

No. 671,042.

Patented Apr. 2, 1901.

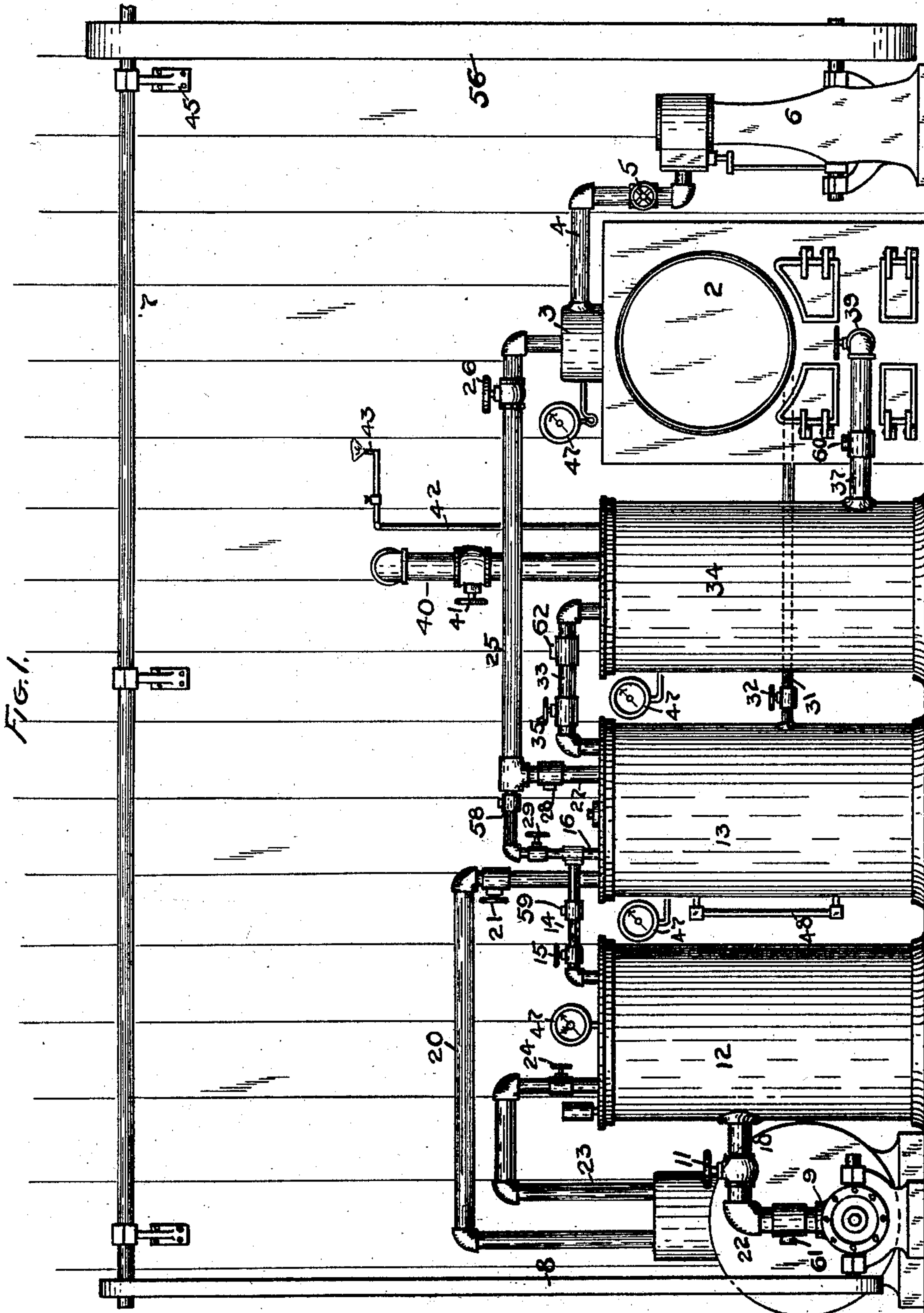
D. BARCKDALL & W. J. WOODWARD.

CARBURETER.

(Application filed Feb. 19, 1900.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:
G. H. Blaker,
M. C. Buck.

INVENTORS.
Daniel Barckdall and
Willis J. Woodward.
BY
V. H. Lockwood
His ATTORNEY.

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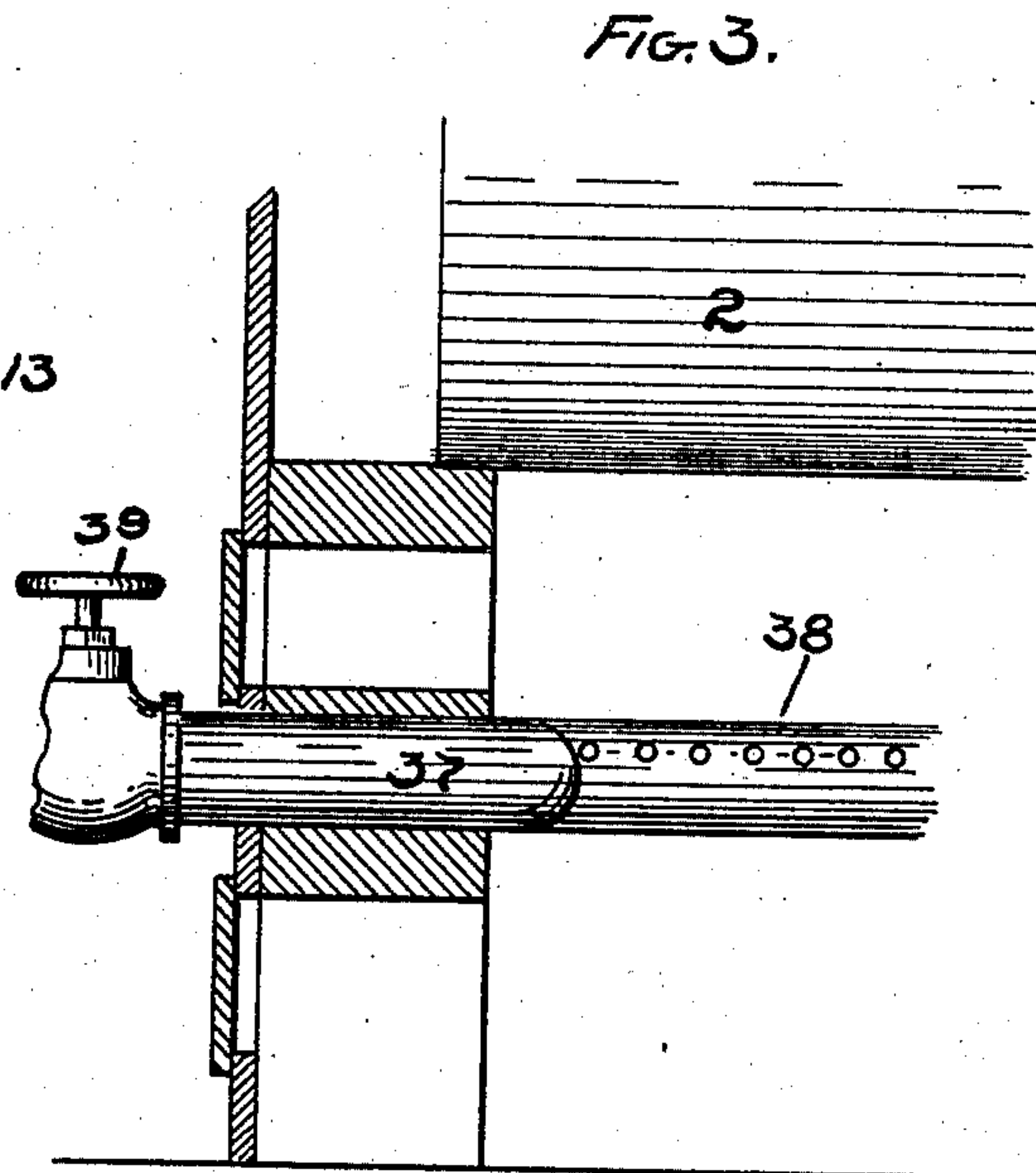
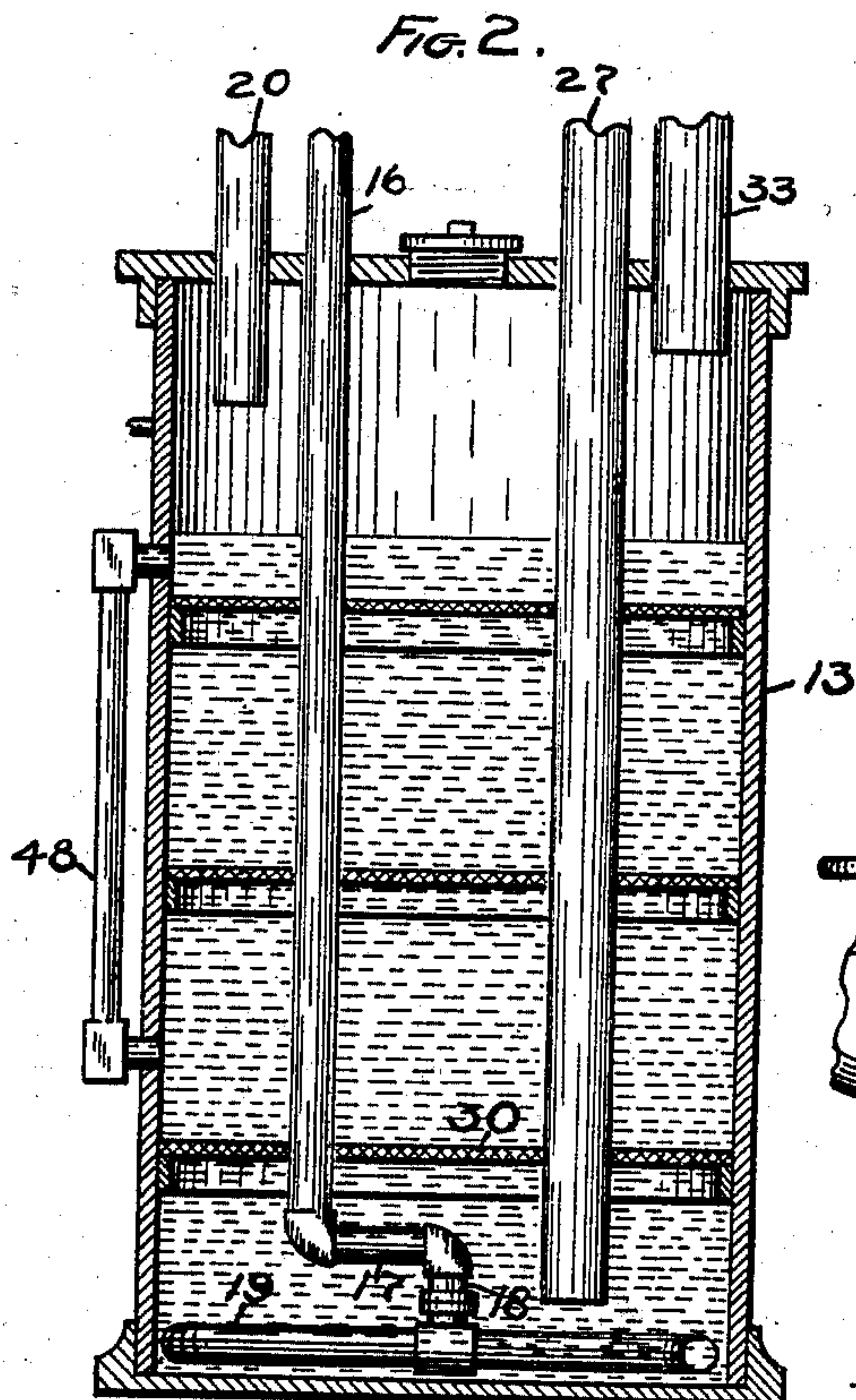
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UNITED STATES PATENT OFFICE.

DANIEL BARCKDALL AND WILLIS J. WOODWARD, OF INDIANAPOLIS,
INDIANA, ASSIGNORS OF ONE-THIRD TO GUILFORD A. DEITCH, OF
SAME PLACE.

CARBURETER.

SPECIFICATION forming part of Letters Patent No. 671,042, dated April 2, 1901.

Application filed February 19, 1900. Serial No. 5,793. (No model.)

To all whom it may concern:

Be it known that we, DANIEL BARCKDALL and WILLIS J. WOODWARD, of Indianapolis, county of Marion, and State of Indiana, have
5 invented a certain new and useful Gas-Making Apparatus; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like numerals refer to like parts.

The object of this invention is to provide a gas-manufacturing plant that will greatly reduce the cost of the manufacture of gas below that of apparatus now generally in use.
15 The gas formed therefrom is a combination of a gas formed by the passage of air through a hydrocarbon liquid, like oil, and the vapor arising from the passage of air through water. The oil and water are commingled in the carbureting-tank, and air is forced under considerable pressure through said body of water and oil. Mixed with the incoming air in the device shown, or separate, if desired, steam is introduced into the hydrocarbon-tank.
25 This steam maintains the hydrocarbon in a heated condition, which tends to render it more susceptible to volatilization. The steam also upon entering said tank is condensed and furnishes to said tank the supply of water after the initial supply of water has been furnished to the tank. This initial supply of water comes, preferably, from the boiler and is heated; but after the machine is started further supply from such source is needless.
35 The chief effect and advantage of such means for generating gas is in the cheapness. No outside fuel is required for the furnace or boiler, but the same is heated by the generated gas. After the initial heating of the boiler the gas
40 stored in the apparatus can be drawn on to start as well as to maintain the fire in the furnace under the boiler, whereby the steam is supplied as well as the air furnished under suitable pressure for the manufacture of gas.

45 Aside from the broad invention above set forth the specific invention consists in the combination of the hydrocarbon-tank, means for supplying oil and water to said tank, a pump to force air through said carbureting-tank, and a boiler that supplies steam to said

carbureting-tank and also drives an engine for operating said pump.

The full nature of our invention will be understood from the accompanying drawings and the description and claims following of
55 one form of device embodying our said invention, and the scope of the invention will be understood from the claims following said description.

In the drawings, Figure 1 is a front elevation of our gas-making plant. Fig. 2 is a central vertical section of the carbureting-tank. Fig. 3 is a vertical section of a portion of the front end of the furnace and boiler.

In detail, 1 is a furnace provided with a suitable steam-boiler 2, having above it the steam-drum 3. The steam through the pipe 4, having in it the valve 5, drives the engine 6. The engine drives, through the belt 56, the counter-shaft 7, mounted above. Said counter-shaft drives, through the belt 8, an air-pump
65 9. Said air-pump forces air through the pipe 10, which has a valve 11, into the air-tank 12. The air is compressed in said tank 12 and enters the carbureting-tank 13 through the pipe 14, that is controlled by the valve 15, and the vertical pipe 16, that extends down to a point near the bottom of the tank 13, where it is bent at 17 to extend to the center of the tank, and to the extreme end 18 an S-shaped outlet-pipe 19 is so mounted as to be horizontally rotatable by the pressure of air issuing from it.
75 80

The carbureting-tank is supplied with oil through the inlet-pipe 20, having the valve 21, that leads from the bottom of the oil-tank 22, said oil being forced up by the air from the tank 12 entering the oil-tank through the pipe 23, which has the valve 24. Along with the incoming air steam is introduced also into said carbureting-tank 13 through the pipe 16, the steam coming from the drum-head 3 by means of the pipe 25, having the valves 26 and 29. A separate steam-pipe 27, having the check-valve 28, extends to the lower end of the carbureting-tank 13. It is used instead
95 of the pipe 16 or along with the pipe 16 when desired for the introduction of steam. The carbureting-tank is provided with a series of horizontal perforated plates or screens 30 for the distribution of the various elements that
100

enter said carbureting-tank—the air, steam, water, and oil. Hot water is supplied to the carbureting-tank 13 by a pipe 31, that leads from the boiler and has in it a valve 32.

5 A pipe 33 leads from the upper end of the carbureting-tank 13 into the gas-tank 34 and has in it a valve 35. Through this pipe the gas which is formed is stored in said tank 34. From said tank a pipe 37 leads to the burner
10 38 in the furnace and is regulated by the valve 39. The main supply-pipe 40 leads from the upper end of the tank 34 to any place where the gas is to be used, it being regulated by the valve 41.

15 42 is a pipe leading to an illuminating-burner 43.

The counter-shaft 7 is supported on the wall of the building in which the plant is located by the brackets 45. Suitable pressure-
20 gages 47 are provided for all tanks in the apparatus.

48 is a fluid-gage on the carbureting-tank. Suitable check-valves 28, 58, 59, 60, 61, and 62 are provided to prevent backflow of gases
25 or fluids.

The operation of the device is as follows: Supposing from the prior use of the apparatus gas is already stored in the tank 34, the valve 39 is opened to let the gas through the
30 pipe 37 into the burner 38 and start the furnace. Water is let into the carbureting-tank through the pipe 31 from the boiler as soon as it becomes warm by opening the valve 32. When there is sufficient water in the carbureting-tank, the valve 32 is closed. After
35 sufficient steam is generated in the boiler the valve 5 is opened and the engine started. The engine in turn actuates the air-pump 9, and by opening the valve 11 the tank 12 is
40 supplied with air to any degree of pressure desired. The carbureting-tank is then supplied with oil from the tank 22 by opening valves 21 and 24, whereby the oil is forced through pipe 20 by the air under pressure
45 from pipe 23 into the tank 13 until sufficient has flowed in, as indicated by the gage 48. Then the valve 15 is opened, which allows the air from the tank 12 to pass down through the pipe 16 to the lower end of the carbureting-tank. At the same time the valve 26 is
50 opened, letting steam from the boiler enter the carbureting-tank through the pipes 16 and 27. The steam maintains the oil in a warm condition, and part condenses and part
55 passes through the hydrocarbon. The air is forced through the water and oil in the carbureting-tank, taking with it the vapor from the water and particles of the oil, the combi-

nation forming a gas of very fine quality. By opening the valve 35 the gas as generated
60 passes into the receiver 34. It is conveyed therefrom through the main 40 to the places for use.

The relative quantity of air and steam entering the hydrocarbon-tank is regulated by
65 the valves 15, 26, and 29.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In a gas-making apparatus, a hydrocarbon-tank, means for supplying oil or hydro-
70 carbon thereto, an air-inlet pipe entering the upper end of said tank and extending to a point near the lower end, means for forcing air through said pipe, and an independent
75 steam-inlet pipe entering the upper end of said tank and open at its lower end and extending to a point near the lower end.

2. In a gas-making apparatus, a hydrocarbon-tank, an oil-supply tank, means for conveying the oil from said oil-tank to the hydrocarbon-tank, a hot-water tank, means for
80 conveying water from said tank to the hydrocarbon-tank, and means for forcing air through the fluids in said hydrocarbon-tank.

3. In a gas-making apparatus, the combination of a hydrocarbon-tank, means for supplying oil to said tank, means for supplying
85 water to said tank, a boiler, means for supplying steam from said boiler to said tank, an air-pump, and means for forcing air from said
90 pump through the fluids in the hydrocarbon-tank.

4. In a gas-making apparatus, the combination of a hydrocarbon-tank, a gas-tank, means for conveying the gas as generated from
95 the hydrocarbon-tank into said gas-tank, a steam-boiler, means for conveying gas from said gas-tank for heating said steam-boiler, a steam-engine driven from said boiler, an air-tank, a pump driven by the steam-engine for
100 compressing air in said tank, an oil-supply tank, means for conveying the oil therefrom to the hydrocarbon-tank, a steam-pipe leading from the boiler to the hydrocarbon-tank, and a pipe leading from the air-tank to the
105 lower end of the hydrocarbon-tank, substantially as set forth.

In witness whereof we have hereunto affixed our signatures in the presence of the witnesses herein named.

DANIEL BARCKDALL.
WILLIS J. WOODWARD.

Witnesses:

M. C. BUCK,
V. H. LOCKWOOD.