

[54] **RADIATOR OVERFLOW APPARATUS**

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[51] Int. Cl.: **F01p 11/02**

[58] Field of Search: **123/41.14, 41.27, 41.54; 165/51, 107**

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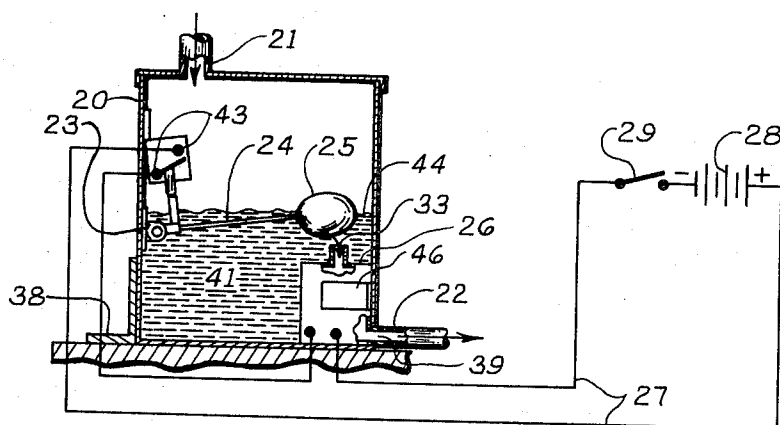
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[57] **ABSTRACT**

An apparatus for allowing excess radiator fluid to overflow without loss of fluid. An overflow tank is connected to an overflow tube in the top of the radiator. The exit tube of the overflow tank is connected to the radiator hose and a valve is provided which prevents fluid from flowing into the overflow tank from the radiator hose. A pump is provided within the overflow tank to pump the fluid held by the tank into the radiator hose. The pump is battery powered and may be energized by automatic or manual means.

2 Claims, 3 Drawing Figures



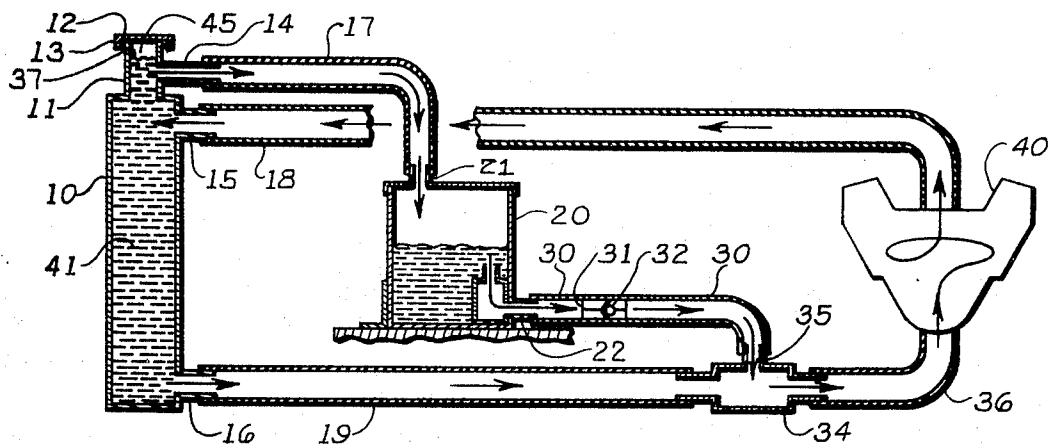


Fig. 1

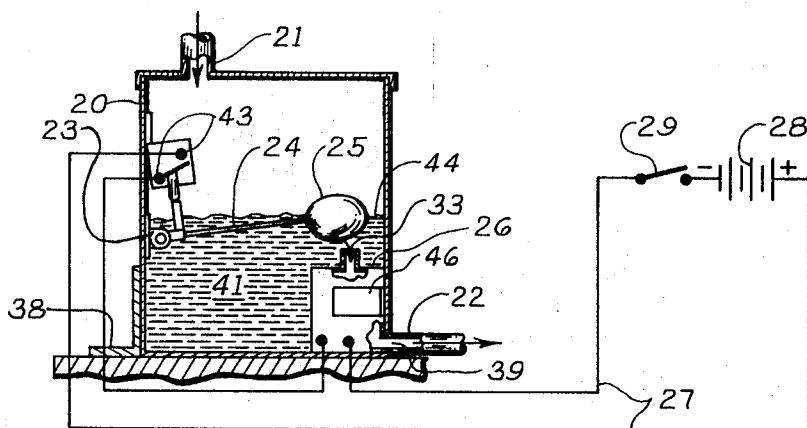


Fig. 2

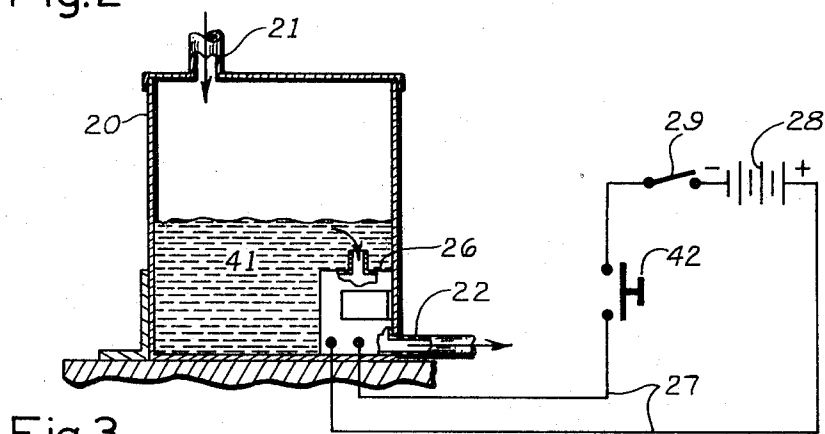


Fig. 3

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RADIATOR OVERFLOW APPARATUS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a radiator overflow apparatus for holding excess radiator fluid.

2. Description of the Prior Art

It has been the general practice in the automobile industry to provide an overflow tube at the top of the automobile radiator in order to allow excess fluid to flow out of the radiator. The engine heat absorbed by the radiator fluid results in increased pressure and fluid expansion which could cause a rupture in the radiator and associated hoses. Thus, an escape outlet or overflow tube is provided. The fluid escaping through the overflow tube falls on the ground with the result that the user of the automobile must eventually add additional quantities of fluid in order to prevent the engine from overheating. The present invention eliminates the problem of manually adding water or fluid back to the engine cooling system by providing a tank for capturing the overflow fluid and a means for pumping the fluid back into the engine cooling system.

U.S. Pat. to Duesenberg No. 1,852,770 describes a cooling system for internal combustion engines which has a tank connected to receive overflow fluid from the radiator. A thermostatically controlled valve is located in the tank for closing the tank and for allowing pressure to be built up in the cooling system. The water is returned to the cooling system by a vacuum when the engine is stopped. Another device for cooling an engine is shown in U.S. Pat. to Mallory, No. 1,678,644. The Mallory device provides an overflow system with a condensing space located within the engine for receiving excess fluid.

There is a need for an overflow device for receiving excess fluid from a radiator which holds the fluid until such a time as the fluid is needed. The device should be capable of holding the excess fluid for long periods of time even though the engine is not operating. The overflow device should be inexpensive and easy to install on new or used automobiles.

SUMMARY OF THE INVENTION

The present invention provides an apparatus for receiving and holding overflow fluid from an automobile radiator until such a time when the fluid is needed. The present invention has an overflow tank connected between the overflow tube of the radiator and the radiator hose. A one way flap valve is provided to prevent fluid from flowing from the radiator hose back into the overflow tank. The overflow tank is provided with a pump to transfer the fluid from the overflow tank to the radiator hose. The pump may be controlled by automatic means composed of a float and electrical contacts or the pump may be controlled by manual means, as for example, a push button switch located on the automobile dashboard. The overflow tank is provided with a bracket for mounting the tank to the automobile. A coupling is provided to connect the overflow tank to the radiator hose.

It is an object of this invention to provide an apparatus for receiving excess fluid from an engine cooling system and for holding the excess fluid for long periods of time until required.

It is also an object of this invention to provide a radiator overflow apparatus which may be controlled by automatic or manual means.

It is a further object of this invention to provide an apparatus for receiving overflow fluid from an automobile cooling system which may be easily installed in a new or used automobile at low cost and without extensive engine modification.

The full nature of the invention will be understood from the accompanying drawing and the following description and claims.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 shows a side view of a circulating system for cooling an engine utilizing the present invention.

FIG. 2 is an enlarged view of the overflow tank shown in FIG. 1 with automatic means for controlling the flow of fluid.

FIG. 3 is an enlarged view of the overflow tank shown in FIG. 1 with manual means for controlling the flow of fluid.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now more particularly to FIG. 1, there is shown a radiator 10 for holding and cooling fluid 41. A hollow neck 11 is attached to the top of radiator 10 and has a lip 12 surrounding neck opening 45 for holding radiator cap 13.

As is well known in the automobile industry, the internal combustion engine may be cooled by circulating fluid, generally water or a combination of water and anti-freeze, from radiator 10 through radiator hose 19 and 36 to various cooling ducts within engine 40. The fluid absorbs the heat from the engine and returns to radiator 10 via return hose 18. The heat in the fluid is then radiated by radiator 10 and the fluid is recirculated back through the engine. Radiator 10 has two hollow tubes 15 and 16 attached to a side wall of the radiator for receiving hoses 18 and 19.

It is the general practice in the automobile industry to provide a hollow tube 14 attached to neck 11 of radiator 10. A hose is then attached to tube 14 to allow for draining of fluid 41. As the heat within the circulating system increases, water level 37 correspondingly increases. To prevent rupture of the radiator or associated hoses resulting from the increased pressure and water level, overflow tube 14 is provided to allow for escape of excess fluid. A sizable quantity of fluid may be drained from radiator 10 out through overflow tube 14 over a period of time. The user of the system must then refill the radiator with additional amounts of fluid in order to prevent the engine from overheating.

FIG. 1 shows a overflow tank 20 for holding the excess fluid until such a time as the fluid is needed. Overflow tank 20 then allows the fluid to flow back into the radiator hose. Overflow tank 20 is attached to radiator overflow tube 14 by means of overflow hose 17. An enlarged view of the overflow tank 20 is shown in FIG. 2. Overflow hose 17 is attached to tank 20 by means of a hollow fluid inlet tube 21 attached to the top wall of the tank. A hollow fluid outlet tube 22 is attached to the bottom of the tank side wall to allow the fluid to exit from the tank. Hose 30 is fastened to exit tube 22 on one end and to radiator hose coupling 34 at the other end of the hose. Hose 30 has a one-way valve 32 in holder 31. Valve 32 allows the fluid to flow from overflow tank 20 into coupling 34 but prevents the fluid from flowing in the opposite direction which could result from pressures within the engine cooling system. A suitable valve would be valve number C 602-19A 563-A of the Ford Motor Company, Detroit, Michigan. Coupling 34 is a hollow tube connected between radiator hose 19 and radiator hose 36 and is provided with a hollow tube 35 for attachment of hose 30. The arrows within hoses 19, 36, 18, 17 and 30 indicate the direction of fluid flow.

FIG. 2 is an enlarged view of the overflow tank with automatic means for controlling the flow of fluid. Pump 26 is fastened to the side wall of overflow tank 20 by means of clip 46. Pump 26 is provided with an entrance opening 33 and an exit opening 39. Pump 26 is located in such a manner as to allow the fluid flowing from exit opening 39 to flow out through tube 22. The pump has terminals for receiving direct current power. The pump is energized by applying power to the power terminals and by closing contacts 43 and switch 29. A float 25 attached to arm 24 is hinged to the side wall of tank 20 by means of hinge 23. Contact means 43 are provided on the side wall of overflow tank 20 and arm 24 in such a manner as to touch when float 25 has reached its most upward position. Pump 26 is energized when the fluid level 44 is sufficiently high to force float 25 to cause contacts 43 to touch. As water level 44 decreases, float 25 and arm 24 pivot on hinge 23, contact is broken by contacts 43 and the pump 26 is deenergized. The power to operate pump 26 is provided by battery 28 connected by wires 27 to the pump. The automo-

bile ignition switch 29 may be connected in series with battery 28 in order to prevent the pump from operating when the automobile is not in use. A bracket 38 is provided on overflow tank 20 to allow for proper mounting of the tank to a suitable location within the automobile. Suitable pumps are commercially available for the above described application. For example, pump number C8UZ-17664A, of the Ford Motor Company, Detroit, Michigan will suffice.

FIG. 3 illustrates the same overflow system illustrated in FIG. 2 with the exception that the flow of fluid is controlled by manual means in lieu of automatic means. That is, float 25, arm 24 and contact means 43 are not utilized and instead of manual switch 42, connected in series with the ignition switch 29 and battery 28, provides the required conditions for pump 26 to energize. Switch 42 may be conveniently located on the dashboard of the automobile and should be a normally open type of switch.

It will be evident from the above description that the present invention provides an apparatus for allowing fluid to overflow from an engine cooling system without loss of fluid. It will also be evident from the above description that the present invention provides an overflow apparatus which may be utilized on new or used automobiles without a large installation expense involved. It will be further evident that from the above description that the present invention provides an apparatus for holding excess fluid from an engine cooling system for long periods of time.

While the invention has been illustrated and described in detail in the drawing and foregoing description, the same is to be considered as illustrative and not restrictive in character it being understood that only the preferred embodiment has been shown and described and that all changes and modifications that come within the spirit of the invention are also to be

protected. It should be understood that the described radiator overflow apparatus applies to any engine having a fluid cooling system.

The invention claimed is:

1. The combination of:

- an engine radiator having a bottom outlet tube,
- a top inlet tube, and an overflow outlet tube;
- a first hose means connecting said bottom outlet tube with an engine to be cooled;
- a second hose connecting said inlet tube with said engine;
- an overflow tank having a top inlet tube connected to said overflow outlet tube, said tank having an outlet tube;
- an electrical pump positioned within said tank and operable to pump water out said tank outlet tube, said pump having terminals connected to a battery in series with a manual switch;
- a third hose connecting said tank outlet tube with said first hose means; and,
- a float mounted on a pivoting arm, said arm being pivotably hinged to the inside wall of said tank, a first electrical contact being mounted on said arm, a second electrical contact being mounted to said inside wall, said first and second contacts and said arm being arranged in such a manner that said first contact touches said second contact only when said arm is in its most upwardly position, said first and second contacts being connected in series between said battery and said tank.

2. The combination of claim 1 additionally comprising a fluid valve being connected between said tank and said first hose means allowing fluid flow from said tank to said first hose means.

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