April 3, 1934. G. P. LUCKEY ET AL 1,953,244

METHOD AND APPARATUS FOR THE DETECTION OF COMBUSTION VAPORS

Original Filed Oct. 8, 1925

FIG 1

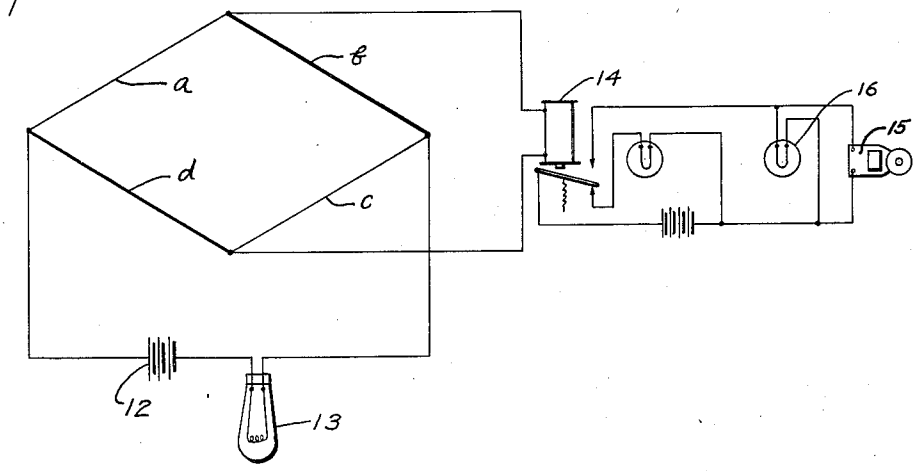
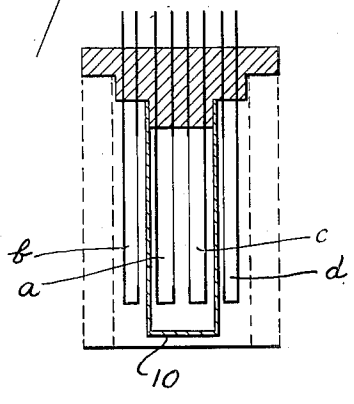


FIG 2



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METHOD AND APPARATUS FOR THE DETECTION OF COMBUSTION VAPORS

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Original application October 8, 1925, Serial No. 61,218. Divided and this application March 25, 1930, Serial No. 438,888

2 Claims. (Cl. 177—311)

This invention relates to a method and apparatus for the detection of inflammable gases or vapors by utilizing two scientific principles; the first that of the Wheatstone bridge, and second that of the catalytic action of platinum wire on inflammable gases.

The object of this invention is to provide an indicator device which will indicate the presence of these inflammable gases, which device is actuated by the application of the above two mentioned scientific principles.

A further object of this invention is to provide an apparatus which will indicate the presence of inflammable vapors without causing the entire combustion of all such vapors present.

Other and more specific objects of this invention will appear from the accompanying specification and in the drawing, in which

Fig. 1 is a diagrammatic view of the entire electrical circuit employed, and

Fig. 2 is a diagrammatic view of the Wheatstone bridge.

Describing the drawing more in detail, reference letters *a*, *b*, *c*, and *d*, in Figures 1 and 2 are four platinum wires connected in the form of a common Wheatstone bridge, the segments *b* and *d* being open and uninsulated while *a* and *c* are inclosed in an airtight thin copper tube 10. The four platinum segments are heated to a constant dull red color by means of a battery 12 and resistance such as an electric light bulb 13; the current being supplied at the juncture of the one unencased segment *d* and one encased segment *a*—the current juncture of the other two segments. The walls of the copper tube 10 are so thin that the temperature of the atmosphere surrounding the segments encased is, under normal conditions, the same as that surrounding the unencased segments. However, when the exposed platinum segments come in contact with a combustible vapor a catalytic action is set up between the vapor and the air, and the vapor is burned with flameless combustion on the surface of the wires. Thus these wires may be introduced into an atmosphere charged with inflammable vapors and as stated only that portion of the vapors which come in contact with the exposed wire will be oxidized.

This flameless combustion greatly increases the temperature of the wire and consequently increases the resistance, thereby throwing the bridge out of balance. A relay is connected across the bridge at the points *ab* and *dc* and with the change in potential of the bridge the current passes through this relay, which actuates a magnet 14 and thereby closes an auxiliary indicating circuit containing some sort of indicating device herein shown as a bell 15 and a red light 16.

It is to be understood that this invention is not limited to the use of platinum wires in the Wheatstone bridge as other metals react the same as platinum when introduced into the presence of combustible vapors.

This application is a divisional application of applicants' copending application, Serial No. 61,218, filed October 8, 1925, by George P. Luckey and E. F. Bacon, entitled Method and apparatus for the detection of combustion vapors.

We claim:

1. A catalytic detector device comprising a support, four catalytic segments connected in the form of a Wheatstone bridge, a casing having a relatively high heat conductivity for hermetically enclosing two of said segments that are oppositely disposed, and for rapidly transmitting external temperature changes to said enclosed segments.

2. A catalytic detector device comprising a support, four catalytic segments, a casing having a relatively high heat conductivity for hermetically inclosing two of said segments, and for rapidly transmitting external temperature changes to said inclosed segments.

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