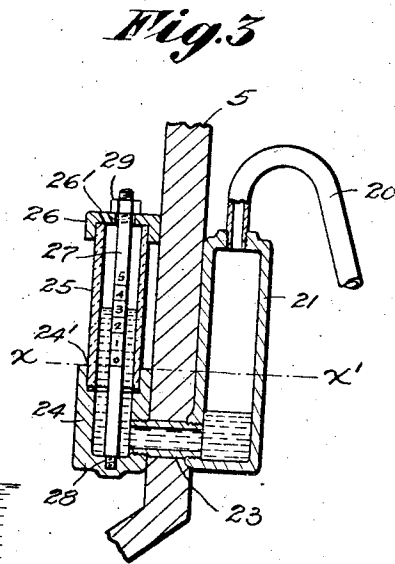
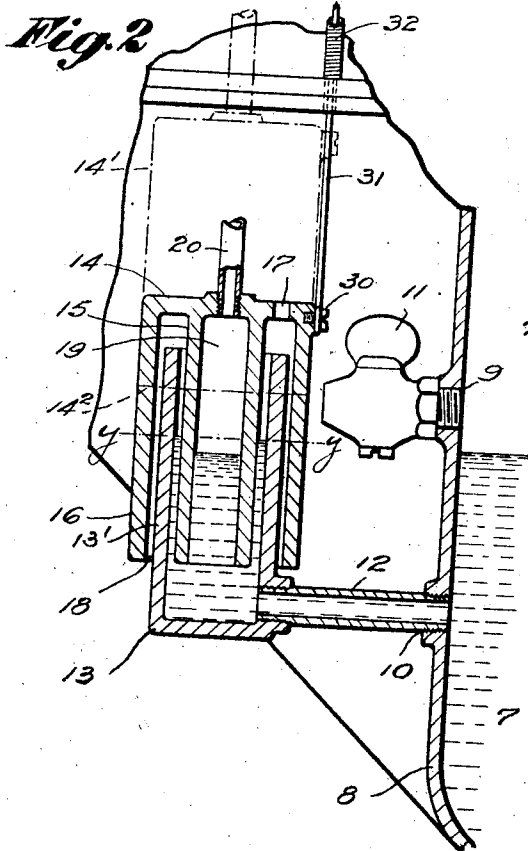
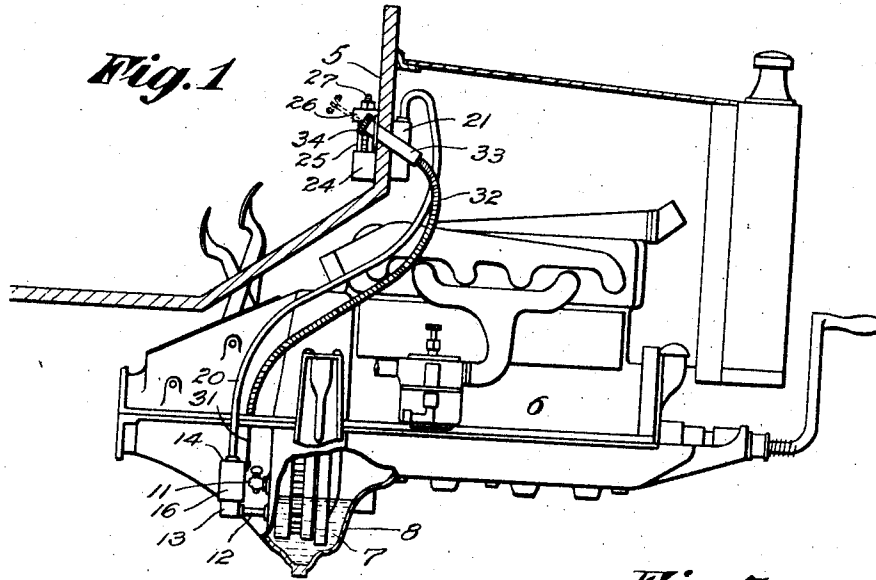


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LIQUID LEVEL INDICATOR.
APPLICATION FILED FEB. 23, 1917.

1,241,384.

Patented Sept. 25, 1917.



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LIQUID-LEVEL INDICATOR.

1,241,384.

Specification of Letters Patent. Patented Sept. 25, 1917.

Application filed February 23, 1917. Serial No. 150,349.

To all whom it may concern:

Be it known that I, HENRY HUEBER, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Liquid-Level Indicators, of which the following is a specification.

This invention relates to liquid gages, and is designed, more particularly, for use on automobiles to indicate the depth of lubricating oil in the crank casing.

The object of my invention is the provision of a novel sight gage and controlling appliances therefor to indicate to the driver of an automobile the amount of lubricating oil in said casing.

A further and important object of the invention is the provision of devices for regulating the referred to controlling appliances to compensate for expansion and contraction of the fluid agent due to change of temperature.

The invention consists in the novel construction, adaptation and combination of parts, as will be hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side elevation shown partly broken away of an automobile engine with apparatus embodying the present invention applied thereto. Figs. 2 and 3 are longitudinal vertical sections of the lower and upper portions of my improved apparatus with associated parts of the engine and automobile body.

The reference numeral 5 designates the dash-board of an automobile, and 6 is the engine having a chamber 7 within its so-called fly wheel casing 8. This chamber should contain a sufficient quantity of oil to extend to a level somewhere between openings 9 and 10; Fig. 2, which are usually provided with pet-cocks, such as 11.

In carrying out my invention, the cock for the lower opening 10 is omitted and in lieu thereof is inserted a nipple 12 whose outer end is screwed into a cylindrical open top vessel 13 and serving to support the latter. Said nipple thus affords communication between the lower end of said vessel and the interior of the casing 8 whereby it is evident that the liquid surfaces in both the vessel and said chamber are in the same horizontal plane.

For the vessel 13 is provided a cover 14 having depending peripheral walls 15 and

16 arranged concentrically so that the former will extend into the vessel and the other wall, 16, will surround the same. The annular space between the walls is open to the external atmosphere through a hole 17 provided in the top and also from the bottom, as indicated by 18.

The chamber 19 within the wall 15 is connected by a flexible tube 20 with the upper end of a liquid receptacle 21 attached to the front of the automobile dash-board 5. Said receptacle communicates from its lower end by a tube 23 with the lower end of a companion receptacle 24 which is attached to the back of said dash-board. The receptacle 24 has socketed in a recess 24¹ thereof, the lower end of a glass tube 25 whose upper end is socketed in a cap 26.

27 represents a rod extending axially through the glass tube and engaging in a screw-threaded hole 28 of the receptacle 24 and with a nut 29 provided on said cap for securing the glass tube in place. Said rod is provided with graduated marks and indicating characters 0, 1, 2, etc., whereof the zero mark is located to be in a plane, denoted by broken lines $x-x^1$ (Fig. 3) corresponding to the level of the indicating liquid contained within the two receptacles when subjected to atmospheric pressure in both receptacles. The other graduated marks are spaced to indicate the depths of oil in the vessel through the agency of air pressure prevailing in the space above the indicating liquid in the receptacle 21, as will be more fully explained.

26¹ represents a vent hole for the air into the glass tube 25 from the external atmosphere. The cover 14 of the vessel 13 is connected, as by a screw 30, to the lower end of a wire or flexible rod 31 which extends through a guide tube 32 and a sleeve 33 which is secured to the dash-board 5. Said wire is desirably provided with a knob 34 for the operator to grasp to exercise a pull through the wire 31 to elevate the cover 14 into the broken line position 14¹ (Fig. 2) when desired, and subsequently restore the cover into its operative position, as represented by full lines in Fig. 2.

The aforementioned cover 14 with the outer wall 16 has for its function to prevent dirt or the like from entering the vessel, and also serves with respect to the peripheral wall 13¹ of said vessel to guide the inner wall 15 of the cover substantially

in axial alignment with the vessel. The wall 15, in effect, serves as an extension to the flexible tube and will be thus designated in the following description which I will now make of the operation of the invention.

Assuming that the oil in the vessel is at a level indicated by line $y-y$ in Fig. 2 (which corresponds with that in the casing 8) when the cover 14 is raised through the instrumentality of the wire 31 into approximately its dotted line position 14¹; under such a condition the lower edge of the tube extension 15 will be in a plane denoted by 14² to allow a free passage of air into the chamber 19. The extension is then lowered or pushed down by the operator through the medium of wire 31 into full line position, Fig. 2.

When this occurs, the air confined within the chamber 19 and within the receptacle 21 is subjected to pressure exceeding that of the atmosphere, which acts against the indicating liquid 22 within the glass tube 25, resulting in the liquid being forced down in the receptacle 21 and correspondingly elevated in the glass tube. The elevation of the liquid in said tube, as denoted by the graduation marks on the rod 27 should indicate the depth of oil in the fly-wheel casing 8.

When the engine has, however, been operated for some time, and because of the apparatus being exposed to the heat radiated from the engine, the apparatus will be more or less affected thereby.

The air within the tube 20 and in the members communicating therewith will thereupon expand to exert an abnormal pressure upon the liquid 22 in the receptacle 21 to unduly raise the indicating liquid in the tube 25 to give an incorrect reading on the rod 27 as to the oil level in the casing 8.

To overcome such an occurrence, the operator has with the present invention only to pull up the tube extension through the medium of the wire 31 so as to enable the excess air pressure to be reduced by affording communication between the chamber 19 and the exterior atmosphere. Such equalizing of pressures, however, exists only while said extension is held above the oil level, as the air pressure within the chamber 19

will progressively increase during the lowering of the cover wall 15 in the oil, but only to an extent to which the rod 27 is adjusted with respect to the quantity of indicating liquid, or vice versa.

What I claim is:—

1. In apparatus of the class described, the combination with a stationary vessel containing oil, of a receptacle secured at a higher elevation than said vessel, a gage glass connected at its lower end to the lower end of said receptacle, a gage-rod provided in the glass tube, an indicating liquid partly filling the receptacle and said glass tube, a flexible tube connected at one end to the upper end of said receptacle, an extension at the other end of the flexible tube, and means for regulating the elevation of said extension, for submerging the same in the oil within said vessel or withdrawing it therefrom.

2. In apparatus of the class described, a vessel containing oil, a receptacle and a communicating glass tube partly filled with an indicating liquid whose elevation in the tube is discernible through the latter, a flexible tube having an extension submerged in the oil and its other end connected with the space above the indicating liquid in said receptacle, and means to temporarily withdraw said extension from the oil.

3. In apparatus of the class described, a vessel containing oil, a cover therefor having a chambered portion extending into said oil, a receptacle, a glass tube communicating at its upper end with the external atmosphere and at its lower end with said receptacle, said receptacle and tube being partly filled with an indicating liquid, a tube connecting the upper part of the chamber in the referred-to cover-portion with the space above the indicating liquid in said receptacle, and means for elevating and lowering said cover whereby the chambered portion thereof may be withdrawn from or introduced into the oil contained in said vessel.

Signed at Seattle, Washington, this 16th day of February, 1917.

HENRY HUEBER.

Witnesses:

PIERRE BARNES,
E. PETERSON.