the device shown and not herein described are of the ordinary or any preferred construction and need not be specifically referred to, as they form no part of this invention. I may mention, however, that I preferably extend the chimney 69 to such a height that the products of combustion may escape at a point above the water-compartment, so that the water may not be heated thereby.

When it is desired to recharge the appara-

tus, the bottom is unscrewed from the top and the spring-arms 48 are pressed outward to permit the carbid-container 45 to be removed from engagement therewith, when the plate 50 may then be removed to uncover the opening in the end of the container, as previously described.

Having thus described my invention, what I claim as new is—

1. In a portable acetylene-lamp, the combination with a flexible or collapsible gas-holder having a movable side, of a revoluble carbid-cage having a ratchet-wheel, a rock-shaft, a water-feed controlled thereby, a lever-arm secured thereto and carrying ratchet mechanism engaging said ratchet-wheel, an arm secured to said rock-shaft and an arm pivotally connected to said movable side, said arms being pivotally connected, the combination operating to revolve the carbid-cage as the gas-holder is inflated as set forth.

2. In an acetylene-lamp, the combination with a gas-holder having a movable member, of a revoluble carbid-cage having a ratchet-wheel, a rock-shaft, a lever-arm secured thereto and carrying a curved plate having studs, a curved ratchet-plate having apertures therein, each of said apertures having upwardly-inclined bottoms, said ratchet-plate being supported on said studs through said apertures and its teeth engaging the teeth of said ratchet-wheel, an arm secured to said rock-shaft and an arm pivotally connected to said movable member, said arms being pivotally connected, the combination operating as set forth.

3. In a portable acetylene-lamp, the combination with a gas-holder having a movable member, of a revoluble carbid-cage having a ratchet-wheel, a rock-shaft, a lever-arm secured thereto and carrying ratchet mechanism engaging said ratchet-wheel, an arm secured to said rock-shaft, an arm pivotally connected to said movable member, said arms being pivotally connected, and the mechanism operating to revolve the carbid-cage as the gas-holder is filled, a water-compartment, a pipe leading therefrom having a drop-orifice, and means operated by said rock-shaft to open and close said drop-orifice in the movements of the gas-holder, substantially as described.

4. In a portable acetylene-lamp, the combination with a flexible or collapsible gas-holder having a movable side, of a revoluble carbid-cage having a ratchet-wheel, ratchet mechanism coöperating therewith, a rock-shaft, arms operatively connecting said rock-shaft with said ratchet mechanism and movable side, respectively, the mechanism being adapted to revolve the carbid-cage as the gas-holder is inflated, a water-compartment, a pipe leading therefrom having a drop-orifice, and means operated by said rock-shaft to open and close said drop-orifice in the movements of the gas-holder, substantially as described.

5. In an acetylene-lamp, the combination with a flexible or collapsible gas-holder having a movable side, of a revoluble carbid-cage having a ratchet-wheel, ratchet mechanism coöperating therewith, a rock-shaft having a recess, arms operatively connecting said rock-shaft with said ratchet mechanism and movable side, respectively, a water-compartment, a pipe leading therefrom having a drop-orifice, and a shaft revolubly mounted in the lamp and having arms, one of said arms carrying a stopper for said drop-orifice and the other of said arms bearing at its end against said shaft, the combination operating as set forth.

6. In an acetylene-lamp, the combination with a flexible or collapsible gas-holder having a movable side, of a carbid-container, a water-compartment, a pipe leading therefrom having a drop-orifice above said container, a rock-shaft operatively connected with said movable side and having a fixed collar provided with a slot and a peripheral recess and a loose collar provided with a similar recess and a pin working in said slot, and arms on said rock-shaft, one of said arms carrying a stopper for said drop-orifice and the other of said arms having at its end a projection adapted to enter said recesses, the combination operating as set forth.

7. In an acetylene-lamp, the combination with a flexible or collapsible gas-holder having a movable side, of a carbid-container, a water-compartment, a pipe leading therefrom having a drop-orifice above said container, a rock-shaft operatively connected with said movable side and having a fixed collar provided with a slot and a peripheral recess and a loose collar provided with a similar but smaller recess and a pin working in said slot, and arms on said rock-shaft, one of said arms carrying a stopper for said drop-orifice and the other of said arms having at its end a projection adapted to enter said recesses, the combination operating as set forth.

8. In an acetylene-lamp, the combination with a flexible or collapsible gas-holder having a movable side of a pivotally-mounted, spring-controlled arm secured at its outer end to said side and tending normally to collapse said gas-holder, a revoluble carbid-cage, and means operatively connecting said movable side and said cage whereby to revolve said cage in the movement in one direction of said side, substantially as described.

9. In an acetylene-lamp, the combination with a flexible or collapsible gas-holder having a movable side of a pivotally-mounted, spring-controlled arm secured at its outer end to said side and tending normally to collapse said gas-holder, means as described for regulating the tension of the spring of said arm, a revoluble carbid-cage, and means operatively connecting said movable side and said cage whereby to revolve said cage in the movement in one direction of said side, substantially as described.

10. In an acetylene-lamp, the combination with a flexible or collapsible gas-holder hav-

ing a movable side, of a pivotally-mounted, spring-controlled arm secured at its outer end to said side and tending normally to collapse said gas-holder, a water-compartment, a pipe leading therefrom having a drop-orifice, a revoluble carbid-cage, means operated by said movable side to revolve the carbid-cage in the movement in one direction of said side and to open the drop-orifice in the movement in the opposite direction of said side, and means for holding the gas-holder in a distended position whereby to maintain the drop-orifice closed, substantially as described.

11. In an acetylene-lamp, the combination with a flexible or collapsible gas-holder having a movable side, of a pivotally-mounted, spring-controlled arm secured at its outer end to said side and tending normally to collapse said gas-holder, a water-compartment, a pipe leading therefrom having a drop-orifice, a revoluble carbid-cage, means operated by said movable side to revolve the carbid-cage in the movement in one direction of said side and to open the drop-orifice in the movement in the opposite direction of said side, and means for holding the gas-holder in a distended position whereby to maintain the drop-orifice closed, comprising a bar carried by said arm, a spring-pressed rod having at one end a hook engaging said bar and having its opposite end screw-threaded and projecting through the casing of the lamp and an adjusting-nut engaging said screw-threaded end, substantially as described.

12. In an acetylene-lamp, the combination with the bottom affording a generating-chamber and having a carbid-cage revolubly mounted therein and the top removably secured to the bottom and having two compartments, one of said compartments affording a water-chamber, a collapsible gas-holder mounted in the other compartment and having a movable side, an opening formed in the partition between the two compartments and affording communication between the generating-chamber and the gas-holder, an arm carried by said movable side and working through said opening, a pipe leading from said water-chamber and having a drop-orifice and means operated by said arm in the movements of said movable side to revolve said cage and open and close said orifice, substantially as described.

13. In an acetylene-lamp, the combination with a flexible or collapsible gas-holder having a movable side, of a generating-chamber communicating therewith, a carbid-container, a water-compartment, a pipe leading therefrom having a drop-orifice above said container, means operated by said movable side for opening and closing said drop-orifice, a burner communicating with said generating-chamber and a valve for said burner, the combination operating as set forth.

14. In an acetylene-lamp, the combination with a flexible or collapsible gas-holder having a movable side, of a generating-chamber communicating therewith and having a revoluble carbid-cage mounted therein, a water-compartment, a pipe leading therefrom having a drop-orifice above said cage, means operated by said movable side for opening and closing said drop-orifice and for revolving said cage, a burner communicating with said generating-chamber, and a valve for said burner, the combination operating as set forth.

15. A carbid-cage having its wires indented for the purpose, in operation, of preventing water which may fall upon the wires, from running along on them, substantially as described.

16. A carbid-cage having its wires bent or indented on opposite sides of a central point, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM O. NELSON.

Witnesses:
GEO. W. REA,
BRUCE S. ELLIOTT.