No. 844,606. PATENTED FEB. 19, 1907.

S. M. MEYER.

ACETYLENE GAS GENERATOR.

APPLICATION FILED APR. 24, 1905.

2 SHEETS—SHEET 1.

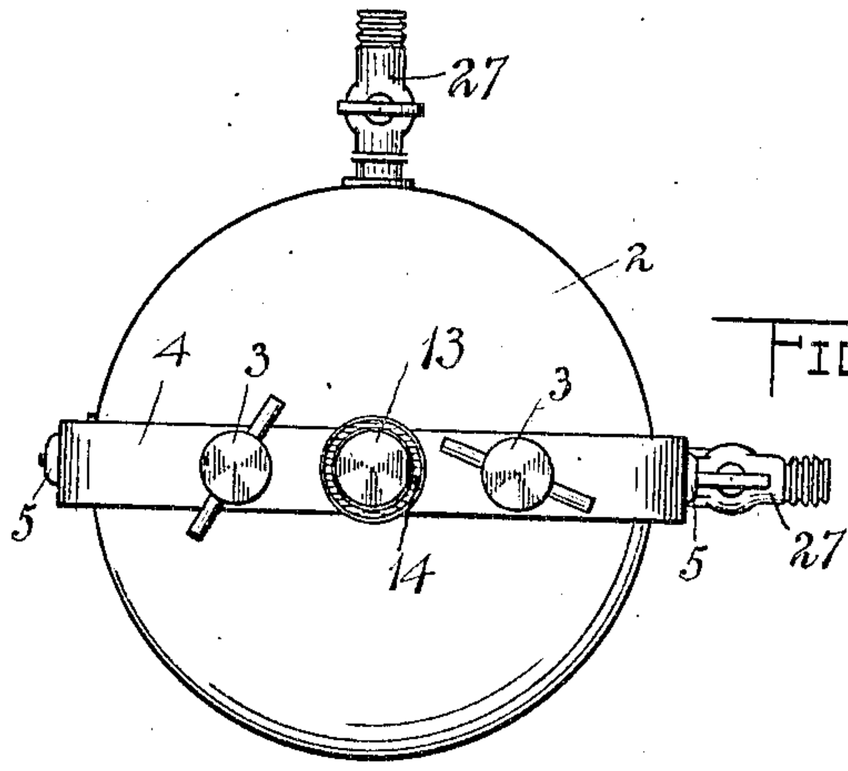

FIG. 1.

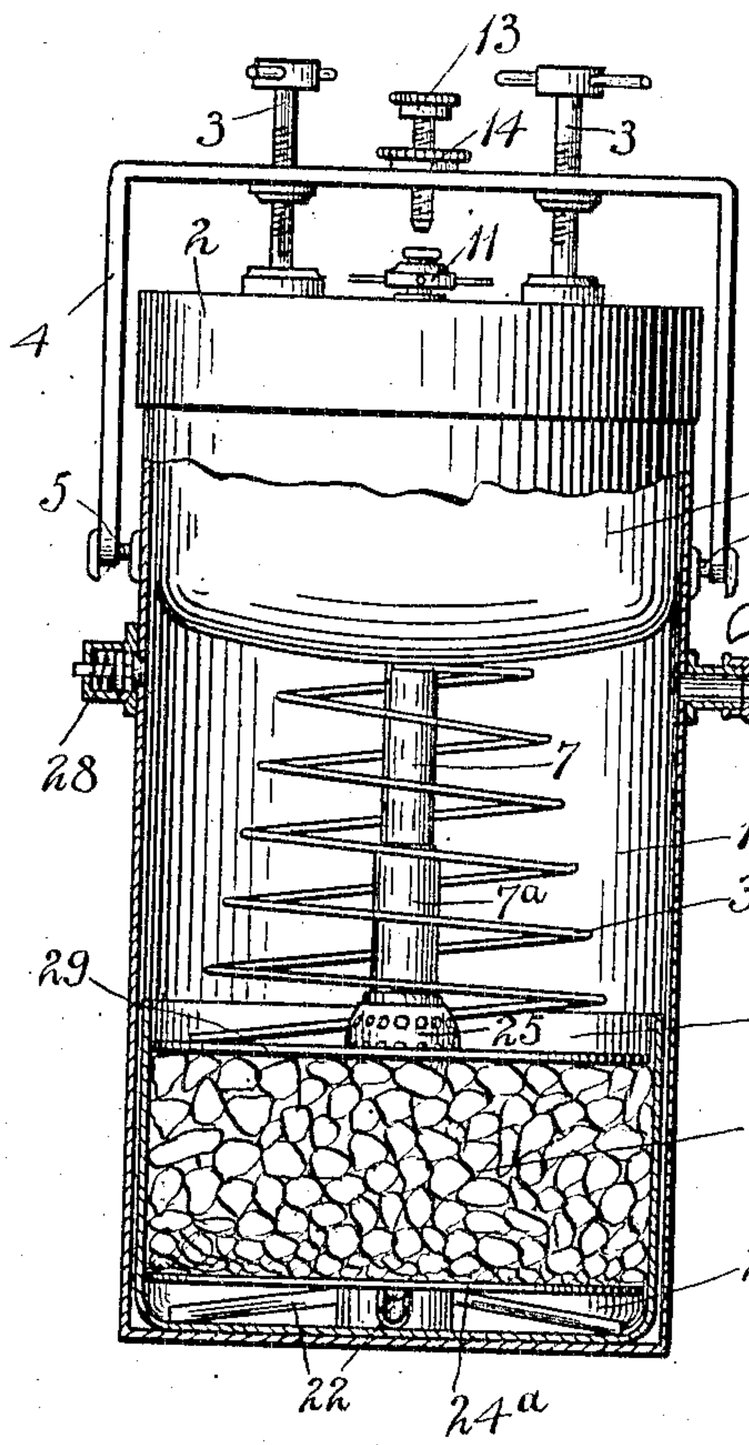

FIG. 2.

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2 SHEETS—SHEET 2.

FIG. 3.

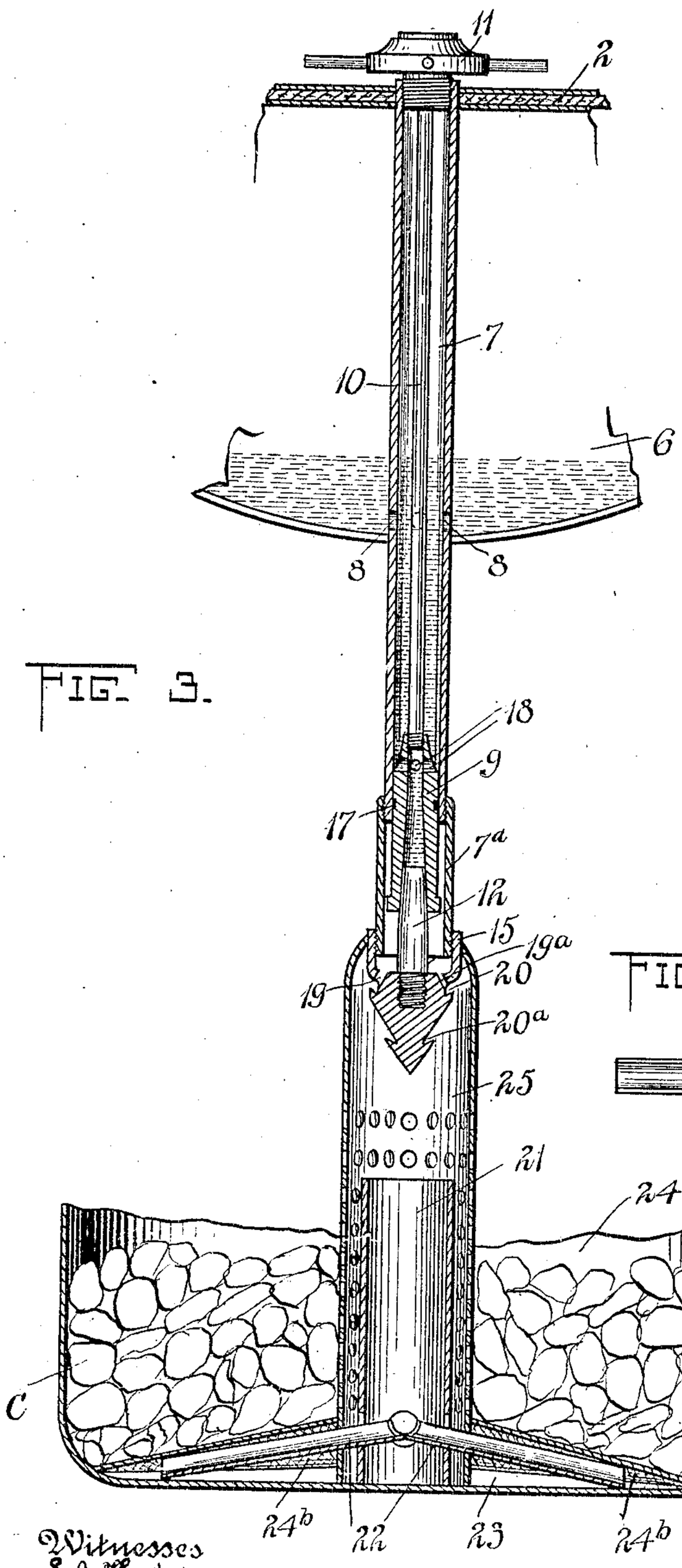


FIG. 4.

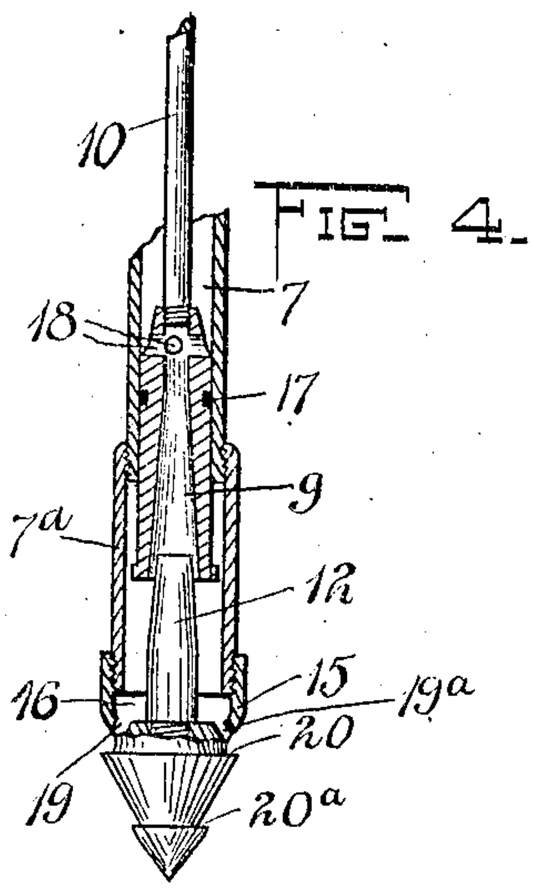


FIG. 5

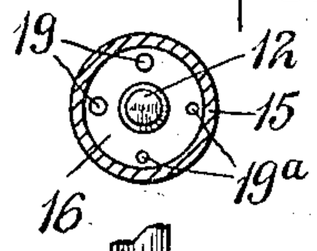
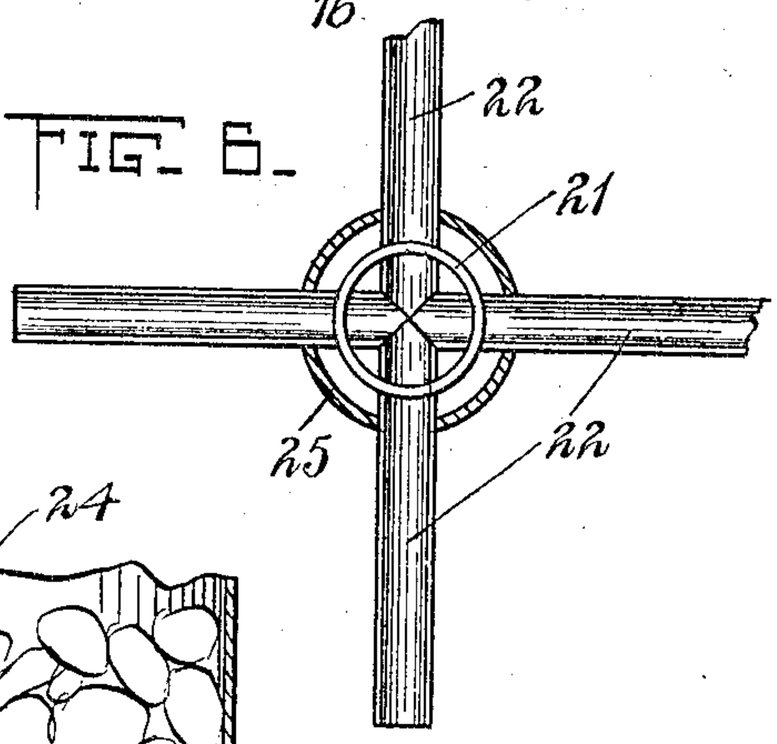


FIG. 6.



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UNITED STATES PATENT OFFICE.

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ACETYLENE-GAS GENERATOR.

No. 844,606. Specification of Letters Patent. Patented Feb. 19, 1907.

Application filed April 24, 1905. Serial No. 257,191.

To all whom it may concern:

Be it known that I, SVEND MARTIN MEYER, a citizen of the United States, and a resident of the borough of Brooklyn, in the city and State of New York, have invented a new and useful Improvement in Acetylene-Gas Generators, of which the following is a specification.

My invention relates to the class of acetylene-gas generators in which water is supplied gradually and in regulated quantity from a reservoir above to a body of calcium carbid contained in the lower part of the apparatus and from whence the gas is delivered to a suitable receiver or containing-reservoir for use.

My improvements consist in means for regulating the water-supply, special appliance for conducting the water into contact with the carbid, means for automatically controlling and regulating the flow of water by the pressure of gas generated, and other details of construction hereinafter described, and pointed out in the claims.

The objects of my invention are to avoid danger from fire or explosion, to promote economy in effecting the largest possible output of gas from the quantity of carbid used and avoiding waste in recharging, to combine efficiency and simplicity in the operating parts, to promote uniformity in operation, and to avoid injurious effects from movement or sudden jars in portable lamps or those used in automobiles, bicycles, or other vehicles.

In the accompanying drawings, Figure 1 is a top view of a generator illustrating my invention. Fig. 2 is an elevation of the same, partly in section. Fig. 3 is a vertical section, on a larger scale, of portions of the water-supply pan or reservoir and carbid-pan and the water-supply pipe, radial distributing-troughs, and other accessories removed from the outer tank. Fig. 4 is a detail elevation, partly in section, of the water-drip and regulating-valve. Fig. 5 is a sectional plan view of the same. Fig. 6 is a section plan of the water-distributing device in the lower part of the apparatus.

The tank 1 is closed at top by a cover 2, which is held down by clamp-screws 3, threaded in a yoke or bail 4, which is mounted on trunnions 5 on the sides of the tank. In the upper part of the tank is a removable water pan or reservoir 6, the lower part of which appears in elevation in Fig. 2, while its upper part is concealed by the upper portion of the tank 1, which is not in section. From the cover 2 a central tube 7 extends downward through and below the bottom of the water-reservoir 6, and into this tube water flows through a number of apertures 8 just above the bottom of the reservoir. The flow of water is regulated by a tubular valve 9, formed on a valve-rod 10, which is threaded in the center of the cover 2 and rotated by an external hand-wheel 11 to set the valve accurately in required proximity to its seat-plug 12. The setting of the valve is further determined by a stop-rod 13, threaded in the center of the yoke or bail 4 and fixed in adjusted position by a jam-nut 14. The valve 9 is of hollow or tubular form, as shown best in Fig. 4, having an upwardly-tapering conical bore fitting over the fixed conical plug 12, which projects upward from an inverted conical base 15, the margin of which forms a cup 16, which is permanently screwed on the lower end of an extension tube 7ª, screwed on the lower end of the tube 7 and of rather larger diameter than the latter. The valve 9 works tightly within the tube 7 by means of a packing 17 and is provided above said packing with four (more or less) radial ports 18 to permit the passage of water from the interior of the tube 7 to the bore of the valve 9. By the adjustment of the hollow valve 9 relatively to the fixed plug 12 a very gradual, uniform, and regulated flow of water is allowed to pass through the hollow valve to the cup 16, from which it passes by peripheral outlets 19 19ª to the exterior of the conical base 15. This is formed on its downwardly-tapering outer face with a succession of annular channels or troughs 20 20ª to arrest and equalize the flow and cause it, after being conducted down the outside of the inverted cone, to fall from the bottom point thereof in a regular succession of drops the frequency of which is nicely regulated by adjustment of the valve 9 relatively to its seat-plug 12.

From the conical bottom of the base 15 the water drips into the open top of a fixed tube 21 upon the common center of a series of outwardly-inclined radial troughs 22, here

shown four in number, which conduct it to the outer portion of the chamber 23 in the bottom of the removable carbid-pan 24, from which the water rises through a perforated diaphragm 24ª, forming a false bottom of the carbid-charging pan 24, into contact with the body of carbid, (indicated at C,) supported by said perforated diaphragm in the lower part of the pan 24. The base 15 and bottom of the tube 7 7ª are supported by a tube 25, fixed to the bottom of the pan, within the perforated diaphragm 24ª and surrounding the open-top tube 21 at a little distance, so as to provide an annular passage, which communicates with the carbid and gas reservoir through numerous perforations in the said tube 25, so that after the bottom stratum of carbid on the diaphragm 24ª is spent and the perforations in said diaphragm are choked with lime-water rising within the tube 25 will have access to the carbid through the perforations in said tube, and thus continue the generation of gas.

The gas is delivered for use through any desirable number of valve-guarded outlets 27 in the upper part of the gas-holding portion of the tank 1.

28 represents a safety-valve to guard against excessive pressure.

It is preferred to make the drip openings 19 19ª in the cup 16 of different sizes, as shown, in order that the gradual passage of water may not be prevented by the pressure of gas.

In operation the mode of checking and controlling the drips by successive annular channels 20 20ª on the exterior of the conical base 15 is found to effectually prevent injurious effects on the flame by sudden jars when my generator is used in connection with an automobile or bicylce lamp or the like. A further important advantage in maintaining uniformity in feed and preventing "jumping" of the flame, caused by jolting of the machine, results from the substitution of the hollow conical feed-valve and stationary plug-seat for the needle-valve in common use. Sudden jars being applied to the body of water in the reservoir tend to force drips through the needie-valve with great irregularity. With my elongated hollow conical valve and fixed plug-seat, on the other hand, the momentum of the water is effectually arrested by friction and a uniform feed is maintained accurately regulated in extent by adjustment of the valve.

Instead of or in addition to the perforated or reticulated metal diaphragm 24ª I may use a cloth diaphragm 24ᵇ, as illustrated in Fig. 3, to assist in distributing the water over the bottom surface of the carbid and prevent choking of the troughs 22 with carbid or with lime. I also prefer to apply a perforated metal diaphragm 29, held down by springs 30, on top of the body of carbid in the pan 24.

In assembling the parts after the pan 24 has been filled with carbid and with its concentric fixed tubes 21 25 placed in the bottom of the tank 1 the perforated cover-diaphragm 29 is placed over the body of carbid and the spring 30 placed on top of said cover-diaphragm. The water-pan 6, carrying the tube 7 and its accessories, is introduced into the tank, the conical base 15 of the tube 7 7ª slipping in the top of the tube 25, as shown in Fig. 3. The cover 2 being placed on the tank over the pan 6, the bail 4 is turned up into position and the screws 3 screwed down to tightly close the tank and press down the pan 6 and delivery-tube 7 7ª 15 into normal position, in which position the bottom of the pan 6 applies pressure to the spring 30, and thereby to the cover-diaphragm 29. The valve-wheel 11 may then be turned to open the water-supply valve to the required extent.

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

1. In an acetylene-gas generator, the combination of a tight gas-holding tank, an annular carbid-pan having tight bottom and sides, separate and removable from the said tank and completely contained therein, means for dripping water in the central tube of said annular carbid-pan and means for distributing water radially outward in the bottom of said pan, substantially as described.

2. In an acetylene-generator, the combination of a tank for receiving carbid and containing gas generated therefrom, a perforated diaphragm near the bottom of said tank for supporting the carbid therein, a plurality of vertical pipes, the outer one perforated and the inner one open at top, surrounded by the perforated diaphragm, a series of radial troughs inclined downward and outward from the interior of the inner vertical pipe and extending into the space beneath the perforated diaphragm and means for dripping water within the inner vertical pipe on the common center of the inclined radial troughs, whereby the fresh water is conveyed to the outer part of the space beneath the perforated diaphragm, substantially as described.

3. In an acetylene-gas generator, the combination of a tight gas-holding tank, an annular charging-pan for carbid separate and removable from said tank and completely contained therein and having a central tube perforated for the passage of gas and water, a perforated false bottom supporting the carbid in the annular charging-pan and providing a water-distributing chamber above the true bottom thereof, and means for supplying water in regulated quantity to the center of the annular pan and conveying it radially outward beneath the false bottom thereof, substantially as described.

4. In an acetylene-generator, the combination of a tank for receiving carbid and hold-

ing gas generated therefrom, a vertical tube through which water is supplied and a dropping device for regulating the supply of water, comprising a tubular valve, within the supply-tube, a conical seat for said valve, means for accurately adjusting the tubular valve on its seat, and a perforated cup secured to the lower end of the supply having a base in form approximately of an inverted cone, to the outside of which water is delivered from the perforated cup and from the pointed bottom of which it falls in successive drops and a suitable conduit which conveys the water to the carbid, substantially as described.

5. A water-dropping device for acetylene-generators, comprising a valve-guarded tube terminating at bottom in a perforated cup and a base for said cup of inverted conical form having annular channels to check and regulate the flow of water down the outside of said base, substantially as described.

6. A water-dropping device for acetylene-generators comprising a water-reservoir, a valve-guarded tube leading therefrom, and a cup secured to the lower end of said tube having a downwardly-tapering base, an annular channel surrounding said base and a plurality of apertures in the bottom of the cup delivering water therefrom to said annular channel and permitting the passage of air or gas to replace the descending water, substantially as described.

The foregoing specification signed at New York, N. Y., this 15th day of April, 1905.

SVEND MARTIN MEYER.

In presence of—

W. P. HAMMOND,

CHARLES H. WEBB.