R. T. NEWTON.

LIQUID GAGE.

APPLICATION FILED JAN. 11, 1919.

1,382,532.

Patented June 21, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

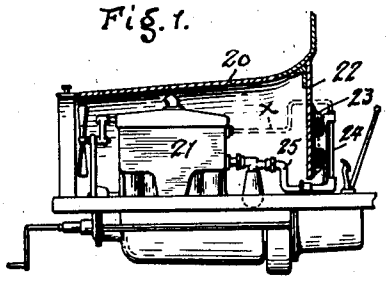


Fig. 12.

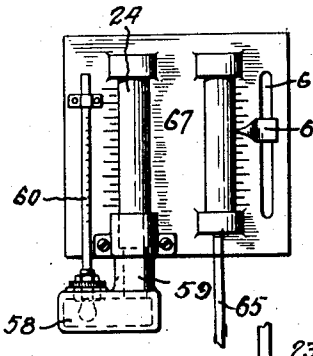


Fig. 13.

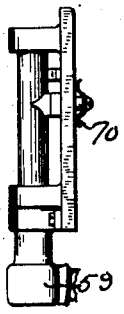


Fig. 4.

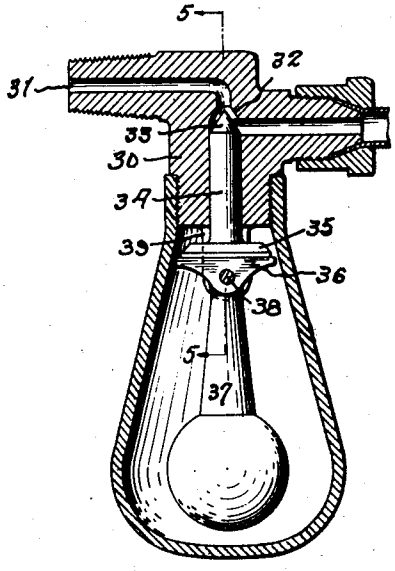


Fig. 5.

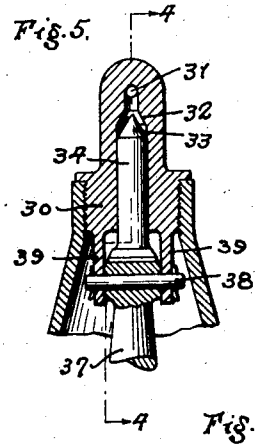


Fig. 2.

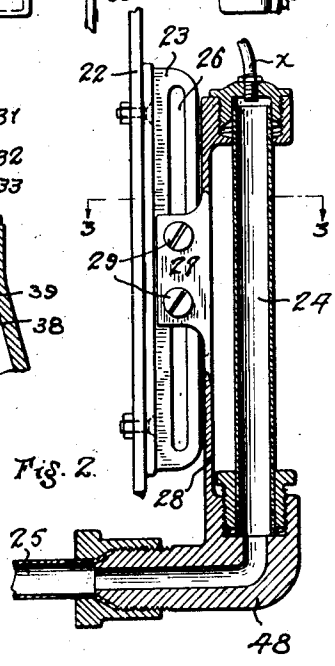


Fig. 6.

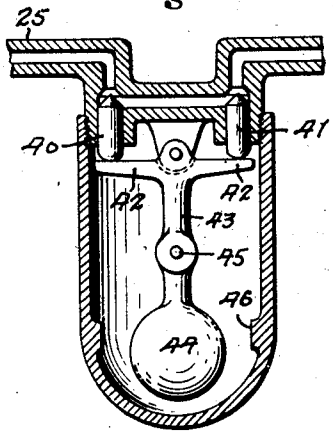
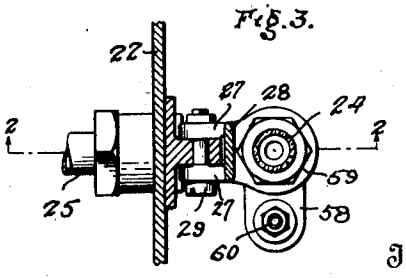


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 10.

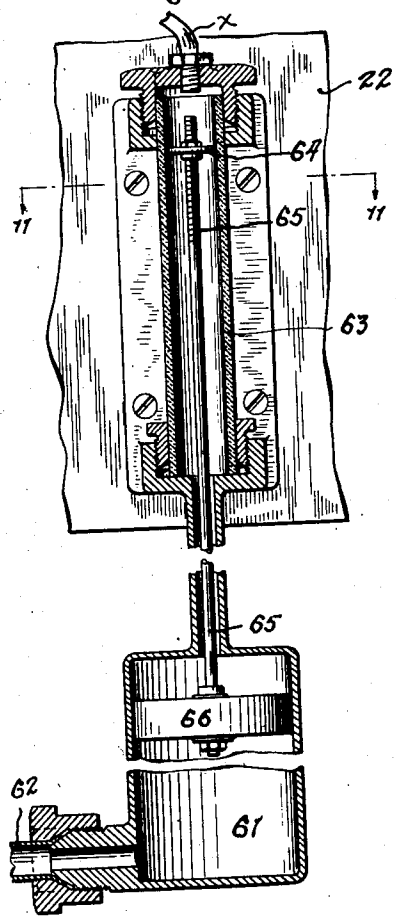


Fig. 11.

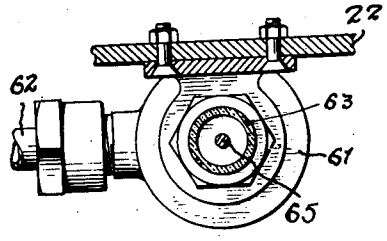


Fig. 7.

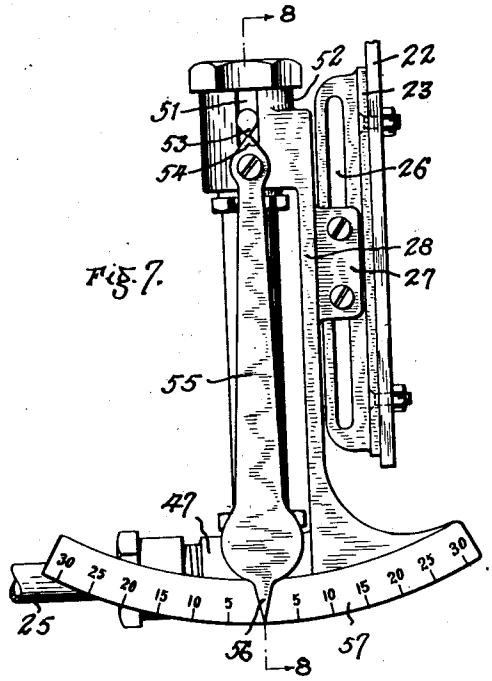


Fig. 8.

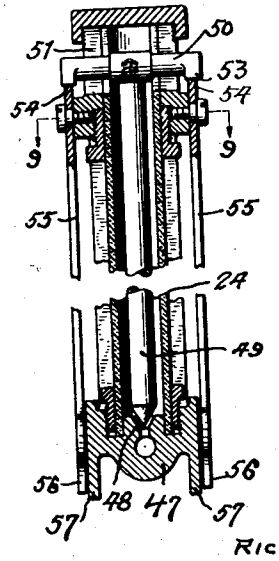
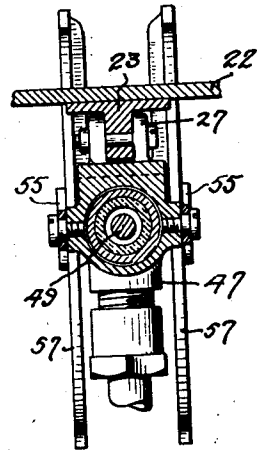


Fig. 9.



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LIQUID-GAGE.

1,382,532. Specification of Letters Patent. Patented June 21, 1921.

Application filed January 11, 1919. Serial No. 270,668.

To all whom it may concern:

Be it known that I, RICHARD T. NEWTON, a citizen of the United States of America, and residing in the city, county, and State of New York, have invented certain new and useful Improvements in Liquid-Gages, of which the following is a specification.

My invention relates to gages and particularly to gages for indicating the liquid level in radiator and gasolene tanks for automobiles, the object of my invention being to provide means arranged on the dash of the car or in other convenient position within easy vision of the driver, by which he can see at a glance the condition of the liquid level in the tanks.

In the accompanying drawings—

Figure 1 is a partial section through the hood at the front end of the car showing a connection from the radiator jacket to the indicator on the dash, and associated parts.

Fig. 2 is a vertical section, to enlarged scale, of the indicator and its supporting bracket.

Fig. 3 is a section on the line 3—3, Fig. 2.

Fig. 4 is a vertical section, on the line 4—4, Fig. 5, through the gravity operated valve arranged in the gage piping.

Fig. 5 is a section on the line 5—5, Fig. 4.

Fig. 6 is a view similar to Fig. 4, but showing a modified construction of the gravity controlled valve.

Fig. 7 is a side elevation of another modification of the gravity valve.

Figs. 8 and 9 are sections on the lines 8—8, Fig. 7, and 9—9, Fig. 8, respectively.

Fig. 10 is a vertical section through the gasolene tank valve.

Fig. 11 is a section on the line 11—11, Fig. 10.

Fig. 12 is a front elevation of a twin gage arrangement for both tanks, and

Fig. 13 is a side elevation thereof.

It is highly desirable that the driver of an automobile, should have within easy vision gages indicating the condition of his fuel supply in the gasolene tank and also the condition of the cooling liquid in the radiator tank and preferably also a thermostat showing the temperature of the latter. While indicating gages for the gasolene tanks have been previously suggested they have not gone into extensive use partially because of their more or less expensive construction, and partially because of their deficient operation. Moreover, so far as I am aware there has never heretofore been provided a radiator tank indicator or gage at the dash of the car nor a thermostat associated therewith. By the present invention I have provided indicator means for both tanks arranged at the dash and preferably associated with the thermostat to disclose the temperature of the water in the radiator tank.

In Fig. 1, I have shown the engine hood 20 in section to disclose the radiator jacket 21 which surrounds the cylinders. On the dash 22 is mounted a bracket 23 carrying the gage 24 connected at its lower end by piping 25 to the lower portion of the radiator tank. Inasmuch as the position of the radiator may vary with relation to the dash in cars of different makes, I prefer to make the bracket of the construction shown in Fig. 2 and comprising a vertical slideway 26 embraced by the lugs 27 of the gage plate 28 and secured in adjusted position by the clamping screws 29. By vertically adjusting the gage the level of the liquid therein can be properly related to the graduations on the plate 28 when the radiator tank is full.

Inasmuch as the liquid flows directly from the radiator jacket to the gage and thus establishes direct communication between the same, it is obvious that when the car is on a grade the variation of the liquid level in the tank will affect the liquid in the gage glass and cause the latter to register incorrectly. In order to maintain the gage level exact, I have provided a weight actuated valve device arranged in the piping 25 between the radiator jacket and the gage and serving to stop the flow of liquid through the piping when the car is on a predetermined grade sufficient to substantially affect the reading of the gage. As shown in Figs. 4 and 5 the weight device for controlling the valve is shown as a pendulum. The valve is arranged in the casting 30 coupled with the piping 25 and pierced by an offset fluid passage 31 in which is formed the valve seat 32. Coöperating with the valve seat is a cone valve 33 formed at the end of a vertically arranged valve stem 34. The enlarged head 35 of the valve stem rests against the head 36 of a pendulum 37 pivoted at 38 to lugs 39 on the casting 30. When the car is level the head 35 of the valve rests flat against the head 36 of the pendulum as shown. But when the car is on a grade the pendulum

takes a position at an angle to the valve stem and lifts the latter with a cam action thus closing the valve and preventing the flow of liquid from the tank to the gage. The gage is thus temporarily cut off from the tank and maintains the level existing therein before the car reached grade. Communication between the gage and the tank is at once reëstablished automatically when the car again reaches the level and the gage reading is at once corrected automatically to indicate the liquid level in the radiator at that time. The sensitiveness of the valve to grade may be made as fine as requisite by setting the valve at the necessary distance from the valve seat and by predetermining the length of the cross heads on the valve stem and pendulum.

In Fig. 6, I have illustrated another and more sensitive valve construction. Instead of a single valve I provide a pair of valves 40 and 41 resting on the opposite ends of the cross head 42 of the pivoted pendulum lever 43. The pendulum weight 44 is jointed at 45 to the lever. When the car is level both valves are open but when the car reaches predetermined grade one or the other of the valves is closed as the lever 43 swings on its pivot. The jointing of the weight 44 to the lever at 45 serves to prevent sudden actuation of the lever 43 due to inertia or sudden starting or stopping of the car and moreover relieves the valve parts of unnecessary wear and strain. Stops 46 on the pendulum casing limit the sway of the weight.

In Figs. 7, 8 and 9 I have shown still another arrangement of the pendulum valve in which the pendulum is exposed and is associated with a graduated sector to indicate the grade on which the car is traveling. As here shown the piping 25 from the radiator tank terminates in an elbow casting 47 which receives the lower end of the gage glass 24 and has a valve seat 48 formed therein. The valve stem 49 passes up through the gage glass and is provided with a cross head 50 which projects at its opposite ends through slots 51 in the head 52 of the bracket plate 28. The ends of the cross head terminate in downwardly projecting cam lugs 53 which rest on coöperating cam lugs 54 at the upper ends of the twin pendulum arms 55. An indicator point 56 at the lower end of each pendulum arm travels over a graduated sector 57 formed at the lower end of the bracket plate 28 and serves by its position to indicate the grade of the road upon which the car is traveling. Obviously when the car is on grade and the pendulum out of alinement with the valve stem the cam surfaces 53 and 54 permit the valve stem 49 to drop upon the valve seat 48 thus sealing the gage glass from the tank and maintaining the liquid level therein constant irrespective of the displacement of the liquid in the radiator. On the return of the car to level the cam surfaces 53 and 54 coöperate to lift the valve stem and again establish communication between the radiator and gage.

The fact that the radiator liquid is led directly to the gage at the dash, enables me to combine with the gage a thermometric device of any suitable sort to indicate the temperature of the liquid in the tank. Thus a bay 58 may be formed in the coupling 59 at the bottom of the gage glass and a thermometer 60 secured in position with its bulb dipping into the bay, to indicate the temperature of the liquid.

Under certain conditions where the fuel tank is located at a sufficient height with relation to the dash it is possible to use a gage of the present type for indicating the liquid level therein at the dash. Where such a gage is used it may be necessary by reason of the nature of the feed of the fuel to the carbureter to take care of pressure in the fuel tank. Where such is the case it is desirable to counterbalance the pressure on both sides of the liquid in the gage by establishing a connection from the top of the gage glass by a pipe such as X to the fuel tank. I have indicated in dotted lines in Fig. 1 such a connection to the radiator, where this arrangement may also be of value at times in view of the fact that the cooling liquid not infrequently becomes sufficiently heated to generate steam.

Inasmuch as the gasolene tank is usually located at a level below the dash it is not generally feasible to use an indicator therefor, of the same construction as used for the radiator tank. An indicator may be located at the dash however, by the adoption of an arrangement such as shown in Figs. 10 and 11. In accordance with this construction, a float tank 61 is located beneath the dash at the same level as the main fuel tank (not shown) and connected therewith by the piping 62. The fuel tank gage glass 63 is mounted above the auxiliary tank 61 and the gage 64 supported therein by the rod 65 extending upward from the float 66. Obviously as the liquid level in the fuel tank falls, the level of the liquid in the auxiliary tank falls and the float 63 follows thus carrying down in the gage glass the indicator 64 and thereby disclosing the condition of the fuel supply in the main tank.

While either gage may be used separately I prefer the twin gage mounting illustrated in Figs. 12 and 13. Here the two gage glasses 63 and 64 are mounted on a common plate 67 which also carries the thermometric device 60 adjacent the radiator tank gage. The plate may be slotted at 68 to receive a pointer 69 adapted to be set at the gage level for the fuel tank at the start of a run and

thus enable the driver of the car to observe the gasolene consumption during a given trip. A spring 70 bearing against the back of the plate affords a friction grip for the pointer and holds the latter in adjusted position.

Clearly the type of gage construction shown for the fuel tank may be equally well employed for the radiator tank or other tank. Moreover, the construction and arrangement of parts may be modified while accomplishing the same end and without departing from what I claim as my invention.

I claim—

In an automobile, a dash-board gage device comprising a bracket secured to the dash, a gage glass vertically adjustable on said bracket, a liquid tank, piping connecting the lower portion of the gage glass with the tank below the liquid level therein, and constantly open, and piping connecting the tank above the liquid level therein with the upper portion of the gage glass to equalize the pressures in the glass and tank, in combination with valve means in the liquid piping to halt the flow through said piping when the car is on predetermined grade.

In testimony whereof I have signed my name to this specification.

RICHARD T. NEWTON.