

No. 719,391.

PATENTED JAN. 27, 1903.

E. B. STONER.
ACETYLENE GAS GENERATOR.

APPLICATION FILED APR. 17, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

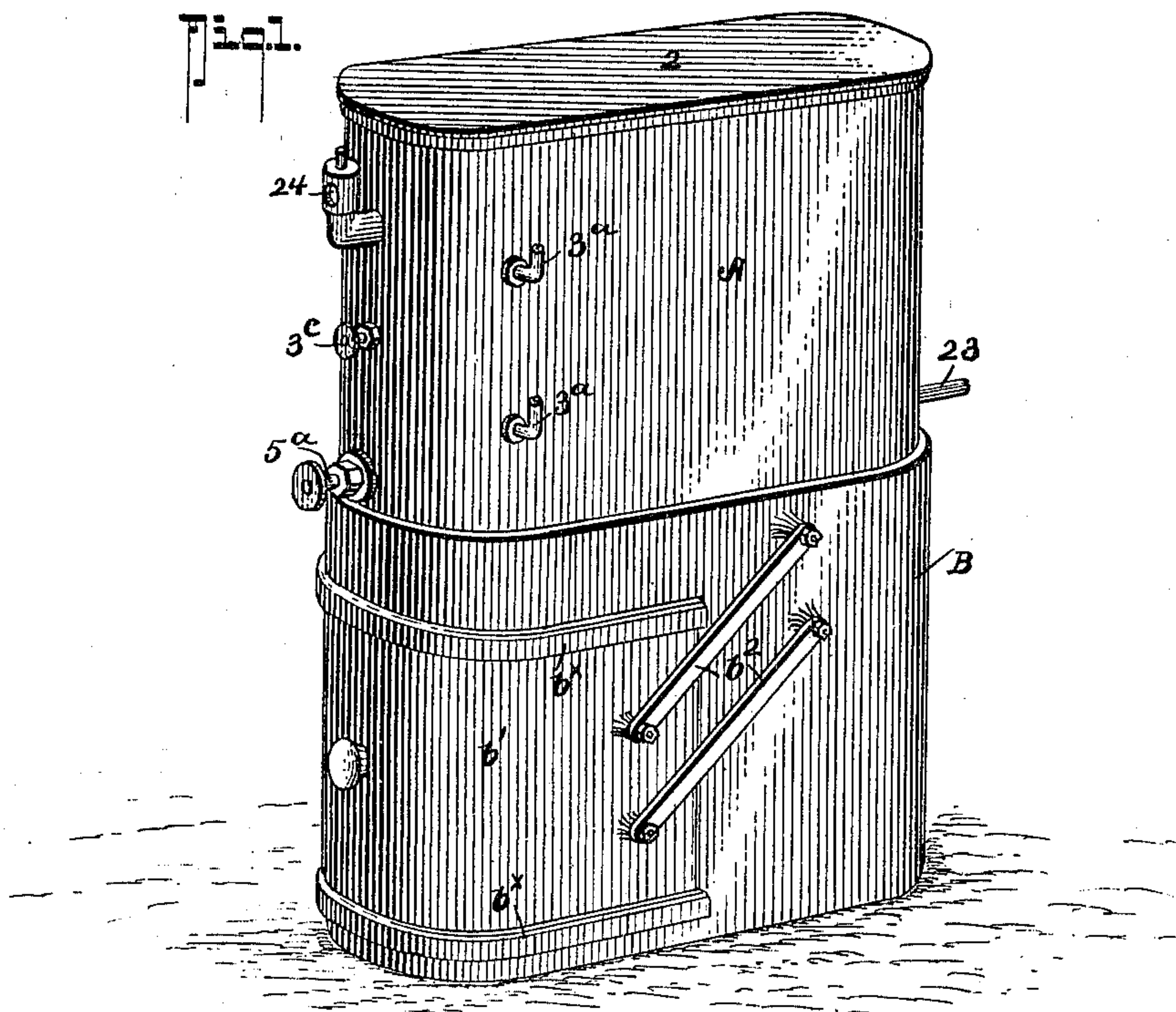


Fig. 2.

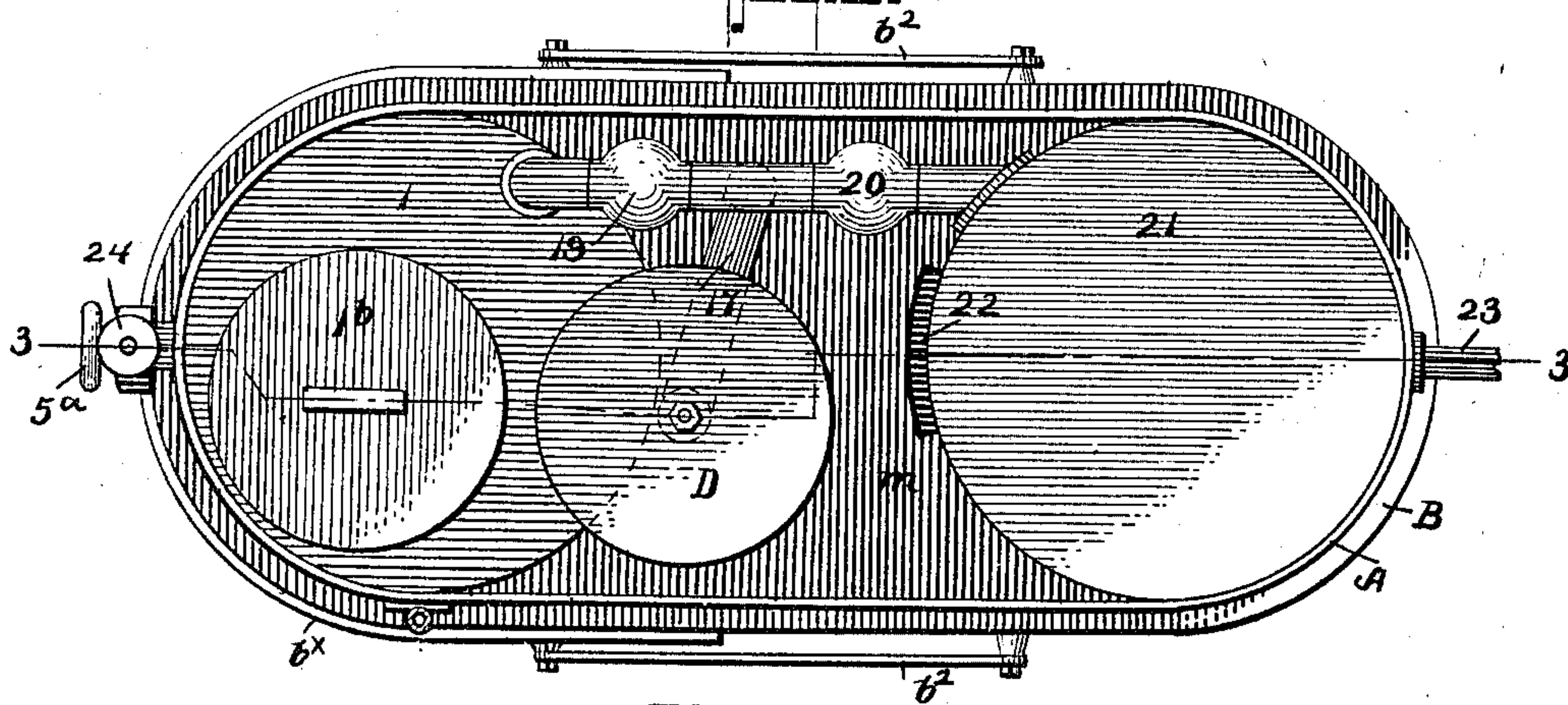
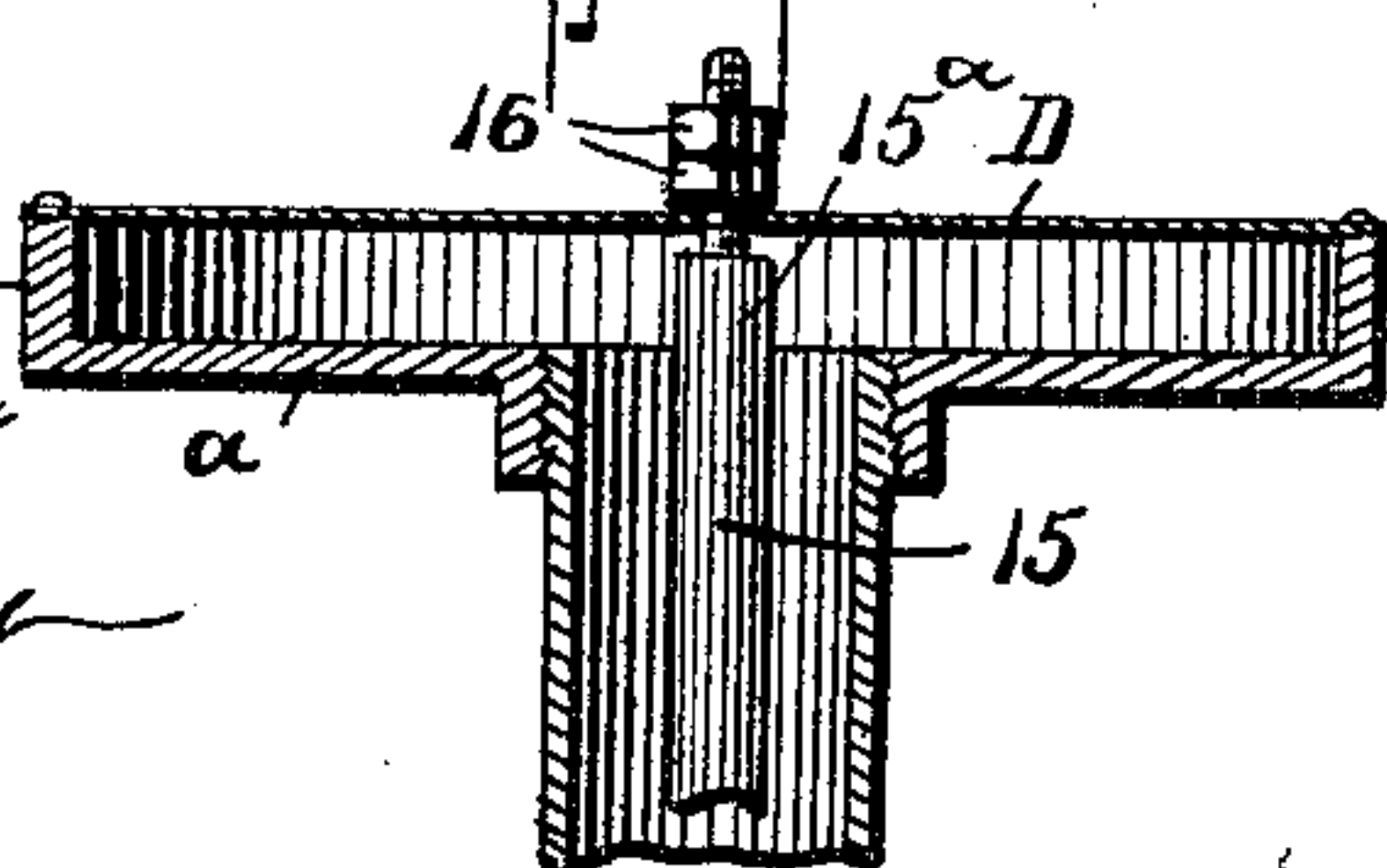


Fig. 3.



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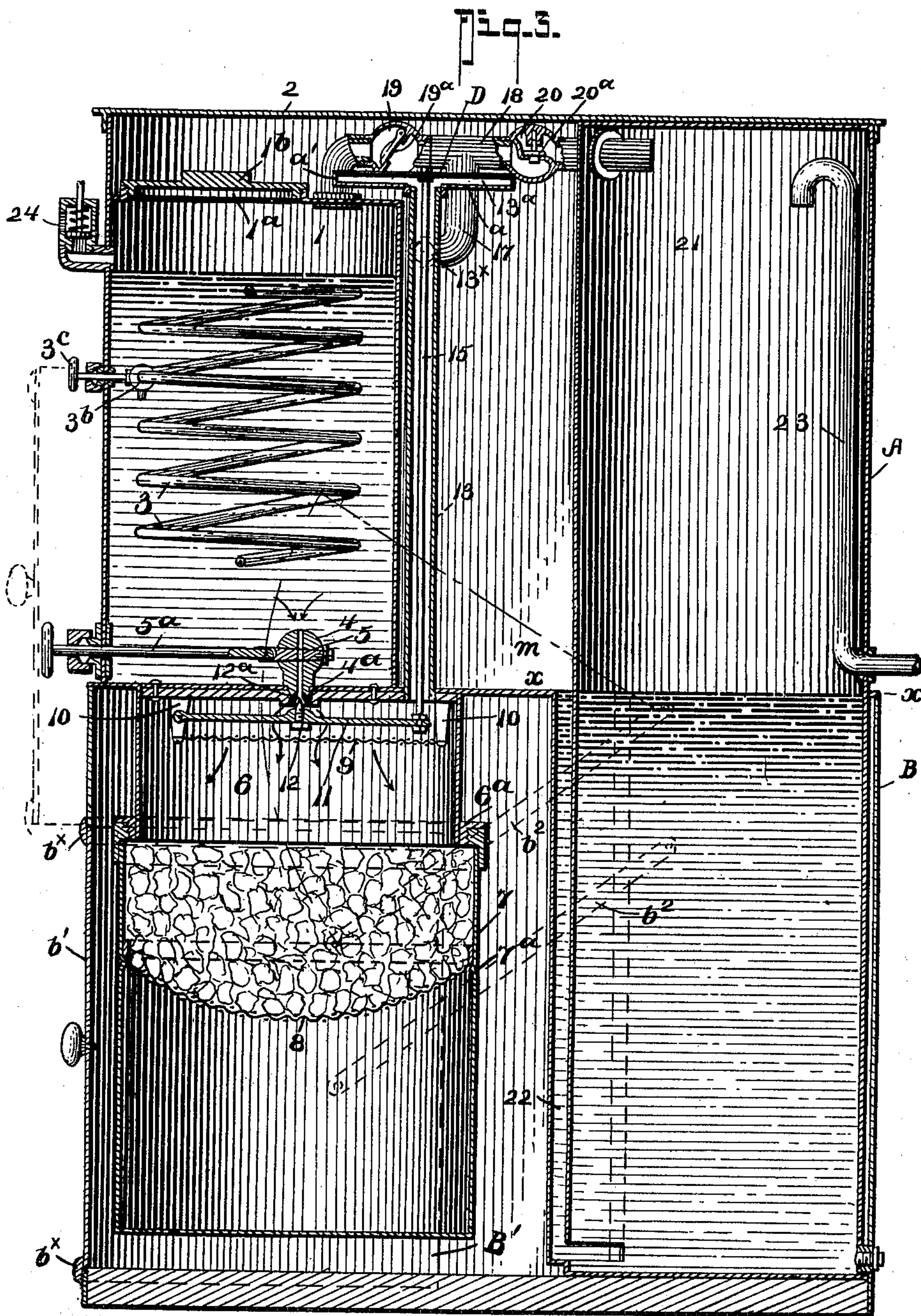
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UNITED STATES PATENT OFFICE.

EARL B. STONER, OF ASTORIA, OREGON.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 719,391, dated January 27, 1903.

Application filed April 17, 1902. Serial No. 103,418. (No model.)

To all whom it may concern:

Be it known that I, EARL B. STONER, residing at Astoria, in the county of Clatsop and State of Oregon, have invented a new and Improved Acetylene-Gas Generator, of which the following is a specification.

My invention is in the nature of an improved gas-generator, more especially adapted to generate and supply an illuminating-gas for locomotive-headlights; and the same primarily has for its purpose to provide a compact, simple, and inexpensive apparatus adapted to be conveniently supported between the headlight and the smoke-stack and in which the generating means is designed for automatically generating the gas proportionate to its consumption and under a substantially uniform pressure.

In its generic nature my invention comprehends a novel coöperative arrangement of carbide-holder, a water-feed, collecting-chamber, and valve-controlled means operable under varying gas-pressure, having a special constructive combination whereby the generator will maintain a substantial position and the several coöperating parts held in their proper operative condition under all of the ordinary running conditions of the engine.

In its more complete make-up my invention includes a new and novel means for automatically controlling the feed of the water to the carbide according to the pressure of the gas within the generator, to equalize the pressure in the water-holder and gas-collector, and to prevent the overflow of water from the water-holder, it also including a simple means for feeding the water into the water-holding tank from the boiler of the engine and for keeping the feed-water heated and from freezing.

In its more subordinate features my invention consists in certain details of construction and peculiar combination of parts, all of which will hereinafter be fully described, and specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of my invention. Fig. 2 is a plan view thereof, the top plate or cover being removed. Fig. 3 is a vertical longitudinal section of the same on the line 3 3 of Fig. 2. Fig. 4 is a detail view

of the shiftable diaphragm for controlling the water-feed-valve devices.

In the drawings, in which like numerals and letters indicate like parts in all the figures, my gas-generating means is constructed and has a shape suitable for its application to a headlight of a locomotive-engine, for which my invention is more especially intended; but I desire it understood that with slight modifications the same can be readily adapted for generating and supplying illuminating-gas for domestic purposes.

In the construction shown the body of my apparatus embodies a lower half B, which to make a convenient size of generator may be eight inches wide, seventeen inches long, and twelve inches high, and the upper part A of substantially the same size as shown.

For compactness the body is elliptical (see Fig. 2) and said body made up of sheet metal with a wooden or metallic base. In the upper half at one side is fixedly held a water tank or holder 1, provided with a feed-opening 1^a in the top, covered by a cap-plate 1^b, to which access may be readily had by lifting off the removable top 2, that covers the entire upper half, as clearly shown in the drawings. Water is fed through the opening 1^a when the tank 1 is not equipped with a heating means to keep the water therein from freezing. When thus provided, the tank 1 has a pipe-coil 3, which connects through the pipe-leads 3^a 3^a with the engine-boiler, and when the pipe-coil is used the same is provided with an escape-valve 3^b, (see Fig. 3,) controlled from the outside by the handle 3^c, by proper adjustment of which water may be led into the tank 1 direct from the engine-boiler.

In the bottom of the tank 1 is an offtake 4, controlled by a valve 5, having its rod or stem 5^a extended outside of the tank, (see Figs. 1 and 3,) whereby it can be conveniently adjusted to a closed, open, or partly-open position.

The offtake 4 discharges into the generating or carbide-holding chamber, and its outlet is formed with a valve-seat 4^a, the reason for which will presently appear. Surrounding the offtake-outlet 4^a is a pendent annular flange 6, provided with an internally-threaded flange 6^a, on which the externally-thread-

ed end of the carbid-holder 7 is detachably supported, said holder consisting of a cylindrical holder closed at the bottom to collect the carbid-ash and having an annular internal rim 7^a for supporting the carbid-holding cage or basket 8, as clearly shown in Fig. 3.

In line with the carbid-holder 7 the lower half B of the apparatus has an opening B' sufficiently large to admit of withdrawing and replacing the said holder 7, and this opening is normally closed by a swingable body-section b', provided with flanges b^x at the top and bottom to make a neat closure, and this section b' is supported on two arms b² b² at each side, the lower ends of which are pivotally joined to the section b' and the other ends to the stationary part of the body-section B, the connection of the arms b² being such that the door or closure portion b' will drop to its closed position by gravity, and by reason of said connection of the arms when swung up to the position shown in dotted lines in Fig. 3 the door b' will clear the valve-handle 5^a.

9 designates a perforated plate or screen secured on the lower ends of two lugs 10 10, pendent from the under side of the tank 1, which is provided to prevent the carbid when it expands from touching the valve-seat 4^a and controlling devices therefor.

11 designates a lever pivotally joined to one of the pendent lugs 10 and above the screen 9, and this lever carries an adjustable valve-plug 12, having a taper edge 12^a to engage with the valve-seat 4^a, which, to make a tight joint, is rubber-faced. The valve-plug 12 is utilized for regulating the drip of the water through the offtake when the main controlling-valve 5 is wholly or partly open. The means employed for controlling the plug-valve 12 is governed by the varying pressure of the gas within the apparatus, and the construction of said means and their coöperative arrangement with the valved leads for conveying the gas into the receiver and the water-tank forms an essential feature of my invention. The plug-valve-controlling means is best shown in Fig. 3, by reference to which it will be noticed an offtake-pipe 13 extends upward adjacent the water-tank 1, and this pipe has its entrant end in communication with the carbid-chamber. The outer end of the pipe 13 joins with a horizontal chamber 13^a, formed by a lower plate a, having an annular rim a' and an upper thin spring-plate or diaphragm D. A rod 15 joins with the free end of the lever 11, passes up the pipe 13, and is adjustably joined with the diaphragm by its shouldered end 15^a and the nut 16, said adjustment being provided for regulating the flexibility of the diaphragm D. The pipe 13 also has an outlet 13^x near its upper end, with which the pipe 17 connects and which in turn joins with a pipe 18, that connects the water-tank 1 with the gas-collector 21, presently again referred to, and the pipe 18 has two valve-chambers 19 and 20, one at each side of the connection with pipe 17. In the

chamber 19 is mounted a swinging or flap valve 19^a, and in the chamber 20 is a flat drop-valve 20^a, having such relation to the valve 19^a as to require a greater pressure to lift it, for the purposes hereinafter explained.

The gas-collector 21 extends the full height of the body portions A and B, and its lower part is utilized as a water-holder, the normal water-line of which is on a level with the bottom of the top section A. (See line *xx*, Fig. 3.) The bottom of the holder 21 has an outlet connecting with an overflow-offtake 22, the upper end of which discharges over the bottom of the upper section into the chamber or space *m*, and in the upper part of the holder 21 is a gas-offtake pipe 23 for leading the product to the headlight or for supporting the distributing-pipes for domestic lighting.

24 designates a safety-valve located at the normal water-line in the tank 1. The purpose in making the valve 19^a of less resistance than the valve 20^a is to obtain as near equal pressure on top of the water in tank 1 as the upward pressure in pipe 13 from the carbid-chamber, and the said valve also prevents water in the tank 1 from flowing into the gas-feed pipe 17.

The operation of my gas-generating apparatus is best explained as follows: The carbid and water supply in tank being as indicated in Fig. 3, the valve 5 is turned to permit the dropping of water onto the carbid, it being understood that at this time the plug-valve is at its open position. The gas generated passes up through the pipe 13 and from thence into pipe 17 and into the union 18 and against the valves 19^a and 20^a, valve 19^a being of the lightest resistance, the gas, when the pressure is sufficient to lift valve 19^a, passes into the tank 1 on top of water therein. When pressure in tank 1 is that required to open the valve 20^a, said valve 20^a opens and gas then flows into collector 21, an appreciable reduction of pressure in tank 1 during this operation being prevented by the check-valve 19^a. When pressure in collector and the tank 1 is equalized, both valves 19^a-20^a open, it being understood, as the gas pressure in tank 21 is maintained or cushioned by the water therein, which recedes by the pressure thereon, and overflows into space *m*. When the pressure exceeds that of a predetermined point, the said pressure then acts on the diaphragm D and lifts it, and in so doing the plug-valve is made to wholly or partly close the valved outlet 4^a from the water-tank 1.

It will thus be seen the operation of generating is entirely automatic and the feed of the water to the carbid controlled in a manner to effect a uniform production of the gas at all times. In case the consumption should not equal the supply the generation will be entirely cut off until the pressure against the diaphragm is insufficient to maintain it at its maximum expanded or raised position.

Changes in the details of construction and

general arrangement of parts may be readily made without departing from the scope of the appended claims.

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

10 1. In a gas-generator as described, a generator-shell, a water-tank therein, having a discharging-orifice in its bottom, an automatically-operating valve for controlling said orifice, shiftable by the varying gas-pressure, a carbid-holder detachably supported under said discharging-orifice, the shell having an opening adjacent the carbid-holder, and a
15 closure member for said opening closable by gravity, and means for swinging said member vertically to an open position, substantially as shown and for the purposes described.

20 2. In a gas-generator, the combination with the water-tank, the collector, said collector having a water-receptacle and an overflow therefor, a union-pipe joining the tank and the collector, a carbid-chamber, a valved discharge on the tank for passing the water to a
25 carbid-chamber, a gas-offtake from said chamber communicating with the pipe that joins the tank and the collector, a diaphragm-regulator, also connected to the offtake, said regulator including connecting-levers joined with
30 the valve for the water discharge, a valve in the union-pipe between the water-tank and the offtake-pipe, a second valve in the union-

pipe between the offtake-pipe and the collector, the latter valve being arranged to require a greater gas-pressure to open it than is re- 35 quired for the other valve in the union-pipe, all being arranged substantially as shown and for the purposes described.

3. The combination with the generator-shell, the water-tank, said tank having a dis- 40 charge, a pendent annular flange under the tank, a screen in said flange, a vertically-movable plug-valve adapted to engage with and close the tank-discharge, a carbid-holder detachably suspended on the annular flange, 45 a collector, a union-pipe joining the tank and the collector, a gas-offtake from the generating-chamber, discharging into the union-pipe, said union-pipe having check-valves 19^a and 20^a, the latter opening under a pressure 50 greater than that required for valve 19^a, the latter controlling the flow of gas into the tank 1, the valve 20^a controlling the flow of gas into the collector, and a diaphragm-regulator joined with the offtake-pipe, said regulator 55 including a stem within the offtake-pipe and a pivoted lever that supports the plug-valve, all being arranged substantially as shown and described.

EARL B. STONER.

Witnesses:

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