E. J. HALL.

CARBURETER.

APPLICATION FILED MAY 15, 1911.

1,212,478. Patented Jan. 16, 1917.

Fig. 2.

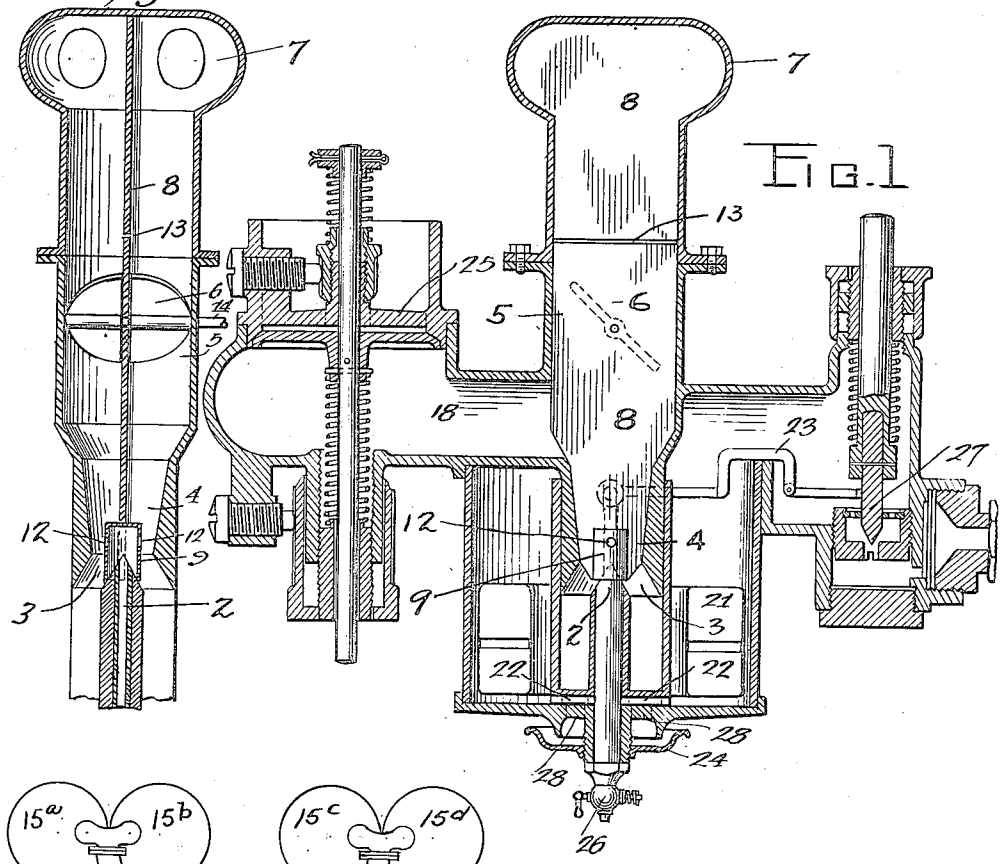


Fig. 1

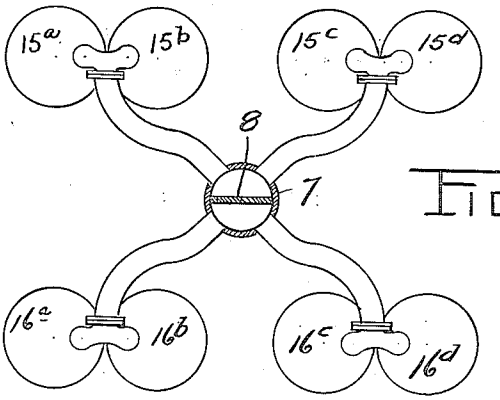


Fig. 3

WITNESSES

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CARBURETER.

1,212,478. Specification of Letters Patent. Patented Jan. 16, 1917.

Application filed May 15, 1911. Serial No. 627,159.

To all whom it may concern:

Be it known that I, ELBERT J. HALL, a citizen of the United States, and a resident of West Berkeley, county of Alameda, and State of California, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

The invention relates to carbureters which are employed in connection with internal combustion engines, and more particularly to carbureters which are employed in connection with engines having six, eight, or more cylinders.

The object of the invention is to provide a carbureter which will supply an equal charge of hydrocarbons to each cylinder of the engine.

Another object of the invention is to provide a carbureter having two hydrocarbon inlets and one air inlet, the hydrocarbon inlets being arranged so that an equal amount of hydrocarbon passes through each inlet.

Another object of the invention is to prevent one cylinder of the engine from drawing too rich a mixture from the carbureter and thereby causing another cylinder to draw too poor a mixture.

In engines having six or more cylinders, the valve of one cylinder at least is open all the time, and at times two of the valves are open at the same time, so that two cylinders are drawing hydrocarbons from the carbureter at one time. This overlapping of the valves has provided many disadvantages which it is the object of the present invention to overcome.

The valve on one cylinder, in which the piston is just beginning its stroke opens before the valve on another cylinder, in which the piston is just ending its stroke closes. The suction of the cylinder about to close is greater than that in the cylinder just opened, so that the first cylinder open will draw the hydrocarbons from the intake pipe of the latter cylinder and cause such cylinder to draw a poor mixture, or perhaps only air, until the first cylinder closes. This effect is not very evident when the carbureter valve is only slightly open because the high vacuum which exists in the carbureter and the intake pipes at such times prevents the action to any marked degree. When the valve is wide open or almost wide open, the pressure in the carbureter and intake pipes is substantially atmospheric, and having no vacuum to pull against, the first cylinder open will draw the gas from the carbureter to the detriment of the cylinder next opening. I overcome these difficulties by dividing the carbureter into two parts by a vertical wall, and arrange the hydrocarbon inlets so that an equal supply of hydrocarbon is fed to each side of the carbureter. The intake pipes for each set of cylinders are connected on opposite sides of this wall, so that the valves on the cylinders connected to one side do not overlap. The result is practically two carbureters with one air inlet and one hydrocarbon inlet in each carbureting chamber.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings and particularly pointed out in the appended claims, it being understood that various changes in the construction and the details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

Referring to the drawings: Figure 1 is a vertical section taken through the carbureter at right angles to the valve, Fig. 2 is a vertical section at right angles to that shown in Fig. 1, taken through the Venturi tube, the mixing chamber and the manifold. Fig. 3 is a diagrammatic representation of an eight cylinder engine showing the method of connecting the carbureter thereto.

The carbureter may be of any desired form, and in the drawings I have shown a particular form of carbureter constructed in accordance with my invention. The carbureter shown comprises a float chamber 20 in which is arranged an annular float 21 which is connected to the hydrocarbon inlet valve 27 by the lever 23. Arranged below the float chamber is a drip cup 24 which is used in priming the engine. A cock 26 is arranged at the bottom of the hydrocarbon nozzle 2, for the purpose of draining the carbureter. The hydrocarbon passes from the float chamber 20 into the nozzle 2

through the passages 22 arranged at the bottom of the float chamber. The primary air enters the carbureter around the drip cup and passes upward through the apertures 28 and into the air inlet tube 3 and Venturi tube 4. The auxiliary air enters the mixing chamber 5 through the valve controlled aperture 25 and the passage 18. Arranged in the mixing chamber 5 is the customary butterfly valve 6 for controlling the supply of mixture to the manifold 7 and consequently to the engine cylinders.

Arranged within the carbureter, and preferably at right angles to the valve 6, is the vertical wall 8 dividing the carbureter into two equal parts. This wall preferably extends through the manifold 7, the mixing chamber 5, and the Venturi tube 4 past the hydrocarbon inlet. A cylindrical portion 9 at the lower end of the wall is arranged to cover the hydrocarbon inlet, so that all the hydrocarbons entering the carbureter must first enter the cylinder 9. The cylinder is provided with similar apertures 12 on opposite sides of the wall, so that equal supplies of hydrocarbon are drawn into each chamber. The air entering the Venturi tube is divided by the wall 8 into equal parts, so that a similar mixture occurs in each chamber.

The central wall 8 is preferably made in two parts, which are spaced apart a slight distance so that an aperture 13 occurs in the wall, preferably above the valve 6. This aperture 13, connecting the chambers on opposite sides of the wall balances the gas supply when the engine is throttled down and a high vacuum exists in the carbureter. When running with the valve full open, the aperture has no effect, it being useful only when the gas is being drawn off in small quantities.

When the dividing wall 8 is arranged at right angles to the valve 6, the valve must be split, so that half lies on each side of the wall. The rod 14 carrying the valve passes through the wall and projects from the carbureter, so that the valve may be operated.

In Fig. 3 I have shown the carbureter as connected to an eight cylinder V-engine in which the cylinders on opposite sides are placed at approximately a right angle to each other. It is not necessary that the cylinders be arranged in this method, as they may be arranged in a straight line and the same result accomplished. The cylinders 15^a—15^b—15^c—15^d forming one set are connected to the manifold 7 on one side of the wall 8, and the cylinders 16^a—16^b—16^c—16^d are connected on the other side. The result is practically two four cylinder engines, each provided with a carbureter. As there is no overlapping of the valves in the four cylinder engine, there is only one cylinder drawing at one time on one side of the dividing wall. This prevents any cylinder from robbing another cylinder of its proper supply of gas.

I claim:

1. The combination with a carbureter and a manifold, of means for dividing both the carbureting chamber and the manifold into two independent chambers each of which chambers has independent connection for supplying gas to one or more cylinders of an engine.

2. In a carbureter, a hydrocarbon inlet, a vertical wall provided at its lower end with a cylindrical portion adapted to cover the hydrocarbon inlet, said cylindrical portion being provided with apertures on opposite sides of said wall, and an air inlet concentric with said cylinder.

3. In an internal combustion engine, a carbureter, a manifold connected to said carbureter and to which the hydrocarbon conductors are connected and a vertical wall dividing said manifold into two independent chambers and extending from the top of the manifold downwardly into the carbureter to a point adjacent the hydrocarbon inlet therein.

4. The combination with a carbureter and manifold, of a butterfly valve arranged to control the passage of carbureted mixture through the manifold, and a vertical wall arranged within said carbureter and manifold and extending for the length of the manifold arranged at right angles to the axis of the valve, half of said valve being disposed on each side of said wall.

5. The combination with a carbureter and a manifold attached thereto, of a central vertical wall dividing the manifold and carbureting chamber into two parts and extending downwardly below the hydrocarbon inlet, a hydrocarbon inlet, an air inlet adjacent said hydrocarbon inlet and means into which said hydrocarbon inlet discharges for causing an equal feed of hydrocarbon to the two chambers on opposite sides of the wall.

6. The combination with a carbureter and manifold, of a vertical central wall dividing the carbureting chamber and manifold into two separate chambers, said wall being provided with a small aperture at that portion which lies in the manifold.

7. The combination with an internal combustion engine having six or more cylinders, of a carbureter having a carbureting chamber, a manifold connected to the carbureting chamber, an apertured vertical wall dividing the carbureting chamber and the manifold into two separate chambers, and conductors connecting the cylinders with the separate chambers.

8. The combination with an internal combustion engine having cylinders in which the time of opening of the inlet valves overlap, of a carbureter having a carbureting cham-

ber divided into two chambers by an apertured vertical wall, and conductors connecting each cylinder with one or the other of the carbureting chambers in such manner that only one of the inlet valves in the cylinders connected to one chamber is open at one time.

9. In a carbureter provided with a valve, a hydrocarbon inlet and a Venturi tube, a central vertical wall arranged at right angles to the axis of the valve, and a hollow cylindrical portion fixed to the lower edge of the wall and overlying the hydrocarbon inlet, said cylinder being of less diameter than the Venturi tube and being provided with apertures opening on opposite sides of the wall.

ELBERT J. HALL.

Witnesses:
H. G. PROST,
P. S. PIDWELL.