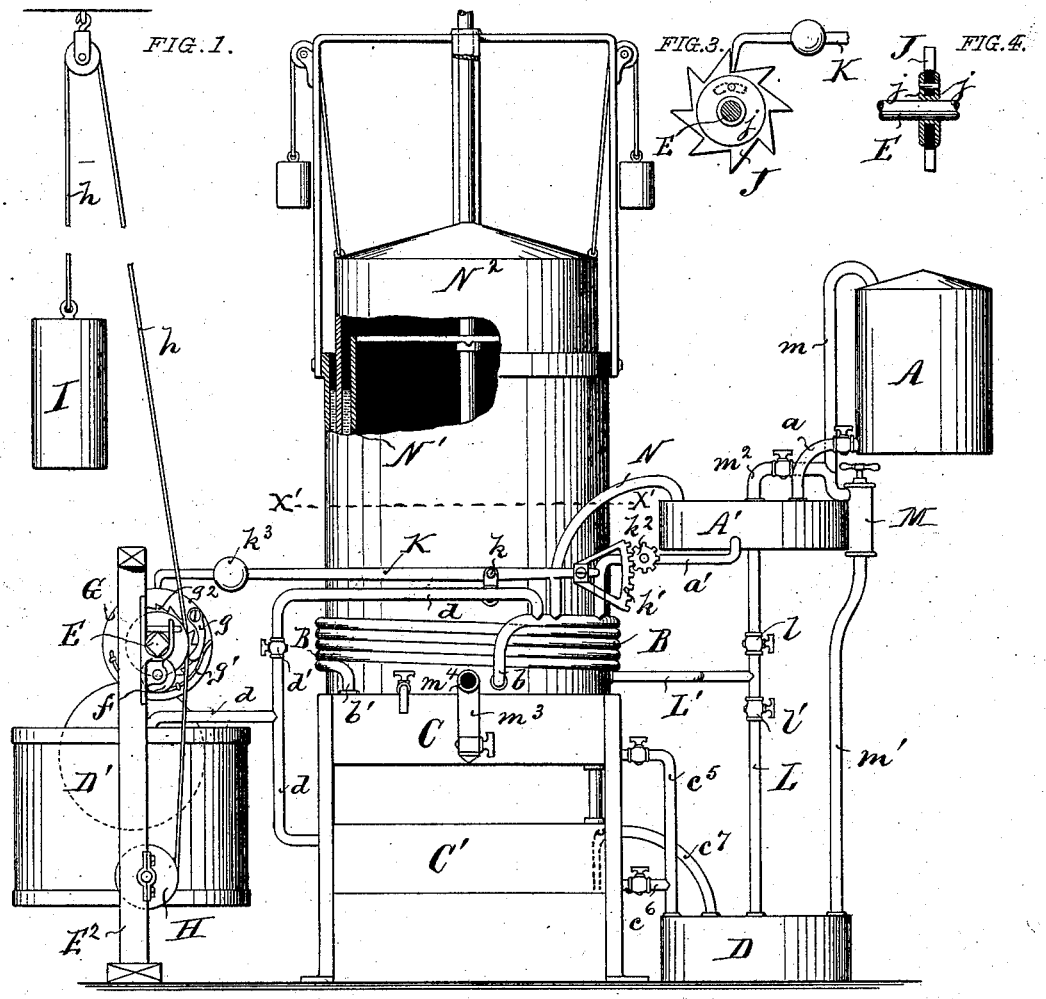
2 Sheets—Sheet 1.

N. TACKEBERRY.

Apparatus for Carbureting Air.

No. 211,194. **Patented Jan. 7, 1879.**



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2 Sheets—Sheet 2.

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FIG. 5.

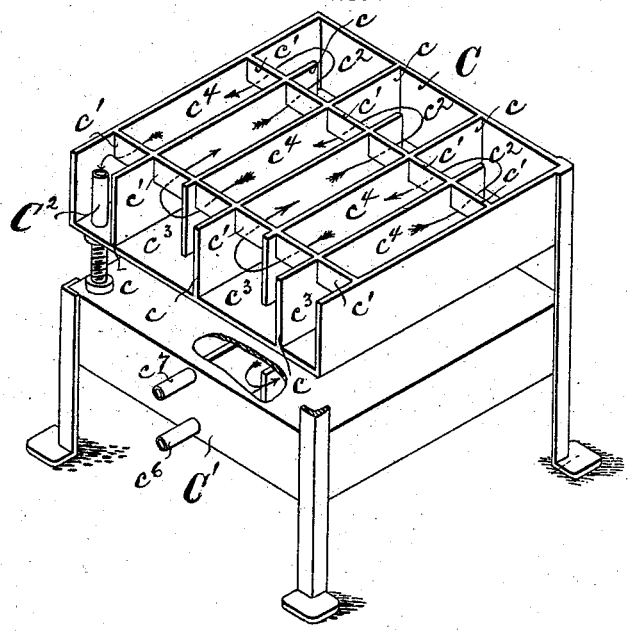


FIG. 6.

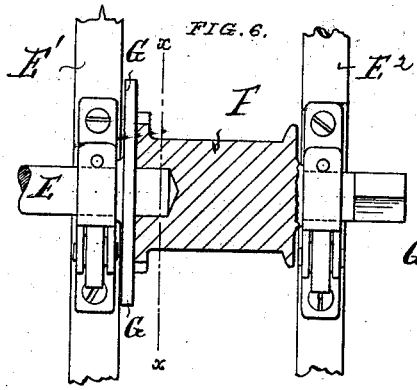


FIG. 7.

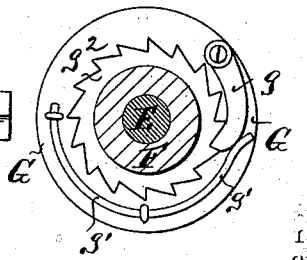
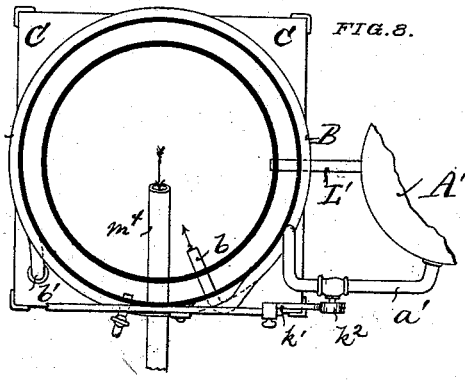


FIG. 8.



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UNITED STATES PATENT OFFICE.

NATHANIEL TACKEBERRY, OF PERRYVILLE, MISSOURI.

IMPROVEMENT IN APPARATUS FOR CARBURETING AIR.

Specification forming part of Letters Patent No. **211,194**, dated January 7, 1879; application filed. January 18, 1878.

To all whom it may concern:

Be it known that I, NATHANIEL TACKEBERRY, of Perryville, Perry county, and State of Missouri, have invented an Improved Apparatus for Carbureting Air, of which the following is a specification:

This invention relates to that class of carbureters in which gasoline is utilized for illuminating purposes.

The apparatus is more specially designed for lighting country mansions, churches, manufactories, &c., and which are beyond the reach of city gas-mains.

The invention will first be fully described, and the novel construction and combination of parts will hereinafter be pointed out in the claims.

In the drawing, Figure 1 is a front elevation of the entire apparatus, part of the gasometer being in section. Fig. 2 is a side elevation, showing mainly the air-forcing apparatus. Figs. 3 and 4 are respectively details of the tooth-wheels and its connection with driving-shaft and lever-rod. Fig. 5 is a perspective of the carbureter, showing also the interior construction of one of its tanks. Fig. 6 is a sectional elevation, showing how the upper drum is mounted with relation to the driving-shaft. Fig. 7 is a sectional elevation on line $x\ x$ of Fig. 6. Fig. 8 is a top sectional view on line $x'\ x'$ of Fig. 1.

A is the main tank, in which the gasoline is stored. From the tank A the gasoline is passed by pipe a (controlled by a suitable cock) to the supply-tank A′, and from this it is passed through the apparatus. The pipe a' conducts the fluid to a coil of pipe, B. One end, b, of the coil passes inside near bottom of the gasometer. The other end, b', of the coil connects with the carbureter. (See Figs. 1 and 8.) The coil can be increased in length, it surrounding the gasometer, and the arrangement being further such as to facilitate the flow of the fluid to the carbureter.

I am aware that coils of pipe have been used for purposes of subjecting the gasoline to a process of evaporation before its entrance in the carbureter; also to cause the fluid to pass over a greater area of surface. In my case the coil B, besides serving the purposes just stated, also subjects the passing gasoline in the pipe to the action of the air from the blower, as will hereinafter appear. The arrangement I show also insures compactness and convenience.

I am also aware that carbureters are constructed to consist of a series of pans of like construction, located one over the other, within each of which are partitions, arranged so as to form a serpentine passage, through which the gas or air is caused to pass in contact with the carbureting-liquid. The above features do not therefore form the gist of my invention.

In my case the carbureter also consists of two or more tanks, C C^1, each having partitions c; but I provide the further cross partitions or strips c^1. (See Fig. 5.) The partitions c are arranged to leave an open passage at c^2 c^3, and so that each sub-chamber c^4 communicates with each other. (See Fig. 5.) The gasoline from the coil enters at one corner of the tank or sub-chamber thereof, and, filling all these to the proper height determined upon, the surplus passes down a tube, C^2, into the next duplicate series of sub-chambers which exist in the tank C^1, and in the manner indicated by the arrows in Fig. 5.

The carbureter so constructed insures the following results and advantages: First, by means of the sub-chambers a circulation of the air (derived from the air-forcing apparatus, as will hereinafter appear) takes place from one sub-chamber to another, thus mixing and causing the air the better to permeate the fluid. Secondly, the cross-strips cause the air-currents to wave under said strips, and more directly press and mix with the fluid, facilitating the process of evaporation. The air-gas that is formed passes upward in the same direction and through the same means that the gasoline has passed downward, said air-gas being finally stored in the gas-holder through the end of the coil that connects with same.

The tube C^2 is screw-threaded, (see Fig. 5,) so that it can be screwed higher or lower to establish the desired depth for the gasoline to fill the carbureter. The overflow passes down the tube C^2 and enters the lower tank, C^1, where the same process of evaporation takes place, the air-gas passing likewise upward through the tube C^2, to be finally collected in the gasometer.

c^5 c^6 are pipes connecting the tanks C C^1 to the waste-tank D. (See Fig. 1.) Said pipes serve to drain the chambers or tanks C C^1. c^7 is a pipe to pass the overflow to waste-tank, and to prevent said pipe being a siphon it has a small orifice near top. (See Fig. 1.)

The air-forcing apparatus consists of the blower, together with the mechanism for operating the same. I use an ordinary blower, D′, it being a tank filled with water and containing a wheel partially immersed, and which in operation draws the air and forces it through the pipe *d*, which branches to connect to the coil and also to the carbureter. (See Fig. 1.)

The air-pipe *d* at *d′* has a cock to control the passage of the air to the coil. The pipe *d* also has a cock to control the passage of the air-blast to the carbureter. The cock *d′* being closed the air is forced into the carbureter, and said cock is only opened to allow air to mix with the fluid in the coil and the air-gas in the gasometer, and only in case the air-gas is too rich in quality. I am thus enabled to regulate and suit the amount of air to pass either to the coils or the carbureter by means of the air-pipe *d* and its cock, and can mix or not mix the air with the air-gas, as the nature of said gas may require.

In order to operate the blower D′, I have constructed the winding and driving mechanism to possess the following improved results, viz: It is my object to be capable of raising the heavy propelling-weights independent of each other, and also that the pressure may be retained to keep the lights still burning.

I connect the shaft of the wheel of the blower, by a system of gearing, (see Fig. 2,) to the driving-shaft E, this being mounted to turn in suitable bearings in the inside frame, E^1. The outside frame, E^2, (see Figs. 1 and 2,) is to support the drums and parts wherewith to operate the driving-shaft. The two upper drums, F F, I arrange so as to be capable of turning independently of the driving-shaft, for the purposes just stated. Hence, one end of each of the drums F turns loosely on the projecting end of the driving-shaft, (see Fig. 6,) the other shaft end of said drums turning upon a roller. (See Fig. 1.) The end of the drum-shaft bearing on the rollers *f* is strapped and secured by a bolt in the ordinary manner, and shown in Fig. 1. Thus the drums F F can be revolved independently of the driving-shaft; and in order to connect said parts so as to revolve together, I have provided a disk, G, rigid on the driving-shaft. (See Figs. 1, 2, 6, 7.) The disk carries the pawl *g* and spring g^1, the latter being to hold the pawl in engagement with a ratchet-wheel, g^2, which is secured to the end of each of the drums F. (See Figs. 1, 6, 7.) By this arrangement, in turning the driving-shaft in one direction the pawl engages the ratchet-wheel, and connects the drum F with the disk and driving-shaft, and so that both said parts revolve together; but in revolving the drum in the opposite direction it alone revolves. The disk, pawl, spring, and ratchet-wheel are duplicated for the opposite drum F, as indicated in Fig. 2.

A propelling-weight, I, (see Fig. 1,) connects to each drum F F by means of cords passing over pulleys. The arrangement of the cord in my case is such that the pressure of the acting-weight shall be in a downward direction with relation to the driving-shaft bearing upon the rollers. The strap and bolt are not sufficient to sustain the immense pressure of the weight; hence to overcome this difficulty I have provided the lower drums, H H. (See Figs. 1, 2.) One end of the cord *h* is secured to the upper drum, F; thence passes down around the said lower drum, H; thence is passed over the upper pulley, and sustains the weight I, as shown in Figs. 1, 2. This arrangement of lower drums and cords insures the practical supporting of the driving-shaft on the rollers, the strain on the shaft being in a downward direction.

The lights are not extinguished during the winding or raising of the weights, as one of these can be raised while the other is acting or operating the blower, and hence the pressure is retained. Said arrangement also facilitates the raising of the weights, as is apparent.

J is a toothed wheel, secured loosely on the driving-shaft between two rigid washers or disks, *j*. (See Figs. 2, 3, 4.) This tooth-wheel has a slot, in which engages a pin, and which connects the wheel to the opposite disks, so as to revolve with the driving-shaft and reciprocate the lever-rod K. (See Figs. 3, 4.) The lever-rod K has its fulcrum at *k*. The long arm is bent to engage the tooth-wheel J, and the short arm I provide with a segment-gear, k^1, to mesh with the gear of the cock k^2, that controls the passage of the gasoline to the coil. (See Fig. 1.) The reciprocating action imparted to the lever-rod opens and shuts the cock k^2, causing the flow of the gasoline to be intermittent. The weight k^3 (see Figs. 1, 3) on the lever-rod is to automatically close the supply-cock k^2, for, said weight dropping and the tooth-wheel having the play of its slot, there is thus insured an automatic closure of the said cock k^2, and a stoppage of the gasoline to the coils and carbureter, in case the blower ceases operation.

L is a pipe leading from the supply chamber or tank to the waste-tank. L′ is a branch-pipe connecting to the inside of the gas-holder, for the purpose of allowing the gasoline direct from the supply-tank to enter the gas-holder in case the air-gas is too poor. The pipe L is controlled by cocks at *l l′*. The pipes L L′ serve also as a drain-pipe to empty whatever gasoline is in the holder into the waste-tank.

M is a pump, connecting to the waste-tank and to the main tank by pipes *m* m^1, for purposes of pumping back the gasoline to said main tank. The pipe m^2, having one end connecting to the discharge-pipe of the pump, and the other end to the top of the supply-tank, is for the purpose of creating an equal pressure throughout the apparatus, for what-

ever gas is in the main tank can pass into the supply-chamber, and thence through the machine. N is a vent-pipe. It also serves to equalize the pressure throughout the apparatus.

m^3 is a drip-pipe, to collect all the condensed gas.

Between the inner and outer wall of the gasometer is a water-chamber, to receive the inner vessel or receiver, N′. (See Fig. 1.) This arrangement is ordinary, as well as the manner of raising and lowering of the said receiver.

In operation, the gasoline is first supplied to the coils and the tanks of the carbureter, the latter being filled to the desired height. This done, the air-forcing apparatus is next put in operation, and the process of carburation takes place.

m^4 is the delivery-pipe. The air-gas formed is collected or stored within the inner vessel, and from thence, by means of the pipe m^4, delivered to the burners.

What I claim as my invention is—

1. In a carbureter, the combination of the adjustable tube C^2 and two or more tanks, as and for the purpose set forth.

2. In a carbureter, the combination of two or more tanks, C C^1, having partitions *c*, cross-strips c^1, open passages c^2 c^3, the tube C^2, the coil B, the supply-tank, and the gasometer.

3. The tooth-wheel J, having slot, the side disks, *j*, having pin, and the driving-shaft, said parts being combined for operating said tooth-wheel.

4. The lever-rod K, having segment-gear k^1 and weight k^3, in combination with the toothed cock k^2, as and for the purpose set forth.

5. The combination of the tooth-wheel J, the disks *j*, having pin, the driving-shaft E, and the lever-rod K, as and for the purpose set forth.

6. The combination of the tooth-wheel J, having slot, the disks *j*, and connecting-pin, the driving-shaft, the lever-rod K, having weight, segment-gear, the cock k^2, and the supply-tank.

7. The combination of the pipe m^2, pipe *m*, tank A, supply-tank A′, pipe N, coil B, carbureter C, and gasometer, to equalize the pressure of the air-gas throughout said parts.

8. The combination of the pipes L L′, supply-tank A′, gasometer, and waste-tank D, as for the purposes set forth.

In testimony of said invention I have hereunto set my hand,

NATHANIEL TACKEBERRY.

Witnesses:
W. V. MOORE,
WALTER POWER.