To all whom it may concern:

Be it known that I, FRANK M. MOORE, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Acetylene-Gas Generators; and I do 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.

This invention relates to improvements in acetylene-gas generators.

The object of the invention is to provide a generator which shall be simple of construction, comparatively inexpensive of production and efficient in operation, and one in which the feed of the water to the carbide is automatically controlled by the pressure of the gas, which when it reaches the maximum pressure intended will cut off the flow of water and prevent further generation, a decrease in the pressure of the gas causing a resumption of the flow of water and the generation of gas.

A further object of the invention is to provide a generator which is movably mounted in such manner that when turned to one position the flow of water will be cut off and when adjusted to one or more different positions the water will be let on, thus stopping or starting the generation of gas without the use of valves or other extraneous devices.

With these and other objects in view the invention consists of certain novel features of construction, combination, and arrangement of parts, which will be hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a side elevation of an acetylene-gas generator constructed in accordance with my invention. Fig. 2 is an end elevation thereof. Fig. 3 is a central vertical section of the generator, showing the same turned to the position in which the generation of gas ensues. Fig. 4 is a similar view showing the generator reversed to stop the generation of gas. Fig. 5 is a horizontal section on line 5 5 of Fig. 3.

Fig. 6 is a detail sectional view through the hollow shaft and its bearing.

The present form of generator is especially intended for use on students' lamps, locomotive-headlights, &c., but is not limited thereto, as the essential features of the invention also adapt the generator for general use under all conditions where a reversible or rotary generator of the character shown may be employed.

Referring now more particularly to the drawings, the numeral 1 represents a supporting-frame which is preferably in the form of a yoke comprising an attaching-bracket 2, a horizontal bar 3, carried by the bracket, and supporting arms 4 and 5, rising from the ends 65 of said bar. The lower ends of the arms 4 and 5 are preferably united to the bar by couplings 6, one of which—that carried by the arm 5—is hollow or tubular to receive a reduced stem 7 on the contiguous end of the bar, said stem being threaded for the reception of a nut 8, whereby the arm 5 is detachably secured to the bar. The upper ends of the arms 4 and 5 carry bearings 9 and 10, which receive short shafts or trunnions 11 and 12, projecting from the sides of the generator-casing 13, whereby said casing is mounted to oscillate or to rotate in or upon the yoke. As shown, the trunnion or shaft 11 is hollow and communicates with the interior of the casing 18 and has the general form of a tapered plug-valve, which extends through the bearing 9 and is held in place by a screw or suitable fastening 14. The said hollow shaft also has a port 15 and an annular groove 16 to allow gas to escape, as hereinbefore described, to pass to the burner-tube 17, which tube is provided with a valve 18 for regulating the supply of gas to the burner. By detaching the nut 8 and screw 14 the arm 4 may be detached from the frame and generator, leaving the latter free to be removed, by which means the parts may be conveniently disassembled and packed in close compass for storage and shipment and as conveniently assembled when it is desired to mount the generator for use.

The gas is conducted from the generator to the hollow shaft through a conducting-tube
19, which has its inlet end located adjacent to that end of the generator which is uppermost when the generator is in use, and the said inlet end of the tube is provided with a 5-strainer 20, which prevents any particles of the slaked or waste carbide from entering the tube when the position of the generator is reversed.

The generator-casing 13 has the general 10-form of a cylinder which is closed at that end which is uppermost when the device is in use and is open at its opposite end. A screw-cap 21 closes the open end of the casing and is chambered to receive the lower end of the carbid-holder 22, which is suitably fixed thereto and is closed at its upper or free end by a screw-cap 25. The carbid-holder comprises a perforated cylindrical cage or basket of such diameter relative to the casing as to form between them an intervening space 21 for the reception of the waste carbide discharging through the perforations in the cage, as hereinafter described. A waterproof packing-ring 26 fills the space in the chamber of the cap 21 about the cage and prevents the accumulation of water and packing of the waste carbide therein.

Carried by the cap 21 and projecting into the carbid-holder is a water-reservoir tube 26, which tube is closed at its free end and fixed at its opposite end to said cap, the fixed end of the reservoir being open for the supply of water thereto and adapted to be closed by a cap 27. Surrounding the fixed end of the tube and seated within the chamber of the cap 21 between said tube and the carbid-holder is a washer 28, of absorbent material, which takes up the water supplied from the reservoir and distributes it to the carbid, and in the reservoir, adjacent to the washer, are one or more series of apertures 29, through which the water passes from the reservoir. A sleeve 30 slides upon the reservoir and acts as a valve by which the feed of water to the 45-carbide may be controlled. One end of this sleeve is enlarged, as shown at 31, to form when arranged opposite one or more of the rows of apertures an intervening space of restricted size, through which the water from 50-said apertures may flow to the absorbent washer 28 to be distributed to the carbid in the holder 22. The valve-sleeve 30 is of course preliminarily adjusted to the desired position before the carbid-holder and reservoir are inserted in the generator-casing, the adjustment being made by hand through the open end of the carbid-holder, which is then closed by the cap 23.

In priming the generator for operation the cap 21 is unscrewed and removed, together with the carbid-holder and water-reservoir, and then the parts are held in a perpendicular position, with the cap 21 upward, the reservoir filled to a point just below the lower 65-apertures 29, and the cap 27 applied to close the open end of the reservoir. After this the valve-tube 30 is adjusted, the carbid placed in the holder 22, and the cap 23 applied. The carbid-holder and water-reservoir are now in a condition to be inserted in the generator-casing 13, and in applying them the casing is turned to an upright position, with its open end uppermost, the carbid-holder and reservoir inserted therein, and the cap 21 then screwed up to close the said open end of the casing. The generator is then primed for operation; but as the feed-orifices 29 are located above the level of the water in the reservoir the flow of water to the carbid cannot take place to cause the generation of gas.

When it is desired to set the device in operation, the position of the generator-casing is reversed—that is to say, the generator is turned completely around, so that the cap 21 will be lowermost, as shown in Fig. 3—whereupon the feed-apertures 29 will be located at the base of the water-reservoir and the water will pass out through the apertures uncovered by the valve-tube 29 and be supplied to the absorbent washer 28, which will distribute it to the calcium carbid, whereupon the generation of gas commences and is continued as long as the generator is maintained in the stated position and water is supplied to the carbid. The gas generated in the reservoir flows outward therefrom through the tube 19 to the hollow shaft 11 and thence through the burner-tube to the burner, where it is consumed. When the generator is in the position shown in Fig. 4, it will be readily seen, of course, that the generation of gas is arrested; but when the generator is turned to any other position in which the water can flow out of the apertures 29 gas will be generated and will be allowed to pass to the 105-burner through the groove 16 in the hollow shaft 11, so that the generator may be adjusted to the position most convenient for use and as circumstances may require.

When in the operation of the apparatus the pressure of gas within the generator-casing exceeds the pressure or head on the column of water in the water-reservoir, the generation of gas will be reduced or completely arrested, as the water will be forced up into the 115-said reservoir above the level of the uppermost series of openings 29. As soon as the pressure within the reservoir decreases the water will again descend and start the generation of gas in the manner previously described, so that the device will be entirely automatic in action, the generation of gas being regulated automatically by the pressure of the gas itself, so that under no condition can the pressure within the generator pass beyond the safety-point. This is also the case when the light is temporarily extinguished by the closing of the valve controlling the flow of gas to the burner and the generator contains water and carbid. Generation will continue, unless the generator has been adjusted to the position shown in Fig. 3, until the pressure of the gas is sufficient to force the water above the opening 29. As
leakage and condensation cannot well be prevented, the pressure of the gas confined in the generator will decrease and the generation of gas will again commence; but as 5 soon as the pressure of the gas reaches a certain point generation will again be arrested, and this will continue until the supply of carbide and water is exhausted. When it is desired to stop the generation of gas for any considerable time, the generator is turned to the position shown in Fig. 4; but in the event that the generator should not be turned to this position no harm beyond the waste of the carbide could ensue, as the generation of gas 15 would be automatically arrested in the manner before described before the pressure could reach the danger-point.

The short shafts or trunnions 11 and 12 afford sufficient frictional contact with their bearings 9 and 10 to maintain the generator in the position to which it is adjusted without the use of holding means of any character. When it is desired to dismantle the apparatus, the nut 8 and screw 14 are disengaged, 25 whereupon the arm 5 may be detached and the generator released by simply withdrawing the hollow shaft 11 from engagement with its bearings 9.

The object of employing a perforate carbide holder and forming the space 25 between said holder and the wall of the generator-casing is to provide for the automatic discharge of the slaked carbide or residuum from the holder before it packs in the holder and interferes 35 with the access of water to the carbide and the generation of gas. It has been found in practice that where this construction is employed in a lamp or lantern which is portable and which is kept in more or less constant motion 40 the agitation produced causes the waste carbide to discharge through the meshes or perforations of the holder and to bank up in the space around the holder, thereby preventing the objection referred to.

From the foregoing description, taken in connection with the accompanying drawings, it is thought that the construction, mode of operation, and advantages of my improved gas-generator will be readily apparent without requiring a more extended explanation.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

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

1. In an acetylene-gas generator, the combination with a supporting-frame; of a generator mounted to turn therein and comprising a casing, a cap closing one end of the casing, a carbide-holder carried by the cap, and a water-reservoir also carried by the cap and inclosed in the generator-casing, said water-reservoir being provided adjacent to the cap 65 with openings for the passage of water to the carbid, substantially as specified.

2. In an acetylene-gas generator, the combination with a supporting-frame; of a generator rotatably mounted therein and comprising a casing, a carbide-holder mounted in the casing, a water-reservoir concentric with and inclosed within the carbide-holder and provided with discharge-apertures, and a support common to the carbide-holder and water-reservoir, the construction being such that when the casing is turned to one position, water is permitted to discharge through said apertures, and when the casing is turned to a different position, the flow of water through said apertures is cut off, substantially in the manner described.

3. In an acetylene-gas generator, the combination with a supporting-frame; of a generator mounted to turn therein, and comprising a casing, a cap closing one end of the casing, a carbide-holder supported by the cap, a water-reservoir concentrically arranged within in the carbide-holder and also supported by the cap, said reservoir being provided as a point adjacent to the cap with discharge-apertures, and means for regulating the outflow of water through said apertures, the construction being such that when the casing is turned in one position, the flow of water will be entirely cut off, and when the casing is arranged in a different position, the flow of water will be let on through the discharge-apertures uncovered by the means for regulating the flow of water therethrough, substantially as described.

4. In an acetylene-gas generator, the combination with a supporting-frame comprising a yoke provided with bearings, and a generator having trunnions to turn within said bearings, said yoke being made of sections detachable to permit of the insertion and removal of the generator, substantially as set forth.

5. In an acetylene-gas generator, the combination with a supporting-yoke, of a generator mounted to turn therein and comprising a casing, a cap closing one end of the casing, a carbide-holder inclosed within the casing and connected to said cap, a water-reservoir tube also connected with the cap and having one end opening through the cap and provided with a suitable closure and also provided adjacent to said cap with discharge-apertures, and a valve-tube slidable on the reservoir-tube to regulate the flow of water through the discharge-apertures, substantially as described.

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

FRANK M. MOORE. [L. S.]

Witnesses:

HARRY T. VIALL,
HARRY JORDAN.