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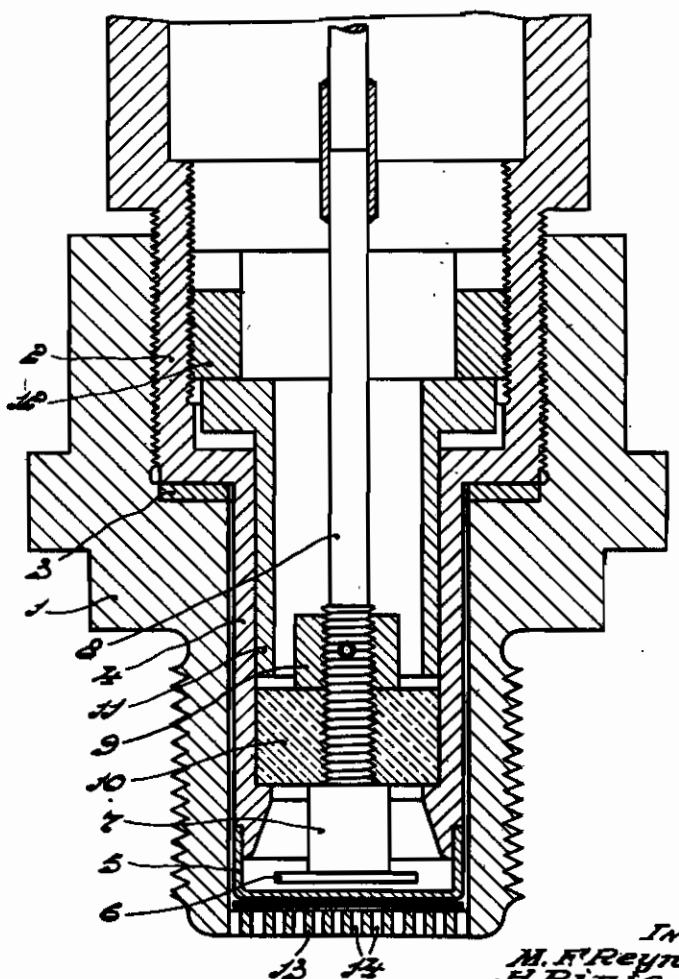

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ALIEN PROPERTY CUSTODIAN

PRESSURE OBSERVER

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For pressure measurements use is often made of a diaphragm which is exposed to the pressure to be measured and constitute one of the electrodes of a condenser in which the distance between the two electrodes consequently varies with the pressure to be measured.

Usually this condenser is screwed, either directly or set in a holder, into a hole in the wall of the vessel in which the pressure variations must be watched (for instance the cylinder of a combustion motor).

Of course it is desirable that the capacity of the condenser should be acted upon solely by the pressure to be measured and, for instance, not also by temperature variations nor by strains set up in the material upon tightening screws.

The present invention provides a construction by which these conditions are satisfied.

According to the invention the diaphragm constitutes the bottom of a cylindrical tube which is freely suspended in a bore of the holder and which makes a tight fit with this holder at the top.

The said bore of the holder may be closed by a perforated wall at the bottom side.

Further particulars of the invention may appear from the following, in which one form of construction of a pressure observer according to the invention is described by reference to the accompanying drawing.

A steel holder 1 has a polygonal, for instance a hexagonal upper end, whereas its bottom end is furnished with an external screw thread by means of which the holder can be screwed into a wall, for instance a cylinder wall. The holder has an internal cylindrical bore which at the top is wider than at the bottom. The upper wide part is internally provided with a screw thread, in which is screwed a hollow steel cylinder 2 whose bottom end 4 is so much thinner as to fit with a small amount of play in the lower bore of the holder 1. A shoulder of the cylinder 2 rests on a copper ring 3 together with which it forms an obturation. At the bottom side the cylinder 2 is closed by a diaphragm 3 made from thin special steel and secured by welding. The flat part of this diaphragm together with a metal plate 6 closely arranged above the diaphragm constitutes a condenser whose capacity depends on the momentary deflection of the diaphragm. The plate 6 is secured to the bottom of a thickened part 7 of a metal shaft 8 on which is slipped a small cylinder 10 of ceramic material which by means of a collar 9 and a set screw is kept pressed against the thickened part 7. The cylinder 10 fits in the bore of cylinder 4 and is pressed at the bottom against a re-entrant edge of this cylinder by means of a thrust piece 11 and a ring 12 screwed into the cylinder 2.

For the reason stated hereinafter the bore in the holder 1 does not extend to the bottom, but there is left a wall 13 having a thickness of several millimetres in which are provided a number of perforations 14. Obviously the distance between the parts 5 and 6 is entirely independent of the force at which the holder is screwed into the wall of the cylinder, but also of the force at which the cylinder 2 is fastened and tightened in the holder. By a suitable choice of the material of parts 4, 5, 6 and 7 provision has furthermore been made that the air-gap between 5 and 6 does not change on the occurrence of temperature variations.

When the pressure observer is used for the cylinder of a combustion motor in which, of course, high temperatures occur provision must be made for sufficient cooling of the diaphragm and/or for adequate protection thereof against the hot gases. Cooling can be promoted by coating the parts 4 and 5 with a layer or foil of a metal of high thermal conductivity such as copper or silver. The said protection primarily afforded by the perforated wall 13 and in addition, if required, by inserting one or more mica plates between the said wall and the diaphragm 5.

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