

Oct. 9, 1928.

1,687,216

H. W. KING

LIQUID DEPTH INDICATING DEVICE

Filed Aug. 4, 1924

Fig. 1.

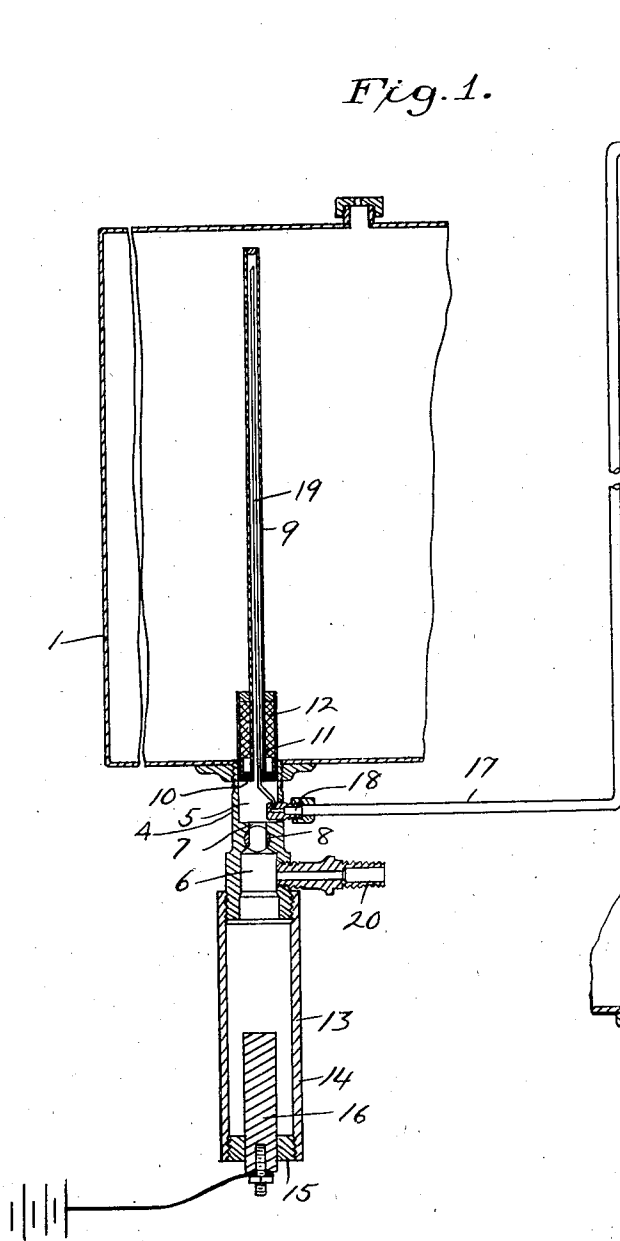
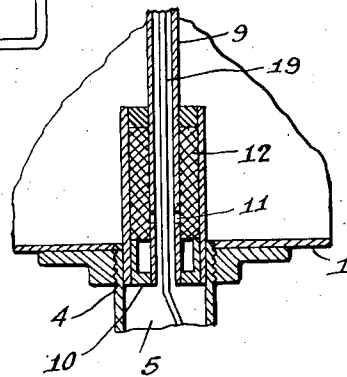


Fig. 2.



Inventor

Horace W. King

By *Whitmore Hubert Whitmore & Belknap*

Attorneys

UNITED STATES PATENT OFFICE.

HORACE W. KING, OF ANN ARBOR, MICHIGAN, ASSIGNOR TO KING-SEELEY CORPORATION, OF ANN ARBOR, MICHIGAN, A CORPORATION OF MICHIGAN.

LIQUID-DEPTH-INDICATING DEVICE.

Application filed August 4, 1924. Serial No. 730,097.

The invention relates to liquid depth indicating devices and is particularly applicable to a motor vehicle for the measurement of the height or volume of the liquid fuel in the supply tank. The invention has for one of its objects the provision of a simple, compact device which may be readily applied. The invention also has for other of its objects the novel arrangements and combinations of parts as more fully hereinafter set forth.

Fig. 1 is a sectional elevation of a liquid depth indicating device embodying my invention.

Figure 2 is a detail view showing an enlargement of the lower portion of the air tube.

As shown in the present instance, 1 is the supply tank of a motor vehicle containing liquid fuel and 2 the dash of the motor vehicle. 3 is the pressure gage mounted upon the dash, this gage being preferably of the U type and containing a suitable indicating liquid. 4 is a fitting having the chamber 5 in its upper portion and the chamber 6 in its lower portion which chambers are connected by the passageway 7. This passageway is controlled by a suitable valve 8. The fitting 4 is threaded into the bottom of the supply tank 1.

9 is the air chamber within the supply tank 1 and preferably formed of a tube having its upper end closed by suitable means such as a plug and its lower end open and communicating directly with the chamber 5 in the fitting 4. 10 is a ring fitting around the lower end of the air chamber 9 and fitting within the upper portion of the chamber 5 whereby the air chamber is carried by the fitting. The lower end of the air chamber communicates directly with the liquid fuel in the supply tank through the apertures 11 located above the ring 10, these apertures being protected from sediment in the liquid fuel by the cylindrical screen 12 surrounding that portion of the air chamber having the apertures and carried by the fitting 4, the upper end of the screen being closed by suitable means.

13 is the electrolytic cell carried by the fitting 4 and comprising the cylindrical shell 14 which is preferably formed of iron and is threaded upon the lower end of the fitting, the plug 15 secured in the lower end of the shell, as by threads, and the electrode 16 which is preferably formed of iron and is mounted upon the plug 15 and extends up-

wardly within and spaced from the shell 14. The plug 15 is preferably formed of some insulation material, such as hard rubber. A suitable electrolyte, such as sodium hydroxide, is contained within the shell 14, this electrolyte being heavier than and non-miscible with the liquid fuel.

The pressure gage 3 is connected to the air chamber 9 by means of the pipe 17 which leads from the pressure gage to the nipple 18 mounted upon the fitting 4 and communicating at its inner end with the pressure tube 19 which extends upwardly within the air chamber 9 and has an open upper end communicating with the air chamber at its upper end. This pressure tube is less diameter than that of the tube forming the air chamber and is preferably carried by the nipple.

In operation and assuming the valve 8 to be open, liquid fuel enters the lower end of the air chamber 9 through the screened openings 11, passes downwardly through the chamber 5, the passageway 7 and the chamber 6 of the fitting. The liquid fuel then passes to the carburetor through the nipple 20 which is mounted in the lower portion of the fitting 4 and communicates with the lower chamber thereof. When electric current passes to the electrode 16 some of the electrolyte is electrolytically decomposed to form a gas which passes upwardly through the chamber 6, passageway 7 and chamber 5 of the fitting 4 and into the air chamber 9, thereby displacing the liquid fuel down to the openings 11. The pressure of the gas in the air chamber at this time is equal to the hydrostatic head of the liquid fuel in the supply tank and this pressure is communicated to the pressure gage 3 through the pressure tube 19, nipple 18, and pipe 17, the gage being suitably calibrated to indicate either or both the depth and quantity of the liquid fuel in the supply tank as desired.

What I claim as my invention is:

1. The combination with a pressure gage and a tank containing a liquid, of a vertically extending air chamber within said tank communicating with the liquid at the full depth to be measured and with said gage, and an electrolytic cell communicating with said air chamber and with the liquid in said tank, said air chamber and electrolytic cell being constructed to form a unit.

2. The combination with a pressure gage and a tank containing a liquid, of a vertically

extending air chamber within said tank communicating with the liquid at the full depth to be measured and with said gage, and an electrolytic cell below said tank for receiving
5 the liquid from said tank, said cell communicating with said air chamber, said air chamber and electrolytic cell being mounted as a unit upon said tank.

3. The combination with a pressure gage
10 and a tank containing a liquid, of a fitting secured to the lower side of said tank and provided with an opening registering with an opening in the tank, an air chamber mounted upon said fitting and extending
15 within said tank, said air chamber communicating with the liquid at the full depth to be measured and also communicating with said gage, and an electrolytic cell secured to and depending from said fitting and communicating with said air chamber through
20 the opening in said fitting.

4. The combination with a pressure gage and a tank containing a liquid, of a unit including a fitting connected to the bottom of
25 said tank and provided with an opening registering with an opening in the tank, an air chamber mounted upon said fitting and extending upwardly within said tank said air chamber communicating with the liquid
30 at the full depth to be measured and with said pressure gage, a screen mounted upon said fitting and surrounding the portion of said air chamber communicating with the

liquid, an outlet for the liquid mounted upon said fitting and communicating with its
35 passageway, and an electrolytic cell secured to and depending from said fitting and communicating with said passageway.

5. The combination with a pressure gage and a tank containing a liquid, of a fitting
40 secured to said tank, an air chamber mounted upon said fitting and extending within said tank, said air chamber communicating with the liquid in the tank at the full depth to be measured and also communicating with said
45 gage, an electrolytic cell mounted upon said fitting and means for placing said cell in communication with said air chamber through the fitting.

6. The combination with a pressure gage
50 and a tank containing a liquid, of a unit including a fitting connected to the bottom of said tank and provided with a passageway therethrough, an air chamber mounted upon said fitting and extending upwardly within
55 said tank, said air chamber communicating with the liquid in the tank at the full depth to be measured and with said pressure gage, a screen mounted upon said fitting and surrounding the portion of said air chamber
60 communicating with the liquid, an outlet for the liquid mounted on said fitting and communicating with its passageway and an electrolytic cell mounted upon said fitting and communicating with said passageway.

HORACE W. KING.