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3,437,467

AIR INJECTOR FOR A CARBURETOR

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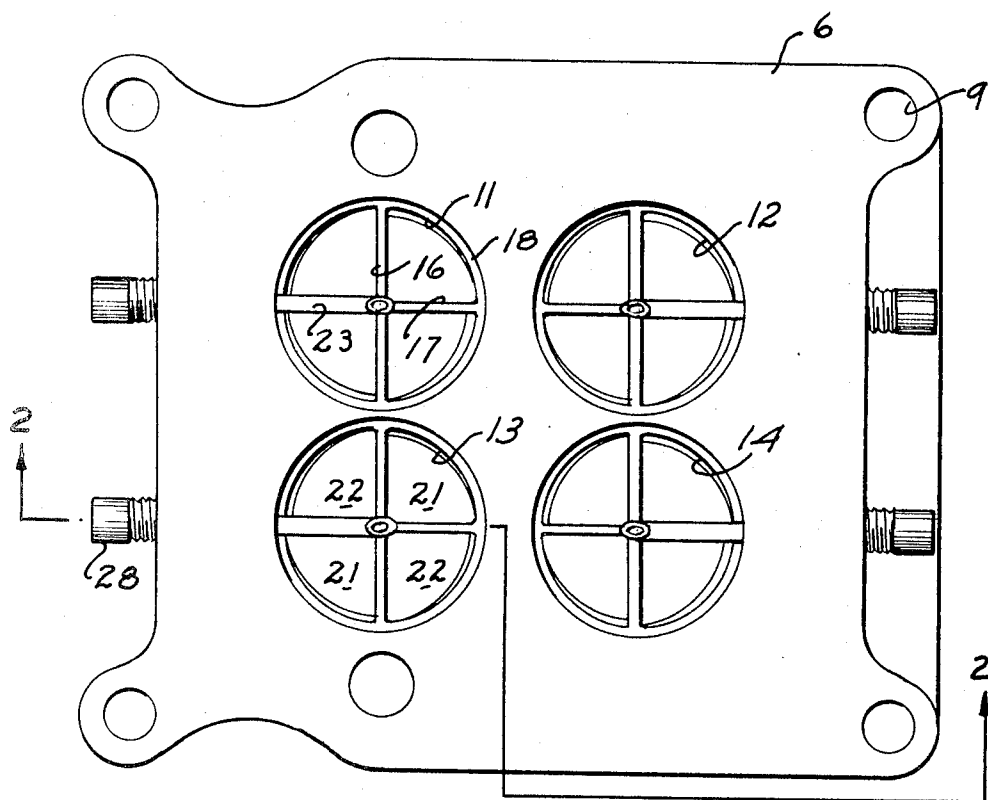


Fig. 1.

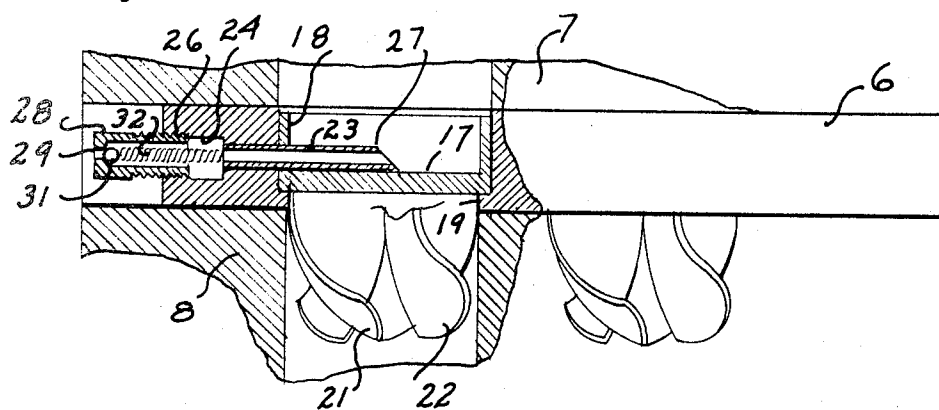


Fig. 2.

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AIR INJECTOR FOR A CARBURETOR

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2 Claims

ABSTRACT OF THE DISCLOSURE

Inserted between the carburetor and the intake manifold of an internal combustion engine is a body having longitudinal pasageways for the flow therethrough of the air-fuel mixture. Disposed within each passageway is a pair of cross bars from which depend helical swirl vanes. An air inlet tube extends laterally inwardly from the atmosphere outside the body to the intersection of the cross bars, the inner end of the air tube being formed at an angular inclination facing toward the oncoming air-fuel mixture so as to inject and intimately mix the air from the tube into the air-fuel mixture.

My invention relates primarily to means for use in connection with a carburetor in an automotive engine induction mechanism for improving the combustible mixture flowing to the engine. A device of comparable nature is shown in my Patent 2,985,524 issued May 23, 1961.

It is an object of the invention to provide an improved air injector which can be utilized as an attachment in connection with a standard carburetor.

Another object of the invention is to provide an air injector for a carburetor which is particularly effective in introducing auxiliary air into the air mixture and providing a homogeneous product.

Another object of the invention is to provide an air injector for a carburetor in which the structure can be adapted for use in carburetors having one or a plurality of air passages.

Another object of the invention is to provide a simple, directly operating mechanism for supplying auxiliary air to a fuel induction mechanism of an engine.

Another object of the invention is to provide a simple device which can readily be utilized as a mixing adapter or an adjunct in connection with a carburetor mechanism.

Another object of the invention is in general to provide an improved air injector for a carburetor.

Other objects together with the foregoing are attained in the embodiment of the invention described in the accompanying description and illustrated in the accompanying drawings, in which:

FIGURE 1 is a plan of one form of air injector pursuant to the invention; and

FIGURE 2 is in part a side elevation and in part a cross section, the plane of which is indicated by the lines 2—2 of FIGURE 1.

While the air injector can be fabricated in many different ways and can be designed to fit in the induction system of various engines, whether they have one or more fuel mixture passageways, it is illustrated herein as it has successfully been embodied in an arrangement for use in connection with a carburetor having four symmetrically arranged induction passages.

The device itself includes a flange body 6 conveniently made of a light metal of good thermal characteristics such as aluminum and having approximately a rectangular outline in plan and being of substantially uniform thickness. The body 6 is designed to fit in the induction mechanism of an engine, for example between a carburetor discharge passage 7 and a part 8 pertaining to the manifold. For that reason, the body 6 has in it, preferably

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adjacent the corners, a plurality of holes 9 for the reception of fastening or mounting studs or bolts, not shown.

Passing entirely through the flange body are circular cylindrical air passages 11, 12, 13 and 14, being disposed with their central axes all parallel and in alignment with the adjacent mechanism, so that flow therethrough is continuous, preferably in the direction from the part 7 toward and into the part 8. Since the arrangement of each of the passages is substantially like the other, a description of one applies to all of them.

Disposed in each of the passages are diametral bars 16 and 17 arranged to intersect on the central axis of the passage and being disposed preferably as adjuncts of a ring 18 which fits tightly within the passage 13, for example, preferably against a ledge 19 formed therein. The margins of the bars 16 and 17 are approximately half-way through the flange block 6. The bars are conveniently formed integrally with or are extended by pairs of helical vanes 21 and 22 which project from the flange body a substantial distance, so that in practice they extend into the passageway on the adjacent piece 8.

Extending through the flange body for each one of the passages is a conduit 23 conveniently formed of a copper tube or the like which is mounted in the material of the block 6 and extends to a counterbore 24 therein having interior threads 26. The tube 23 projects into its respective one of the passages and is provided with an angular termination 27 substantially on the axis of the passageway on the side of the bars opposite to the extended vanes 21 and 22.

To control air flow through the conduit 23, there is screwed into the threaded counterbore a check valve body 28 having an exterior atmospheric opening 29 therein controlled by a ball 31 pressed closed by a spring 32 bearing against the flange body 6. The strength of the spring 32 is such that the check ball 31 is seated or closed in the event there is no substantial pressure difference between the exterior and the associated passage 13, but when the pressure within the passage 13 is relatively low, the spring force is overcome and the ball 31 is unseated by inflowing air from the atmosphere passing then into the passage 13.

While it is preferred to have the conduit 23 made of a separate tube, it is alternatively possible to provide a similar air passage merely by drilling through the metal of the flange body 6 and then providing a termination adjacent the edge rather than at the axial center of the passage.

In operation, the flange body is mounted, as indicated, between part of the induction mechanism and the carburetor mechanism of an internal combustion engine, so that the normal fuel mixture flow takes place through the various passageways 11, 12, 13 and 14. Under conditions of high vacuum; that is, when the engine is running under relatively light load, the check valve is effective to admit auxiliary air from the atmosphere into each one of the passages adjacent the center thereof and in a location so that the additional air is caught up with the inflowing mixture and is swirled or rotated and subjected to turbulence by reason of the configuration of the vanes 21 and 22. There is thus afforded an improved mixture for combustion. By reason of the rotation and helical travel, the fuel and air are intimately admixed and are made quite homogeneous.

What is claimed is:

1. An air injector for a carburetor comprising:

(a) a flange body having a circular-cylindrical passage therethrough;

(b) means for mounting said flange body against a carburetor;

(c) a plurality of diametral bars spanning said passage,

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said bars intersecting at a central location in said passage;

(d) a plurality of helical vanes disposed in said passage, said vanes originating on one side of said diametral bars; and

(e) an air tube passing through said flange body from the exterior thereof, said air tube extending along the other side of one of said diametral bars and terminating at said central location on said other side of said bars, said inner end of said air tube being formed at an angular inclination facing away from said diametral bars and toward the carburetor for intimate mixing of air from said air tube with the air-fuel mixture from the carburetor.

2. The device of claim 1 further including a check valve mechanism communicating with said air tube and mounted in said flange body on the exterior thereof.

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JOSEPH SCOVRONEK, *Primary Examiner.*

U.S. Cl. X.R.

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