G. H. BURROWS.

Carbureting Apparatus.

No. 234,955. Patented Nov. 30, 1880.

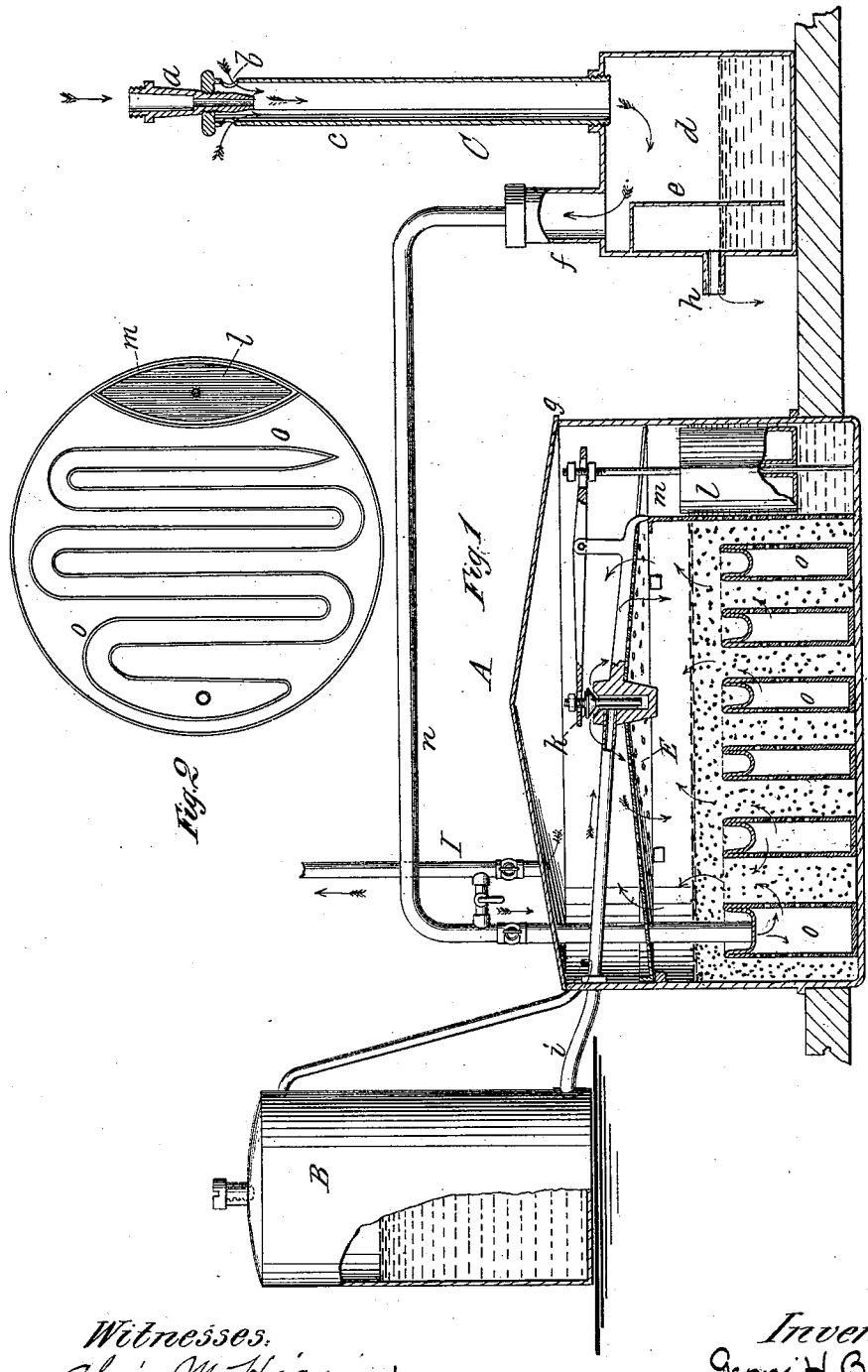


Fig. 1

Fig. 2

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UNITED STATES PATENT OFFICE.

GEORGE H. BURROWS, OF BOSTON, MASSACHUSETTS.

CARBURETING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 234,955, dated November 30, 1880.

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To all whom it may concern:

Be it known that I, GEORGE H. BURROWS, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Carbureting Apparatus, of which the following is a specification.

My invention relates to that class of gas apparatus or carbureters for enriching illuminating-gas or charging atmospheric air with the vapor of a volatile hydrocarbon, and my improvements aim chiefly to render the arrangement of the liquid-reservoir more safe, and yet insure a certain and regular supply to the carbureting-chamber; also, to insure the more perfect saturation of the absorbent material of the carbureting-chamber, as well as to effect the even distribution of the volatile liquid therein and to thoroughly charge the air or gas with its vapor. To these ends the main features of my invention are embodied in the relative arrangement and connection of the liquid-reservoir with the carbureting-chamber and the manner of controlling its discharge therein; also, in the internal construction of the carbureting-chamber, including the means for distributing the fluid over the absorbent, and in the form of the air or gas passages through the same, as hereinafter fully set forth.

Figure 1 of the drawings annexed presents a sectional elevation of my improved gas or carbureting apparatus, and Fig. 2 shows a plan of the carbureting-chamber.

In these views A indicates the carbureting-chamber, B the reservoir for the volatile liquid, and C the air-forcing device, which is employed when carbureting air and thus forming an illuminating-gas therefrom, as will be readily understood. The air-forcing device is not, of course, used when coal or the fixed gas is to be enriched, this gas being passed directly through the carbureting-chamber in the usual manner. This air-forcing device may be of any approved or existing kind; but I prefer the device illustrated, in which a small jet of water discharged from the nozzle *a* at high velocity draws in air through the aperture *b* in the induction-tube *c* on the principle of the injector, and forces the same into the accumulating-chamber *d*, where the water gravitates to the bottom, and, rising above the sealing-partition *e*, confines the air in the upper part of the chamber, from which it escapes through the outlet *f*, while the water flows out of the overflow-pipe *h* at the opposite side of the partition.

The carbureting-chamber A may be of any suitable form or size, according to the capacity of the apparatus, but is preferably of circular shape, as illustrated, and may have a removable head, *g*, capable of being fastened down tightly upon the top of the chamber, and permitting access to the interior thereof when required.

The liquid-reservoir is separate or remote from the carbureter, as shown, being located, preferably, in an outhouse, or in a pit, or in the yard, removed from the house, while the apparatus or carbureter is arranged in the cellar or basement of the house, in the usual manner, thus rendering the arrangement safer than would be the case were the reservoir of liquid placed within the same.

The reservoir B is raised somewhat above the carbureter, as shown, and is connected therewith by the pipe *i*, leading from the base of the reservoir, and through which the liquid feeds by gravity into the carbureter, discharging therein above the absorbent-bed, as shown.

The discharge end of the pipe is terminated with an automatic valve, *k*, whose opening and closing are governed by the fall or rise of a float, *l*, arranged in a small liquid-chamber, *m*, at one end of the absorbent-bed, into which the liquid rises and acts by its rise or fall to or from a determined level to operate the float-valve, and thus regulate the inflow of the fluid, so as to insure a uniform supply and a perfect saturation of the absorbent.

The pipe *n*, through which the air or gas enters the carbureter, connects with one end of the distributing-passage *o* in the base of the carbureter, as shown. This air-passage is preferably of oblong form in cross-section, and is of sinuous direction, being extended over the base of the carbureter in zigzag folds from side to side, as illustrated best in Fig. 2. It is perforated all along its length on its vertical sides near the top edge, and is fully embedded in coarse sawdust or other absorbent, which rises to the depth of several inches above it, as fully shown in Figs. 1 and 2.

The float-valve is so arranged that the liquid is allowed to rise in the absorbent to a little below the perforations in the air-passage, so as to keep the absorbent thoroughly saturated, yet not obstruct or flood the air-passage.

To further insure the perfect saturation of the absorbent the top of the air-passage is depressed all along its length to form a groove or channel, into which the liquid descending from above may lodge, and thence become absorbed close to the air-holes of the passage, as will be readily understood from Fig. 1. This construction of the air-passage constitutes another feature of my invention, the advantage of which will be readily appreciated.

The remaining feature of my invention consists in the arched or domed diaphragm E, arranged in about the middle of the carbureter above the absorbent-bed thereof, and forming a complete horizontal arched or conical partition therein. This partition is perforated over its whole extent with numerous holes, and at the arched center of the partition, and above the same, the discharge-valve *k*, governing the fluid-supply, is arranged as shown in Fig. 1. The fluid thus entering the carbureter flows over and down the arched top of the partition and drips through the numerous holes thereof in a fine shower on the absorbent-bed, thus uniformly distributing the liquid over the same, and also exposing a large surface for evaporation to the air or gas, which, rising through the absorbent-bed, passes against the drip through the holes of the partition, and flows out by the pipe I, which connects with the system of gas-pipes extending through the house in the usual manner.

By these combined features of construction it will be observed that a very large surface of the volatile liquid is exposed to the air or gas, so that its perfect saturation with the vapor thereof is insured and a rich gas thus produced, while the supply and distribution of the fluid to the absorbent-bed is rendered uniform and sure, and at the same time the arrangement and construction of parts are safe, cheap, and simple, which are advantages of prime importance in machines of this class.

I do not claim a liquid-reservoir isolated from the carbureter and having its discharge in the carbureter regulated by an automatic float-valve, as I am aware that the same is commonly used; neither do I broadly claim a perforated partition above the carbureting-bed through which the liquid is discharged thereon; but I do claim the same in connection with such an arrangement of inlets and outlets relatively thereto as causes the outflowing carbureted current to pass through said perforated partition in opposition to the fluid-drip through the same, as this is novel and gives a much better carbureting effect.

I am also aware that perforated air-passages embedded in an absorbent are common; but a novel feature of such passages in my device consists in making them imperforate below the level of the saturating-fluid in the absorbent, and perforated only above such level, whereby obstruction of the air-passages by the fluid is prevented.

I am also unaware of the previous use of the accumulating channel or gutter on the top of the air-passages as used in my device, which allows an accumulation of fluid therein, which fluid constantly trickles over the edges of the gutter down into the absorbent close to the perforations of the air-passages, and thus insures a more ample distribution of the fluid close to the air-jets, where the absorbent should be the most freely moistened.

What I claim as my invention is—

1. A carbureting apparatus having its carbureting-chamber constructed with a perforated partition above its carbureting-bed, in combination with a fluid-supplying device arranged to discharge above and through said perforated partition upon the carbureting-bed, together with air or gas passages opening in the carbureter below the said perforated partition, and a discharge-pipe opening from or out of the carbureter above said partition, whereby the carbureted current passes through the said perforated partition in opposition to the fluid-drip through the same, substantially as herein shown and described.

2. The combination, with a carbureting-chamber, of air-passages arranged in the base thereof, embedded in absorbent, and imperforate at their lower portion below the level of the saturating-liquid in the said absorbent, and perforated above the said level to discharge the air directly through said absorbent at or slightly above the level of the saturating-fluid, substantially as herein set forth.

3. The combination, in a carbureting apparatus, with a carbureting-chamber provided with a fluid-supplying reservoir discharging above and upon the absorbent-bed or air-passages thereof, of air-passages in said bed, perforated on their sides to discharge the air laterally, and formed with an imperforate gutter or channel on the top thereof, substantially as and for the purpose set forth.

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Witnesses:
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