

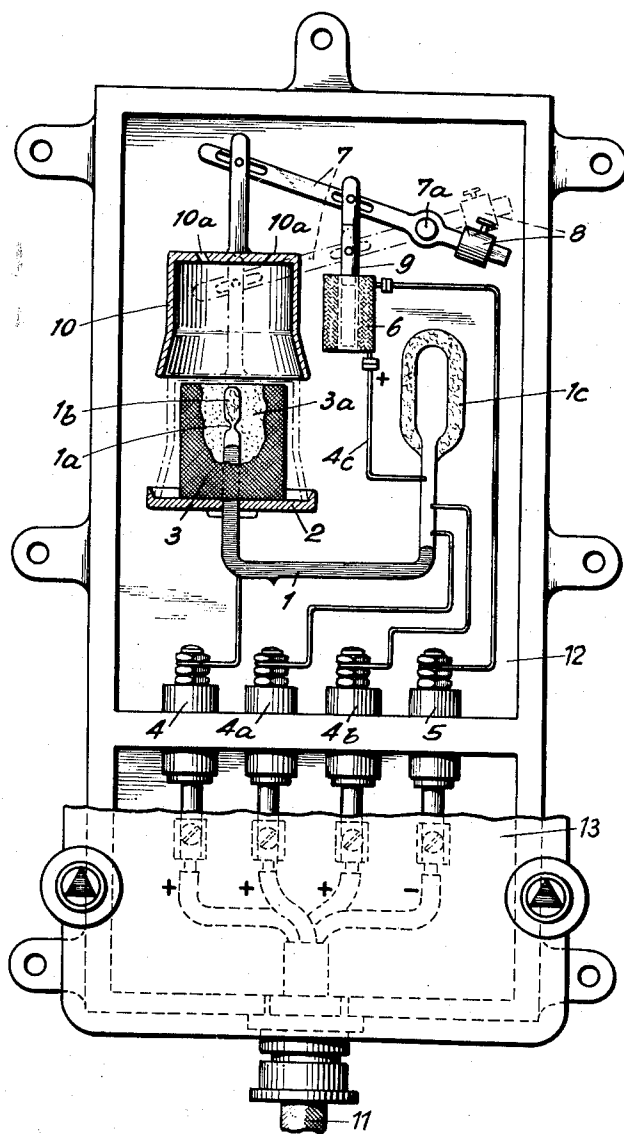
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GAS ALARM

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GAS ALARM

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1 Claim. (Cl. 200—61.03)

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Gas alarms which employ chemical reagents and U-shaped differential mercury switches have already become known.

These known gas alarms, however, have considerable disadvantages:

(a) According to the hitherto employed method the catalytic reagents were applied to the carrier materials by means of a simple mixing or baking process; they penetrated very little into the carrier materials, had no permanent adhering to them, and what is of special importance, they hardly reacted to the particularly dangerous CO-content of the gases.

(b) The hitherto employed mercury switches contained some ether in the left hand leg on top of the mercury column as an expansion agent. In case the catalyst gets too hot due to strong or longer presence of gases the non-evaporated ether or the ether vapor could change over to the right hand leg of the mercury switch, thereby spoiling the apparatus. Also heat radiation affecting the right hand leg of the mercury switch was liable to falsify or even to prevent the alarm.

(c) Hitherto it was impossible to prevent overheating of the catalyst after the alarm was effected due to the continued access of gases and oxygen which fact often resulted in burst mercury switches and even led to explosions.

It is, therefore, the object of the present invention to provide a gas alarm which avoids said disadvantages, and the leading ideas of which are that: (referring to (a)) an effective catalyst which reacts reliably in the presence of CO is made according to a special method and under application of high pressure, thus ensuring deep penetration of the catalytic reagents into the carrier materials and simultaneously providing a permanent adhering of the same; (referring to (b)) the upper left end of the U-shaped mercury switch is provided with liquid absorbing material above a notch therein and this material represents the entire quantity of the expansion agent, and the enlarged upper right end of the mercury switch is surrounded by insulating material which is held in position by an outer glass bulb placed around it in order to keep off heat radiation; (referring to (c)) after completion of both ahead and full alarm signals a circuit is closed which energizes a magnet coil which will pull-in its core being attached to an arm of a double-armed lever, thereby lowering a screening cap of suitable shape and material which is fixed at the end of the same lever arm over the catalyst, and closing on a sealing support so that the heat can only escape through openings in the

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top part of said screening cap, while when the catalyst has cooled down the circuit for the magnet coil will be opened again and the screening cap lifted once more by means of an adjustable counterweight provided at the other arm of said double-armed lever.

A preferred form of apparatus in accordance with the invention will now be described by way of example and with reference to the accompanying drawing, which shows a schematic view of the apparatus, partly in section:

A four lead cable 11 is connected to a connecting box 13 arranged at the lower end of a housing 12. The lead carrying positive voltage is connected e. g. to the terminal at the extreme left and the lead carrying negative voltage is connected to the terminal at the extreme right. The positive voltage is hereby connected to the mercury column of a mercury switch 1 through a terminal 4, while the negative voltage is hereby connected to the upper end of a magnet coil 6 through a terminal 5. Further terminals 4a and 4b are connected to alarm signals outside the apparatus the circuits of which are closed by first and second alarm contacts provided in the right leg of the mercury switch 1. A contact 4c arranged in the right leg of the mercury switch 1 energizes the magnet coil 6 the magnet core 9 of which lowers a screening cap 10 over catalysts 3, 3a against a sealing support 2, thereby preventing any further access of gases and oxygen. The screening cap 10 has in its top part ventilation openings 10a and is movably attached as well as a magnet core 9 to a double-armed lever 7 being pivoted at 7a.

If the necessary temperature, required for the operation of the screening cap has dropped due to the cooling down of the catalyst the mercury column drops below the contact 4c, thereby de-energizing the magnet coil 6 and permitting a counterweight 8 arranged on the other arm of the double-armed lever 7 to relift the screening cap.

1a is a notch shortly below the left upper end of the mercury switch 1; 1b, liquid absorbing material, and 1c insulating material on the end of the right hand leg of the mercury switch which is kept in position by an additional glass bulb.

The cover for the upper part of the housing is not shown. It must be designed to meet the regulations for flame protection and explosion protection.

Various changes, modifications and supplemental arrangements may be made in the structural details of the apparatus shown, without de-

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parting from the spirit and the leading ideas of this invention:

For instance: The double-armed lever 7 bearing the counterweight 8, the magnet core 9, and the screening cap 10 may be omitted and the magnet core 9 itself being arranged above the screening cap 10 connected directly with the screening cap 10, thereby attaining a direct lifting and lowering movement of the same.

We claim:

A gas alarm comprising a U-shaped mercury switch, one leg having a restriction therein adjacent its upper end providing a chamber for the reception of liquid absorbing material that constitutes the entire quantity of an expansion agent, an insulating material surrounding the upper end of the other leg of the U-shaped switch, a glass cover for said insulating material to repel heat

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radiation from the interior of the switch leg, a magnet coil having a core, a counter-balanced lever to which the core is connected, said lever adapted to operate a screening cap in relation to a catalyst, a source of electrical energy with a line extending from said source to one end of the magnet coil, a line extending from the second leg of the switch to the other end of the magnet coil and lines extending from said source of energy to the lower end and second leg of said switch.

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