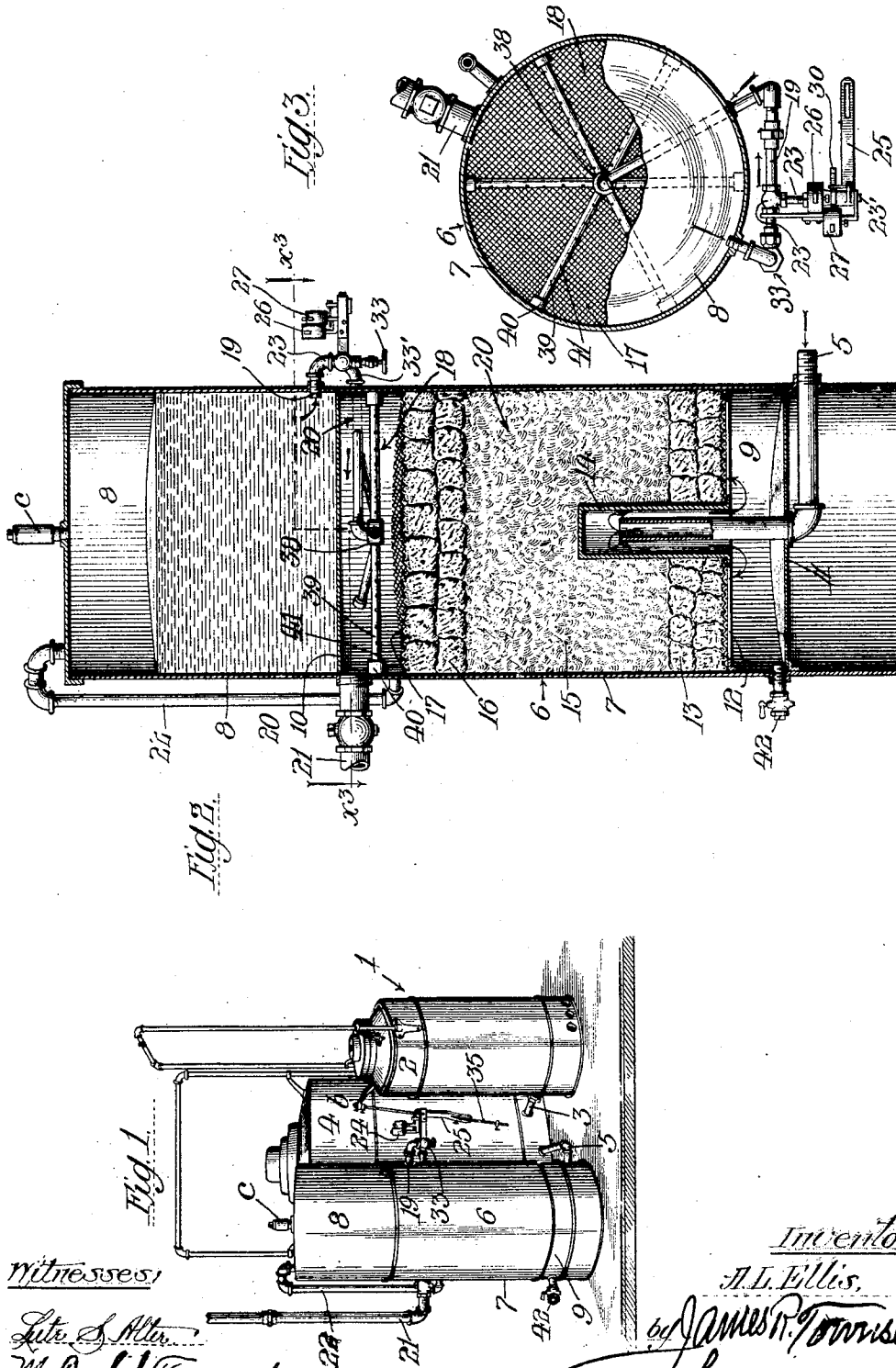


No. 852,780.

PATENTED MAY 7, 1907.

A. L. ELLIS.
AUTOMATIC GASOLENE GAS MACHINE.
APPLICATION FILED OCT. 31, 1906.

2 SHEETS—SHEET 1.



Witnesses:

Lute S. Allen
W. Beulah Townsend

Inventor:

A. L. Ellis,

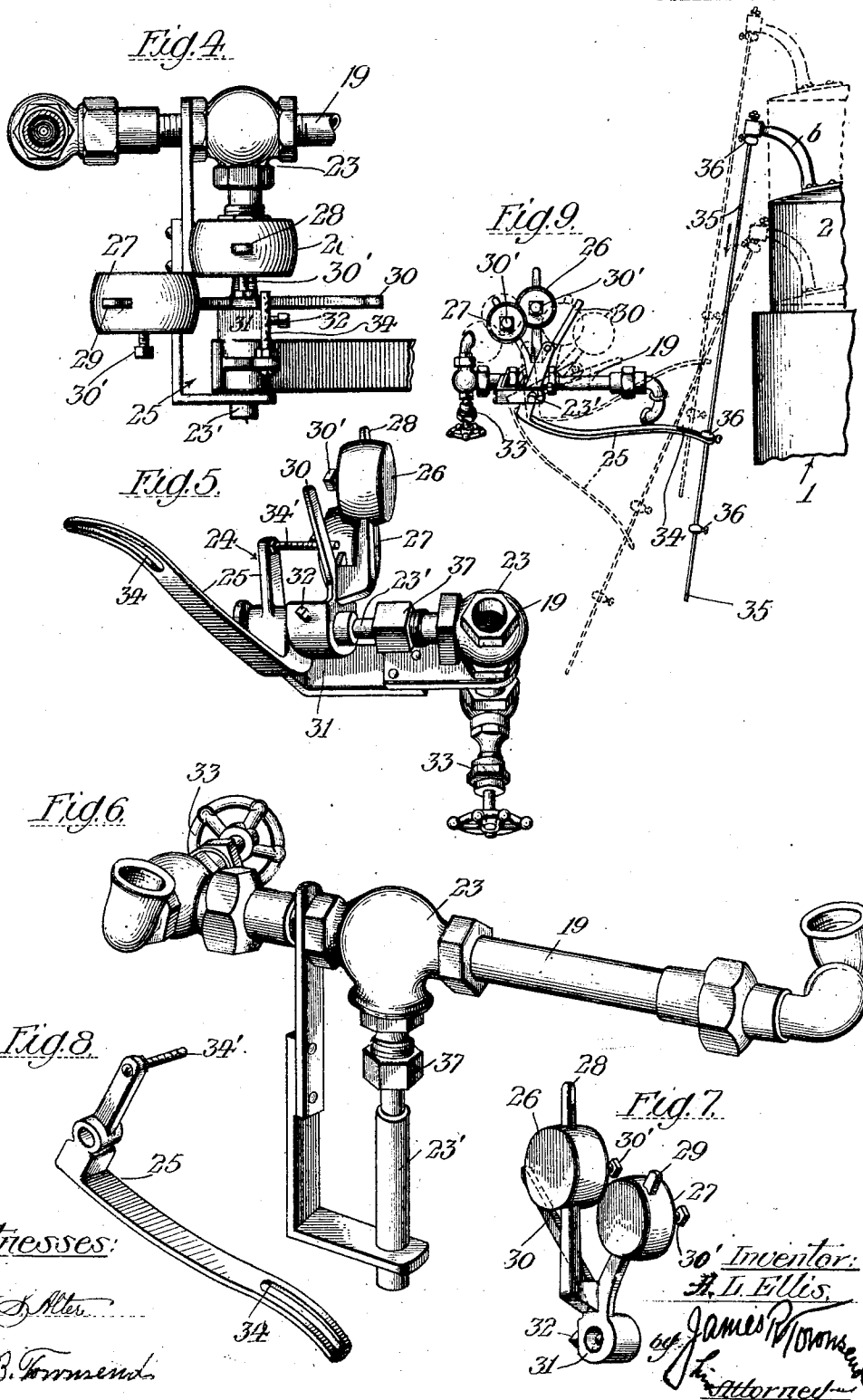
by James R. Townsend
his Attorney

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2 SHEETS—SHEET 2.



Witnesses:

L. B. Allen

M. B. Townsend

Inventor:
A. L. Ellis

by *James H. Townsend*
Attorney

UNITED STATES PATENT OFFICE.

AUGUSTUS L. ELLIS, OF LOS ANGELES, CALIFORNIA.

AUTOMATIC GASOLENE-GAS MACHINE.

No. 852,780.

Specification of Letters Patent.

Patented May 7, 1907.

Application filed October 31, 1906. Serial No. 341,486.

To all whom it may concern:

Be it known that I, AUGUSTUS LEANDER ELLIS, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Automatic Gasolene-Gas Machine, of which the following is a specification.

This invention relates to machines for producing inflammable gas or vapor from liquid hydrocarbon, denatured alcohol, and other liquids from which inflammable gas may be made.

An object of the invention is to provide positive, direct, and simple means for making from gasolene or other suitable liquid, a gas of uniform quality, by supplying in correlative proportions to the carbureter, air and inflammable liquid, the former being supplied continuously and under uniform pressure while the gas is being used, and the latter being supplied intermittently in appropriate quantities at intervals during the same time, thereby causing the air to always act upon a body of fresh liquid; and to accomplish this in a most direct and positive way and without any pump for the inflammable liquid. By this means the same quality of gas may be produced throughout the entire period in which the machine is in operation, and the liability to get out of order is brought to a minimum.

In order to secure an absolutely uniform gas at a uniform pressure at all times, it is necessary to supply the air and inflammable liquid to the carbureter under uniform conditions for each, and in order to do this it is necessary that the air be delivered to the carbureter at a practically constant and uniform pressure; and that the liquid be supplied under sufficient pressure to spray it upon the absorbent material in the carbureter, but in such small quantity as to prevent flooding of the carbureter and overcharging the air. I therefore employ an airometer between the air pump and the carbureter as a part of the means for supplying the liquid and air in correlative proportions; and I provide a gravity feed and a weighted rotary cut-off valve to control the flow therefrom to the carbureter, and I operate said cut-off by connection with the bell of an air pump.

Although my gas machine is adapted for making gas from any suitable liquid, I shall hereinafter refer to liquid hydrocarbon as the liquid used.

The invention is applicable in gas machines provided with an air pump by which the air to be carbureted is supplied, and relates to carbureting means, to means for supplying hydrocarbon and air in correlated proportions, and also to various features, combinations and parts hereinafter particularly described.

The invention may be carried out in different forms and styles of machines, and I shall illustrate the same in one of the forms I deem most desirable.

The carbureter in this invention is of novel construction and is supplied with liquid hydrocarbon that is directly under the control of the air-supplying means. The valve to control the supply of liquid hydrocarbon may be operated by the movements of an airometer or by the movements of an air pump, or by other means.

I shall illustrate the invention as applied in a machine in which the hydrocarbon supply is controlled by the movements of an automatic air pump operated by water supplied under pressure to raise the bell or receiver of the air pump and then automatically discharge to allow the receiver to descend. This form of pump being well known, will not be illustrated in detail herein.

The accompanying drawings illustrate the invention in the form I at present deem preferable.

Figure 1 is a perspective view of a gas machine embodying my invention as applied with an automatic air pump and an airometer, both of common construction, and a carbureter and feeding device for the same connected with said air pump and airometer. Fig. 2 is an axial section of the carbureter with the hydrocarbon cut-off and spraying star intact. Fig. 3 is a plan section on line x^3 , Fig. 2. Fig. 4 is an enlarged fragmental detail plan of the feeding mechanism. Fig. 5 is a perspective view of a portion of the feeding mechanism detached. Fig. 6 is a detached perspective detail of part of the feed valve and connecting pipes. Fig. 7 is a detached view of the valve-actuating arms. Fig. 8 is a detached view of the valve-arm operating lever. Fig. 9 is a side elevation of the feeding mechanism connected with an automatic air pump, fragments of which are shown.

Solid lines show the pump bell descending and the weighted cut-off devices nearly overbalanced to turn off a charge of hydrocarbon.

Dotted lines show the weighted cut-off in its fully open and fully closed positions.

1 is an air pump which may be operated by water pressure in a well-known way, and which is provided with a vertically-movable receiver or bell 2 that is operated up and down in the usual way to pump air through a pipe 3 to an airometer 4 for equalizing and keeping at uniform pressure the air which is thence delivered through a pipe 5 to the lower part of a carbureter 6. This uniform pressure of the air is necessary in order to supply the air and hydrocarbon to the carbureter in correlative proportions. Said carbureter comprises a shell 7 provided at the top with a hydrocarbon reservoir or tank 8, and at the bottom with an air chamber 9.

10 is a diaphragm or partition forming the bottom of the tank 8, and 11 is a diaphragm forming the bottom of the air chamber 9.

12 is a foraminated partition or support above the air chamber 9 for sustaining a layer of sponges 13.

14 is an air distributor in the form of a hollow cylinder or cap open at its lower end to receive air from the pipe 5 and distribute it to the air chamber 9. Said pipe 5 extends up into the cap 14 so that the air which enters the carbureter is forced to flow from the end of the pipe 5 downward and outward at the bottom of the cup to be evenly distributed to the under side of the lower sponges 13 which are carried by the foraminated partition 12.

15 is a porous body which may be formed of excelsior above the layer of sponges 13 and surrounding and overlying the upper end of the air distributor 14.

16 designates a top layer of sponges, and 17 a foraminated partition or screen above said top layer, preferably made of wire netting.

18 is a spreading device for distributing liquid hydrocarbon over the netting and porous filling.

19 is a valved conduit leading from the reservoir 8 above the partition 10 and opening into the carbureting chamber 20 through the hydrocarbon spreader or star 18 which delivers the hydrocarbon to the porous bodies 16, 15, 13, beneath the same, and all located in the carbureting chamber.

21 is a gas outlet main leading from the top of the carbureting chamber 20 to the burners, not shown.

22 is an equalizing pipe communicating between the carbureter chamber 20 and the top of the hydrocarbon reservoir 8 to supply the vacuum in the hydrocarbon reservoir, and equalize the pressure on opposite sides of the diaphragm 10 as the hydrocarbon flows from chamber 8 into chamber 20.

The purpose of providing a layer of porous material,—preferably sponges,—then a layer

of fibrous material such as excelsior, and then another layer of porous material, preferably sponges, in the order in which they are provided in my gas machine, is as follows:—

The first layer of porous material on which the hydrocarbon is sprayed will hold in suspension the smaller and lighter particles of hydrocarbon, while the heavier and larger particles of hydrocarbon will pass on through the fibrous material which will divide and break them into smaller bodies, and the last or lower layer of porous material will hold them in suspension, thus placing the entire amount of hydrocarbon supplied at one action, to the carbureter, in such a position that the air as it is supplied to the carbureter at a lower layer of porous material, will come in contact first with the heavier or less volatile part and afterward with the lighter, more volatile parts of the gasolene, and as it passes through the various layers of porous and fibrous material, will become charged with sufficient hydrocarbon to produce an even and fixed gas. The hydrocarbon being only supplied in proportion to the air, does not permit the air to be overcharged with the hydrocarbon and compels the air to act more evenly and thoroughly on the hydrocarbon, and so insures a better carburizing of the same.

An intermittent automatic hydrocarbon cut-off device is provided in the form of a feed valve and operative parts connected therewith, which will now be described.

23 is a feed valve for controlling the flow of liquid hydrocarbon through the valved conduit 19, the same being operated by a suitable trip 24 having a bell-crank or lever loosely mounted on the valve-stem and adjustable overbalancing weights 26 and 27 adjustably mounted respectively on arms 28 and 29, which arms are connected with an operating-arm 30 and with a sleeve 31 adjustably fixed on valve stem 23' by set-screw 32. Integrally united with said sleeve are the three arms numbered 28, 29 and 30, two of which,—namely 28 and 29, are provided with counterweights 26 and 27, previously referred to. These weights are adjustable on said arms by means of set screws 30'. On the same stem 23' is fulcrumed a bell-crank or lever 25 provided at one end with an elongated slot 34 and having a lug or pin 34' at the other end which is arranged to extend between and alternately engage the arm 30 and the arm 29. The slot 34 is provided in the bell-crank for the purpose of allowing the operating-rod 35 to extend therethrough. Upon this rod are mounted adjustable members or buttons 36 which, when contacting with the lever or bell-crank 25, on the rise and fall of the pump-bell, cause the pin or lug 34' to lift the weighted arms up to and

over the center of gravity, whereupon the same will fall and either close or open the valve.

The operation of the rod 35 is controlled entirely by the movement of the air-pump which supplies air to the airometer from which the air is introduced into the carbureter previous to mixing it with the gasoline vapors. The upper end of the rod 35 is loosely mounted in bracket *b* in order to allow a certain amount of play of said rod which the movement of the bell-crank arm necessitates.

The stem 23' of the valve is screw-threaded and engages the screw threads provided on the interior of the shell or chamber 37 of the valve casing, whereby by the movement of the weighted extremities on the sleeve it travels endwise either in one direction or the other according entirely to the movement of the air-pump.

To regulate the quantity of hydrocarbon delivered from the tank 8 of the carbureter, I provide a valve 33 located on the supply-pipe 19 which communicates with the gas chamber 20. Thus the volume of the flow may be regulated by manual operation of said valve 33, and the period of such flow will be governed automatically by movement of the air-pump up and down which operates the bell-crank loosely mounted upon the stem of the valve, which in turn operates the weights on the valve-actuating arms and so opens and closes the feed valve automatically.

c is a capped filler pipe for supplying hydrocarbon to the tank.

The star 18 may be formed with a gas body 38 and radiating arms 39 of perforated pipe sections provided with caps 40 at their ends.

The perforations 41 for spraying the hydrocarbon are arranged along the sides of said pipes, so as to spray the hydrocarbon, evenly over the screen 17.

42 is a valved outlet for drawing off any hydrocarbon that may pass through to the bottom of the air chamber 9.

When the machine is properly installed and connected with the house piping for the distribution of the gas to the places of consumption, the lighting of the lights, stoves or grates causing or opening a vent for the escape of the gas starts the machine by causing the air to pass from the airometer into and through the carbureting chamber, where it comes in contact with the hydrocarbon, causing the air to become charged with the hydrocarbon, so forming gas which passes out through the outlet pipe 21 to the places of consumption.

The descent of the airometer operates a lever, not shown, which in the well known way operates a valve, not shown, allowing the water or other power element to pass

into the cylinder in the air pump, causing the air-pump to act and automatically supply the airometer with air to take the place of that which has been used in making the gas, which has been consumed. This action will continue as long and in the proportion of the amount of gas used, and the turning off of the lights, stoves or grates will stop or close the vent and so stop the operation of the gas making process.

What I claim is:

1. A gas machine comprising an air supply and a carbureter, said carbureter having diffusing means therein, connections between said air supply and said carbureter, means for admitting air to the bottom of said diffusing means, means for spraying hydrocarbon upon said diffusing means, and means for controlling the hydrocarbon supply, comprising a valve having a stem, weighted means on said stem for seating and unseating said valve, and means for controlling said weighted means.

2. The combination with a pump, an airometer and a carbureter, of a reservoir in the upper portion of said carbureter, a porous body in the lower part, a star located above said porous body, a connection between said star and reservoir, an air inlet at the bottom of said means, automatic means for regulating the supply of hydrocarbon to said star comprising a stem, a plurality of arms mounted on said stem, a series of weights mounted on said arms, and a lever for causing the overbalancing of said weights from one side to the other.

3. The combination with a pump, an airometer and a carbureter, of means operable by the movement of said pump for regulating the supply of hydrocarbon to said carbureter, said means comprising a valve, a stem on said valve, weights on said stem, a lever for operating said weights, the same having an elongated arm and being mounted on said stem, and a connection between said elongated arm and pump.

4. The combination with a pump, an airometer and a carbureter, of a supply tank in said carbureter, a connection between said tank and carbureter, means for automatically controlling the supply of said hydrocarbon to said carbureter, said means comprising a valve having a seat and stem, a sleeve fixed to the valve stem and having a plurality of fingers, a plurality of weights on said fingers, a bell-crank-lever loosely mounted on said stem, means operated by said lever for engaging said fingers alternately, and means operable by the movement of said pump for controlling the movement of said lever.

5. The combination with a pump, an airometer and a carbureter, of a supply tank in said carbureter, a connection between said

tank and carbureter, means for automatically controlling the supply of said hydrocarbon to said carbureter, said means comprising a valve having a stem arranged to
5 open and close the valve, a sleeve adjustable on said stem having a plurality of fingers, two of said fingers being provided with weights, means for adjusting said weights on said fingers, an elongated lever on said stem
10 engaging one of said fingers and arranged to move the weighted members from one po-

sition to another, and a connection between said elongated lever and said pump whereby the movement of the former is controlled.

In testimony whereof, I have hereunto set 15 my hand at Los Angeles, California, this 25th day of October, 1906.

AUGUSTUS L. ELLIS.

In presence of—

JAMES R. TOWNSEND,
M. BEULAH TOWNSEND.