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FUEL ECONOMIZER ATTACHMENT FOR INTAKE MANIFOLDS

Filed June 18, 1958

Fig.1

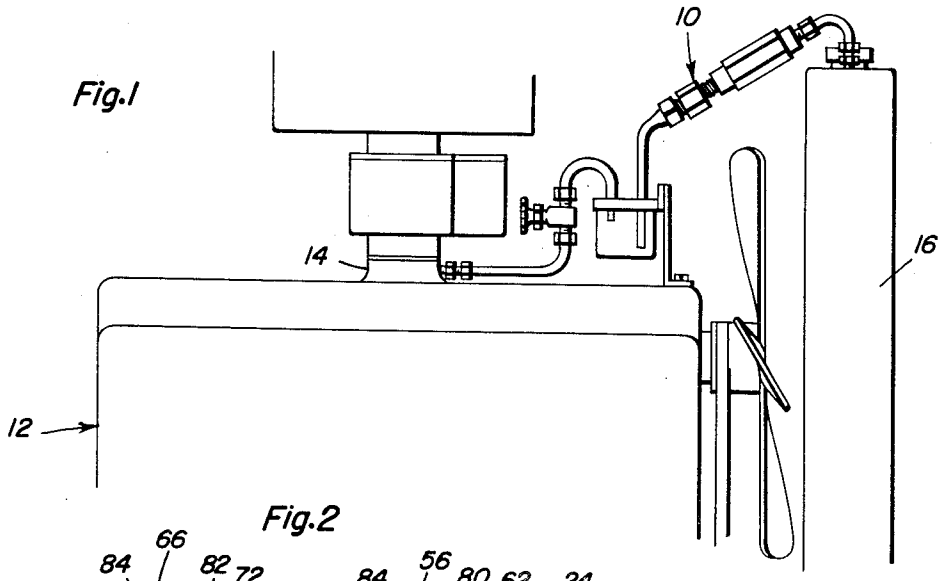


Fig.2

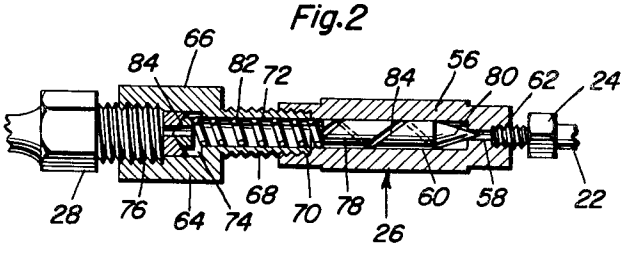


Fig.3

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FUEL ECONOMIZER ATTACHMENT FOR INTAKE MANIFOLDS

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This invention relates in general to new and useful improvements in attachments for automotive vehicles, and more specifically to a fuel economizer attachment for the intake manifold of an automobile engine.

It is well known that when the air drawn into the intake manifold of an internal combustion engine contains a small quantity of moisture, a more efficient operation of an internal combustion engine results. This is clearly evident on a rainy day. Further, heretofore there have been devised attachments which will introduce moisture into the fuel-air mixture for an internal combustion engine. While these devices had desirable advantages, there were also numerous disadvantages. One of the primary disadvantages was the necessity of a separate supply tank for the water, which supply tank had to be constantly refilled and which required that the service station attendant be reminded to refill it. Also, there was provided no efficient means for assuring against the existence of an excessive quantity of moisture in the air.

It is therefore the primary object of this invention to provide a moisture supplying attachment for internal combustion engines, which attachment may be connected directly to the radiator of the vehicle of which the internal combustion engine is a part so that the radiator provides the moisture supply desired, the radiator being a component of a vehicle which is constantly checked by service station attendants so that the supply for the moisture injecting attachment is constantly maintained.

Another object of this invention is to provide a fuel economizer attachment for the intake manifolds in internal combustion engines, the attachment being in the form of a moisture injection system, the moisture injection system relying upon moisture obtained from a tank, the attachment having a moisture collection door disposed intermediate its ends whereby excessive moisture is removed.

Another object of this invention is to provide a fuel economizer attachment for intake manifolds of internal combustion engines for the purpose of supplying moisture thereto, the attachment being in the form of piping and valves which extend between a radiator and an internal combustion engine intake manifold for the purpose of obtaining moisture from the radiator and supplying it in the desired quantity to the intake manifold, there being provided suitable valve means for controlling the flow of moisture.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a schematic view showing an internal combustion engine and radiator and extending between the intake manifold of the internal combustion engine and the radiator the fuel economizer attachment which is the subject of this invention;

FIGURE 2 is an enlarged fragmentary longitudinal sectional view taken substantially upon a plane passing along the longitudinal center line of a valve for controlling the flow of moisture laden air from the radiator; and

FIGURE 3 is an enlarged perspective view of the fuel economizer attachment.

Referring now to the drawings in detail, it will be seen that there is illustrated the fuel economizer attachment which is the subject of this invention, the attachment being referred to in general by the reference numeral **10**. The attachment **10** is used in conjunction with an internal combustion engine **12** having an intake manifold **14**. Also associated with the internal combustion engine **12** is a radiator **16**.

Referring now to FIGURES 2 and 3 in particular, it will be seen that the attachment **10** is provided at one end thereof with a fitting **18** which may be threadedly engaged in the upper part of a radiator **16**. Threadedly engaged in the fitting **18** is a fitting **20** which connects to the fitting **18** a section of tubing **22**. The opposite end of the section of tubing **22** is provided with a fitting **24** which couples it to a valve which is referred to in general by the reference numeral **26**, the valve **26** being a flow control valve.

Connected to the opposite end of the valve **26** by means of a fitting **28** is a section of tubing **30**. The tubing **30** is connected to a device for removing excessive moisture, the device being referred to in general by the reference numeral **32**. The device **32** is in the form of a transparent container **34** having a top **36**. The section of tubing **30** is secured to the top **36** and extends down into the container **34** adjacent the bottom **38** thereof.

Also carried by the top **36** is an inverted U-shaped section of tubing **40** which has an end extending into the container **34** but spaced a considerable distance above the bottom **38**. Thus only moisture laden air is drawn into the section of tubing **40**. The section of tubing **40** is connected by means of a fitting **42** through a shut-off valve **44** which has a control handle **46**.

Connected to the shut-off valve **46** by means of a fitting **48** is the section of tubing **50**. The section of tubing **50** is provided with a fitting **52** which is in turn connected with a fitting **54**, the fitting **54** being threadedly engageable in the intake manifold **14**.

Referring now to FIGURE 2 in particular, it will be seen that the control valve **26** includes an elongated valve housing **56** having a reduced bore **58** at one end thereof, and an enlarged bore **60** extending through the central portion in the opposite end thereof, the bores **58** and **60** being coaxial, and communicating with each other. The bore **58** has an enlarged internally threaded outer portion **62** in which there is threadedly engaged the fitting **24**.

The valve **26** also includes a fitting **64** which has an enlarged portion **66** and a reduced portion **68**. The reduced portion **68** is externally threaded and is threadedly engaged in an enlarged internally threaded end portion **70** of the bore **60**.

The portion **68** is provided with a bore **72** therethrough which opens into the enlarged portion **66** into an enlarged bore **74** formed therein. The opposite end of the enlarged bore **74** opens into a still larger internally threaded bore **76** in which there is threadedly engaged the fitting **28**.

Disposed within the member **56** within the bore **60** is a needle valve member **78** having a conical end **80** which projects into the bore **58** so as to control the flow of moisture laden air through the control valve **26**. Bearing against the needle valve member **78** and disposed within the bore **72** is a spring **82**. The spring **82** has the opposite end thereof engaged with a suitable seat assembly **84** disposed within the bore **74**. By controlling the position of the fitting **64** with respect to the the member **56**, the pressure exerted on the needle valve member **78** by the spring **82** will vary and thus vary the setting of the conical portion **80** with respect to the bore **58**. This, of course, will control the flow of moisture laden air through the control valve **26**.

In order that moisture laden air may pass the needle valve **78**, the needle valve **78** is provided with a spiral passage **84**. The spiral passage **84** communicates the opposite ends of the bore **60**.

In the operation of the present invention, when the internal combustion engine **12** is operating, a vacuum is produced in the intake manifold **14**. This, of course, produces a vacuum in the attachment **10**. Moisture laden air is then drawn from the radiator **16** into the attachment **10**. The flow of such moisture laden air is controlled by the control valve **26**, as described above. The moisture laden air then passes down into the excess moisture remover **32** and excessive moisture will drop out of the moisture laden air into the container **38**. The air is then received from the container **38** by the section of tubing **40** and flows into the intake manifold **14**. When it is not desired to utilize the device **10**, the shut-off valve **44** may be moved to a closed position.

The present invention is an improvement on a conventional development, that is the provision of moisture laden air to a fuel-air mixture of an internal combustion engine. However, there has been provided a highly desirable valve system for controlling the flow of the air and there has been provided means for assuring that excess moisture does not enter into the fuel air mixture. Further, by obtaining the moisture from the radiator, which part of a vehicle is constantly checked by service station attendants, a constant supply of moisture laden air is assured.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

A fuel economizer attachment for gasoline engines comprising a moist air supply line, a first fitting at one end of said moist air supply line adapted for attachment to an engine radiator, a second fitting on the opposite end of said moist air supply line adapted for attachment to an intake manifold for delivering moist air from a radiator

to a fuel air mixture of an intake manifold, a flow control valve mounted within said moist air supply line, said control valve including a valve housing having a constant diameter longitudinal bore therein, an elongated spring urged cylindrical valve member snugly and slidably received within said bore, said housing having inlet and outlet openings, said openings being in communication with opposite ends of said bore, said valve member having a conical end portion receivable in said inlet opening comprising a closure therefor, a small restricting spiral passage formed in the outer surfaces of said valve member with the ends of said passage in communication with the opposite ends of said bore, whereby a greater pressure in said inlet opening relative to the pressure in said outlet opening will force said conical portion of said outlet away from said inlet opening allowing the moist air in said radiator to pass through said valve and into said intake manifold.

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