C. A. ENGGREN.

GAS CARBURETER.

No. 190,714. Patented May 15, 1877.

Fig. 1.

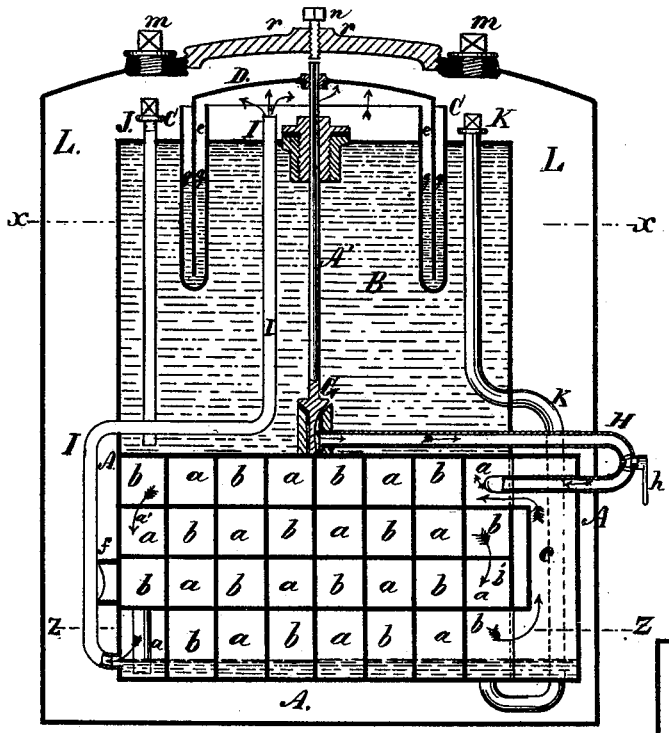


Fig. 3.

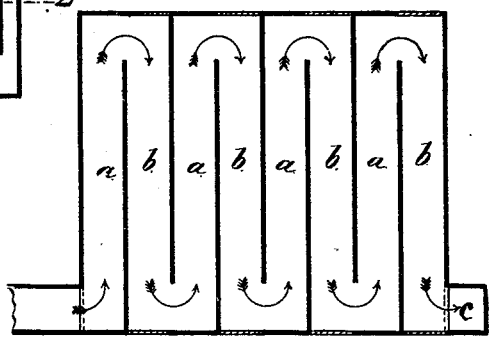
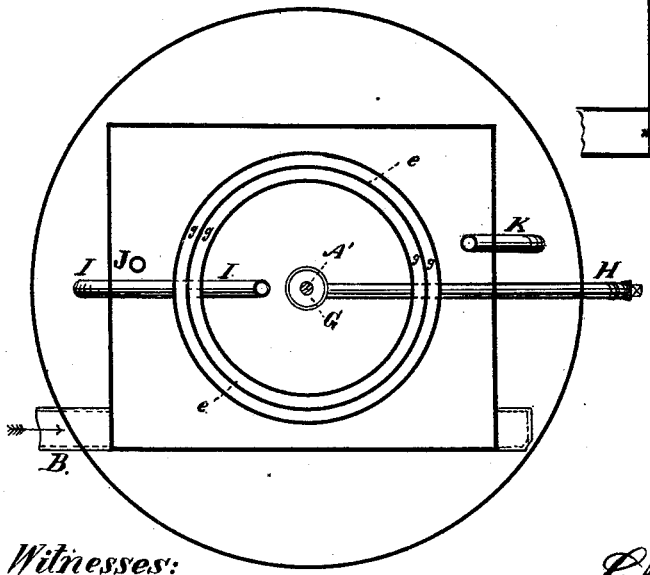


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

CHARLES A. ENGGREN, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN GAS-CARBURETERS.

Specification forming part of Letters Patent No. **190,714**, dated May 15, 1877; application filed August 18, 1876.

To all whom it may concern:

Be it known that I, CHARLES A. ENGGREN, of Brooklyn, in the county of Kings and State of New York, have invented certain Improvements in Gas-Carbureters, of which the following is a specification:

The object of this invention is to provide a means of supplying the carbureting liquid to a gas-carbureter in sufficient quantities and at the proper time to insure the requisite carbureting of the gas admitted to and passing through the apparatus; and to this end the invention comprises a valve automatically operated by gas admitted through a suitable pipe to the actuating device from the interior of the carbureter, and arranged in such relation with the liquid-inlet pipe of the latter that when the quantity of the hydrocarbon liquid is reduced below a certain point gas is admitted under a gasometer, flexible diaphragm, or other device, to lift the valve, and consequently admit the desired portion of the hydrocarbon aforesaid to the carbureter.

Figure 1 is a central vertical longitudinal sectional view of a gas-carbureter made according to my invention. Fig. 2 is a horizontal sectional view taken in the line X of Fig. 1; and Fig. 3 is a horizontal sectional view of a portion of the apparatus, taken in the line Z of Fig. 1.

The body A of the carbureter is composed of several systems of tubes or passages, *a b*, superposed one above another, as shown more fully in Fig. 1, and alternating, as represented more fully in Fig. 3. The gas from the main enters the carbureter at the bottom and one side, as at B, passing through the lower system of tubes *a b*, as represented by the arrows in Fig. 3. From this lower tier or system of passages *a b*, it passes up to a vertical passage, C, to the uppermost tier, through the passages of which it passes in the same manner, though in a reverse direction. Having reached the end of this uppermost tier, it passes through a suitable opening, as indicated by the arrow *a'*, into the tier below, through which it passes until, through an opening, as indicated at the arrow *b'*, it passes in the one immediately below, and thence in the same zigzag fashion as through the others to the outlet *f*.

Above the body A is a tank, B, containing the liquid hydrocarbon used for carbureting the gas. Provided in this tank is an annular vessel, C, which forms the trough of a gasometer, D, said trough being filled with water, mercury, or other suitable liquid, *g*, into which are inserted the sides *e* of the gasometer D. Attached to the gasometer D is a downwardly-extending stem, A', of the valve G, the latter arranged to close and open the passage to the pipe H, through which, when open, the liquid hydrocarbon contained in the tank B passes to the system of tubes or passages *a b*, the hydrocarbon flowing from one to the other of these passages zigzag, in the same manner as the gas, as hereinbefore explained, except that the liquid flows along the bottom of each tube or passage; the hydrocarbon—that is to say, that portion thereof not absorbed during the process of carbureting—passing to the bottom of the body A. The gas and liquid passing in the same direction, through the zigzag tubes or passages *a b*, are kept in intimate contact with each other during a sufficient length of time to insure the perfect carbureting of the gas; the arrangement, moreover, being such that the gas passing into the bottom of the body of the carbureter is first brought in contact with the heavier or less volatile portions of the carbon, thereby absorbing the same more readily than would be possible in a later stage, when it had become surcharged with the lighter parts of the hydrocarbon, a great economy in the quantity of hydrocarbon required, as well as a great increase in the degree of the carbureting of the gas, being by this means secured. When there is a sufficient quantity of hydrocarbon in the body A, the valve G will be lowered to shut off the flow of the hydrocarbon from the tank B to said body A; but when the quantity becomes diminished in the body A, the depth of such hydrocarbon at the bottom of the latter becomes reduced, so as to open the passage from the bottom of the body A, through a pipe, I, with the interior of the gasometer D. As soon as this is done, the pressure of the gas lifts said gasometer, and, consequently, the valve G, so that the pipe H is opened, and a sufficient quantity of the liquid hydrocarbon flows into the car-

bureter. When the liquid is received in the bottom of the body A to such an extent as to close the passage of the gas to and through the pipe I, the gasometer D descends and closes the pipe H until a further diminution of the liquid in the hydrocarbon causes the valve to be automatically lifted to provide a further supply.

It will be seen that by this means the supply of the hydrocarbon to the carbureter is automatically regulated and adjusted in the construction of the apparatus. The tank B may be supplied with a pipe, J. In order to draw off any residuent of the liquid hydrocarbon in the bottom of the apparatus, a pipe, K, communicating with said bottom, is provided, to which a pump may be attached on occasion. The pipe H may be provided with a stop-cock, *h*, by which said pipe may, when desired, be closed independent of the action of the valve G. The pipes J and K are, of course, closed during the normal operation of the apparatus by suitable plugs. Access is had to them when said pipes are to be used through openings above them in the surrounding case or jacket L of the apparatus, said openings being normally closed by screw-plugs *m*. The upward lift of the valve G may be limited by a screw-stop, *n*, placed in the line of the axis thereof, and working through a fixed nut in the top *r* of the shell or casing L.

I do not in this present application claim the combination in a gas-carbureter of the superposed system of attenuating-tubes, the gas-inlet and gas-outlet and the liquid-inlet pipe, all constructed and arranged to provide for the simultaneous flow in the same direction of the liquid hydrocarbon of the gas to be carbureted. Neither do I claim in this present application the process of carbureting gas or air by causing the fluid to be carbureted to pass in a stream or current in contact with the stream or current of the carbureting liquid flowing in the same direction, for the reason that I propose to claim the just hereinbefore-named combination of parts and the just hereinbefore-named process in an application for Letters Patent separate and distinct from this; but

What I claim herein as my invention is—

The valve G, automatically actuated by the pressure of the gas admitted through the pipe I, the body A of the carbureter underneath, the actuating device D, to which the stem A′ of the valve G is attached, the whole arranged in relation with the liquid-inlet pipe H of the carbureter, substantially as described, whereby, when the liquid hydrocarbon in the body A is diminished below a certain point, the gas is transmitted under pressure to lift the valve G, for the purpose set forth.

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Witnesses:

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