

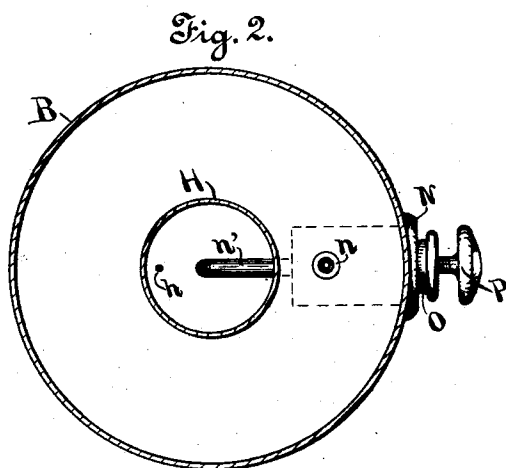
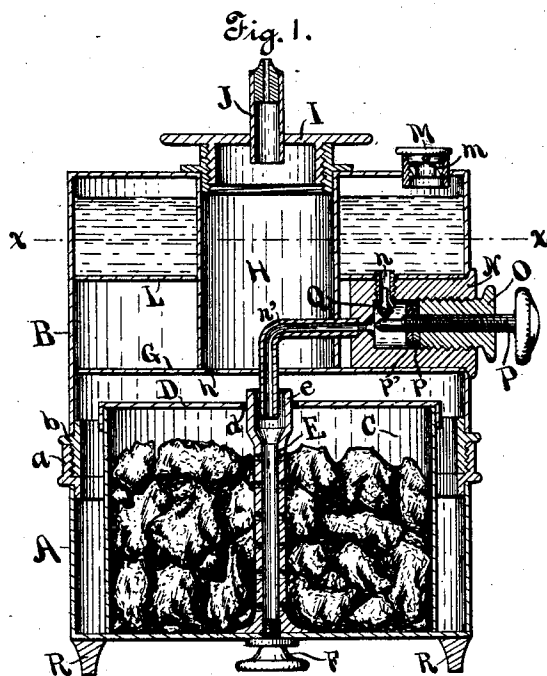
No. 608,571.

Patented Aug. 9, 1898.

F. E. BUNDY.
ACETYLENE GAS GENERATOR.

(Application filed Apr. 5, 1897.)

(No Model.)



WITNESSES:

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FRANK E. BUNDY, OF ELMIRA, NEW YORK.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 608,571, dated August 9, 1898.

Application filed April 5, 1897. Serial No. 630,842. (No model.)

To all whom it may concern:

Be it known that I, FRANK E. BUNDY, a citizen of the United States, residing at Elmira, in the county of Chemung and State of New York, have invented certain new and useful Improvements in Gas-Generators, of which the following is a specification.

My invention relates to improvements in gas-generators in which a gas is produced by the decomposition of a solid by a liquid; and it appertains more particularly to generators of acetylene gas wherein the gas is to be produced at a low pressure and in no larger quantity than is needed for immediate consumption; and the objects of my improvements are, first, to provide a simple and compact arrangement for the water and carbid receptacles within a single inclosing case which may be made small enough to adapt the generator for use in connection with various kinds of lamps, lanterns, headlights, &c., as well as of larger size for supplying a number of burners; second, to provide means for properly regulating the feed of the water to the carbid, so that the gas shall be produced at a rate and pressure sufficient to supply a given burner, and, third, to provide a secondary gas-chamber which receives gas from the generating-chamber through a small reducing-passage and delivers it to the burner or burners dry and at a pressure which shall be steady and free of the fluctuations that must obtain where the gas is taken directly from the generating-chamber. I attain these objects by the apparatus illustrated in the accompanying drawings, in which—

Figure 1 represents a vertical section of such a generator adapted for use in connection with lamps, &c.; and Fig. 2, a cross-section of the same on the line *x x* in Fig. 1.

Similar letters refer to similar parts throughout both views.

The containing or inclosing case is cylindrical in form and consists of the base and top sections A and B, coupled together by a screw-coupling *a b*. In the base-section is a pan or cup C, which forms the carbid-receptacle. This is provided with a cover D, which has a hole *d* at the center. At the center of the cup C is an upright perforated tube E, having an enlarged top portion *e*, which extends up through the hole in the cover. The

tube E is fastened in position by the screw F, which extends up through the bottom of the base-section and makes a gas-tight joint when the two parts are screwed tightly together. This arrangement admits of the tube being readily removed when necessary to clean it. The hole *d* is large enough to leave a small annular opening around the top of the tube E.

The top section has a diaphragm G, located so as to come a short distance above the carbid-receptacle. From the center of this diaphragm rises a small cylindrical chamber H to the top of the section. A very small hole *h* forms a communicating passage from below the diaphragm into this chamber. The top of the chamber is closed by a screw-cap I, through which passes tube J to the burner. Above the diaphragm G and encircling the chamber H is a second diaphragm L, which forms the bottom of the water-tank. This tank is located at a distance above the carbid-receptacle sufficient to give the head of flow necessary to produce the gas at the desired pressure. A filler-plug M is provided in the top of the tank, which is also the top of the section B, and this plug is provided with a small vent-hole *m* through its side, so that when it is screwed up a trifle it will admit atmospheric pressure above the water in the tank. Below the water-tank is a valve-case N, provided with a central bore threaded at its outer end to receive the screw-plug O. Through this plug is screwed the valve-stem P, having a conical valve at its end which seats in a corresponding valve-seat at the end of the bore in N. A nipple *n* leads from the tank to the bore of the valve-case, the lower end of the nipple being cut to form a seat for the small conical check-valve Q, which closes upwardly and is held in place by a small guide-stem and the valve-stem P, upon which it rests when open. A tube *n'* leads from the valve-case down through the diaphragm G to deliver the water into the top of the tube E. A set-nut *p* and jam-nut *p'* are screwed on the valve-stem P inside the plug O, and by a little experiment these nuts can be so set that when the valve-stem is turned out until they strike the plug the valve-opening will be just sufficient to supply water to the carbid at the rate necessary

to produce the gas in quantity corresponding to the consumption. Legs B raise the generator a sufficient distance to accommodate the thumb-screw F when the generator forms the base of a lamp. The lamp or lantern chimney or combustion-chamber will be attached to the cap I in any approved manner.

To operate the lamp, the sections A and B are separated and the cup C charged with carbide, the cover D being removed for this purpose. The parts are then replaced, as shown in the drawings, and the water-tank is filled. When it is desired to produce a light, the filler-plug is turned up to open the vent and the valve-stem P is turned out as far as it will go. In a short time gas will issue at the burner and can be touched off with a match, after which it will burn with a steady and brilliant flame, according to the size of tip used. The water flows from the tank through tube *n'*, whence it drops into tube E, attacking the carbide first through the lower perforations and afterward through the higher ones, as the bottom of the cup C fills with lime deposit. The gas rises through the small annular opening *d*, the greater part of the moisture held in suspension being condensed on the cover D and falling back to attack fresh carbide. The gas accumulates around and on top of cup C, where it is further dried by condensation from contact with diaphragm G and the sides of the outer casing. Passing slowly through the restricted orifice *h* into chamber II it accumulates therein in a thoroughly dry condition and is cooled by reason of the water-jacket formed by the supply-tank. From the chamber II it is taken off at the burner and at a steady pressure, since this chamber acts as a pressure-regulator, inasmuch as only a very small stream of gas can issue through orifice *h*, and any sudden rise of pressure in the generating-chamber formed below diaphragm G, caused by a flashing of the gas when water is admitted too freely, as when the lamp is given a heavy jar, will not be felt in said chamber. The rise of pressure in the generating-chamber stops the flow of water, but the gas cannot escape out through the water-tank, since the check-valve Q will be closed the instant a backflow is set up through tube *n'*.

While I have described my invention as applied to lamps, it may also be applied to larger apparatus, and I do not therefore confine myself to the precise arrangement and construction of parts as above described.

I am aware that various ways have been heretofore devised for feeding a liquid to a solid in gas-generators by gravity and for regulating and properly proportioning such feed; and I do not claim this broadly.

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, within an inclosing case, of a generating-chamber in the lower part of the case, a diaphragm in the upper

part of the case, a secondary gas-chamber above the diaphragm and in direct communication with the generating-chamber through a restricted orifice in the diaphragm, a gas-outlet from the secondary chamber, a liquid-receptacle in the upper part of the case surrounding the secondary gas-chamber, a perforate stand-pipe in the generating-chamber, a passage leading from the liquid-receptacle to said stand-pipe, and a hand-operated valve in said passage whereby the liquid-delivery is positively adjusted or shut off substantially as described.

2. In a gas-generator, the combination, within a generating-chamber, of a solid-receptacle smaller than said chamber, a cover for the solid-receptacle provided with a restricted orifice through which the generated gas rises into the chamber above the receptacle, a gas-outlet leading from the generating-chamber outside of the covered receptacle, and means for feeding liquid to the solid in the receptacle, substantially as described.

3. In a gas-generator, the combination, within an inclosing case, of a generating-chamber in the lower part of the case, a solid-receptacle within the generating-chamber, a cover for said receptacle provided with a restricted orifice through which the generated gas rises into said chamber above the receptacle, a secondary gas-chamber in the upper part of the inclosing case into which the gas passes through a second restricted orifice, a liquid-receptacle also in the upper part of the case, a valve-controlled passage leading from the liquid-receptacle to the solid in the solid-receptacle, and a gas-outlet from the secondary gas-chamber, substantially as described.

4. In a gas-generator, the combination of a generating-chamber, a solid-receptacle within the generating-chamber, a perforated stand-pipe in said receptacle, a cover for the receptacle provided with an opening which forms a restricted orifice around the top of the stand-pipe through which orifice the generated gas rises into the generating-chamber above the receptacle, a gas-outlet from said chamber, a source of liquid-supply, and a valve-controlled passage leading from the source of supply to the top of the stand-pipe, substantially as described.

5. In a gas-generator, the combination with a solid-receptacle and a liquid-receptacle of a valve in the line of communication between the two, said valve comprising a valve-chamber having communication with the two receptacles, a screw-plug at one end of the valve-chamber, a valve-stem screwed through the plug, and a set-nut on the stem inside the plug, substantially as described.

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

FRANK E. BUNDY.

Witnesses:

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C. TRACEY STAGG.