

June 28, 1932.

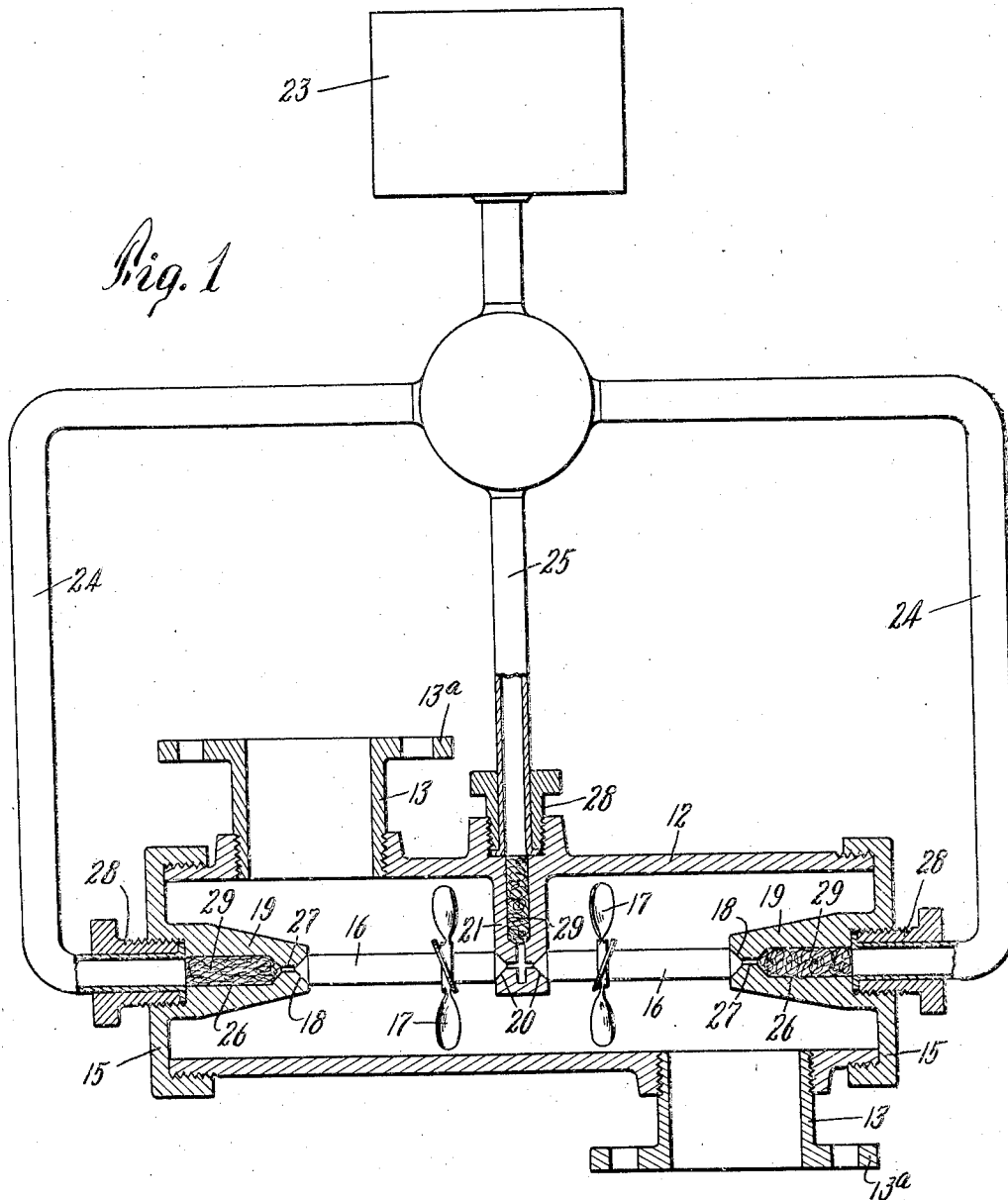
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GAS ECONOMIZER FOR INTERNAL COMBUSTION ENGINES

Filed May 18, 1931

2 Sheets-Sheet 1



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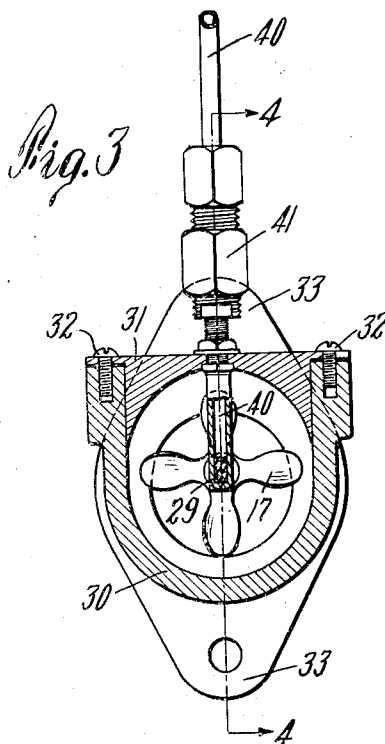
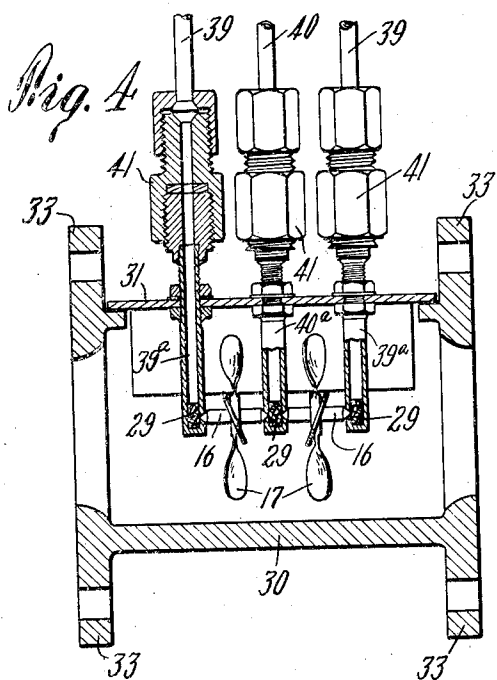
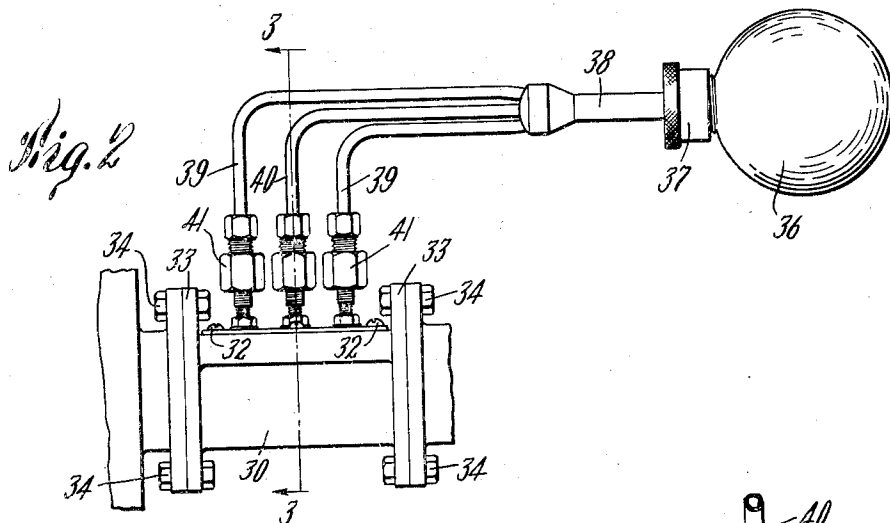
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GAS ECONOMIZER FOR INTERNAL COMBUSTION ENGINES

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GAS ECONOMIZER FOR INTERNAL COMBUSTION ENGINES

Application filed May 18, 1931. Serial No. 538,147.

This invention relates to attachments for internal combustion engines whereby the flow of hydrocarbon vapor and air induced by suction from the carbureter to the engine cylinders, is agitated to more thoroughly mingle the hydrocarbon particles with the air.

A well known attachment for this purpose includes a mixing chamber through which the vapor and air mixture passes to the intake manifold, said chamber having internal bearings supporting a rotor having agitating blades, and rotatable in the chamber by the movement of the mixture therethrough.

The chief object of the invention is to provide an attachment of this character with a lubricating system so organized that said bearings are automatically lubricated when the mixture is moving through the mixing chamber and are not lubricated when the economizer is not in operation and there is no movement of the mixture, waste of the lubricant being automatically prevented when the engine is not running.

Other objects will hereinafter appear.

Of the accompanying drawings forming a part of this specification,—

Figure 1 is a sectional view of an embodiment of the invention, the lubricating system being shown somewhat diagrammatically.

Figure 2 is a side elevation, showing the preferred embodiment of the invention.

Figure 3 is a section on line 3—3 of Figure 2.

Figure 4 is a section on line 4—4 of Figure 3.

The same reference characters indicate the same parts in all of the figures.

I will first describe the embodiment shown by Figure 1.

The mixing chamber is composed of a tubular body 12, having a branch 13 at each end adapted as by a flange 13a to be coupled, the one to a carbureter, and the other to an intake manifold, one branch constituting an inlet, and the other an outlet, and heads 15 secured to opposite ends of the body, the arrangement being such that a mixture of air and vapor moves in a path lengthwise of the body 12 from the inlet to the outlet.

A mixing rotor is journaled in bearings in the mixing chamber and is located in the path of gases moving therethrough and rotatable by said gases, the movement of which is induced by suction in the intake manifold, so that when the engine is running, a partial vacuum is maintained in the chamber.

While the rotor may be any suitable construction, I have shown it in this instance composed of two aligned shafts 16, each having a propeller or fan 17, composed preferably of four blades, and rotated by movement of the mixture through the chamber. The mixing chamber is, in this instance, provided with two end bearings 18, in which the outer ends of the shafts 16 are journaled, said bearings and the journal portions of the shafts being preferably conical, so that each shaft has a pivot bearing. The bearings 18 are formed in projections 19 on the heads 15.

The inner ends of the shafts 16 are journaled in central bearings 20, 20, formed in opposite sides of a central projection 21. The shafts are rotatable independently and the blades of one propeller or fan are oppositely inclined from those of the other, so that the propellers and shafts are rotated simultaneously in opposite directions, a thorough agitation and mixing of the elements of the mixture being thus caused.

To cause automatic lubrication of the shaft bearings, only while the engine is running, I provide the lubricating system next described.

23 designates an oil reservoir located outside the mixing chamber. Oil from said reservoir flows to the two end bearings 18 through end conduits 24, 24, and to the central bearings 20 through a central conduit 25.

In this instance, the projections 19, 19 and 21 are tubular, each having a larger bore portion 26 and a smaller bore portion 27, said projections therefore constituting portions or sections of the conduits. Glands 28 screwed into the body and heads of the mixing chamber secure the conduit portions 24 to the chamber.

In the enlarged bore portions 26 are inserted porous packings 29, preferably of felt or wicking, which regulate the supply of oil

to the bearings, the oil seeping slowly through said packings, and suitably lubricating the bearings without liability of leaking between the bearings and the shaft portions contacting therewith.

The reservoir 23 is normally hermetically closed excepting at said bearings. By "normally" I mean that when the reservoir is charged with oil it is closed by any suitable means such as the means indicated by Figure 2, so that oil is prevented by atmospheric pressure from flowing downward through the conduits unless and until such flow is induced, as next described.

When the engine is running, the partial vacuum in the mixing chamber induces a flow of oil to the several bearings from the reservoir through the conduits, the flow being retarded by the porous packings. When the engine is not running and there is no vacuum-producing movement of gases through the mixing chamber, oil is prevented by atmospheric pressure from escaping from the lubricating system, so that there is no waste of oil.

The oil reservoir may be provided with any suitable filling opening and an air-tight closure therefor, so that when the filling opening is closed, the entire lubricating system is hermetically closed excepting at the outlet ends of the conduits.

In the embodiment shown by Figures 2, 3 and 4, the mixing chamber is composed of a U-shaped body portion 30, and a cap plate 31, attached by screws 32 to the body. The ends of the body portion are provided with flanges or ears 33, which are secured by bolts 34 to the carbureter and intake manifold. The rotor includes the shafts 16 and propellers 17, as in the previously described embodiment. The oil reservoir 36 may have an opening through which it may be filled and emptied and may have a separable air-tight connection 37, of any suitable construction, with a conduit section 38, from which extend two end conduit sections 39, and a central conduit section 40. These sections are separably connected by couplings 41, of any suitable construction, with terminal conduit sections 39a, 39a and 40a fixed to the cap plate 31, and projecting into the mixing chamber.

The bearings for the shafts 16, are in this instance, formed in the sides of the terminal sections, and the porous packings 29 are inserted in said sections, as shown by Figure 4.

The operation of the embodiment shown by Figures 2, 3 and 4, is the same as that of the embodiment shown by Figure 1, movement of oil from the reservoir to the bearings being prevented when the economizer is not in operation. The oil reservoir in each embodiment is elevated above the mixing chamber.

I claim:

1. A gas economizer comprising, in com-

ination, a mixing chamber composed of a U-shaped body portion and a cover detachably secured to the body portion and forming one side of the chamber, the ends of the body portion being provided with means adapted to be coupled to a carbureter and an intake manifold, a lubricating system including an oil reservoir outside the mixing chamber, and conduits extending from the reservoir into the chamber and provided with bearings within the chamber, constituting the outlets of said conduits, the conduits including outer sections connected directly to the reservoir and terminal sections extending through and secured to the cover and detachably connected with the outer sections, the bearings being formed in said terminal sections, said reservoir being normally hermetically closed excepting at its junction with said conduits so that movement of oil to the bearings is prevented by atmospheric pressure when the economizer is not in operation.

2. A gas economizer comprising, in combination, a mixing chamber having an inlet adapted to be connected with a carbureter, and an outlet adapted to be connected with an intake manifold, a plurality of bearings in said chamber, a mixing rotor located in the path of gases moving through the chamber and rotatable by said gases, said rotor including a shaft journaled in said bearings and mixing blades on said shaft, and a lubricating system including an oil reservoir located outside and above the mixing chamber, and a plurality of conduits extending through a wall of the mixing chamber and having intake ends communicating with the reservoir and outlets communicating with said bearings, the system being normally hermetically closed excepting at said bearings so that movement of oil to the bearings is prevented by atmospheric pressure when the economizer is not in operation.

3. A gas economizer comprising, in combination, a mixing chamber having an inlet adapted to be connected with a carbureter, and an outlet adapted to be connected with an intake manifold, a plurality of bearings in said chamber, a mixing rotor located in the path of gases moving through the chamber and rotatable by said gases, said rotor including a shaft journaled in said bearings and mixing blades on said shaft, and a lubricating system including an oil reservoir located outside and above the mixing chamber, and a plurality of conduits extending through a wall of the mixing chamber and having intake ends communicating with the reservoir and outlets communicating with said bearings, the system being normally hermetically closed excepting at said bearings so that movement of oil to the bearings is prevented by atmospheric pressure when the economizer is not in operation, said conduits being provided with porous oil supply regulating pack-

ings confined in the conduits adjacent the shaft bearings, and arranged so that the oil supplied to said bearings passes wholly through said packings and is retarded thereby, and slowly supplied to the bearings.

4. A gas economizer, comprising, in combination, a mixing chamber having an inlet adapted to be connected with a carbureter, and an outlet adapted to be connected with an intake manifold, bearings in said chamber, including two end bearings and two central bearings, a mixing rotor located in the path of gases moving through the chamber and rotatable by said gases, said rotor being composed of two shafts, one journaled in one of the end bearings and one of the central bearings, and the other shaft in the other end and central bearings, so that the shafts are independently rotatable, the blades of said shafts being arranged to cause the shafts to rotate simultaneously in opposite directions, and a lubricating system including an oil reservoir outside the mixing chamber, two end conduits supplying oil to the two end bearings, and a central conduit supplying oil to the two central bearings.

In testimony whereof I have affixed my signature.

MANLEY BARRY.