H. B. SIMMONS.

CARBURETOR.

APPLICATION FILED APR. 12, 1917.

**1,418,100.** **Patented May 30, 1922.**

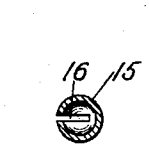



Fig. VII.

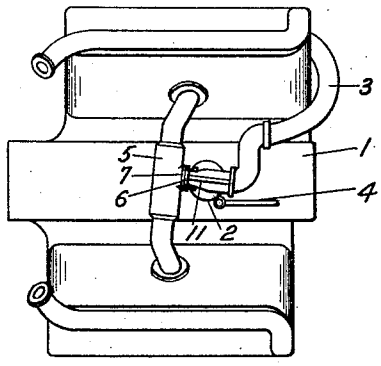



Fig. I.

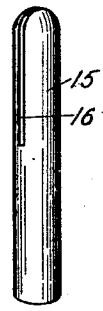



Fig. VI.

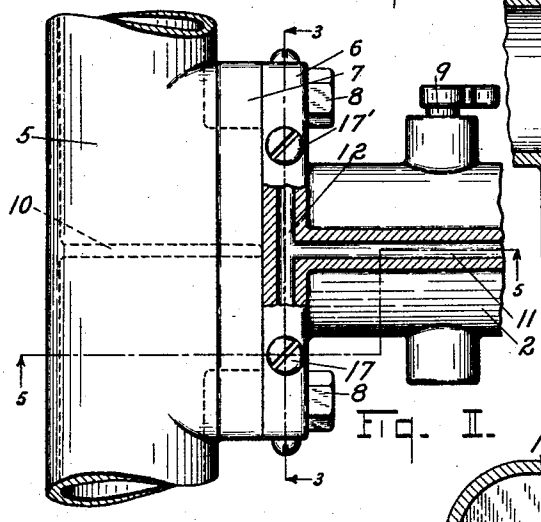



Fig. II.

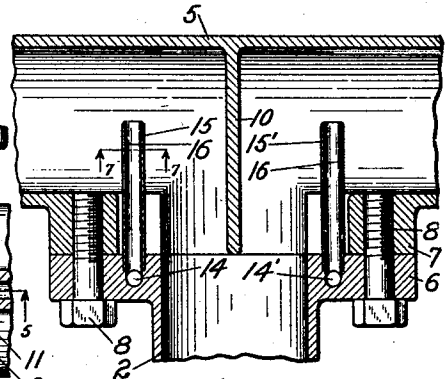



Fig. IV.

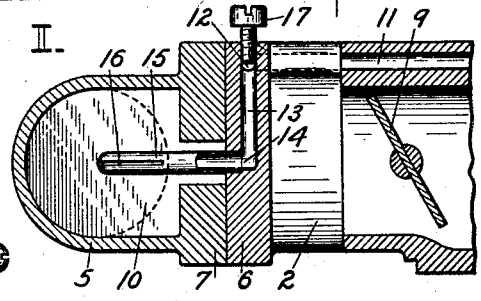



Fig. V.

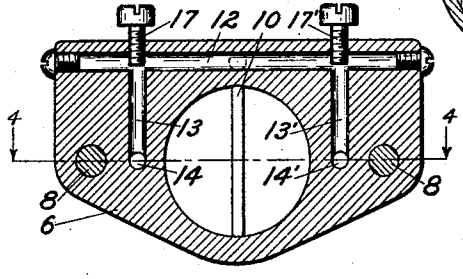



Fig. III.

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# UNITED STATES PATENT OFFICE.

HOWARD B. SIMMONS, OF TOLEDO, OHIO.

## CARBURETOR.

1,418,100. Specification of Letters Patent. Patented May 30, 1922.

Application filed April 12, 1917. Serial No. 161,509.

*To all whom it may concern:*

Be it known that I, HOWARD B. SIMMONS, a citizen of the United States, residing at Toledo, county of Lucas, State of Ohio, have invented new and useful Improvements in Carburetors, of which the following is a specification.

This invention relates to hydro-carbon motors for motor vehicles and more particularly to the means for equalizing the mixture and flow of gas to each side of a V type motor.

The principal object of this invention is to provide regulated air inlet ports to the intake manifold, independent of a carburetor inlet, for the purpose of equalizing the mixture and flow of gas to each side of a V type motor. Another object is to provide a common auxiliary air inlet port, the same forming a T and delivering air to each side of a divided intake manifold. Another object is to regulate the volume of air delivered to either side of the divided manifold. Another object is to deliver air to the manifold by such means that the volume of air will be equally broken up and mixed with the incoming charge of gas.

Further objects, and objects relating to economies of manufacture, and details of construction, will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification and my invention is clearly defined and pointed out in the appended claims.

A structure constituting a preferred embodiment of my invention is illustrated in the accompanying drawing, forming a part of this specification, in which:

Figure 1 is a plan view of a V type motor, showing a preferred form of my invention applied thereto;

Figure 2 is an enlarged fragmentary plan view of an intake manifold and carburetor showing the auxiliary air inlet passage in section;

Figure 3 is a sectional view, taken on line 3—3 of Figure 2 showing the carburetor flange and arrangement of auxiliary air inlet ports;

Figure 4 is a sectional view taken on line 4—4 of Figure 3 showing the divided manifold and air inlet ports;

Figure 5 is a sectional view taken on the broken line 5—5 of Figure 2 showing further details of the manifold and air inlet ports;

Figure 6 is a perspective view of one of the inlet pipes; and

Figure 7 is a sectional view taken on line 7—7 of Figure 4.

In the drawings, similar reference characters refer to similar parts throughout the several views and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Considering the numbered parts of the drawings; the motor is illustrated diagrammatically as by 1, and the carburetor 2 is connected with the usual air intake 3 and gasoline intake 4. I provide the usual intake manifold 5, the same being connected with the carburetor 2 by the carburetor flange portion 6 and the intake manifold flange 7. The carburetor is held in position by the bolts 8 and has the usual throttle valve 9.

It has been found in the operation of V type motors that owing to the imperfection of manufacture, or to the wear of the various parts, or to the leakage of the valves, that both sides of the motor will not work at full efficiency on the same mixture of gas. With the common intake manifold and carburetor, as heretofore applied to this type of motor, there has been no provision made for regulating the mixture of gas as it is drawn into either side of the motor. To eliminate this objection, I provide a partition 10 in the intake manifold 5, and regulated auxiliary air inlet ports to either side of the divided manifold as will be hereinafter described.

To regulate the mixture of gas, I provide a common auxiliary air inlet port 11, the same being connected at one end with the air inlet 3 to the carburetor and the other end to the port 12 being in transverse relation to the inlet port 16. On each side of the gas inlet port to the manifold, I provide ports 13 and 13′, which connect with the port 12 at one end and at the other end with ports 14 and 14′, the latter ports delivering air to the intake manifold 5 on opposite sides of the partition 10. While the ports leading to the manifold may be of any desired form or shape, I preferably provide

slotted air inlet pipes 15 and 15′, the same being secured at one end to the flange portion 6 of the carburetor and connecting with the inlet ports 13 and 13′. The end of the pipes 15 and 15′ extending into the manifold are slotted at 16, it being found that this form of pipe has a tendency to break up the volume of air as it is mixed with the incoming gas.

To regulate the volume of air from the auxiliary air inlet as it is drawn in either side of the divided manifold I provide adjusting screws 17 and 17′ in the port 12, the same being located on opposite sides of the common auxiliary air inlet port 11. By different adjustments of the screws 17 and 17′ a wide variation in the volume of air delivered to either side of the manifold may be secured. If desired, the port leading to one side of the intake manifold may be completely closed, and the other adjusted so that a small amount of air may be drawn into the manifold thus correcting the mixture of gas for both sides of the motor as may be required for proper working conditions. It may be desirable to draw additional air through the auxiliary air inlet port to both sides of the manifold, so regulating the ports that each side of the motor will draw a proper mixture of gas.

From the above description it can be seen that the principal object of the invention, which is to equalize the mixture and flow of gas to each side of a V type motor, is admirably accomplished by the preferred form of embodiment described. If the mixture conducted to one side of the motor is too rich, the corresponding valve 17 or 17′ may be adjusted to permit more air to enter through the auxiliary air passage into the manifold thereby reducing the richness of the mixture. On the other hand, if the mixture to one side of the motor is not rich enough, the corresponding valves 17 or 17′ may be adjusted to reduce the volume of air passing through the auxiliary air passage into the corresponding side of the manifold. By these adjustments of the valves 17 and 17′ the mixture and flow of gas to each side of the motor may be regulated so that both sides of the motor will work at full efficiency.

It is also apparent that by using these valves 17 and 17′ in the auxiliary air passage, the adjustment of the usual needle valve (not shown) in the carburetor need not be adjusted as perfectly as is necessary in the absence of valves regulating the volume of air passing through an auxiliary air passage. This is true as the mixture of the air and fuel drawn into the motor may be regulated by the valves 17 and 17′ without any adjustment of the needle valve in the carburetor.

I am aware that the embodiment of my invention here shown and described is susceptible of considerable variation without departing from the spirit and scope thereof, and, therefore, I desire to claim the same broadly as indicated by the appended claims. I have found, however, that this particular embodiment is described from many standpoints and, therefore, I desire to claim the same specifically as well as broadly as will appear from the appended claims.

What I claim and desire to secure by Letters Patent is:

1. In a device of the class described, the combination with an intake manifold connected to both sides of a twin motor; of a carburetor connected to said manifold; a partition in said manifold opening for dividing the mixture of air and fuel from the carburetor and directing it to both sides of the motor; and means for supplying auxiliary air to the manifold opening on either side of said partition.

2. In a device of the class described, the combination with an intake manifold, connected to both sides of a twin motor, and having an opening in the side thereof; of a carburetor having a mixing chamber opening into said opening in the manifold; a partition in said manifold equally dividing said opening for dividing the mixture of fuel and air from the carburetor and directing it to both sides of the motor; and means for supplying auxiliary air to the manifold on either side of said partition.

3. In a device of the class described, the combination with an intake manifold connected to both sides of a twin motor and having an opening in the side thereof; of a carburetor connected to said manifold; a partition in said manifold for dividing the mixture of air and fuel from the carburetor and directing it to both sides of the motor; means for supplying auxiliary air to the manifold on either side of said partition; and means for regulating the volume of auxiliary air passing into the manifold on each side of the partition.

4. In a device of the class described, the combination with an intake manifold, connected to both sides of a twin motor, and having an opening in the side thereof; of a carburetor having a mixing chamber opening into said opening in the manifold; a partition in said manifold equally dividing said opening for dividing the mixture of fuel and air from the carburetor and directing it to both sides of the motor; and means upon the carburetor for supplying auxiliary air to the manifold at either side of said partition.

5. In a device of the class described, the combination with an intake manifold, connected to both sides of a twin motor, and having an opening in the side thereof; of a carburetor opening into said opening in the manifold; a partition in said manifold di-

viding said opening for dividing the mixture of fuel and air from the carburetor and directing it to both sides of the motor; an air passage through the wall of the carburetor having oppositely extending ports for supplying to the manifold auxiliary air to either side of said partition; and a screw valve in each of said ports for regulating the volume of auxiliary air passing into each side of the manifold.

6. In a device of the class described, the combination with a manifold connected to both sides of a twin motor; of a carburetor for supplying a mixture of air and fuel to both sides of the motor through said manifold; means for supplying auxiliary air to the mixture before passing through the manifold to each side of the motor; and means for regulating the auxiliary air supply to each side of the motor.

7. In a device of the class described, the combination with a manifold pipe extending transversely of and connected to both sides of a twin motor and having an opening in the side thereof, a carburetor connected to said pipe and communicating with said opening, a partition in the pipe for dividing the mixture of air and fuel from the carburetor and directing it to both sides of said pipe and means for supplying varying quantities of auxiliary air to the opposite sides of the partition from the main air supply of the carburetor.

8. In a device of the class described, the combination with a manifold pipe extending transversely of and connected to both sides of a twin motor and having an opening in the side thereof, a carburetor connected to said pipe and communicating with said opening, a partition in the pipe for dividing the mixture of air and fuel from the carburetor and directing it to both sides of said pipe, and means for supplying auxiliary air to the manifold on either side of the partition.

9. In a device of the class described, the combination with an intake manifold connected to both sides of a twin motor, a carburetor connected to said manifold, and a tube extending from the inlet of said carburetor transversely into said manifold and having a laterally extending opening therethrough for delivering an auxiliary supply of air to the manifold.

10. In a device of the class described, the combination with an intake manifold, connected to both sides of a twin motor, of a carburetor connected to said manifold, a tube connected to the carburetor intake and extending transversely into said manifold and having a laterally extending opening therethrough for delivering an auxiliary supply of air to the manifold from said intake, and means for regulating the supply of air to said tube.

11. In a device of the class described, the combination with an intake manifold connected to both sides of a twin motor, a carburetor connected to said manifold, a partition in said manifold for dividing the mixture of air and fuel from the carburetor and directing it into both sides of the motor, and a tube projecting into the manifold upon each side of the partition for supplying auxiliary air to said manifold.

12. In a device of the class described, the combination with an intake manifold, connected to both sides of a twin motor, of a carburetor connected to said manifold, a partition in said manifold for dividing the mixture of air and fuel from the carburetor and directing it to both sides of the motor, a tube projecting into the manifold upon each side of the partition for supplying auxiliary air to said manifold, and means for regulating the supply of air to said tubes.

13. In a device of the class described, the combination with an intake manifold having branches leading to a plurality of gas engine cylinders, a carburetor connected to said manifold and having a main air supply passage leading thereto, and an auxiliary air passage leading from said main air supply passage to each of said branches.

14. In a device of the class described, the combination with an intake manifold having branches leading to a plurality of gas engine cylinders, a carburetor connected to said manifold and having a main air supply passage leading thereto, an auxiliary air passage leading from said main air supply passage to each of said branches, and means for regulating the amount of air supplied through said auxiliary passage to each of said branches.

15. The method of forming a mixture for an internal combustion engine provided with a carburetor and an intake manifold which consists in withdrawing a portion of the main charge of air which is used as an element to form the mixture in the carburetor, conducting this withdrawn air to different sections of the manifold and mixing the same with the fuel.

16. The method of forming a mixture for an internal combustion engine provided with a carburetor and an intake manifold which consists in withdrawing a portion of the main charge of air as it enters the carburetor, conducting this withdrawn air to different sections of the manifold and mixing the same in desired amounts with the fuel as it passes through the manifold.

17. The method of forming mixtures for the various cylinders of a multiple cylinder internal combustion engine provided with a carburetor and an intake manifold which consists in withdrawing a portion of the air being supplied to the

carburetor, conveying it around the carburetor, and admitting it in regulated amounts to sections of the manifold supplying different cylinders.

18. The method of forming proper mixtures for the various cylinders of a multiple cylinder internal combustion engine having a carburetor and an intake manifold which consists in withdrawing a portion of the air supply to said carburetor, conveying this air around the carburetor to different sections of the manifold and regulating the relative flow thereof to said sections.

In witness whereof I affix my signature.

HOWARD B. SIMMONS.