

UNITED STATES PATENT OFFICE

1,955,897

PROTECTION DEVICE FOR GAS DETECTING APPARATUS

Vincent M. Vertucci, Jersey City, N. J., assignor
to Electro Metallurgical Company, a corporation
of West Virginia

Application January 9, 1928, Serial No. 245,502

2 Claims. (Cl. 23—255)

This invention relates to devices for detecting the presence of combustible gases in air and especially to that type of apparatus in which a filament of suitable material, such as platinum, is heated in contact with an atmosphere to be tested, the temperature being such that, if any combustible gas be present, oxidation will take place due to the heat of the filament. The heat of oxidation will further raise the temperature of the filament and this increase in temperature is measured by any suitable means, preferably by noting the change of resistance of the filament with a Wheatstone bridge. An example of such a device is disclosed in the patent to A. N. Erickson, 1,880,941, dated October 4, 1932. If in such an arrangement, the circuit which includes the filament is opened, the current through the galvanometer or equivalent delicate measuring instrument used in the bridge is greatly increased, and the instrument may be damaged. For example, gas detection devices of some types are provided with means whereby the circuit through the filament is broken when the protecting screen is removed from the filament, an example of a device of this class being disclosed in the patent to A. N. Erickson, 1,798,977, March 31, 1931. An object of the present invention is to protect the measuring instrument under the conditions noted. The construction and arrangement of my protective device will be evident from the following specification having reference to the accompanying drawing in which Figures 1 and 2 are diagrammatic illustrations of two embodiments of my invention in which the head is shown in cross section and Figure 3 is a cross section of a device such as disclosed in Erickson Patent 1,798,977, with which my device is adapted to be used.

In Fig. 1, I show one embodiment of my invention in which provision is made for the breaking of the circuit from the battery when the filament is cut out of the circuit by the removal of the protective screens. In this figure, a Wheatstone bridge is shown, two of the legs containing fixed resistances A and B, a third leg containing a fixed resistance C and a variable resistance D and the fourth leg contains the filament F. The filament F is connected to a pair of terminals 1, 2 which are respectively placed adjacent to terminals 3, 4, all these terminals being mounted in a suitable head. A protective bonnet assembly R which carries screens S for preventing propagation of the flame from the filament F to the outside air also carries contacts K arranged to close the circuits between terminals 1 and 3 and between

terminals 2 and 4 when the bonnet is in place. The screen S is insulated from the contacts K by suitable insulation X. Upon the removal of the bonnet assembly these circuits are broken and the bridge unbalanced and if no protective means were provided the battery M would cause a current to flow through the resistance C and D, the galvanometer G and the resistance B. This current would be so great as to cause danger of injury to the galvanometer G. In order to prevent this, instead of attaching the lead from the battery M to the point 5 as it would be done in the ordinary Wheatstone bridge, I connect the battery lead to the contact 2 thus cutting the battery out of the circuit when the protective bonnet is removed.

In Fig. 2, I show a modification in which the galvanometer G' is connected to the contact 1', the lead from the battery being connected to the junction 5' of two of the legs of the bridge as in the usual arrangement. The resistance A', B', C', D', the battery M' and the filament F' are arranged in a similar manner to that shown in Figure 1. It is evident that when the circuit between the contacts 1' and 3' is broken the galvanometer G' will be out of the circuit and there will be no danger of injury thereto. Screen S', bonnet R', contacts K', and insulation X' correspond to Fig. 1.

I claim:

1. An apparatus for detecting combustible gases comprising a Wheatstone bridge, a filament in one of the legs of said bridge, a galvanometer across said bridge, a battery for supplying heating current to said filament and for deflecting the galvanometer when the bridge is unbalanced, a protective bonnet surrounding the filament and means operatively connected to said bonnet for breaking the circuit through the filament containing leg of the bridge upon the removal of the bonnet and for simultaneously breaking the circuit between the galvanometer and the battery.
2. An apparatus for detecting combustible gases comprising a Wheatstone bridge, a filament in one of the legs of said bridge, a protective bonnet surrounding said filament, a galvanometer, a battery and a circuit between said galvanometer and said battery, said last mentioned circuit including a connection adjacent said filament and means operatively connected with said bonnet for breaking the circuit through the filament upon removal of the bonnet and simultaneously breaking the current between the galvanometer and the battery.

VINCENT M. VERTUCCI. 110