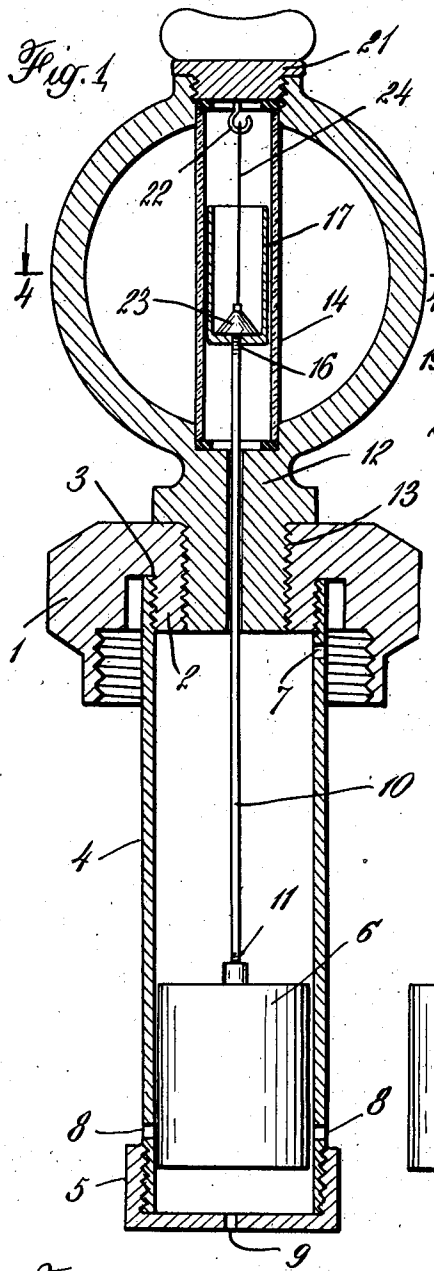
April 6, 1926. 1,579,652

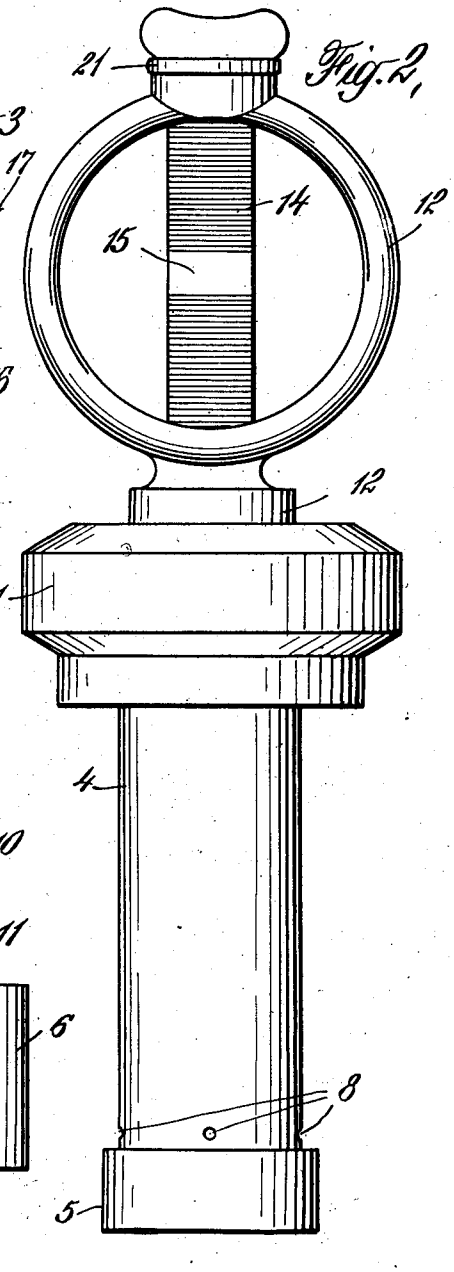
V. V. DETWILER

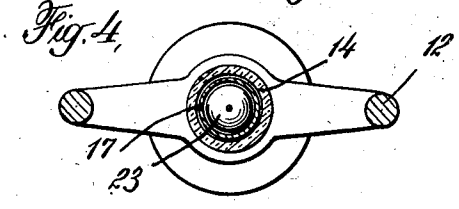
AUTOMOBILE ACCESSORY

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UNITED STATES PATENT OFFICE.

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AUTOMOBILE ACCESSORY.

Application filed April 8, 1925. Serial No. 21,563.

To all whom it may concern:

Be it known that I, VINTON V. DETWILER, a citizen of the United States, residing at Augusta, in the county of Kennebec, State of Maine, have invented certain new and useful Improvements in Automobile Accessories; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to automobile accessories and particularly to a hydrometer attachment adapted to be applied to an automobile radiator to indicate whether or not there is sufficient alcohol or other anti-freezing substance in the radiator to prevent the radiator contents from freezing at a certain temperature.

One object of the invention is to provide a hydrometer attachment for automobile radiators which will give a danger signal if there is likelihood of the mixture in the radiator freezing at a certain temperature for which the device has been set, and will give a different signal when there is no danger of the mixture freezing at that temperature.

Another object is to so construct the device that a third signal will be given when the level of the liquid in the radiator becomes too low to insure proper and positive operation of the hydrometer.

Another object is to actuate or control all three of the above mentioned signals by a single and common float.

Another object is to so construct the device that it may be readily and quickly reset to give the proper signals for different temperatures.

A further object is to provide a hydrometer attachment for automobile radiators which is reliable in its operation, inexpensive to manufacture but sturdy in construction and which may be readily assembled and taken apart.

Fig. 1 is a vertical section of the device associated with the radiator cap of an automobile;

Fig. 2 is a front elevation of the device shown in Fig. 1;

Fig. 3 is an elevation of the indicator and float element, and

Fig. 4 is a horizontal section taken on the line 4—4 of Fig. 1.

1 indicates the radiator cap of an automobile. It is provided with an interior boss 2 to which there is attached, preferably by a threaded connection 3, a depending tubular casing 4. The casing 4 is closed at its lower end by means of a cap 5 which is preferably screwed on to the casing 4 so that it may be readily removed when desired. The casing 4 contains a float 6 which may be of any suitable construction, for instance a hollow metal cylinder. The casing 4 is provided with one or more openings 7 located above the normal level of the liquid in the radiator and one or more openings 8 near the lower end of the casing. The cap 5 may also be provided with one or more openings 9. The opening, or openings, 7 constitute air vents and the openings 8 and 9 admit and discharge the liquid in the radiator to and from the casing 4. By allowing the liquid to enter the casing 4 through openings 8 provided in the side walls of the casing there is but little tendency for the float to be pushed upwards when the device is first installed on the radiator, as would be the case if all the liquid were admitted through the bottom opening or openings 9. The float 6 is preferably of such size that it fits closely enough in the casing 4 for the cushioning action of the liquid to prevent rapid movement of the float in the casing due to jars or shocks. It is also of such a design that the combined specific gravity of the float, and the parts of the device carried by it, will be the proper amount to make the device operate as desired. The float 6 is attached to a rod 10 preferably by means of a threaded connection 11, and this rod extends upwardly into an indicator casing 12 supported upon the radiator cap 1 as by means of a threaded connection 13. The casing 12 may be of any ornamental and attractive design. It carries a glass tube 14 which is masked in such a way as to provide, about midway of its length, a transparent window 15 (Fig. 2). The upper end of the rod 10 has secured thereto, preferably by means of a threaded connection 16, a cup-like indicator element 17. The outer surface of the indicator element 17 is provided with three areas of different colors as shown in Fig. 3. For instance, an upper area 18 may be black, an intermediate area 19 may be white and a lower area 20 may be red. The window 15 is adapted to expose to view not more than one complete color area at any one time.

Immediately above the tube 14 the casing

12 is provided with a removable cap 21 provided on its lower surface with a hook or other supporting device 22 to which a weight 23 may be connected as by means of a flexible cord 24. The device is so designed, and the cord 24 is of such a length, that when the intermediate white area 19 of the indicator registers with the window 15, the weight 23 will be resting upon the bottom of the cup 17 and the cord 24 will be taut. Any downward movement of the indicator from this position will cause the cup to withdraw from the weight 23 and leave it suspended on the cord 24 while any upward movement of the indicator from such position will cause the weight 23 to be lifted by the cup.

It will be understood that the cap 1 is intended to replace the ordinary radiator cap of the car on which the device is to be installed. The tubular casing 4 is of the proper size and length for the particular car for which the device is designed.

In operation the liquid in the radiator partly fills the tubular casing 4 and the parts are so designed that if the specific gravity of the liquid is such that there is no danger of the mixture freezing at a given temperature, the weight 23 will cause the float 6 and the indicator 17 to move down to and remain in the position shown in the drawing. In this position of the parts the white area 19 will appear through the window 15 and this indicates that there is no danger of the mixture freezing at the temperature for which the device is set. If the amount of alcohol or other anti-freezing substance in the mixture becomes reduced the float 6 will rise until indicator element 17 touches cap 21, and elevate with it the weight 23. The red area 20 will then appear through the window 15, thus giving a danger signal that the mixture is likely to freeze at the temperature for which the device is set.

It will now be noted that the signal 19, which may be conveniently termed the "O. K." signal, must be given when the float is in a low position due to the fact that the more alcohol there is in the mixture the more the float will sink. The float will also lower if the level of the liquid in the radiator becomes too low. A problem, therefore, immediately presents itself because the device under ordinary conditions would show the O. K. signal when the mixture had the proper specific gravity and also when the level of the liquid became too low. This would make the device unreliable because when the level of the liquid is low the "O. K." signal would be given regardless of how much alcohol there was in the mixture. However, the device is so constructed as to take care of this problem because if the level of the liquid in the casing 4 becomes too low the float 6 will sink until the black area 18 is exposed through the window 15, and float 6 rests on cap 5, and this gives a warning that the level of the liquid is too low to insure proper operation of the device. As the float 6 moves below the position at which the white area 19 registers with the window 15, the cup 17 will withdraw from the weight 23 and leave the latter suspended upon the cord 24. If the weight 23 were permitted to act on the cup 17 during the entire downward travel of the latter the float 6 would tend to remain in its lowermost position both when the mixture has the proper specific gravity and when the level of the liquid is too low. Even if the black area 18 appeared through the window 15 under these circumstances, it would not properly indicate which of the conditions just mentioned existed. Therefore, when the mixture has the proper specifice gravity the weight 23 must force the float down to an intermediate position only, so that the lowermost position of the float may be utilized to give the low level warning. Due to the suspended weight arrangement the "O. K." signal will be given only when there is sufficient alcohol in the radiator and when the level of the liquid is, at the same time, sufficiently high.

Under these circumstances, that is, with a sufficiently high level and plenty of alcohol, the liquid will flow up around the float 6 and the float will rise just to the point of being ready to lift the weight, and no matter how high the level of the liquid may be in the casing 4, the float will not be lifted beyond this position as the weight is such as to prevent this. Therefore, the "O. K." signal will continue to show through the window 15. However, should the alcohol content of the mixture decrease below the safe amount, the float 6 will rise and lift with it the weight 23. The device is therefore in a critical state of balance as a little more water in the mixture will move the float up while a little lower level will move it down.

It should be noted that the device indicates the level of the liquid only to the extent of giving a warning should the level become too low to insure proper action of the device. The device does not indicate the level of the liquid at all times because when there is sufficient liquid in the radiator its level is not indicated.

It will now be apparent that the setting of the device is determined by the size of the weight 23. If it is desired to set the device to give the warning signal when the mixture is not right to stand a relatively low temperature a smaller weight should be used, whereas if the warning signal is to be given when the mixture is not right to stand a higher temperature a larger weight should be used. In order that the device may be set to give the proper indications for any given temperature the cap 21 is made readily removable as above described and the weight

23 may be replaced by a different weight corresponding to the different temperature for which it is desired to reset the device. When the cap 21 is removed from the casing 12 the weight 23 is withdrawn from the cup 17 by the cord 24. The cord 24 may be removed from the hook 22 and a different weight and cord substituted for it, or the weight may be removed from the cord and a different weight attached to the same cord.

The preferred form of the device has been described quite specifically, but this should not be construed in a limiting sense. Furthermore, the device has been described as an automobile accessory or attachment because the form herein disclosed is particularly adapted for such use but certain features of the device render it serviceable for other uses.

I claim:

1. An attachment for automobile radiators comprising a radiator closure cap, a hydrometer operatively mounted on said cap and comprising a float located below the cap, an indicator operated by the float and located above the cap, means exerting downward pressure on the float throughout the movement of the float above a predetermined point, and means to render said last named means ineffective throughout the movement of the float below such point.

2. An attachment for automobile radiators comprising a radiator closure cap, a hydrometer operatively associated therewith and comprising a float, an indicator operated thereby, a weight for holding the float down to a predetermined level for specific gravities at and below a predetermined value, and means to discontinue the action of said weight on the float when the float moves below said predetermined level.

3. An attachment for automobile radiators comprising a radiator closure cap, a hydrometer operatively associated therewith and comprising a float, an indicator for indicating three successive positions of the float, loading means for the float effective during that movement of the float which causes the indicator to designate two of the positions of the float, and means for rendering the loading means ineffective during that movement of the float which causes the indicator to designate the third position of the float.

4. A hydrometer comprising a float, an indicator for indicating three successive positions of the float, loading means for the float effective during that movement of the float which causes the indicator to designate two of the positions of the float, and means for rendering the loading means ineffective during that movement of the float which causes the indicator to designate the third position of the float.

5. A hydrometer comprising a float, an indicator operated thereby for designating three successive positions of the float, means for loading the float during its movement through the two uppermost positions, and means for removing the load from the float during its movement to and from the lowermost position whereby when the hydrometer is placed in a liquid the float will assume the intermediate position for specific gravities at and below a value determined by the effect of said loading means, will assume its uppermost position when the specific gravity of such liquid exceeds said value and will assume its lowermost position when the level of the liquid becomes too low to effect reliable operation of the hydrometer.

6. A hydrometer comprising a float, an indicator adapted to display three signals, namely, a warning signal in the uppermost position of the float, a signal representing an O. K. signal in an intermediate position of the float and a warning signal in the lowermost position of the float, means for loading the float during its movement which displays the intermediate and lowermost signals, and means for rendering said loading means ineffective during that movement of the float which displays the uppermost warning signal whereby when the hydrometer is placed in a liquid a display of the intermediate signal will indicate that the specific gravity of the liquid is at or below a value determined by the effect of the loading means and a display of the lowermost signal will indicate that the specific gravity is above said value and a display of the uppermost signal will indicate that the level of the liquid is too low to effect reliable operation of the hydrometer.

7. An attachment for automobile radiators comprising a radiator closure cap, an indicator casing mounted on and extending above the cap, a float casing mounted on and extending below the cap, a hydrometer having a float operating in the float casing, a cup-shaped indicator operatively connected with the float and operating in the indicator casing, loading means supported in said cup-shaped indicator during a part of its movement and means operative during the remaining part of the movement of the indicator for relieving the indicator of the weight of said loading means.

8. An attachment for automobile radiators comprising a radiator closure cap, a float operatively associated therewith, an indicator casing supported by the cap, a cup-shaped indicator operating in said casing and operatively connected with the float, a weight mounted in said cup-shaped indicator, and means operative during the downward movement of said indicator to discontinue the downward movement of the weight and thereby discontinue the effect of the weight on the indicator.

9. An attachment for automobile radia-

tors comprising a radiator closure cap, a float operatively associated therewith, an indicator casing supported by the cap, a tube carried by said indicator casing, a cup-shaped indicator operating in said tube and operatively connected with the float, a removable cover carried by the indicator casing above said tube, a weight located in said cup-shaped indicator, and means for suspending said weight from said removable cover.

In testimony whereof I affix my signature.

VINTON V. DETWILER.