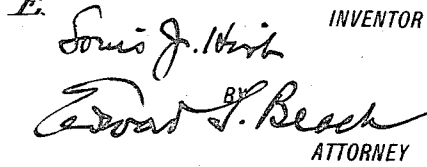


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UNITED STATES PATENT OFFICE.

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CARBURETER.

1,243,409.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LOUIS JOSEPH HIRT, a citizen of the United States, residing at Yonkers, in the county of Westchester 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. The object of the invention is to produce an efficient carbureter for vaporization of different grades of liquid fuel and in which adequate provision is made for variation of the quantity of gas passing to the engine and also for regulation of the relative quantities of exterior cold air and of warmed air taken into the carbureter, which is provided with an electric heater for preheating the liquid fuel prior to its atomization and vaporization and mixture with the admitted warmed air volumes.

In the accompanying drawing forming a part hereof and which shows a vertical central elevation of my new carbureter with a liquid-fuel float-valve structure indicated as an integral part of the bottom-casing-forming member of the carbureter, the upper carbureter casing member A is tubular and formed near its lower end with an intake port *a* for admission of exterior cold air or air at normal outside temperature. Casing member A is carried by a bottom casing member A', the two casings being secured together, and an extension A² of casing member A' is chambered for the usual float valve. The lower casing member A' has a warmed air intake-port *a'* in communication with a chamber *a*² formed within the body of casing member A', such member being also formed with a liquid-fuel receiving chamber *a*³ which is in communication with a liquid-fuel supply passage *a*⁴ from the float-valve chamber in extension A².

Within the chamber of the upper member A, I mount a tubular choke ring 1 which is slidably adjustable up and down in the chamber of that member, the upper end of the choke-ring being upwardly and outwardly beveled at 2, and its lower end being downwardly and outwardly beveled at 3. This choke ring is held in adjusted position by a set-screw 4 through the wall of casing member A. In use, choke ring 1 is stationary. An endwise-movable choke-ring 5, having an exterior diameter less than the interior diameter of the stationary choke-ring

1, is mounted at or near the lower end of the stationary choke-sleeve, and is provided with an exterior protecting pin indicated by 6, with which the inward end of an adjusting lever 7 is connected, this lever passing through an opening 8 in the wall of the upper casing member A and being pivoted therein on a pin 9. This endwise movable choke-sleeve 5 is slidably mounted on the exterior wall of an upstanding Venturi tube 10, the upper end of the slidable choke-sleeve 5 being inwardly and upwardly beveled at 11. By vertical adjustments of the endwise-movable choke-sleeve relatively to the stationary choke-ring, the area of the annular passage between the choke ring and choke-sleeve may be varied, the exterior air-intake port *a* communicating with the lower end portion of the interiorly tubular casing member A, and the intaken exterior air through port *a* being sucked upwardly through the annular space between the variably adjacent ends of the stationary choke-ring and adjustable choke-sleeve. The Venturi tube 10 is screwed into an opening in the top of casing member A' at 12, this opening communicating with the warmed air chamber *a*² of casing member A'. The vaporizing devices comprise an upstanding hollow screw 13 the lower end of which is exteriorly threaded at 14 into a hole in casing member A' that connects the liquid-fuel chamber *a*³ with the warmed-air chamber *a*². An upstanding screw 15 which is threaded at 16 into an opening in the bottom of casing member A' has its shank passing upwardly through the liquid-fuel chamber *a*³ into the chamber of the hollow screw 13. The hollow screw 15 is bored endwise from its bottom or head to form two openings for reception of the leads *e* and *e'* from any suitable source E of electricity, herein indicated as a battery. The upward end portion of screw 15 is reduced in diameter, forming within the chamber of screw 15 a shoulder *x* where the bores 17 come out, and above this shoulder the reduced upper portion of screw 15 forms a stem 18. This reduced portion, or stem, is covered by an asbestos insulating sheath 19, and the leads *e*, *e'* which, within the bores 17 are insulated from the screw 15, are supported by the stem 18 within the upper portion of the chamber of the hollow screw 13, the leads being out of contact with the interior and upper end wall of such chamber. The up-

per end of the hollow screw 13 is interiorly threaded for reception of a hollow, threaded, atomizing plug 20, the upper end of which is imperforate, and the lower end of which communicates with the chamber of the hollow screw 13. This atomizing plug 20 is formed just above the upper end of the hollow screw 13 with lateral fuel exits 21 into the lower portion of the chamber of the Venturi tube 10. Within the warmed-air chamber a^2 and the lower portion of the chamber of the Venturi tube 10, there is slidably mounted on the exterior of the hollow screw 13, an endwise-movable choke-sleeve 22 having a peripheral groove 23 for reception of the inward end of an adjusting lever 24 which passes through an opening 25 in the side wall of the warmed-air chamber a^2 , and is pivoted therein by a pin 26. The upper end of this slidable choke-sleeve 22 is upwardly and inwardly beveled. The area of the annular passage between the opposed end walls of the Venturi tube and the choke-sleeve 22 may be varied by adjustments of that choke sleeve.

The annular passage between the opposed ends of the stationary choke-ring 1 and of the upper endwise-movable choke-sleeve 3 is indicated by p . The annular passage between the lower end of the Venturi tube and the upper end of the under slidable choke-sleeve 22 is indicated by p' ; and below the shoulder x of the upstanding screw 15 and between that shoulder and the lower end of the screw 13, the exterior diameter of the screw 15 is less than the interior diameter of the chamber of the screw 13 forming an annular passage p^2 for fuel in its more or less gaseous flow from the liquid-fuel chamber a^3 to the chamber p^3 of the hollow screw 13 and wherein the asbestos sheath and heating portions of the leads e , e' are contained. The passage connecting this chamber p^3 with the fuel exits 21 in the plug screw 20 is indicated by p^4 .

The stationary choke-ring 1 may be adjusted at a desired point below the path of the throttle valve B, and the exterior air-intake a and opening 8 through which lever 7 passes, this opening 8 being also an exterior-air intake. By actuation of lever 7, the area of the passage p for cold air or exterior air at atmospheric temperature may be varied at will. By actuation of lever 24 the passage p' for warmed air from chamber a^2 may be varied at will, and the result is that with these adjustments a very considerable and important range of the

position of these parts is obtainable for variation at will by the operator of the relative volumes of the exterior-intaken air volume and of the intaken warmed-air volume; and at the same time, the liquid-fuel itself is preheated in the chamber p^3 whereby relatively heavy liquid-fuel may be advantageously used. The described beveling of the ends of the stationary choke-ring, of the upper end of the upper slidable choke-sleeve 5, of the lower end of the Venturi tube, and of the upper end of the under slidable choke-sleeve, facilitate the flow and expansion of air or gas as the adjustments are made.

While this carbureter is of general advantage, it is especially advantageous in aviation because as the flying machine rises into the colder and lighter air of higher altitudes, the relative proportions of preheated air and of the exterior colder air may be quickly adjusted to keep the supply of mixture at any desired temperature, and thereby enable the aviator to keep the engine compression nearer its normal than he could otherwise keep it, without varying the richness of his mixture.

What I claim is,—

1. A carbureter comprising a mixing chamber and a throttle valve within said mixing chamber, an adjustable choke ring below said throttle valve and means to hold said choke ring in adjusted position, an upstanding Venturi tube leading to said choke ring, a liquid fuel supply including a chambered atomizer within said Venturi tube, an upper choke sleeve slidable on the exterior of said Venturi tube and provided with an accessible operating means, and an under choke sleeve slidable on the exterior of said atomizer and having an accessible operating means.

2. A carbureter comprising, an upper chamber having an internal annular means for partially choking same, an upstanding Venturi tube leading to said choking means, an air supply being provided around said Venturi tube, a choke sleeve slidable on the exterior of said Venturi tube to vary the air space therearound and provided with an accessible operating means, a fuel supply including a chambered atomizer within said Venturi tube, and an under choke sleeve slidable on the exterior of said atomizer and having an accessible operating means.

In testimony whereof I have hereunto set my hand this 27th day of September, 1916.

LOUIS JOSEPH HIRT.