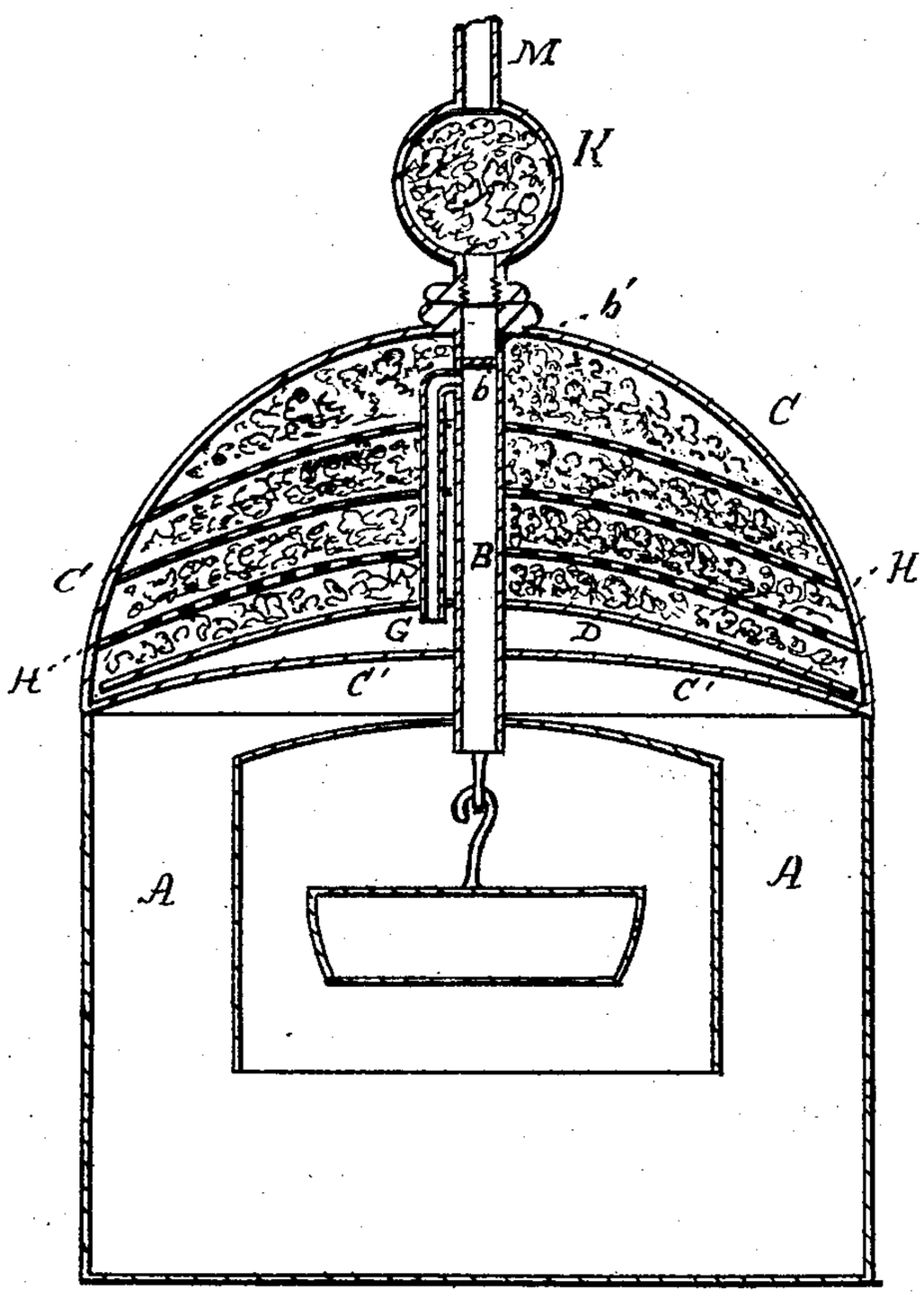
A. W. PORTER.

Apparatus for Carbureting Gas and Air.

No. 152,006. Patented June 16, 1874.



Witnesses.
Henry Mason
James King

Inventor
A. W. Porter

UNITED STATES PATENT OFFICE.

ALONZO W. PORTER, OF NEW YORK, N. Y.

IMPROVEMENT IN APPARATUS FOR CARBURETING GAS AND AIR.

Specification forming part of Letters Patent No. **152,006**, dated June 16, 1874; application filed June 8, 1874.

To all whom it may concern:

Be it known that I, ALONZO W. PORTER, of New York city, in the county and State of New York, have invented certain new and useful Improvements in Apparatus for Carbureting Gas, Air, &c., of which the following is a specification:

My invention relates to certain improvements in apparatus for carbureting gas, air, &c., by means of which I am enabled to keep up the operation of the apparatus until the last drop of hydrocarbon fluid is exhausted without any perceptible change in the quality or brilliancy of the light, and to present an extended surface of the hydrocarbon fluid to the action of the gas so long as any of said hydrocarbon remains in the carbureter; and, also, to more completely and uniformly carburet the gas than has ever been hitherto done, by means of a new packing or filling for the carbureter, all of which will be fully hereinafter described.

In all apparatus of this class, as hitherto constructed, the hydrocarbon liquid becomes reduced in quantity and gravity at the same time, and when nearly exhausted fails to carburet the gas properly. The liquid being reduced in gravity, and becoming heavier toward the end of the operation of the machine, as stated, it cannot be taken up with the same facility by the gas as when first put in; and, owing to the faulty construction of previous machines, the air can only be made to pass over the full extent of carbureting-surface when such machines are first charged, and while filled with the hydrocarbon liquid. Therefore, after such machines have been in operation for a while, and the charge of hydrocarbon fluid has been partially worked off, the brilliancy of the light is impaired, and toward the latter part of the operation of the carbureter, before more than two-thirds of the hydrocarbon fluid has been worked off, such apparatus, in most cases, cease to operate, and the hydrocarbon remaining in the carbureter has to be thrown aside, and the apparatus recharged. In carbureters as heretofore constructed, it has been found impossible to carburet the gas uniformly throughout the entire operation, owing to the fact that no capillary material is known that will conduct or draw the liquid to a height of more than four inches; consequently the carbureting is less and less effectively done toward the end of the operation.

My invention is designed to overcome these defects, and to make the hydrocarbon liquid go as far as possible. This being the cheapest ingredient in the compound gas formed by this class of machines, the great object is to have the hydrocarbon in as large a proportion as possible; or, in other words, to have the gas saturated with the hydrocarbon throughout the entire operation of the apparatus. This I have succeeded in accomplishing, as will be evident from the following description of the construction and operation of my apparatus.

My invention consists, first, in constructing the bottom of the carbureter, as hereinafter described, so that the hydrocarbon liquid, as it is evaporated, will be retained at the periphery or sides of the same, the last portion of the said liquid remaining at this point, and in introducing the gas at the bottom and close to the periphery or sides all around the carbureter, so that it will be forced to pass through a quantity of the liquid as long as any remains in the carbureter; second, in a new and improved packing, consisting of a series of perforated plates, arranged at not more than four inches apart, one above the other, within the carbureter, the spaces between said plates being filled with fibrous or capillary material, the whole combined to operate substantially as hereinafter described; third, in the combination with a carbureter, as described, of a condensing-chamber, constructed and applied as hereinafter set forth; and, fourth, in the combination of the various devices forming my carbureter with each other, and with a hydrogen-gas generator, as will be hereinafter specified.

The drawing represents a vertical section of my carbureter.

A represents the generator, in which the hydrogen gas is produced in the ordinary manner from dilute acid and metal filings and turnings. B represents a pipe leading from the same through the carbureter, and C represents the carbureter. Said carbureter is constructed with a concavo-convex bottom, C′,

the convex side upward, as shown. Above the bottom is a concavo-convex plate, D, with convex side up, as shown, said plate extending nearly to the edge or periphery of the bottom C′, and the plate is so suspended or hung in the carbureter as to leave a small space, F, between its periphery and the periphery of the bottom all round. The pipe B is stopped or partitioned at *b*. From below this partition extends a pipe, G, down through the concavo-convex plate D, where it terminates, as shown. This pipe serves to conduct the gas under the said plate D from the pipe B. H H represent a series of two or more perforated metal plates arranged at a distance of not more than four inches apart within the carbureter, and supported in any convenient manner. The spaces between these plates I fill with sisal hemp, excelsior, or other capillary material. The plates act as relays or stations for the hydrocarbon liquid, which, even when nearly exhausted, will be uniformly distributed throughout the packing. The first layer of packing conveys the liquid to the first plate, and this seizes and conveys it to the next layer of packing, and so throughout the entire series. K represents a condensing-chamber secured to the upper end of the tube B. The said tube is provided with an aperture, *b′*, opening into the carbureter, as shown, through which the carbureted gas passes to the condenser. The service-pipe M extends from the top of the condenser to the various burners.

The operation of my apparatus is as follows: The carbureter having been charged with any desired quantity of hydrocarbon fluid, and the generator having been properly charged and made ready for use, on opening the burners the gas will begin to be generated, and will pass up through the pipe B, and then down pipe C and under the plate D, and out through the aperture or space E into the carbureting-chamber. It will then pass up through the compound packing, becoming thoroughly carbureted, after which it will pass to the condenser. The condenser, being packed, as usual, with fibrous material, condenses and returns any superfluous hydrocarbon vapor in the gas. From the condenser the gas passes to the burners.

It will be evident that the hydrocarbon fluid will be evaporated from all portions of the carbureter before it can be taken up at the extreme edge or periphery of the bottom, and that so long as there is a particle of the fluid in the carbureter it will seek this point. The air, being admitted at this point all around the carbureter, is necessarily forced through the whole of the hydrocarbon material, no matter what may be the quantity in the carbureter, and is consequently always thoroughly carbureted. By my system of packing, with fibrous material and metallic relays, I have the packing material constantly and uniformly saturated during the whole operation of the apparatus.

What I claim is—

1. A carbureter constructed as described, so that the last portions of the hydrocarbon liquid will be distributed to the extreme outer edge of the carbureter or to its periphery, at which point the gas is admitted, by which means the last drop of the liquid is taken up by the gas, and the gas at all times thoroughly carbureted, substantially as described.

2. The packing herein described, consisting of the perforated plates or relays and the fibrous or capillary material, as and for the purposes described.

3. The combination of the carbureter, as described, and condenser attached to the end of the tube B, substantially as specified.

4. The combination of the concavo-convex bottom C′, concavo-convex plate D, and tubes G and B, substantially as and for the purpose set forth.

5. The combination of the bottom C′, plate D, pipes G′ and B, and the compound packing, as herein described.

6. The combination of the carbureter and generator, communicating with each other by the tubes G and D, substantially as herein described.

Witnesses: A. W. PORTER.

CHAS. L. COOMBS,

WM. E. CHAFFEE.