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Olati

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[54] **CARBURETOR FOR INTERNAL COMBUSTION ENGINES**

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[30] **Foreign Application Priority Data**

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[52] **U.S. Cl.** .....**261/95,** 261/96, 261/99, 261/69 R, 251/212

[51] **Int. Cl.**.....**F02m 17/28**

[58] **Field of Search**.....261/99, 95, 96, 104, 261/107, 69 R; 251/212; 123/133, 135

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[57] **ABSTRACT**

A very fine subdivision of the gasoline in a carburetor and complete combustion are achieved by means of a microporous body, prepared from sintered granulated iron. The microporous body is placed in a tank which is connected with a suction duct for the flow of air. The microporous body is longitudinally crossed by a slot, provided with cylindrical columns made of porous materials. The microporous body and the columns are soaked in gasoline. The gasoline flows through a hole, the opening of which is regulated by the vertical oscillatory motion of a conical needle, the motion being provided by a diaphragm and by an adjustable spring. On the opposite side of the suction duct, is a gate constituted of two bulkheads, the opening and closing of which are controlled by the accelerator. Air touches the surface of the columns on which are formed microscopic myriads of gasoline drops and a fine mist is formed.

6 Claims, 5 Drawing Figures

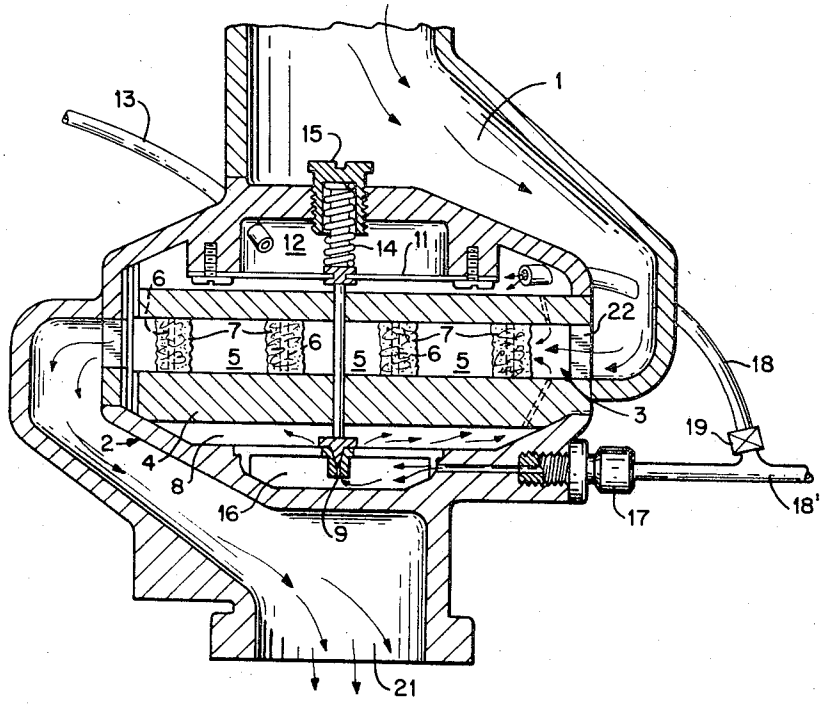


FIG. 1

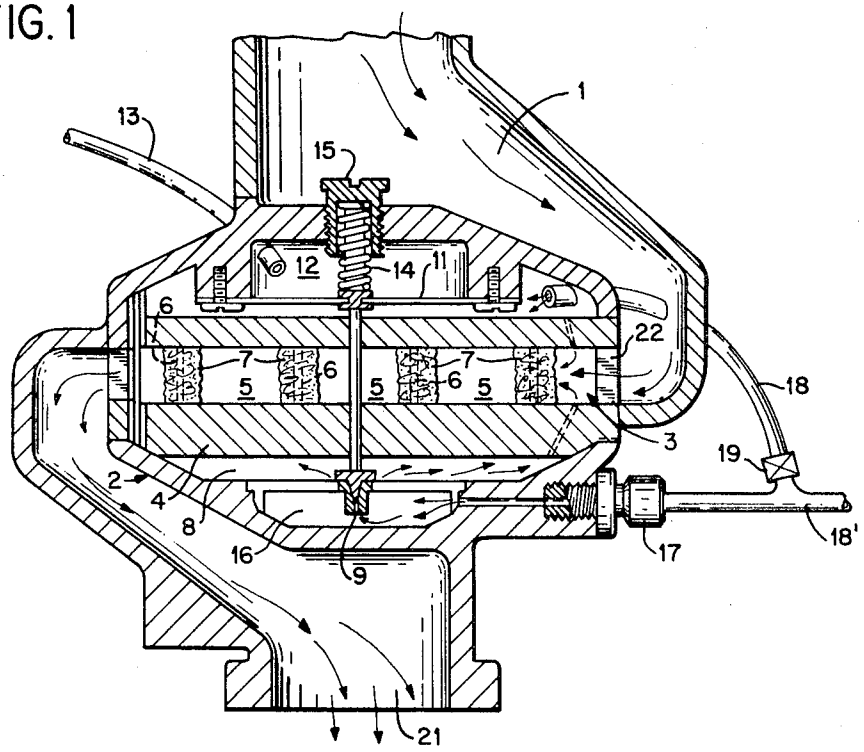


FIG. 2

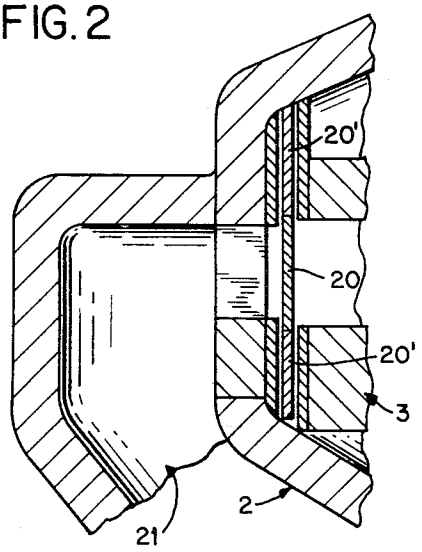


FIG. 3

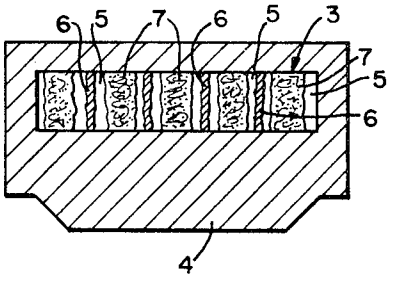


FIG. 4

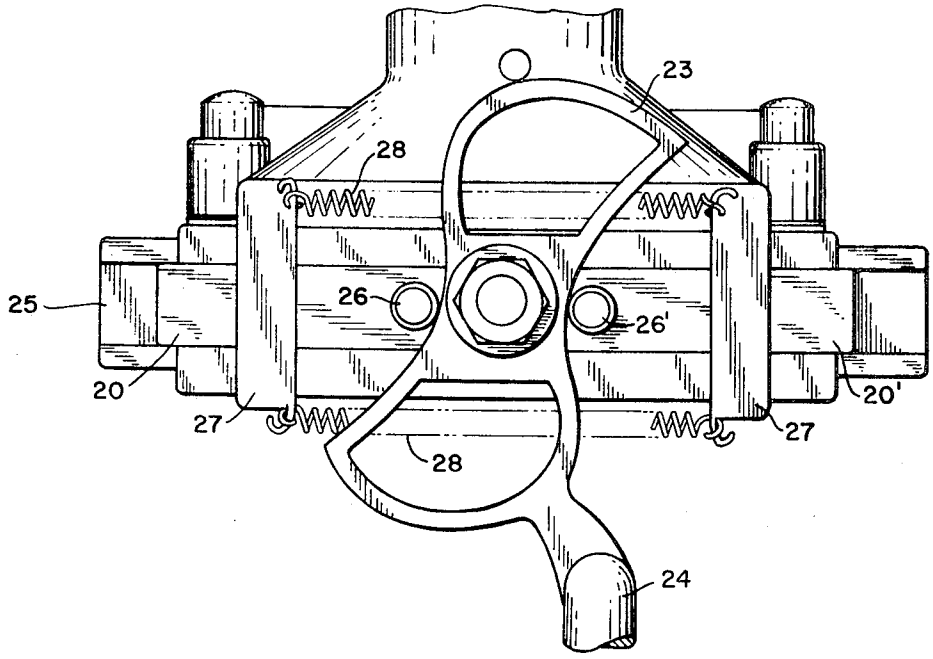
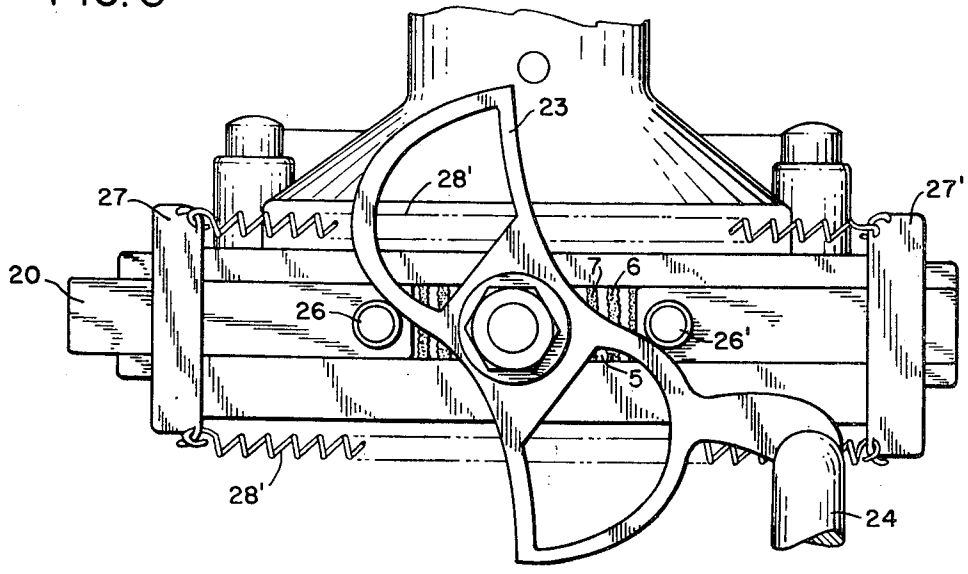


FIG. 5



CARBURETOR FOR INTERNAL COMBUSTION ENGINES

This invention relates to an improved carburetor for internal combustion engines.

More particularly, this invention relates to an improved carburetor for internal combustion engines, in which the combustible mixture is formed by atomization of the fuel.

As it is well known, the internal combustion engines require for their operation a suitable fuel (gasoline) and combustion supporter (generally, air) mixture, which is compressed in the course of the operating cycle.

In order to obtain a proper combustion, it is necessary for the fuel to be subdivided as much finely as possible upon its atomization by the air in order to form the aforementioned mixture.

Said gasoline atomization has been obtained heretofore by special spray nozzles with which ordinary carburetors are provided.

This method does not enable, however, to obtain more than a certain degree of fuel "atomization" and provides further a mixture having characteristics being generally different in the various portions of the combustion chamber.

It occurs in practice that the aforementioned mixture shows zones being more or less rich in gasoline particles, the gasoline having a higher or lower concentration in the different portions of the mixture mass itself.

This fact makes a proper combustion of the mixture scarcely possible and leads both to the formation of toxic compounds, such as carbon monoxide, and the presence of unburnt gases.

In view of the foregoing, there is toxicity of the exhaust gases and in addition there occurs pollution of the atmospheric air, which is particularly serious in the cities with strong density of motor car population.

It is, therefore, a prime object of this invention to provide a novel carburetor, permitting to overcome the aforesaid inconveniences and to obtain an extremely fine subdivision of the gasoline.

It is a further object of this invention to provide a novel carburetor, permitting to obtain gasoline drops being on the micron magnitude order and a uniform dispersion thereof in the combustion supporter (air).

It is still another object of this invention to obtain an almost perfect fuel-combustion supporter mixture in order to avoid in the exhaust gases the presence of unburnt gases. These and still other objects of the invention are attained by using a carburetor provided with a particular microporous body soaked with fuel on which the air flow is caused to come.

Said microporous body consists preferably of ceramic and is obtained from a particular manufacturing process.

These and other features of an operational and constructional nature of the carburetor according to the present invention may be better understood from the following description with the aid of the various figures of the accompanying drawings, which represent a preferred but non-limiting embodiment form of this invention, in which:

FIG. 1 shows a schematic view of the side cross-section of the instant carburetor with a vertical plane;

FIG. 2 represents a detail of FIG. 1, namely a view of the side cross-section of the air-lock, regulating the outflow of the quantity of mixture from the carburetor;

FIG. 3 shows a schematic view of the front cross-section of the microporous body with which the instant carburetor is provided, with a vertical plane; and

FIGS. 4–5 represent a perspective front view of the device actuating both bulkheads building the air-lock in FIG. 2, in the closing and opening positions, respectively.

Referring now to the reference numerals of the various figures on the accompanying drawings, the improved carburetor for internal combustion engines according to the present invention is constituted of a suction duct 1 for the air proceeding from a filter, acting further as cover of the carburetor itself.

Said suction duct 1 is connected to a rectangularly shaped, small-sized tank 2 in which there is accommodated the microporous body 3.

The said microporous body is obtained with particles of synthetic iron having a high purity (at least 99.5 percent), suitably mixed and then sintered.

The specific porosity of the thus obtained material is determined by the mixing of particles of a suitable granulation, specially investigated for the specific use of the microporous body itself.

Said synthetic iron particles are accommodated in a special container 4, constituted of a stainless steel frame, inside which they reach a perfect compactness by means of a suitable vibratory motion and are then sintered. The container 4 is placed in the tank 2.

The aforementioned microporous body 3 is longitudinally crossed by a slot, showing a series of passageways 5, separated by metal walls 6.

Within the aforesaid passageways 5 there are provided cylindrical columns 7, consisting of porous material, which on account of their capillarity are soaked with gasoline, being conveyed to the gasoline containing chamber 8. The cylindrical columns of microporous material are placed within the tank 4. Container 4 forms a portion of the carburetor.

In said chamber 8 the gasoline arrives through the hole 9 by means of the vertical oscillatory motion of the conical needle 10, provoked by the diaphragm 11, constituting the lower surface of the depression chamber 12.

The depression in the chamber 12 is caused by the suction of the engine transmitted by the line 13, connecting thereto, and the closing position of the needle 10 on the hole 9 is maintained by the antagonistic spring 14, which is adjustable via the screw 15.

The fuel arrives in the tank 16 through the line 17, connected to a special pump.

There is further provided the possibility of conveying gasoline via the line 18, connected to the line 17 by means of a suitable thermostatic valve 19, directly on the upper part of the microporous body 3, should it be necessary to enrich the fuel mixture.

The instant carburetor is further provided on the opposite part relative to the suction duct 1 with a gate, constituted of the bulkheads 20 and 20' the opening or closing of which is controlled by the accelerator via a cam 23.

As may be seen in FIGS. 4 and 5, the cam 23 is provided with an oblique side arm 24, on which the lever of the accelerator pedal acts. The two bulkheads 20 and 20' can slide in the guide 25 and are provided with one ferrule 26 and 26' and a bar 27 and 27', respectively, perpendicular thereto.

At the ends of both bars **27** and **27'** there are connected two springs **28** and **28'** under tension, permitting to hold joined together the two bulkheads, and hence closed the gate.

The cam **23** acts on the two ferrules **26** and **26'**, and its shape is such as to impart said ferrules a rectilinear motion.

The opening of said gate by the displacement from the middle to the outside of the bulkheads **20** and **20'** puts progressively into communication a greater number of passageways **5** with the manifold **21**, conveying the mixture to the explosion chambers.

From the foregoing is now apparent the operation of the carburetor for internal combustion engines according to the present invention.

The air proceeding from the filter flows through the manifold **1** and reaches the slot **22** of the microporous body **3**.

By depressing the accelerator pedal, through the cam **23** the gate, constituted of the two bulkheads **20** and **20'** opens and a depression is determined over the diaphragm **11** which raises the needle **10**, thereby opening the gasoline admission nozzle.

The gasoline impregnates by capillarity the microporous body **3** and the cylindrical columns **7** provided in the passageways thereof.

The air passing therethrough slightly touches the surface of the aforementioned columns on which myriads of microscopical gasoline drops appear, incorporates the drops themselves and builds the mixture in the form of mist.

Said mixture enters through the manifold **21** the cylinders, where it is compressed and burnt during the explosion stage.

What I claim is:

1. A carburetor for internal combustion engines which comprises a duct for the introduction of air, a tank communicating therewith, a microporous body located in said tank, said microporous body being longitudinally crossed by a slot and having a plurality of passageways, metal walls separating the passageways, a plurality of columns in said passageways, said columns and said microporous body being integral therebetween, said microporous body and said columns being made of sintered high purity iron, means responsive to intake manifold vacuum for introducing the fuel and a chamber for the fuel, said chamber communicating with said passageways wherein the columns are located, whereby the drops of fuel form a mist on the surface of said columns and a mixture of fuel and air is formed, said passageways providing the means for conveying the mixture of fuel and air to the engine, means responsive to the accelerator and to the engine for controlling the number of said passageways which provide said mixture of air and fuel to the engine.

2. The carburetor according to claim **1** wherein a conical needle capable of a vertical oscillatory motion controls the flow of the fuel.

3. The carburetor according to claim **1** which is provided with means for admitting additional fuel to the upper part of the microporous body.

4. The carburetor according to claim **1** wherein the fuel droplets coming in contact with air are of size in the order of 1 micron.

5. The carburetor according to claim **1** wherein said means for controlling the number of passageways for the mixture of fuel and air is a gate consisting of two bulkheads and provided with ferrules engageable by camming means responsive to the accelerator and responsive to the engine, said ferrules being capable of performing a rectilinear motion from the center towards the exterior.

6. The carburetor according to claim **5** wherein said bulkheads are connected by springs.

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