A. R. LONG.

CARBURETER.

APPLICATION FILED SEPT. 21, 1911.

1,042,017.

Patented Oct. 22, 1912.

Fig. 2.

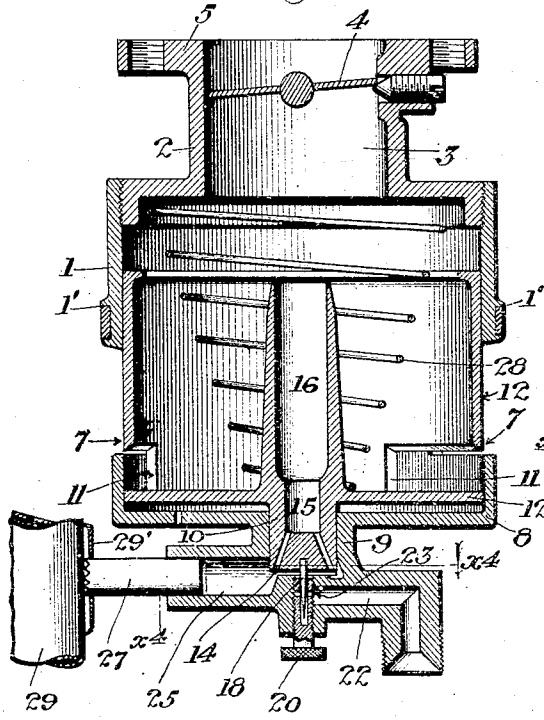

Fig. 1.

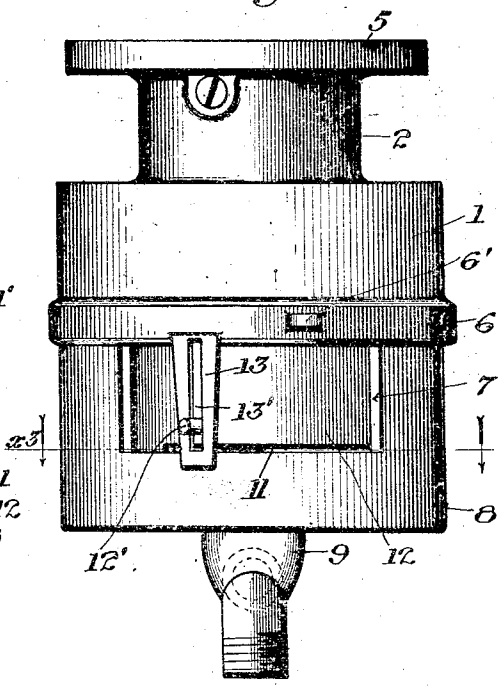

Fig. 3.

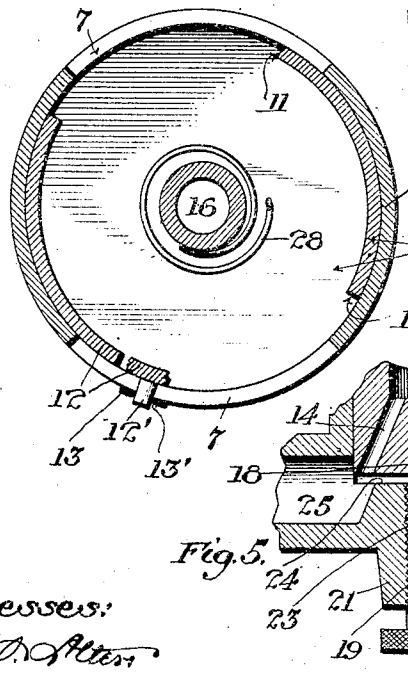

Fig. 4.

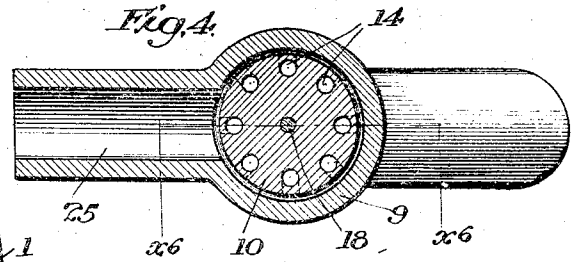

Fig. 6.

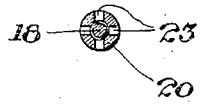

Fig. 5.

Witnesses:

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UNITED STATES PATENT OFFICE.

ALBERT R. LONG, OF LOS ANGELES, CALIFORNIA.

CARBURETER.

1,042,017. Specification of Letters Patent. Patented Oct. 22, 1912.

Application filed September 21, 1911. Serial No. 650,654.

To all whom it may concern:

Be it known that I, ALBERT R. LONG, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Carbureter, of which the following is a specification.

This invention relates to a carbureter for use with internal combustion engines, and one object of the invention is to maintain any given or desired proportion of air to fuel under automatic control of the suction of the engine.

Another object of the invention is to provide for variation of the given proportion of air to oil under control of the operator.

A further object of the invention is to transform the fuel if liquid fuel is used, to gas with sufficient air to prevent condensation before it is delivered to the fresh cold air being taken in by the engine.

Other objects of the invention will appear hereinafter.

The accompanying drawings illustrate an embodiment of the invention, and referring thereto: Figure 1 is a side elevation of the carbureter. Fig. 2 is a vertical section thereof. Fig. 3 is a section on line x^3—x^3 in Fig. 1. Fig. 4 is a section on line x^4—x^4 in Fig. 2. Fig. 5 is a section on line x^6—x^6 in Fig. 4. Fig. 6 is a horizontal section through the oil regulating valve.

1 designates the casing of the carbureter which is preferably cylindrical and may be closed at its upper end by a cap member 2, formed with an outlet passage 3, controlled by a throttle 4, said member 2 being provided with means such as flange 5, for connection with the intake of an internal combustion engine. The casing 1 is formed with lateral air inlet ports or openings 7 and is closed at the bottom, the bottom member or portion 8 of the casing being formed with a central tubular portion 9 serving as a guide for a stem or stud 10 of the air valve. Said air valve consists of a cylindrical shell 12 mounted to slide within the cylindrical casing 1, said shell being open at the top and closed at the bottom, with the stem 10 extending downwardly from the closed bottom of the shell. Valve shell 12 is formed with side ports or openings 11, for coöperating with the ports 7 in the casing. Valve shell 12 is rotatable as well as slidable in casing 1 and is guided vertically by a pin 12′ on the valve engaging in a slot 13′ in a vertical flange 13 depending from a ring 6 which is mounted to turn in an annular groove 1′ in casing 1 and is provided with operating means 6′. The stem 10 is hollow and serves as a means for introducing fuel into the carbureter, the lower end of said stem having perforations 14 communicating with the interior chamber 15 in the stem and opening at the bottom of said stem. A tubular riser 16 extends up from the bottom of member 12 and communicates at its lower end with the interior of the hollow stem, and at its upper end with the mixing chamber within the casing 1. From the bottom of the stem 10 a needle valve or regulating pin 18 extends downwardly into a bore or chamber 19 in a screw 20 which screws into a head 21 formed on the lower end of the tubular member 9. A tubular fuel supply connection 22 opens into said head and communicates through passages 23 in the screw 20 aforesaid. At the upper end of the head 21 there is provided a valve seat 24 coöperating with the lower end or bottom of the valve stem 10 to form a complete shut off for the fuel when the valve is down. The tubular member 9 is further provided with a lateral tubular extension 25 forming an air inlet communicating with a passage 26 extending around the lower end of the valve stem, sufficient air to carry up into the valve, the oil or fuel furnished through the oil or fuel inlet. Said tubular member 25 communicates with any suitable heating means, for example, a pipe 27 extending alongside the exhaust pipe 29 of the engine, to receive heat from the exhaust and heat the air passing to the air inlet at 25. A deflector 29′ may be provided to increase the heat absorbing effect. A spring 28 extends between the top or cap member of the casing 1 and the bottom of the valve shell 12, tending to hold the valve in closed position to cut off both air and oil supply, the valve closing by spring pressure independently of or in conjunction with the action of the gravity, according to the position of the carbureter.

The operation is as follows: Normally, or when the engine is at rest, the air valve 12 is closed, said valve being held down by spring 28 so as to bring the ports 11 out of register with the ports 7. In this position of the valve the bottom of the stem 10 of the valve rests on the valve seat 24 so that communication with the oil supply is com-

pletely cut off. Owing to this complete cut off of the air and oil inlets by the valve, there is no danger of fire from back-firing through the carbureter. When the engine is started up the suction therefrom produces a partial vacuum in the interior of casing 1 and causes the valve member 12 to be lifted by automatic pressure exerted on the bottom thereof through an opening 30, which is provided in the casing 1 to permit passage of air from the outside into the space below the valve shell 12. This movement of the valve member 12 causes the upper edges of the ports 11 therein to pass the lower edges of the ports 7 in the casing and open communication from the outer air to the interior of the valve member 12 through the said ports 7 and 11. At the same time the lifting of the valve member 12 raises the stem 10 thereof off of the valve seat 24 and also partially withdraws the regulating pin 18 from the bore 19 in the screw 20 so as to permit oil or fuel to pass from the oil inlet 22 through the passage 23 and bore 19 to the space between the valve seat 24 and valve stem 10, and to the annular passage 26 around said space. The suction from the engine also draws air from the interior of the tubular riser 16 and the hollow stem, causing air to pass through the perforations or passages 14 in the stem, and the air entering said passages in proximity to the oil or fuel directly below the valve stem draws the oil or fuel with it into the interior of the stem and into the tubular riser, the amount of air admitted in this manner being just sufficient, or but little more than sufficient, to carry up the fuel or oil supply through the oil controlling valve. The air entering in this manner through the tubular member 25 and perforations 14 having been previously heated in the normal operation of the engine by passing through the pipe 27, causes the oil which is carried along with it to be vaporized or gasified so that the mixture in the tubular riser 16 is a stable mixture not liable to condensation. This rich mixture of the oil vapor and air passes out at the top of the riser 16 and mixes with the air which is passing from the ports 11 upwardly through the mixing chamber, diluting this rich mixture required for explosion or perfect combustion, the proportions of air and oil being automatically regulated and determined by the simultaneously operating and mechanically connected air and oil valve members so that a given proportion of fuel and air is maintained throughout the operation. As the speed of the engine increases the suction will also increase, and the valve member will be lifted so as to open the air and oil ports to a greater extent and allow more air and oil to flow into the carbureter, but in any case the amount of air furnished through the ports 11 is proportionate to the amount of oil so that the mixture remains of substantially constant quality at all speeds. In certain cases, however, it is necessary to provide for additional air supply, for example, at high speeds, and at high elevations, and under such circumstances the controlling device 38 is moved so as to turn the valve shell 12 to provide for a greater exposure of the port 11.

What I claim is:

1. A carbureter comprising a casing provided with a mixture outlet and air inlets, an air valve mounted to slide within said casing and provided with ports coöperating with said inlets to control admission of air to the interior of the casing, said valve member having a portion acting as a piston in said casing to operate the valve member by the suction in the casing and said valve member having a stem with an internal chamber communicating with the interior of the said casing, said casing being formed with another air inlet extending adjacent to said stem, said stem having perforations communicating with said last named air inlet and with the interior of the stem, and a fuel supply connection communicating with said passage adjacent to said perforations.

2. A carbureter comprising a casing provided with a mixture outlet and air inlets, an air valve mounted to slide within said casing and provided with ports coöperating with said inlets to control admission of air to the interior of the casing, said valve member having a portion acting as a piston in said casing to operate the valve member by the suction in the casing and said valve member having a stem with an internal chamber communicating with the interior of the said casing, said casing being formed with another air inlet extending adjacent to said stem, said stem having perforations communicating with said last named air inlet and with the interior of the stem, and a fuel supply connection communicating with said passage adjacent to said perforations, said casing having a valve seat adjacent to said fuel inlet for coöperation with said stem to shut off the fuel connection.

In testimony whereof, I have hereunto set my hand at Los Angeles, California this 15th day of September, 1911.

ALBERT R. LONG.

In presence of—
ARTHUR P. KNIGHT,
GLADYS RUSSELL.