

PUBLISHED  
MAY 4, 1943.  
BY A. P. C.

C. H. H. RODANET  
GAUGES INDICATING THE LEVEL OF A LIQUID  
OF THE GASEOUS BUBBLING TYPE  
Filed Oct. 22, 1940

Serial No.  
362,231

Fig. 1.

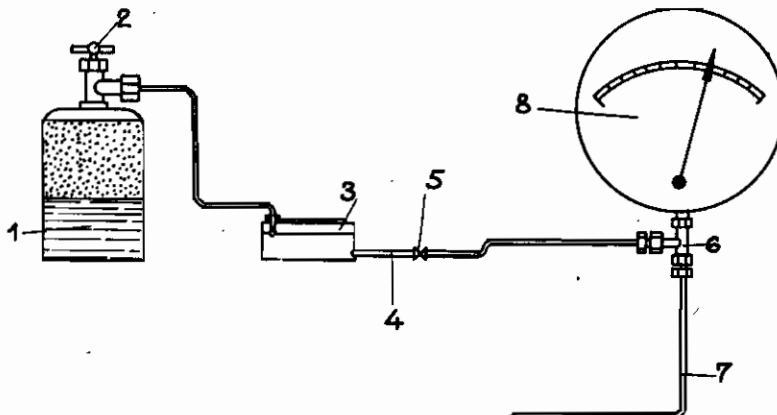
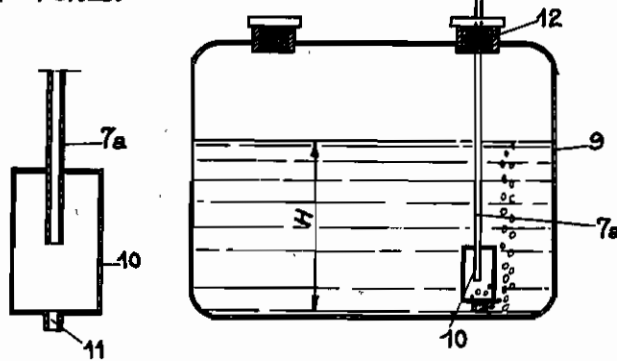


Fig. 2.



INVENTOR:  
CHARLES HILAIRE HENRI RODANET  
BY *Haseltine, Lake & Co.*  
ATTORNEYS

# ALIEN PROPERTY CUSTODIAN

## GAUGES INDICATING THE LEVEL OF A LIQUID OF THE GASEOUS BUBBLING TYPE

Charles Hilaire Henri Rodanet, Neuilly-sur-Seine, France; vested in the Alien Property Custodian

Application filed October 22, 1940

The present invention relates to gauges indicating the level of a liquid of the gaseous bubbling type. These gauges are particularly utilised on motor vehicles for indicating on the instrument board, the level of the gasoline contained in a tank remote from said board. The indication of the level is supplied by the index of a pressure-gauge graduated in litres and which expresses the pressure of a gas, usually air, driven through a tube immersed in the gasoline. The pressure with which the air is driven, said air issuing at the lower immersed end of the tube, directly measures the column of gasoline above said end and, consequently, the volume of liquid contained in the tank.

These gauges do not give permanent indications. For effecting the reading of the level, it is necessary to drive air through the immersed tube, by means of a special pump.

To this inconvenience is added a more serious one which results from condensations, between the periods of utilisation, of the gasoline vapours in the pipe lines of the apparatus. The liquid gasoline which stagnates at the low points of the pipe lines, the path of which is sometimes complicated, falsifies the measurements.

The invention is adapted to remedy these inconveniences and for that purpose, it mainly consists in maintaining a stream of gas, of small outflow, which is continuous and permanent, within the pipe lines of the apparatus.

In the embodiment of the invention which, for the moment, appears to be the most advantageous, the source of gas is a reserve of a liquefied gas the steam pressure of which, at temperatures of utilisation, is higher than one atmosphere. Among the gases which satisfy this condition, propane is particularly suitable owing to the fact that it is absolutely neutral with respect to metals.

The accompanying drawing illustrates, by way of example only, an embodiment of the invention.

Fig. 1 is a general diagram of a liquid gauge improved according to the invention.

Fig. 2 is a diagrammatic axial section of the lower part of the tube immersed in the liquid to be measured.

The source of gas under pressure is shown in the form of a bottle 1 containing a charge of gas in the liquid state (propane for instance). Propane in the gaseous state, is admitted through a

suitable cock 2 in a pressure reducer 3 of any suitable kind and the arrangement of which is of no importance for the invention. This pressure reducer is adapted to lower and regularise the pressure of the gas which flows in the conduit 4 through an orifice, adjustable or not, and for instance, through a throttled portion 5 of said conduit, which regularises and limits the outflow to a very small value. Thus, if the apparatus is applied to the measurement of the gasoline in the tank of a motor vehicle or of an airplane, said outflow can be of the order of 50 cubic centimeters per day.

The conduit 4 is connected at 6, to the conduit 7 connected at one end to the indicating manometer or gauge 8 and which is immersed at its opposite end in the liquid of a tank 9.

The lower end of the immersed tube 7<sup>a</sup> is preferably engaged in a bell (see in particular Fig. 2) the lower bottom of which communicates with the liquid mass through a pipe or orifice 11 the bore of which is of the same order as that of the tube 7<sup>a</sup>. The gas constantly delivered in the bell 10 escapes by bubbling through the liquid, the height H of which, or the volume above the horizontal plane passing through the edges of the orifice 11, is indicated by the pressure-gauge 8.

The bell 10 thus devised constitutes a liquid trap which, when the tank is inverted (case of an airplane for instance) prevents the liquid of the tank from directly entering the tube 7<sup>a</sup>.

In the diagram, the source of gas 1 and the pressure reducer 3 have been shown as being outside the tank 9. It will be understood that these elements can be grouped in a single unit arranged for instance to be mounted on the plug 12, inside the tank 9. This unit might also be combined with the frame of the pressure-gauge 8. The consumption of gas being very small, the source 1 is not cumbersome and allows compact units to be easily constructed.

The invention is obviously not limited to the measurement of gasoline in motor vehicles. It is applicable to the distant measurement of all liquids. It can even constitute a densimeter if the level of the liquid is maintained constant. The pressure-gauge can be an apparatus having contacts electrically controlling all desired effects from the variations of the level of a liquid.

CHARLES HILAIRE HENRI RODANET.