No. 609,831. Patented Aug. 30, 1898.

C. LE R. PARKER.

CARBURETER.

(Application filed July 22, 1897.)

(No Model.)

Fig. 1.

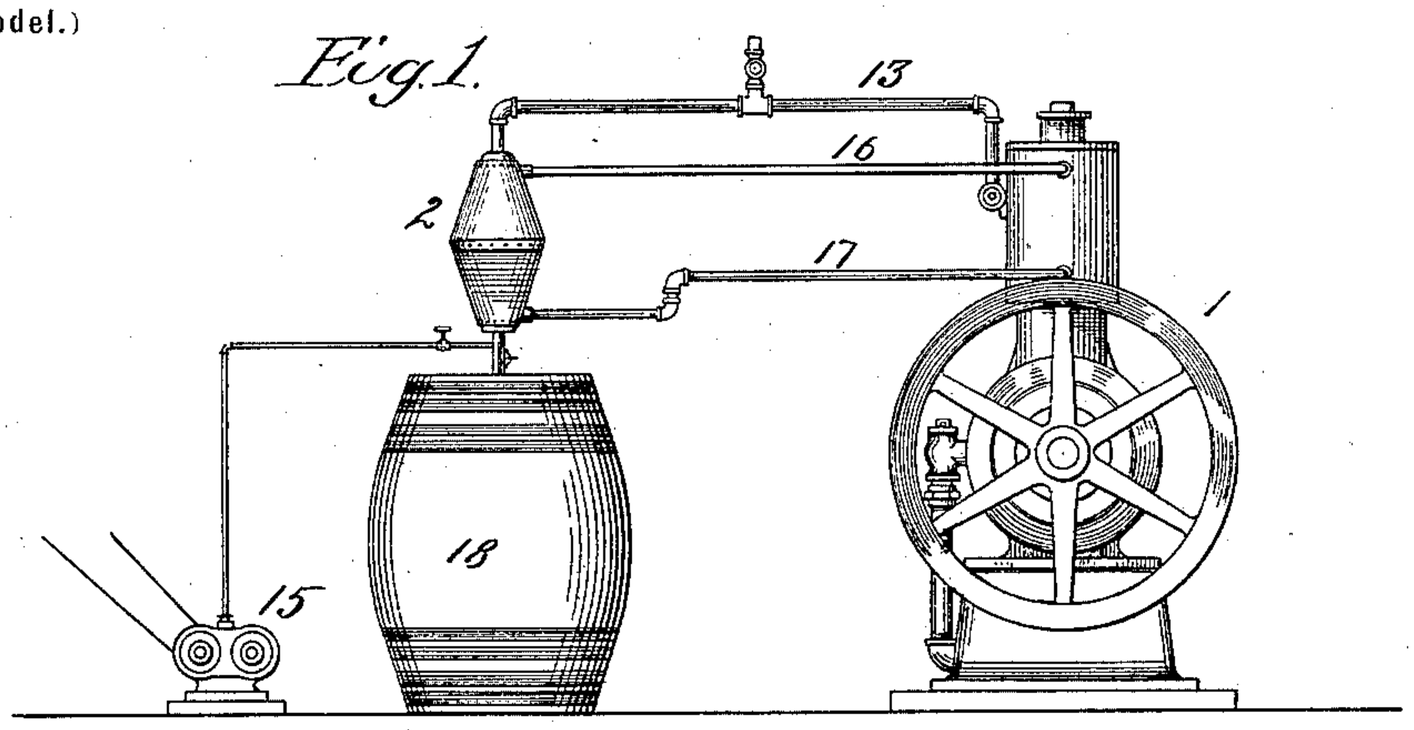


Fig. 2.

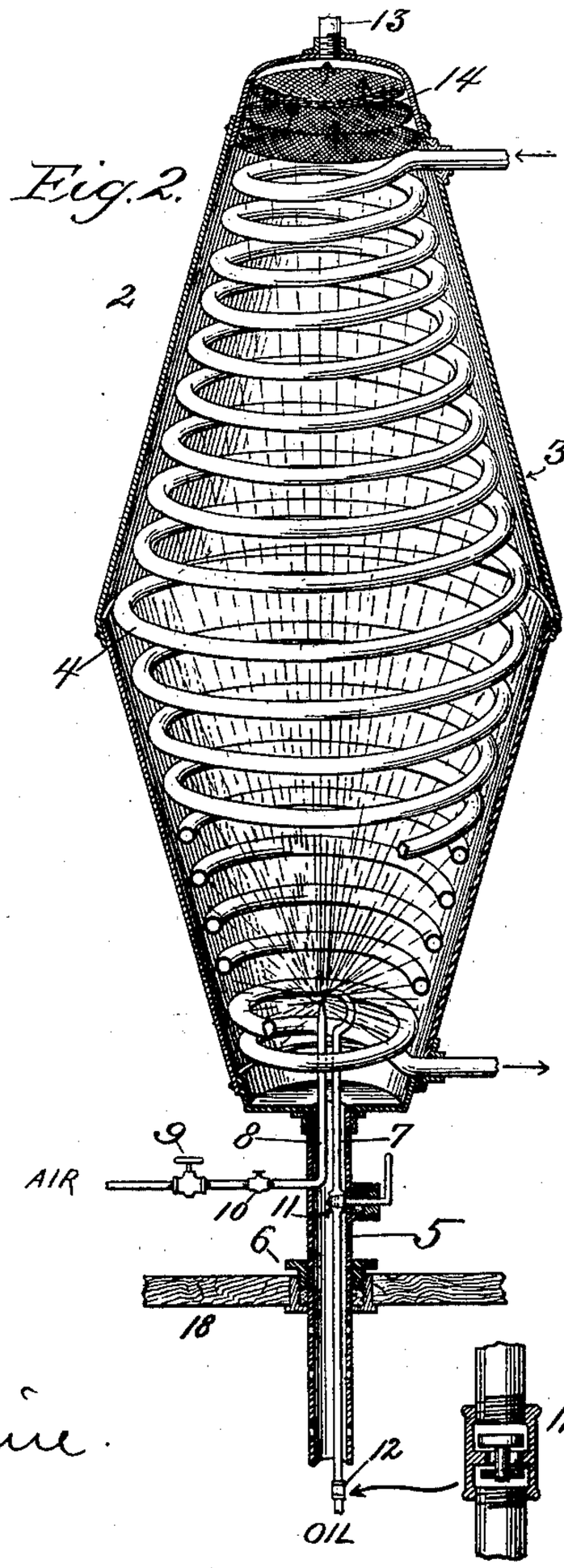
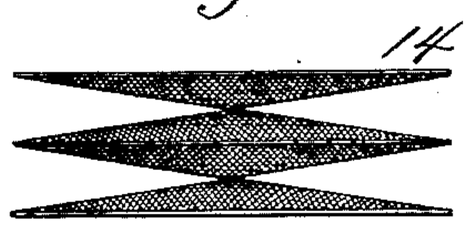


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

CLARENCE LE ROY PARKER, OF SILVER CREEK, NEW YORK, ASSIGNOR TO DAVID PARKER, OF SAME PLACE.

CARBURETER.

SPECIFICATION forming part of Letters Patent No. 609,831, dated August 30, 1898.

Application filed July 22, 1897. Serial No. 645,593. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE LE ROY PARKER, a citizen of the United States, residing at Silver Creek, in the county of Chautauqua and State of New York, temporarily residing at Washington, District of Columbia, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

My invention pertains to apparatus for carbureting air or gas, and though susceptible of use in other relations or independently of other appliances is more especially designed for supplying gas for gas-engines.

In the accompanying drawings, Figure 1 is an elevation of my improved apparatus in connection with a gas-engine of common type; Fig. 2, a sectional perspective view of the carbureter on a larger scale; and Fig. 3, a side elevation of a fender or guard which may be used in the carbureter or omitted, as preferred.

It is of course well understood that evaporation of oils and liquids takes place more rapidly at a higher than at a lower temperature and that such evaporation is greatly facilitated by converting the liquid into a fine spray or mist. It is likewise well known that rapid vaporization or evaporation of any liquid is attended by the absorption of heat from the surrounding atmosphere or medium and that cold more or less intense may thus be produced. In its preferred or most advantageous embodiment my invention contemplates the utilization of both of these factors, the water or other medium first used to cool the cylinder of a gas or vapor engine being utilized to assist in vaporizing any suitable oil or hydrocarbon and the rapid vaporization being availed of to cool the water or circulating medium to fit it for continued use for cooling the engine-cylinder.

In many situations the requisite volume of water for maintaining the cylinder of a gas or vapor engine at proper working temperature cannot be had without considerable expense and inconvenience, and in some places its use is impracticable. This is true in places not supplied with a constant flow of water or in small boats and launches, where a proper supply cannot be carried aboard and there is not surplus power available for pumping it from outside the craft, and in various other situations. The extra cost where water is taken from a service-main is also an item of moment. By my improved device I avoid all difficulty in this regard and render such engines available in all situations, besides effecting rapid and perfect vaporization of the oil or hydrocarbon, carbureting the air or gas effectively, and doing this at a temperature that tends to produce a permanent or fixed gas suitable for general use.

Referring again to the drawings, 1 indicates a gas or vapor engine of any common type, having its cylinder jacketed for circulation of a cooling medium.

2 indicates the carbureter, here represented as applied directly to a barrel or cask containing gasolene or other hydrocarbon. The construction of the carbureter is shown in Fig. 2, where it will be seen to consist of an external shell 3 in the form of two slightly-truncated cones united at their bases and containing a spiral coil 4 of pipe or tubing, conforming in general outline to the shape of the shell or casing. Both ends of the shell are furnished with closing-heads, in which are formed inlet and exit openings.

5 indicates a pipe which communicates with the lower end of the chamber within the shell or casing 2 and is designed to enter the vessel in which is contained the hydrocarbon or oil to be vaporized. That portion of the pipe which is intended to be within the cask or vessel is perforated, as shown, and just above the perforations the pipe is encircled by a close-fitting screw-threaded plug or bushing 6, designed to screw tightly into the bung-hole of the cask or vessel, as indicated. If desired, the plug may be made in two parts, one screwing into the other and serving to apply pressure to packing placed between them, thus producing a stuffing-gland about the pipe 5 and preventing all escape of gas or vapor at that point.

Within the pipe 5 are two smaller pipes or tubes 7 and 8, the former extending down through the pipe 5 to the lower end thereof and having its upper end bent laterally, as shown. Pipe 8 passes through the side of pipe 5 and terminates just below and close to the laterally-bent end of pipe 7, so that when air, steam, or other fluid is forced through

pipe 8 a suction shall be produced in pipe 7, whereby the hydrocarbon or other liquid will be drawn up through said pipe 7 and thrown in the form of a spray into the chamber within the shell. In other words, the pipes 7 and 8 are so formed, proportioned, and arranged as to produce the well-known spray or jet apparatus used in various connections at the present time.

Pipe 8 is furnished with a throttle-valve 9, by which to open and close it, and with a regulating-valve 10, which is designed to be set and left at proper working adjustment, so that the apparatus shall be ready for operation the moment the throttle is opened. By thus avoiding the necessity of nicely adjusting the valve each time the apparatus is to be started I avoid a source of considerable delay.

Pipe 7 is furnished with a regulating valve or cock 11, which may be adjusted and thereafter left undisturbed so long as a given relation between the quantity of air or gas and the volume of hydrocarbon is desired. The stem of the cock is carried through a stuffing-gland where it passes to the outside of pipe 5.

To maintain the jet apparatus in condition for immediate starting, a check-valve 12 is placed at or near the lower end of pipe 7, so that oil raised therein may not flow back. By this provision the pipe is kept always supplied with oil and no time is lost in raising it to the nozzle or discharge end of the pipe.

At the top of the shell or casing there is an outlet-pipe 13, which may pass to any desired place of storage or consumption, and beneath the outlet, but above the coil 4, there is arranged a guard or fender 14, composed of a series of disks of wire-gauze, perforated metal, or the like, slightly dishing in form. Successive disks are reversed in position—that is to say, one is placed convex side uppermost and the next concave side uppermost, as seen in Fig. 3.

In using the apparatus in connection with a gas or vapor engine the ends of coil 4 are connected with the water-jacket at two points differing in elevation as much as practicable. The outlet-pipe 13 is connected with the gas-inlet of the engine, and the pipe 8 is connected with a blower or air-forcing device 15 of any suitable character. Other connections may of course be provided to carry off any surplus of gas or carbureted air produced by the apparatus.

Thus constructed and connected the action of the device is as follows: The blower or air-forcing device 15 is put in operation, and a stream or blast of air being blown through the delivery end of pipe 8 and across the end of pipe 7 the hydrocarbon is drawn up in pipe 7 and sprayed over the coil 4. The tapering form of the coil renders it a peculiarly good target for the spray, which encounters it from end to end, while any particles that coalesce and produce a drop fall back from the upper to the lower coils and finally run back through pipe 5 into the cask or vessel. Any drops of oil thrown up through the center of the coil encounter the fender 14, by which they are intercepted. By reason of the inclination of the surfaces of the disks composing the fender the oil or hydrocarbon flows downward until it finally encounters the walls of the shell and runs down, or else it drops from the fender into the interior of the shell. Sufficient vapor to start the engine being thus produced and mingled with the air by which the spray is formed the charge is carried to the engine-cylinder and exploded therein. As the engine begins to operate and as one charge after another is exploded heat is developed in the cylinder, which is in great measure absorbed by the water in the surrounding jacket. In this way the water becomes heated, and by reason of the well-known law the hotter water rises to the top. As this occurs and as the hotter water flows along pipe 16, connecting with the upper end of coil 4, the colder water of the coil, cooled in some degree by evaporation of the hydrocarbon in shell 3, flows in by pipe 17 to supply the place of the water passing over to coil 4. In this way a natural circulation of the water is established, which becomes stronger and more rapid as the heat of the water increases and the coil becomes more effective in hastening the vaporization of the oil or spray thrown against it. It will thus be seen that the action of the two agents, the heated water and the refrigerating-spray, is reciprocal, and if the parts be properly proportioned the water will be found to heat the sprayed hydrocarbon sufficiently to insure its complete vaporization and to produce a reasonably stable or fixed gas, while, on the other hand, the water is so far cooled by the time it reaches the lower part of coil 4 that it is in fit condition to again absorb the heat of the engine-cylinder.

If desired, a reducing-valve may be applied to pipe 16 or 17 to control the rate of circulation of the water.

It will be observed that the pipe 5 is of such size as to afford free communication between the interior of shell or casing 3 and the inside of cask or vessel 18, so that the pressure shall be equalized in the two and the free flow of oil through pipe 7 be accordingly insured.

I have shown pipe 13 as furnished with a branch containing a cock or valve whereby gas may be taken off to other points in any desired quantity within the capacity of the apparatus.

While I contemplate utilizing the heat of water employed to cool the cylinders of gas-engines, I do not restrict myself thereto, but may use hot water, steam, or other heated fluid in the coil 4, the exhaust-steam of engines being available for the purpose, particularly where condensing-engines are employed. It is to be understood, therefore, that the invention is in no degree restricted

to the combination of the carbureter with the water-jacket of a gas or vapor engine, though such combination is within my invention.

Owing to the large surface afforded by the coil and so advantageously exposed to the spray the capacity of the carbureter is very great relatively to its size, and it is admirably adapted to the production of illuminating-gas in isolated places.

Gas of poor illuminating quality may be enriched, being introduced instead of air through pipe 8. The shell and coil may present the form of a single cone each, though the double form is deemed best. It is also permissible to employ other forms of coil or "manifolds," the essential feature being the exposure of large surface to the spray.

Having thus described my invention, what I claim is—

1. A carbureter, consisting of an external shell; a heating-coil within the shell; an oil-pipe; and an air-inlet pipe, the air-pipe being arranged to deliver its blast across the mouth of the oil-pipe and to deliver oil therefrom, in the form of a spray, directly upon the heating-coil.

2. A carbureter, consisting of a shell or casing of conical or tapering form; a heating-coil within said shell and of like form; an oil-pipe; and an air-pipe arranged substantially as shown and described, whereby it is caused to deliver a blast of air across the discharge-opening of the oil-pipe and to project oil in the form of a spray directly upon the coil, and whereby the air is thoroughly carbureted.

3. A carbureter comprising an upright shell in the form of two conical bodies united at their bases; a heating-coil of like form within the shell; a pipe for the introduction of carbureting liquid; and a pipe for the introduction of air, gas or steam under pressure, the latter pipe being arranged to deliver its blast across the open end of the liquid-pipe, and both said pipes having their outlet-openings at the lower end of the shell; whereby the liquid is thrown in the form of a fine spray against the upper turns of the coil, and any particles which fall back are intercepted by the lower turns of the coil.

4. The herein-described carbureter, consisting of shell 3; oil-pipe 7; air-pipe 8 arranged to deliver a blast of air across the opening of pipe 7; and a heating-coil 4 located directly in the path of the spray produced by the blast of air across the oil-pipe opening; whereby the oil is delivered in the form of spray to the heating-coil and is vaporized by contact therewith.

5. The carbureter herein shown and described, comprising an outer shell 3; an internal heating-coil 4; an oil-pipe 7; a blast-pipe 8; and a fender or guard 14 between the gas-outlet and the coil.

6. In combination with the water-jacket of a gas or vapor engine; a carbureter consisting of a shell or casing, a heating-coil wholly contained within said shell and communicating with said water-jacket, and means for spraying oil or hydrocarbon upon the coil, whereby all the heat given off by the water is utilized within the carbureter to vaporize the oil or hydrocarbon, and the cooling effect of the spray is applied to every portion of the coil to reduce the temperature of the water.

In witness whereof I hereunto set my hand in the presence of two witnesses.

CLARENCE LE ROY PARKER.

Witnesses:

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C. S. DRURY.