No. 878,706. PATENTED FEB. 11, 1908.

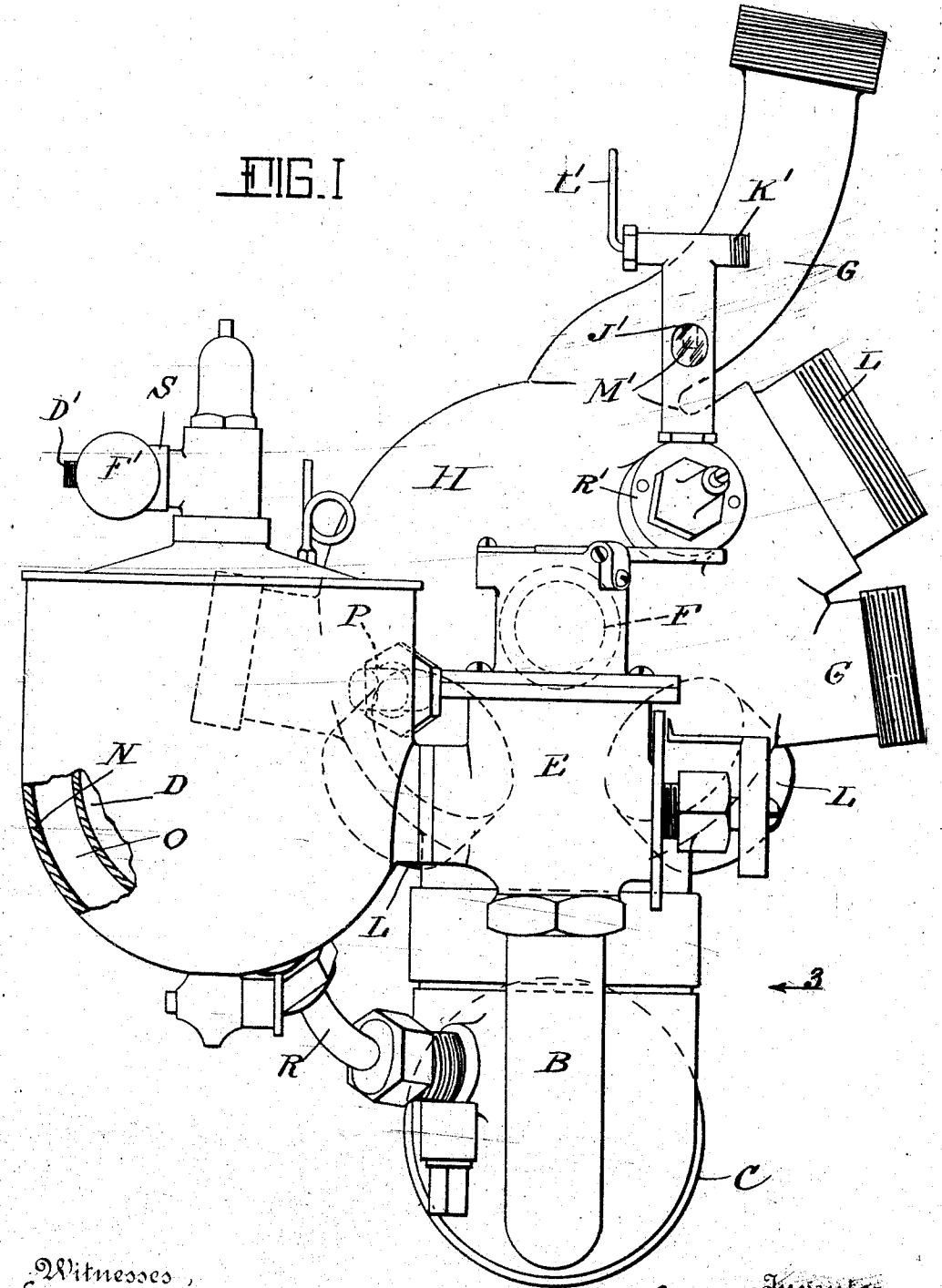
L. ANDERSON.

CARBURETER.

APPLICATION FILED NOV. 22, 1906.

4 SHEETS—SHEET 1.

FIG. 1



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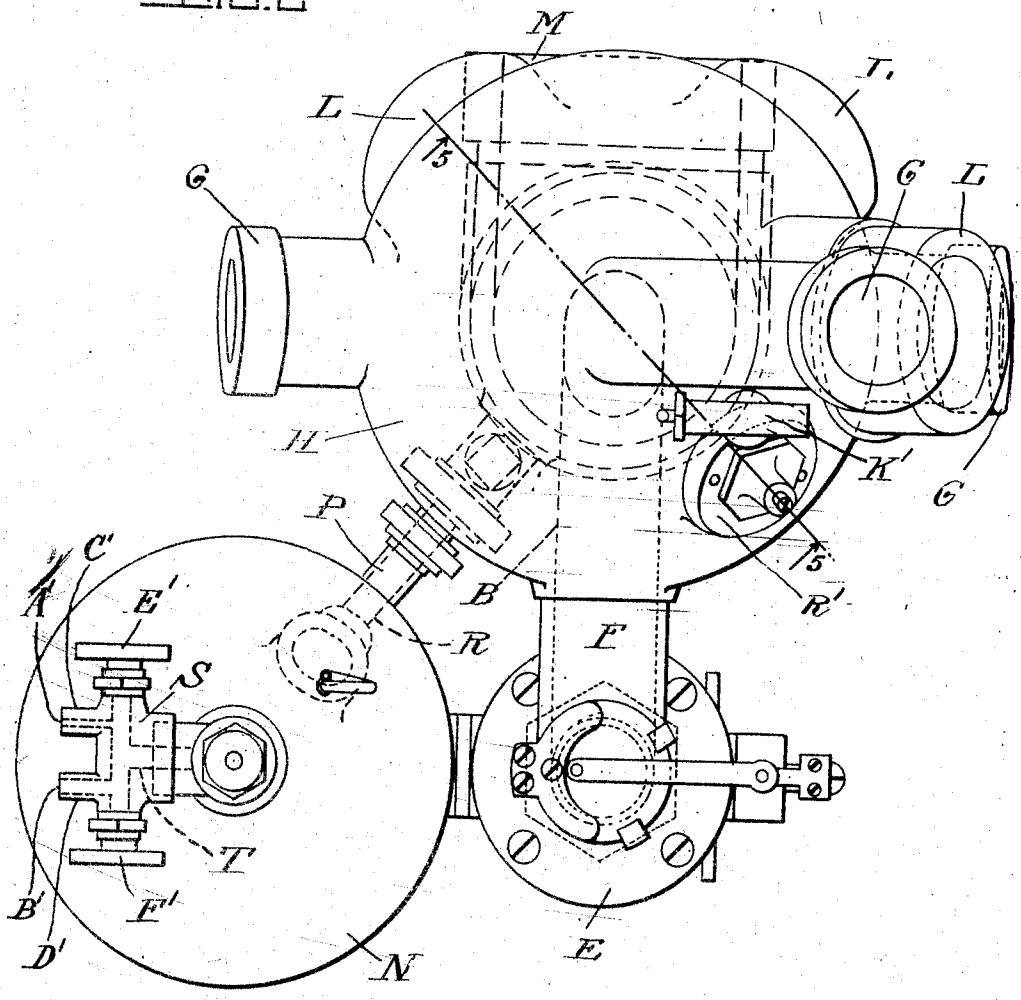
4 SHEETS—SHEET 2.

FIG. 2



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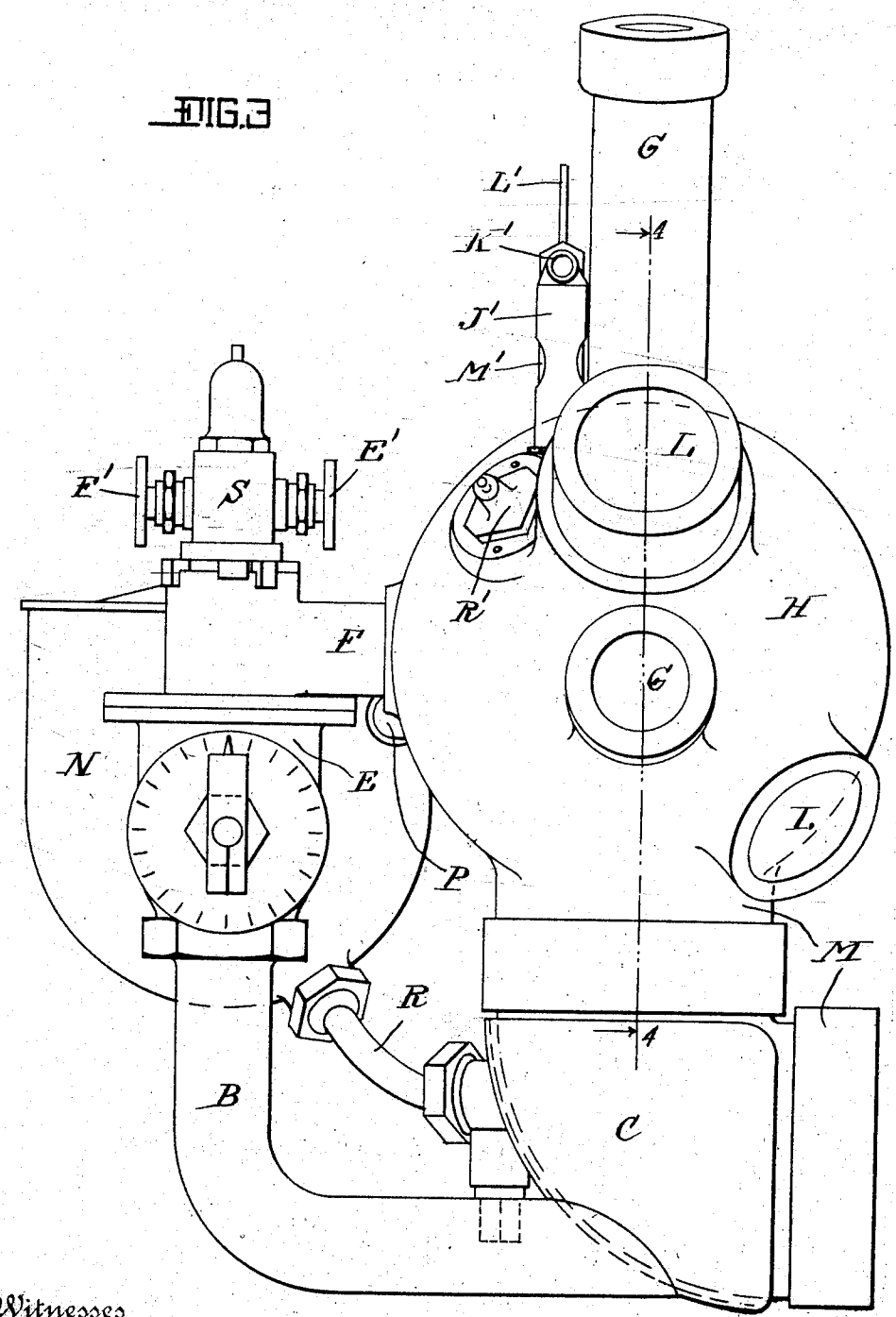
4 SHEETS—SHEET 3.

FIG. 3



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4 SHEETS—SHEET 4.

FIG. 4

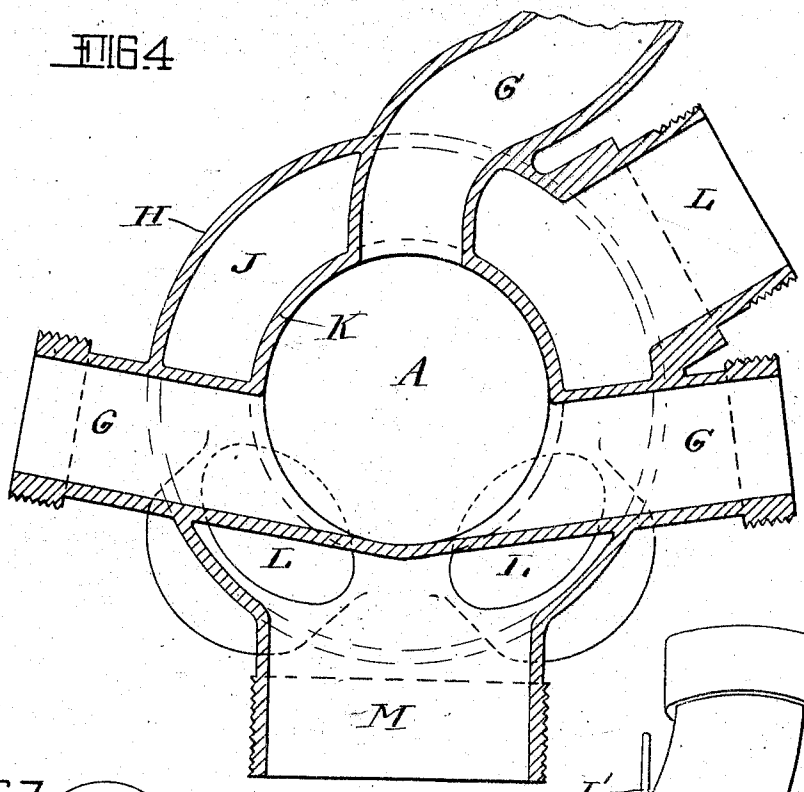


FIG. 7

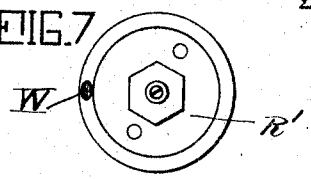


FIG. 6

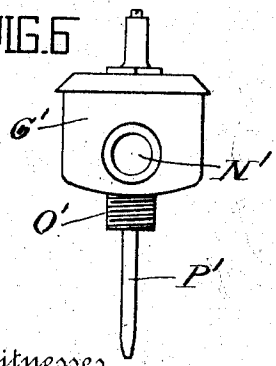
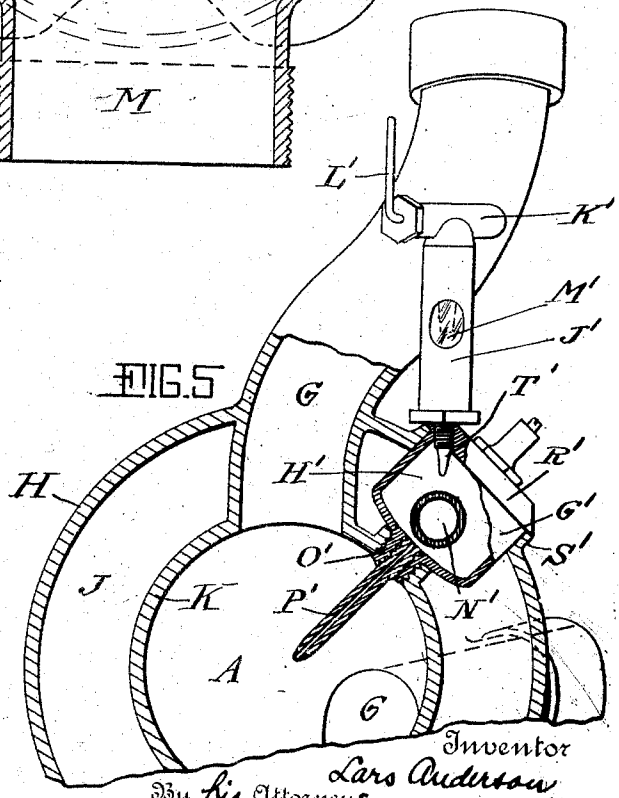


FIG. 5



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UNITED STATES PATENT OFFICE.

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CARBURETER.

No. 878,706. Specification of Letters Patent. Patented Feb. 11, 1908.

Application filed November 22, 1906. Serial No. 344,636.

To all whom it may concern:

Be it known that I, LARS ANDERSON, a citizen of the United States, residing at New York, county of New York, and State of New York, have made a certain new and useful Invention in Carbureters, of which the following is a specification.

This invention relates to carbureters.

The object of the invention is provide a carbureter which is simple in construction and efficient in operation, and which is equally well adapted for use with gasolene or kerosene, or other hydrocarbon.

A further object of the invention is to provide a carbureter, in which the explosive mixture is efficiently converted into explosive condition before being admitted to the explosion chamber of the engine.

A further object of the invention is to provide means, whereby when kerosene, or other similar hydrocarbon oil, is employed, the deposit of soot or other unburned particles of combustion within the carbureter, or engine cylinder, is prevented.

Other objects of the invention will appear more fully hereinafter.

The invention consists substantially in the construction, combination, location, and arrangement of parts, all as will be more fully hereinafter set forth as shown in the accompanying drawings, and finally pointed out in the appended claims.

Referring to the accompanying drawings and to the various views and reference signs appearing thereon: Figure 1, is a view in elevation of a carbureter embodying the principles of my invention. Fig. 2, is a view in top plan of the same. Fig. 3, is a view in elevation looking in the direction of the arrow 3, in Fig. 1. Fig. 4, is a broken view in section on the line 4, 4, Fig. 3. Fig. 5, is a broken view in section on the line 5, 5, Fig. 2. Fig. 6, is a detached detail view of the plug for supplying water to the carbureting chamber. Fig. 7, is a plan view of the same.

The same part is designated by the same reference sign wherever it occurs throughout the several views.

In the operation of hydrocarbon engines it is particularly desirable to employ the cheaper grades of hydrocarbon oils in order to secure the greatest degree of economy. In the use of kerosene, or other similar hydrocarbon oil of the cheaper grades, difficulty has been experienced in properly carbureting the oil, and in attaining the properly proportioned admixture of oil and air to form the explosive charge. Difficulty has also been experienced by reason of the accumulation of soot, or other unburned products of combustion, within the carbureter chamber as well as within the engine cylinder. Difficulty has also been experienced in efficiently starting up the engine initially, by reason of the fact that the kerosene, or similar hydrocarbon, does not vaporize as readily as gasolene, or other similar fuel, especially when the engine and carbureter are cold.

It is among the special purposes of my present invention to provide a construction wherein the difficulties noted are obviated in a most simple and efficient manner, and wherein the engine may be started into operation initially by a priming of gasolene or other suitable fuel, and the operation thereof continued, without interruption, with kerosene, or other similar and cheaper grade of fuel, and wherein, if desired, the engine may be run with other kinds or qualities of fuel.

In carrying out my invention I provide a mixing chamber A, preferably of spherical or globular form in outline, into which the mixture of air and oil is drawn or delivered by the suction of the engine, or, in other words, by the vacuum created in the operation of the engine. The air for the explosive mixture is drawn through a pipe B, having a funnel C, at the receiving mouth thereof, and which is open to the outer air. The fuel, or hydrocarbon oil supply, is drawn from a reservoir chamber, and which is indicated by reference sign D, see Fig. 1, the delivery of the oil and air being effected through a valve chamber, the casing of which is indicated by reference sign E, suitable valves not shown and not forming any part of my present invention, being arranged within said valve chamber, to regulate and control the supply of air and oil. From this valve chamber the air and oil in admixture is delivered through a pipe connection indicated by dotted line at F, in Figs. 1, and 2, and by full lines in Fig. 3, into the interior of the spherical or globular chamber A, of the carbureter, where such mixture is thoroughly vaporized, and converted into an explosive

charge for supply to the explosion chamber of the engine. From the chamber A, the explosive mixture is delivered through pipe connections G, to the engines to be operated, as many such pipe connections as engines being employed. I have shown three of such connections but, of course, my invention is not to be limited or restricted in this respect. Inclosing and surrounding the mixing chamber A, is a spherical or globular hollow casing H, forming an inclosing chamber or space J, for the casing K, of the carbureting chamber A. With this inclosed space J, communicates a pipe connection L, for the circulation therethrough of the exhaust from each engine. Thus where three engines are employed, the casing H, is provided with three connections L. Also communicating with the inclosed space J, is an exhaust connection M, delivering to the outer air.

If desired, and in order to preliminarily heat the oil supply before being admitted from the reservoir D, I may provide said reservoir with an inclosing jacket N, leaving a space O, surrounding the reservoir D, and a pipe connection P, opens communication between the exhaust chamber J, and the chamber O, which surrounds the reservoir. From the chamber O, the exhaust is delivered into the main exhaust pipe M, through a pipe connection R, see Figs. 1, and 3.

If desired, and in order to preliminarily heat the air before the same is mixed with the hydrocarbon, the air intake pipe B, may terminate in the enlarged funnel C, which, as shown, is arranged to partially surround and inclose the delivery end of the main exhaust connection M. From this construction it will be seen that the air is drawn into the intake air pipe B, around the heated exhaust pipe connection M, and is thereby preliminarily heated. These features of preliminarily heating the oil supply, as well as the air supply, and in the simple manner herein described, are conducive to the attainment of the advantages and results secured in the practical operation of an apparatus embodying my invention.

In order to render the apparatus convertible, that is, adapted as well for the use of gasolene, or other similar hydrocarbon fuel, as for kerosene, or other cheaper grade of hydrocarbon, and in order to permit in a simple and efficient manner the priming of the apparatus in starting up initially with a readily volatilizable fuel, as gasolene, when it is desired to continue the operation of the engine with kerosene, I provide a fitting S, having a passage T, see Fig. 2, delivering into the reservoir, and with which passage communicate openings or passages A^1, B^1, formed through nipples C^1, D^1, respectively, with which the fitting S, is provided. These passages A^1, B^1, differ from each other in cross-sectional area according to the character of the fuel employed, since the heavier and cheaper grades of hydrocarbon oils, such as kerosene, require a larger delivery passage than the lighter and more expensive grades, as gasolene. The passages A^1, B^1, are respectively controlled by valves E^1, F^1. In this manner, supply of either gasolene or kerosene may be effected from independent sources, or tanks, without interfering with each other, or independently of each other, as may be desired, thereby enabling the same apparatus to be employed whether for gasolene or kerosene, or any other variation in grade, or character, or quality of fuel, and enabling the carbureter to be preliminarily primed and started with gasolene where it is the desire or intention to continue the operation with kerosene.

In order to prevent the deposit of soot, or other accumulation, from the unburned particles or products of combustion, or otherwise, within the carbureter or the engine cylinder, I propose to deliver into the mixing chamber a jet of water or steam, to be delivered along with the explosive charge into the explosion chamber of the engine cylinder, and to be exhausted therefrom along with the exhaust, and I provide an exceedingly simple and efficient construction for accomplishing this purpose. In carrying out this idea I employ a plug G^1, having an interior chamber H^1, see Fig. 5, into which a supply of water may be delivered through a jet and pipe connection J^1, from a pipe K^1; from any convenient source, the supply being regulated by the valve controlled by stem L^1, which, if desired, may be regulated automatically from the engine governor, not shown, so as to regulate the supply according to the speed of the engine. If desired, the jet connection J^1, may be provided with a glass covered peep hole M^1, through which may be disclosed the height or level of the water contained in such connection. Extending transversely through the plug G^1, is an open ended tube forming a passage N^1, which when the plug is inserted through a seat or opening in the casing H, communicates freely with the jacket chamber J, of the carbureter, thereby permitting the exhaust to circulate freely through said passage N^1, and hence heating the water contained in the chamber H^1, of the plug. In other words, the heated exhaust gases circulate not only around the exterior surface of plug G^1, but also through said plug, or rather through the opening N^1 therethrough. The plug G^1, is provided with a threaded hub O^1, adapted to be screwed into a socket formed through the casing K, to receive the same, said hub carrying a pipe or jet P^1, the bore of which opens communication from the plug chamber H^1, into the center, preferably the geometric center, of the chamber A.

In practice I have found that the water is ordinarily converted into steam in the chamber H^1, and is delivered into the mixing chamber A, in the form of steam, but, if not so converted before delivery into the mixing chamber A, it is converted into steam in said chamber by reason of the efficient heating of the walls of said chamber by the circulation therearound of the heated products of combustion and gases from the exhaust of the engine, such steam being delivered along with the explosive charge into the engine cylinders, and serving to efficiently maintain the mixing chamber, as well as the explosion chamber and cylinders, free from deposit or accumulation of soot or other unburned particles of combustion. The plug G^1, is provided with a capped end R^1, fitting over a boss S^1, formed in casing H, and the jet connection J, is provided with a nipple T^1, see Fig. 5, adapted to be screwed into a threaded opening W, see Fig. 7, formed through the plug.

I have found that by employing a spherical or globular-shaped chamber A, I am enabled to secure better results, not only in the way of increasing the efficiency of the mixing operation of the oil and air, but also in the way of heating the mixed oil and air by inclosing such chamber within a spherical or globular-shaped jacket or casing. A better circulation of the heated exhaust gases is secured and a more efficient delivery of the explosive charge from the mixing chamber to the engine cylinders is effected since such delivery is effected radially from the chamber A.

By the construction above described I provide a carbureter which, in practice, I have found to be efficient and well adapted for the use of kerosene for the hydrocarbon oil, as well as for gasolene, or for other oils or fuels. It will be seen that I utilize to the very best advantage obtainable the heat of the exhaust gases, not only in surrounding and heating the mixing chamber, but also in heating the oil reservoir, and in heating the water supply for maintaining the carbureter and engine clean and free from objectionable deposits, or other accumulations, and also in heating the air which is drawn into the carbureter as a constituent of the explosive charge.

It is believed that the operation of the device will be readily understood from the foregoing description when taken in connection with the accompanying drawings.

Having now set forth the object and nature of my invention, and a construction embodying the principles thereof, what I claim as new and useful and of my own invention, and desire to secure by Letters Patent is:

1. In a device of the character described, a chamber in the form of a hollow sphere or globe, and having an unobstructed interior, a pipe for delivery thereinto of the mixture of oil and air, a delivery pipe communicating radially with said chamber, a spherical or globular inclosing casing for said chamber forming a jacket therefor, an exhaust pipe connection delivering from the engine to said jacket, and an exhaust connection to the outer air delivering from said jacket.

2. In a device of the character described, a chamber in the form of a hollow sphere or globe, and having an unobstructed interior, a jacket therefor, a pipe connection for the mixture of oil and air delivering into said chamber, a plurality of pipes delivering radially from said chamber to the engine cylinders, an exhaust pipe connection from the engine to said jacket, and a main exhaust pipe delivering from said jacket to the outer air.

3. In a device of the class described, a chamber, means for delivering a fuel and air mixture thereto, a jacket for said chamber, a pipe communicating from the engine to said jacket and a pipe connection from the jacket to the outer air, in combination with a jet extending through said jacket and into said chamber, and means for supplying water to said jet.

4. In a device of the class described, a chamber, means for delivering a fuel and air mixture thereto, a jacket for said chamber, a pipe connection from the engine to said jacket and a pipe connection from the jacket to the outer air, in combination with a chambered plug extending into said jacket, a jet delivering therefrom into said chamber, and means for supplying water to the chamber of the plug.

5. In a device of the class described, a chamber, means for delivering a fuel and air mixture thereto, an inclosing jacket for said chamber, a pipe connection from the engine to said jacket, and a pipe connection from the jacket to the outer air, in combination with a hollow plug extending into said jacket, said plug having a passage therethrough communicating freely at each end with said jacket, a jet delivering from the interior of the hollow plug into said chamber, and means for supplying water to said hollow plug.

6. In a device of the class described, a chamber having communication with the engine cylinder, and a jacket inclosing said chamber, said jacket having communication with exhaust and the outer air, in combination with means for delivering to the chamber a mixture of fuel and air, including an air intake pipe, and a sleeve with which said pipe connects, said sleeve surrounding the outer air connection of said jacket.

7. In a device of the class described, a chamber having an engine connection, a jacket for said chamber, said jacket having connection with the engine exhaust and with

the outer air, in combination with a fuel reservoir, a jacket therefor, a pipe communication between the chamber and reservoir jackets, and a pipe communicating between the reservoir jacket and the outer air connection of the chamber jacket.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 15th day of November A. D. 1906.

LARS ANDERSON.

Witnesses:

S. E. DARBY,

ALVA DEL CASTRO.