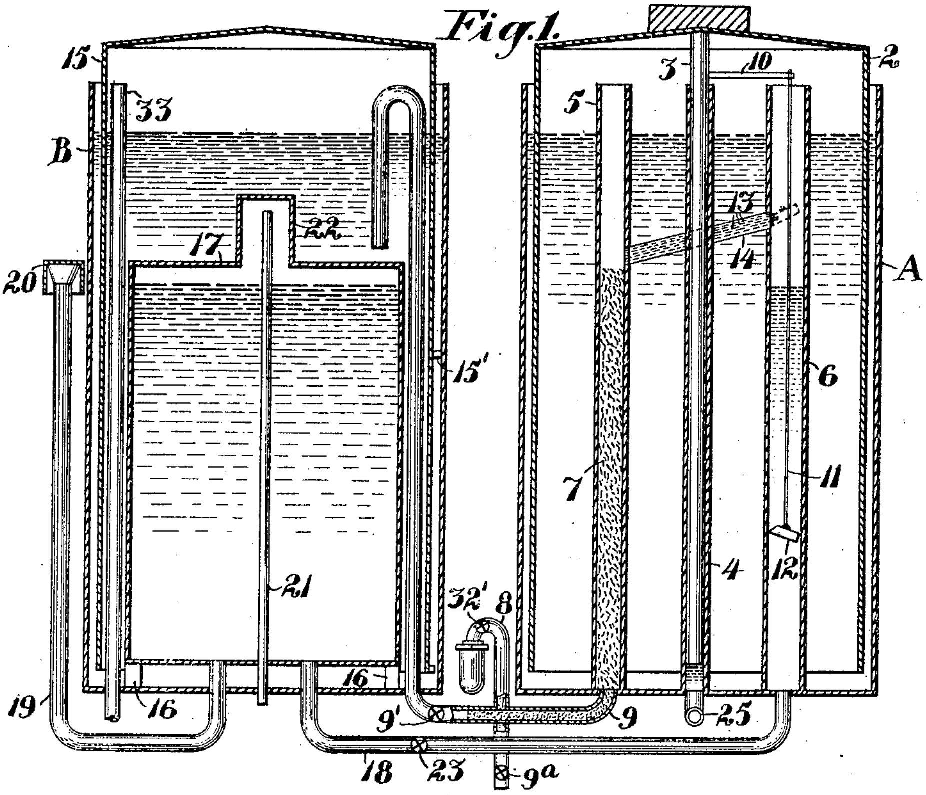
No. 810,087. PATENTED JAN. 16, 1906.

S. P. SANDERS.

CARBURETER.

APPLICATION FILED MAY 10, 1905.

Fig. 1.



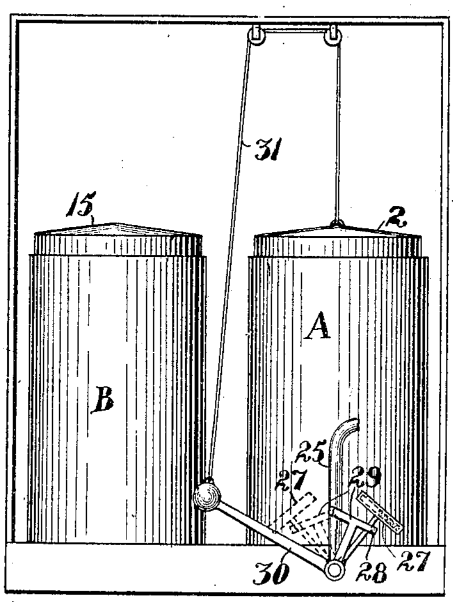


Fig. 2.

Fig. 3.

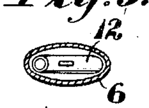
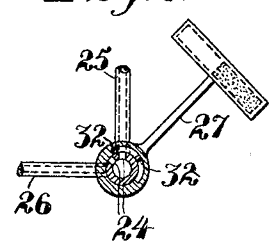


Fig. 4.



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CARBURETER.

No. 810,087. Specification of Letters Patent. Patented Jan. 16, 1906.

Application filed May 10, 1905. Serial No. 259,738.

To all whom it may concern:

Be it known that I, STEPHEN P. SANDERS, a citizen of the United States, residing at Cupertino, in the county of Santa Clara and State of California, have invented new and useful Improvements in Carbureters, of which the following is a specification.

My invention relates to improvements in machines for making carbureted air for lighting, heating, cooking, or other purposes, and pertains especially to machines for generating gas from gasolene or other suitable liquid hydrocarbon.

My object is to lessen the cost of the construction and to provide a clean, safe, simple, and practical machine for making a gas of absolutely uniform standard.

The invention consists of the parts and the construction and combination of parts, as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a sectional view of my improved machine. Fig. 2 is an elevation of same. Fig. 3 is a cross-section of the oil-well. Fig. 4 is a detail in partial section, showing operating means of three-way cock.

A represents a tank adapted to contain water, in which the bell 2 operates. This bell carries a central downwardly-extending stem or shaft 3, having a snug sliding fit in the ram-cylinder 4, which latter projects up from the bottom of the tank and is open below to a suitable source of fluid-pressure supply. The admission and discharge of the fluid into the ram beneath the stem 3 to reciprocate the bell are accomplished by suitable means hereinafter to be described.

Suitably arranged within the tank A and projecting up into the bell above the water-level is a carbureter-cylinder 5 and also an oil-well 6, both suitably fixed in the bottom of the tank and open at their upper ends.

The carbureter is filled with a wicking or absorbent filling 7, of burlap, sponge, or other suitable material, and the well 6 is so connected with a suitable source of hydrocarbon-supply that a quantity of hydrocarbon is always maintained in the well. From this well at convenient intervals a predetermined quantity of liquid is dipped up and deposited into the carbureter above the filling 7 to become absorbed and distributed by the latter, so that when the bell rises to draw in a charge of air from the outside through the inlet-pipe 8 and the pipe 9, which enters the bottom of the carbureter, this air so drawn in will be charged with the volatile liquid distributed through the filling. Exhaust from the bell 2 as the latter falls also occurs through the carbureter, so that the air becomes thoroughly saturated to form a rich illuminating or fuel gas, as may be desired.

The periodical delivery of the liquid into the carbureter may be accomplished by any suitable means. As here shown the stem 3 has a radial arm 10, from which depends a rod or wire 11, carrying at its lower end a bucket 12. This bucket consists, preferably, of a section of pipe closed at one end and pivotally suspended from the rod 11, so as to have a limited tilting movement, and the well 6 is preferably elongated or oval in cross-section to prevent the bucket from swinging from side to side. When the bucket is filled, it will normally stand in incline position, as indicated in Fig. 1, so that as it rises its more elevated end will engage a projecting wire or wires contained in the duct 14, which connects the well with the carbureter above the filling 7. With the bucket thus partaking of the movement of the bell the bucket will go to the bottom of the well and fill as the bell lowers, and as the bell rises it will automatically discharge its load into the pipe 14, the wires 13 serving not only to trip the bucket, but to lead the liquid into the pipe 14.

Any convenient form of receiver for the manufactured gas may be used, and the gasolene or other liquid from which the gas is made may be stored in any desired or convenient manner or place so long as a constant supply is maintained in the well. I prefer the construction herein shown, in which the gas-receiver and gasolene-supply tank are combined in a single structure.

B represents a tank adapted to contain water, in which the bell 15 rises and falls in the usual manner. Suitably supported within the tank on the standards 16 is a submerged gasolene or oil tank 17, from the bottom of which extends a pipe 18 to connect with the well 6 of the generator part of the apparatus. The tank 17 is designed to be filled through a pipe 19, having its filling end about on the same level with the top of the tank. Except during the act of filling the end of the pipe 19 may be closed by cap 20 to prevent evaporation.

21 is a small air-vent pipe extending up through the tanks B and 17 and opening into a small dome 22, formed in the top of the oil-

tank 17. The outer end of the pipe 21 is open to the atmosphere to permit of the egress and ingress of air from and to the oil-tank during the filling of the latter or during the discharge thereof into the well. The tanks B and 17 are so positioned relative to the well 6 that a proper level of hydrocarbon will always be maintained in the well. A check-valve 23 in pipe 18 prevents the liquid from being forced out of the well on the descent of the bell 2. The pipe 9, through a portion of which both inhaust and exhaust to and from the carbureter take place, passes up through the bottom of the tank B and terminates in a return-bend having its lower end discharged beneath the water-level within said tank and within the space inclosed by the bell 15. The purpose of the return-bend is to provide a water seal or check against the backflow of gas from bell 15 when the latter descends or when the bell 2 rises. As an extra preventive in this regard a check-valve 9′ may be also used. A draw-off cock 9^a may be disposed in the pipe 9, and preferably the filling 7 is continued from the carbureter down into the pipe 9 and across the drain-section in which the valve 9^a is located. The capacities of the bell 2 and of the bucket 12 are so proportioned that each inhaust of the bell 2 induces a suitable supply of air, which on becoming properly saturated with the volatile hydrocarbon produces just the right mixture.

It is understood that the lifting of the inhaust or breathing bell 2 is done by the ram 4 or other outside force, but that said bell falls by gravity and its weight is sufficiently greater than bell 15 so that the vapor mixture in bell 2 will pass across to bell 15 and operate to raise the latter. At the same time the difference in weight between the two bells should not be great enough to cause any material fluctuation in the pressure of the gas in the mains leading to the burner. A stop 15′ limits the upward movement of bell 15. With the latter against stop 15′ bell 2 will cease to fall.

Various mechanisms may be employed to regulate the inlet and discharge of a propelling medium into the ram. In the present instance I have shown a three-way cock 24, adapted to turn the water from the supply-pipe 25 into the ram or to turn the water from the ram into the discharge-pipe 26 and shut off the supply from pipe 25, according as the bell is to lift or to lower. The operation of this valve is preferably controlled by the rise and fall of the bell. The stem of the valve 24 carries a rocking member 27, which has a limited oscillating movement independent of the stem. This rocking member is here shown in the shape of a T, having its upper horizontal arms made tubular to contain a quantity of mercury or other suitable shiftable weight for the purpose of causing the arm to work quickly to turn the valve and immediately cut off or turn on the water from the supply-pipe 25. Normally this rocking member will stand at an incline to one side or the other of a vertical line supported by the stops 28 on an arm 29, carried by an operating-lever 30, which has its weight end connected by a cord or chain 31 with a bell 2. The function of the arm 30 is to lift the member 27 until the latter approaches or slightly passes the vertical. As soon as this occurs, however, the mercury or other shiftable weight contained in the cross-piece of member 27 causes the arm to instantly descend on the opposite side, thereby hitting a stop 32 on the valve-stem to rock the latter and turn the cock in the desired way.

The operation of the apparatus is as follows: The tank 17 being filled with liquid, flow therefrom to the well 6 takes place through the pipe 18. Assuming the cock 24 to be turned to let in water to the ram 4, the bell 2 is lifted, causing the bucket 12 to dip up a predetermined quantity of liquid and at the proper moment, or when the bell 2 has drawn in a full charge of air, discharge the liquid so dipped up into the carbureter, where it soaks through the absorbent filling therein. At the moment the valve 24 is reversed by the falling of the arm 30, and if the receiver 15 is not already filled, the bell 2 will begin to descend. This causes the air within the bell 2 to be exhausted through the carbureter, carrying with it the volatile liquid distributed through the filling across through pipe 9 into the receiver. A check-valve 32′ in the air-inlet pipe 8 prevents any gas escaping to the outer atmosphere. From the receiver the gas may be conducted as desired through the service-pipe 33, which passes through the bottom of tank A and has an end opening into the receiver above the water-level.

The device is very simple in construction, is compact, and has comparatively few parts, with very little liability for them to get out of order.

The operation in generating the gas is analogous to breathing through the lungs, since the air drawn in through the carbureter picks up a quantity of the hydrocarbon still remaining in the absorbent filling, and on exhalation further becomes saturated from the charge of liquid delivered into the carbureter. The resulting gas of one inhalation of the apparatus is consumed before another inhalation begins. Thus the gas is made fresh at the instant it is ready for use, and the making of it stops as soon as the burners are turned off. Therefore there is no quantity of gas stored to become stale or to be condensed back into liquid in the pipes. The bucket serves to maintain an agitation of the liquid in the well, so that the liquid which is actually delivered into the carbureter is always of the same den-

sity and the generated gas is all of equal richness. The proportions of oil and air may be changed at any time by changing or varying the capacity of the bucket.

The advantage of twice passing the air through the carbureter is that it provides a more thorough mixing of the air and vapor and a more even, a richer, and a better mixture than if passed only once through the carbureter, as is customary in all machines or carbureters of which I have any knowledge.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A carbureting-machine having in combination two water-containing tanks, a bell in each tank, a receptacle submerged in one of said tanks and containing a liquid hydrocarbon, two tubes fixed to the bottom of the other tank and rising above the water-level thereof, one of said tubes containing an absorbent filling, means connecting the hydrocarbon-receptacle of the one tank with one of the tubes of the other tank, an air-supply connecting with the tube containing the filling, a pivotally-mounted bucket suspended from the bell and operatable in the tube which receives the hydrocarbon from the receptacle, a pipe connection between the two tubes, and means whereby on the raising of the bell the bucket is elevated to deliver its charge of hydrocarbon into the pipe connection for saturating the filling of the other tube, said bell, in its descent, forcing the carbureted air out of said filled tube, and means conducting the carbureted air to the bell of the other tank.

2. In a gas-machine the combination of a water-containing tank, a bell therein, a carbureter comprising a tube fixed in the tank and provided with an absorbent filling, said tube opening into the top of the bell, a second tube in said tank and means for delivering hydrocarbon to said second tube, a transverse connection between the two tubes, and means including a pivotally-suspended bucket operatable in the hydrocarbon and connected with the bell, for delivering predetermined quantities of liquid from the second tube into the first tube above the filling thereof.

3. In a gas-machine, the combination of a source of liquid-hydrocarbon supply, a gas-receiver, a tank to contain water, a bell in said tank, a carbureter in the tank and discharging into the bell, said carbureter comprising a tube submerged in the tank and containing an absorbent filling, said tube having its upper end open, means for delivering predetermined quantities of liquid from said source of supply into the carbureter, said delivery means including a pivotally-suspended bucket operatable in the hydrocarbon and connected with the bell, means whereby on the lifting of the bell a charge of air is drawn thereinto and through the carbureter, and connections between the interior of the bell and said receiver and through the carbureter whereby on the falling of the bell the air previously drawn thereinto is made to pass again through the carbureter.

4. A carbureting-machine having in combination two water-tanks placed side by side, a receiver for liquid hydrocarbon submerged in one of said tanks, two open-ended tubes fixed in the other tank and substantially submerged therein, and extending above the water-level thereof, one of said tubes containing a filling of absorbent material, and the other tube connecting with and adapted to hold liquid hydrocarbon, a bell for each tank, a tiltable bucket operatable in the liquid-holding tube and connected to move with the bell of that tank, a pipe forming a transverse connection between the two tubes and into which pipe the bucket empties its charge at intervals, means for vaporizing the liquid delivered to the tube containing the filling, and means for delivering the carbureted air to the bell of the other tank.

5. In a gas-machine, the combination of a carbureter having an absorbent filling, a carbureted-air receiver, connections between the carbureter and receiver means for delivering a predetermined quantity of liquid into said carbureter, said means including a tubular hydrocarbon-receiver being ovoidal in cross-section and a tubular bucket closed at one end and open at the other end and operable therein to make periodic delivery of hydrocarbon to the carbureter, and means for inducing a current of air through said carbureter in one direction and for returning the same through the carbureter in an opposite direction to the receiver.

6. In a gas-machine, the combination of a water-tank, a bell therein, a carbureter in the tank and opening into the top of the bell, a gas-receiver connected with the carbureter, an oil-well in the tank, means for delivering liquid into said well, means operated by the bell to discharge the quantity of liquid from the well into the carbureter, said last-named means including a pipe connecting the oil-well with the carbureter, a suspended bucket operatable in the oil-well and tiltable to discharge into said connecting-pipe, and means connecting the bucket with the bell, connections between the carbureter and a source of air-supply, means for lifting the bell to induce a current of air through the carbureter and means to permit the bell to fall to expel the air so induced, through the carbureter.

7. In a gas-machine, a carbureter, a gas-receiver connected therewith, an oil-well connected with a source of supply, connections between the well and carbureter above the normal level of the liquid in the well, means for alternately creating suction and compression in the carbureter, and means operated by said suction and compression means for

delivering a predetermined quantity of liquid from said well into the carbureter, said last-named means including a bucket connected to move with the bell and operatable in the oil-well, said bucket being tiltably mounted whereby it automatically discharges into the connection between said well and carbureter.

8. In gas-machine construction, the combination of a tank, a bell therein, a carbureter, a receiver connected with the carbureter, means to reciprocate the bell, an oil-well connected with the carbureter and means to deliver a predetermined quantity of liquid into said carbureter, said well being of greater diameter in one direction than in the other and said means for delivering liquid from said well into the carbureter including an elongated bucket supported intermediate of its ends and suspended from the bell, and trip means in the path of the bucket to effect its discharge.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

STEPHEN P. SANDERS.

Witnesses:
S. H. NOURSE,
HENRY P. TRICOU.