

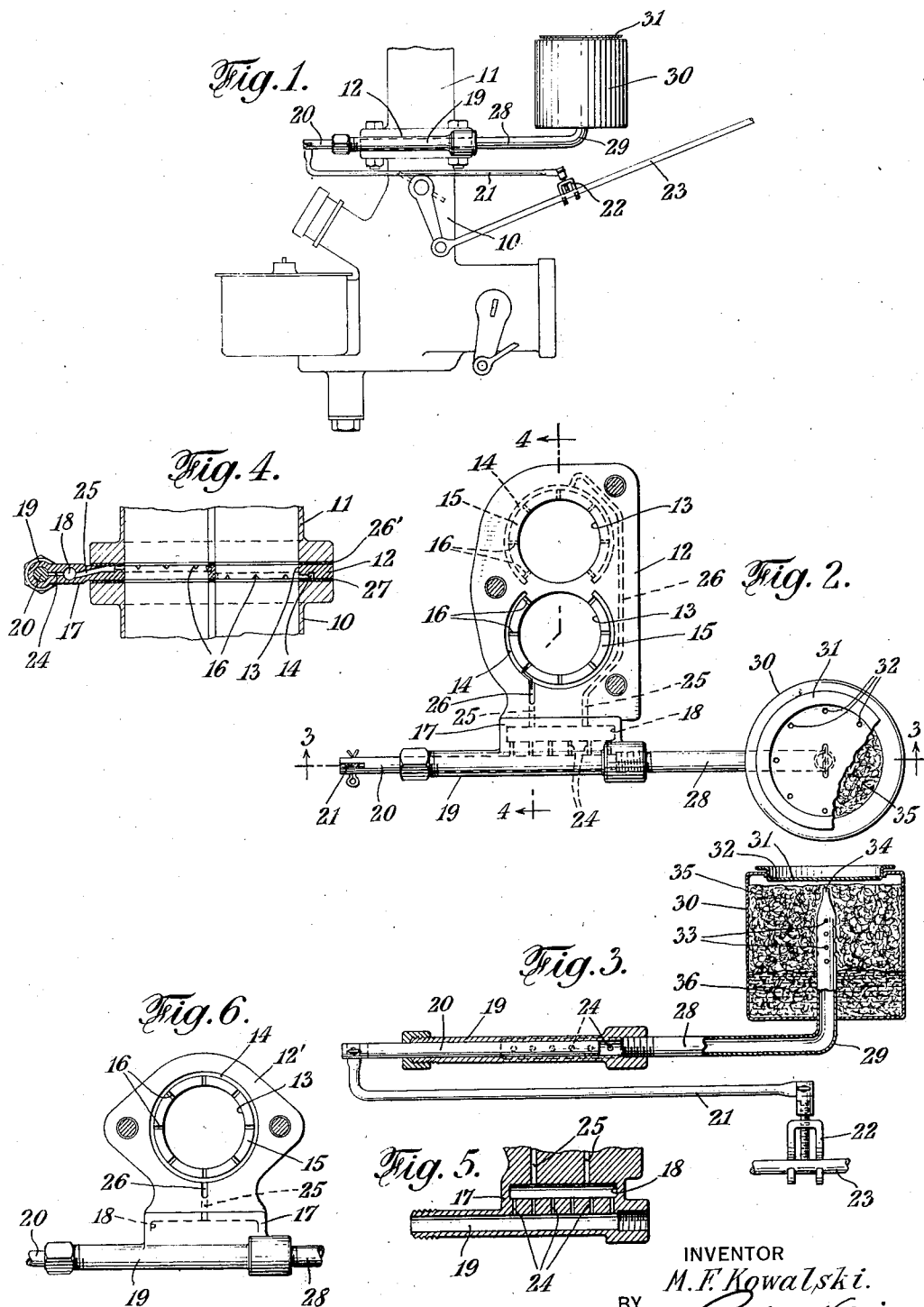
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GAS AND AIR MIXING DEVICE

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GAS AND AIR MIXING DEVICE

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1 Claim. (Cl. 123—198)

This invention relates to devices for introducing auxiliary air, saturated with a liquid agent, into the intake manifold of an internal combustion engine at a point where such manifold connects with a carburetor.

The prime object of this invention is to provide an automatically controllable device of this character wherein auxiliary or supplemental air, to be introduced into the manifold, is saturated before its introduction with an agent for decarbonizing the interior of combustion engines, such as hydrocarbon solvents and/or with an agent for supplying lubricant, such as high flashpoint oils to the top moving parts of the engine, such as the top portion of a piston and the controlling valves of the engine, and wherein the amount of supplemental air, saturated with such agent or agents, which is to be introduced, is automatically controlled, together with the operation of the throttle, by way of the accelerator, normally governing the operation of an engine.

Another object of this invention is to provide a device of the character indicated, wherein the means for saturating auxiliary air with a decarbonizing and/or top lubricating agent are so constructed, as to force the air to pass through suitable absorbent material, wherein such agent or agents are suspended in fine and uniform distribution, thereby preventing the introduction, with the saturated air, of the agent or agents in concentrated liquid form.

Another object of this invention is to provide within such device automatic control means and a mixing chamber, said control means being constructed and arranged to be associated with the existing accelerator control, so that while the engine is idling, no supplemental air, saturated with a decarbonizing agent and/or top lubricant agent, is introduced. However, when the throttle is opened, auxiliary or supplemental saturated air is introduced in proper proportion to the opening of the throttle.

The foregoing and still further important objects and advantages of the present invention will become more fully apparent from the ensuing description in connection with the accompanying drawing, which latter while illustrating presently preferred forms of my invention, are by no means intended to limit the same to the actual showing, and wherein

Fig. 1 illustrates my device as applied at the junction between the carburetor and the intake manifold of an engine;

Fig. 2 is a plan view of my device applicable to a double intake manifold;

Fig. 3 is a cross-sectional view taken on line 3—3 of Fig. 2;

Fig. 4 is a sectional view taken on line 4—4 of Fig. 2;

Fig. 5 is a cross-sectional detail view through the control passage and mixing chamber of my device; and

Fig. 6 illustrates a modified construction of my device applicable for a single manifold engine.

Referring now to the drawing, numeral 10 denotes a carburetor provided with a suitable flange to connect with a corresponding flange of manifold 11, between which flanges the injector body 12 of my device is placed. This injector body is flat in construction, as may be clearly seen from Figs. 2 and 4, and corresponds in shape to the shape of the flanges of the carburetor and manifold. The form shown in Figs. 1, 2 and 4 is intended for a double carburetor and for two individual manifolds, such as used with eight-cylinder internal combustion engines, wherein for each four cylinders an individual carburetor is employed. In Fig. 6 a similar construction of the injector portion is indicated at 12', designed for a single carburetor and single manifold.

Body 12 is provided with suitable openings 13 registering with the manifold openings. Surrounding the openings are circular grooves 14, which are separated from openings 13 by an annular ridge or barrier 15, in which latter are provided radial grooves 16 forming communicating passages between circular grooves 14 and openings 13. These circular grooves and these radial grooves are disposed in the same plane. In the construction illustrated in Figs. 2 and 4, the grooves for each opening are shown at the opposite faces of body 12, but they may be disposed on the same face if so desired.

Adjacent to body 12 is an extension 17, within which is provided a cylindrical mixing chamber 18, and adjacent to extension 17 is arranged a cylindrical control conduit 19, within which operates a control plunger 20. At the outer end of the latter is secured a connecting rod 21 with suitable attaching means 22, designed for the purpose of attaching rod 21 to the existing throttle or accelerator-operating lever 23 of a carburetor. Connecting the interior of the control conduit 19 with the mixing chamber 18 is a plurality of control passages 24, clearly indicated in Fig. 5. From mixing chamber 18 extends to each ring groove 14 a passage-way, partially in the form of bores 25, and changing to groove-

shaped continuations 26, the latter terminating at, and leading into circular grooves 14.

When flat member 12 is mounted between the flanges of carburetor 10 and manifold 11, I employ at both upper and lower faces of the member suitable upper and lower gaskets 26' and 27, respectively. These gaskets form, with their adjacent surfaces to member 12, suitable covers for all the grooves at both faces of that member, while at the same time providing a gas-tight connection between the carburetor and the manifold. This arrangement will be clearly seen from the illustration of Fig. 4.

Secured to control conduit 19 is another conduit 28 in the form of a tube or pipe, bent at right angles at 29 (see Fig. 3) and inserted through the bottom of container 30. This container is normally closed by a cover 31 which is provided with a plurality of perforations 32, clearly seen in Fig. 2. The portion of pipe 28 extending into the container 30 is provided with perforations 33, while the uppermost end of pipe 28 is sealed at 34. Within the container, I arrange an absorbent 35, such as felt, cotton, sponge, or any other suitable material which will readily absorb a liquid agent, such as a decarbonizer and a top lubricant or a mixture of both. Such liquid agent or agents will have the tendency of settling above the bottom of the container, as indicated at 36.

The portion of tubing 28 extending into the container is so arranged that its perforated portion is disposed above the accumulation of the liquid agent near the bottom of the container, whereby the passage of such agent in a fully liquid state through conduit 28 and into the carburetor is effectively prevented. The porous or spongy material which absorbs and elevates the liquid is intended to finely and uniformly distribute the latter so that when air is sucked in, it will draw with it the liquid in the form of a spray or mist, rather than in concentrated liquid form.

Operation

Assuming that my device is installed in the manner illustrated in Fig. 1 its operation may be described as follows: While the motor equipped with my device is idling, accelerator or throttle lever 23 is in its normal position, at which position plunger 20 fully extends into control conduit 19. At this position of the plunger 20, any passage of air through aperture 32 of cover 31 into container or chamber 30, and from that chamber through apertures 33 of tubing 28 into control passage 19 is prevented, since at that position of the plunger all of the passages 24 are closed. The moment, however, the accelerator rod is operated, plunger 20 is moved outwards and will clear first one, and successively all passages 24, depending upon the opening of the throttle of the carburetor.

As soon as one or more of the passages 24 are cleared by the plunger, the suction of the engine will cause air to pass through apertures 32 of cover 31 into saturating chamber 30, wherein the air is forced to pass through the moist felt 36 surrounding the upper perforated portion of pipe 28. The air becomes saturated by the liquid in a finely diffused form and progresses through tubing 28 to control passage 19, and through the open port or passage 24 into mixing chamber 18. From this mixing chamber the saturated air will now pass by means of bores 25 and covered grooves 26 into annular grooves 14, where it is distributed. From grooves 14 the air issues

through radial grooves 16 radially into ports 13 of the manifold. By this process, auxiliary or supplemental air, together with a decarbonizing agent or top lubricant or both, is introduced at a point where a combustible mixture is already formed and is ready to enter the engine cylinders.

This additional air, introduced after the combustible mixture from the carburetor is formed, produces a violent turbulent action in the mixture and, so to speak, freshens it up, whereby, although a somewhat leaner, but more readily combustible mixture is delivered to the cylinders than would be usually the case if such supplemental air would not be introduced, a considerable saving in fuel results. In addition, the agent or agents sucked in with the supplemental air prevent firstly, the formation of carbon deposits, or loosen such deposits when they are formed, and secondly, spray the moving parts, usually exposed to very high heat, with an unburnable lubricant, known as top lubricant, which assures the proper operation of such parts, and prevents, especially, the binding of the valves in the valve guides.

The further the accelerator rod 23 is depressed, the further plunger 20 is moved outwards and clears a greater number of communicating passages 24, leading from the control passage 19 to mixing chamber 18. When more than one of these passages 24 are cleared, mixing chamber 18 becomes of decided importance in that it not only promotes admixing of the saturated air, but also assures proper distribution, especially for devices, such as shown in Fig. 2, where more than one passage leads towards ports 13.

The absorbent shown in saturating chamber or container 30 may, as had been said before, be of any suitable material, although I prefer felt. Such absorbent is exchangeable so that when its absorbent properties diminish, it may be readily replaced by opening cover 31. The liquid agents introduced into container 30 may be poured in directly through apertures 32 of the cover. My invention is especially intended for providing supplemental air saturated with a carbon removing agent, but of course is also designed for saturating such air with a top lubricant, or a mixture of a decarbonizing agent and a top lubricating oil. In the course of experimentation I have found that an efficient decarbonizing agent for my device may be produced by mixing together known ingredients in the following proportion:

	Parts
"Salvasol" #5	128
Flushing oil	16
Carbon tetrachlorid	16
Acetone	1

"Salvasol" is a distilled kerosene product brought on the market by the Standard Oil Co. of New York. The rest of the ingredients are well-known products. While the above proportion of ingredients seems to give very satisfactory results it is obvious that any other efficient decarbonizing agent may be used in connection with my device.

While I have shown and described specific forms of my invention, be it understood that the arrangement of the parts employed may be altered to suit various existing conditions, especially when the device is to be applied to old models of cars, and I therefore reserve for myself the right to make such changes and improvements as may become necessary, without departing from

the broad scope and spirit of my invention, as defined in the annexed claim.

I claim:

5 The combination with the intake manifold and a double barrel carburetor of an internal combustion engine, of a fitting interposed therebetween, a fluid source associated with said fitting, the latter comprising a gasket-like, thin body portion having an enlarged side extension, a
10 valve chamber and a mixing chamber in said extension, said fluid source being connected with said valve chamber, a plurality of control passages connecting the valve chamber with the mixing chamber, a piston control valve slidably
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mounted in the valve chamber for successively closing and opening said passages, valve operating means, connected with the engine throttle, for simultaneously operating said piston valve therewith, said gasket-like body portion having openings registering with the two manifold barrels, an annular groove, concentric with each said opening, a plurality of radial grooves connecting said annular groove with said opening, and a connecting groove leading from the annular
10 groove to a passage issuing from said mixing chamber, thereby establishing connections between the latter and said openings.

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