T. J. GROTT.

CARBURETER.

APPLICATION FILED APR. 16, 1909.

951,002.

Patented Mar. 1, 1910.

2 SHEETS—SHEET 1.

Fig. 2.

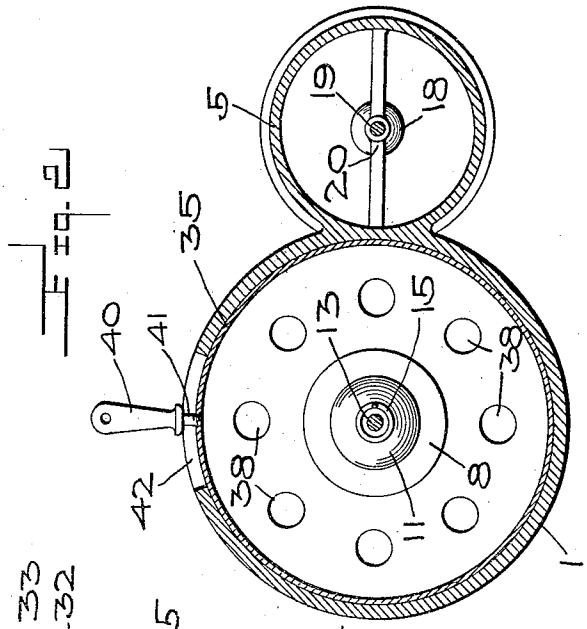
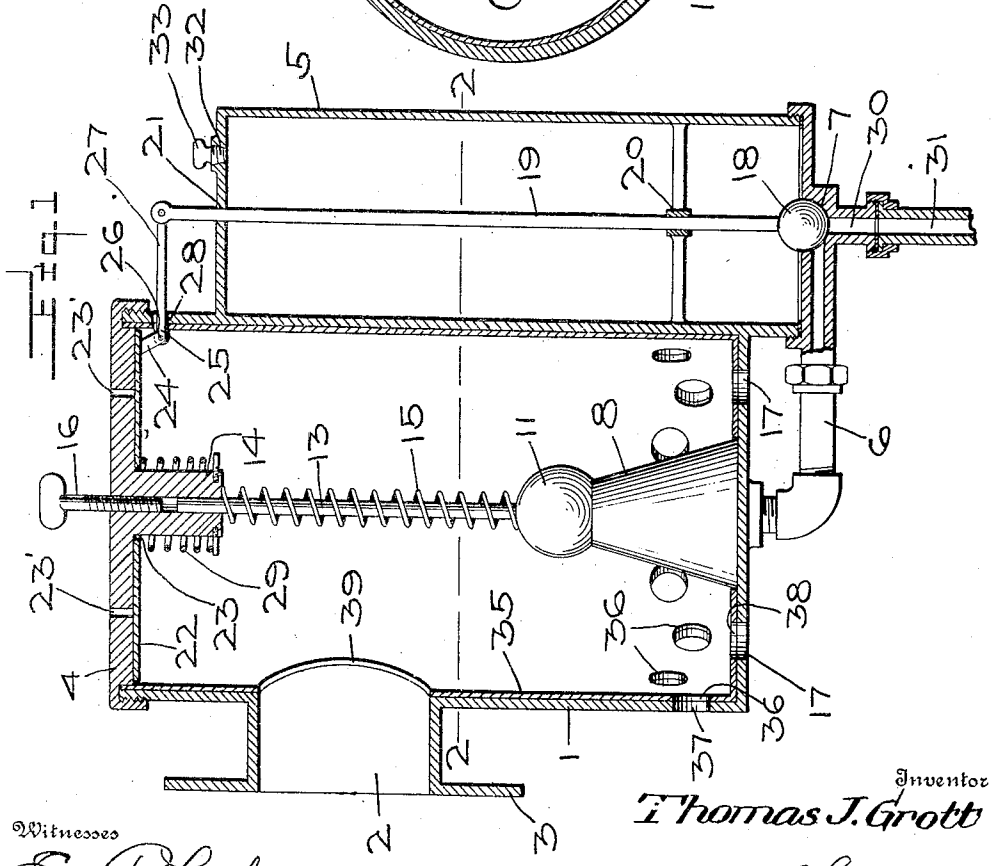


Fig. 1.



Witnesses

Ed. R. Lusby

E. L. Chandlee

Inventor

Thomas J. Grott

By Woodward & Chandlee

Attorney

T. J. GROTT.

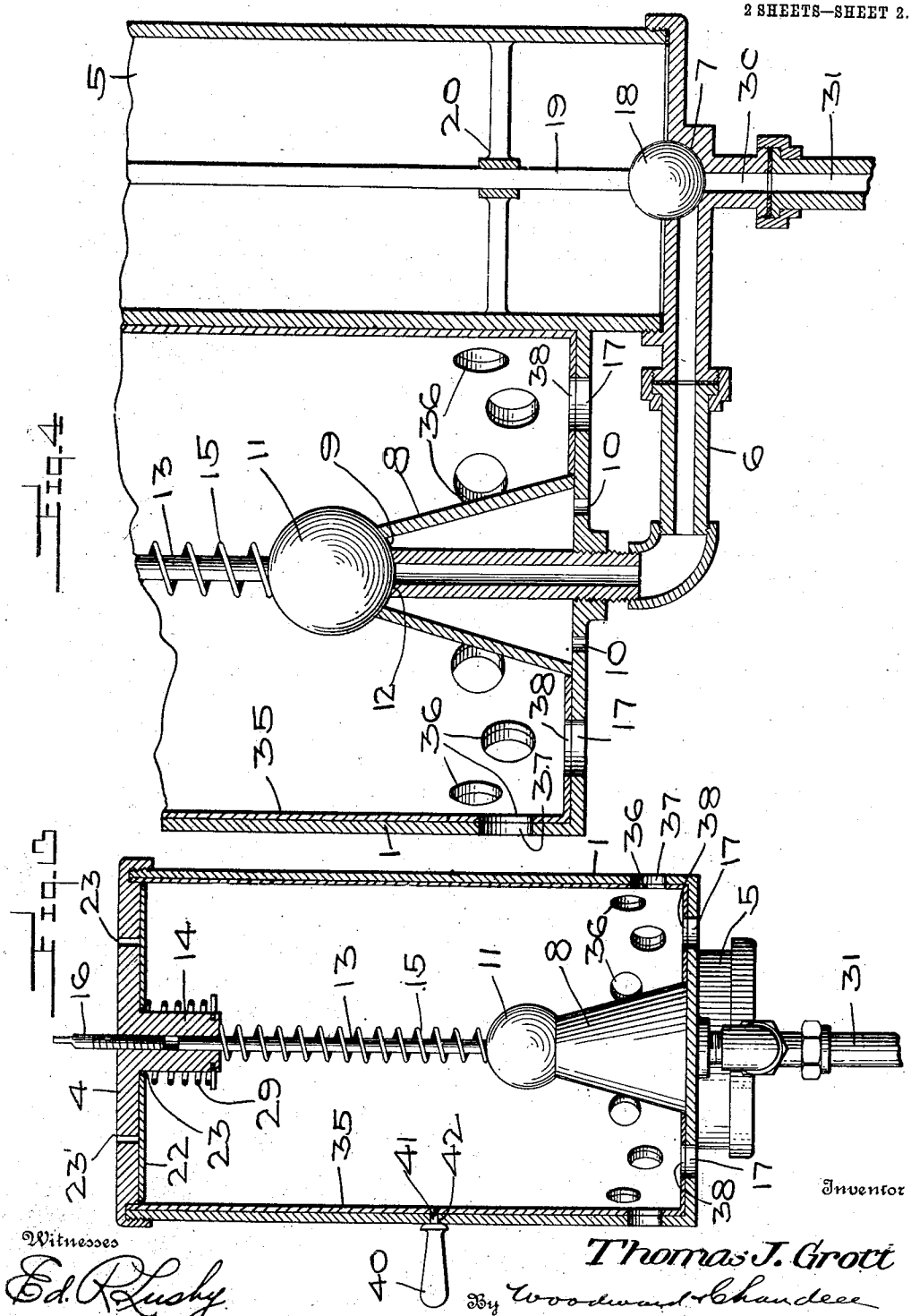
CARBURETER.

APPLICATION FILED APR. 16, 1909.

951,002.

Patented Mar. 1, 1910.

2 SHEETS—SHEET 2.



Witnesses

Ed. R. Lusby

E. C. Chandlee

Inventor

Thomas J. Grott

By Woodward & Chandlee

Attorney

UNITED STATES PATENT OFFICE.

THOMAS J. GROTT, OF RICHMOND HILL, NEW YORK.

CARBURETER.

951,002. Specification of Letters Patent. Patented Mar. 1, 1910.

Application filed April 16, 1909. Serial No. 490,312.

To all whom it may concern:

Be it known that I, THOMAS J. GROTT, a citizen of the United States, residing at Richmond Hill, in the county of Queens and State of New York, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

This invention relates to carbureters for explosive engines and has for its object to provide an improved carbureter by means of which kerosene or other fuel is automatically released from a primary chamber and a main supply reservoir and drawn into a mixing chamber by the suction of air drawn from the mixing chamber into the engine when it is started and while it is running, and also by means of which the flow of oil from the reservoirs is automatically cut off by the stopping of the engine.

The invention further has for its object to provide an improved carbureter by means of which flooding of the oil or other fuel is prevented and a complete vaporizing of the fuel obtained.

Other objects and advantages will be apparent from the following description, and it will be understood that changes in the specific structure shown and described may be made within the scope of the claims without departing from the spirit of the invention.

In the drawings forming a portion of this specification, and in which like numerals of reference indicate similar parts in the several views, Figure 1 is a view in elevation and in vertical section of a carbureter constructed in accordance with this invention, Fig. 2 is a horizontal sectional view centrally of the device looking downward, Fig. 3 is a vertical section at right angles to Fig. 1, Fig. 4 is a detail section of the lower portion of the carbureter.

The carbureter constructed in accordance with this invention comprises a cylinder 1, serving as the mixing chamber and formed with the opening 2 at one side for the passage of the mixture of air and oil to the engine, and with the flange connection 3 for securing the carbureter to the engine. The top of the cylinder 1 is closed by a suitable cover 4 screwed thereon, or secured thereto in any other suitable manner. Preferably secured to one side of the cylinder 1, in any suitable manner is a reservoir or priming chamber 5 to contain kerosene, gasolene, or other liquid fuel. Liquid fuel is conveyed from the priming reservoir 5 to the cylinder 1 by means of the pipe 6, connected at one end with the bottom of the reservoir 5 and communicating with an opening 7 therein, and connected at the other end with the cylinder 1, the pipe 6 extending vertically up through the bottom of the cylinder 1, and to the top of a hollow cone 8 secured to the bottom of the cylinder 1. Between the top of the cone 8 and the end of the pipe 6 is a circumferential opening 9 and in the bottom of the cylinder 1 are a number of air inlet openings 10 arranged in a circle and opening into the lower end of the hollow cone 8. By means of the foregoing construction air may pass up through the cone and out of the circumferential opening 9 into the mixing chamber. To control the admission of oil or gas, and air into the mixing chamber, a ball valve 11 is provided which is seated on the top of the pipe 6 and the cone 8, the end of the pipe 6 being made concave as at 12, to adapt the ball valve 11 to be seated thereon and close the pipe 6, and the circumferential opening 9. The ball valve 11 is limited in its upward movement by a rod 13 connected at one end thereto and extending up into a sleeve or guide 14 depending from the cover 4. The ball valve 11 is yieldingly held against the end of the pipe 6 by means of a tension spring 15 encircling the rod 13 and connected at one end to the valve 11 and at the other end to the lower end of the sleeve 14. The upward movement of the valve 11 may be regulated by the adjusting screw 16, screwing into the sleeve 14, and against which the upper end of the rod 13 strikes. The bottom of the cylinder 1 is also provided with a number of air inlet openings 17, arranged in a circle about the cone 8, in addition to the air inlet openings 10. The opening 7 in the bottom of the primary oil reservoir 5 is closed by a ball valve 18 on the lower end of a stem or rod 19 extending through a cross guide bar 20 in the chamber 5 and up through the said chamber and an opening 21 in its top. Located in the top of the cylinder 1 is a disk shaped valve 22, extending across the cylinder 1 and having an opening 23 through which extends the sleeve 14, the opening 23 being of such a size as to permit the valve 22 to have a limited swinging movement. The valve 22 is mounted on the short arm 24 of a bell

crank lever 25 hinged to a rod 26 having its ends secured to the sides of the cylinder 1, the long arm 27 of the bell crank lever 25 extending through a slot 28 in the side of the cylinder 1 and being hinged at its outer end to the upper end of the stem or rod 19. The valve 22 is held up in a horizontal position by means of a coiled spring 29 encircling and secured at its lower end to the sleeve 14, and in this position of the valve 22, the valve 18 is held down against the opening 7. The valve 18 not only closes the opening 7, but also a passageway 30 connecting the end of the pipe 6 with a branch pipe 31 connecting with a main liquid fuel supply reservoir. The priming chamber 5 may be filled with kerosene or other liquid hydrocarbon through an opening 32 in the top of the chamber 5 closed by a cover 33.

The operation of the carbureter is as follows: When the engine is started the suction of air from the cylinder 1 through the opening 2 into the engine by the action of the latter, draws down the valve 22 against the tension of the spring 29 compressing the latter and thereby through the bell crank lever 25 and the rod 19 lifts the ball valve 18 and uncloses the opening 7 and passageway 30. The suction in the cylinder 1 causes the kerosene to flow from the priming reservoir 5 and to be drawn through the pipe 6 and sucked from beneath the ball valve 11 into the mixing chamber 1 and commingle with the air drawn up through the cone 8 and to be discharged in the form of a ring into the mixing chamber. The air drawn up through the openings 17 in the bottom of the cylinder 1, coöperates with the commingled oil and air entering the mixing chamber beneath the valve 11 to form a complete mixture of the oil and air. The construction and arrangement of the end of the pipe 6, the cone 8, and the ball valve 11 yieldingly resting thereon permits of a partial vaporization of the liquid hydro-carbon as it is admitted to the mixing chamber. The lifting of the ball valve 18 in the bottom of the priming chamber 5 uncloses the passageway 30 and permits oil or other fuel to be drawn from the main fuel supply reservoir through the pipe 31, and pipe 6 and beneath the ball valve 11 into the mixing chamber 1. When the engine is stopped, the suction of air from the mixing chamber ceases and the valve 22 is instantly raised to normal position by means of the reaction of the spring 29. This movement of the valve 22 causes the ball valve 18 to close the opening 7 and passageway 30, thereby shutting off the flow of oil to the mixing chamber. In this way it will be seen that the flow of oil to the mixing chamber is automatically checked and flooding is prevented.

By means of this invention a carbureter is provided which is light and simple in construction, having a small number of parts not likely to get out of order and in which the vaporization of the liquid fuel will be accomplished in an efficient manner.

To throttle the passage of air through the device, there is an interior casing 35 revoluble within the cylinder 1, and its base having openings 38 adapted to register at times with the openings 17 in the base of the cylinder, and its wall having openings 36 adapted to register at times with openings 37 formed in the cylinder 1. An opening 39 is also formed through the wall of the casing 35 adapted to register with the passage 2, and arranged to restrict the entrance to said passage at times, though it will be understood that if desired this opening may be so enlarged that no restriction will occur. A horizontal slot 42 is formed in the wall of the cylinder 1, an operating arm 40 projecting therethrough in engagement with the casing 5, by means of a stem 41 as shown in Fig. 2. The arm 40 may be either manipulated manually or by means of suitable operative connections engaged with the opening at the extremity thereof. It will be also noted that openings 23′ are formed in the cover to allow the entrance of air above the valve 22 to facilitate its operation.

It should be explained that the purpose of the supplementary reservoir 5 is to supply an adequate amount of gasolene to the mixing chamber when starting an engine. At the start, the device being usually turned by hand the movement is slow, and consequently the vacuum created in the mixing chamber is slight and may not be sufficient to draw a sufficient quantity of gasolene thereinto. By the provision of the reservoir 5 with a sufficient quantity of gasolene, the minute the rod 19 is lifted, gasolene will flow into the carbureter under the action of gravity, independently of the vacuum created in the mixing chamber.

What is claimed is:

1. In a carbureter for explosive engines, a mixing chamber, a vertical hollow cone, with an open upper end mounted on the bottom of said chamber, and having a number of air inlet openings in the bottom of said cone, an oil supply pipe projecting up through the bottom of said chamber and to the top of the cone and having a circular air space between the top of the cone and the top of the pipe, and a ball valve seated on the top of said cone, and pipe.

2. In a carbureter for explosive engines, a mixing chamber, a vertical hollow cone with an open top mounted on the bottom of said chamber, a number of air inlet openings being formed adjacent the base of said cone, an oil supply pipe projecting up through the bottom of said chamber and to the top of the cone, and having a circular

air space between the top of the cone and the top of the pipe, a ball valve seated on the top of said cone and pipe, a retracting spring for moving the valve to a closed position and means for adjusting the opening movement of the valve.

3. A carbureter for explosive engines, comprising a mixing chamber having a number of air inlet openings in its bottom, a hollow cone with an upper open end mounted over a portion of said openings, a primary reservoir having an opening in its bottom, an oil supply pipe connected with said opening extending to the mixing chamber and up through its bottom to the top of the cone, a circular air passage being formed between the top of the cone and the end of the pipe, a ball valve seated on the top of said cone and pipe, a valve closing the openings in the priming reservoir and the oil supply pipe, an air actuated valve located in the mixing chamber and a connection between said valve and the priming reservoir valve to allow the suction of air from the mixing chamber to act on the valve in the mixing chamber to open the valve in the primary reservoir, and to automatically close the latter valve when the engine stops.

4. In a carbureter for explosive engines, a mixing chamber, a hollow cone with an open top located in the bottom of said mixing chamber, air inlets in the bottom of said cone, an oil supply pipe projecting up into said cone, to its top and forming a circumferential air space between it and the cone, a ball valve seated on said cone and pipe, a depending guide in the top of the mixing chamber, a stem on the ball valve having its upper end projecting into said guide, a retracting spring mounted on the ball valve and its stem and a set screw in said guide for limiting the opening movement of the ball valve.

5. In a carbureter for explosive engines, a mixing chamber adapted to be secured to an engine and supply a vaporized mixture thereto, a hinged air actuated valve located in said mixing chamber, and having a lever arm projecting through the side of said chamber, a priming reservoir secured to the side of the mixing chamber and having an oil outlet opening in its bottom, a valve closing said opening and mounted on the lower end of a stem extending up through the top of the priming chamber and hinged to the lever arm of the air valve, said air valve being acted upon by suction of the air from the mixing chamber by the engine to open the priming reservoir valve, and automatically acting to close the latter valve when the engine stops.

In testimony whereof I affix my signature, in presence of two witnesses.

THOMAS J. GROTT.

Witnesses:

WILLIAM C. SCHMIDT,

SAMUEL D. VAN NOSTRAND.