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CARBURETOR AIR FILTER DETECTING DEVICE

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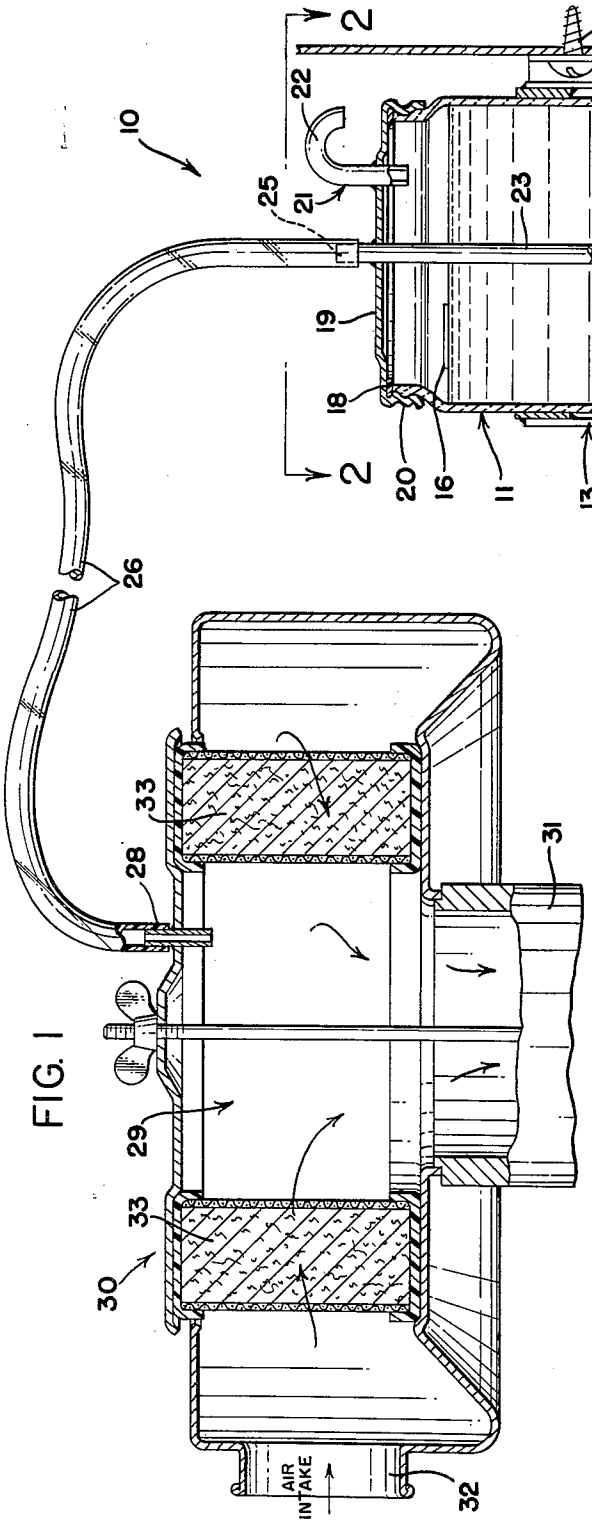

FIG. 1

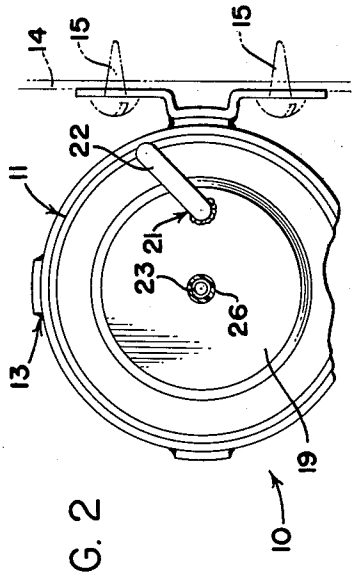

FIG. 2

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CARBURETOR AIR FILTER DETECTING DEVICE

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The present invention relates generally to a device used in conjunction with air filters of the kind used to filter the air inducted into an internal combusion engine. More particularly, the present invention relates to a device which visually signals restriction of air flow through an air filter and which is simultaneously or concurrently adapted to provide top cylinder lubrication when the air flow through the air filter is restricted.

Air filters are used on internal combustion engines to remove the dust and abrasive material suspended in the atmosphere which could be drawn into the combustion chamber with attendant damage to the cylinder walls. The inducted air permeates the filter without restriction. However, as the impurities accumulate in the filter, air flow is restricted. By thus impeding the air flow, an excessively rich fuel/air mixture is drawn into the combustion chamber. Such a mixture not only greatly increases fuel consumption, but also causes severe damage to the cylinder walls, pistons and piston rings by inspiration of unvaporized fuel which washes the lubricant therefrom.

It is therefore the primary object of the present invention to provide a carburetor air filter detecting device which will visually signal the restriction of air flow through an air filter and which will supply a liquid lubricant with the combustion mixture when the air flow is restricted.

It is a further object of the present invention to provide a carburetor air filter detecting device of simplified construction which will be inexpensive to manufacture.

These and other objects which will become apparent to the reader of the following specification are accomplished by means hereinafter described and claimed.

One preferred embodiment is shown by way of example in the accompanying drawings and hereinafter described in detail without atempting to show all the various forms and modifications in which the invention might be embodied; the invention being measured by the appended claims and not by the details of the specification.

In the present invention the restriction of air flow through the carburetor air filter creates a partial vacuum in the central chamber of the air filter. This partial vacuum draws oil out of a conveniently placed reservoir which mixes with the intake air and is drawn into the engine's combustion chamber. The lowered oil level in the reservoir indicates an accumulation of foreign material in the filter, and the oil supplied to the engine acts as a lubricant. Furthermore, as part of this oil drawn into the combustion chamber burns, it causes the exhaust to have a characteristic blue-gray appearance which is also a visual signal of the clogged condition of the air filter.

Referring to the drawings:

FIG. 1 is a schematic cross section of a detecting device, according to the invention, operatively connected to a carburetor air filter; and,

FIG. 2 is a plan view taken substantially on line 2—2 of FIG. 1,

The detecting device, indicated generally by the numeral **10**, comprises a preferably transparent container **11** which serves as a reservoir for a volume of oil, indicated at **12**. A support bracket **13** receives container **11** and is secured to the fire wall **14** of an automobile engine compartment (not shown) as by metal screws **15**. A level line **16** is preferably provided on container **11** to indicate the standard or full condition of the oil reservoir.

A sealing washer **18** is provided between container **11** and cap **19** to prevent accidental loss or spillage of oil from the reservoir **12**. Cap **19** may be demountably secured to the upper portion of container **11**, as by threads **20**. A vent **21** is provided through cap **19** to provide free communication of atmospheric pressure to the surface of oil in the reservoir.

The vent **21** is provided with a crooked portion **22** which prevents the admission of water or dirt through the vent **21**. Portion **22** should be sufficiently elevated above the upper surface **16** of oil in the reservoir to prevent loss of oil by normal sloshing due to the motion of the vehicle on which the device **10** is mounted.

Also extending through cap **19** is a feed pipe **23**. The lower end **24** of feed pipe **23** is positioned in proximity to or adjacent the lower portion of the reservoir container **11**, and the upper end **25** extends through cap **19** sufficiently to permit attachment of connecting tube **26** thereto. The other end of tube **26** is similarly attached to an insert pipe **28** which communicates with the central chamber **29** of a standard carburetor air filter, indicated generally by the numeral **30**, which is affixed to the intake passage **31** of a carburetor (not shown). As is shown by the arrows, the air entering the filter intake **32** must pass through filter element **33** before entering chamber **29** for free flow to the carburetor intake passage **31**.

Connecting tube **26**, which is preferably transparent, may connect directly from container **11** to filter **30** or it may be positioned such that a portion, at least, is visible from the driver's seat, for a purpose hereinafter more fully described.

It is mandatory that container **11** be positioned so that the level line **16** is below the level of the end of insert pipe **28** within chamber **29**. The actual level differential, however, is selected according to the viscosity of the oil used in the reservoir, the diameter of the connecting tube **26** and feed pipe **24**, the compression of the engine cylinders, and the normal air flow resistance of the type filter unit **33** utilized.

Under normal operation, the suction stroke of the pistons draws air through the filter **30**. The level differential (i.e., the level of the container **11** with respect to filter **30**) is such that the negative pressure in chamber **29** is not sufficiently low to permit atmospheric pressure to force the oil in the reservoir through feed pipe **23** and into tube **26**. However, as the filter unit **33** accumulates foreign material strained from the air it affords more and more resistance to the passage of air therethrough. By so impeding the air flow, the pressure in chamber **29** is lowered and the atmospheric pressure forces the oil in the reservoir upwardly through feed pipe **23** and tube **26** into chamber **29** where it mixes with the air drawn into the combustion chamber. The oil relubricates the cylinder walls to counter the lubricant washing effect of the overly rich fuel/air mixture resulting from the decreased availability of intake air. The oil also burns to give a characteristic blue-gray color to the exhaust.

Constructing tube **26** of a transparent material permits visual observation of the flow or the extent to which oil from the reservoir has been drawn toward filter **30** when the engine is running. Providing a level line **16** on container **11** permits one to observe whether any of the oil has been drawn into the filter **30**, even after the engine has been turned off.

What is claimed is:

1. In combination with an engine having an air induction passage and a filter unit having a central cavity connected to said passage through which air flows to said engine, an air filter detection device comprising, a liquid lubricant containing reservoir, and conduit means

communicating between said reservoir and said central cavity, said reservoir positioned below the communicative connection of said conduit to said central cavity in order that said conduit means will draw said lubricant from said reservoir into said passage in response to the partial vacuum within said central passage when there is a restriction of air flow through said filter unit.

2. In combination with an engine having an air induction passage and a filter unit having a central cavity connected to said passage through which air flows to said engine, an air filter detection device comprising, a vented liquid lubricant containing reservoir, a length of conduit means, the first end of said conduit means communicating with said central cavity, the second end of said conduit means communicating with said reservoir to drain the lubricant therefrom, said second end of said conduit means being on a lower level than said first end, said conduit means utilizing the partial vacuum within said central cavity to draw said lubricant from said reservoir and into said passage.

3. A device of the type described in claim 2, said conduit means being transparent.

4. In combination with an engine having an air induction passage and a filter unit having a central cavity connected to said passage through which air flows to said engine, an air filter detection device comprising, a reservoir, said reservoir being filled with liquid lubricant to a preselected level, the level of said lubricant being visible exteriorly of said container, a vent for continuous atmospheric communication with that portion of the container above the level of said lubricant, a feed pipe exteriorly of said lubricant reservoir extending interiorly of said lubricant and adapted to drain said lubricant, a length of transparent conduit means, the first end of said conduit means communicating with said central cavity, the second end of said conduit means communicating with said feed pipe exteriorly of said lubricant, the level of said lubricant in said reservoir being lower than the level of the first end of said conduit means, said conduit means utilizing the partial vacuum within said central cavity to draw said lubricant from said reservoir and into said passage.

5. In combination with an engine having an air induction passage and a filter unit having a central cavity connected to said passage through which air flows to said engine, an air filter detection device comprising, a mounting bracket, a transparent container received in said bracket and adapted to serve as a liquid lubricant reservoir, a level line on said container, a cap detachably secured to the upper portion of said container, a crooked vent extending through said cap for continuous atmospheric communication with the interior of said container, a feed pipe extending through said cap, the upper end of said pipe terminating exteriorly of said cap, the lower end of said pipe extending below said level line and terminating in proximity to the lower portion of said container, a length of transparent conduit means, the first end of said conduit means communicating with said central cavity, the second end of said conduit means communicating with said feed pipe exteriorly of said cap, the level of said level line being lower than the first end of said conduit means, said conduit means utilizing the partial vacuum within said central cavity to draw said lubricant from said reservoir and into said passage.

References Cited in the file of this patent

UNITED STATES PATENTS

1,857,512	Matteson	May 10, 1932
2,108,556	Hardt	Feb. 15, 1938
2,537,495	Wallin	Jan. 9, 1951
2,627,934	Martinek	Feb. 10, 1953
2,655,894	Rabbitt	Oct. 20, 1953
2,816,622	Weaver	Dec. 17, 1957

FOREIGN PATENTS

1,107,966	France	Aug. 17, 1955