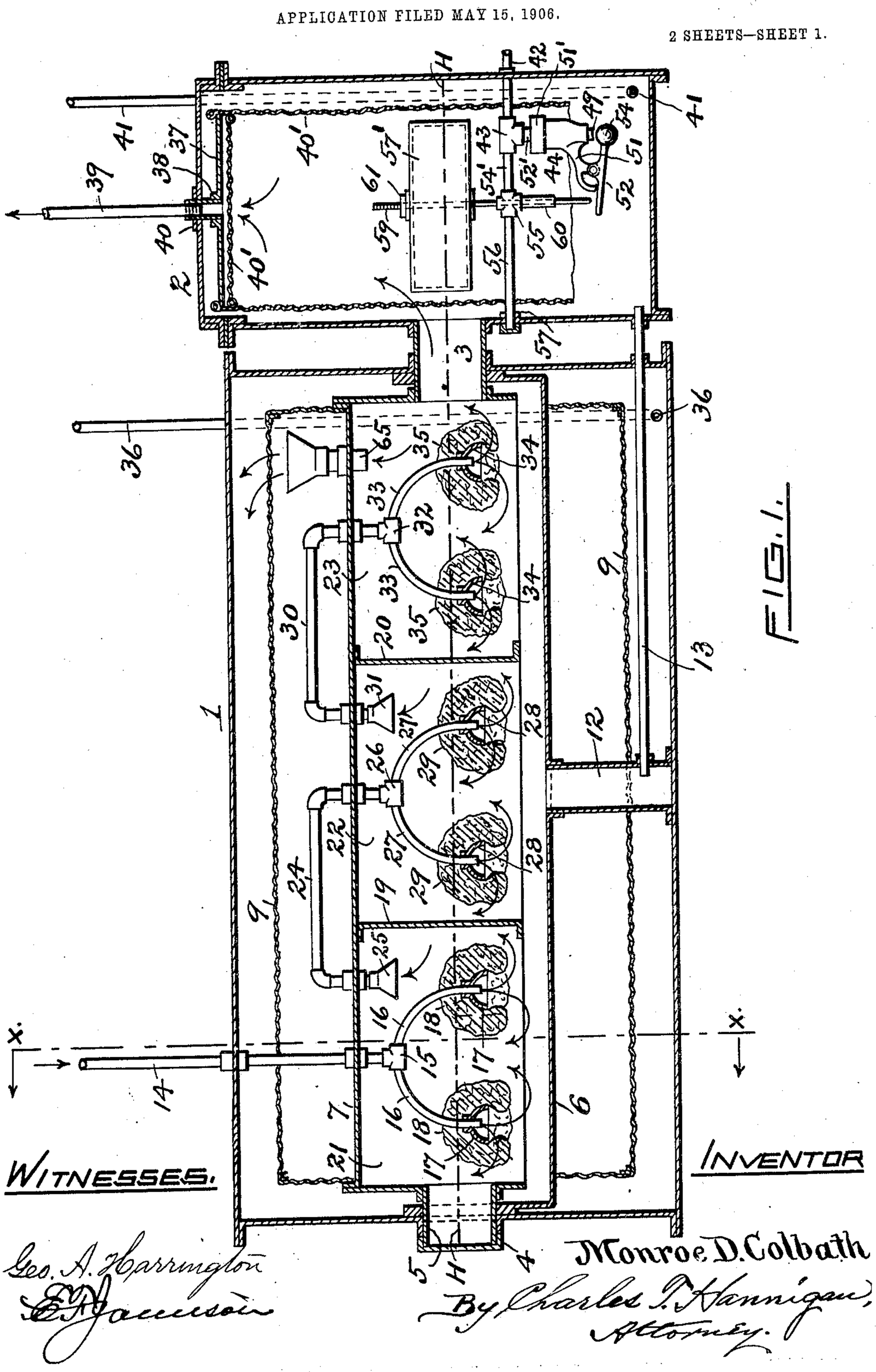
No. 844,995. PATENTED FEB. 19, 1907.

M. D. COLBATH.

CARBURETER.

APPLICATION FILED MAY 15, 1906.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

FIG. 3.

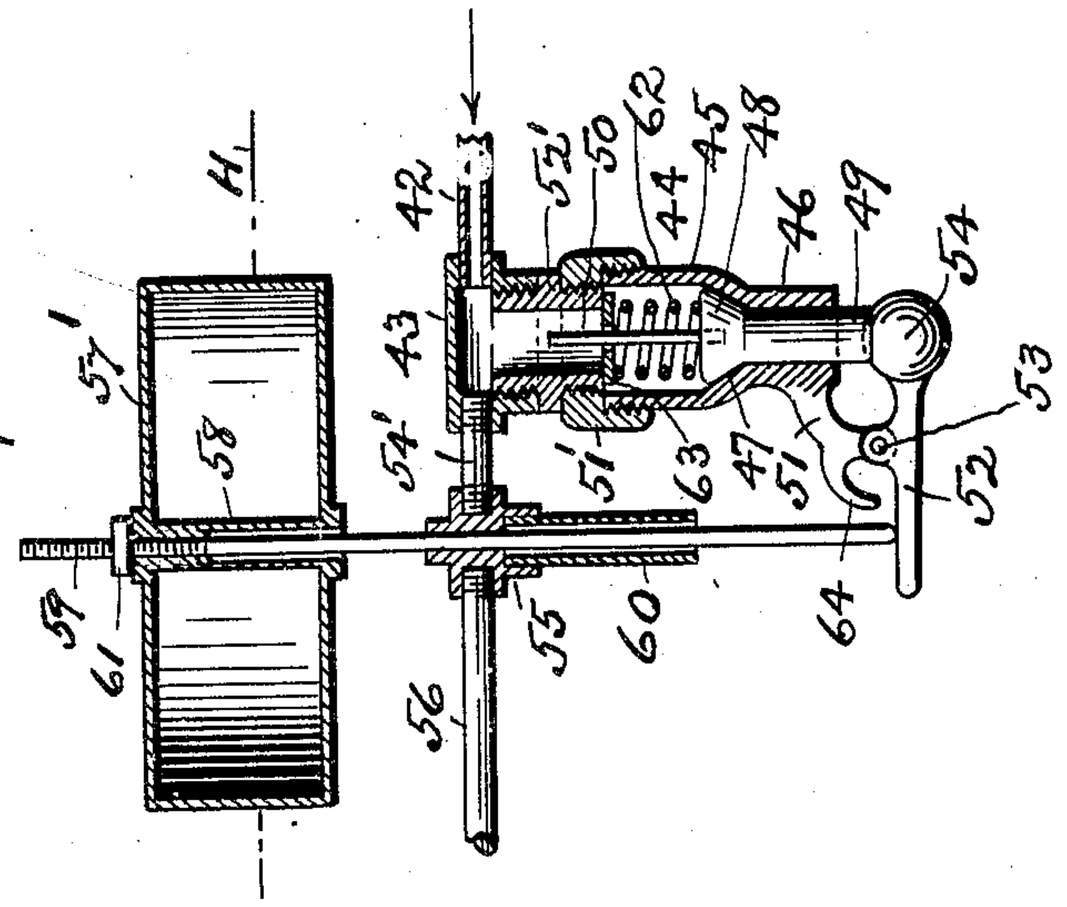
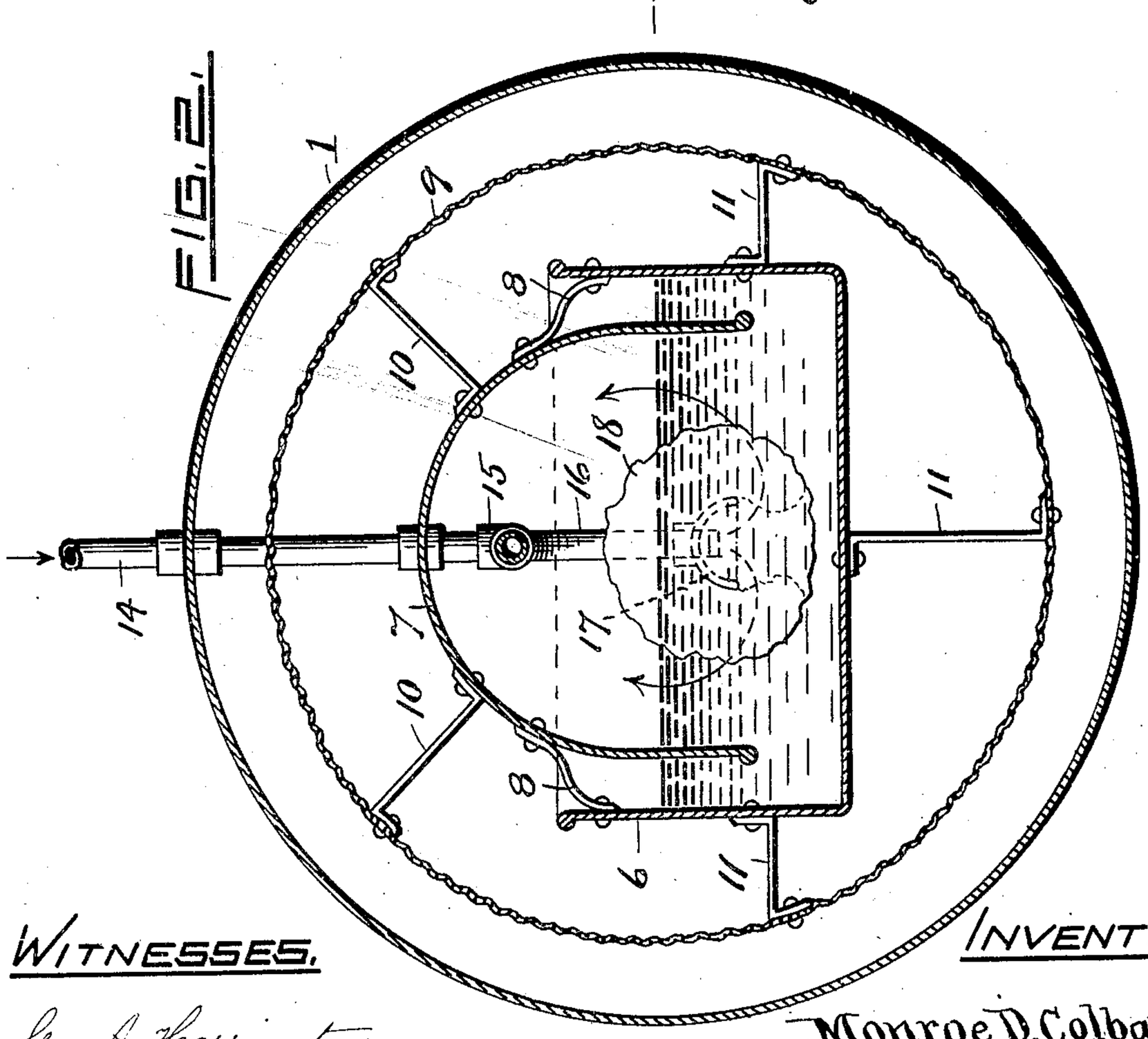


FIG. 2.



WITNESSES.

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CARBURETER.

No. 844,995. Specification of Letters Patent. Patented Feb. 19, 1907.

Application filed May 15, 1906. Serial No. 317,022.

To all whom it may concern:

Be it known that I, MONROE D. COLBATH, a citizen of the United States, residing at Hampden, in the county of Penobscot and State of Maine, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

This invention has relation to carbureters, and relates in particular to that class of carbureters designed to be buried or located below the surface of the earth.

The object of the invention is to produce a carbureter of novel form and construction wherein the air to be treated will be thoroughly impregnated with hydrocarbon vapors and delivered to points of consumption substantially free from moisture.

Another object of the invention is to provide a carbureter of novel form and construction occupying comparatively small space proportionate to its capacity and of comparatively simple and inexpensive construction.

A still further object of the invention is to provide novel means for separating, condensing, and removing from the carbureting apparatus any moisture which may be present in the air or in the hydrocarbon liquid employed.

A still further object of the invention is to provide novel means for automatically feeding the hydrocarbon liquid to the carbureting apparatus.

Other objects of the invention will be developed during the following description; and the invention having the above objects in view consists in the constructions, combinations, and arrangements of parts hereinafter described and claimed.

My improvements are illustrated in the accompanying drawings, in the several figures of which like numerals designate corresponding parts, and in which—

Figure 1 is a vertical longitudinal sectional view of the complete apparatus constituting my improvement. Fig. 2 is a vertical transverse sectional view of the same on the line $x\,x$ of Fig. 1; and Fig. 3 is a vertical sectional view, on an enlarged scale, centrally of the automatic feeding appliance of the carbureter shown in Figs. 1 and 2.

The exterior casing of the carbureter is composed of two tanks, (designated, respectively, 1 and 2,) the tank 1 being considerably longer than the tank 2 and both being preferably of cylindrical form and arranged end to end and connected by a comparatively large centrally-located pipe 3, which penetrates the adjacent heads of both tanks and extends a short distance within the larger tank 1. The tank 1 contains the greater part of the carbureting appliances and will be hereinafter particularly referred to as the "carbureting-tank," while the tank 2 contains the automatic feeding appliances and will be hereinafter termed the "feed-tank."

The head of the tank 1 farthest from the tank 2 is formed with a hollow boss 4, within which is seated a collar 5, that serves to support a carbureting-pan 6 and a dome 7 at one end, the opposite end of said carbureting-pan and dome being supported by the pipe 3, as clearly shown in Fig. 1 of the drawings. The pan 6 is of rectangular form in cross-section, while the dome 7 is substantially semicircular in cross-section, having depending edges that extend to within a short distance of the bottom of the pan, the crown of the dome extending somewhat above the level of the upper edges of the pan. The dome is supported at its ends, as before mentioned, by the collar 5 and by the pipe 3, and it is connected to the pan intermediate its ends by stays 8 8.

The pan 6 and the dome 7 are inclosed in a foraminous bag 9, which is composed of any suitable material, such as burlap, and is supported by means of ribs or rods 10 10, connected to the dome 7, and by similar ribs or rods 11 to the pan 6. A pipe 12 depends from the center of the pan 6, this pipe being closed at its lower end by the inner wall of the tank 1, and such pipe constituting a condensation-chamber and being connected by an outlet-pipe 13 with the feed-tank 2. An air-inlet pipe 14 leads from above the surface of the ground in which the carbureting apparatus is buried through the top of the tank 1 and through the top of the dome 7, and said pipe 14 has on its lower end a T-coupling 15, from which extends outwardly and downwardly two curved pipes 16 16, each of which has on its lower end a cup-shaped collar 17, these collars serving to sustain in expanded form sponges 18, which sponges dip into the liquid hydrocarbon contained within the tank 1, the level of such hydrocarbon being shown by the dotted line H H and the sponges being almost entirely submerged in such hydrocarbon.

The dome 7 is separated by partitions 19 20 into three compartments, which for

the sake of distinguishing them apart are designated 21 22 23. A pipe 24 of substantially U shape connects the compartment 21 with the compartment 22 through the top of the dome 7, this pipe 24 having a funnel-shaped inlet end 25 within the compartment 21 and carrying on the end that extends into the compartment 22 a T-coupling 26, from which extends two outwardly and downwardly curved pipes 27 27, having on their lower ends cup-shaped collars 28 28, which carry sponges 29, such curved pipes, collars, and sponges being similar to the curved pipes 16, collars 17, and sponges 18. A pipe 30, which is similar in construction to the pipe 24 and which has a funnel-shaped inlet end 31, is disposed within the chamber 22 and carries on its opposite end, within the chamber 23, a T-coupling 32, which latter carries outwardly and downwardly curved pipes 33 33, having on their lower ends cup-shaped collars 34, that sustain sponges 35, the construction and arrangement of the pipe 30, the pipes 33 33, the collars 34, and the sponges 35 being the same as that of the pipes, collars, and sponges in the compartment 22, as hereinbefore described. A drainage or pump-out pipe 36 extends from near the bottom of the tank 1 to a point above the ground, the purpose of this pipe being to provide for the withdrawal of any condensed moisture that may accumulate at the bottom of the tank 1.

A disk 37 is arranged within the tank 2 near the top thereof, and this disk is formed with a central boss 38, into which is screwed the lower end of the gas-outlet pipe 39, said gas-outlet pipe also screwing through a boss 40 in the top of the tank 2 and extending to the point of consumption. The disk 37 serves to sustain a carbureting-bag 40′, this bag being composed of similar material to the bag 9 and the top of the same extending, as shown in Fig. 1, beneath the bottom of the gas-outlet pipe 39. The tank 2 is provided with a drainage or pump-out pipe 41, similar in arrangement and function to the drainage-pipe 36 of the tank 1. A hydrocarbon-supply pipe 42 leads into the tank 2 and is connected by a T-coupling 43 and a nipple 52′ to an automatically-operating governing-valve 44, the construction of which will be best understood by reference to Fig. 3 of the drawings, to which I will now refer. In this figure the valve and attached parts are shown on an enlarged scale, the valve-casing being composed of an upper portion 45 and a diminished portion 46, between which portions a valve-seat 47 is formed, in which is seated a conical valve 48, said valve having an integral depending stem 49 and an attached upwardly-extending stem 50. The valve-casing is provided at one side with a bracket 51, and upon this bracket is pivoted a lever 52 by a pivot 53, said lever carrying on one end a weight 54, which weight bears against the lower end of the depending stem 49 of the valve 48. The valve-casing carries a screw-cap 51′ on its upper end, which screw-cap receives the nipple 52′, that in turn screws into the T-coupling 43, into which is also screwed the hydrocarbon-supply pipe 42, the opposite end of the T-coupling 43 receiving a solid rod 54′, that screws into one branch of a cross-coupling 55, the cross-coupling also receiving a second solid rod 56, which seats in a boss 57 in the head of the tank 2, the said rods 54′ 56 and the coupling 55 serving as a means for sustaining the valve 44 and also as a means for guiding the stem of the float to be hereinafter described. Said float is designated 57′ and is preferably in the form of a hollow cylindrical metallic vessel and is provided with a centrally-arranged tube 58, which is screw-threaded to receive a screw-threaded rod 59, that extends through the cross-coupling 55 and through a guiding-tube 60, depending from said cross-coupling, and bears at its lower end upon the upper edge of the lever 52. A jam-nut 61 screws on the upper end of the rod 59 and serves to assist in maintaining the float 57′ at any position to which it may be adjusted on said rod. The upper portion 45 of the valve-casing contains a spiral spring 62, upon the top of which is arranged a perforated disk 63, through which the upper stem 50 of the valve 48 passes, the disk 63 bearing against the lower end of the nipple 52′ and the spring 62 being soldered to the disk and soldered to the upper surface of the valve 48. The spring 62 exerts an expansive force against the valve and tends to keep the same closed, while the valve is opened, when the level of the liquid in the tank 1 falls by the weight of the float 57′, the lever 52 being nicely balanced by the weight 54. A stop 64 is formed integral with the bracket 51 and serves to limit the upward movement of that end of the lever 52 upon which the rod 59 bears.

The operation of the apparatus is as follows: A suitable hydrocarbon liquid is admitted through the pipe 42, and the valve 48 being open such liquid falls into the tank 2 and rising in the same fills said tank 2 and also the pan 6 to the level indicated by the dotted line II II. When the liquid has reached this level, the float 57′ has risen to such a height as to permit of the spring 62 closing the valve 48 on its seat 47, thereby preventing further ingress of hydrocarbon liquid, while the level at II II is maintained. When the tank 2 and the pan 6 have been charged, as above described, air is forced through the pipe 14 and passing into the curved pipes 16 16 emerges from below the collars 17 and the sponges 18 in the compartment 21, partially impregnated with hydrocarbon vapors, and then passes through the pipe 24 and the curved pipes 27 27 into the compartment 22 and aris-

ing through the hydrocarbon liquid therein passes by way of pipe 30 and the curved pipes 33 33 to the compartment 23, and passing under the level of the hydrocarbonliquid in this compartment the air, now heavily impregnated with hydrocarbon vapors, passes out of the last compartment 23 through the pipe 3 and into the tank 2. From the tank 2 the hydrocarbon vapors pass through the bag 40′ and thence out through the pipe 39 to the points of consumption. The bag 40′ in tank 2 serves for the purpose of absorbing the hydrocarbon liquid and holding the same by capillary attraction. Thus the carbureted air in passing through said bag 40′ is caused to become further enriched with the vapor of said liquid and after passing through said bag to the gas-outlet pipe 39 is in the form of an inflammable gas of superior quality. Any moisture or water which may be brought in with the hydrocarbon liquid will settle in the bottom of the tank 2, and any moisture which may be brought in with the air through the pipe 14 will settle in the pipe 12, and as the pipe 12 is in communication with the tank 2 by the pipe 13 the condensed moisture will be conveyed to the tank 2, and all the moisture therein collected and condensed can be removed by suction applied to the pipe 41. Any moisture which might settle in the bottom of the tank of the tank 1 can be similarly removed through the pipe 36. As the level of the hydrocarbon liquid falls the float 57′ will fall with it and will open the valve 48, which will remain open until the liquid has been restored to its former normal level, this operation of alternately opening and closing the valve 48 being automatically performed and serving to maintain the hydrocarbon liquid at substantially a constant level in the apparatus.

I claim—

1. In a carbureter, the combination with two connected tanks, one of said tanks having a hydrocarbon-inlet, the other of said tanks having an air-inlet and one of said tanks having a gas-outlet, of an automatically-operated valve located in one of said tanks, and connected to the hydrocarbon-inlet, a pan located in the other of said tanks, a dome arranged above said pan, said dome being divided into a plurality of compartments, said air-inlets leading into one of the compartments in the dome, pipes extending from each of said compartments into the adjacent compartment and below the fluid-level of the pan, cup-shaped collars carried by said pipes and sponges carried by said pipes above the cup-shaped collars.

2. In carbureting apparatus, a tank adapted to contain hydrocarbon liquid, a pan located in said tank, a dome disposed above said pan and divided into a plurality of compartments, an air-pipe leading into one of said compartments, pipes connecting each compartment with the adjacent compartment, cup-shaped collars carried by one end of each of said last-named pipes and sponges carried by said last-named pipes adjacent said cup-shaped collars.

3. In a carbureter, the combination with a tank, and a pan arranged in said tank, of a dome disposed over said tank and having depending edges extending into the tank, said dome being divided into a plurality of compartments an air-inlet pipe extending into one of said compartments, and below the liquid-level of said pan, a collar carried by the lower end of said pipe and a sponge mounted on the lower end of said pipe.

4. In a carbureter, the combination with a tank, and a pan arranged in said tank, of a dome disposed over said pan, said dome being divided into a plurality of compartments, a pipe extending from above the liquid-level in one of said compartments to within the adjacent compartment, branch pipes carried by said pipe, and extending below the liquid-level of the last-named compartment, and sponges carried by said branch pipes adjacent the lower ends thereof.

5. In a carbureter, the combination of a tank having a gas-outlet, a pan arranged in said tank adapted to contain a hydrocarbon liquid, a dome having a plurality of compartments in open communication with and extending below the liquid-level in said pan, a pipe adapted to discharge air under pressure and leading into one of the compartments of said dome, a pipe extending from each compartment into the next adjacent compartment and having one of their ends connected to curved pipe extensions which enter below the liquid-level in said pan, cup-shaped collars secured upon the curved extensions of last-mentioned pipes, sponges mounted upon said collars, a vapor-outlet pipe leading from said dome, and a bag made of capillary material inclosing the pan, the dome, and the vapor-outlet pipe.

6. In a carbureting apparatus, the combination with two tanks, of a pan and a dome disposed in one of said tanks, an air-inlet pipe extending from without the tank to within the dome contained therein, a gas-outlet pipe extending from within said dome to without the same, a bag inclosing the pan, the dome, and the outlet-pipe in the dome, an outlet-pipe extending from the other of said tanks, a carbureting-bag arranged in the last-named tank, a gas-outlet pipe extending from a point exterior of the bag in the last-named tank to a point of consumption.

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

MONROE D. COLBATH.

Witnesses:
TERENCE B. TOWLE,
MABEL A. COOK.