Sept. 13, 1927. 1,642,332

C. CARLSSON

VENTURI FOR CARBURETORS

Filed Nov. 9, 1925

Fig. 1.

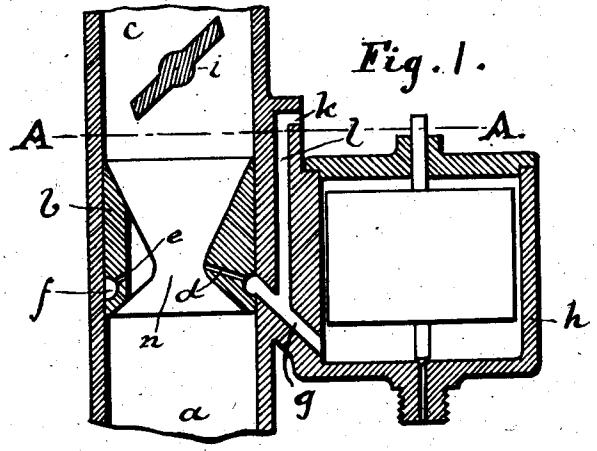


Fig. 3.

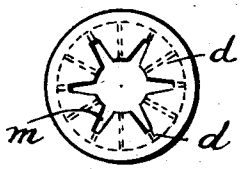


Fig. 2.

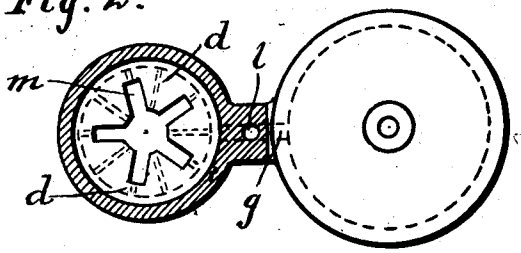


Fig. 4.



Fig. 6.

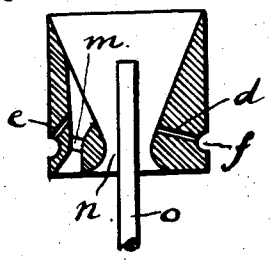
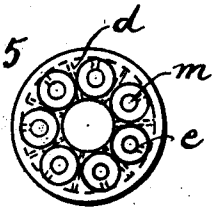


Fig. 5



Inventor

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UNITED STATES PATENT OFFICE.

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VENTURI FOR CARBURETORS.

Application filed November 9, 1925, Serial No. 67,862, and in Sweden November 29, 1924.

The present invention relates to a venturi, or a disperser for fluid fuel, designed for carburetors for internal combustion engines and the like, and is specially constructed for intimately mixing the fuel with air.

In venturis for carburetors of hereto used types, the mixing of the fuel with air is generally effectuated by the air passing along and around a nozzle, or inside a nozzle, provided with fuel supply holes, and thus sucking out the fuel. By this means the fuel enters the air in the shape of jets and is generally not sufficiently dispersed. Especially if the sucking is slight, the fuel is apt to be deposited as small drops on the wall of the tubing, conducting it to the motor, and to cause irregularities in the working of the latter.

The present invention purposes a construction, that abolishes this trouble of the fuel being deposited as drops, by dispersing the fuel in such a way, that every part of the air receives its share of the fuel. If the fuel is thus evenly distributed, the air is able to absorb it all, and no drops will be formed.

The invention is illustrated, by way of example, in the accompanying drawings, in which

Fig. 1 is a longitudinal section of an embodiment of the invention, placed in a carburetor,

Fig. 2 is a cross section of same, along the line A—A of Fig. 1, viewed from above,

Fig. 3 is a similar cross section of another embodiment,

Fig. 4 is a longitudinal section of a third embodiment.

Fig. 5 is the same embodiment, viewed from above, and

Fig. 6 is a longitudinal section of a fourth embodiment of the invention.

For the purpose set forth the venturi *b* of the invention is shaped as an exteriorly cylindrical ring, suiting the cylindrical inside of a carburetor, *a*, *c*, and interiorly hollowed out conically from both ends, forming a cavity *n*, narrowing towards the middle of said ring, as is shown in the Figs. 1, 4 and 6. In this narrower part of said ring *b* are cut out longitudinal channels *m*, in the shape of open grooves, Figs. 1, 4 and 3, of cylindrical or conical or double-conical holes, parallel to the axis of the ring or venturi, Figs. 1 and 4, or inclined towards this axis, Fig. 6, or sidewise inclined. When said channels are open grooves, they can have rectangular cross section, as in Fig. 2, or triangular or cut triangular cross section, as in Fig. 3, or semi-circular or other suitable cross section.

Further the venturi *b* is provided with two rows or tiers of fuel supply holes, *d*, *e*, piercing its wall, radially or nearly so, opening on the inside, one row into said longitudinal channels *m* and the other row directly into the interior cavity *n*, in the interstices between said channels *m*. These two rows of holes may be on the same level, Fig. 1, or on different levels, Figs. 4 and 6. The other ends of said fuel supply holes *d* and *e* open into an annular channel *f*, cut out in the outer cylindrical surface of the venturi. Further a central piece *o* Fig. 6, may be provided for the directing of the air, cylindrical, as in Fig. 6, or conical and axially movable.

The said annular channel *f* communicates with a fuel supply channel *g*, cut through the wall of the carburetor *a* and leading from a fuel supply tank *h* with, for instance, a float gage *p* to keep the fuel level constant. Said fuel supply channel *g* further communicates with an air inlet channel *l*, likewise cut out in the wall of the carburetor *a*, and with an opening *k* to the open air.

For the regulating of the air and fuel supply a throttle valve *i* may be provided in the tubing *c* to the motor.

The number of longitudinal channels *m*, and with these that of the fuel supply holes *d*, *e*, may be varied. Up to a certain limit a greater number increases the effect of the dispersing, but above this limit the said channels and holes become too small and are apt to be choked up.

The venturi according to the invention works in the following manner. The air enters from one end, at *a* in Fig. 1, and is, in the venturi, cut up into one central current and, by the longitudinal channels *m*, several peripheric small currents. By the vacuum, or suction, caused by the motor, or by the passing of the air currents, fuel is sucked out from the fuel supply holes *d*, *e*. The central current receives its share of fuel from one row, *d*, of fuel supply holes, and the several peripheric air currents receive each its share through one of the holes *e* of the other row. Thus the fuel is nearly evenly distributed in the air, each part of the air receiving its share of the fuel. At the

inner ends of the longitudinal channels *m* all the air currents meet and mix together, whereby the fuel is still better dispersed in the air, especially if said longitudinal channels *m* are inclined to the axis of the venturi, effecting a whirling motion of the air current.

The fuel supply channels *g* communicating with the outer air through the air inlet channels *l*, the fuel is already in the fuel supply holes *d*, *e* mixed with some air, which still further facilitates the dispersing of the fuel in the air currents.

If the fuel supply holes *d*, *e* are placed on different levels, the fuel will, if the suction is slight, be provided only through the holes of the lower level, which is a great advantage, as the air volume then being smaller requires less fuel. At an increase of the suction, or the velocity of the air current, the air volume also increases and additional fuel is sucked out through the higher row of fuel supply holes, the larger volume of air being capable of absorbing a greater quantity of fuel. The strength of the suction can be regulated to the requirement of the motor by the throttle valve *i*.

The fuel supply holes *d*, *e* may be arranged in different ways, without affecting the effectivity of the venturi. Thus either of the rows *d* or *e* may be placed on the higher or the lower level, or the holes in either or both rows may be alternately placed on different levels.

The invention is moreover susceptible of various changes in its form, proportions and minor details of construction, and the right is herein reserved to make such changes as properly fall within the scope of the appended claims.

Having described the invention, what I claim is:

1. A venturi for carburetors and the like, consisting of an exteriorly cylindrical ring, interiorly hollowed out by a double-conical cavity, and provided with longitudinal air channels communicating with said cavity, fuel supply holes piercing the wall of the venturi, said fuel supply holes being arranged in two rows, one of said rows opening into said longitudinal channels, and the other row directly into the narrower part of said double-conical cavity in the interstices between said longitudinal channels.

2. A venturi for carburetors and the like, consisting of an exteriorly cylindrical ring, interiorly hollowed out by a double-conical cavity, and provided with longitudinal air channels communicating with said cavity, fuel supply holes piercing the wall of the venturi, said fuel supply holes being arranged in two rows, one of said rows opening into said longitudinal channels, and the other row directly into the narrower part of said double-conical cavity in the interstices between said longitudinal channels, said two rows of fuel supply holes being arranged on different levels.

In testimony whereof I have hereunto affixed my signature.

CARL CARLSSON.