P. M. BLOM.

CARBURETER.

APPLICATION FILED JAN. 29, 1909.

977,066. Patented Nov. 29, 1910.

Fig I.

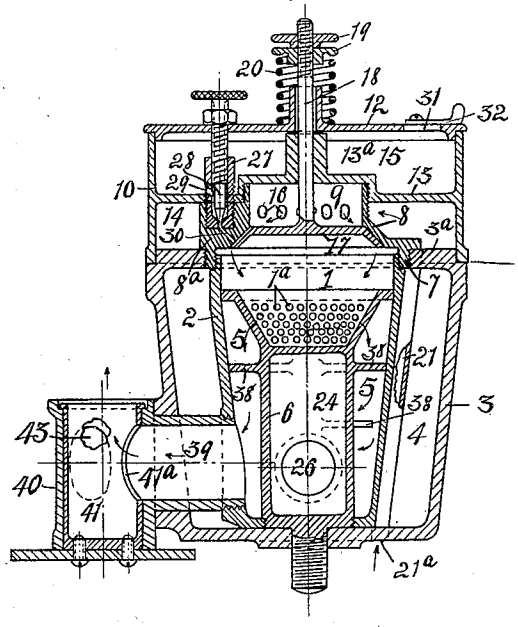


Fig II.

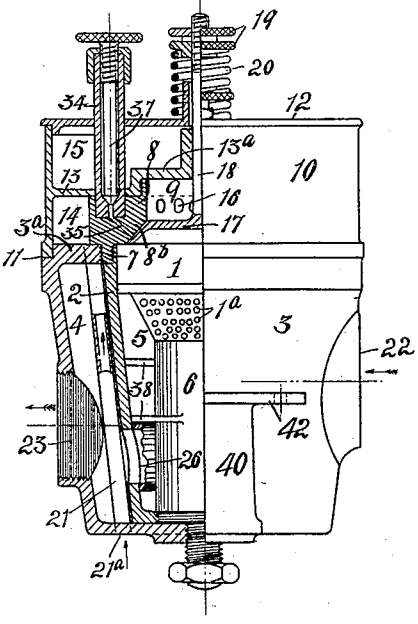


Fig III.

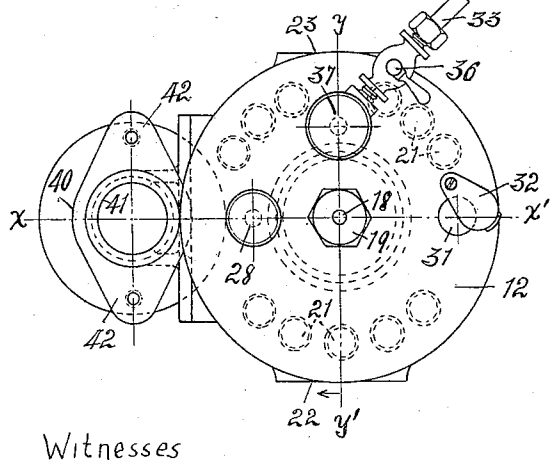
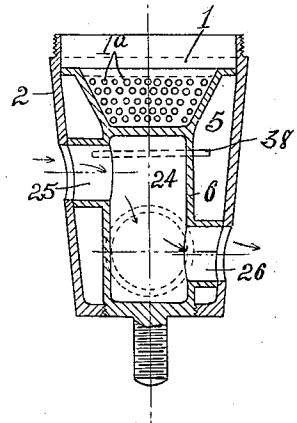


Fig IV.



Witnesses

Hazel B. Hiett

Louise Schneider

Inventor

Oehr Martin Blom,

By Owen & Owen

His attys.

UNITED STATES PATENT OFFICE.

PEHR MARTIN BLOM, OF TOLEDO, OHIO.

CARBURETER.

977,066. Specification of Letters Patent. Patented Nov. 29, 1910.

Application filed January 29, 1909. Serial No. 475,003.

To all whom it may concern:

Be it known that I, PEHR MARTIN BLOM, a citizen of Finland, and a resident of 2309 Maplewood avenue, Toledo, Ohio, have invented a certain new and useful Carbureter; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to carbureters for use in connection with internal combustion engines, and has particular reference to the class of carbureters, in which either gasolene or kerosene can be used as fuel.

The object of my invention is to provide a carbureter of simple, cheap and durable construction in which the exhaust from the engine is utilized to heat the air supply before it is drawn into the carbureter and also to heat said carbureter to a degree sufficient to cause the thorough vaporization of kerosene as it passes into and through the carbureter.

Another object of my invention is to provide a carbureter that will operate successfully with gasolene or kerosene in either high or low temperature.

The operation, construction and arrangement of the parts of my invention are fully described in the following specification, and a preferred embodiment thereof illustrated in the accompanying drawings in which,—

Figure I is a central vertical section through my carbureter on the line x—x' in Fig. III. Fig. II is a vertical section on the line y—y' in Fig. III. Fig. III is a top plan view of the carbureter, and Fig. IV is a central vertical section of the central vaporizing parts taken as on a line y y' in Fig. III and looking in the direction indicated by the arrow.

Referring to the drawings, 1 designates the mixing-chamber, which has its lower portion preferably in the form of an inverted truncated cone and is located in the upper end of a tubular casing 2, which is in turn disposed within an outer casing or shell 3 to provide a passage or annular chamber 4 therearound, said chamber 4 being closed at its top and bottom by said shell or in any other suitable manner.

The walls of the flaring portion of the chamber 1 are spaced below their upper edges from the casing 2 to provide a vaporizing-chamber 5 therearound, and this annular chamber is continued to the bottom of said casing by the provision of a tubular wall 6 therein, which extends from the bottom of the chamber to the bottom of said casing, as shown. Communication is afforded between the chambers 1 and 5 through a series of perforations 1^a in the flaring walls of the chamber 1. A casting or member 8 is mounted above the chamber 1, as by threading an annular flange 7, provided on the bottom of such member, within the internal flange portion 3^a of the casing or shell 3, and without the upper end of the casing 2 as shown, and is provided with a central opening forming an air-chamber 9.

A casing 10 is mounted on the top of the shell 3 with its lower edge closely seating within an incut or groove at the edge of such shell, as at 11, and has its top closed by a cover 12. The casing 10 is formed with a partition 13, which divides it into the two superimposed chambers 14 and 15, the lower one, 14, of which surrounds the member 8 and has communication with the air-chamber 9 therein through a series of openings 16 in the walls of the chamber 9. The casing 10 is held to its seat on the shell 3 by forming the partition 13 with a vertically offset portion 13^a which threads over the upper end of the member 8.

Communication between the mixing-chamber 1 and superimposed air-chamber 9 is normally closed by a disk-valve 17, which is fashioned to seat against a conical surface at the base of the walls of the chamber 9 and is carried by a stem 18. This stem projects upwardly through the portion 13^a of the partition 13 and the cover 12 and carries thumb-nuts 19, 19 above the cover 12. The valve 17 is normally held to its seat by means of a coiled compression spring 20, which encircles the stem intermediate the cover 12 and lower nut 19, having its ends thrust thereagainst, and has its tension regulated by said nuts.

A plurality of small tubes 21 are disposed within the chamber 4 around the tube 2 and communicate at their lower ends with the atmosphere at the base of the shell 3, as at 21^a, and at their upper ends with the chamber 14, thus providing means for supplying air to said chamber.

An opening 22 is provided on one side of

the shell 3 for the inlet of the exhaust gases from an engine with which it is suitably connected, and an opening 23 is provided in the opposite side of such shell for the exit of the exhaust gases from the chamber 4. The heated products of combustion which enter the chamber 4 circulate around the air-tubes 21 and casing wall 2, and a portion divides and passes through the conduit 24, located centrally within the casing 2 and formed by the wall 6, the upper end of which conduit communicates laterally with the chamber 4 adjacent the inlet opening 22 through a passage 25, while the lower end thereof communicates laterally with said chamber adjacent the outlet opening 23 through the passage 26.

The upper chamber 15 of the casing 10 is intended to form a storage-chamber for gasolene. A plug 27 is threaded through the partition 13 and into a boss 8^a formed at one side of the member 8, and is provided with a longitudinal bore into which the stem of a needle-valve 28 is threaded. This bore has lateral communication with the chamber 15 through an aperture 29 in the plug and has its lower end in communication with the seat for the valve 17 through a channel 30, which is normally closed by said valve 17, as shown in Fig. I, so that no gasolene can be fed into the vaporizing chamber 1 except when the air-valve 17 is moved from its seat and the valve 28 is open. The upper end of the valve-stem projects through an opening in the cover 12 and is formed with a head, as shown, to facilitate a turning thereof. Gasolene is poured into the chamber 15 through an opening 31 in the cover 12 which opening is provided with a closure member 32 that is pivoted to the cover.

Kerosene is supplied to the carbureter from a suitable tank or other source of supply (not shown) through a supply-pipe 33, bored plug 34 and channel 35, which latter is provided in a boss 8^b formed at one side of the member 8, see Fig. II. The plug 34 projects through the cover 12, chamber 15, and partition 13 and has its lower end secured in the top of the boss 8^b. Supply-pipe 33 is provided with a shut-off valve 36 and the bore of the plug 34 is contracted at its lower end to form a seat for the regulating-valve 37 which is mounted therein. The channel 35 opens into the seat for the air-valve 17 and is normally closed by such valve.

Arranged in stepped relation in the annular vaporizing-space 5 is a series of baffle-walls or partitions 38, for the purpose of retarding the passage of the charge through such space, thus causing the same to become thoroughly vaporized and more highly heated before it passes to the engine.

The charge leaves the vaporizing-space 5 near the bottom thereof through the laterally projecting tube 39, which extends through the chamber 4 and casing 3 and communicates with the side of a tubular valve-chamber 40 in which the tubular valve 41 is mounted, a portion of this valve being shown in Fig. I as broken away. The chamber 40 has its lower end closed by said valve and its upper end is formed with a flange 42 to adapt it for connection with a pipe leading to an engine cylinder. The valve 41 is provided in its side with a circular opening 41^a adapted to be placed into full register with the tube 39 to open communication between it and the interior of the valve. An opening 43 is provided in the side of the valve-chamber 40 in suitable position relative to the outer end of the tube 39 to enable the valve opening 41^a to be placed into partial register with each. By this arrangement the outlet from the tube 39 may be partially throttled and at the same time air may be admitted through the opening 43 to mix with the charge should it be too rich.

In the operation of my carbureter, gasolene is used as fuel until the carbureter becomes sufficiently heated to vaporize kerosene. After the valve 28 has been opened the initial supply of gasolene is obtained by a few light pushes on the valve-stem 18 to open the air-valve 17 and permit a small quantity of gasolene to flow into the mixing-chamber 1. As soon as the engine is started the air-valve 17 will be automatically opened by suction each time the engine draws its charge from the carbureter, thus drawing into the mixing-chamber 1 a supply of gasolene from the chamber 15 and air from the chamber 9. When the carbureter has become sufficiently heated to vaporize kerosene, the gasolene-valve 28 is closed and the valve 36 opened to supply kerosene, the valve 37 having been previously adjusted to feed the required amount of kerosene. The air and kerosene which enter the chamber 1 are thoroughly mixed and broken up by passing through the small openings 1^a, and in its passage through the space 5 becomes highly heated and thoroughly vaporized by its contact with the walls of the conduits or passages 4 and 24 which becomes highly heated by the action thereon of the exhaust products of combustion from the engine. The charge is retarded and caused to take a circuitous course through the passage 5 by reason of its contact with the partitions or baffle-walls 38 therein. The air-supply to the carbureter is quite highly heated before entering the air-chamber 14 due to its passage through the tubes 21 around which the exhaust products circulate, thus facilitating the vaporization of the kerosene when it commingles with the air in the mixing-chamber 1 and before entering the vaporizing-chamber or passage 5 where it is superheated and more thoroughly vaporized to form a highly combustible mixture.

I desire it to be understood that my invention is not limited to any specific form or arrangement of parts except in so far as such limitations are specified in the claims.

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

1. In a carbureter, a vaporizing-chamber, a frusto-conical mixing-chamber located within said vaporizing-chamber and having its small end closed and its side wall provided with a plurality of perforations to open communication between said chambers, and channels provided through the vaporizing-chamber and around the outer wall thereof for the passage of the exhaust from an engine.

2. In a carbureter, a vaporizing-chamber, a frusto-conical mixing-chamber located within said vaporizing-chamber and having its small end closed and its conical wall perforated to open communication between said chambers, an exhaust-chamber located within the vaporizing-chamber at one side of the closed end of the mixing-chamber, and passages around said vaporizing-chamber and also through the same into said exhaust-chamber for the passage of the exhaust from an engine.

3. In a carbureter, a series of casings arranged one without the other and forming internal mixing and exhaust-chambers, a vaporizing-chamber surrounding portions of said chambers and in communication with the mixing-chamber, and an exhaust passage around the vaporizing-chamber and having communication with said internal exhaust-chamber, and means controlling the admission of air and liquid fuel to the mixing-chamber.

4. In a carbureter, a series of casings arranged one without the other and forming superimposed internal mixing and exhaust chambers, a vaporizing-chamber encircling said mixing and exhaust chambers in communication with the mixing-chamber, and having baffle plates therein, and an external exhaust passage around the vaporizing-chamber and having communication with said exhaust-chamber, an air-chamber in valve controlled communication with said mixing-chamber, tubes opening communication between the atmosphere and air-chamber through said external exhaust passage, a source of liquid fuel supply in valve controlled communication with the mixing-chamber.

5. In a carbureter, a plurality of casings forming an internal mixing-chamber, a vaporizing-chamber arranged around and in communication with said mixing-chamber, passages around the vaporizing-chamber for the exhaust from an engine, an air passage over the mixing-chamber in communication with the atmosphere through said exhaust passage, a fuel storage-chamber over the air passage, and means controlling the admission of liquid fuel and air to the mixing-chamber.

6. In a carbureter, a vaporizing-chamber, a mixing-chamber associated with the vaporizing-chamber and in communication therewith, a casing disposed around the vaporizing-chamber to form a passage therearound for the exhaust from an engine, an air-chamber in valve-controlled communication with the mixing-chamber, air tubes passing through said passage, and opening communication between the atmosphere and the air-chamber, and a fuel-supply in valve-controlled communication with the mixing-chamber.

7. In a carbureter, a vaporizing-chamber, a mixing-chamber associated with the vaporizing-chamber and having communication therewith, an air-chamber in valve-controlled communication with the mixing-chamber, a casing forming a passage for the exhaust from an engine around the vaporizing-chamber, tubes leading through said passage for the passage of air from the atmosphere to the air-chamber, and a conduit provided through the vaporizing-chamber for the passage of the exhaust.

8. In a carbureter, a vaporizing-chamber, a mixing-chamber associated with the vaporizing-chamber and having communication therewith, an air-chamber in valve-controlled communication with the mixing-chamber, a casing forming a passage for the exhaust from an engine around the vaporizing-chamber, tubes leading through said passage for the passage of air from the atmosphere to the air-chamber, said vaporizing-chamber having a passage therethrough which communicates at its ends with said exhaust passage.

9. In a carbureter, a casing, a vaporizing-chamber disposed within said casing and spaced therefrom to form a passage for the exhaust from an engine around the vaporizing-chamber, a mixing-chamber in communication with the vaporizing-chamber, an air-chamber and an oil-chamber in valve-controlled communication with the mixing-chamber, air-tubes passing through the exhaust passage around the vaporizing-chamber and opening communication between the atmosphere and the air-chamber, and a valve which is normally seated to close the communication between the mixing-chamber and the air and oil-chambers, said valve being opened by the drawing of a charge from the carbureter.

10. In a carbureter, a vaporizing-chamber having a valve-controlled outlet, a mixing-chamber in communication with the vaporizing-chamber, conduits around and through the vaporizing-chamber for the passage of the exhaust from an engine, an air-chamber

and an oil-supply in communication with the mixing-chamber, a valve yieldingly acting to normally close communication between the mixing-chamber and the air-chamber and oil-supply, and air-tubes extending through the conduit around the vaporizing-chamber and opening communication between the atmosphere and the air-chamber.

11. In a carbureter, a vaporizing-tube, a casing disposed around said vaporizing-tube to provide an encircling passage, said passage having communication with the exhaust from an engine, a mixing-chamber disposed in the upper portion of said vaporizing-tube, said mixing-chamber having the walls of its lower portion of conical form and provided with a series of apertures in communication with an annular vaporizing-passage which is provided between the walls of said tube and said mixing-chamber, a tubular wall 6 extending from the bottom of the mixing-chamber to the lower portion of the vaporizing-tube to continue the vaporizing-passage to the lower portion of such tube, the chamber formed within said tubular wall having communication with the passage around the vaporizing-tube whereby exhaust gases may pass through the vaporizing-tube, an air-chamber disposed above the mixing-chamber, a fuel-supply conduit in communication with the mixing-chamber, a valve yieldingly acting to normally close the communication between the mixing-chamber and the air-chamber and fuel conduit, and air-tubes passing through the passage disposed around the vaporizing tube and opening communication between the atmosphere and the air-chamber, substantially as described.

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

PEHR MARTIN BLOM.

Witnesses:

M. E. Stephan,

J. W. Nunn.