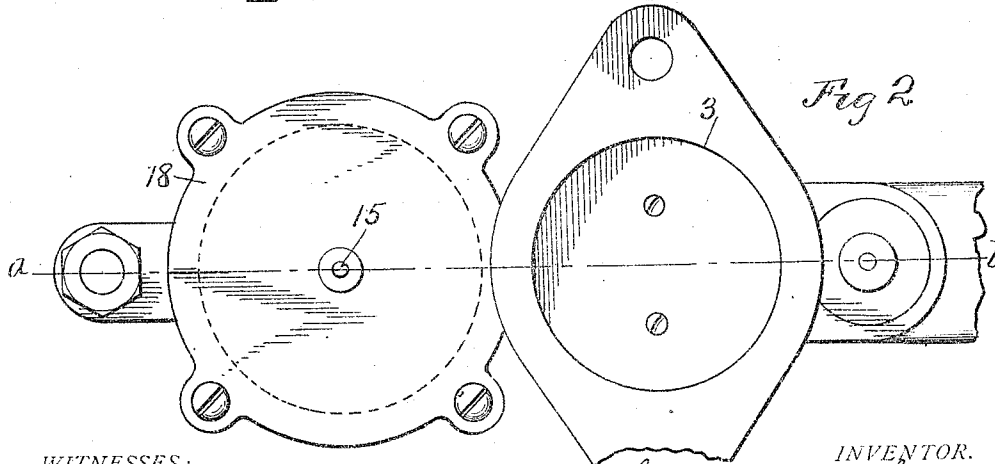
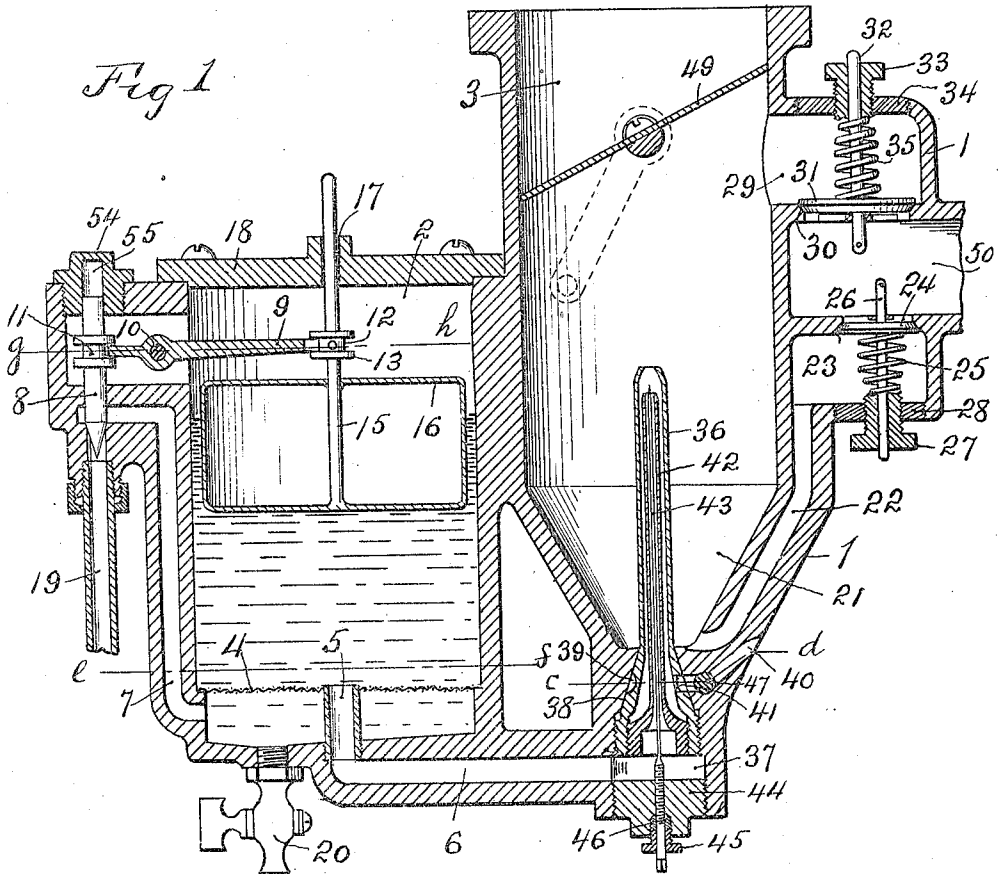


C. W. HARTSHORN.
CARBURETER.
APPLICATION FILED MAY 12, 1913.

Patented Feb. 9, 1915.

2 SHEETS—SHEET 1.

1,127,992.



WITNESSES:

R. Hamilton.
E. B. House.

INVENTOR.

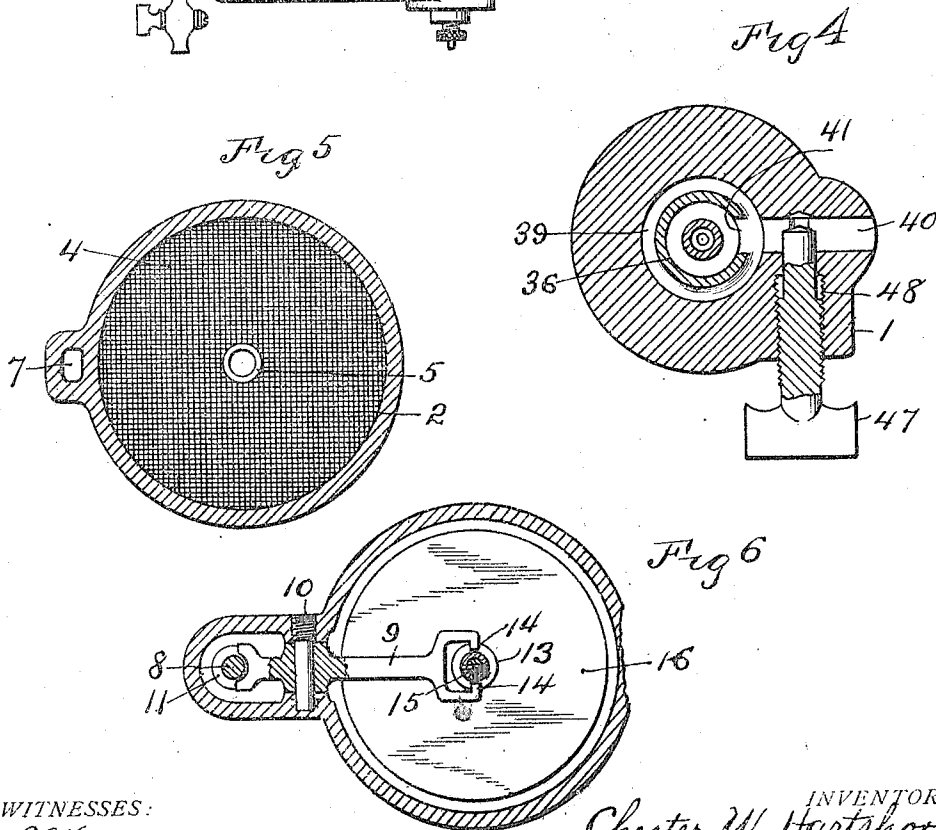
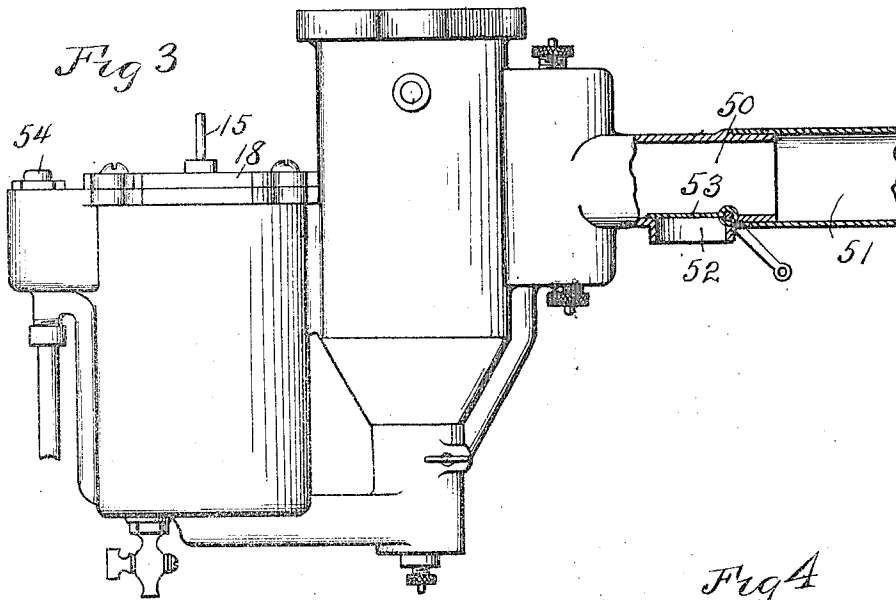
Chester W. Hartshorn
BY *Warren D. House*
His ATTORNEY.

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UNITED STATES PATENT OFFICE.

CHESTER W. HARTSHORN, OF FORD, KANSAS.

CARBURETER.

1,127,992.

Specification of Letters Patent.

Patented Feb. 9, 1915.

Application filed May 12, 1913. Serial No. 767,043.

To all whom it may concern:

Be it known that I, CHESTER W. HARTSHORN, a citizen of the United States, residing at Ford, in the county of Ford and State of Kansas, have invented a certain new and useful Improvement in Carbureters, of which the following is a specification.

My invention relates to improvements in carbureters.

It is particularly adapted for use on carbureters of automobile engines.

One of the objects of my invention is to provide a carbureter by means of which a very complete admixture of air with the fuel vapor may be obtained.

A further object of my invention is to provide novel means for atomizing the liquid fuel and mixing with the atomized fuel an amount of air sufficient to produce a rich mixture, and subsequently intermingling with this rich mixture an amount of air sufficient to produce an explosive compound of the greatest efficiency.

My invention provides further, novel means by which the liquid fuel is strained and the impurities removed therefrom.

Other novel features of my invention are hereinafter fully described and claimed.

In the accompanying drawings which illustrate the preferred form of my invention—Figure 1 is a vertical sectional view of my improved carbureter, taken on the line *a-b* of Fig. 2. Fig. 2 is a top view of the carbureter, partly broken away. Fig. 3 is a side view of the carbureter, shown partly in elevation and partly in vertical section. Fig. 4 is a cross section on the line *c-d* of Fig. 1. Fig. 5 is a cross section on the line *e-f* of Fig. 1. Fig. 6 is a cross section on the line *g-h* of Fig. 1.

Similar reference characters indicate similar parts in the different views.

1 designates the casing of the carbureter, which is provided with a float chamber 2 and a mixing chamber 3. The float chamber 2 is divided into two compartments by means of a horizontal screen partition 4, through the center of which vertically extends a tube 5, which serves as an outlet and which has its lower end communicating with a horizontal passage 6. An oil inlet comprising a passage 7 discharges into the lower compartment of the float chamber 2, below the screen partition 4. Flow through said passage 7 is controlled by means of a

vertically movable lift valve 8, which is moved vertically by means of a lever 9, located within the valve chamber 2 and pivoted on a horizontal pin 10. One end of the lever 9 is mounted in a peripheral groove 11 of the valve 8. The other end of the lever 9 is bifurcated and has inwardly extending projections 14, located in an annular groove 12, of a collar 13, which is rigidly secured to the vertical stem 15, of a float 16. The float 16 is supported by the liquid fuel in the upper compartment of the float chamber 2. The stem 15 extends through and is slidable in a vertical hole 17, which is provided in a cap 18, which serves as a cover for the float chamber 2.

When the float 16 falls by reason of liquid being drawn from chamber 2, the lever 9 will lift the valve 8 so as to permit fuel to enter the passage 7 from a supply pipe 19, connected therewith, and connected with a supply tank, not shown. When the float has risen to a predetermined point the lever 9 will cause the valve 8 to close. The lower compartment of float chamber 2, has communicating with it a drain cock 20, through which impurities may be drawn from the said lower compartment.

When the liquid fuel enters the lower compartment through the passage 7 it will pass upwardly through the horizontal screen 4, and will thereby have eliminated from it the dirt and floating material. As the fuel passes upwardly through the screen such impurities as lodge against the lower side of the screen will be readily dislodged therefrom by reason of the liquid passing downwardly through the screen whenever the drain cock 20 is opened.

The mixing chamber 3 is preferably of cylindrical form interiorly, and is preferably provided at its lower end with a conical inner wall 21, which flares upwardly and has adjacent to its apex the inner end of an air inlet or passage 22, the outer end of which is provided with a valve seat 23, in which is adapted to be seated an inlet valve 24, which is normally held in the closed position by yielding means comprising preferably a coil spring 25, which encircles the stem 26 of the valve 24, and has its lower end resting upon a screw threaded plug 27, which has screw threaded engagement with a collar 28. The collar 28 is externally screw threaded and is fitted in a

screw threaded opening provided in the casing 1. The lower end of the stem 26 is slidably mounted in a vertical hole extending through the plug 27. By adjusting the plug 27 the tension of the spring 25 may be varied.

An air inlet 29 has its inner end communicating with the mixing chamber 3, adjacent the upper end thereof and at its other end is provided with a valve seat 30, on which is adapted to rest a valve 31, which is provided with a vertical stem 32, slidably mounted in a threaded plug 33, which is fitted in an externally threaded collar 34, mounted in a threaded hole in the casing 1. A coil spring 35, encircles the stem 32, and serves as a yielding means for forcing the valve 31 to the closed position. The lower end of the spring 35 rests against the valve 31 and its upper end against the plug 33. By adjusting the plug 33 the tension of the spring 35 may be varied.

Preferably the spring 25 is weaker than the spring 35, and the valve 31 is larger than the valve 24 in its diameter. By means of this arrangement, when the engine is started and a partial vacuum is effected in chamber 3, the open upper end of which is in communication with the explosion chamber of the engine, not shown, the valve 24 will first be opened. As the speed of the engine increases and the suction pull in chamber 3 becomes stronger, the valve 31 will open so as to supply the proper amount of air needed.

A vertical air tube 36, has its lower end externally screw threaded and fitted in a threaded hole 37, which extends upwardly through the casing 1, and communicates with the chamber 3 at the apex of the conical portion 21. The upper end of the hole 37, is conical shaped and has fitted to it a conical portion 38 of the air tube 36, said conical portion 38 is provided with an annular groove 39, which communicates with an air inlet 40, provided in the casing 1, and also with a hole 41, which extends through to the interior of the air tube 36.

Located within the air tube 36 and concentric therewith, is a fuel tube 42, the enlarged lower end of which is externally screw threaded and fitted in the internally screw threaded lower end of the tube 36. The tube 42 is preferably converging at its upper or discharge end, which end is located below the upper end of the tube 36, which also converges upwardly at its upper end. Within the tube 42, is a needle valve 43, which is adapted to extend through the upper end of the tube 42. The lower end of the needle valve 43 is screw threaded and mounted in a screw threaded hole in a plug 44, which is fitted to the threaded lower end of the hole 37. The needle valve 43 also extends through a threaded stuffing collar

45, fitted to the hole in the plug 44. Packing material 46 is located in said hole and encircles the needle 43, at the inner end of the collar 45. By adjusting the needle valve 43, the discharge of oil from the tube 42 may be regulated at will.

A thumb screw 47 is fitted in a screw threaded hole 48, provided in the casing 1 and communicating with the air inlet 40, as best shown in Fig. 4. By adjusting the thumb screw 47, the air inlet 40 may be more or less closed.

In the chamber 3, is pivotally mounted a butterfly valve 49, of the ordinary type.

The passages 22 and 29, communicate with a common passage 50, which communicates with a pipe 51, adapted to be connected to a source of heated air, not shown. The passage 50 also communicates with a passage 52 leading to the atmosphere. A damper 53, Fig. 3, is pivoted in the passage 50 and is adapted to be swung to a position opening the passage 52 and closing the passage 51, or vice versa.

A screw threaded plug 54, is fitted in an opening provided in the casing 1, and is provided in its lower end with a hole 55, in which the upper end of the valve 8 is slidably mounted.

In the operation of my invention, when the engine to which the carbureter is attached is cranked, and the butterfly valve 49 is opened, a partial vacuum will be effected in the mixing chamber 3, thus causing oil to be discharged from the tube 42, into the air tube 36. At the same time air will be drawn through the inlet 40, hole 41, into and upwardly through the tube 36. By reason of the discharge ends of said tubes being converging and disposed as described, the oil will be atomized and mixed with air discharged from the tube 36, to form a very rich compound. At the same time the valve 24 will open and air will pass from the passage 50 and inlet or passage 22, into the lower end of the mixing chamber 3, from which end it will be drawn upwardly and mixed with the compound of atomized oil and air emanating from the air tube 36. The engine will utilize the mixture drawn from the chamber 3, and when the speed of the engine has increased so as to effect a more perfect vacuum in the chamber 3, the valve 31 will be opened to permit the larger amount of air to enter the mixing chamber required by the greater amount of oil which will be discharged from the tube 42, due to the increased suction effect in the mixing chamber. As the oil passes from the float chamber 2, through the pipe 5, passage 6, hole 37, and tube 42, the float 16 will lower, thereby opening the valve 8, in the manner hereinbefore described.

The valves 43, 47, 24, and 31 may be regulated while the engine is running, if desired.

I do not limit my invention to the structure shown and described, as modifications, within the scope of the appended claims, may be made without departing from the spirit of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:—

1. In a carbureter, a mixing chamber having two air inlets, two inwardly opening valves for respectively closing said inlets, two yielding means for respectively normally forcing said valves to the closed positions, an air tube having an air inlet and discharging into said mixing chamber at a point intermediate of said two air inlets, and a fuel tube located within and discharging into said air tube toward the discharge end thereof, an annular space communicating with the air inlet of the air tube being provided between said two tubes.

2. In a carbureter, a mixing chamber having two air inlets, two inwardly opening valves for respectively closing said inlets, two yielding means of different power for respectively normally forcing said valves to the closed positions, an air tube having an air inlet and discharging into the said mixing chamber at a point intermediate of said two air inlets, and a fuel tube located within and discharging into said air tube toward the discharge end thereof, an annular space

communicating with the air inlet of said air tube being provided between said two tubes.

3. In a carbureter, a mixing chamber having at one end a conical inner wall and having two air inlets one of which communicates with said chamber adjacent to the apex of said conical wall, the other inlet being located adjacent to the other end of the chamber, two inwardly opening valves for respectively closing said inlets, two yielding means of different power for respectively forcing said valves to the closed positions, the yielding means which actuate the valve controlling the inlet which communicates with the conical end of the chamber having less power than the other yielding means, an air tube having an air inlet and discharging into said mixing chamber at a point intermediate of said two air inlets, and a fuel tube located within and discharging into said air tube toward the discharge end thereof, an annular space communicating with the air inlet of said air tube being provided between said two tubes.

In testimony whereof I have signed my name to this specification in presence of two subscribing witnesses.

CHESTER W. HARTSHORN.

Witnesses:

T. M. GRAY,
RAY B. PRICE.