May 14, 1929. W. B. JARVIS 1,712,796

LIQUID LEVEL INDICATOR

Original Filed July 12, 1923.

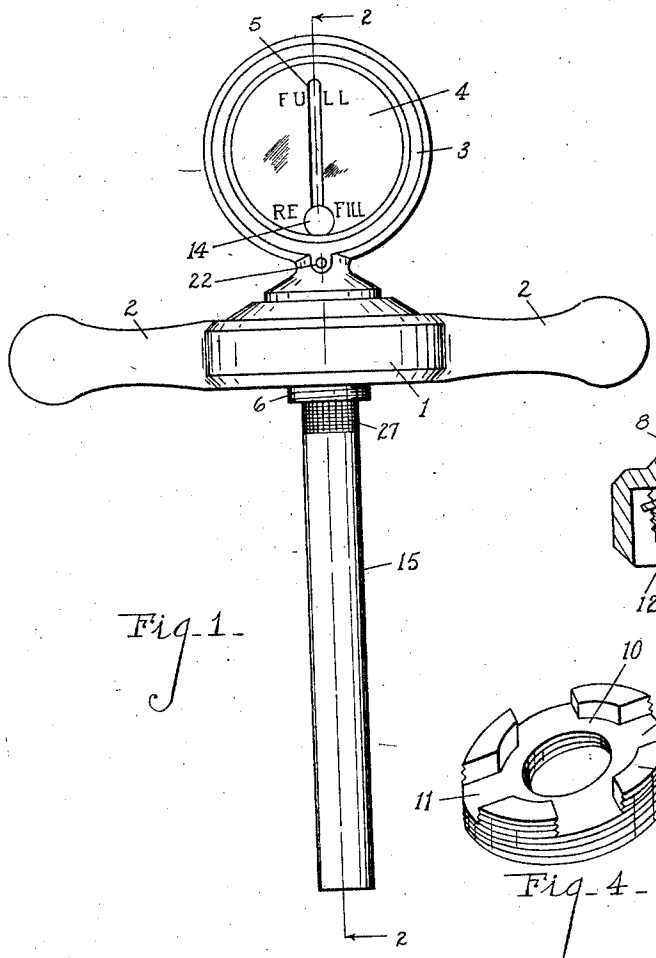


Fig. 1.

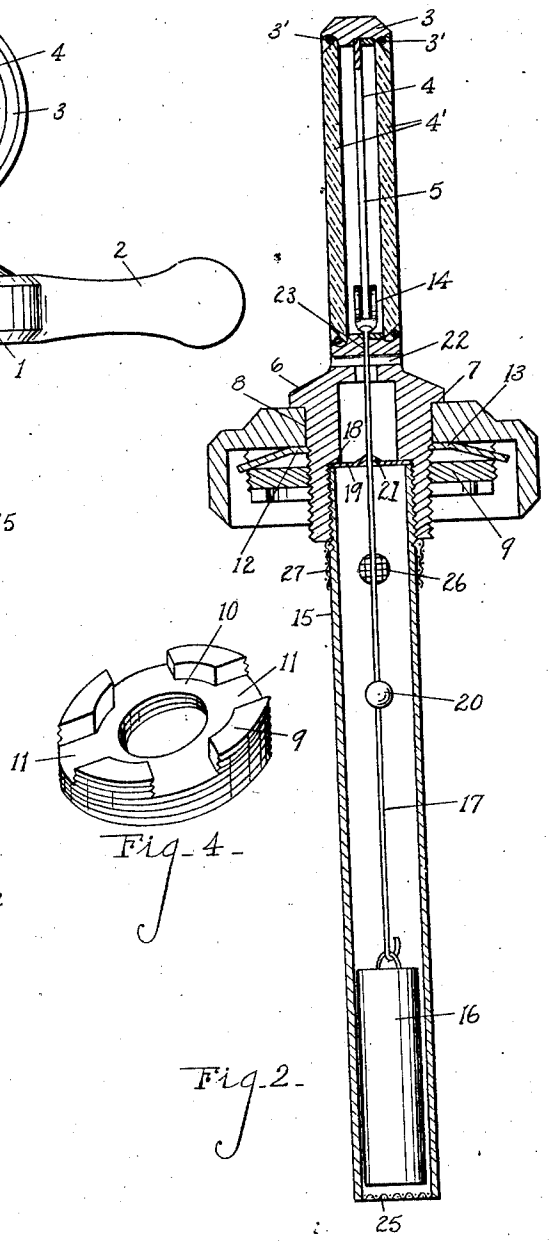


Fig. 2.

Fig. 4.

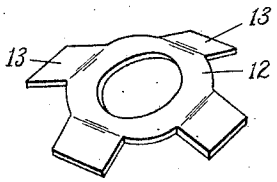


Fig. 3.

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UNITED STATES PATENT OFFICE.

WILLIAM B. JARVIS, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR TO W. B. JARVIS COMPANY, OF GRAND RAPIDS, MICHIGAN.

LIQUID-LEVEL INDICATOR.

Original application filed July 12, 1923, Serial No. 651,123. Divided and this application filed July 5, 1928. Serial No. 290,406.

This application is a division of my Patent No. 1,683,038, issued September 4, 1928.

The main object of this invention is to provide an improved water gage for automobile radiators and an improved means for securing the gage to the radiator, permitting its being adjusted to face the dial at the proper or desired angle or relation.

A further object is to provide in a gage of the class described a valve means preventing the passage of the liquid to the dial and also the escape of stem or water when the radiator is in such condition as to be likely to eject the same.

Objects relating to structural details will definitely appear from the detailed description to follow. The invention is defined in the claims.

A structure which is a preferred embodiment of my invention is clearly illustrated in the accompanying drawing, in which:

Fig. 1 is a front elevation of a gage embodying the features of my invention.

Fig. 2 is a vertical section on a line corresponding to line 2—2 of Fig. 1 looking in the direction of the arrows.

Fig. 3 is a perspective view of the friction holding member.

Fig. 4 is a top perspective view of the radiator neck engaging nut or member.

Referring to the drawing, 1 represents the radiator cap provided with arms 2. It will be understood, however, that these arms are an optional feature and may be shaped as desired, or omitted.

The dial case 3 is, in the structure illustrated provided with front and rear windows 4′, the dial case comprising a frame into which the windows are set as by the split rings 3′. Within the case is a dial plate 4 having a vertical slot 5 therein.

The dial case has an integral shank 6 shouldered at 7 to rest on the top of the cap and the shank is arranged through the hole 8 in the cap. The shank is internally shouldered at 18 to receive the valve disk or plate 19 which is clamped against the shoulder by the tubular float housing 15 threaded into the shank.

The shank 6 is externally threaded to receive the nut 9 so that the cap is clamped between the shoulder 7 and the nut 9. The nut has a recess 10 in its upper side provided with radial slots 11 adapted to provide a seat for the spring washer 12 which has arms 13 disposed in the slots 11 of the recess. The arms 13 extend outwardly and downwardly projecting beyond the periphery of the nut to engage the top or edge of the neck of a radiator when the cap is threaded thereon, thus frictionally holding the cap in its adjusted positions and permitting it to be adjusted so that the dial case faces properly on the radiator.

The indicator 14 is guided in the slot 5 in the dial plate and is carried by the rod 17 arranged through the valve plate 19. The ball valve 20 on the rod coacts with this plate, which has a curved seat 21, when the float 16 is in its elevated position. The shank 6 has transverse ventilating ports 22 opening into the longitudinal bore 23 which communicates with the dial case and through which the rod 17 is arranged. This prevents the passage of liquid to the dial and also the escape of steam or water when the radiator is in such condition as to be likely to eject steam or water or permit its escape.

The float housing 15 is open at its lower end and is provided with a screen 25. It also has openings 26 at its upper end, in the structure illustrated, provided with a screen 27 which, for convenience, is wrapped around the housing.

I have illustrated and described my improvements in an embodiment which I have found very desirable. I have not attempted to illustrate or describe certain embodiments or adaptations which I contemplate as I believe the disclosure made will enable those skilled in the art to embody or adapt the same as may be desired.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. A dial plate, an indicator movable in co-operative relation with the dial, a base adapted to be mounted on a liquid container, a chambered neck above the base and supporting the dial plate, the chamber having small end openings and vent openings through its sides, a tube extending downwardly from the base, a float within the tube, and means passing through the end openings of the neck chamber and connecting the float and indicator.

2. A dial plate, an indicator movable in co-operative relation to the dial plate, a base adapted to be mounted on a liquid container, a chambered neck on said base supporting the dial plate, the chamber having small end openings and a lateral vent opening, a tube extending downwardly from the base and having its lower end adapted to communicate freely with the liquid in the container and having an aperture above the normal level of the liquid in the container, a float within the tube, a connector passing loosely through the end openings of the neck chamber and connecting the indicator and the float, and means on the connector for sealing the lower end of the neck chamber when the connector is raised to a certain position.

3. In a liquid gage for auto radiators, comprising a dial, a dial supporting plate having an apertured threaded extension, an indicator registering upon the dial, said dial support having a hollow cylindrical tube adapted to be suspended within a liquid container whose depth and movement of liquid are to be registered, the said tube enclosing a float and having a screened opening in the bottom end and a series of openings near the top thereof whereby a circulation of fluid is afforded within the tube and the float thus moved or agitated vertically in accordance with the surface of the liquid in the container, an annular supporting nut threaded interiorly and exteriorly engaging said extension by its inner threads and the radiator flange by its exterior threads, and means passing through said aperture for connecting the indicator and the float, substantially as set forth.

4. A liquid gage for auto radiators comprising a dial, a dial supporting plate having an apertured annular extension threaded interiorly and exteriorly, an indicator for registering upon the dial, a hollow cylindrical tube threaded into said annular extension adapted to be suspended within a liquid container whose depth and movement of liquid are to be registered, the said tube having a threaded upper end adapted to fit the interior threads of said extension, a screened opening in the bottom end and a series of openings near the top thereof whereby a circulation of fluid is afforded within the tube, an annular supporting nut threaded interiorly and exteriorly, engaging said extension by its inner threads and the radiator flange by its exterior threads, and actuating means enclosed in said tube and having positive connection with said indicator through said aperture whereby the liquid circulation will move or agitate the said actuating means in accordance with the surface of the liquid in the container.

5. A liquid gage for auto radiators comprising a dial plate, an indicator for registering upon the dial, an actuating stem for said indicator, said plate having a supporting base which is longitudinally apertured for the passage therethrough of said stem and having on its under face a flanged hub part which is screw-threaded without, a vertical tube member enclosing actuating means for the indicator through the intermediacy of the stem and having means for engaging the said hub, a nut element having screw threads within and without, the former adapted to engage said threads of the hub and the latter adapted to engage the inner threads of the filler tube of the usual radiator on an auto, the said nut member being further provided on its face with radial slots, a heavy spring dished washer having an annular part and radially extending arms fitting the beforesaid slots when these two parts are superposed and said arms extending beyond the periphery of the nut so that the edge of the filler tube engages the ends of the arms before engaging the rigid parts of the device, and a casting comprising a circular flanged inverted dish-shaped piece and having manually engageable arms extending therefrom, said piece having a circular opening at its center to receive the said hub loosely therein and the main flanged part adapted to receive therein the said nut and washer in spaced relation from the said casting whereby, when assembled, the entire device may be turned as a unit by operating the casting arms to mount the gage on a radiator.

6. A water gage for auto radiators comprising a head having a supporting base with a lower part provided with an externally threaded hub, a nut having inner screw threads adapted to engage the hub and external threads for engaging the threads of a filler tube of a radiator, the said nut being further provided on its upper face with radial slots, and a heavy warped spring washer including an annular part and radially extending arms fitting the said slots when the two parts are superposed and said arms extending beyond the periphery of the nut so that the edge of the filler tube engages the ends of the arms before reaching the rigid parts of the device, and a casting having a flanged part to receive therein the said nut and washer whereby, when assembled, the entire device may be turned on its axis as a unit by operating the casting to mount the gage on a radiator.

7. In a liquid gage for auto radiators, the combination of an indicating element, a supporting base therefor, there being a vertical elongated chamber within said base, said chamber being connected with the outer air by vent openings and said base being supported by a cylindrical part which is tubular and is a reduced lower end of said base, said cylindrical part forming a hub threaded in-

ternally and externally, said chamber being connected with said indicating element and said tubular part by reduced openings, tubular means beneath said base having a threaded upper end engaging the inner threads of said hub, an annular nut having inner threads engaging the said hub and outer threads engaging the supporting flange of an auto radiator, and float actuated means passing axially through the hub, the said chamber and its reduced openings for operating said indicating element, substantially as set forth.

8. Valve mechanism for opening and closing automatically the opening between the actuator and indicator of an auto radiator gage, comprising a slender connecting means, a sheet metal apertured disk having an upwardly extending protuberance about the aperture and fitting into said opening, there being a corresponding socket on its lower face, and a sphere fixed to said connecting means fitting said socket whereby the said opening will be closed or opened as the said connecting means rises or falls, substantially as set forth.

9. An indicator for a receptacle having an internally threaded flange, comprising indicating means, a base for the indicating means, a hub depending from the base, a handled collar fitting loosely on the hub below the base, an annular nut threaded onto the hub below the collar binding the collar against the base and having external threads adapted to engage the internal threads of said receptacle flange, and means depending from said base and adapted to operate the indicator when the device is in position on the receptacle.

10. A gage for automobile radiators including a dial plate in a dial chamber and a support therefor, a connection between the dial chamber and support having a passage therethrough affording communication between the dial chamber and radiator when the gage is in place thereon, an indicator within the dial chamber, a float member below the dial chamber and support, a connecting member between the float and indicator extending through the passage to the dial chamber, and means on said connecting member for closing said passage to the dial chamber when said float and indicator are elevated.

11. In a liquid level gage, the combination of a dial case provided with a shank having a shouldered chamber therein and internally threaded below said shoulder, said shank having a vertical passage therein connecting said chamber to said dial case, the passage having a vent opening to the atmosphere, a tubular float housing having openings at the top and bottom threaded into said shank, a valve plate clamped between said shoulder in said chamber and the end of said float housing, said valve plate having an opening therein to receive an indicator rod, an indicator rod reciprocating through said plate and said passage in said shank, a dial plate within said dial case, an indicator on said rod operatively associated with said dial case, a valve mounted on said rod to coact with said valve plate when the float is in raised position, and a float disposed in said float housing and connected to said rod.

12. In a liquid level gage, the combination of a dial element provided with a shank having a chamber therein and a downwardly facing internal shoulder, said shank being internally threaded, a float housing threaded into said shank, a valve plate having a central hole therein clamped between said shoulder in said chamber and the end of said float housing, said shank having an opening above said chamber to receive an indicator rod, an indicator rod reciprocable through said shank, an indicator on said rod operatively associated with said dial element, a valve on said rod coacting with said valve plate when the float is in its raised position, and a float disposed in said float housing and connected to said rod.

13. In a liquid level gage, the combination of a dial element provided with a shank, said shank having a longitudinal opening therethrough, a valve seat having a central hole therein, a float housing depending from said shank, an indicator rod reciprocable through said shank and hole in said valve seat and provided with an indicator member operatively associated with said dial element, a valve on said rod adapted to coact with said valve seat when the float is in its raised position, and a float disposed in said float housing and connected to said rod.

14. In a liquid level gage, the combination of a dial element provided with a shank having a vertical opening therethrough, a valve seat having a central hole therein, there being an external vent communicating with said vertical opening in said shank above the said valve seat, an indicator rod reciprocable through said shank and said hole in said valve seat and provided with an indicator member operatively associated with said dial element, a float operatively connected to said rod, and a valve on said rod coacting with said valve seat when the float is in its raised position.

15. A liquid level gage for automobile radiators comprising a dial housing, a dial plate in said housing, a neck for said dial housing having a chamber therein and also having a passage connecting said chamber with said dial housing, said passage being vented to the atmosphere below said dial housing, a float housing below and communicating with said chamber through a relatively small opening, a float in said float housing, an indicator in said dial housing

operatively associated with said dial plate, a rod connecting said float to said indicator and reciprocable through said chamber and its communicating openings with said dial housing and float housing, and a valve on said rod closing the opening between the float housing and said chamber when the float is in its raised position.

16. A dial plate, an indicator operatively associated with said dial plate, a base for said dial plate adapted to be mounted on a liquid container, a float guiding tube extending downwardly from said base, said base being provided with a chamber between said dial plate and float guiding tube, said chamber having openings at the top and bottom thereof adapted to receive an indicator rod, the upper opening having a vent opening to the atmosphere below said dial plate, a float within said tube, and an indicator rod connecting said indicator and float and disposed through said openings at the top and bottom of said chamber and provided with a valve adapted to close the bottom opening of said chamber when the float is in its raised position.

In witness whereof I have hereunto set my hand.

WILLIAM B. JARVIS.