No. 765,108. PATENTED JULY 12, 1904.

H. SOEDER.

CARBURETER.

APPLICATION FILED JUNE 14, 1902.

NO MODEL.

Fig. 1

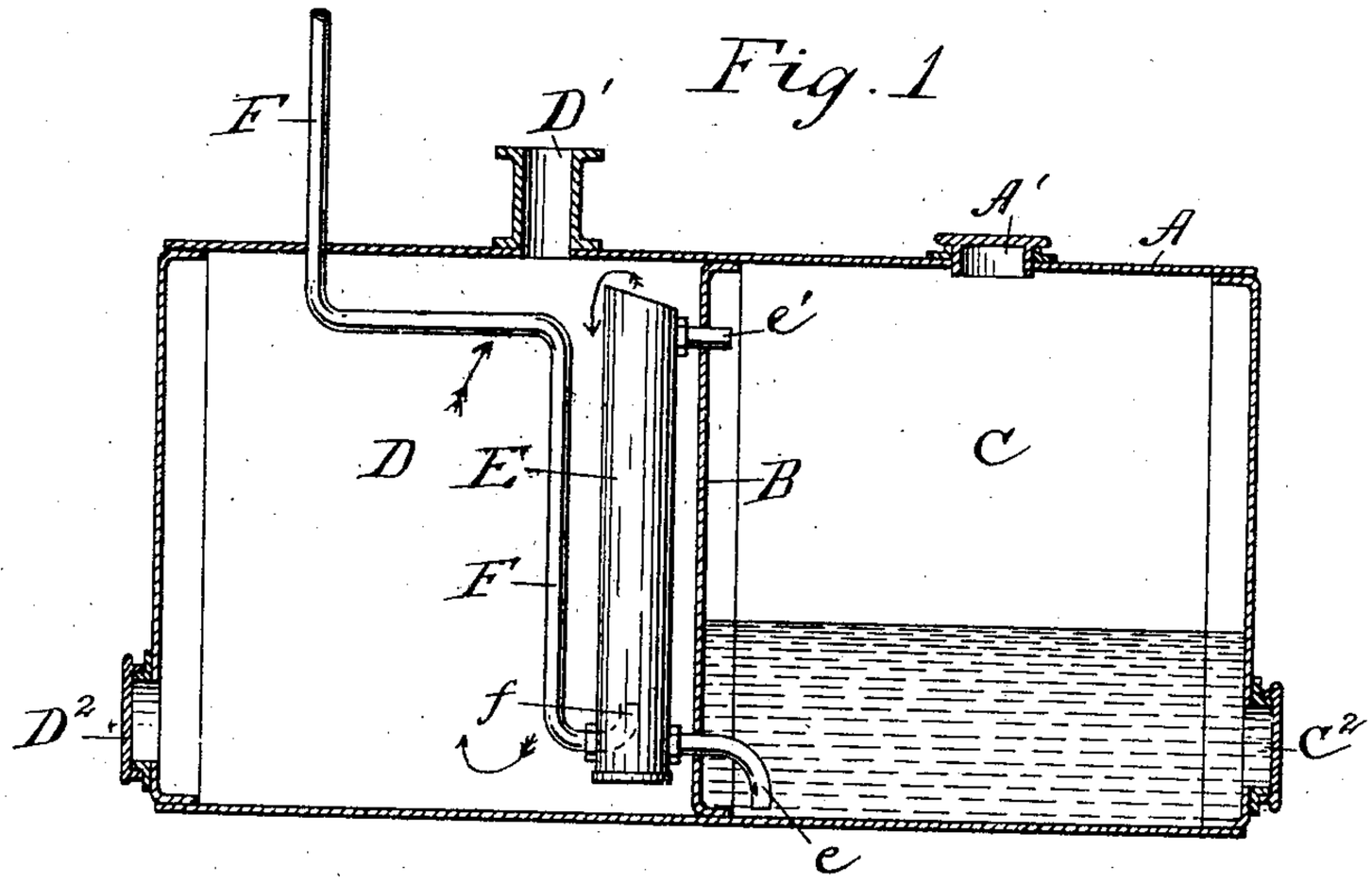


Fig. 2

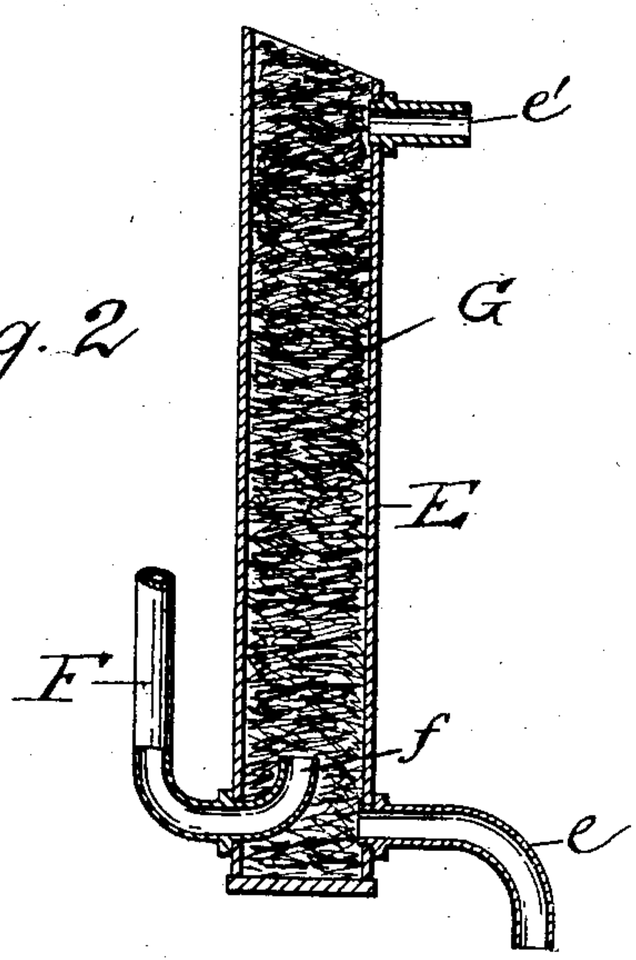
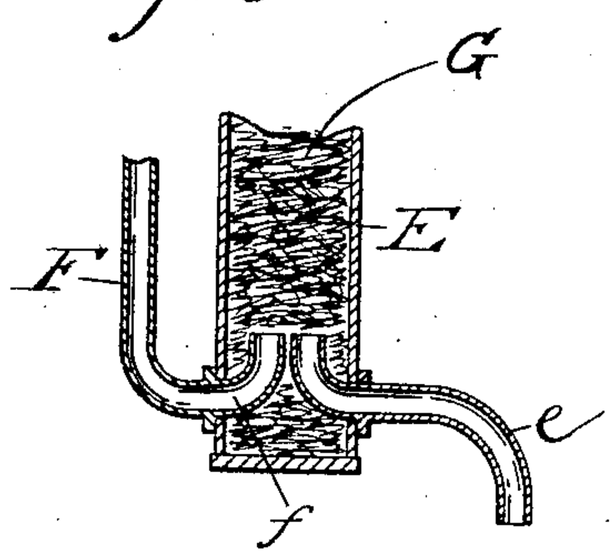


Fig. 3



Witnesses:-

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No. 765,108. Patented July 12, 1904.

UNITED STATES PATENT OFFICE.

HENRY SOEDER, OF CLEVELAND, OHIO.

CARBURETER.

SPECIFICATION forming part of Letters Patent No. 765,108, dated July 12, 1904.

Application filed June 14, 1902. Serial No. 111,700. (No model.)

To all whom it may concern:

Be it known that I, HENRY SOEDER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Gas-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to gas-machines or carbureters, and more especially to such machines designed for charging air with hydrocarbon-vapor to increase or confer the illuminating or heating power, or, in other words, render the same combustible.

The objects of my invention are, first, to provide a machine in which the carbureted air when supplied from the machine shall be free from oily particles or impurities and be as far as possible saturated with the inflammable ingredient and thoroughly mixed.

Another object of my invention is to keep the formation of the gas regulated according to the consumption of the same, thus equalizing the pressure at all times within certain predetermined limits, sustaining said pressure and supply according to the consumption, thus providing a steady flame.

Still another feature of my invention is to provide a compact device within which the air is carbureted and stored and sustained in a saturated condition under pressure and being in said container in direct influence with the saturating medium, thus at all times keeping the air in a saturated condition while under pressure.

My invention consists in peculiar features, assemblage of parts, and details of construction, which will be hereinafter fully set forth, and especially cited in the claims.

In the drawings, Figure I is a view in longitudinal vertical section of a machine which embodies my invention. Fig. II is an enlarged vertical sectional view of the carbureting mechanism. Fig. III is an enlarged fragmentary vertical section of the carbureting mechanism, showing a slight modification of an oil-feed pipe.

A represents a tank of any suitable contour, which provides the container for the hydrocarbon and also the reservoir for the storage of the carbureted air and also comprises or embodies the carbureter. This tank A is divided into two compartments by a diaphragm B, the compartment C being adapted to contain the liquid hydrocarbon, and the compartment D adapted to contain the carbureted air and also preferably the carbureter E. Leading into the tank A is a pipe F, which enters at the lower portion of the carbureter E and is given an up-turn, as at *f*. The carbureter E is an elongated chamber preferably a large tube, tightly packed with an absorbing and filtering substance. I prefer for this purpose to employ silk G; but other substances may be employed. The carbureter E at its lower end connects, as at *e*, with a hydrocarbon in the compartment C, and at its upper end it connects, as at *e'*, also with the compartment C for the purpose of conveying the overflow, if any, in the carbureter to said compartment. The upper end of the carbureter E is left open and communicates with the compartment D, which is the reservoir containing the carbureted air.

The pipe F communicates with an air-pump, preferably one known as the "force-pump." It is, however, preferable that this pump should be operated by a medium of constant pressure, and for this purpose I employ therefor as a matter of preference a pump run by water-pressure or hydrostatic pressure. Thus when the pressure in the compartment D is raised to a certain point predetermined the pump will stop to operate, and when the pressure is lowered in the compartment D the pump starts to operate. These pumps are of such varied construction and so well known that I do not deem it necessary to illustrate or describe the same in detail.

D' represents an outlet or supply pipe which is connected to the service-pipe, and it is thus that the gas is conveyed to the point of consumption. This outlet is at the upper end of the the compartment O.

Charging-aperture A' is supplied to the compartment C, and cleaning-apertures C^2 and

D^2 may be provided at the lower end of the compartments C and D for the purpose of cleaning out said compartments.

The following is the operation of my device, setting forth its peculiarities and advantages: The main difficulty heretofore encountered in the use of carbureted air has been the improper mixture of the air with the hydrocarbon vapor. Either the mixture was not thorough or where the mixture was thorough the air carried with it particles of liquid hydrocarbon, which affected the consumption in several ways—first, in the consumption a disagreeable odor was emitted; second, the combustion was irregular at times, flashing upward and at other times decreasing in volume of flame, also sooty deposits were formed in the burner, and hence the same was choked up. All of the above disadvantages prevented to a great extent if not entirely the use of the carbureted air in connection with "mantle-burners" on account of the desired regularity of the flame and the smallness of the apertures in the burner through which said gas had to pass. All of the above difficulties and objections have been obviated by my invention, which operates as follows: A pump of predetermined pressure is connected to the pipe F, and the compartment C is provided with hydrocarbon to a point above the surface of the inlet *e*. This hydrocarbon, preferably gasolene, passes through the nipple *e*, saturates the packing G, and percolates upward through said packing, keeping the same charged with more or less of the liquid hydrocarbon. The pipe F leads into the lower end of the carbureter E and having an upturned end *f*, which by reference to Fig. II can be seen to be so constructed that its outlet is directed upward, causing the air to be projected in this direction and through the saturated packing G, thus acting also as or on the principle of an ejector, pumping the hydrocarbon or sucking the hydrocarbon through the inlet or nipple *e*, thus always keeping the packing saturated regardless of its percolating qualities. The air passes upward through the carbureter, thoroughly mixes with the hydrocarbon, taking the same up to a saturating-point; but by passing through the packing above the surface of the hydrocarbon the liquid hydrocarbon is filtered and the carbureted air passes out through the upper end of the carbureter E. If from any cause liquid hydrocarbon should be carried to the upper portion of the carbureter E above the level of the liquid in the compartment C, the same will pass into the compartment C from the carbureter E through the nipple *e'*, which is located a short distance below the upper end or outlet of the carbureter. No communication is had between the compartment D and the compartment C, and hence the carbureted air as it passes from the carbureter E enters the compartment D, where it is stored and always under pressure, and the action of the air through the carbureter keeps the air within the compartment D always in action, inasmuch as its outlet being at the upper end and the newly-charged air being the heaviest will always tend to descend, as indicated by the arrows in Fig. I. Thus it will be seen that the air is always kept in agitation and always kept in saturated condition and that the heavier gases will always pass to the bottom, leaving the lighter gas to pass through the outlet D', from whence it passes to the desired place for combustion. The mixed air and hydrocarbon vapor being, as before stated, of the lightest saturated quality, but at the same time fully charged, is not so apt to condense; nor have I found that it will condense in the service-pipes or parts of the burner, and hence choking and sooty formation are prevented.

Charging-orifice A' for the compartment C is provided with an air-tight or gas-tight cover, as are also the hand-holes C^2 and D^2, which are provided to each compartment for the purpose of cleaning any sediment or accumulations in said compartments.

In setting forth this invention I have described and illustrated the same in a simple and convenient construction, with details and assemblages which I consider best adapted to carry out the object of the invention; but in doing so I do not wish to be understood as limiting my invention to these assemblages or details of construction, as the same may be modified in various ways and still retain the gist of my invention.

What I claim is—

1. A device for carbureting air comprising a tank having a hydrocarbon-chamber and a carbureted-air chamber, a carbureter mounted within the said air-chamber and having connecting means between the lower end thereof and the hydrocarbon-chamber, air-supply means extending through the air-chamber and connected to the bottom of the carbureter, and means connecting the upper end of the carbureter with the said hydrocarbon-chamber, substantially as described.

2. A device for carbureting air comprising a tank having a partition therein dividing the same into gas and hydrocarbon reservoirs, a carbureter mounted upon said partition within the gas-chamber, air-supply means connected therewith, means connecting the lower end of the carbureter with the hydrocarbon-reservoir, and means connecting the upper end of the carbureter with the hydrocarbon-reservoir, substantially as described.

3. In a device of the character described, the combination with the tank having a partition therein, forming gas and hydrocarbon reservoirs within said tank, a carbureter having means therein to mix the air and hydrocarbon mounted upon said partition, the up-

per end of said carbureter being in communication with the hydrocarbon-reservoir, means connecting the hydrocarbon-reservoir with the lower end of the carbureter, and air-supply means extending through the gas-reservoir and upwardly into the lower end of the carbureter, substantially as described.

4. In a carbureting apparatus the combination of a tank having a partition therein, forming gas and hydrocarbon reservoirs a carbureter mounted within the gas-reservoir upon said partition, means carried within said carbureter to mix the air and hydrocarbon, air-supply means leading to the carbureter, and means extending through said partition and connecting the hydrocarbon-reservoir with the carbureter, substantially as described.

5. In a machine for carbureting air, a hydrocarbon-chamber a carbureter separate from said hydrocarbon-chamber but communicating with the same at its lower end, a carbureted-air reservoir with which said carbureter communicates at the upper end or portion, said reservoir having the service-outlet also located at its upper end and air-supply means extending through said air-reservoir and communicating with the carbureter, the lower portion thereof being upwardly turned within said carbureter, substantially as and for the purpose set forth.

6. In a carbureting apparatus, a tank having a partition forming gas and hydrocarbon reservoirs therein, a chamber secured to said partition having its upper end open and in communication with the gas-reservoir, means therein to intimately mix the hydrocarbon and air, means connecting the lower end of the chamber with the hydrocarbon-supply, and means for introducing air thereto substantially as described.

7. In carbureting apparatus, a tank having a partition therein forming compartments within said tank thereby providing a gas and hydrocarbon reservoir, a chamber mounted on the partition in which hydrocarbon and air may mix, means for conducting the hydrocarbon from said reservoir into said mixing-chamber, means for conducting air under pressure into said mixing-chamber, substantially as set forth.

8. In carbureting apparatus, a tank having a partition dividing the same into gas and hydrocarbon receiving compartments or reservoirs, a vertical chamber, mounted on said partition, in communication at its upper portion with both reservoirs, provided with material adapted to deter the upward passage of air and hydrocarbon therein, means for conducting hydrocarbon from the lower portion of said reservoir into the lower portion of said mixing-chamber, means for conducting air under pressure into the lower portion of said mixing-chamber, substantially as set forth.

Signed at Cleveland, in the county of Cuyahoga and State of Ohio, this 4th day of June, 1902.

HENRY SOEDER.

Witnesses:
E. B. DONNELLY,
W. E. DONNELLY.