

Aug. 21, 1956

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2,759,718

INTERNAL COMBUSTION ENGINE CARBURETOR

Filed June 17, 1953

3 Sheets-Sheet 1

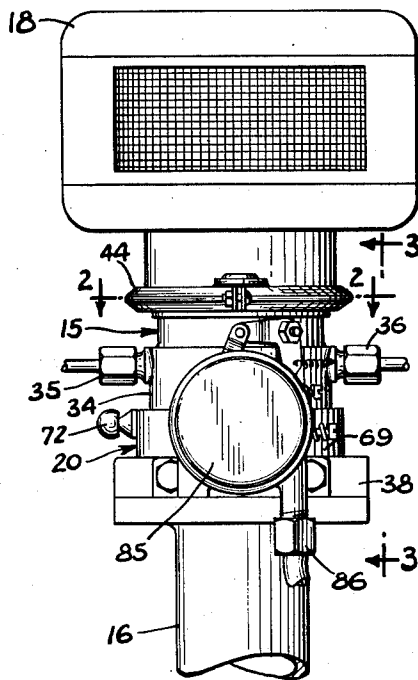


Fig. 1

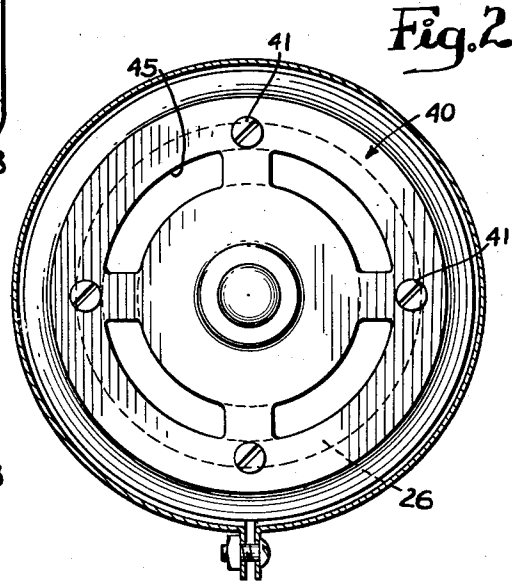


Fig. 2

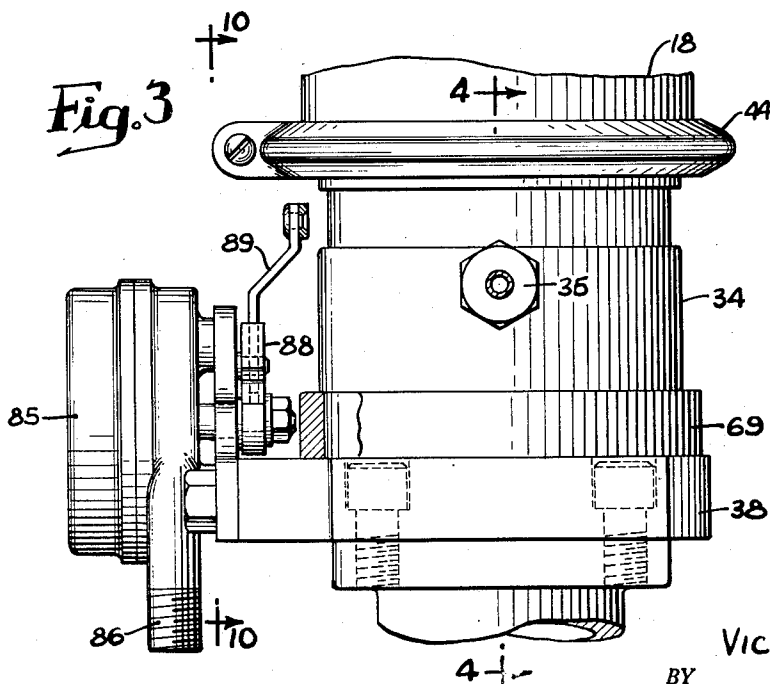


Fig. 3

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Fig. 4

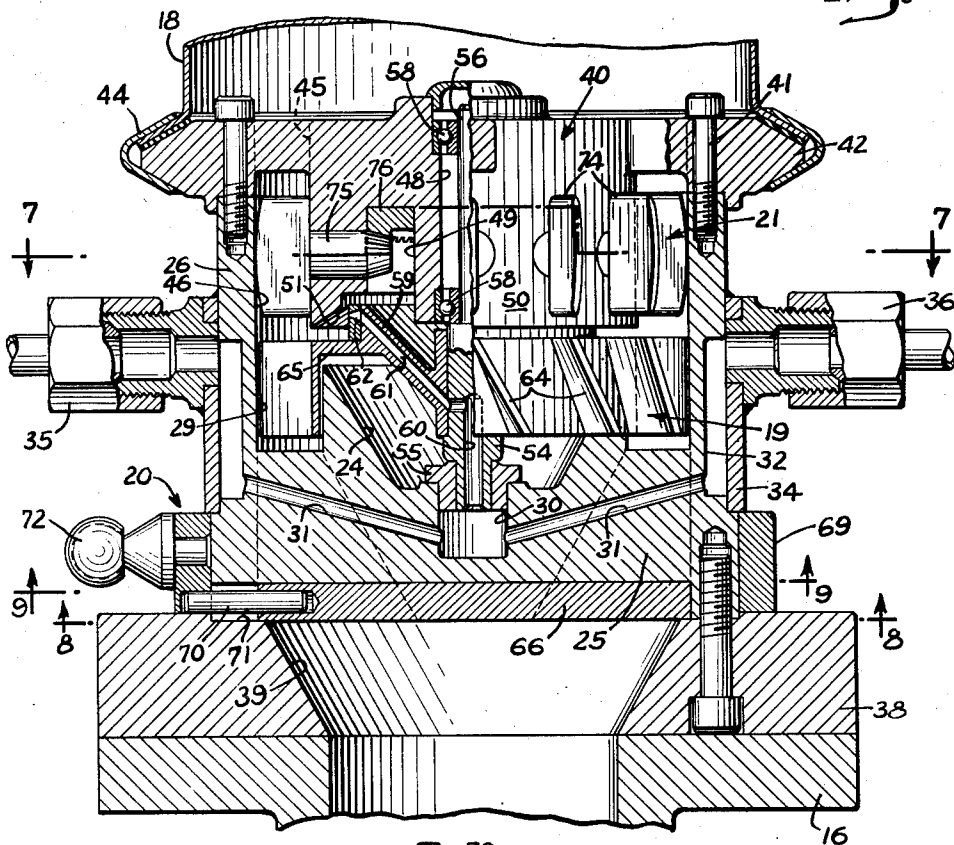
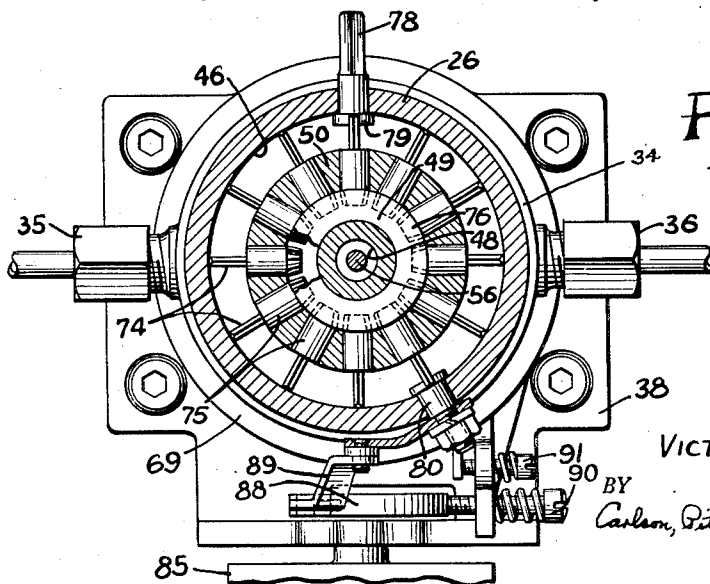


Fig. 7



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Fig. 8

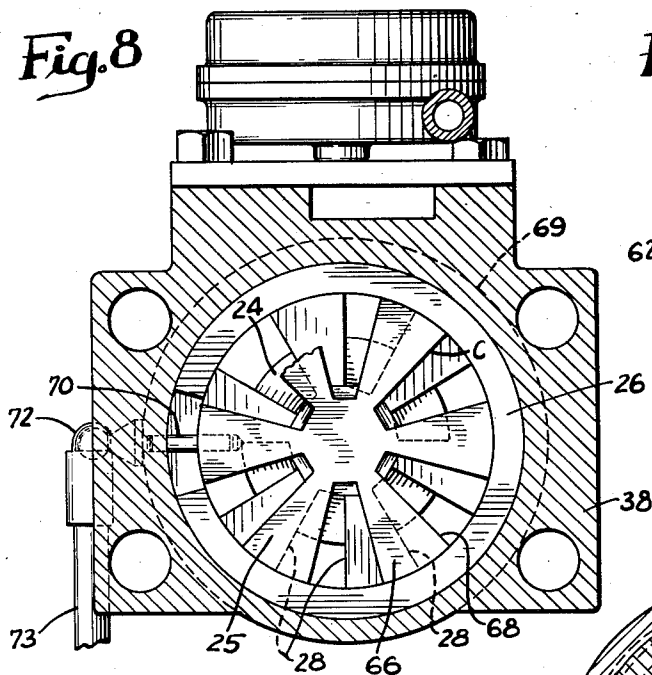


Fig. 5

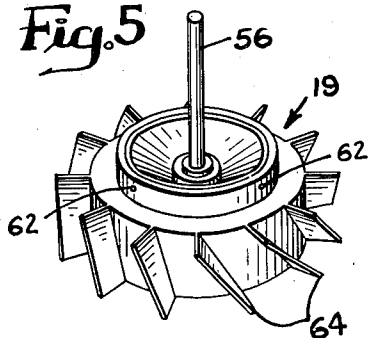


Fig. 9

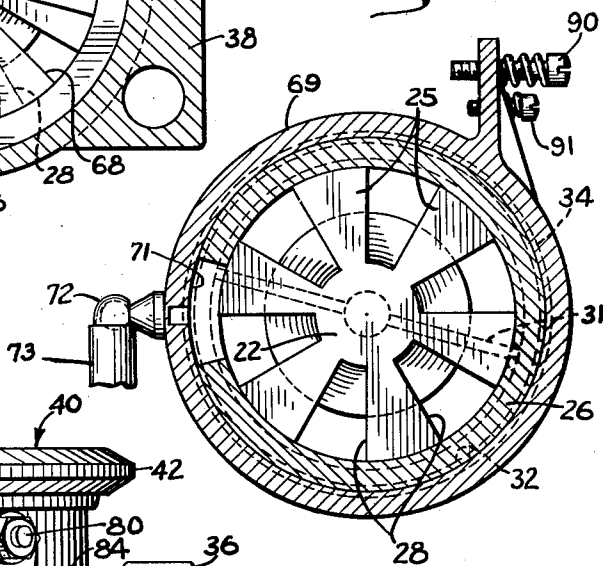


Fig. 10

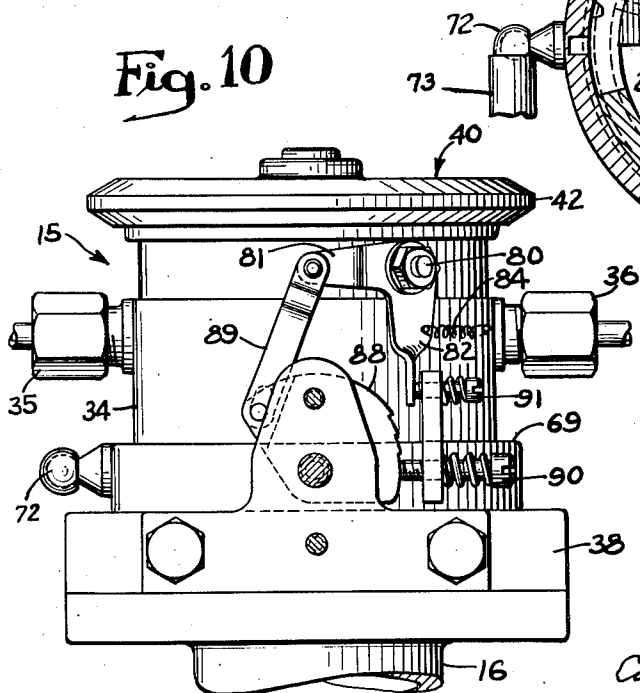
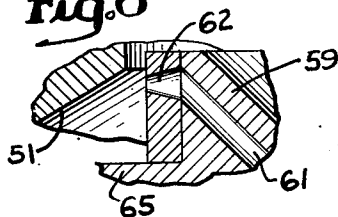


Fig. 6



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INTERNAL COMBUSTION ENGINE CARBURETOR

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10 Claims. (Cl. 261—65)

The present invention relates to carburetors for internal combustion engines, for example, gasoline engines and, more particularly, relates to floatless carburetors having a rotary element for accomplishing both fuel feed and vaporization.

It is a primary object of the present invention to provide an improved carburetor of the foregoing type yielding an automatically corrected optimum air-to-fuel ratio over a full range of engine speeds.

It is another object of the invention to provide such a carburetor which affords an increased air-to-fuel ratio at relatively high air intake rates, thus yielding greater acceleration and higher maximum speeds for a given engine than obtained with prior carburetors and also giving increased fuel efficiency at such high speeds.

An additional object of the invention is to provide a carburetor having improved means automatically responsive to an increase or decrease in the rate of air intake for increasing or decreasing the fuel supply rate.

Another object is to provide a carburetor having improved means for effecting the complete and efficient vaporization of liquid fuel at a high rate.

Still another object is to provide such a carburetor which is not choked in the usual sense and yet which may be set for any of a wide range of air-to-fuel ratios.

A further object is to provide a carburetor which is capable of remote manual setting of the desired air-to-fuel ratio, as for example, the setting of the fuel mixture for an automobile engine from a dashboard control knob under varying conditions of traffic or altitudes of operation.

Further objects and advantages will become apparent as the following description proceeds, taken in conjunction with the accompanying drawings, in which:

Figure 1 is a front elevation of a carburetor embodying the present invention and shown as connected to the intake manifold of an internal combustion engine;

Fig. 2 is a horizontal section taken substantially along the line 2—2 in Fig. 1;

Fig. 3 is an enlarged side elevation of the carburetor;

Fig. 4 is a vertical section taken substantially along the line 4—4 in Fig. 3;

Fig. 5 is a perspective view of a rotor employed in the illustrated embodiment of the present carburetor;

Fig. 6 is an enlarged fragmentary view, in section, of one of the fuel nozzles carried by the rotary element;

Figs. 7, 8, and 9 are horizontal sections taken substantially along the lines 7—7, 8—8, and 9—9, respectively, in Fig. 4; and

Fig. 10 is a front elevation of the present carburetor, partially in section along the line 10—10 in Fig. 3.

Although a particular embodiment of the invention has been shown and described in some detail, there is no intention to thereby limit the invention to the details of such embodiment. On the contrary, the intention is to cover all alterations, modifications, and equivalents falling within the spirit and scope of the invention defined in the appended claims.

Referring now to the preferred form of the present

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invention here shown, the novel carburetor comprises a hollow housing 15 adapted to be fitted at one end to the intake manifold 16 of an internal combustion engine (not shown). Intake air is drawn through the housing as an incident to operation of the engine, and for filtering purposes an air cleaner 18 of any suitable type may be mounted on the other end of the housing. A rotor 19 (Figs. 4 and 5) is journaled in the housing and includes impeller means adapting it to be driven by the intake draft, together with fuel supply means for centrifugally injecting liquid fuel against the housing and into the region of the impeller means. A throttle assembly 20 is provided at the lower end of the housing for adjusting the intake to the engine, and a mixture adjusting assembly 21 controlling the angular impact of intake air on the impeller means is located in the upper end of the housing.

The housing 15 includes a middle portion having a cup-shaped central section 24 carried by integral fingers 25 extending radially inward from an annular wall 26 and defining a plurality of axial, wedge-shaped openings 28 (Figs. 4 and 9). The cup-shaped section 24 extends above the radial fingers 25 to form with the wall 26 an annular raceway 29, and has at its bottom a fuel depression or well 30. The middle housing portion is adapted to supply fuel to the well 30 by one or more hollow passageways 31 defined within the fingers 25 and communicating with an annular groove 32 in the external side of the wall. In the form shown, two such passageways 31 are provided in diametrically opposed fingers 25. A concentric sleeve 34 is placed over the outer wall of the housing to constitute the groove 32 as a fuel supply passageway, an input fitting 35 being connected to the sleeve 34 to receive fuel from a suitable fuel pump (not shown). A corresponding outlet fitting 36 is also connected into the sleeve 34 for the purpose of scavaging excess fuel and returning it to a storage tank (not shown).

For attachment to an engine manifold, the housing further includes a base portion 38 which may be bolted to the lower end of the middle portion and which has a central tapered opening 39 through which mixed fuel and air pass. At the upper end, a cap 40 is attached by suitable spaced bolts 41 for the purpose of journaling the rotor and carrying the mixture adjusting assembly. The cap has a peripheral flange 42 for receiving a ring clamp 44 which holds the air filter 18 on the upper end of the housing. The cap further has a plurality of arcuate air inlet openings 45 located just radially inward of the inner surface of the middle portion's annular wall 26 (Figs. 2 and 4), together with a depending central portion which forms, with the wall, an inlet passage 46 extending axially from the inlet openings 45. The depending portion is centrally apertured at 48 for receiving a portion of the rotor, as described below, and also has an annular recess 49 defined by an outer collar 50 for carrying the mixture adjusting assembly 21. The lower end of this annular collar 50 is tapered inwardly and upwardly to provide a dome or conical skirt 51 laterally offset from the air inlet passage 46.

The rotor 19 is adapted to be journaled in the housing to be impelled by the intake draft much as in the manner of a turbine. In general terms, the present invention may be classified as a "turbo-carburetor," where the turbine-like rotor is driven by intake air and adapted to supply fuel for vaporization in a novel and advantageous manner. As here shown (Figs. 4 and 5), the rotor includes a shaft having a shouldered lower end 54 journaled and seated by a hollow bronze bearing 55 fitted into the fuel well 30, and a reduced upper end 56 journaled by ball bearings 58 disposed in the central aperture 48 of the cap 40. The rotor is thus located coaxially within the housing. An annulus having circularly spaced fuel emission ports is provided on the rotor in the form of a cup-shaped collar 59 integrally formed on or secured

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near the lower end of the shaft. The collar extends upwardly to present its peripheral portion adjacent the conical skirt 51. Hollow fuel supply passageways are defined in the rotor leading from the well 30 to the periphery of the cup-shaped collar, here shown as an axial bore 60 extending partly through the rotor shaft from the well 30, and a plurality of radially extending passages 61 communicating between the upper end of the bore and the periphery of the collar 59. In the present instance, three such passages 61 are provided, spaced at 120-degree intervals around the collar. Each is terminated by an outwardly facing port or tapered nozzle 62 through which fuel is ejected radially under the impetus of centrifugal force, to strike the adjacent skirt surface 51. The nozzles or ports 62 may take any of a variety of forms, but preferably are tapered (Fig. 6) to increase the velocity of ejected fuel. The ports are desirably minute in cross-section, in the order of .014 inch, the necessary fuel capacity for different size engines being provided by a greater or lesser number of such ports. For a relatively large and powerful engine, six or eight ports might be spaced around the periphery of the collar, while for a small engine only two ports may be sufficient.

The rotor further includes an annular array of turbine-like impeller blades or appendages 64 carried by a radial extension 65 of the collar and disposed within the raceway 29 of the middle housing portion. These blades 64 are adapted to spin the rotor through interaction with inlet air passing downwardly through the inlet openings 45 and passageway 46.

It will be seen from Fig. 4 that the inlet fitting 35 and the top of the fuel groove 32 are located just slightly lower than the nozzles 62 on the rotor. When the carburetor is not in operation, fuel may be present in the groove 32 and the well 30, and may stand up in the collar passageways 61 to a point just below the nozzles. There is no spilling of fuel from the nozzles as a result, but upon even relatively slow rotation of the rotor, as when an engine is being started, the fuel in the collar passageways receives a centrifugal propulsion to be ejected through the nozzles. The fuel pressure, if indeed there is any appreciable pressure, at which fuel is supplied to the inlet fitting is unimportant. On the other hand a high fuel pressure at the ports 62 is created in operation by centrifugal force to spray fuel from them.

Not only is fuel thrown from the nozzles deflected downwardly by the conical skirt 51 onto the blades 64 and into the air stream so as to be efficiently vaporized, but a compensating effect is additionally afforded by the present structure. The inlet passage 46 as defined by the central section is unobstructed by any nozzle structure, so that intake air passes freely. However, the abrupt offset of the bottom of the annular collar 50, defining the conical skirt 51 and the region in which the nozzles 62 are positioned, causes a reduced pressure effect just beneath the skirt at high air intake rates, permitting greater rates of fuel ejection and entrainment. As explained more fully below, this is highly advantageous in achieving the best engine performance under acceleration and at high speeds.

The throttle assembly 20 which controls the amount of fuel and air mixture supplied to the manifold comprises a circular valve plate 66, rotatably positioned between the bottom of the central housing portion and the base 38. It contains a plurality of radially extending wedge-shaped slots 68 adapted to register to a greater or lesser degree with the wedge-shaped openings 28 in the central housing portion, depending upon its angular setting (Fig. 8). For effecting such setting, an annular throttle ring 69 is slidably disposed around the outer surface of the housing and is connected to the plate by a pin 70 extending through a limited arcuate slot 71 in the housing's wall. A ball stud 72 is carried by the throttle ring 69 for universally receiving a throttle linkage 73, preferably spring biased to substantially close the axial openings 28 for idling as determined by a stop

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on the throttle ring. The valve plate 66 is shown at the half open position in Fig. 8, and it will be appreciated that the several wedge-shaped openings 28 in the central portion may be totally closed or fully opened by a slight angular adjustment of the plate through the movement of the linkage stud 72.

The mixture adjusting assembly 21 is carried by the depending annular central section of the top cap 40 and is effective in controlling the speed of the rotor 19, and thus the amount of fuel centrifugally thrown from it, for a given rate of air intake. The assembly includes a plurality of vanes 74 radially extending from this central section into the inlet passage 46 and adapted to direct the incoming air with adjustable angularity against the impeller blades 64 (Figs 4 and 7). The vanes 74 are each mounted on a pin 75 radially inserted to extend through the annular collar 50 and toothed in the form of a pinion gear at its inner end which projects into the annular recess 49. A circular geared rack 76 is slidably disposed for rotation in the upper end of this recess and is cooperatively engaged with the teeth of each pin.

The inclination of all of the vanes 74 may be simultaneously adjusted by rotation of the geared rack 76 and for such rotation it is sufficient that only one of the vanes be rotated to the desired position, the others following in unison. In the present instance such angular adjustment for the vanes is effected by a first key 78 (Fig. 7) inserted through the housing and having a slotted head 79 which receives one of the vanes. This key may be mechanically connected by suitable means to a remote manual control, it being only necessary to rotate the key the desired amount to reposition all of the vanes.

A second and similar key 80 is provided in the present instance for automatic actuation by temperature responsive and idling control means. The second key carries a pair of arms 81 and 82 adapted to rotate it under such automatic control. A spring 84 biases the arms to a position placing the vanes in their normal running mixture position Fig. 10. For the purpose of temperature compensation in the air-to-fuel ratio, a thermostatic element 85 may be mounted along one edge of the base (Fig. 3), having a fitting 86 for connection to a temperature sensing point on an engine and a notched cam 88 rotatable in opposite directions upon increases or decreases in temperature. The cam 88 is connected by a slotted link 89 to the first of the key arms 81 and thus serves to vary the angular settings of the several vanes 74 as engine temperature changes.

For cooperating with the temperature responsive means to adjust both the throttle idling position and the air-to-fuel ratio during idling operation, the throttle ring 69 is provided with a pair of adjustable screw stops 90 and 91, the first for engaging the notched cam 88 of the thermostatic control device and the second for engaging the other arm 82 for the second key (Fig. 10). It will be appreciated that under different temperature conditions the throttle ring 69 will be set at different positions for idling by means of the notched cam 88, the engine thus idling faster at lower temperatures. In addition to this, it has been found that most internal combustion engines require a richer fuel mixture at low idling speeds and such a richer mixture is automatically obtained in the present instance by the engagement of the second top screw 91 to rotate the key arm 82 and increase the richness of the fuel mixture through the repositioning of the vanes 74, as described more fully below.

Operation

In the operation of the carburetor, fuel is supplied to the input fitting 35 from a fuel pump (not shown) and through the annular and radial passageways 32 and 31 to the well 30 at the bottom of the cup-shaped section 24. Excess fuel is returned to the fuel tank through the outlet fitting 36. As intake air is sucked through the

carburetor, it strikes the impeller blades 64 at an angle determined by the setting of the vanes 74 and spins the rotor 19 at a speed proportional to the rate of air intake for such vane setting. As the rotor spins, fuel is drawn up through the rotor shaft passageway 60, through the radial passageways 61 in the collar, and ejected through the nozzles 62 against the conical skirt 51, from whence it is deflected down onto the impeller blades 64. Centrifugal force is a primary factor in the ejection. The impact of the fuel on the skirt 51, and the air stream passing over the blades 64, serve in conjunction to efficiently and completely vaporize the fuel and mix it with the intake air, the mixture then passing down through the axial openings 28, the throttle plate slots 68, and into the manifold.

The rate of air intake is adjusted by setting the position of the throttle valve plate 66, which thus determines the speed of the engine for a given load. Of primary importance to the improved performance of the present carburetor is the fact that, for a given position of the mixture-adjusting vanes 74, the speed of the rotor 19 is substantially directly proportional to the rate of air intake. Further, the rate of centrifugal fuel ejection from the rotor nozzles 62 is substantially proportional to the speed of the rotor, except for a corrective factor at high speeds to be later noted. Thus, as the throttle is set at different positions in its range of movement, the ratio of air-to-fuel for the mixture passing into the manifold is maintained substantially constant. This is accomplished automatically without different jets being cut into or out of operation.

By way of example of the capability of carburetors embodying the present invention to supply and vaporize fuel at all engine speeds and power requirements, it has been found that in one application of such a carburetor on a 205 horsepower gasoline engine, the intake air has a velocity of about 300 feet per second at full throttle. Under such conditions, with the nozzle orifices made .014 inch in diameter, gasoline was ejected at a pressure of 120 pounds per square inch with a velocity of 165 feet per second. Positive control of air fuel ratio, fuel delivery, and fuel vaporization was thus greatly improved over that obtainable with an ordinary Venturi type carburetor.

In most internal combustion engines, there is an optimum air-to-fuel ratio for each speed of operation, it being desirable to have a relatively rich mixture in the order of 10:1 by weight for idling, a leaner mixture in the order of 15:1 for intermediate speeds above idling, and a richer mixture in the order of 12:1 at relatively high speeds such as obtained with the throttle nearly wide open. In other words, the air-to-fuel ratio should be substantially constant over the full range of engine speeds, but should be slightly richer at either extremely high or low idling speeds. Similarly, under normal speeds but with heavy loads, and upon acceleration, the air-to-fuel ratio should be greater than for ordinary operation. In idling the air intake rate is low, but upon high speeds, heavy loads, or acceleration, the throttle is relatively wide open and the air intake rate high. The action of producing a richer mixture at relatively high air intake rates is here obtained by the lateral displacement of the nozzles 62 and skirt 51 with respect to the air stream, i. e., radially inward of the intake passage 46. As air is drawn through the intake passages at high velocities, as when an engine is operating at high speeds, a partial vacuum is created beneath the skirt 51 and in the region of the nozzles 62. This results from operation of Bernoulli's principle and permits fuel to be ejected and entrained at a rate greater than otherwise obtainable for a given rotor speed. Thus, while the centrifugally induced fuel pressure at the nozzles is substantially directed proportional to rotor speeds, which is in turn proportional to the rate of air intake, the rate of fuel injection becomes disproportionately greater at high speeds due to

a lowered pressure or vacuum into which the nozzles discharge.

The operation up to this point has been considered with the assumption that the mixture-adjusting vanes 74 were set in one position. The angle at which the vanes are set will determine, for a given rate of air intake, the speed at which the rotor spins, and therefore the rate at which fuel is ejected from the nozzles. Stated another way, the angular setting of the vanes 74 is a parameter determining the rates of fuel injection over the whole range of air intake rates. It thus determines the air-to-fuel ratio which is maintained, except for the corrective feature described, over the entire range of engine speeds. It has been found that one embodiment of the present carburetor may be set to provide an air-to-fuel ratio from about 8:1 to as high as 20:1, by weight, simply by adjusting the vanes 74.

The operation of an internal combustion engine is normally affected by changes in the altitude of its operation as a result of differences in density of the atmosphere. Such changes are noticeable particularly, for example, when automobile carburetors have been set for proper operation at sea level and the automobiles are then operated in mountainous country. By means of the simplified mixture adjusting arrangement provided in the present carburetor, such changes in atmospheric density may be easily and quickly compensated for optimum performance by turning the first adjustment key 78 until the vanes 74 are properly inclined. For example, a control knob might be located on an automobile dashboard and mechanically connected for rotatably positioning the first key 78 and therefore positioning the mixture adjusting vanes.

Further, the position of the vanes 74 may be automatically set to give richer mixtures at low engine temperatures and at slow or idling engine speeds by means of the thermostatic control 85 linked to the second key 80, and the throttle ring stop 91 engaging the arm 82 on the second key when in idling position. With regard to temperature compensation, when the engine temperature is relatively low, as when just being started, the temperature control cam 83 rotates clockwise as viewed in Fig. 10 and correspondingly rotates the second key 80 to position the vanes 74 to direct intake air against the impeller blades 64 for maximum rotor speed for a given rate of air intake. As the engine becomes warmed up, the cam 83 again returns to its original position, repositioning the vanes 74 and decreasing the rotor speed for a given rate of air intake to reduce the amount of fuel centrifugally injected through the nozzles, and thus the air-to-fuel ratio. With regard to automatic compensation of the fuel mixture at idling speeds, the same action takes place when the throttle plate 66 is returned to its idling position and the second stop screw 91 causes rotation of the key to increase the air-to-fuel ratio.

In summary, it will be seen from the foregoing that the present "turbo-carburetor" is particularly adapted to supply large amounts of fuel to an engine operating at high speeds and to completely vaporize such fuel by virtue of the high fuel pressures set up at the rotor nozzles 62 due to centrifugal forces, and by virtue of the fuel being sprayed out of the nozzles and deflected onto the blades 64 where it comes into contact with the air stream. Further, the rotor speed and the rate of fuel injection are substantially proportional to the rate of air intake and thus the air-to-fuel ratio is maintained substantially constant over wide ranges of engine speed. A compensating action comes into play, however, at extremely high engine speeds by virtue of a vacuum being created in the region of the rotor nozzles 62 to increase the rate of fuel delivery for a given centrifugally induced nozzle pressure. On the other hand, the air-to-fuel ratio which is to be substantially maintained over the range of engine speeds may be manually as well as automatically adjusted by varying the positions of the deflecting vanes 74. This

may be accomplished by a remote manual control for quick and easy compensation of different atmospheric densities at different altitudes. And, finally, the air-to-fuel ratio may be automatically corrected, without choking, for changes in temperature or upon idling throttle settings. Temperature adjustment is afforded by a simple linkage of a thermostatic element to the mixture adjusting vane, and an idling mixture is effected by a throttle stop which serves also to set or reposition the mixture adjusting vanes.

I claim as my invention:

1. In a carburetor, the combination of a housing affording a generally annular passageway for axial flow of intake air from end to end thereof, throttle means at the outlet end of said passageway for regulating the rate of air flow, a rotor journaled in said housing to revolve about an axis substantially coaxial with said passageway and having peripheral blades thereon located in said passageway for effecting rotation of the rotor at a speed substantially proportional to the rate of air flow, said rotor having a plurality of minute fuel ejection ports disposed in an annulus thereon and opening outward at points spaced upstream from said blades for the emission of fuel under the impetus of centrifugal force imparted by the rotation of said rotor, means for supplying fuel through the interior of said rotor to said ports, and an annular, substantially conical skirt located upstream from said ports and disposed in radially spaced relation thereto for breaking up the streams of fuel emitted from said ports and deflecting it into the air passing through said blades where such fuel is further intermixed with the air, said skirt further causing increased fuel ejection by creating reduced air pressure in the region of said ports at high rates of air flow.

2. In a carburetor, the combination of a housing affording a generally annular passageway for axial flow of intake air from end to end thereof, throttle means at the outlet end of said passageway for regulating the rate of air flow, a rotor journaled in said housing to revolve about an axis substantially coaxial with said passageway and having peripheral blades thereon located in said passageway for effecting rotation of the rotor at a speed substantially proportional to the rate of air flow, said rotor having a plurality of minute fuel ejection ports disposed in an annulus thereon and opening outward at points spaced upstream from said blades for the emission of fuel under the impetus of centrifugal force imparted by the rotation of said rotor, means for supplying fuel through the interior of said rotor to said ports, an inclined skirt overlying said ports in spaced relation thereto for breaking up the streams of fuel emitted from said ports and deflecting it into the air passing through said blades where such fuel is further intermixed with the air, and means for controlling the angle of incidence of air impinging on said blades to thereby control the rate of rotor rotation and hence the richness of the fuel-air mixture.

3. In a carburetor for an internal combustion engine having an intake manifold, the combination of a hollow housing adapted to be fitted at one end on the manifold to have intake air sucked through it as an incident to operation of the engine; a rotor journaled within said housing and including a shaft, a collar on said shaft, a plurality of radial impeller blades, and said rotor having passageways leading from the one end of said shaft to the periphery of said collar and outwardly facing ports at the ends of said passageways, a plurality of radial vanes disposed in the other end of said housing for directing intake air on said blades to impell said rotor, and temperature responsive means for varying the angular position of said vanes to increase the rotational speed of said rotor for the same rate of air intake at relatively low temperatures, whereby a lesser air-to-fuel ratio is obtained without choking.

4. In a carburetor, the combination of a housing having walls defining an axial passage therethrough and adapted to have intake air sucked through said passage from one end to the other, a rotor journaled within the passage of

said housing and having radial blades adapted to be propelled by the intake air, means on said rotor for centrifugally injecting fuel into said housing, a plurality of radially extending circumferentially spaced vanes disposed within the inlet end of said passage to direct intake air on said blades, said vanes each being mounted on radial pins rotatably received in said housing and adapted at their ends to form pinion gears, a circular rack gear coaxially and slidably positioned in said housing and engaged with the pinion gears on each said pin to provide for all of said vanes being angularly adjusted in unison by rotation of said rack to vary the speed of said rotor for a given rate of air intake, and a key extending through said housing to engage one of said vanes and adapted to angularly position said one vane through rotation thereof to thereby correspondingly position all of said vanes.

5. In a carburetor, the combination of a housing having walls defining an axial passage therethrough and adapted to have intake air drawn through said passage from one end to the other, a rotor journaled within said passage and having means adapting the same to be propelled by the intake air, means including peripherally carried nozzles on said rotor for centrifugally ejecting liquid fuel into the intake air, a plurality of radially extending vanes disposed upstream of said rotor, said vanes each being carried at one end of a rotatable radial pin having its other end toothed in the form of a pinion, a circular rack gear engaging the teeth of all of said pins, and a key for turning one of said vanes to thereby angularly position all of them and change the angle of incidence of intake air on said rotor propelling means.

6. In a carburetor, the combination set forth in claim 5 further characterized by throttle means positionable for controlling the rate of air intake and including a stop for controlling the setting of said key when the throttle means are set to idling position to thereby adjust said vanes to establish a relatively rich air-to-fuel ratio.

7. In a carburetor, the combination set forth in claim 5 further characterized by temperature responsive means for turning said key upon changes in temperature.

8. In a carburetor, the combination set forth in claim 5 further characterized by throttle means positionable between idling and wide open settings, a stop on said throttle means adapted to control the setting of said key when in the idling position, and a thermostatic element adapted to control the setting of said key upon temperature changes whereby said vanes cause maximum speed of said rotor for a given rate of air intake when the throttle means is in idling position and when the thermostatic element senses a relatively low temperature.

9. In a carburetor, the combination of a hollow housing adapted to have air sucked through it, a cap on the inlet end of said housing having an inlet opening and a depending portion centrally disposed within said housing and spaced inwardly thereof to leave an inlet passage, said depending portion being upwardly recessed in the center thereof to define a skirt surface, the outer wall of said depending portion constituting one wall of said inlet passage, a rotor journaled in said housing, impeller means disposed beneath said inlet passage to spin said rotor through interaction with passing air, an annular portion of said rotor being disposed within said recess and radially inward from said skirt surface, a plurality of fuel ports disposed in spaced relation around said annular portion, and means including fuel passageways within said rotor for supplying fuel to said ports for ejection against the inner wall of said skirt surface to effect atomization and subsequent entrainment with air passing through said inlet passage, whereby reduced air pressure within said recess at progressively higher rates of air intake produces a greater rate of fuel ejection and an automatic decrease in the air-to-fuel ratio.

10. In a carburetor, the combination of a hollow annular housing adapted to have intake air sucked through it, a cap on the inlet end of said housing having arcuate

inlet openings and a portion depending centrally into said housing to leave an annular air inlet passageway beneath said openings, the lower end of said portion defining a conical skirt surface extending inwardly and upwardly from said air inlet passageway, a rotor journaled in said housing, means on said rotor for spinning it through interaction with intake air, a collar on said rotor having a peripheral portion disposed beneath said skirt surface and radially inward of said air inlet passageway, a plurality of outwardly facing nozzles being defined in said peripheral portion, and fuel supply passageways being defined within said rotor to supply fuel for ejection under centrifugal impetus from said nozzles, entrainment of fuel from said nozzles into the intake air also being effected by reduced pressures beneath said skirt surface as a result of intake air passing through said inlet passage.

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