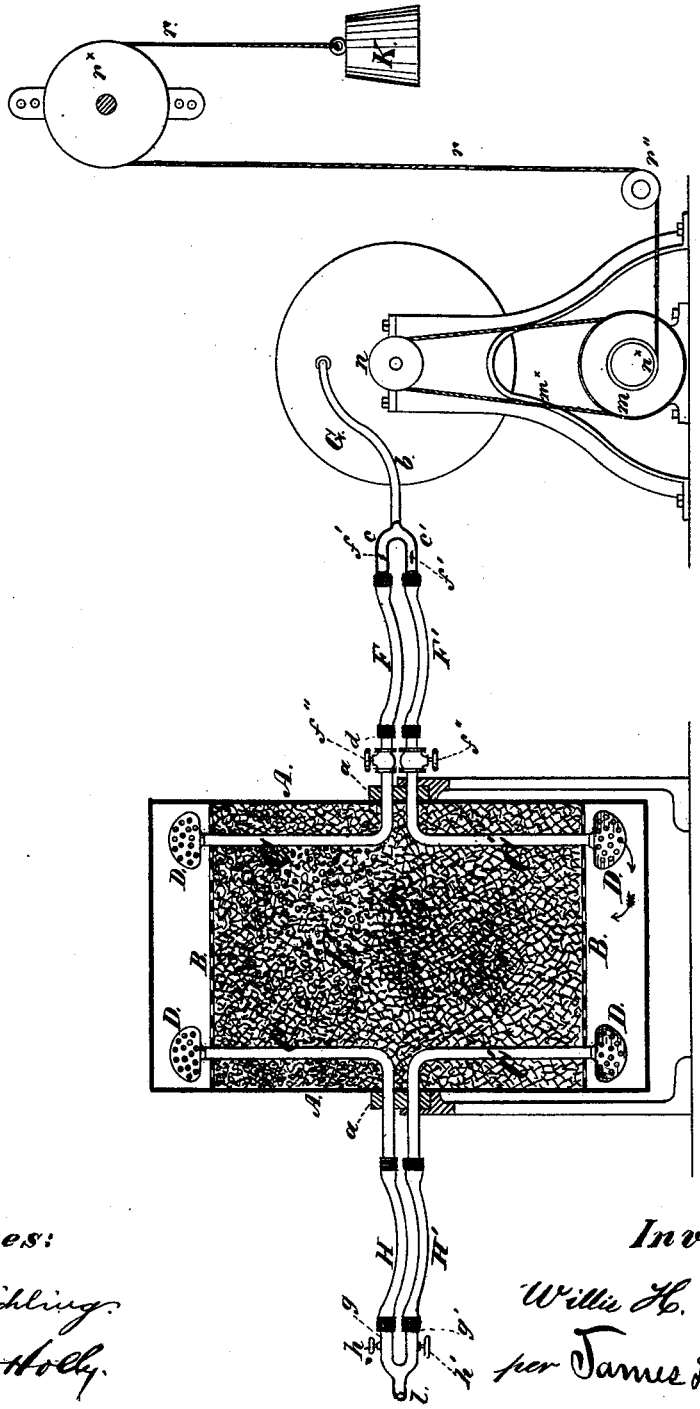
W. H. WINN.

GAS AND AIR CARBURETER.

No. 191,789. Patented June 12, 1877.



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IMPROVEMENT IN GAS AND AIR CARBURETERS.

Specification forming part of Letters Patent No. **191,789**, dated June 12, 1877; application filed January 11, 1877.

To all whom it may concern:

Be it known that I, WILLIS H. WINN, of the city, county, and State of New York, have invented certain Improvements in Gas and Air Carbureters, of which the following is a specification:

It is a common defect in gas and air carbureters that the carbureting-liquid being composed of various fluids having different densities the lighter hydrocarbons are first taken up by the gas or air, while the heavier are left, to be subsequently taken up, but with much greater difficulty, and a much inferior carbureting effect upon the gas or air, as the case may be.

This invention is designed to obviate the difficulty referred to, and to provide for bringing the carbureting-liquid into such relation with the gas or air to be carbureted, when the latter is passed through the carbureting apparatus, that the carburation of the gas or air shall be rendered practically uniform.

With this object in view the invention comprises a novel combination, in a carbureter, of diaphragms, arranged at or near the end of a reversible carbureting-cylinder with duplicate systems of inlet and outlet pipes connected with the pump, by which the gas or air is forced to and through the carbureter, whereby, when, after a period of use, the heavier hydrocarbons have been deposited in the lower part of the cylinder, the reversal of the latter will cause the gas or air to be carbureted to pass upward through such heavier or denser hydrocarbons, and in such minute and intimate contact therewith that the same shall be absorbed to an extent sufficient to carburet the air as thoroughly and effectively as when such gas or air is brought in contact with the lighter hydrocarbons.

The invention further comprises a novel combination, within the carbureting-cylinder, of perforated bulbs with the ends of the duplicate systems of inlet and outlet pipes, whereby provision is made against the choking of said pipes with the sawdust, fibrous material, or other substance saturated with the hydrocarbon, in order that the latter may be exposed to the contact of the gas or air as the same passes through the carbureting-cylinder.

The invention further comprises a novel combination of duplicate flexible connecting-tubes with the duplicate systems of inlet and outlet pipes within the carbureting-cylinder, and with the pump, by which the gas or air to be carbureted is forced to and through the cylinder, whereby cheap, simple, and efficient provision is made for the reversal of the cylinder, as hereinbefore explained.

The drawing represents a side view and partial vertical section of an apparatus made according to my invention.

A is the reversible cylinder, which forms the body of the carbureter, and which is supported on trunnions, *a*, or equivalent pivotal support, so that said cylinder may be turned either end upward. Placed within said cylinder, at a short distance from the opposite ends thereof, are two diaphragms, B, perforated or foraminated, being made either of sheet metal provided with numerous small holes, of wire-cloth, or other suitable material. The central portion of the cylinder between these two diaphragms, B, is filled with sawdust, E, pumice-stone, fibrous material, or other substance capable of absorbing a large quantity of liquid hydrocarbon, and at the same time sufficiently loose or porous to permit the passage of air therethrough.

C C are two pipes arranged opposite each other in one end portion of the cylinder A, their outer ends extending into the space between the adjacent diaphragm B and the adjacent end of the cylinder A, and having upon their said ends perforated bulbs, D. The inner ends of these pipes C C are turned laterally outward to the trunnion *a*. C′ C′ is a duplicate set of pipes identical in character, position, and function with the pipes C C, except that they are placed in the opposite end of the cylinder A, the outermost ends of these pipes C′ C′ being provided like the others with perforated bulbs D, and their inner ends turned laterally outward through the trunnions *a*.

G is the air-pump, by which the gas or air to be carbureted is forced into the cylinder A. The outlet of this pump G has an outlet-pipe, *b*, bifurcated or branched, as represented at *c c′*. From one of these branches *c c′* of the pipe *b* to the outwardly-projecting end *d* of

the adjacent pipe C extends a flexible tube or pipe, F. In like manner from the other branch *c'* to the corresponding outwardly-projecting inner end of the adjacent pipe C' extends another flexible pipe, F'.

The branches *c c'* are provided with stop-cocks *f'*, and in like manner the just herein-mentioned inner ends of the adjacent pipes C C' are provided with stop-cocks *f''*, the outwardly-turned ends of the two other pipes C C' at the opposite side of the cylinder A have attached to them similar flexible pipes H H', which connect with the branches *g g'* of a pipe I, leading to the usual gas-pipes of the building or other locality to be supplied with gas from the carbureter, the branches of this pipe I being, of course, provided, for convenience, with stop-cocks *h h'*. The pump G receives its rotary motion in an accelerated degree by means of the larger band-pulley *m*, connecting by a band, $m^{\times}$, with the small band-pulley *n*, the larger pulley *m* having upon its shaft a smaller pulley, $n^{\times}$, rotated by the cord *r*, passing over the guide-pulleys *r'* $r^{\times}$, and provided with the usual weight K.

In the operation of the apparatus, the gas or air to be carbureted is forced in the usual manner by the pump G to the carbureter, the stop-cock *c* being turned to shut off the passage of the gas or air through the uppermost of the flexible pipes, that marked F, and the stop-cock E being in like manner turned to prevent the outflow of the carbureted gas or air to the lowermost of the flexible pipes on the opposite side of the cylinder A, that is, the flexible pipe marked H'. This done, the gas or air to be carbureted flows inward through the open flexible pipe $F^{\times}$ downward through the adjacent pipe C', thence up through the lowermost of the foraminated diaphragms B, through the mass of porous material E, the latter properly saturated with the naphtha or other suitable hydrocarbon, and thence upward through the opposite diaphragm B to and into the pipe C at that side of the cylinder opposite that at which the gas or air entered said cylinder, and thence out through the flexible pipe H to the pipe I.

It will be seen that by this means the gas or air to be carbureted is forced through the mass E, and this latter, being saturated with the hydrocarbon or carbureted liquid, causes such liquid to be taken up by the air to any requisite extent; but, inasmuch as the heavier portions of the hydrocarbon will sink to the bottom of the cylinder, the carburation of the gas or air will vary in proportion as the lighter portions are eliminated from the carbureting-liquid. When this stage is approached, the cylinder A is simply reversed or turned upside down, and this, by causing the heavier portions to retrace their path, although again in a downward direction, brings the same in such intimate contact with the gas or air forced through the mass E, that the heavier hydrocarbons are taken up by such gas or air with great facility and to such an extent that the carburation of the gas or air is practically uniform, notwithstanding the variations in the density of the carbureting-liquid. It is of course to be understood that when the cylinder A is thus reversed the stop-cocks of the pipes C C' and their connections are reversed, those being closed that before were open, and *vice versa*. It will also be observed that the pipes F F' and H H', being flexible, permit the cylinder A to be reversed, as upon a rock-shaft, without wrenching the connections of the cylinder A, either with the outlet-pipe I or with the pump G. Furthermore, it will be observed that the perforated bulbs D, being fitted upon the extremities of the pipes C C', prevent any particles of the sawdust or other material shown at E from entering and clogging the said pipes C C'.

What I claim as my invention is—

1. In the reversible carbureting-cylinder A the perforated or foraminated diaphragms B, at or near its ends, in combination with the duplicate systems of inlet and outlet pipes C C', substantially as and for the purpose herein set forth.

2. The perforated bulbs D, in combination with the duplicate system of inlet and outlet pipes C C', and the central portion of the reversible cylinder A, containing the absorbent material, all substantially as and for the purpose herein set forth.

3. The flexible connecting-tubes F, with the duplicate systems of pipes C C within the reversible cylinder A, and the pump G, whereby the gas or air is forced to and through the said cylinder, substantially as and for the purpose herein set forth.

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