

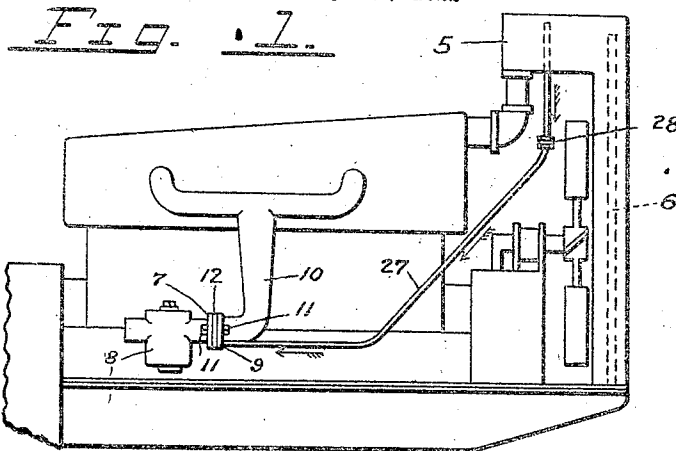
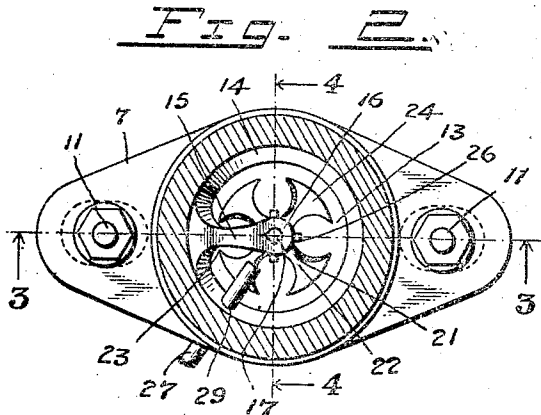
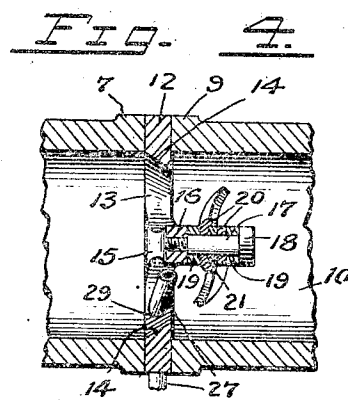
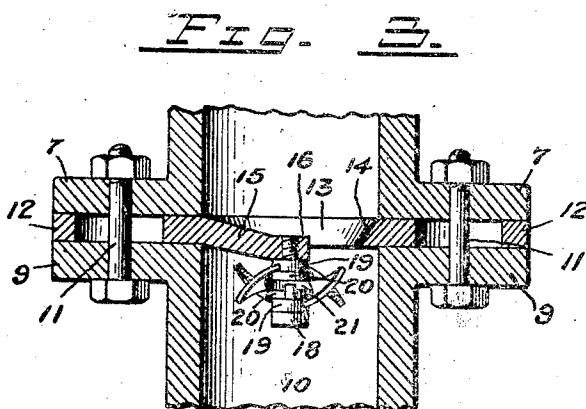
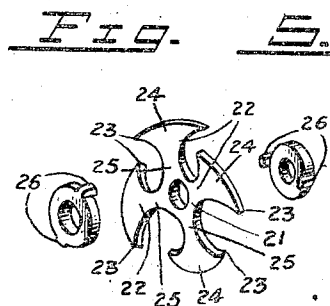
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A. ROGERS

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FUEL MIXER FOR INTERNAL COMBUSTION ENGINES

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UNITED STATES PATENT OFFICE.

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FUEL MIXER FOR INTERNAL-COMBUSTION ENGINES.

Application filed July 10, 1922. Serial No. 573,943.

To all whom it may concern:

Be it known that I, ABBY ROGERS, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented a new and useful Fuel Mixer for Internal-Combustion Engines, of which the following is a specification.

My invention relates to improvements in fuel mixers for internal combustion engines, such as those used in automobiles and motor boats, and the primary object of my invention is to provide a fuel mixer, adapted for installation at the entrance of the intake manifold, whereby a certain percentage of moist air or steam is drawn, through pipe connection from a point slightly above the overflow pipe in the top tank of the cooling system, by suction on the inlet stroke and directed against a rotary element where it is mixed with the fuel charge in its passage from the carburetor to the cylinders of said engines.

Another object is to provide a fuel mixer having a rotary element designed to facilitate its rotary motion by utilizing its centrifugal properties, and planned to increase its mixing capacity by reason of the peculiar shape of its blades.

A further object is to provide a fuel mixer having a base member with a convergent aperture therein and a projecting arm forming a central bearing for a spindle on which the rotary element is mounted whereby said rotary element is offset from the plane of said base member in such position as to be actuated by the concentrated forces of the fuel mixture after passing through said convergent aperture.

Other objects are to provide a fuel mixer which is simple and durable in construction, direct and efficient in operation, that can be manufactured at comparatively small cost, and which may be readily installed on all engines of standard design.

With the above and other objects in view which will appear as the description proceeds, the invention consists of the novel construction, adaptation, arrangement and combination of parts hereinafter described and claimed.

These objects are accomplished by devices illustrated in the accompanying drawings, wherein—

Figure 1 is a view in side elevation of an

automobile engine showing the device in position;

Fig. 2 is a view in end elevation embodying the principal features of the invention;

Fig. 3 is a view in horizontal section taken substantially on a broken line 3—3 of Fig. 2, and showing the rotary element and associated parts in elevation;

Fig. 4 is a view in vertical section taken on a broken line 4—4 of Fig. 2; and

Fig. 5 is a detail view in perspective of the rotary element together with its accompanying fingered washers.

Referring to the drawings, throughout which like reference numerals designate like parts, the numeral 5 designates the top tank of an automobile cooling system having an overflow pipe 6 extending upwardly therein. The numeral 7 designates a flanged portion of a carburetor 8, while the numeral 9 designates a corresponding flanged portion of the intake manifold 10.

Interdisposed with relation to the flanged portions 7 and 9 and held in abutment therebetween by bolts 11 is a base member 12 of the mixer proper which corresponds in exterior contour with said flanged portions. Said base member is provided with a centrally located aperture 13 having a beveled wall 14 which converges in a direction away from the interior wall of the carburetor flanged portion 7 for reasons presently described.

Integrally formed with the base member 12 is an arm 15 which projects within the aperture 13 and is slightly offset from the plane thereof as clearly shown in Figs. 2, 3 and 4 of the drawings. Said arm centrally terminates in a bearing 16 having a threaded opening and the reduced end portion of a spindle 17 is screwed therein. Said spindle is provided at its outer end with a head 18.

Corresponding washers 19 are placed on the body portion of the spindle 17 against the bearing 16 and head 18 respectively, while corresponding fingered washers 20, bearing against the washers 19, provide a central space on the body portion where a rotary element 21 encircles said spindle.

Referring more particularly to Figs. 2 and 5 of the drawings, it will be noted that the blades 22 of the rotary element 21 are separated from each other by substantially circular spaces forming opposite points 23 on

said blades and giving them relatively wide palms 24 as compared with their shanks 25. It will also be seen that the two diametrically opposite fingers 26 on each of the washers 20 are arranged to fit over the inner edges formed by said spaces which will cause said washers to revolve with said rotary element.

For the purpose of supplying moist air or steam to the device, a small pipe 27 is tapped into the top tank 5 of the radiator and is jointed at 28 so the mixer may be removed without breaking the connection with said radiator. The upper end of said pipe extends slightly above the top tank overflow pipe 6 so that water from said top tank will not flood same. The lower end portion of said pipe enters through an opening 29 formed in the base member 12, whence it is directed toward the bearing 16 of the arm 15 as clearly shown in Figs. 2 and 4.

It will be obvious that the motive power which actuates the device is furnished by the suction of the cylinders on the intake stroke. The fuel charge is drawn from the carburetor 8 and in its passage through the aperture 13 is directed by the beveled wall 14 toward the rotary element 21. At the same time a certain percentage of moist air or steam is drawn from the tank 5 through the pipe 27 and against the bearing 16 where it is more or less broken up and mingled with said fuel charge.

The blades 22 of the rotary element 21 are twisted screw fashion similar to the ordinary propeller blade, and, in employing the peculiar shape as hereinbefore described, it has been found that the sharp points 23, advancing against the mingled charge of fuel and moist air, will thoroughly complete the mixing process before same is diffused and thrown outwardly against the interior walls of the intake manifold 10. In other words, the charge is mixed by the peculiar shaped blades before it is driven therefrom as is the case with the blade of ordinary design.

The advantages of the blades 22 as herein described are likewise manifest in the fact that the greater weight being distributed near the peripheries thereof, the resultant momenta, assisted by the small amount of lubricant always present in the gaseous vapor, will keep the rotary element revolving,

without apparent retardation, even during the power, exhaust and compression strokes, and the relatively wide palms 24 of said blades will continue throwing the fuel mixture outwardly against the warm interior walls of the manifold 10 thus minimizing condensation prior to entry of said mixture into the combustion chambers. In the use of my device, I have found, that a more even distribution of fuel is furnished to all cylinders at the same time, that the consumption of fuel is materially reduced, and that the formation of hard carbon is prevented which fact is apparently due to molecular agitation in cooperation with the mixture of aqueous and gaseous vapor.

Having thus described my invention what I claim and desire to secure by Letters Patent is:—

1. A fuel mixer for internal combustion engines comprising an apertured base member, an arm extending into the aperture formed in said base, said arm being offset from the plane of said base and terminating in a central bearing, a spindle positioned in said bearing projecting in a direction with the offset therefrom, a rotary element provided with radial blades adapted to rotate on said spindle, said aperture in said base member being tapered in such manner that its walls converge substantially in alignment with the outer periphery of said rotary element, and means for retaining said rotary element on said spindle.

2. A fuel mixer for internal combustion engines comprising an apertured base member, an arm extending into the aperture formed in said base, said arm being offset from the plane of said base and terminating in a central bearing, a spindle positioned in said bearing projecting in a direction with the offset therefrom, a rotary element provided with radial blades adapted to rotate on said spindle, said blades having substantially circular spaces therebetween forming wide palms with concave edges, said aperture in said base member being tapered in such manner that its walls converge substantially in alignment with the outer peripheries of said blades, means entering said base member for conveying vapor to said rotary element, and means for retaining said rotary element on said spindle.

ABBY ROGERS.