Aug. 7, 1956 M. L. WHITE 2,757,654

FUEL ECONOMIZER

Filed Jan. 20, 1955

Fig. 1.

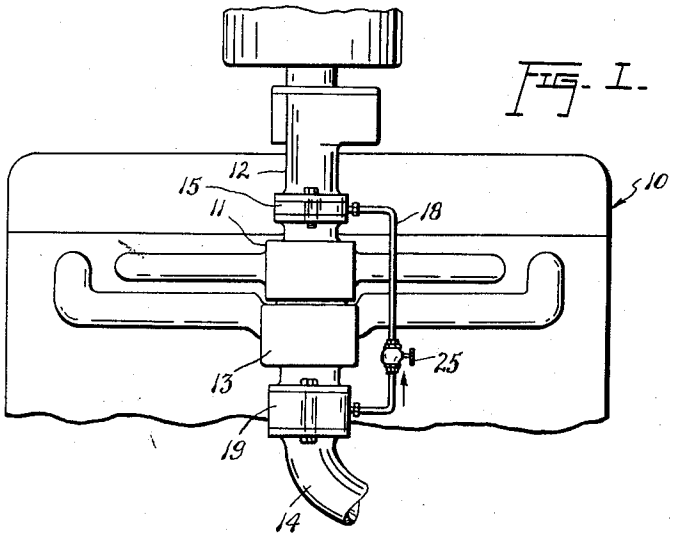
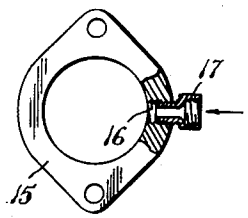


Fig. 2.



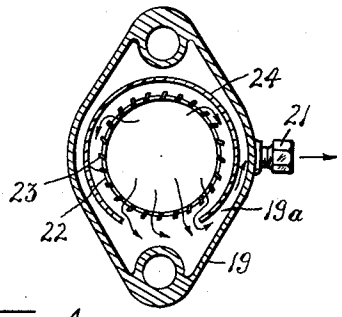


Fig. 4.

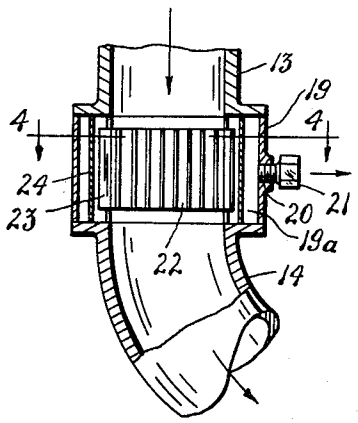


Fig. 3.

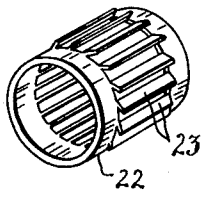


Fig. 5.

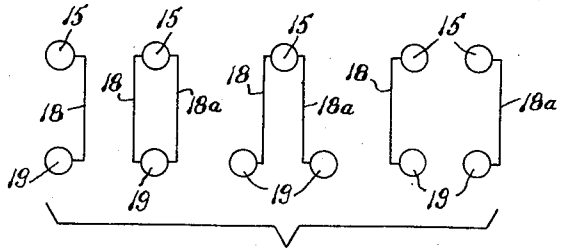


Fig. 6.

Inventor:
Milton L. White
By Munson H. Lane.
Atty.

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FUEL ECONOMIZER

Milton L. White, Atlanta, Ga.

Application January 20, 1955, Serial No. 483,081

5 Claims. (Cl. 123—119)

This invention relates to new and useful improvements and structural refinements in internal combustion engines such as are used in automobiles, and the like, and the principal object of the invention is to attain substantial economy in fuel consumption of such engines.

More specifically, the invention concerns itself with the provision of a fuel economizer apparatus whereby a portion of the exhaust gases of the engine may be introduced into the intake manifold for the purpose of agitating and warming up the fuel mixture for a more thorough and efficient combustion.

An important feature of the invention therefore resides in the provision of a housing adapted to be interposed between the exhaust manifold and the exhaust pipe of an engine for the purpose of facilitating the retrieving of a portion of the exhaust gases an adapter plate to be interposed between the carburator and the intake manifold of the engine, and a conduit connecting the housing to the adapter plate, whereby delivery of exhaust gases from the housing to the intake manifold is attained.

A further object of the invention resides in the construction of the housing itself, the same being provided with means for effectively controlling the flow of exhaust gases therethrough and screening such gases to safeguard against any possibility of blocking the aforementioned conduit by particles of carbon or other foreign matter.

Another object of the invention involves the provision of means for controlling or regulating the rate of flow of exhaust gases through the aforementioned conduit, whereby the apparatus may be adjusted to operate in the most efficient manner.

Some of the advantages of the invention reside in its simplicity of construction, efficient and dependable operation, and in its adaptability for expeditious installation in the manner of an attachment to conventional engines.

With the above more important objects and features in view and such other objects and features as may become apparent as this specification proceeds, the invention resides in the arrangement of parts and details of construction substantially as shown in the accompanying drawing, wherein like characters of reference are employed to designate like parts and wherein:

Figure 1 is a fragmentary side elevational view of an internal combustion engine, showing the invention applied thereto;

Figure 2 is a top plan view, partially broken away, illustrating the adapter plate used in the invention;

Figure 3 is a fragmentary vertical sectional view of the exhaust manifold, exhaust pipe and the housing therebetween;

Figure 4 is a cross-sectional view, taken substantially in the plane of the line 4—4 in Figure 3;

Figure 5 is a perspective view of the screen member used in the invention; and

Figure 6 is a group diagramatic illustration of various modified arrangements for operatively connecting the

exhaust manifold housings with the intake manifold adapter plates.

With reference now to the accompanying drawing in detail, the general reference numeral **10** designates a conventional internal combustion engine including an intake manifold **11**, a carburator **12**, an exhaust manifold **13** and an exhaust pipe **14**.

The invention consists of a fuel economizer apparatus including an adapter plate **15** which is interposed between the customary flanges of the intake manifold **11** and carburator **12** and is formed at one side thereof with a screw-threaded opening **16** to receive a conventional pipe connector **17** having one end of a conduit or tube **18** suitably secured therein.

The apparatus also includes a housing **19** which is interposed between the customary flanges of the exhaust manifold **13** and the exhaust pipe **14**, the lateral wall of this housing being formed with a screw-threaded aperture **20** to receive a pipe connector **21** having the other end of the aforementioned conduit **18** secured therein. It will be apparent from the foregoing that the conduit **18** thus establishes communication between the interior or chamber **19***a* of the housing **19** and the intake manifold **11**.

A substantially tubular screen member **22** is provided in the housing chamber **19***a* in continuous alignment with the exhaust manifold **13** and exhaust pipe **14**, the intermediate portion of the member **22** being formed with struck out fin-like elements **23** affording a series of slots or passages through which a portion of the exhaust gases passing axially through the member **22** may escape outwardly into the chamber **19***a* and, subsequently, into the conduit **18**. The slots or passages afforded by the struck out fins **23** are of such size as to prevent relatively large particles of carbon or other foreign matter from entering the conduit and blocking the same, whereby the member **22** performs the function of a screen as well as that of means for guiding the exhaust gases through the chamber **19***a* while permitting a portion of such gases to be extracted or diverted into the chamber from their main line of flow.

In order to break up or agitate the extracted portion of the exhaust gases in the chamber **19***a* and to somewhat retard their flow into the conduit **18**, an arcuate baffle **24** is provided in the housing **19** between the screen member **22** and the aperture **20**, as is best shown in Figure 4.

The screen member **22** and the baffle **23** may be secured in the chamber **19***a* in any suitable manner, such as for example, by being clamped, together with the housing **19**, between the flanges of the exhaust manifold **13** and exhaust pipe **14**.

Finally, to regulate the rate of flow of the exhaust gases through the conduit **18**, a suitable control valve **25** is provided intermediate the ends of the conduit, the valve **25** being manipulated either directly or by remote control when the engine is in use.

When the apparatus is in operation, a portion of the exhaust gases passing through the screen member **22** in the housing **19** will escape into the chamber **19***a* and will be drawn through the conduit **18** into the intake manifold **11**. Herein, such exhaust gases will effectively agitate and pre-heat or warm the fuel mixture, so that as a result the latter will be capable of a more thorough and efficient combustion and a substantially greater operating economy will be attained.

The various parts and their relationship as above described are schematically illustrated in the left-hand portion of the diagram in Figure 6, which is typical of a simple installation of the invention on a "straight" engine. This simple arrangement may be modifiied by providing the adapter plate **15** and the housing **19** with pairs of

openings or apertures at diametrically opposite sides thereof and employing a pair of conduits **18**, **18***a* for operatively connecting the same, in place of the single conduit **18**. In an instance of a V type engine having a single intake manifold but twin exhaust manifolds, twin housing **19** may be used on the respective exhaust manifolds and connected by a pair of conduits **18**, **18***a* to a single adapter plate **15** under the carburator. Moreover, on a V type engine utilizing twin carburators and twin exhaust manifolds, the respective housings **19** may be connected by a pair of conduits **18**, **18***a* to the respective adapter plates **15** under the respective carburators, as indicated in the right-hand portion of Figure 6.

While in the foregoing there have been shown and described the preferred embodiments of the invention, various modifications may become apparent to those skilled in the art to which the invention relates. Accordingly, it is not desired to limit the invention to this disclosure and various modifications may be resorted to such as may lie within the spirit and scope of the appended claims.

What is claimed as new is:

1. In combination with an internal combustion engine including an intake manifold and a carburator thereon and an exhaust manifold and an exhaust pipe communicating therewith, a fuel economizer comprising an adapter plate interposed between said intake manifold and said carburator and provided with a lateral opening, a housing interposed between said exhaust manifold and said exhaust pipe and affording a chamber therein, said housing having a lateral wall provided with an aperture, a conduit extending from the aperture in said housing to the opening in said adapter plate, and a substantially tubular screen member mounted in said housing in continuous alignment with said exhaust manifold and exhaust pipe and in a radially inwardly spaced relation from the lateral wall of the housing, whereby exhaust gases passing through said screen member into said chamber may be drawn through said conduit into said intake manifold.

2. The structure as set forth in claim 1 together with a baffle provided in said chamber between said screen member and said aperture.

3. A fuel economizer for internal combustion engines, comprising an adapter plate adapted to be interposed between the intake manifold and the carburator of an engine and provided with a lateral opening, a housing adapter to be interposed between the exhaust manifold and the exhaust pipe of the stated engine and affording a chamber therein, said housing having a lateral wall provided with an aperture, a conduit extending from the aperture in said housing to the opening in said adapter plate, and a substantially tubular screen member provided in the chamber of said housing in a radially inwardly spaced relation from the lateral wall of the latter, whereby exhaust gases passing through said screen member may be drawn into said conduit.

4. The structure as set forth in claim 3 together with a baffle provided in said chamber between said screen member and said aperture.

5. The structure as set forth in claim 3 together with a flow control valve provided on said conduit.

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