Sept. 15, 1931. M. R. WOLFARD 1,823,019

CARBURETOR

Filed Sept. 10, 1929 2 Sheets-Sheet 1

Fig. 1.

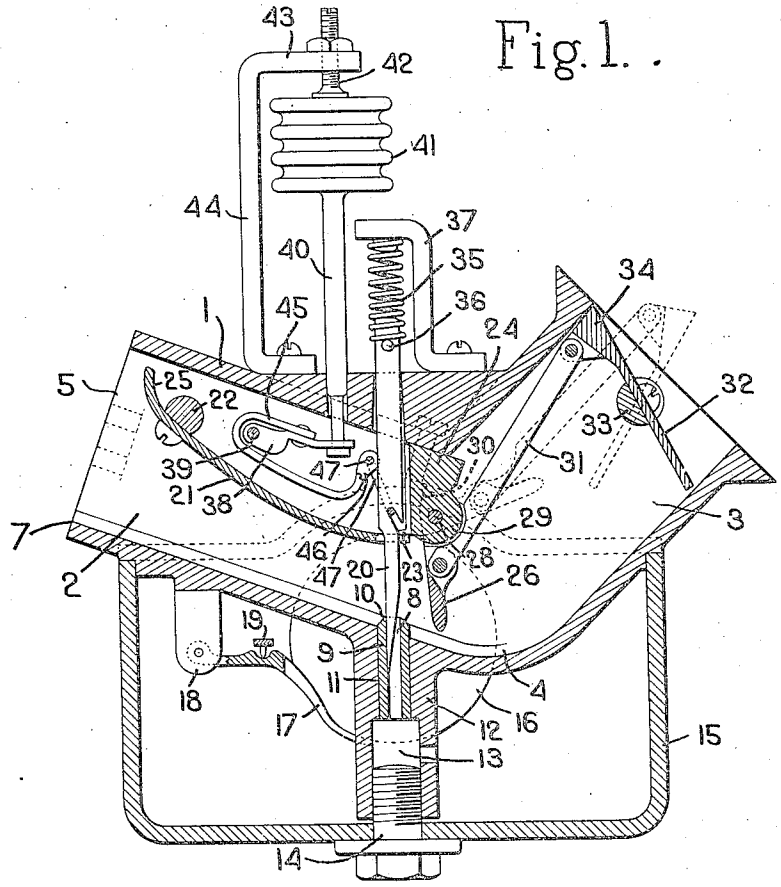
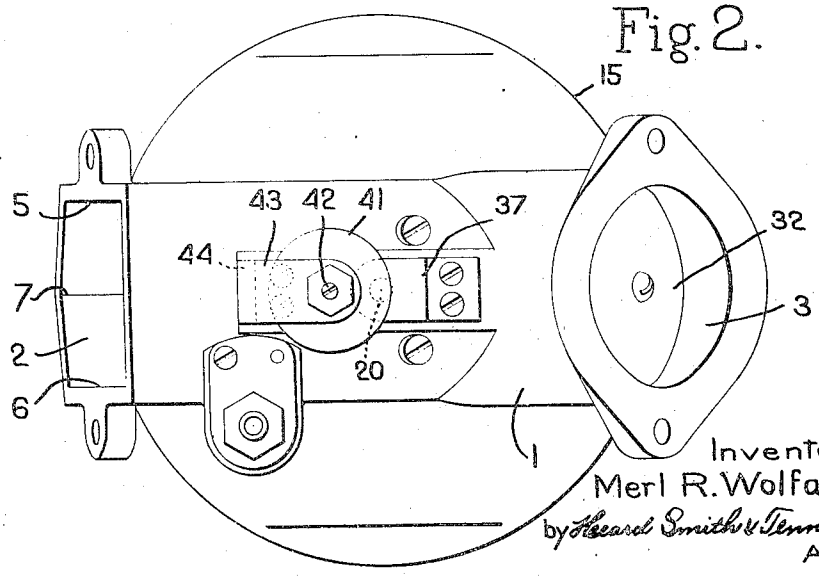


Fig. 2.



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Fig. 3.

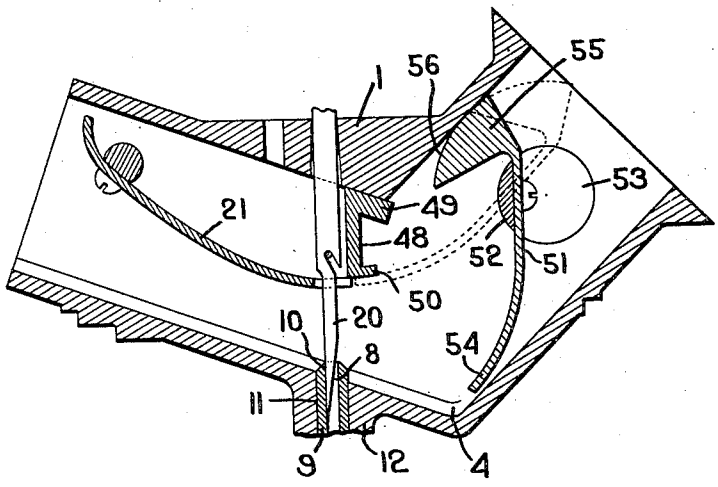


Fig. 4.

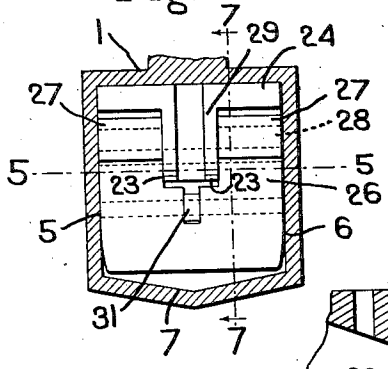


Fig. 5.

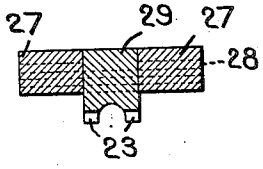


Fig. 6.

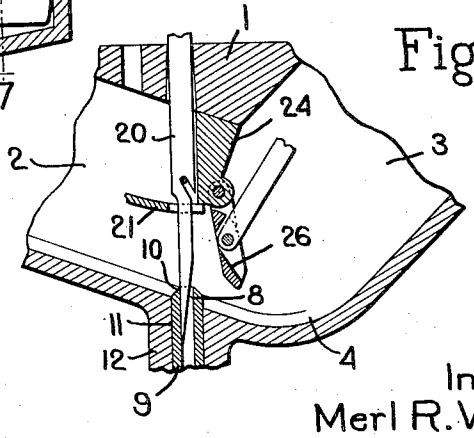
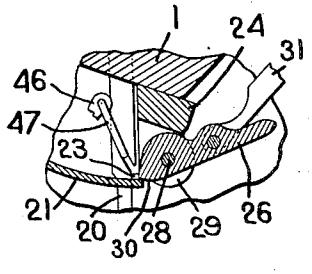


Fig. 7.



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1,823,019

UNITED STATES PATENT OFFICE

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CARBURETOR

Application filed September 10, 1929. Serial No. 391,567.

This invention relates to improvements in carburetors for internal combustion engines and relates primarily to improvements in the type of carburetor illustrated in Figs. 1 to 4 of my prior application Serial No. 293,371, filed June 17, 1928.

An object of the invention is to provide a carburetor having a mixing passage and a fuel inlet, with means operable to concentrate substantially all of the air which passes through the mixing passage and to deflect the same upon the lower wall of the mixing passage beyond and in proximity to the fuel inlet, thereby insuring, under partial load conditions intimate mixture of the fuel with all the air immediately beyond the fuel inlet.

This preferably is accomplished by providing the mixing passage with a depression intermediate of its length, with the fuel inlet located in front of and above the lower portion of said depression, and a throttling valve operable to concentrate substantially all the air flowing through the mixing passage and to deflect the same into said depression during idle and light load operations, and adapted to open progressively as the flow through the mixing passage increases in response to increased demands.

A further object of the invention is to provide a throttle valve beyond said throttling valve and so connected to its that when the throttle valve is moved from idle to wide open position the throttling valve is also moved from idle to wide open position.

Another object of the invention is to provide a mixing passage having relatively inclined inlet and outlet sections to form at their junction a depression, with the fuel inlet communicating with the inlet section above the lower portion of said depression and with means located beyond the fuel inlet adapted, during idle and light load operations to throttle and also operable to concentrate substantially all the air flowing through the inlet section and to deflect the same into said depression.

Another object of the invention is to provide a mixing passage with a partition extending longitudinal thereof adapted to cause the major portion of the air to flow beneath said partition and a smaller portion thereof to flow above the same, with a swinging throttling valve having means operable when in idle and light load positions to concentrate substantially all the air flowing through the passage and to deflect the same into the depression in the mixing passage and also having means progressively to restrict the flow of air above the partition as the throttling valve approaches wide open position.

A further object of the invention is to provide an inlet section having an approximately rectangular cross section with a swinging throttling valve located beyond the fuel inlet and an outlet section of cylindrical cross section with a throttle valve therein. The inlet section preferably has opposite vertical side walls approximately parallel to each other and a lower wall having the middle portion thereof lower than either side portion to form a slightly V-shaped channel.

A further object of the invention is to connect the swinging throttling valve with the throttle valve so that as the latter is moved from idle to wide open position the throttling valve is also moved from idle to wide open position.

A further object of the invention is to provide an approximately rectangular inlet section with a choke valve pivotally mounted above the longitudinal axis of the inlet section and extending toward the junction of the inlet and outlet sections operable when in choking position to direct the air when flowing through the inlet section across the fuel inlet and when moved in open position to contact with a depending bridge wall in such manner as to reduce the area of the inlet passage to form a metering section.

A further object of the invention is so to locate the choke valve that when in wide open position a relatively small amount of air will flow above the same and thence beneath the bridge wall with the throttling valve so constructed that when it approaches wide open position it will gradually reduce the flow of air above the choke valve, thereby increasing the proportion of fuel to air as wide open position of the throttle is approached, thus

enriching the mixture near and at wide open position.

Another object of the invention is to provide a regulating valve slidably mounted in the fuel inlet, having a wall complementary to the wall of said inlet and chamfered on the opposite, down-stream, side combined with a thermostatic means for actuating the same and with improved means for maintaining the complementary walls of said valve and fuel inlet in continuous light engagement and which will avoid any possibility of binding of the valve.

These and other objects and features of the invention will more fully appear from the following description and drawings and will be particularly pointed out in the claims.

Preferred embodiments of the invention are illustrated in the accompanying drawings in which:

Fig. 1 is a vertical longitudinal sectional view of a carburetor embodying the invention.

Fig. 2 is a plan view of the same.

Fig. 3 is a detail vertical longitudinal sectional view of a modified form of the invention, illustration of the float chamber being omitted.

Fig. 4 is a detail view of a preferred form of throttling valve pivotally mounted on a bridge wall in the inlet passage, the casing of the inlet passage being shown in cross section.

Fig. 5 is a horizontal sectional view illustrating the pivotal connection between the bridge wall and the throttling valve, taken on line 5—5 Fig. 4.

Fig. 6 is a detail view of another modified form of the invention.

Fig. 7 is a detail view on line 7—7 Fig. 4, illustrating the throttling valve in open position and closing space between the end of the choke valve and the bridge wall.

The preferred embodiment of the invention illustrated in Figs. 1, 2, 4, and 5 comprises a casing 1, preferably of die-cast metal, having a mixing passage therethrough with an inlet section 2 and outlet section 3 relatively inclined thereto forming at their junction a depression 4.

The inlet section 2 is desirably of approximately rectangular cross section having vertical side walls 5, 6 and a bottom wall 7 inclined downwardly from the side portions towards its middle to form a shallow V-shaped channel. A fuel inlet 8 communicates with the inlet section in front and above the lower portion of the depression. Desirably the fuel inlet is formed by inserting a tube 9 having, a conical upper end 10, into the suitable vertical bore 11 in a downwardly extending boss on the casing, the lower end of said boss being provided with a larger bore 13 having a screw-threaded wall to receive a cap screw 14 for clamping the fuel reservoir 15 upon the casing.

Floats 16 adapted to be buoyed by the liquid in the reservoir are connected to a yoke 17 which is pivotally mounted upon bosses 18 depending from the casing 1 and actuate a lever 19 which controls the supply of fuel to the reservoir to maintain a level of fluid in the reservoir slightly above the fuel inlet 8, thereby providing for a continuous low flowing head at the fuel inlet. This construction preferably is similar to that illustrated in my prior application Serial No. 293,371 above mentioned but may be of any suitable character which will regulate and maintain the full level with a sufficient degree of precision.

The area of the fuel inlet is controlled by a regulating valve 20 having a wall complementary to the wall of the fuel inlet and chamfered on the opposite, down-stream, side with means for maintaining continuous light engagement between the complementary walls of the regulating valve and fuel inlet and means including a thermostatic mechanism for adjusting the regulating valve, which will hereinafter be more fully described. By reason of this construction a low predetermined flowing head of fuel is continuously maintained at the fuel inlet and when the engine is not operating the fuel flows by gravity into the depression 4 forming a pool therein.

Desirably means are provided to contract the effective area of a portion of the inlet section in proximity to the fuel inlet to form a metering section for the air flowing into the inlet section.

In the construction illustrated in Fig. 1 this is accomplished by providing a choke valve 21, which is pivotally mounted upon the cross shaft 22, the choke valve desirably being slightly convexedly curved downwardly to form a metering section in front of and in proximity to the fuel inlet. The lower end of the choke valve when in normal open position engages and is held in contact with flanges extending forwardly from a central boss of a bridge wall 24 which depends from and is connected to the upper wall of the inlet section adjacent to the junction of the latter with the outlet section. The opposite end 25 of the choke valve 21 is curved upwardly near the cross shaft 22 and terminates, when the choke valve is in wide open position, a short distance from the upper wall of the inlet section and when the choke valve is in closed position engages the upper wall of the inlet section. When the choke valve is in open position, as illustrated, the major portion of the air which flows through the inlet section passes beneath the choke valve 21, while a small portion of the air passes above the choke valve and flows by the lower end of the choke valve.

One of the principal objects of the invention, as heretofore stated, is to provide means operable to concentrate all of the air which passes through the inlet section and to deflect the same upon the lower wall of the mixing passage and into the depression 4 during idle and light load operations, thereby insuring intimate mixture of the fuel with all the air immediately beyond the fuel inlet. This is accomplished in the construction illustrated in Fig. 1 by providing a throttling valve 26 which is pivotally mounted upon the bridge wall 24 and when in idling position extends downwardly into said depression beyond and in proximity to the fuel inlet. The throttling valve as illustrated in Figs. 4 and 5 preferably comprises a substantially flat rectangular plate having upwardly extending semi-cylindrical bosses or lobes, 27 providing bearings for a shaft 28, by which they are pivotally mounted in the central boss 29, extending downwardly from the bridge wall 24. The cylindrical portion of the lobes 27 rotate in close proximity to complementary under faces of the bridge wall and prevent passage of the air therebetween, while the substantially flat faces 30 of said lobes act, when the throttling valve is moved to open position, as illustrated in dotted lines in Fig. 1, as valves to close the opening between the end of the choke valve and the bridge wall thereby restricting the flow of air above the choke valve.

In the construction illustrated in Fig. 1, the throttling valve 26 is connected by a link 31 to a throttle valve 32 of the butterfly type which is pivotally mounted upon a cross shaft 33 in the walls of the outlet section 3. The upper end of the throttle valve 32 preferably is provided with a thickened portion 34 which is adapted to prevent the mixture from flowing over the top of this valve during idle and light load operations so that substantially all of the mixture is compelled to flow below the lower portion of the throttle valve during idle and light load operations. By virtue of this construction a flow of air which does not carry its proportional amount of the fuel is prevented during the period when the velocity in the outlet section in front of the throttle valve is insufficient to insure carrying of the fuel in full suspension. The throttle valve 32 may be actuated from a usual controlling mechanism, which need not be described.

While the choke valve as illustrated herein is utilized to form a metering section for the air flowing through the inlet passage and to divide the same so that the major portion of the air flows below the choke valve and a smaller portion above it; the same function might be fulfilled by a fixed partition, similarly cooperating with the bridge wall.

Another important object of the invention is to provide improved means for adjustably mounting the thermostatic member which controls the regulating valve and means for connecting said thermostatic member to the valve which will avoid cramping or binding of the valve during all periods of adjustment and actuation.

In the construction illustrated the regulating valve 20 extends upwardly through a slightly converging aperture in the upper thickened wall of the casing 1 and is slidably mounted therein to have a slight lateral movement to permit the complementary walls of the regulating valve and the fuel inlet to be maintained in continuous light engagement. A spring 35 interposed between a pin 36 in the upper end of the valve and a bracket 37 which is secured to the casing tends to close the regulating valve. The valve, however, is held against the tension of the spring by a thermostat which is subject to manual and preferably also, barometric regulation. A thermostat supporting arm 38 is pivotally mounted at one end upon a cross shaft 39 extending through the walls of the inlet section and is connected at its other end to the lower end of a stem 40, the upper end of which is secured to an expansible bellows 41 which in turn is secured by an adjusting screw 42 to the arm 43 of a bracket 44 which is mounted upon the upper wall of the casing. The end is forked so that the supporting ends thereof may pass on either side of the valve. The thermostat preferably comprises a bi-metallic strip 45 having one end connected to send thermostat-supporting arm and extending around the pivoted end of said thermostat-supporting arm, out of contact therewith, thence forwardly and downwardly with its actuating end 46 extending upwardly and forked so that the supporting prongs thereof may pass on either side of said regulating valve.

A link 47 which is pivotally connected to the forked end 46 engages an upwardly inclined slot in the regulating valve. By reason of this construction the angularity of the free moving link 47 with the axis of the regulating valve may be adapted to give any desired pressure between the complementary walls of the regulating valve and the fuel inlet without any possibility of being affected by changes of adjustment of the position of the thermostatic member.

In the construction illustrated in Fig. 1 the choke valve 21 is illustrated in normal operating position and the throttling valve 26 and throttle valve 32 are illustrated in full lines in idle operating position. The main portion of the air entering the inlet section 2 flows beneath the choke valve 21 past the fuel inlet while a small portion of the air entering the inlet section passes above the choke valve 21 thence downwardly between the end of the choke valve and the throttling valve 26. Substantially all of the air pass-

ing through the inlet section being concentrated and deflected downwardly by the throttling valve 26 into the depression 4 thereby insuring intimate mixture of all of the air with the fuel in proximity to the fuel inlet and before any lifting of the fuel is required. The mixture thus produced then passes below the lower portion of the throttle valve 32 into the usual manifold which leads to the engine.

As the load increases, the throttle valve is gradually opened toward dotted line position and the link 31 thereupon progressively moves the throttling valve toward the open position illustrated in dotted lines. During light load operations the upper end of the throttle valve prevents the passage of any substantial portion of the mixture above the throttle valve, thus concentrating all the mixture flow beneath the lower portion of the throttle valve, and preventing the passage of any air above the throttle valve while the velocity of the air in the outlet section in front of the throttle valve is insufficient to insure the carrying of the fuel in full suspension. As the throttle valve approaches wide open position, the throttling valve is moved toward wide open position and the linkage is such that as it approaches wide open position its angular movement is rapid and the flat faces 30 of the lobes 27 are caused to close the openings at the end of the choke valve 21, thereby causing substantially all of the air to pass beneath the choke valve 21, thus effectively reducing the metering area of the inlet section and thereby increasing the ratio of fuel to air at and near wide open throttle position. This is accomplished without any movement of the regulating valve which controls the fuel inlet and furthermore permits the elimination of usual wear on cams and other complicated mechanism which causes the loss of precision.

The position of the regulating valve may be initially adjusted by the screw 42 and when adjusted is subject to barometric control, as the lower end of the stem 40, which is connected to the thermostat-supporting arm, will be moved up or down in response to changes in barometric pressure. The thermostatic strip 45 is subject to the temperature of the air which flows through the upper portion of the inlet section and is flexed by the changes in temperature of the air in such a manner as to raise or lower the regulating valve 20 in response to such changes, thereby varying the area of the fuel inlet to provide a proper proportion of fuel to air with changes in temperature of the air entering the inlet section. The upwardly extending forked end of the bi-metallic thermostatic strip may be positioned to give any desired inclination of the link 47 relative to the vertical axis of the regulating valve 20 to produce only the necessary force to hold the complementary walls of the regulating valve and the fuel inlet in contact without the possibility of increasing such pressure, with different adjusted positions of the thermostat.

Upon cold starting of the engine the choke valve 21 may be temporarily moved to closed position by usual mechanism and restored to normal position quite promptly because of the fact that the thermostat will give proper operating mixing strength very quickly after starting.

Fig. 6 illustrates a modified construction which differs from that shown in Fig. 1, in that the lower end of the choke valve 21 contacts with the bridge wall 24 throughout the width of the choke valve except for the slot in the choke valve through which the regulating valve passes through. In this construction substantially all the air is directed below the choke valve and is then concentrated by the throttle valve 26 and deflected into the depression 4 during idle and light load operations. Tests have indicated an inherent tendency toward some enrichment of the mixture as wide open throttle position is approached. This tendency is quite sufficient to give satisfactory operation in some classes of automobile service.

In Fig. 3 another construction is illustrated, in which the throttling valve and throttle valve are combined, as it were, in one with the upper portion of the valve constructed so as not to permit any flow to take place over the upper portion of the choke valve, and to cause the mixture flow at all times to take place beneath the valve except when the choke valve is in choking position. In this construction the casing 1, the boss 12 depending from the casing, the tube 9 forming the fuel inlet 8, the regulating valve 20 and the thermostatic regulating means, not shown, may be and desirably are the same as illustrated in Fig. 1. The choke valve 21 may also be similar to that illustrated in Fig. 1 with the exception that its lower end may contact substantially throughout its length with the bridge wall 48 which desirably is of somewhat different construction having an upper flange 49 adapted to be connected to the upper wall of the inlet section and a flange 50 against which the lower end of the throttle valve may be engaged when the combined throttling and throttle valve is in wide open position, so that the choke valve and throttle valve provide substantially a continuous curved upper wall for the mixing passage.

The throttle valve 51 is connected to an eccentric segment 52 of the cross shaft 53 thereby imparting a forward movement to the valve as it is rotated toward open position. The lower portion 54 of the throttle valve extends into the depression 4 which in this construction may be somewhat more

sharply angular than that shown in Fig. 1. The upper end of the throttle valve is provided with a thick body portion 55 having a curved surface 56 adapted to maintain close proximity to the upper wall of the outlet section as the throttle valve is moved from idle to wide open position, thereby preventing the flow of any mixture above the valve and consequently concentrating the flow of the mixture below the valve. Other modified constructions embodying the essence of the present invention may of course be made within the scope and meaning of the following claims.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. A carburetor for an internal combustion engine comprising a mixing passage having an air metering section of substantially constant area during idle and light load operation of the engine, a fuel inlet communicating with said mixing passage so positioned as to be subject to a suction head substantially proportional to the suction head in said metering section, means to maintain continuously a low substantially constant flow of fuel through said fuel inlet into said mixing passage, irrespective of the flow of fuel induced by the suction head in said metering section, and means for concentrating the air flowing through the metering section into an undivided stream beyond and in proximity to the fuel inlet, whereby intimate mixture of the fuel with all the air is effected immediately beyond the fuel inlet.

2. A carburetor for an internal combustion engine comprising a mixing passage having an air metering section of substantially constant area during idle and light load operation of the engine and provided with a depression intermediate of its length, a fuel inlet communicating with said passage in front of and above the lower portion of said depression so positioned as to be subject to a suction head substantially proportional to the suction head in said metering section, and throttling means beyond the fuel inlet acting to concentrate substantially all the air flowing through the mixing passage and to deflect the same into said depression during idle and light load operation of the engine, and operable at heavier loads to increase the throttled area.

3. A carburetor for an internal combustion engine comprising a mixing passage having an air metering section of substantially constant area during idle and light load operation of the engine and provided with a depression intermediate of its length, a fuel inlet communicating with said passage in front of and above the lower portion of said depression, so positioned as to be subject to a suction head substantially proportional to the suction head in said metering section, a swinging throttling valve beyond said fuel inlet acting to concentrate substantially all the air flowing through the mixing passage and to deflect the same into said depression during idle and light load operation of the engine, and operable at heavier loads to increase the throttled area.

4. A carburetor for an internal combustion engine comprising a mixing passage having an air metering section of substantially constant area during idle and light load operation of the engine and provided with a depression intermediate of its length, a fuel inlet communicating with said passage in front of and above the lower portion of said depression, so positioned as to be subject to a suction head substantially proportional to the suction head in said metering section, a throttling valve projecting into said depression, a throttle valve beyond said depression, and means connecting said throttling valve with said throttle valve operable upon actuation of the latter during idle and light load operation of the engine to cause said throttling valve to concentrate substantially all the air flowing through the mixing passage and to deflect the same into said depression.

5. A carburetor for an internal combustion engine comprising a mixing passage having an air metering section of substantially constant area during idle and light load operation of the engine and provided with a depression intermediate of its length, a fuel inlet communicating with said passage in front of and above the lower portion of said depression, so positioned as to be subject to a suction head substantially proportional to the suction head in said metering section, a throttling valve projecting into said depression, a throttle valve beyond said depression, and means connecting said throttling valve with said throttle valve operable upon actuation of the latter during idle and light load operation of the engine to cause said throttling valve to concentrate substantially all the air flowing through the mixing passage and to deflect the same into said depression, and also operable progressively to open said throttling valve as the throttle valve is progressively moved from idle toward wide open position.

6. A carburetor for an internal combustion engine comprising a mixing passage having an air metering section of substantially constant area during idle and light load operation of the engine and provided with a depression intermediate of its length, a fuel inlet communicating with said passage in front of and above the lower portion of said depression, so positioned as to be subject to a suction head substantially proportional to the suction head in said metering section, a throttling valve projecting into said depression, a throttle valve beyond said depression, and means connecting said throt-

tling valve with said throttle valve operable upon actuation of the latter during idle and light load operation of the engine to cause said throttling valve to concentrate substantially all the air flowing through the mixing passage and to deflect the same into said depression, said throttle valve being constructed and positioned to cause substantially all the mixture to flow beneath the lower portion thereof during idle and light load operations.

7. A carburetor for an internal combustion engine having a mixing passage provided with a depression intermediate of its length, a fuel inlet communicating with said passage in front of and above the lower portion of said depression, a partition extending longitudinally of the inlet section of said passage positioned as to form a metering section of substantially constant area during idle and light load operation of the engine and adapted to cause the major portion of the air to flow beneath said partition and over the fuel inlet and a smaller portion thereof to flow above said partition, a swinging throttling valve having means operable when in idle and light load positions to concentrate substantially all the air flowing through said passage and to deflect the same into said depression, and having means progressively to restrict the flow of air above said partition as the throttling valve approaches wide open position.

8. A carburetor for an internal combustion engine having a mixing passage provided with a depression intermediate of its length, a fuel inlet communicating with said passage in front of and above the lower portion of said depression, a partition extending longitudinal of the inlet section of said passage so positioned as to form a metering section of substantially constant area during idle and light load operation of the engine and adapted to cause the major portion of the air to flow beneath said partition and over the fuel inlet and a smaller portion thereof to flow above said partition, a throttling valve projecting into said depression, a throttle valve beyond said depression and means connecting said throttling valve with said throttle valve operable upon actuation of the latter during idle and light load operations to cause said throttling valve to concentrate substantially all of the air flowing through the mixing passage and to deflect the same into said depression, and also operable progressively to open said throttling valve as the throttle valve is progressively moved from idle toward wide open position.

9. A carburetor for an internal combustion engine comprising a mixing passage having relatively inclined inlet and outlet sections forming at their junction a depression, said inlet section having an air metering zone of substantially constant area during idle and light load operation of the engine, a fuel inlet communicating with said inlet section above the lower portion of said depression, so positioned as to be subject to a suction head substantially proportional to the suction head in said metering section, a swinging throttling valve beyond said fuel inlet operable to concentrate substantially all the air flowing through the inlet section and to deflect the same into said depression during idle and light load operation of the engine.

10. A carburetor for an internal combustion engine comprising a mixing passage having relatively inclined inlet and outlet sections forming at their junction a depression, said inlet section having an air metering zone of substantially constant area during idle and light load operation of the engine, a fuel inlet communicating with said inlet section in front of and above the lower portion of said depression, a throttling valve projecting into said depression beyond said fuel inlet, a throttle valve in said outlet section beyond and above said depression and means connecting said throttling valve with said throttle valve operable when the latter is in idle and light load positions to cause said throttling valve to concentrate substantially all the air flowing through the inlet section and to deflect the same into said depression and operable progressively to open said throttling valve as the throttle valve is progressively moved from idle to wide open position.

11. A carburetor for an internal combustion engine comprising a mixing passage having relatively inclined inlet and outlet sections forming at their junction a depression, said inlet section having an air metering zone of substantially constant area during idle and light load operation of the engine, a fuel inlet communicating with said inlet section in front of and above the lower portion of said depression, a throttling valve projecting into said depression, beyond said fuel inlet a throttle valve in said outlet section beyond and above said depression and means connecting said throttling valve with said throttle valve operable when the latter is in idle and light load positions to cause said throttling valve to concentrate substantially all the air flowing through the inlet section and to deflect the same into said depression, and progressively to open said throttling valve as the throttle valve is progressively moved from idle toward wide open position, said throttle valve being constructed and positioned to cause substantially all the mixture to flow beneath the lower portion thereof during idle and light load operations.

12. A carburetor for an internal combustion engine comprising a mixing passage having an inlet section of approximately rectangular cross section, and an outlet section of cylindrical cross section, axially inclined

relatively to each other to form at their junction a depression, said inlet section having an air metering zone of substantially constant area during idle and light load operation of the engine, a fuel inlet communicating with said inlet section in front of and above the lower portion of said depression, a swinging throttling valve located in said rectangular section beyond said fuel inlet operable to concentrate substantially all the air flowing through the inlet section and to deflect the same into said depression, during idle and light load operation of the engine.

13. A carburetor for an internal combustion engine comprising a mixing passage having an inlet section of approximately rectangular cross section, and an outlet section of cylindrical cross section, axially inclined relatively to each other to form at their junction a depression, a fuel inlet communicating with said inlet section above the lower portion of said depression, a swinging throttling valve located in said rectangular section beyond said fuel inlet, a throttle valve in said cylindrical outlet section and means connecting said throttling valve with said throttle valve when the latter is in idle and light load positions to cause said throttling valve to concentrate substantially all the air flowing through the inlet section and to deflect the same into said depression, and progressively to open said throttling valve as the throttle valve is progressively moved from idle toward wide open position, said throttle valve being constructed and positioned to cause substantially all the mixture to flow beneath the lower portion thereof during idle and light load operations.

14. A carburetor for an internal combustion engine comprising a mixing passage having an inlet section of approximately rectangular cross section, and an outlet section of cylindrical cross section axially inclined relatively to each other to form at their junction a depression, a fuel inlet communicating with said inlet section above the lower portion of said depression, a choke valve pivotally mounted above the longitudinal axis of said inlet section and extending toward the junction of said inlet and outlet sections and operable when in choking position to direct the air flowing through said inlet section across the fuel inlet and a swinging throttling valve located in said rectangular inlet section beyond said fuel inlet operable to concentrate substantially all the air flowing through the inlet section and to deflect the same into said depression, during idle and light load operations.

15. A carburetor for an internal combustion engine comprising a mixing passage having an inlet section of approximately rectangular cross section, and an outlet section of cylindrical cross section axially inclined relatively to each other to form at their junction a depression, a fuel inlet communicating with said inlet section above the lower portion of said depression, a choke valve pivotally mounted above the longitudinal axis of said inlet section and extending toward the junction of said inlet and outlet sections and operable when in choking position to direct the air flowing through said inlet section across said fuel inlet, a bridge wall extending downwardly from the upper wall of the inlet section forming a stop for the choke valve when in open position whereby substantially all the air is caused to flow through the reduced area of the inlet passage below the choke valve and a throttling valve pivotally mounted on said bridge wall operable to concentrate substantially all the air flowing through the inlet section and to deflect the same into said depression during idle and light load operations.

16. A carburetor for an internal combustion engine comprising a mixing passage having an inlet section of rectangular cross section, and an outlet section of cylindrical cross section axially inclined relatively to each other to form at their junction a depression, a fuel inlet communicating with said inlet section above the lower portion of said depression, a choke valve pivotally mounted above the longitudinal axis of said inlet section and extending toward the junction of said inlet and outlet sections and operable when in choking position to direct the air flowing through said inlet section across said fuel inlet, a bridge wall extending downwardly from the upper wall of the inlet section forming a stop for the choke valve when in open position whereby substantially all the air is caused to flow through the reduced area of the inlet passage below the choke valve, a throttle valve in said outlet section beyond and above said depression and means connecting said throttling valve with said throttle valve progressively to open said throttling valve as the throttle valve is progressively moved from idle toward wide open position.

17. A carburetor for an internal combustion engine having a mixing passage provided with a depression intermediate of its length, a fuel inlet communicating with said passage in front of and above the lower portion of said depression, a regulating valve slidably mounted in said fuel inlet having a wall complementary to the wall of said inlet and chamfered on the opposite downstream side, a thermostat-supporting member pivotally mounted in the inlet section, means for adjustably positioning said member, a thermostatic element fixedly secured at one end to said member and having its other end connected to said regulating valve by a link inclined to the axis of said valve and adapted to maintain continuous light engagement between the complementary

walls of said regulating valve and fuel inlet, a throttling valve projecting into said depression, a throttle valve beyond said depression and means connecting said throttling valve with said throttle valve operable when the latter is in idle and light load position to cause said throttling valve to concentrate substantially all the air flowing through the mixing passage and to deflect the same into said depression, and progressively to open said throttling valve as the throttle valve is progressively moved from idle toward wide open position.

18. A carburetor for an internal combustion engine having a mixing passage provided with a depression intermediate of its length, a fuel inlet communicating with said passage in front of and above the lower portion of said depression, a regulating valve slidably mounted in said fuel inlet having a wall complementary to the wall of said inlet and chamfered on the opposite downstream side, a thermostat-supporting member pivotally mounted in the inlet section, barometric means located outside of said inlet passage and connected to said member for positioning said member, a thermostatic element fixedly secured at one end to said member and having its other end connected to said regulating valve by a link inclined to the axis of said valve and adapted to maintain continuous light engagement between the complementary walls of said regulating valve and said fuel inlet, a throttling valve projecting into said depression, a throttle valve beyond said depression and means connecting said throttling valve with said throttle valve operable upon actuation of the latter during idle and light load operations to cause said throttling valve to concentrate substantially all the air flowing through the mixing passage and to deflect the same into said depression, and progressively to open said throttling valve as the throttle valve is progressively moved from idle toward wide open position.

In testimony whereof, I have signed my name to this specification.

MERL R. WOLFARD.