A. GRANDJEAN.

OIL FEED FOR CARBURETING APPARATUS.

APPLICATION FILED JUNE 4, 1907.

912,468.

Patented Feb. 16, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

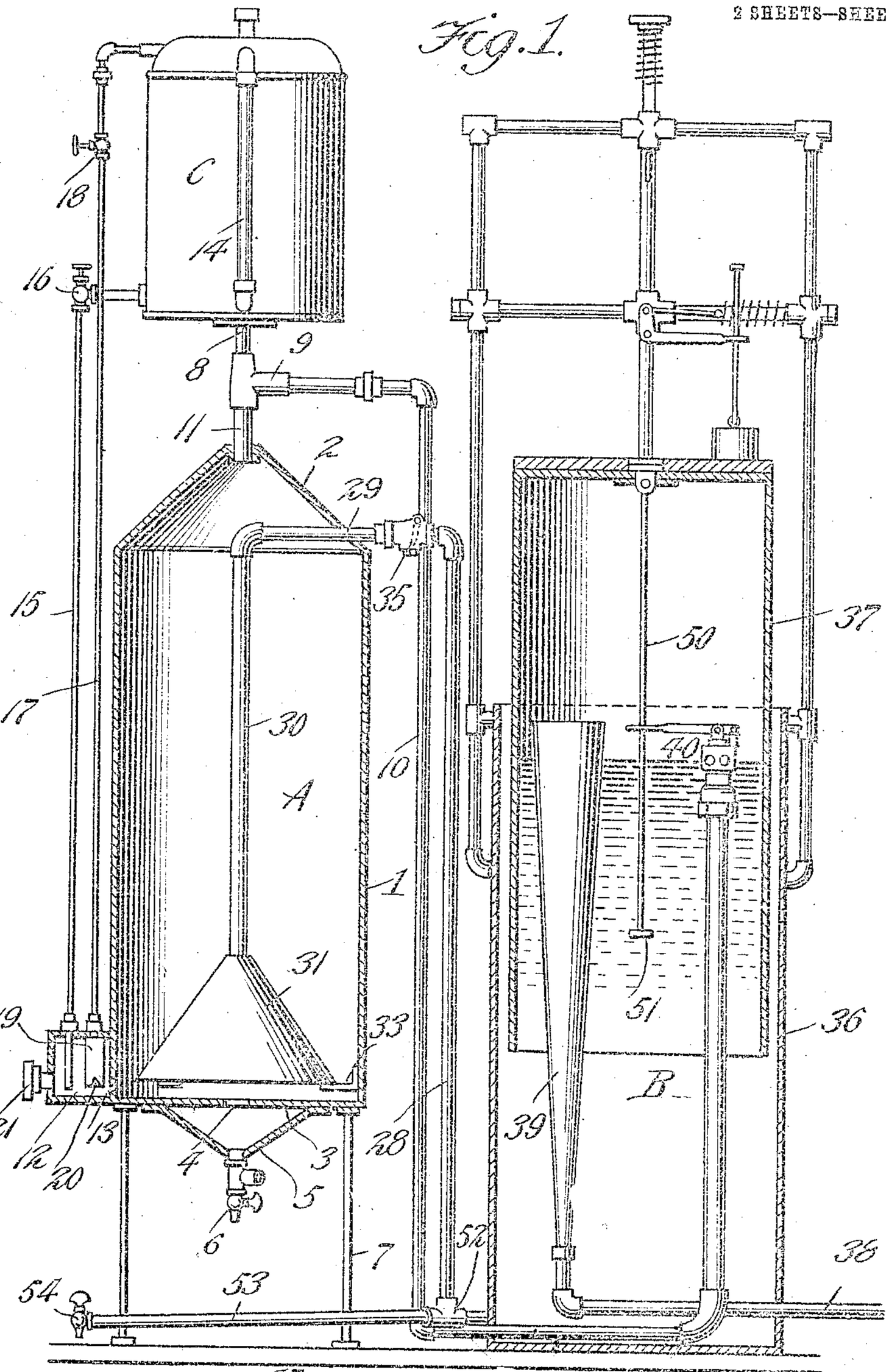
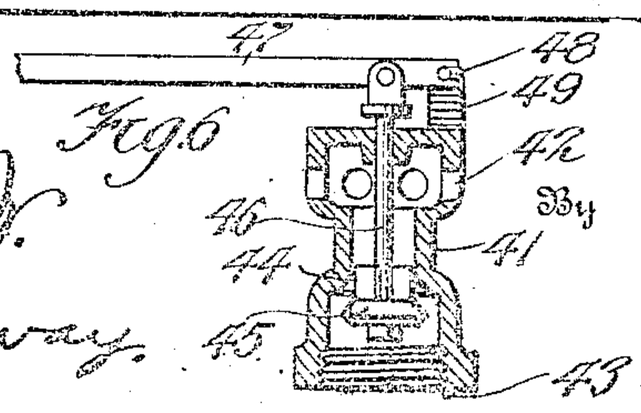


Fig. 6.



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2 SHEETS—SHEET 2.

Fig. 2.

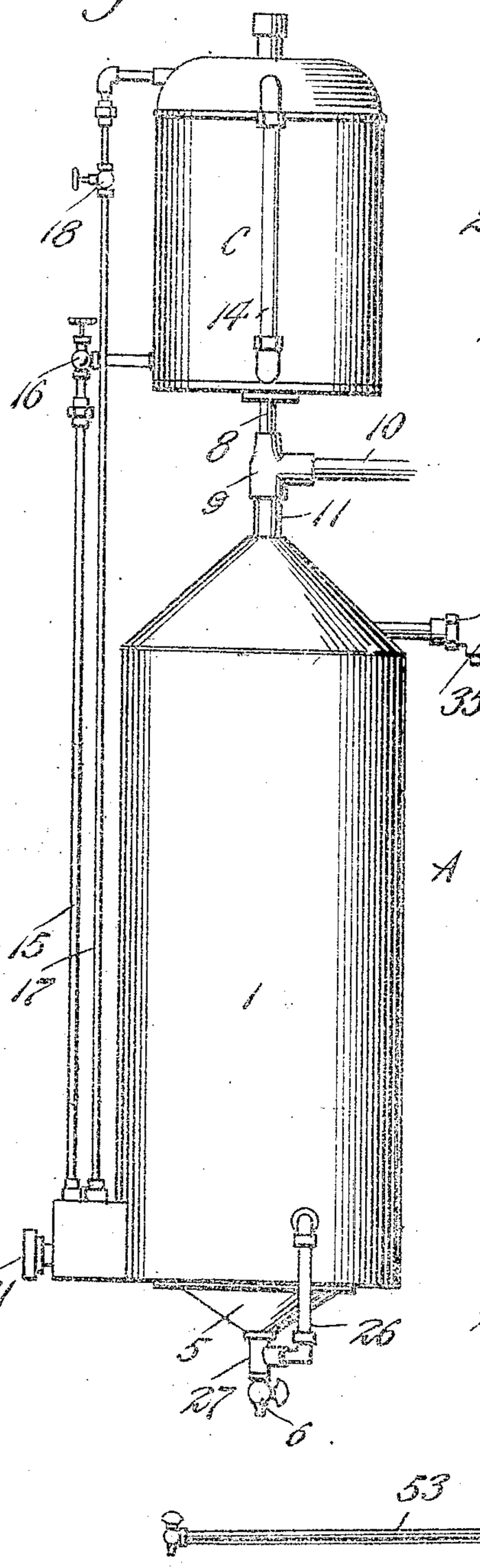


Fig. 5.

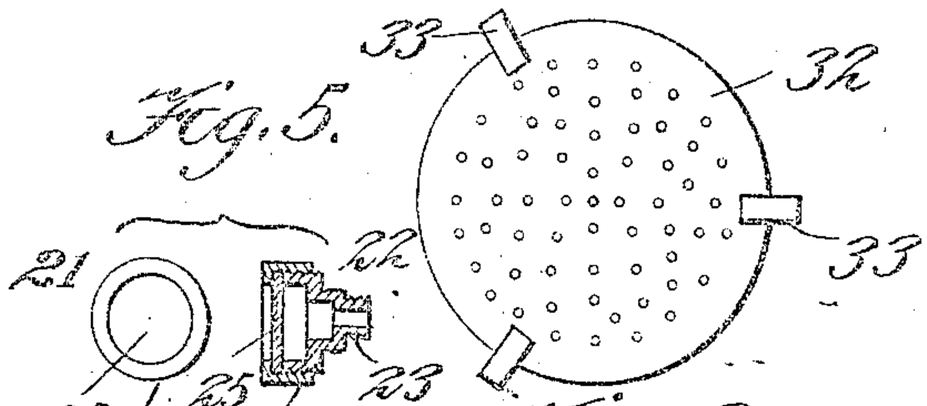
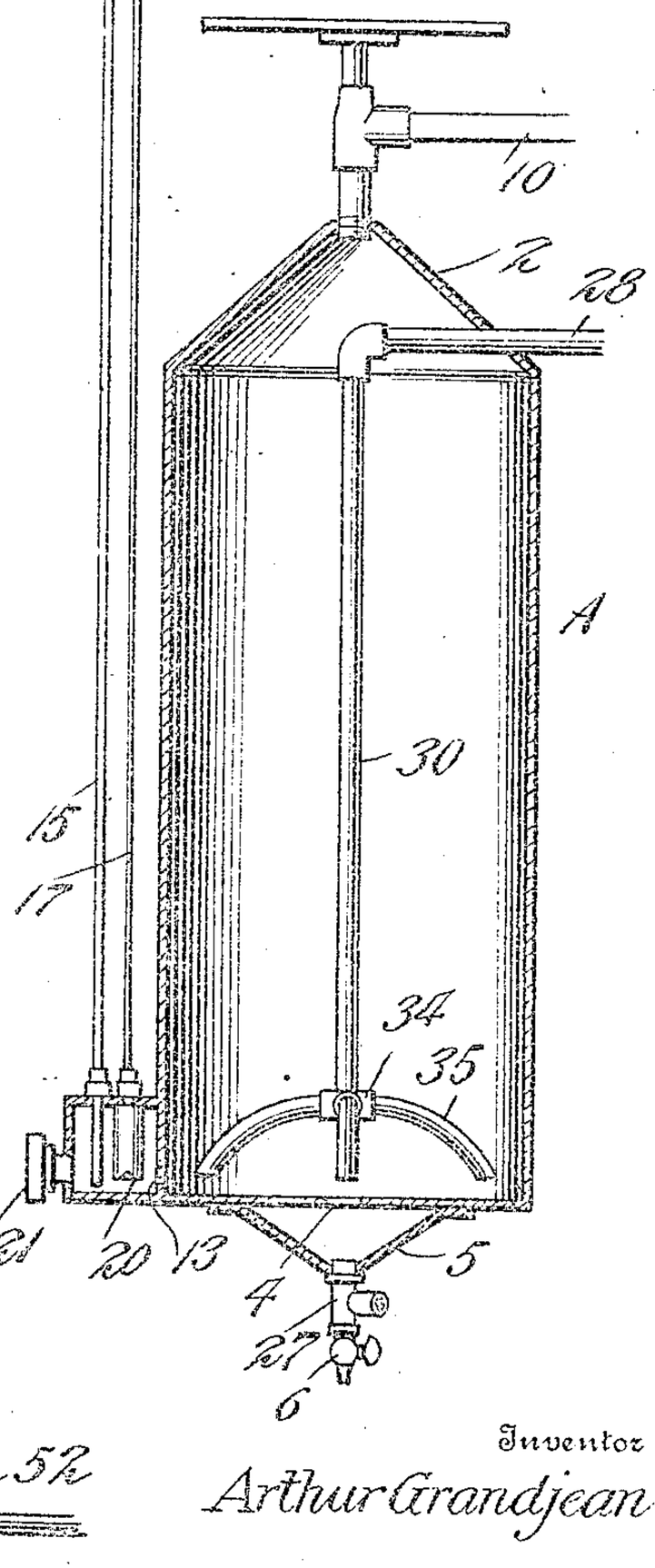


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

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OIL-FEED FOR CARBURETING APPARATUS.

No. 912,468. Specification of Letters Patent. Patented Feb. 16, 1909.

Application filed June 4, 1907. Serial No. 377,245.

To all whom it may concern:

Be it known that I, ARTHUR GRANDJEAN, a citizen of the United States, residing at San Diego, in the county of San Diego and State of California, have invented new and useful Improvements in Oil-Feeds for Carbureting Apparatus, of which the following is a specification.

This invention relates to carbureters of that type in which air under pressure is discharged through a comparatively shallow body of liquid hydro-carbon in the generating chamber of the apparatus.

The invention has for one of its objects to improve and simplify the construction and operation of apparatus of this character so as to be comparatively easy and inexpensive to manufacture, thoroughly reliable and efficient in use, and capable of automatically maintaining a supply of liquid hydro-carbon in the generator.

A further object of the invention is the provision of a generator in which a comparatively shallow depth of liquid hydro-carbon is maintained and which contains an air discharging device partially submerged in the liquid hydro-carbon for delivering the air under pressure downwardly to the same for producing a thoroughly carbureted mixture suitable for illuminating, heating or other purposes.

A still further object is the provision of an automatic feeding system whereby the level of the hydro-carbon can be maintained above predetermined minimum.

With these objects in view and others, as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate certain of the embodiments of the invention, Figure 1 is a central vertical section of a generating chamber and gasometer with associated parts in elevation. Fig. 2 is a side elevation of the generator and fuel supply tank. Fig. 3 is a central vertical section of the generator provided with a modified form of air discharging device. Fig. 4 is a bottom plan view of the air discharging device shown in Fig. 1. Fig. 5 represents detail views of the sight glass in the feed chamber of the generator. Fig. 6 is an enlarged sectional view of the air and gas valve of the gasometer.

Similar reference characters are employed to designate corresponding parts throughout the several views.

The carbureting apparatus shown in the present case is intended primarily for use in connection with the air supplying apparatus shown in applicant's co-pending application, Serial No. 289,465, filed Nov. 28, 1905, although it is to be understood that it is not necessarily limited to this type of apparatus.

Referring to the drawing, A designates a gas generator; B, the gasometer; and C, the source of fuel supply.

The generator comprises a hollow cylindrical body 1 having a conical top 2 and a flat bottom 3 provided with a drain opening 4, there being a funnel-shaped drainage chamber 5 into which sediment can collect and be drawn off through a drip cock 6. The generator is preferably supported on legs 7 and arranged in superimposed relation to the generator is the fuel tank or reservoir C. This tank rests on a bracket 8 that is secured in a T coupling 9 forming a part of the gas conducting pipe 10 that communicates with the generator at the top through the short connecting pipe 11. At one side of the generator adjacent the bottom thereof is a feed chamber 12 that communicates with the generator chamber through the inlet opening or port 13. The fuel tank C, which is provided with a sight glass 14 is connected with the feed chamber 12 by a vertically extending pipe 15 that connects with the tank C adjacent its bottom, there being included in the pipe a cut-off or controlling valve 16. The lower end of the pipe 15 extends to a point slightly short of the bottom of the chamber 12. Also extending between the feed chamber and fuel tank is an air equalizing pipe 17 that contains a controlling valve 18 and connects with the air space or top of the tank which latter is, of course, sealed so as not to be subjected to atmospheric pressure. In practice, the air pipe 17 is usually about one-eighth of an inch in diameter and at the bottom thereof is a short piece of pipe 19 about an inch in diameter, the same having its lower end almost on a level with the bottom of the port 13 and provided with a V-shaped notch 20 by means

of which air can be admitted to the pipe 17 when the level of the fuel falls to a certain minimum, it being understood that under normal conditions the lower end of the large pipe 19 is submerged. The normal level of the fuel in the feed chamber and generator is above the bottom of the pipe 19 and the bottom of the air discharging device, and when the level falls to a point at which air can enter the notch 20, the pressure in the fuel tank will become the same as that in the generator and thereby permit the liquid fuel to flow through the pipe 15 by gravity until the pressure in the generator reaches such a point as to interrupt the flow. In other words, upon the flow of fuel to the chamber 12, the liquid will rise and cover the notch 20 so that the continuance of the flow of fuel will tend to create a vacuum in the fuel tank, it being understood that the lower end of the pipe 19 will be sealed by the rise in level of fuel in the chamber 12.

The enlarging of the lower end of the air pipe is an important feature of the fuel supply means since it prevents the fuel from working upwardly and through the air pipe under certain conditions. It has been found in practice that when the pipe 17 is of small diameter throughout its length and the valve 16 of the fuel supply pipe 15 is closed, as for instance, over night, the fuel will work upwardly and back into the tank. But by enlarging the lower end of the air pipe, as shown, this objection is effectually overcome.

In order to ascertain the level at any time within the feed chamber 12, the latter is provided with a sight glass 21 which, as shown in Fig. 5, comprises a casting 22 having a threaded nipple 23 screwing into the wall of the chamber 12 and on which is threaded a ring 24 for holding a disk of glass 25 in place. There may also be provided a sight gage such as indicated at 26 in Fig. 2 that communicates at its lower end with the drain connection 27 and at its upper end with the generator at a point slightly above the maximum level of fuel therein.

The air to be enriched is supplied under a suitable pressure through a pipe 28 that extends upwardly along the gas connecting pipe 10 and passes horizontally into the conical top 2 of the generating chamber at 29 where it connects with a central vertical pipe 30. On the bottom of the pipe 30 is an air discharging device 31 which, as shown in Figs. 1 and 4, may be in the form of a hollow cone having a perforated bottom 32 by means of which the air is discharged into the fuel in the form of minute jets, the bottom of the device 31 being submerged in the liquid fuel. On the generator are horizontally extending internal brackets 33 on which the air discharging device 31 rests.

In Fig. 3, a modified form of air discharging device is shown, the same comprising a cross coupling 34 on the lower end of the pipe 30, which coupling is provided with radially extending and downwardly curved tubular arms 35 whose lower ends extend below the level of the liquid fuel in the generator. The air, which may be delivered to the generator by means of a pump connected with the pipe 28, is forced through the liquid fuel and thereby becomes thoroughly carbureted and collects in the space above the fuel from which it will be drawn off through the pipe 10 for any desired purpose. In the air supply pipe 28 is a check valve 35, preferably arranged in the horizontal portion thereof and adapted to open toward the generator and close the source of air supply.

Associated with the generator is the gasometer B that is connected therewith by the gas conducting pipe 10 which enters the bottom of the gasometer and extends upwardly therein to a suitable point. The gasometer comprises, as usual, a stationary water containing tank 36 in which is mounted for vertical movement, an inverted bell 37 that is sealed by the body of water in the tank and serves as a reservoir for the gas or carbureted air. The carbureted air is drawn off from the gasometer through a pipe 38 which is provided with an elongated funnel 39 at its inlet end which funnel has its upper end disposed above the maximum water level. The upper or discharge end of the portion of the gas conducting pipe 10 disposed in the gasometer is threaded for receiving a controlling valve 40. This valve, as shown in Fig. 6, comprises a casing 41 closed at its top and having side outlet openings 42. The bottom of the casing is internally threaded for screwing on the gas conducting pipe and above the internal thread 43 is an internal annular shoulder 44 forming a valve seat for receiving the valve 45. The valve is attached to a stem 46 that passes upwardly through the top of the casing and is hingedly connected with a lever 47 which is fulcrumed at 48 on a lug 49 formed on the valve casing. The lever is actuated by a rod 50 that passes upwardly through the outer free end of the lever and is provided with a stop or head 51 at its lower end and anchored at its upper end on the top of the bell. By this arrangement, the stop 51 engages the lever 47 when the bell is raised to its upper limit or is fully charged and thereby closes the valve 40.

When the apparatus is used in connection with a pump, such as is shown in the copending application above referred to, it is necessary at times to drain off water of condensation that collects in the air supply pipe 28, and for this purpose, the said pipe is provided with a T coupling 52 at its bottom with which is connected an inclined drain pipe 53, as shown in Fig. 1, which pipe has a drain cock 54 at its outer end.

Having thus described the invention, what I claim is:—

1. In an apparatus of the class described, the combination of a gas-tight casing provided with an opening in its side adjacent its bottom, an air supply device mounted in the casing having orifices located approximately at the same level as the opening, an air-tight chamber at one side and communicating with the casing through said opening, a fuel reservoir above the chamber, a pipe leading therefrom into the casing and terminating substantially on a level with the opening for feeding fuel by gravity to the chamber, an air-equalizing pipe communicating with the chamber and reservoir, and a tube disposed within the chamber and having its upper end connected with the air-equalizing pipe and having its lower end normally immersed in the liquid fuel in the chamber and also on a level with the opening.

2. In an apparatus of the class described, the combination of a gas-tight casing, a chamber supported thereon, a wall separating the chamber from the casing and provided with an aperture forming a means of restricted communication between them and located at a point below the top of the chamber, a fuel-containing reservoir, a pipe leading from the reservoir into the chamber and terminating at a point below the top of the said opening, an air-equalizing pipe communicating with the top of the reservoir and with the chamber, and a piece of tube of larger diameter than the equalizing pipe and connected with the latter and having its lower end terminating adjacent the said opening.

In testimony whereof, I affix my signature in presence of two witnesses.

ARTHUR GRANDJEAN.

Witnesses:
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C. K. HUDSON.