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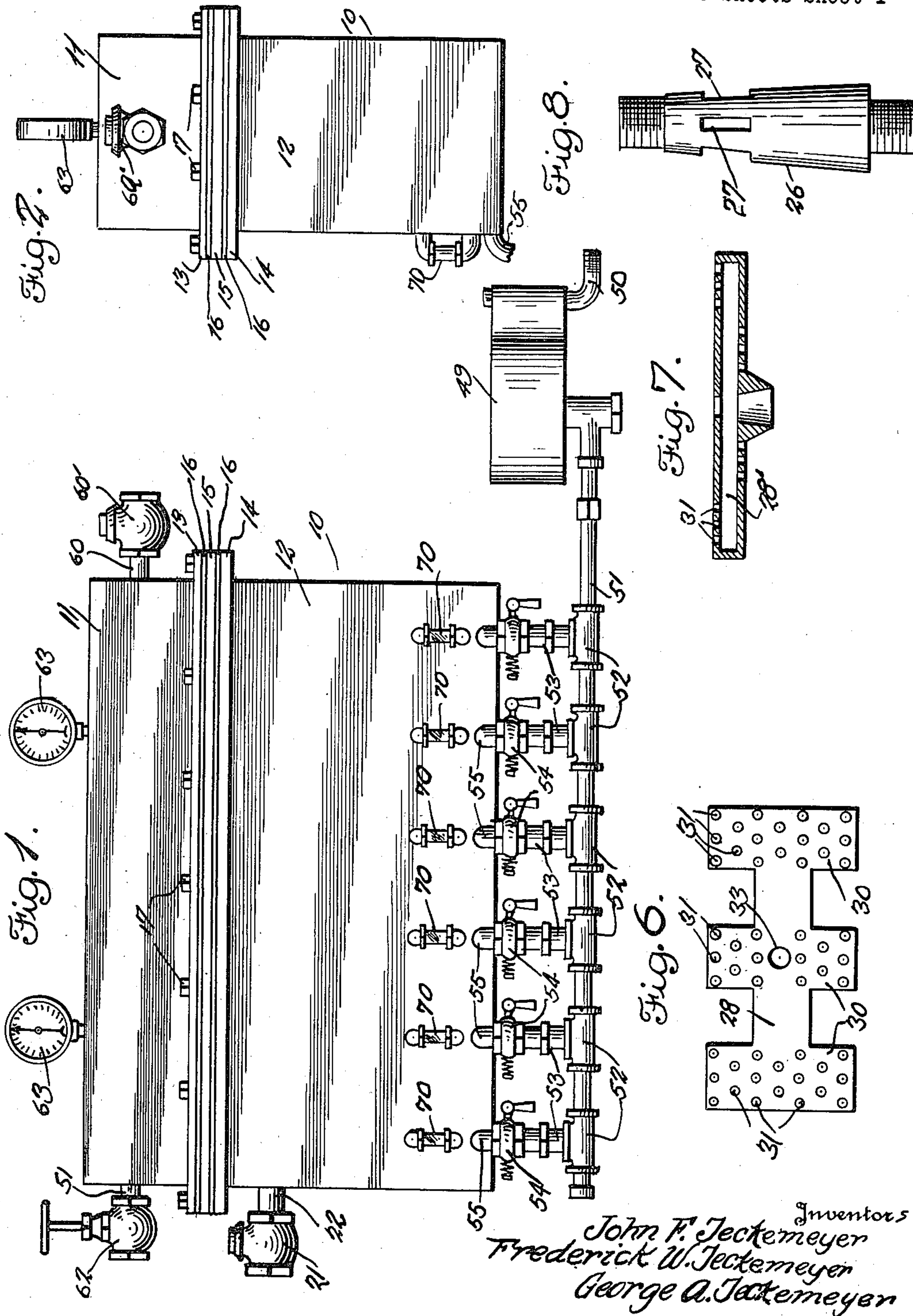
J. F. TECKEMEYER ET AL

2,011,598

GAS CONVERTER AND CLEANER OF THE LIQUID CONTACT TYPE

Filed July 1, 1933

3 Sheets-Sheet 1



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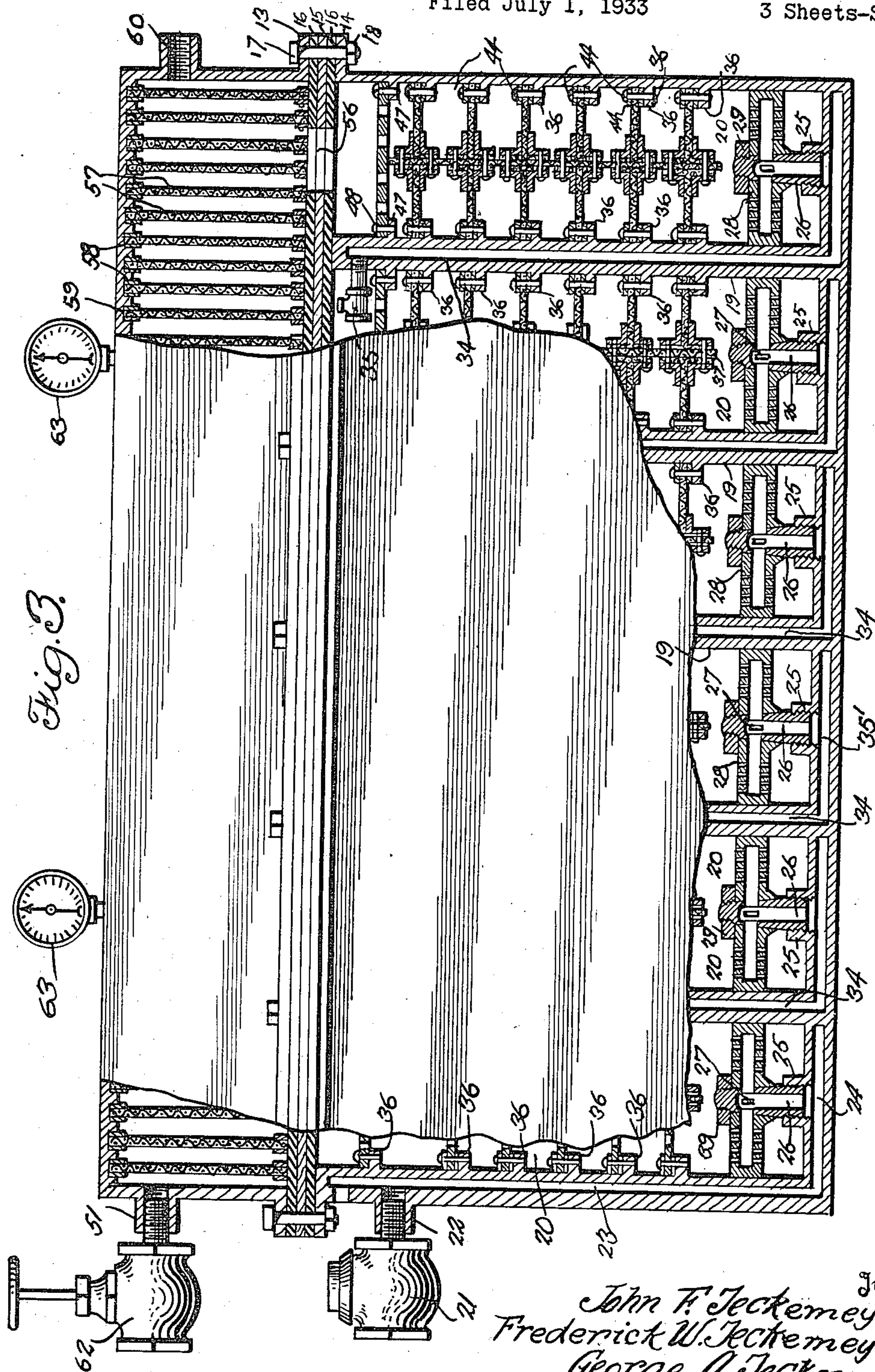
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# GAS CONVERTER AND CLEANER OF THE LIQUID CONTACT TYPE

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3 Sheets-Sheet 2



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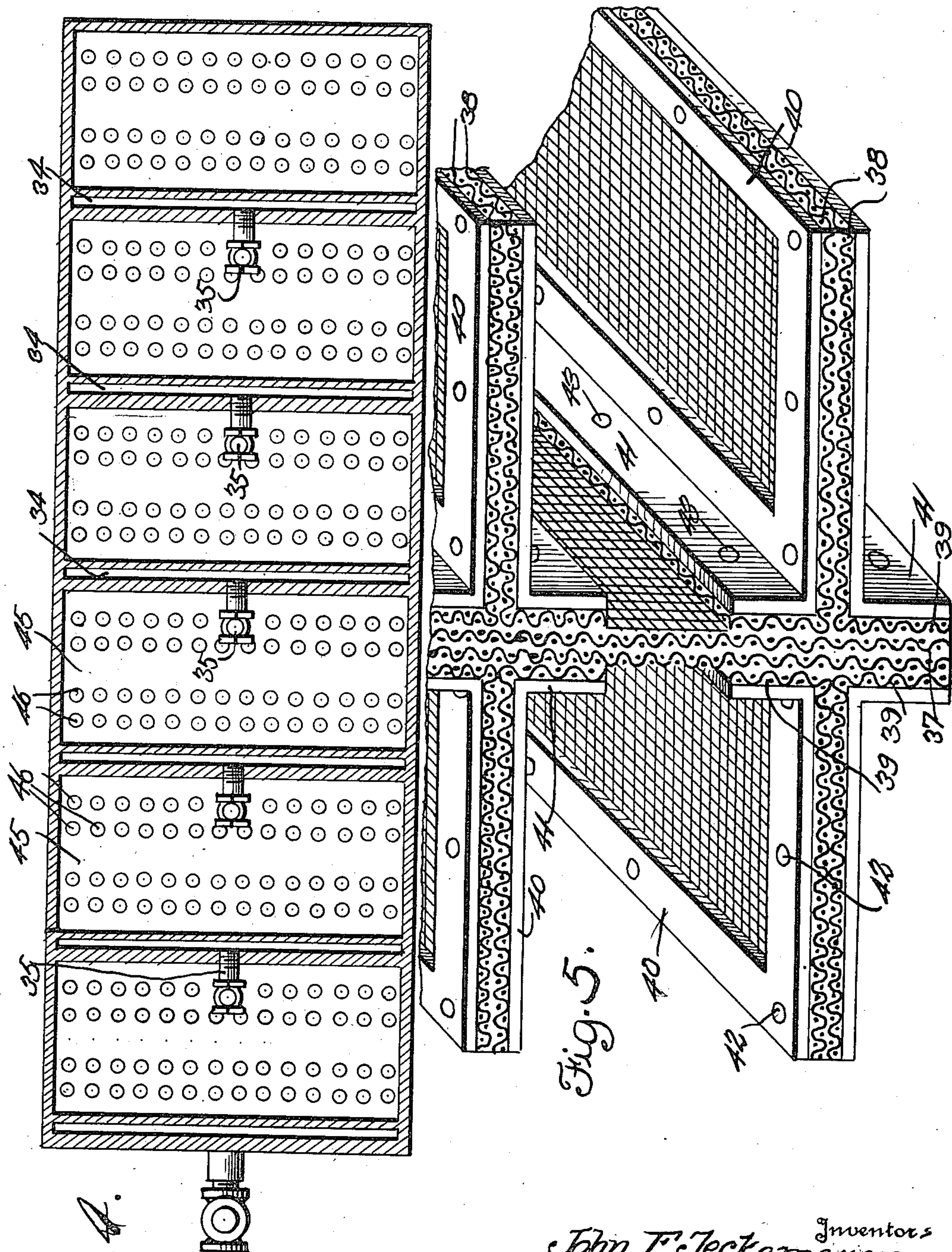
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GAS CONVERTER AND CLEANER OF THE LIQUID CONTACT TYPE

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3 Sheets-Sheet 3



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## UNITED STATES PATENT OFFICE

2,011,598

GAS CONVERTER AND CLEANER OF THE  
LIQUID CONTACT TYPE

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signors of twenty-two per cent to Loran L.  
Lewis, five per cent to Charles Bosau, two per  
cent to Chester Marquis, and five per cent to  
Norval R. Ward, Pittsburgh, Pa.

Application July 1, 1933, Serial No. 678,684

9 Claims. (Cl. 261—121)

This invention relates to certain new and useful improvements in gas converters and cleaners of the liquid contact type.

The primary object of this invention is to produce an apparatus adapted to effect the formation of a gas through the contact of air under pressure with any volatile liquid hydro-carbon, whereby said air becomes saturated and is then fed to a dryer and a cleaner, ready for use.

A still further object of this invention is to produce a device of the above mentioned character adapted to treat natural gas for the production of a super-illuminating gas particularly adapted to illuminating, cooking and other domestic and industrial purposes.

A still further object of this invention is to provide a device of the above mentioned character adapted to effect the formation of gas through the contact of air under pressure with any volatile liquid hydro-carbon or a petroleum whereby said air becomes saturated and is then fed to a drier and cleaner, ready for use.

A still further object of this invention is to provide a casing for a device of the above mentioned character having a series of partitions each provided with suitable ducts for the admission of air under pressure and each also provided with porous sheets uniquely arranged for the purpose of saturating the air under pressure with any volatile hydro-carbon liquid.

A still further object of this invention is to provide a cleaner in the upper portion of the casing having a series of spaced porous sheets such as fabric or the like for drying the saturated air and simultaneously cleaning the same for the production of a gas which has been found to be very valuable for household and industrial purposes.

A still further object of this invention is to provide a petroleum product feeding manifold for the admission of any volatile hydro-carbon liquid or the like to the casing which is controlled by means of a float chamber associated with the source of supply.

A still further object of this invention is to provide a novel supporting frame work for the porous contact sheets which will withstand the action of the compressed air.

Other objects and advantages of the invention will become apparent during the course of the following description, taken with the drawings and in which,

Figure 1 is a front elevational view of the device embodying this invention illustrating the formation of the casing and the liquid level indi-

cator tube for each of the compartments within the casing and further showing the manifold for connection to the source of liquid supply;

Figure 2 is an end elevational view of the casing illustrating the manner in which the upper and lower sections of the casing are secured or bolted together;

Figure 3 is an enlarged fragmentary side elevational view of the device embodying this invention showing a portion of the casing cut away to illustrate the internal construction of the casing and illustrating the position of the porous contact sheets, in the lower portion of the casing and the porous drier and cleaner sheets in the upper portion of the casing;

Figure 4 is a horizontal cross-sectional view taken through the lower portion of the casing directly above the porous contact sheets illustrating the perforated plates positioned thereabove and showing the valve connections between adjacent compartments;

Figure 5 is an enlarged perspective view of one of the porous contact sheet devices illustrating the supporting framework and showing the manner in which the same is constructed;

Figure 6 is a top elevational view of one of the air chamber plates which are positioned in the lower portion of the compartment for the admission of air thereto;

Figure 7 is a transverse cross-sectional view of the same illustrating the position of the opening and the air feed connection; and

Figure 8 is an enlarged vertical elevational view of the air feed to the spray jet device with the duct or passageway in the casing.

In the drawings, the reference character 10 designates in general a two-part casing including upper and lower complementary sections 11 and 12. The upper and lower sections 11 and 12 are provided with flanges 13 and 14 respectively between which is positioned a metallic plate 15 sandwiched between flexible packing elements 16 which may be formed of rubber or other packing material so that when the bolts 17 are passed through the flanges 13 and 14, tightening of the nuts 18 thereon will draw the sections 11 and 12 together thereby producing a water and air-tight connection.

The casing 12 is elongated and is provided with spaced partitions 19 forming chambers 20. A valve 21 is screw threaded in a boss 22 formed in the casing and said valve may be connected to a source of compressed air so that the same will be introduced to the vertical passageway 23 where it will find its way to the horizontal pas-



sageway 24 having an outlet 25 in which is screw threadedly secured a pipe 26 having lateral ports 27. Mounted on the pipe 26 is an air jet device 28 fastened in place by means of a nut 29. The air jet device 28 is provided with a central portion having perforated wings 30 for allowing the passage of air through the liquid contained in the tank by means of the apertures 31 formed in the spray jet device 28. It will be noted that the pipe 26 has its upper end tapered to be received in a correspondingly tapered opening 33 formed in the air jet device so that by tightening the nut 29 the airtight connection will be formed between the air jet device 28 and the vertical pipe 26.

It is intended to connect the upper portion of each chamber 20 with the lower portion of the adjacent chamber in the partitions 19 under control of ducts or passageways 34 by means of valves 35 positioned in the upper portion of the compartment so that the lower ducts 24 will communicate with the opening 26 formed in the pipes which are secured to the bosses 25 thereby allowing air to be conducted to the spray jet devices 28 in a circuitous path of travel through the casing 12. The construction of the air jet or spray devices in each of the compartments 20 is identical and it will readily be observed that by passing air into the valve 21 it will find its way through the boss 22 down the vertical passage 23 in the end wall of the casing to the horizontal duct 24 and then upwardly through the pipe 26 where it will pass to the top of the chamber 20 and will find its way out of the valve 35 into the next adjacent duct 34 formed in the partition 19 where it will again find its way to the lower horizontal duct 35' and to the communicating supported pipe 26.

Formed on the inner walls of the chambers or compartments 20 at spaced intervals are inwardly extending lugs 36 arranged in opposite relation for the purpose of supporting the porous contact sheets which include a vertically disposed sheet of fabric or the like 37 to which are connected a pair of laterally extending porous sheets 38 having angle portions 39 extending in opposite directions and lying or abutting flush with the vertical porous sheets 37 as illustrated in Figure 5. The vertical porous sheet 37 extends downwardly within the compartment or chamber 20 to nearly the bottom thereof as is clearly illustrated in Figure 3 and the porous sheets are supported by means of frame members 40 having inner angular portions 41 adapted to abut against the angular portions 39 of the laterally extending porous sheets 38. Bolts or fastening means 42 pass through the frames 40 for securely clamping the transverse porous sheets 38 together while the flange portions 41 of the frame 40 may be fastened by bolts or the like 43 for securely holding the lateral porous sheets 38 to the vertical porous sheets 37. After the vertical and laterally extending porous sheets have been assembled as shown in Figure 5, they may be positioned in the compartment so that the outer edges of the frame 40 rest upon the lugs 36 which extend inwardly from the side walls of the casing with the bolts 44 passed through the frame members 40 and the lugs 36 to securely hold the assembly in place.

In the upper portion of each of the compartments 20 is secured a perforated metallic plate 45 having air passageways 46 and supported by lugs 47 which extend inwardly from the upper portion of the casing. Bolts 48 may be passed

through the perforated plate 45 and lugs 47 in order to securely hold the same in place.

For the purpose of feeding a liquid volatile hydro-carbon product to the chambers 20, there is provided, a float controlled valve chamber 49 having a connection 50 with a source of any volatile hydro-carbon liquid whereby a predetermined amount is fed to the manifold pipe 51 which is provided with spaced T-joints 52 having connection with valves 54, the outlet of which extends as at 55 into the side wall of the casing 12 as clearly shown in Figure 1. The valves 54 are for the purpose of adjusting the supply of a volatile hydro-carbon liquid to the compartments or chambers 20 so that the liquid level will engage the lower portion of the porous sheets where it is fed to the central porous sheet 37 and will find its way upwardly by means of capillary attraction to the transverse porous sheet 38.

The saturated air will then pass through an opening 56 formed in the last compartment or chamber 20 and will pass into the upper portion 11 of the receptacle 10 thereby being fed to the upper portion 11 at one end thereof.

Secured in the upper section 11 is a series of spaced porous sheets 57 having marginal frame members 58 for being received in grooves 59 formed on the internal upper wall of the section 11. The porous cleaning sheets 57 may extend the entire length of the casing section 11 and may be held in place by the metallic sheets 15 and the packing sheets 16 interposed between the sections 11 and 12 of the casing 10. At one end of the upper section 11 there is provided a screw threaded boss 60 for receiving a clean-out plug not shown and the other end of the section 11 is provided with a screw threaded boss 51 for receiving an outlet valve 62.

Air pressure indicators 63 may be secured in the section 11 for determining the air pressure in the casing at each end thereof and the saturated gas will be cleaned by the porous sheets 57 and at the same time will dry the gas passing there-through before it reaches the outlet valve 62 which valve may be connected to a domestic house lighting system or may be connected to a gas stove or other domestic or industrial gas appliance.

It is to be understood that the air jet devices 28 are hollow and are formed with chambers 28' so that the pipe 26 may have the transverse port 27 communicating with the chamber 28' whereupon the air under pressure is fed to the lower portion of each of the chambers 20 through the apertures 31 where it bubbles through the volatile hydro-carbon product liquid fed to the bottom portions of the casing 10 through the feed manifold 51.

In Figure 1 is shown the connection 60' connected to the screw threaded boss 60 which may contain a valve or outlet pipe for collecting the gas before it has been passed through the drier and cleaner including the porous sheets 57.

A liquid level glass 70 may communicate with each of the compartments or chambers 20 for the purpose of indicating the liquid level of the liquid hydro-carbon product in order that the level may be kept up for assuring the efficient operation of the apparatus.

It is to be understood that the form of the invention herewith shown and described is to be taken as a preferred example of the invention and that various changes may be made in the shape, size and arrangement of parts without departing from the spirit and scope of the invention as claimed.



**We claim:—**

1. A gas producer of the character described comprising a casing formed of upper and lower sections, an air passageway formed in the lower section, an air jet chamber mounted in the bottom of the lower section and spaced from the bottom wall thereof, a vertical porous sheet extending upwardly from the bottom of the lower section, laterally extending porous sheets extending from the vertical porous sheets and means for feeding a liquid to the bottom section of the casing.

2. A gas producer of the character described comprising a casing composed of upper and lower sections, an air duct formed in the lower section having communication with a source of air under pressure, an air jet chamber located in and spaced from the bottom wall of the lower section, means for admitting liquid to the lower section, and a liquid contact device mounted above the air jet chamber comprising a vertical porous sheet, laterally extending porous sheets connecting the vertical porous sheet and a frame for holding the porous sheets in position.

3. A gas producer of the character described comprising a casing composed of upper and lower sections, an air duct formed in the lower section having communication with a source of air under pressure, an air jet chamber located in the lower section and spaced from the bottom wall thereof having communication with the air duct, a vertical porous sheet mounted in the lower section, a plurality of laterally extending porous sheets secured to the vertical porous sheet, means for feeding a liquid to the porous sheets whereby air may bubble therethrough and pass upwardly through the saturated porous sheets, and means in the upper section of the casing for drying and cleansing the saturated air.

4. A gas producer of the character described comprising a casing composed of upper and lower sections, an air jet chamber mounted in the lower section and spaced from the bottom wall thereof, said air jet chamber having communication with a source of air pressure, a vertical porous sheet mounted in the casing extending downward therein to nearly the bottom thereof, a series of laterally extending porous sheets connected with the vertical porous sheet, means for feeding a liquid to the vertical porous sheet and a gas cleaner mounted in the upper section of the casing for drying the gas formed in the lower section.

5. A gas producer of the character described comprising a casing composed of upper and lower sections, a series of partitions mounted in the lower section forming adjacent compartments, an air duct extending through each compartment from the top to the bottom thereof, an air jet chamber connecting the lower extremity of the air duct in each compartment, said air jet chamber comprising a hollow perforated casing supported above the bottom wall of the lower section, the upper end of each air duct having communication with the adjacent compartment, a vertical porous sheet mounted in each compartment, laterally extending porous sheets connected with the vertical porous sheet, rectangular frames for supporting the porous sheets, means for feeding a predetermined supply of liquid to each compartment for the saturation of the porous sheets, whereby air under pressure will bubble through the liquid and pass upwardly through the porous

sheets and means mounted in the upper section of the casing for cleaning the saturated air after it has passed through each of the compartments.

6. In a gas producer of the character described, a casing having a series of communicating compartments, means for feeding a petroleum product to the lower end of each compartment, an air jet chamber in the lower end of each compartment normally submerged in the petroleum product, a series of superposed liquid contact sheets in each compartment above the air jet chamber, and means in the upper end of the casing for purifying and drying the saturated air in its passage from the casing, each air jet chamber having top and bottom perforated walls and an air inlet in its bottom wall whereby air is caused to bubble through liquid surrounding the air jet chamber.

7. In a gas producer of the character described, a casing having a series of communicating compartments, means for feeding a petroleum product to the lower end of each compartment, an air jet chamber in the lower end of each compartment normally submerged in the petroleum product, a series of superposed liquid contact sheets in each compartment above the air jet chamber, and means in the upper end of the casing for purifying and drying the saturated air in its passage from the casing, each air jet chamber having top and bottom perforated walls and an air inlet in its bottom wall whereby air is caused to bubble through liquid surrounding the air jet chamber, and a porous element extending through the liquid contact sheets for feeding liquid thereto by capillary attraction.

8. In a gas producer of the character described, a casing having a series of communicating compartments, means for feeding a petroleum product to the lower end of each compartment, an air jet chamber in the lower end of each compartment normally submerged in the petroleum product, a series of superposed liquid contact sheets in each compartment above the air jet chamber, and means in the upper end of the casing for purifying and drying the saturated air in its passage from the casing, each air jet chamber comprising a casing having perforated top and bottom walls, an air supply pipe attached to the casing and outletting interiorly thereof whereby air escapes through the top and bottom perforated walls for bubbling upwardly through the liquid for contact with the liquid contact sheets.

9. In a gas producer of the character described, a casing having a series of communicating compartments, means for feeding a petroleum product to the lower end of each compartment, means for supplying air under pressure to one end of the casing for travel through the compartments, an air jet chamber in the lower end of each compartment and liquid contact means in each compartment including a series of superposed porous liquid contact sheets and a single porous element in contact with the sheets for conveying liquid thereto by capillary attraction, and the air jet chambers being operative for moving liquid laden air bubbles upwardly in the compartments for contact with the liquid contact sheets, and means in the upper end of the casing for purifying and drying the saturated air before passage from the casing.

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