3 Sheets--Sheet 1.

I. SIMMONS.

Carbureters.

No. 145,248. Patented Dec. 2, 1873.

FIG. 2.

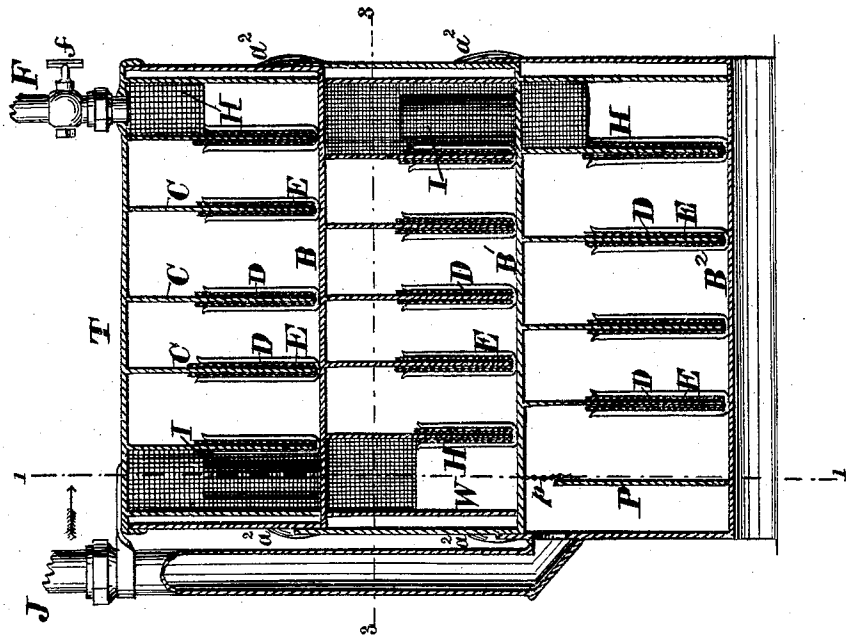
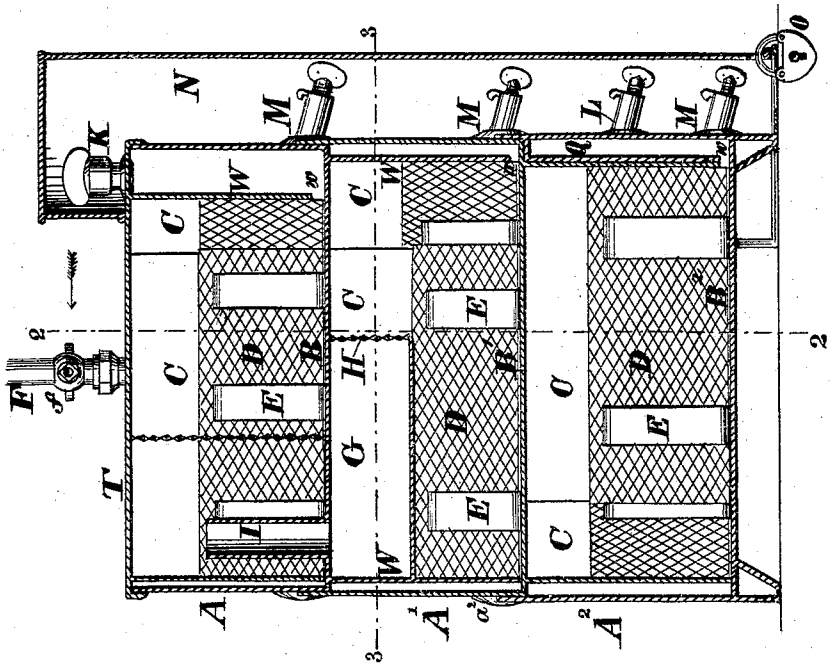


FIG. 1.



WITNESSES:

Jas. L. Ewin

Walter Allen

INVENTOR:

Isaac Simmons

By Knight Bros Attorneys.

3 Sheets--Sheet 2.

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FIG. 3.

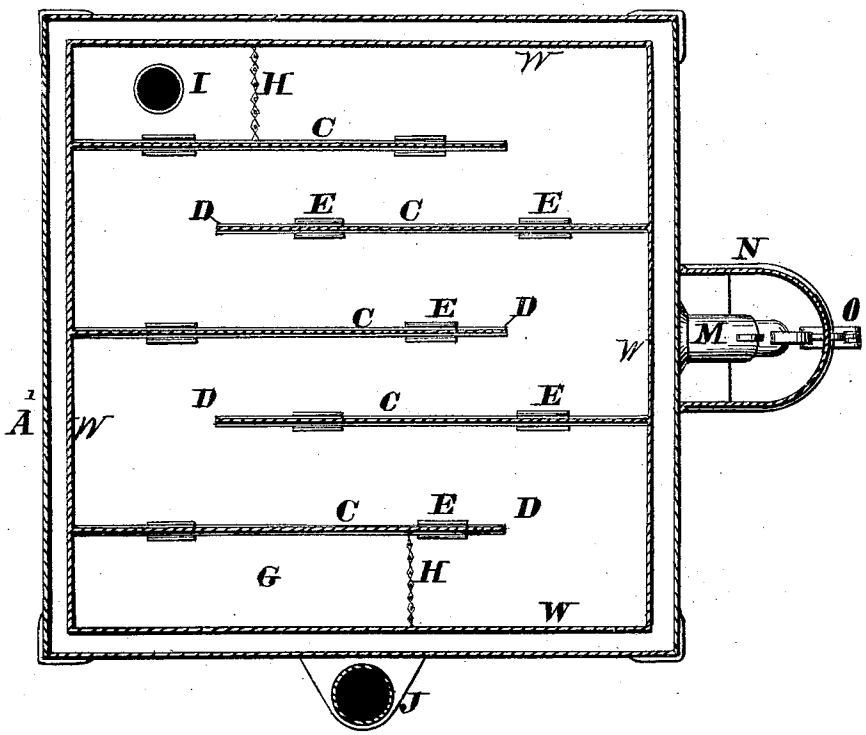
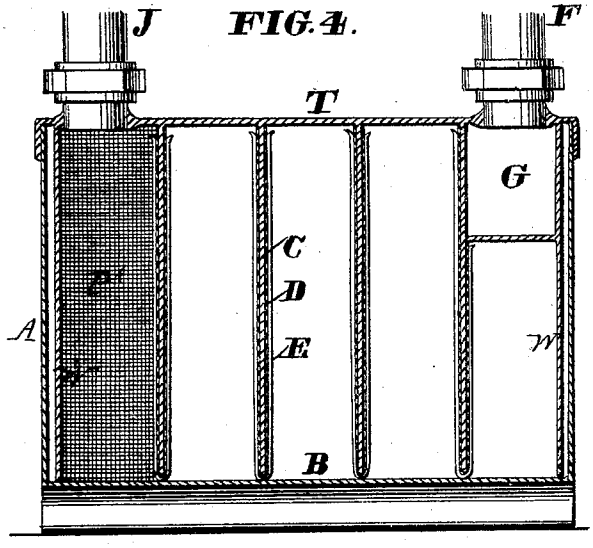


FIG. 4.



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3 Sheets--Sheet 3.

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FIG. 5.

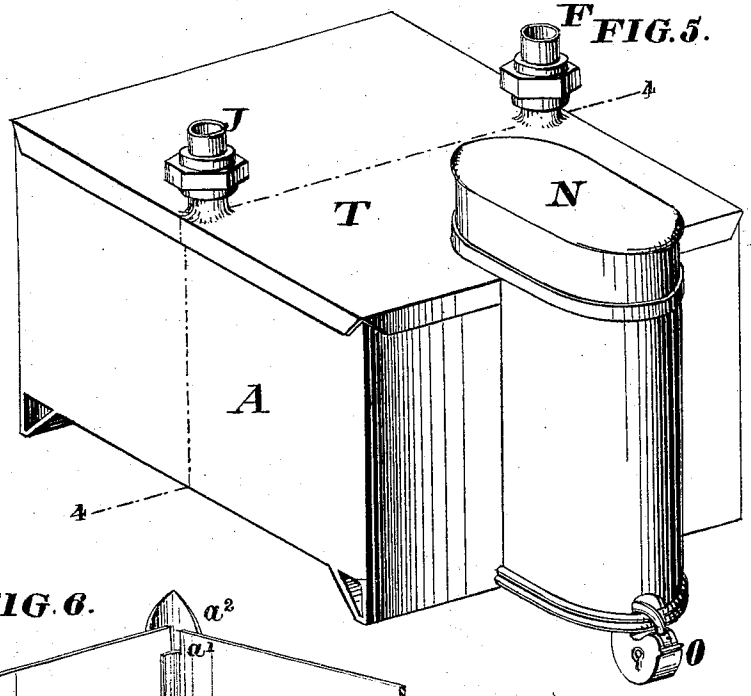


FIG. 6.

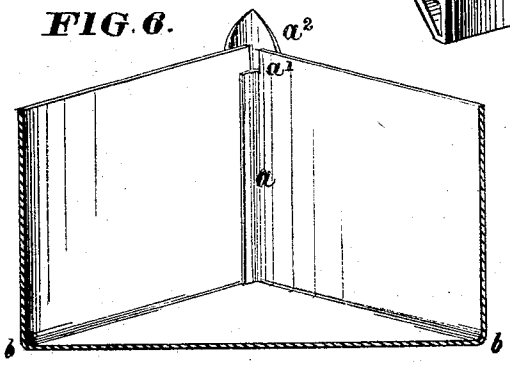


FIG. 7.

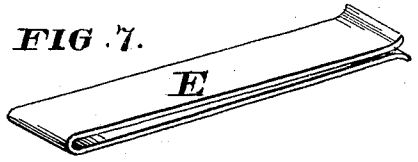


FIG. 8.

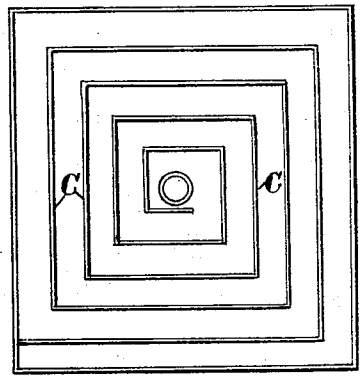
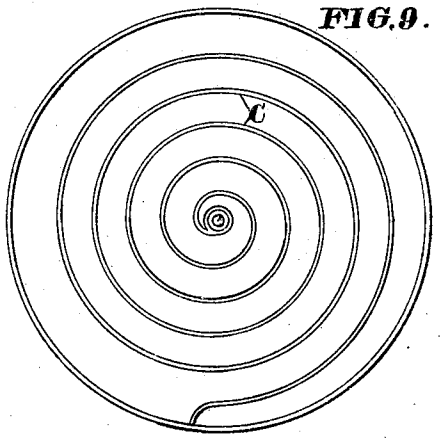


FIG. 9.



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INVENTOR:

Isaac Simmons

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UNITED STATES PATENT OFFICE.

ISAAC SIMMONS, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN CARBURETERS.

Specification forming part of Letters Patent No. **145,248**, dated December 2, 1873; application filed November 21, 1873.

To all whom it may concern:

Be it known that I, ISAAC SIMMONS, of Baltimore, in the State of Maryland, have invented a new and useful Gas and Air Carbureting Apparatus, of which the following is a specification:

My invention relates to that class of carbureting apparatus in which gas or air is conducted through serpentine passages in contact with a volatile hydrocarbon liquid, the said liquid being caused to rise by capillary action in sheets of woven fabric or other fibrous matter, so as to increase the surface exposed to vaporization. My improvements consist, first, in a device for applying and securing the fibrous material; second, in a guard for receiving the flow of gas or air on its entrance into each pan, and distributing it in such a manner as to prevent the carrying of liquid from an upper to a lower pan, or unduly agitating it; third, in a device for covering the liquid supply, discharge, and gage cocks, to prevent access thereto; fourth, in improved mode of constructing the pans and the walls of the gas-chamber.

In the accompanying drawings, Figure 1 is a vertical section of an apparatus illustrating the invention on the line 1 1, Fig. 2. Fig. 2 is a vertical section of the same, in a plane at right angles to the former, on the line 2 2, Fig. 1. Fig. 3 is a horizontal section on the line 3 3, Figs. 1 and 2. Fig. 4 is a vertical section illustrating the application of the invention to a one-story carbureter with a single pan. Fig. 5 is a perspective view of the said one-story carbureter. Fig. 6 is a perspective view of one corner of one of the pans, illustrating the preferred mode of making them. Fig. 7 is a perspective view of a clasp or clip employed to attach and secure the fibrous capillary material. Figs. 8 and 9 are diagrams illustrating modifications in the arrangement of vertical partitions.

A A^1 A^2 represent parts of the external shell or casing, constructed with bottoms or horizontal partitions B B^1 B^2. A B A^1 B^1 A^2 B^2 thus constitute pans, of which one or more may be employed, containing the carbureting liquid. Where a plurality of pans are used, they are arranged one above another, as illustrated in Figs. 1 and 2. From the top T of the apparatus, and from the bottom of each pan except the lowest, inner walls W project down within the pan next below, so as to form the sides of the gas-chamber. These inner walls may extend down to the bottom of the pan, except in front, where a space, *w*, is left, to permit the passage of the liquid in entering the pan, in the case of the top pan, and for drawing off in the case of the others. Within each of the pans is a series of vertical partitions, C C C, which may be arranged in the parallel form shown in Fig. 3, or in a helix, as illustrated in Figs. 8 and 9, or in other usual way, so as to form a serpentine passage, through which the gas or air will be caused to pass in contact with the surface of the carbureting-liquid. In order to increase the vaporizing surface, I employ sheets D D D of Canton flannel, or other suitable fibrous material, passed around the bottoms of the partitions and up to the requisite height on each side, in which position they are held by clasps or clips E E, the partitions C being for convenience of putting the apparatus together, attached to the bottom of the pan next above and to the inner walls W. The partitions reach down to about the bottom of the pan, so that when the fibrous material is applied it will touch the bottom. The capillary material may be carried to about the height of the overflow-tube I, hereinafter described; or in the single-pan apparatus it may extend to the top of the chamber. F represents the induction-pipe, for air or gas to be carbureted. G is a guard at the entrance to each pan, a gauze screen, H, being provided to cause the gas to pass into the pans gradually and in a diffused state. The guards G perform a valuable function in preventing such forcible contact of the entering air or gas with the surface of the liquid as to unduly agitate the latter and carry it over from one pan to another, or cause it to obstruct the passage of the gas. I is a tube, extending as high as the proper level of liquid in each pan, and employed to conduct the gas or air to the guard of the pan next below, and also permitting the overflow of liquid from one pan to another in the act of filling. J is the discharge-pipe, through which the carbureted gas is supplied to the burners. The induction-pipe F and discharge-pipe J may either or both be provided with

cocks *f*. K is a screw-cap or stopper, covering a nozzle through which the carbureting-liquid is introduced. L is a gage or overflow cock to indicate when the pans are filled to the proper height. M M are draw-off cocks, through which the pans may be completely emptied of liquid when required. The stopper K and cocks L M are covered by a cap, N, formed at top to catch over the stopper, and at bottom to be secured by a lock, O, so that access to the cocks by unauthorized parties may be prevented.

The preferred manner of constructing the pans is shown in the sectional perspective view, Fig. 6. The blanks are cut in the form of a Greek cross, and the sides turned up so as to avoid seams at *b* around the bottom, and have seams only at the vertical corners *a*. As the pans fit one into another a gap is left at a^1 at the top of each corner covered by a cap-piece, a^2, which may be readily removed so as to expose the seam of the pan above where it fits within the margin of the other.

The purpose of this device is to permit the inspection and repair of the seam, when needful, through its entire length without taking the pans apart.

My mode of cutting the blanks and constructing the pans avoids any waste of material, as the corner-pieces which are cut out are all used in the interior of the pan.

A partition, P, is placed within the last chamber, having in its upper part an aperture, *p*, which I prefer to cover with wire-gauze in order to check and regulate the flow of gas where it finally passes to the eduction-pipe. In the single-pan apparatus I have shown a vertical gauze partition, P′, for the same purpose, or, instead of making the single-pan apparatus as it is shown in Fig. 4, it may be made similar to the lowest pan and interior arrangement thereof of the apparatus containing more than one pan, in which case the opening for filling the apparatus and also the opening into which the gas or air enters will be placed as they are shown in Figs. 4 and 5. Q represents a partition in the lowest pan, tightly connected at top with the external wall and descending nearly to the bottom of the pan and forming a narrow chamber, with which the cocks L and M communicate. This produces a liquid seal, preventing the escape of gas through the gage-cock L when it is opened.

The construction of the clips E is more particularly shown in Fig. 7. They consist of strips of metal doubled in the form represented and having sufficient elasticity to hold a single thickness of capillary material on the partition or to grasp any number of thicknesses that it may be desired to use. The said clips are of great value in the facility they afford for applying, removing, and changing the fibrous matter.

The pans may be made of any suitable sheet metal, or may be cast if preferred.

The apparatus may, if preferred, be constructed with an upper pan or chamber destitute of vertical partitions, into which chamber the air or gas is first introduced, and from which it is conducted to and through the successive carbureting-chambers. It may also be advantageous, more especially when air is carbonized, to dispense with the internal gas-chamber and partitions in the lowest pan.

The pans, when made round, may be spun up out of sheet-brass, or other suitable metal.

I do not claim broadly a closed box containing capillary material, with entrance and exit tubes for the purpose of charging gas with hydrocarbon vapor, as I am aware that such a device has long been in use.

The following is claimed as new:

1. The clips E, constructed substantially as described, in combination with the partitions C, capillary material D, and pan or pans to contain hydrocarbon liquid.

2. In a carbureting apparatus, consisting of a series of pans arranged one above another, taking the air or gas to be carbureted at top and delivering it at bottom, the guards G and screens H, constructed and arranged as described, to prevent the current of air or gas unduly agitating the liquid or carrying it from an upper to a lower pan.

3. The cap N, constructed and applied substantially as described, to prevent access to the feeding-nozzle K′, cocks L M, by unauthorized parties.

4. The pans A B A^1 B^1, constructed as herein described, with seamless bottoms and vertical corner-seams, to which access is had from end to end, as explained.

ISAAC SIMMONS.

Witnesses:
OCTAVIUS KNIGHT,
WALTER ALLEN.