No. 622,489. Patented Apr. 4, 1899.

L. L. KELLY.

CARBURETER.

(No Model.) (Application filed July 19, 1897.)

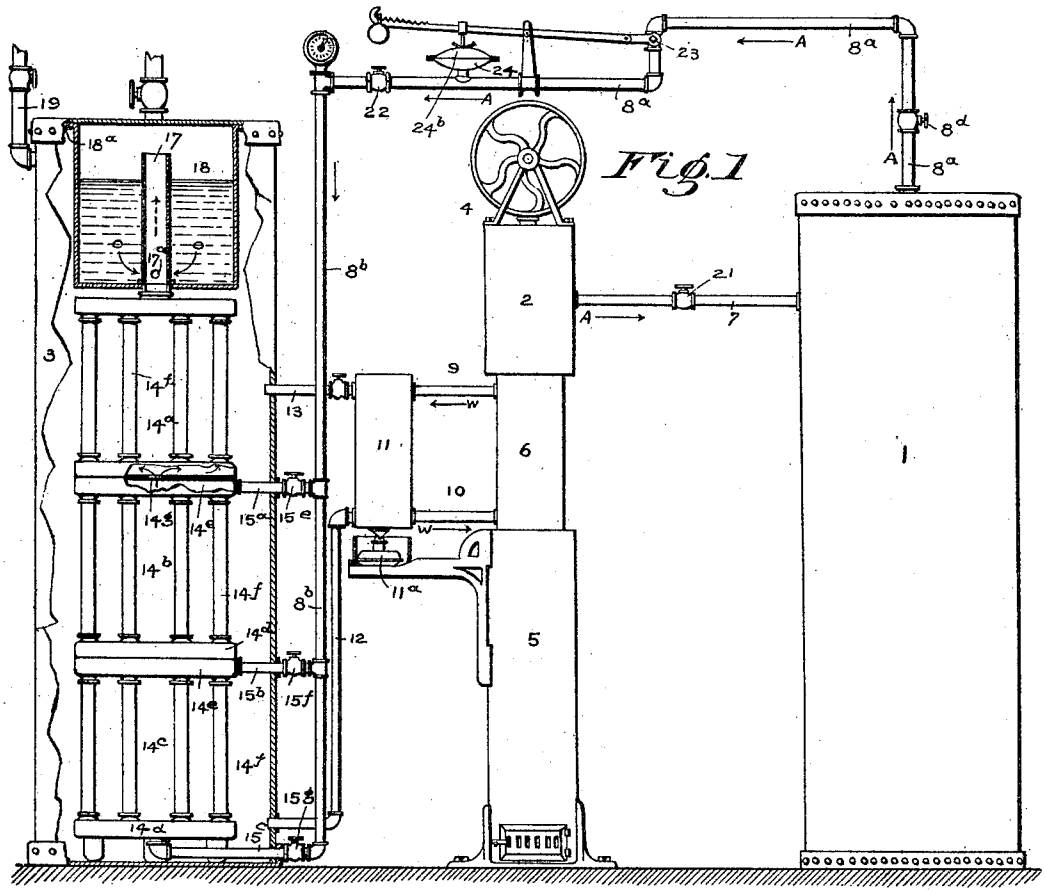


Fig. 1



Fig. 2

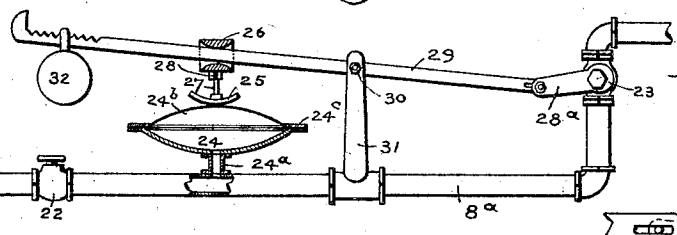
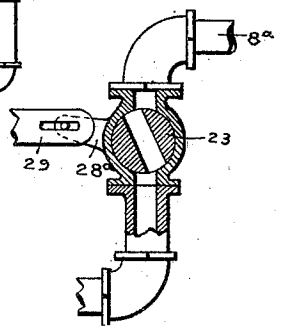


Fig. 3



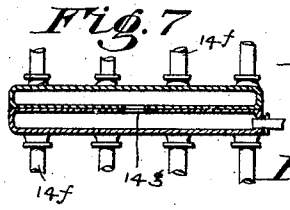


Fig. 7

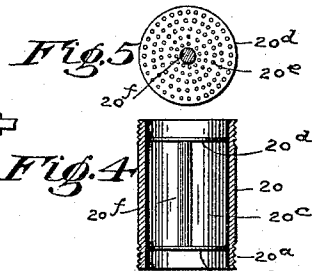


Fig. 5

Fig. 4

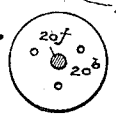


Fig. 6

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CARBURETER.

SPECIFICATION forming part of Letters Patent No. 622,489, dated April 4, 1899.

Application filed July 19, 1897. Serial No. 645,132. (No model.)

To all whom it may concern:

Be it known that I, LEONIDAS L. KELLY, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Carbureting Apparatus, of which the following is a specification.

My invention relates to an apparatus for the manufacture of illuminating-gas from volatile oils, and is especially adapted to carbureters which employ numerous pipes connected together in series, which contain the oil and through which the air or gas to be carbureted is also passed to commingle with the oil.

My invention consists in a certain novel construction and arrangement of tubes and intermediate chambers in connection with a superposed oil and gas holder, in certain novel means for supplying oil to the said pipes and for delivering therefrom gas to the said reservoir, in certain novel means for commingling more thoroughly the oil and gas in the pipe connecting said intermediate chambers, and in a certain novel construction, combination, and arrangement of parts connected with the air-pipe of the carbureter for regulating the supply of air thereto in proportion to the amount of gas generated and the number of burners to be supplied, the combination and arrangements of parts being simple, inexpensive, and effective for the purpose stated.

In the accompanying drawings, which will illustrate my invention, Figure 1 is an elevation of my improved apparatus with a part of the casing of the carbureter broken away to more clearly show the construction thereof; Fig. 2, an enlarged detail, partly in section, of the air-regulator; Fig. 3, an enlarged section of the air-regulating valve; Fig. 4, an enlarged section detail of the air retarding and distributing air-pipe section; Fig. 5, a plan view of the air-distributing disk; Fig. 6, a plan view of the air-retarding disk of the said air-pipe section, and Fig. 7 a transverse section of the cap and base of two radiator-chambers connected together.

The apparatus consists, essentially, in an air-reservoir 1, an air-pump 2, and a carbureter 3, suitably connected together by pipe-sections, the entire apparatus being adapted to be secured to any suitable base or floor and easily coupled together or taken apart for repairs or for removal from one place to another.

The air-pump 2 is preferably and in the construction shown driven by a hot-air or gas engine 4, having a base 5 and a water-jacket 6, the air-pumps being connected by a pipe 7 to the air-reservoir 1 and the water-jacket 6 being connected by pipes 9 and 10, leading, respectively, to the lower and upper end of the water-jacket 6 and to a water-box 11, which latter is connected by a pipe 12, leading to the foot, and by a pipe 13, leading to the upper part of the outer jacket or cylinder of the carbureter. The carbureter is thus kept supplied with a continuously-circulating body of water heated to a suitable degree by the gas or hot-air engine without additional expense or by a lamp 11^a, placed below the water-box.

The carbureter-cylinder 3 contains a suitable number of sections 14^a 14^b 14^c, coupled together in series, each section being connected by a separate pipe 15^a 15^b 15^c with a pipe-section 8^b, which leads from the air-reservoir, the said pipes 15^a 15^b 15^c being provided with stop-cocks 15^e 15^f 15^g, respectively, to control the admission of air to the several radiator-sections.

The supply-pipe 15^c connects directly with the base of the section 14^c in this instance, and the pipe 15^b connects with the cap of the said section 14^c, the air being thus delivered above the pipes of the section 14^c in this instance, and the pipe 15^a connects with the cap of the said section 14^b, the air being thus delivered above the pipes of the section 14^b and distributed more equally to the lower end of the pipes of the said section than would be the case were the air-pipe connection made directly to the base of said section. The sections 14^a 14^b 14^c each consist of base-castings 14^d, caps 14^e, and tubes 14^f, connected together by screw-threads, the cap of each chamber being connected to the base of the adjacent chamber by an opening 14^g of suitable size. The uppermost section 14^a has a central pipe 17, which passes up through the bottom of an oil-supply tank and gas-reservoir 18, connected at its upper end by a flange 18^a with the under side of the cover of the carbureter. One or more small apertures 17^a in said pipe allow the oil to pass from the res-

ervoir 18 down to the sections. The upper end of the pipe 17 opens freely to the space above the oil in the reservoir 18, and a gas-supply pipe 19 leads from the said reservoir to the burners. The pipe 17 prevents the air from acting upon the entire body of oil, thus preserving the quality of the oil until it enters the carbureter proper. The tubes 14^f of the sections are each fitted at their lower ends with a retarding and distributing air-pipe section 20, which consists of a short metal tube having an exterior thread 20^a, adapted to fit a corresponding inner thread of the said tubes 14^f and provided with a retarding-disk 20^b, provided with several holes through which the air under pressure can pass, but in limited quantities, and is thereby retarded and admitted to an intermediate chamber 20^c of the pipe-section 20, the upper end of said section and chamber being provided with an air-distributing disk 20^d, having numerous small holes 20^e therein through which the air must pass before it can reach the oil within the tubes 14^f, the disks 20^b and 20^d being preferably connected by a central stem 20^f, as shown in detail in Figs. 4, 5, and 6. The air under pressure is first retarded by the disk 20^b and then filling the intermediate chamber 20^c is caused to enter equally over the entire area of the disk 20^d and pass up through the oil within the tubes 14^f to commingle completely and thoroughly therewith, the double perforated disks serving to check and prevent the air from puffing up into the tubes 14^f in jets which would leak up the sides of the tube and follow along the same to the gas-holder without sufficiently commingling with the oil to be properly carbureted.

A check-valve 21 in the pipe 7, leading to the air-reservoir, prevents the air from passing back to the air-pump from the carbureter, and a similar check-valve 22 at the discharge end of the pipe 8^a prevents the gas from flowing back to the air-reservoir after it has been carbureted. A stop-valve 8^d in said pipe also serves to completely cut off or regulate the discharge of air from the reservoir to the carbureter, and an oscillatory regulator-valve 23 in the air-pipe 8^a is controlled in a novel manner by a valve-regulating device, which will quickly shut off the air under pressure from the reservoir to the carbureter whenever the gas-holder within the same is properly charged and the lights are supplied therefrom at the proper and predetermined pressure. This adjustment is effected with great accuracy and with quick responsive action to the variability of pressure within the gas-holder by means of my improved valve-regulating mechanism, which consists in a cup 24, secured by a pipe-joint 24^a to the air-supply pipe 8^a, to the rim-flange of which is secured a flexible diaphragm 24^b by means of a ring 24^c, screwed or riveted thereto, the air passing through the joint 24^a and pressing beneath the extended area of the diaphragm. A rolling plate 25, secured adjustably to a sleeve 26 by means of a stem 27 and nut 28, rests upon the top surface of the diaphragm 24^b, and a lever 29, pivotally supported at 30 upon a bracket 31, secured to the pipe 8^a, is connected at its short arm with the crank-arm 28^a of the air-regulating valve 23, a weight 32, adjustably secured upon the longer arm of said lever, serving to nicely adjust the degree of opening of said valve and serving to quickly open and close the same with a very slight movement of the diaphragm and a corresponding slight variation of the pressure of air beneath the same. The jointed connection between the end of the lever 29 and crank-arm of the valve is sufficiently loose to allow the short arm of the lever to vibrate the crank with the greatest precision and rapidity to secure an accurate and sensitive responsive action of said air-regulating valve at all times. The weight 32 may be adjusted to suit the quantity of air admitted, and thus adapt the carbureter to properly supply any required number of burners at any determined degree of pressure. The richness of the gas is regulated by opening any one of the cocks 15^e 15^f 15^g, thus passing the air through any required number of sections. The temperature of the oil is raised to the degree best suited for completely decarbureting it by means of the water surrounding the sections, which is kept warm and in circulation within the carbureter-casing by means of pipes leading to the water-jacket around the hot-air or gas pump, which compress the air in the air-reservoir, thus providing in one apparatus easily set up or transported a complete gas-generating machine. The oil thus treated may be of the refuse or most inferior grade of hydrocarbons and will be completely converted in the carbureter herein described into a superior quality of illuminating-gas.

When the air-pump engine is not working or when no engine is employed in connection with the apparatus, the water may be heated in any preferred manner, as by a burner or by any suitable heating device placed under a water-box connected to the water-jacket of the carbureter.

I claim as my invention and desire to secure by Letters Patent—

1. In a gas-machine, a carbureter comprising an outer shell or casing, a series of oil circulating and commingling sections placed one above the other, each section consisting of numerous pipes secured at their ends to chambers, each chamber having an aperture communicating with the aperture of the adjacent chamber, the top chamber of one of said sections being secured to the bottom chamber of the adjacent section in combination with a superposed oil and gas holder and a compressed-air reservoir connected with the bottom chamber of the pipe-sections of the said carbureter substantially as described.

2. A carbureter for gas-machines comprising a casing, a plurality of pipe-sections con-

tained therein, connected one with the other in series, a superposed oil and gas holding reservoir, and a pipe secured to the bottom of said reservoir provided with perforations at its lower end to receive the oil and open at its upper end above the level of the oil, substantially as described.

3. A carbureter for gas-machines comprising a series of air and oil circulating and commingling pipes arranged in sections and placed one above the other, each consisting of numerous pipes secured at their ends to chambers located between said sections, the said chambers being provided with a central opening in combination with a retarding or distributing pipe section comprising a tube, a retarding-disk provided with an opening or openings and located at the lower end thereof, a secondary distributing-disk provided with numerous openings therein at the upper end thereof, and a stem connecting said disks, the latter being suitably placed to provide an intermediate air and oil commingling chamber, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in the presence of two subscribing witnesses.

LEONIDAS L. KELLY.

Witnesses:
MARY A. CARROLL,
KATE D. MERRILL.