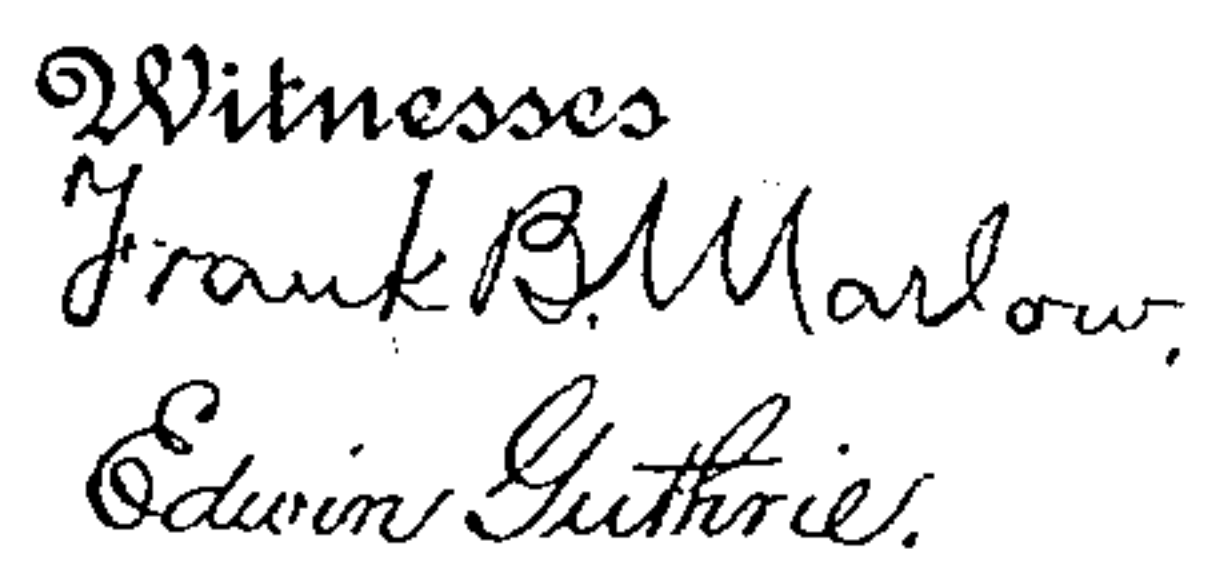


Generator and mixer.

PATENTED MAY 8, 1906.

GAS GENERATOR AND MIXER.

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UNITED STATES PATENT OFFICE.

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GAS GENERATOR AND MIXER.

No. 819,731.

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To all whom it may concern:

Be it known that we, JAMES B. CRAWFORD and EDWARD M. SINCLAIR, citizens of the United States, residing at Sioux City, in the county of Woodbury and State of Iowa, have invented certain new and useful Improvements in Gas Generators and Mixers, of which the following is a specification.

Our invention relates to gas generators and mixers, and has for its objects the production of apparatus for the purpose possessing particularly formed and arranged parts whereby sprayed gasolene and acetylene gas are separately generated and then intimately mixed in quantities that may be regulated with respect to each other. Carbide of calcium of any grade and quality may be employed, as the amount of acetylene in the mixture can be increased or decreased at will.

The particular construction and arrangement comprising our invention is illustrated in the accompanying drawings, of which—

Figure 1 represents vertical sections of the different portions of the apparatus situated side by side. Fig. 2 is a vertical section of the rotary atomizer, drawn on a slightly-enlarged scale. Fig. 3 is a face view of one form of indicator-dial by which the position of the needle-valve can be determined.

The same number is used to refer to the same part throughout.

Considering the drawings, numeral 1 marks the holder for the mixed gases, of which 2 designates the bell, 3 the outflow-pipe, and 4 the inflow. The walls of the holder and bell are doubled, as illustrated, to insure a more perfect seal and to prevent freezing. The space marked 5 between the walls of the holder may be filled with either water or oil as high as necessary. Pipe 4 leads out of the holder to a T, (designated by numeral 6,) and from the T pipes 7 and 8 extend up and down and include check-valves 9 of ordinary construction opening in the directions of the arrows. Pipes 7 and 8 are connected, as shown, to heads 10 and 11, situated at the top and bottom of the pump-barrel 12, of which the piston is marked 13 and its rod 14. The pump is double-acting. It may be made for hand operation, as shown, or driven in any convenient known manner. From the heads 10 and 11 pipes 15 and 16 extend downwardly and upwardly to the second T, which is re-

ferred to by number 17. Pipes 15 and 16 include check-valves 18 and 19, similar to those already mentioned and opening in the direction of the arrows beside them on the drawings.

Connected with the second T 17 is the rotary atomizer for the gasolene. This portion of our invention is also shown in Fig. 2 and comprises the gauze strip 20, bent into the shape of an auger-blade. It is attached top and bottom to the circular plates 21, that are secured to the central spacing screw-rod 22, and between the plates 21 and the annular shelf-plates 23 are placed balls 24, making the rotation of the atomizer practically frictionless. The annular shelf-plates 23 are supported interiorly by the casing 25.

Gasolene enters the atomizer from a suitably-supported tank 26 by pipe 27 and needle-valve 28, that controls the flow. Exteriorly we provide the dial-plate 29, as shown in Fig. 3, upon which the position of the needle-valve is indicated by the pointer 30. The needle-valve duct 31 opens in the seat 32 of the suction-valve 33. Valve 33 is normally held to its seat by coil-spring 34. It is usual to provide a drip-tube 35 and drip-cock 36, whereby any leakage of gasolene may be drawn off.

Acetylene enters T 17 by way of pipe 37, in which is included the cut-off valve 38 for regulating the amount. Pipe 37 enters holder 39, provided for the acetylene. The bell of this holder as well as the holder itself have double walls to prevent freezing. The letters X X mark the average water-line, and the holder is kept filled to this line. Secured centrally upon the base of the holder is a vertical guide-pipe 40, and movable up and down within it is the bell-guiding pipe 41, which insures the bell 42 against displacement sidewise as it rises and falls. Pipe 41 is usually fixed to the bell at its apex and passes downwardly outside the holder, where it is connected with arms 43 and 44. Arm 44 operates the valves 45 in pipe 46, leading from the water area of holder 39 into the carbide-holder 47. Arm 43 turns valve 48 in pipe 49, leading from the carbide-holder 47 into the acetylene-holder 39 and extending above the water-line. It will be understood that the outflow-pipe 37 from this holder is also extended above the normal water-line.

The water-pipe 46 has also a cut-off valve 50 to prevent entrance of water to the carbide when the apparatus is not in use.

Carbide-holder 47 is sufficiently strong to 5
confine any ordinary generation of gas, and its cover is held closed by the clamp-screw 51. A sudden excessive generation of acetylene would raise bell 42 sufficiently to expose the orifice 52 shown in the bell-guiding pipe 41. 10
As soon as that orifice is exposed above the water-line any accumulation of gas discharges into the air through the pipe 41, as will be understood.

In operation the pump-piston 13 draws 15
both gasoline and acetylene into the barrel of the pump, whether the piston be worked up or down. The rush of gasoline, partly reduced to spray by the needle-valve 28, rotates the auger-like gauze 20 and is still further divided. In the pump the two gases 20
are thoroughly mixed as the result of the regular action of the pump and their passage to and from it, and the mixture is forwarded by the pump to the holder 1, from which it flows 25
as used.

We are aware that it is not new to mix acetylene and gasoline atomized and that machines have been constructed for the purpose.

30 We claim the particular construction and arrangement of our apparatus as follows:

1. In a gas generator and mixer, the combination with a mixture-holder, of a pump, an atomizer connected with said pump, a suction-valve, an oil-supply connected with said suction-valve, a needle-valve, the suction-valve arranged to be operated by the suction of the pump, the casing of the said suction-valve having the needle-valve duct opening 40
through it and the said suction-valve being constructed and arranged to open and close the said duct, the casing of the suction-valve being connected with the said atomizer, an acetylene-generator having an outflow-pipe 45
connected to the said pump at the same point of connection of the said atomizer, and a valve in said outflow-pipe for controlling the flow of acetylene, substantially as described.

2. In a gas generator and mixer, the com-

bination with a mixture-holder, of a pump, a 50
rotary atomizer connected with the pump, an oil-supply, a suction-valve arranged to be operated by the suction of the pump, the casing of the said suction-valve having a duct opening through it and connected with the 55
said oil-supply, means for controlling the supply of oil to the said duct, the said suction-valve being constructed and arranged to open and close the said duct, the casing of the suction-valve being connected with the 60
said atomizer, an acetylene-generator having an outflow-pipe connected with the said pump, and a valve in the said outflow-pipe for controlling the flow of acetylene gas, substantially as described. 65

3. In a gas generator and mixer, the combination with a mixture-holder, of a pump, an atomizer connected with the said pump, means for supplying oil to the said atomizer, an acetylene-holder having an outflow-pipe 70
connected with the said pump, the said holder having a water seal, an acetylene-generator, a pipe connecting the water seal of the acetylene-holder with the acetylene-generator and having a cut-off valve, a pipe connecting the 75
said acetylene-generator with the gas area of the acetylene-holder and having a cut-off valve, and attachments whereby the said valves in both said pipes are operated by the movements of the acetylene-holder bell, sub- 80
stantially as described.

4. In a gas generator and mixer, the combination with a mixture-holder, of a pump, an atomizer connected with the pump, a suction-valve connected with the said atomizer, 85
an oil-supply connected with the suction-valve, means for controlling the oil-supply, and an acetylene-generator having an outflow-pipe connected with the said pump, substantially as described. 90

In testimony whereof we affix our signatures in presence of two witnesses.

JAMES B. CRAWFORD.
EDWARD M. SINCLAIR.

Witnesses:

ANNA C. TURNER,
MAE MANGOLD.