Nov. 25, 1969 A. S. KHACHIJAN ETAL 3,480,418

CARBURETOR

Filed July 19, 1965 2 Sheets-Sheet 1

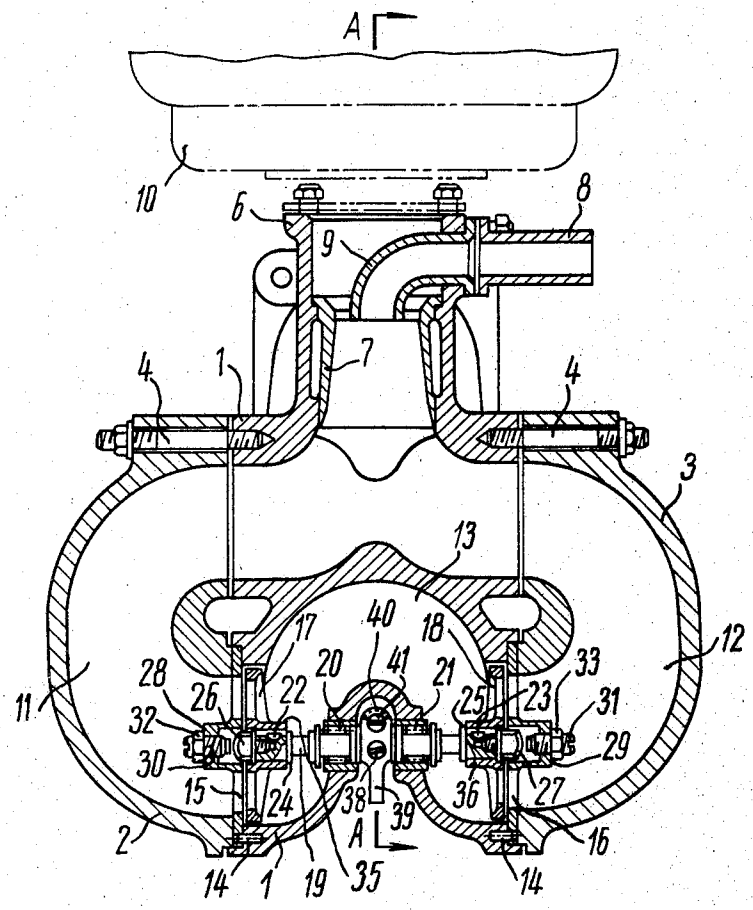

FIG. 1

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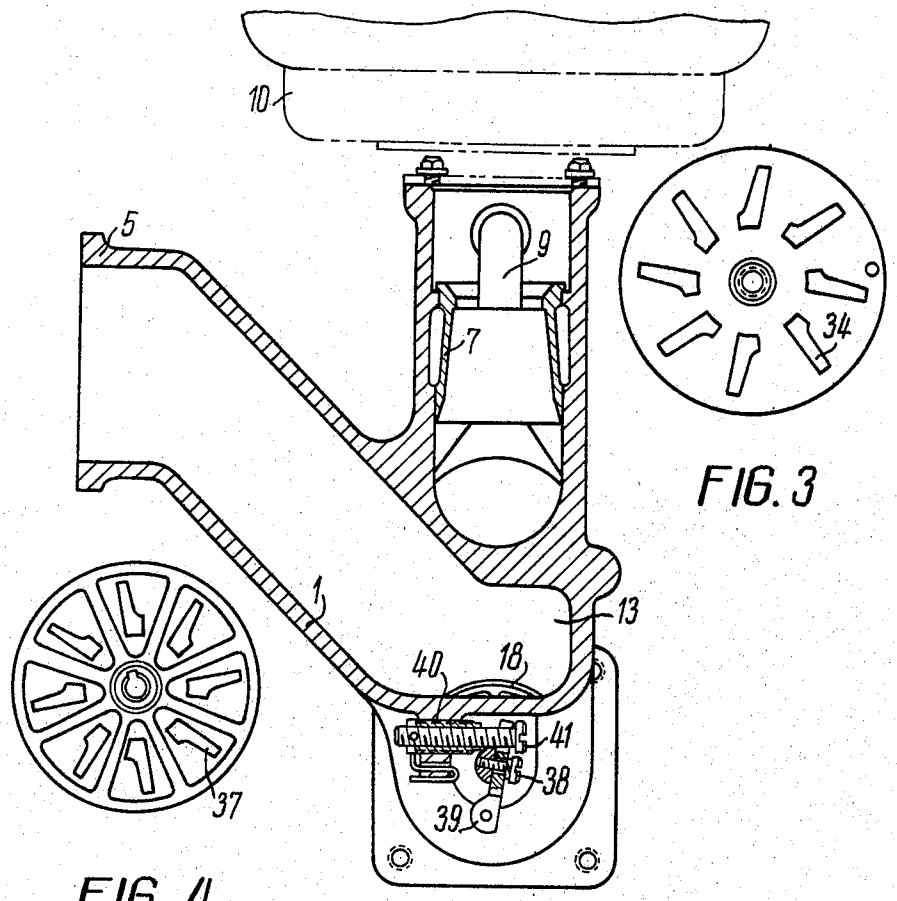

FIG. 3

FIG. 4

FIG. 2

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CARBURETOR

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ABSTRACT OF THE DISCLOSURE

A carburetor having a body with symmetrical curvilinear channels leading from an inlet for fuel-air mixture to an outlet for fuel-air mixture, there being two symmetrical slide valves coupled together and positioned in respective channels for controlling flow of fuel-air mixture from the inlet to the outlet, each slide valve being composed of a fixed diaphragm with shaped slots therein and an adjacent rotatable choke also with slots therein which register with the slots in the diaphragm.

The present invention relates to carburetors with a throttle device used, for example in gasoline engines.

Known at present are gasoline carburetors having a throttle device in the form of an adjustable elliptical choke. Although simple and reliable in operation, said carburetors are not suitable for those gasoline engines which require automatic precision control of speed, since their throttle device is of low response, readily unbalanced in the fuel flow, has an inadequate relationship of passage section in the throttle device to the angle of turn of the choke, and a relatively wide required angle of turn of the choke. The latter circumstance causes excessive bulkiness of the elements connected with the choke coupling, especially when the stroke of said coupling is limited.

All attempts to overcome these disadvantages have so far met with no or little success, whereas we have successfully solved the problem and conceived practical embodiment.

The primary object of this invention is to produce a gas carburetor with a throttle device having precision control of fuel flow at all engine speeds.

Another object of this invention is to relieve the throttle device from the action of dynamic forces from the fuel flow.

It is still another object of this invention to make the coupling elements of the throttle device of compact construction.

As a result, it is possible to materially increase the degree of precision of the engine speed adjustment.

It has now been found that the use of the proposed carburetor makes it possible to use the throttle device of a basic diesel in a gasoline engine without any deterioration of precision automatic speed control.

In accordance with the aforementioned and other objects, this invention contemplates a carburetor which comprises a body having an inlet and an outlet for a fuel-air mixture, said body further having two channels leading from the inlet to the outlet in symmetrical disposition in said body, and throttle means in said body including two symmetrical slide valves coupled together and positioned in a respective channel for controlling flow of fuel-air mixture in said channels from the inlet to the outlet.

Other objects and advantages of this invention will be understood from the following description and accompanying drawing, wherein:

FIG. 1 shows a gas carburetor of the invention in longitudinal section;

FIG. 2 is a section along line A—A of FIG. 1;

FIG. 3 is a plan view of a diaphragm of the slide valve of the carburetor; and

FIG. 4 is a plan view of the choke of the slide-valve.

The gas carburetor is comprised of a body of three sections, i.e., a central section **1**, and two equal and symmetrically positioned lateral sections **2**, **3**. Lateral sections **2**, **3** of the body are detachably fixed to central section **1** with studs **4**. Central section **1** is connected to the inlet manifold of the engine by outlet branch **5**, whose axis lies in the symmetry plane of the body. Inlet branch **6** of central section **1** of the body houses a diffusor **7** into which fuel is fed via pipe **8** and elbow branch **9**. At the inlet of branch **6** is installed an air filter **10**. The inside cavities of central section **1** and lateral sections **2**, **3** of the body form two curvilinear channels **11**, **12** beginning at the outlet of the inlet branch **6** and terminating in cavity **13** which is connected to outlet branch **5**.

Channel **11** is a mirror reflection of channel **12**.

At the outlet of channels **11**, **12** is installed a throttle device incorporating two controllable disk slide valves, one of which is a mirror reflection of the other. The slide valves, in turn, comprise diaphragms **15**, **16** which are fixed with pins **14** to the body between central section **1** and lateral section **2**, **3**. Additionally the slide valves comprise chokes **17**, **18** which are supported in spaced relation from diaphragms **15**, **16** and are rigidly connected to shaft **19** which is rotatable in needle bearings **20**, **21**.

Channels **11**, **12** and the disk slide valves are positioned symmetrically to each other with regard to the symmetry plane of the body.

Chokes **17**, **18** are fixed against turning by keys **22**, **23** and are clamped to ring projections **24**, **25** of shaft **19** with screws **26**, **27**.

Diaphragms **15**, **16** are constructed as disks with bushes **28**, **29** which are internally threaded. In bushes **28**, **29** are engaged bolts **30**, **31** with nuts **32**, **33**, which serve as axial stops of shaft **19**. By turning bolts **30**, **31** the clearances are adjusted between diaphragms **15**, **16** and chokes **17**, **18**.

The disks of diaphragms **15**, **16** have shaped slots **34** uniformly distributed along their circumference (FIG. 3).

Chokes **17**, **18** are constructed as disks with bushes **35**, **36** having shaped slots **37** uniformly distributed along their circumference (FIG. 4) similar to slots **34** in diaphragms **15**, **16**. Slots **34**, **37** are shaped so as to rectify the throttle characteristic and to reduce the torque applied to chokes **17**, **18** in the fuel flow and transmitted to the throttle bush.

With a sufficient number of slots (eight in number in FIGS. 3 and 4), the required angle of choke turn will be decreased and hence the total mass of the elements of the throttle device will also be reduced.

Fixed by screw **38** to shaft **19**, between chokes **17** and **18**, is a dog **39**, by which shaft **19** carrying disks **17** and **18** is actuated by the engine-speed control device.

The travel of dog **39** is limited by the end of threaded bush **40** and the head of a screw **41** screwed into said bush.

In operation, fuel and air are sucked into the carburetor as a partial vacuum is created in the engine inlet system. In diffusor **7** the fuel is mixed in the air.

The fuel-air mixture flows in two streams via channels **11**, **12** from two opposite sides to the throttle device.

Since channels **11**, **12** and the disk slide valves are positioned symmetrically to each other with regard to the symmetry plane of the body, whereas the passage sections of both slide valves are equal irrespective of the position of dog **39** and moreover since one slide valve is a mirror reflection of the other, and channel **11** is a mirror reflection of channel **12**, chokes **17**, **18** will be acted upon by equivalent axial counterforces, and hence the throttle device will acquire the necessary responsiveness.

Depending on the degree to which chokes **17**, **18** are rotated by shaft **19**, the degree of registry of the slots on the chokes and diaphagm will be controlled and hence a varying amount of fuel-air mixture will pass through the throttle device into cavity **13**, wherefrom it proceeds via outlet branch **5** into the engine inlet manifold. The degree to which the passage section through the slots is opened will depend on the position of dog **19**.

Although this invention has been described in connection with the preferred embodiment thereof, modifications and variations may be made without departing from the spirit and scope of the invention as defined in the appended claims.

We claim:

1. A carburetor comprising a body having an inlet and an outlet for a fuel-air mixture, said body further having two channels leading from the inlet to the outlet in symmetrical disposition in said body, and throttle means in said body including two symmetrical slide valves coupled together and positioned in a respective channel for controlling flow of fuel-air mixture in said channels from the inlet to the outlet.

2. A carburetor as claimed in claim **1**, wherein each said slide valve comprises a fixed diaphragm and a rotatable choke adjacent the diaphragm, said choke and diaphragm having shaped slots therein which register with one another.

3. A carburetor as claimed in claim **2**, wherein said throttle means comprises a rotatable shaft connected to the choke of each slide valve for rotating the same in concurrence, and a dog, on said shaft for rotating the same, to control the throttle means and the flow of the fuel-air mixture.

4. A carburetor as claimed in claim **3**, wherein said choke and diaphragm are each of disk shape, said diaphagm including an internally threaded bush and a bolt in said threaded bush serving as an axial stop for said shaft.

5. A carburetor as claimed in claim **1**, wherein said body is constituted of a plurality of detachably connected portions, and said channels are curvilinear and are formed by cavities provided in the sections.

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