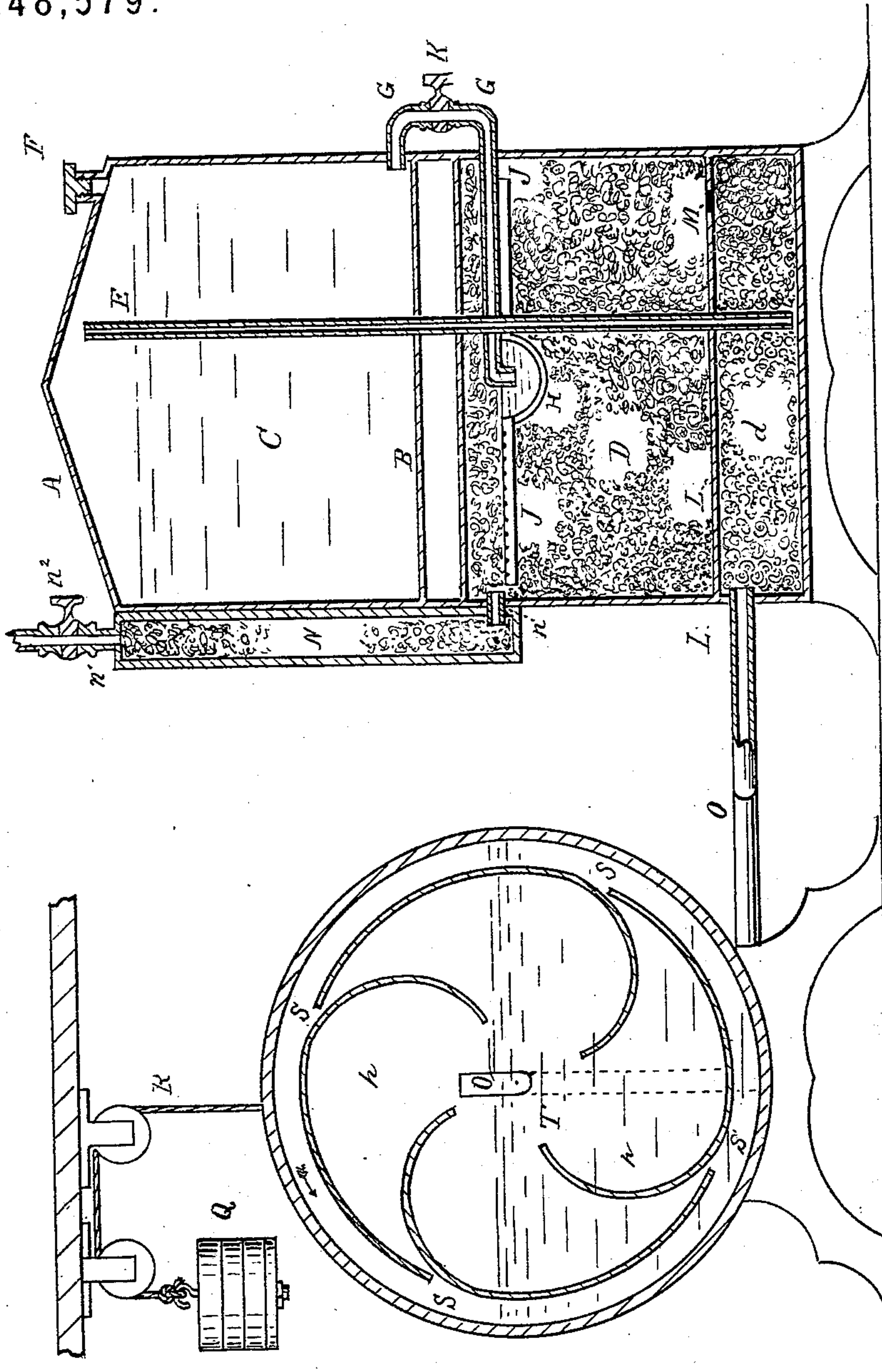


B. SLOPER.

Apparatus for Carburetting Air and Gas.

No. 148,579.

Patented March 17, 1874.



Witnesses

Chas. L. Grooms  
W. S. Halleck

Inventor

Byron Sloper



# UNITED STATES PATENT OFFICE.

BYRON SLOPER, OF NEW YORK, N. Y.

## IMPROVEMENT IN APPARATUS FOR CARBURETING AIR AND GAS.

Specification forming part of Letters Patent No. 148,579, dated March 17, 1874; application filed March 7, 1874.

*To all whom it may concern:*

Be it known that I, BYRON SLOPER, of New York, in the county of New York and State of New York, have invented certain Improvements in Apparatus for Generating Gas for Illuminating Purposes, of which the following is a specification:

My invention relates to a new and improved apparatus for generating gas for illuminating purposes; and it consists of a carbureter, in connection with a suitable blowing device or air-pump and a condenser, all operating as will be more fully hereinafter described. The carbureter consists of two chambers or compartments, separated from each other by a double partition packed with some substance that is a non-conductor of heat. In one of the chambers the hydrocarbon liquid is contained in bulk, and in the other it is subjected to the action of the air to be carbureted in small quantities at a time, in order that it may not be lowered in temperature and reduced in specific gravity during the operation. In connection with the carbureter I employ any suitable device for creating a current of air, but I prefer the ordinary meter-wheel blower; and I also employ, in connection with a carbureter, a condenser, through which the gas is passed before entering the service-pipe, in order to deprive it of any superfluous moisture.

The machines heretofore in use have proved in a great measure impracticable, owing to the fact that the hydrocarbon liquid, when subjected to the action of the air in bulk, during the process of evaporation, becomes much reduced in temperature, and if the evaporation is rapidly carried on, as will be the case when a large number of lights are burning at once, the temperature will fall to nearly the freezing-point of water, and the specific gravity of the hydrocarbon will be so lowered and its density so increased that the air will pass through the apparatus without taking up sufficient vapor, and the brilliancy of the lights will be much impaired. Again, where the hydrocarbon is evaporated from the main body the specific gravity of the fluid becomes constantly more reduced, as the lighter portions are evaporated off, until finally it is unfit for further use and has to be thrown away. In this manner

fully one-third of the hydrocarbon liquid is lost. My invention is designed to overcome these objections by separating the bulk of the hydrocarbon from the portion undergoing evaporation, and feeding it automatically in small quantities down through the carbureter from the top, in a shower, only as fast as used.

The drawing represents a sectional view of an apparatus constructed according to my invention.

A is the carbureter, of metal or other suitable material, which is divided by means of a transverse partition, B, into two chambers, C and D, the upper one, C, forming a reservoir, in which the bulk of the fluid is contained, and the lower one the carbureter proper. The partition B is made double, leaving an air-space between its walls, or it is packed with non-conducting material to prevent the transmission of caloric from one chamber to the other. From a point just above the bottom of the lower chamber extends an air-pipe, E, up through the partition B, into the chamber C, where it terminates near the top and above the level of the funnel F, through which the chamber C is filled, so that no hydrocarbon liquid can ever find its way into the carbureter through said tube. From the lower part of the chamber C extends a pipe, G, passing outside of the apparatus and entering the upper part of the chamber D. This pipe terminates at the center of the said chamber, and is bent downward, dipping into a basin or bowl, H, from which extend a series of radial arms, J, perforated along the top, as shown. The pipe G is provided with a stop-cock, K, which is to be closed during the operation of filling the reservoir or chamber C. Near the bottom of the chamber D is a partition, L, forming a compartment, *d*, in the lower part of the chamber D. The object of this partition is to cause the air to first pass over the bottom of the carbureter before passing through into the chamber D, for the purpose to be hereinafter described. The chambers D and *d* communicate by means of a small aperture, M, at one side. N is a condenser attached to the apparatus, and communicating with the carbureter by means of a tube, *n*, and with the service-pipe by means of a tube, *n*<sup>1</sup>, provided with a cock, *n*<sup>2</sup>. This condenser serves as an



exit-passage for the gas from the carbureter. P is the air-forcing device, and it consists of a meter-wheel or chambered cylinder, *p*, arranged to rotate in a cylindrical casing containing water, as shown, by means of the weights Q and suitable gearing, which it is not necessary to show, through the medium of the rope R. The wheel is to be rotated in the direction of the arrows, and it will take in the air at the openings S S at its periphery, and force it into the drum T, and from thence into the pipe O, leading into the carbureter. The chambers D and *d* are filled with suitable packing, such as "excelsior," sisal hemp, &c., and also the condenser.

The operation of my apparatus is as follows: The cock K in the pipe G being closed, the screw-cap is removed from the funnel F, and the chamber C is filled with hydrocarbon fluid. The screw-cap is then properly secured in the funnel F, so as to be perfectly air-tight, and the cock K opened. The hydrocarbon fluid, by its own gravity, will begin to flow, through the pipe G, into the bowl H, and through the perforated arms J, and will be showered over the packing, so as to saturate it perfectly, and into the carbureting-chambers D and *d*, displacing the air in said chambers, which finds its way, through the air-pipe E, into the chamber C, breaking the vacuum in the upper part of said chamber, allowing the fluid to continue to flow, through the pipe G, into the sealing-cup and arms J, and shower through the packing, until sufficient fluid accumulates in the lower part of the carbureter to cover or seal the end of the air-tube E, when a vacuum will be formed in the upper part of the chamber C, and no more liquid can enter the carbureting-chamber until sufficient hydrocarbon fluid is evaporated to unseal the end of the air-tube again, when the operation will begin anew and continue, as before, until the tube is again sealed.

The bowl H always contains sufficient fluid to seal the end of the pipe G'. Hence no air can find its way into the chamber C through said tube.

In order to provide for the frequent renewal of the hydrocarbon fluid in the carbureter, and prevent the upper part of the packing from becoming dry, which would cause the lights to burn dimly, it is necessary to evaporate the

hydrocarbon fluid more rapidly at the bottom of the apparatus. To effect this, I provide the carbureter with a partition, L, which forms a compartment, *d*, just above the bottom of said carbureter, through which the air is compelled to pass before entering the main body of the same. The air, as it enters the lower chamber, being wholly free from hydrocarbon fluid, of course it will take up a larger portion of vapor than after it passes to the main body of the carbureter, so as to evaporate the fluid off rapidly in compartment *d*, and thus more frequently unseal the end of the air-pipe E.

The carbureted air, on leaving the main body of the carbureter, passes to the condenser N, in which any superfluous hydrocarbon vapor is condensed, and passes back to the carbureter. From the condenser, the carbureted air passes to the service-pipe. The blower being in readiness—that is, the weight in proper position, and the casing properly filled with water—upon turning on the gas at the burners the wheel will begin, automatically, to rotate, and will regulate itself to the quantity of gas consumed.

What I claim is—

1. A carbureter constructed substantially as described, so that the bulk of the hydrocarbon fluid will be held separate from that undergoing evaporation in the carbureter, and will be automatically showered, in small quantities at a time, upon the packing with which the carbureter is filled, at intervals, as required.

2. The automatic sealing device, arranged in the upper part of the carbureter, in connection with a supply-tube leading from a reservoir, substantially as described.

3. A carbureter constructed as described, so that the air will be compelled to pass first over the bottom of the same, in order to more frequently unseal the air-tube and break the vacuum in the upper part of the reservoir, for the purposes described.

4. In combination with the sealing device in the upper part of the carbureter, the perforated distributing-pipes, for the purpose of showering the fluid over the packing.

BYRON SLOPER.

Witnesses:

CHAS. L. COOMBS,  
M. F. HALLECK.