

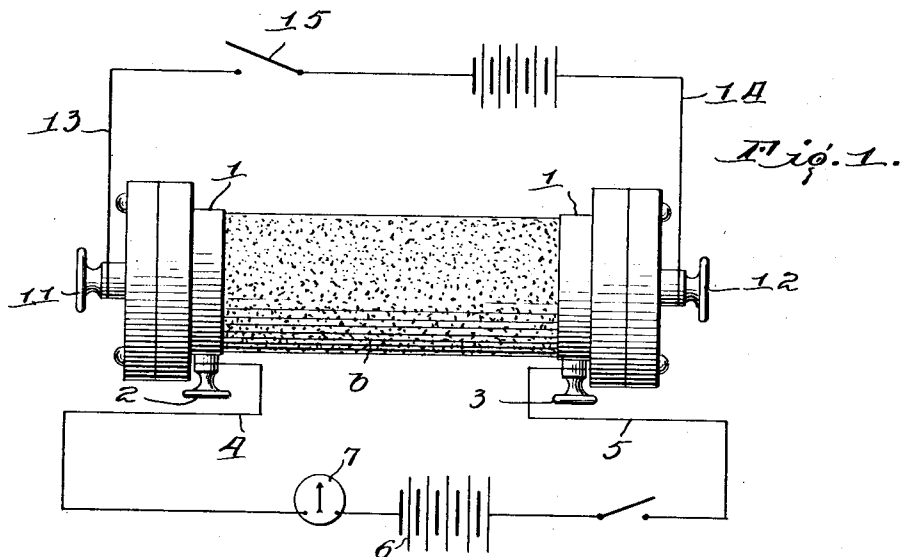
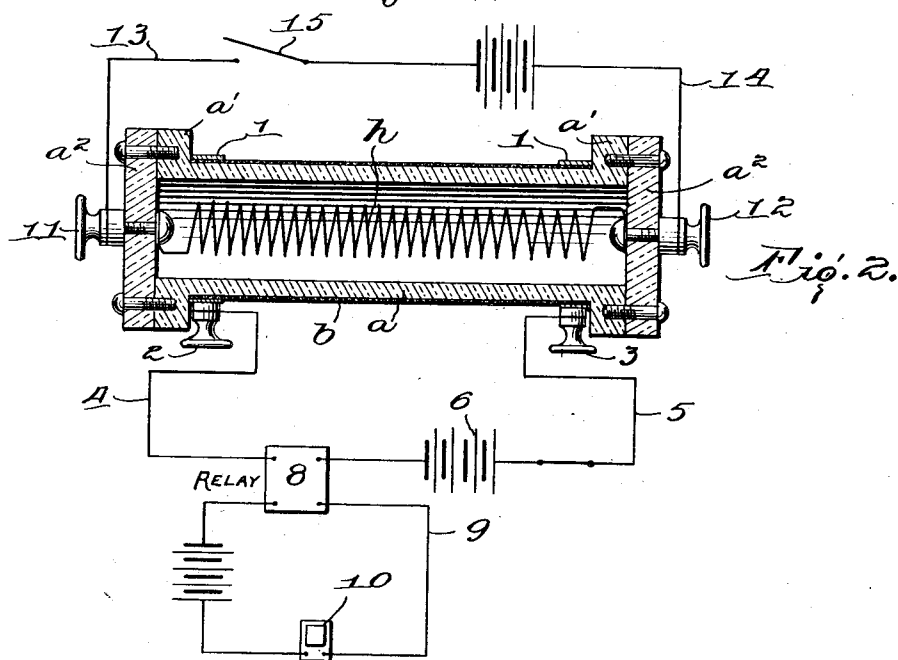
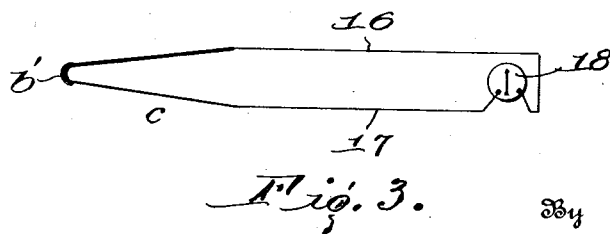
Oct. 27, 1925.

1,559,461

S. RUBEN

GAS AND VAPOR INDICATING DEVICE

Filed May 28, 1921



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UNITED STATES PATENT OFFICE.

SAMUEL RUBEN, OF NEW YORK, N. Y.

GAS AND VAPOR INDICATING DEVICE.

Application filed May 28, 1921. Serial No. 473,460.

To all whom it may concern:

Be it known that I, SAMUEL RUBEN, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Gas and Vapor Indicating Devices, of which the following is a specification.

This invention relates to means for detecting the present and indicating the density of gases and vapors. In one form of the invention, I arrange in an electric circuit, having a source of constant potential, an adsorption material which is also electrically conductive, together with a device for indicating the value of the current flowing through the circuit, or a relay for controlling a circuit containing an audible signaling device. The conductivity of this adsorption material in a dry state, and out of the presence of gases or vapors, is constant, but varies largely in the presence of gases and vapors according to the density of the occluded gas or vapor and the time of exposure of the material to the gas or vapor. Hence, when brought into the presence of the gas or vapor, the resistance of the electric circuit will change and the current flowing through the circuit will also change, and the meter or relay will be actuated to indicate the presence of the gas or vapor.

In another form of the invention, the adsorption material is employed as a heating element for a thermo-couple in a circuit containing a visual indicating device or a relay controlling an audible signalling device. The adsorption material is applied to the junction of the dissimilar elements of the thermo-couple, and becomes heated by the adsorption of the gases or vapors, and this heat, transferred to the thermo-couple causes the generation of a current which traverses the circuit and actuates the signalling device.

In the accompanying drawing,
Fig. 1 represents a gas or vapor detecting apparatus embodying my invention in its preferred form, the electric circuit being shown diagrammatically and including a meter as an indicator;

Fig. 2 shows in longitudinal central section the same apparatus, the electric circuit including a relay which operates an audible signal device contained in a local circuit; and;

Fig. 3 is a modification in which the adsorption material serves as a heating me-

dium for a thermo-couple which is connected in circuit with the meter or indicating device.

Referring to Figs. 1 and 2 of the drawing, a represents a body of insulating material in the form of a spool having flanges a' and caps a'' fitting on the flanges. The body of the spool between the flanges has a coating of absorption material b , such as palladium black, platinum sponge, or finely divided conductive material. Metal bands 1 are clamped about the spool and the coating and make electrical connection with the coating. These bands are provided with suitable terminals 2-3, which are connected by conductors 4 and 5, respectively, to a battery 6. In Fig. 1, a milli-voltmeter 7 is connected in the conductor 4, to indicate the current flowing in the circuit. In Fig. 2, a relay 8 is connected in the conductor 4, and this relay controls the local circuit 9 in which is included an electrically operated bell or buzzer 10.

When no gas is present, a constant current will flow in the circuit 4-5, and the milli-voltmeter 7, in Fig. 1, will be adjusted to give no indication; but in the presence of a gas, the gas will be adsorbed by the coating of material on the insulator. This will change the resistance of the material which is in the electric circuit, and the volume of current flowing in the circuit will vary accordingly and be indicated on the milli-voltmeter. The readings on the meter will indicate the density of the gas or vapor, and also, to some extent, its nature, since some gases and vapors will increase the resistance of the adsorption material while other gases and vapors will decrease its resistance.

In Fig. 2, these variations of current from normal will actuate the relay and the latter will cause the bell or buzzer to give an audible signal.

In order to dry the coating in case it becomes wet or moist, a heating coil h is provided within the insulator. This coil is connected to binding posts 11 and 12 on the caps a'' and connected with an electric circuit 13-14, in which is included a switch 15, which may be closed to cause the current to flow through the coil and heat the spool and coating and drive the moisture out of the coating. The adsorbed gases will gradually leave the coating and be replaced by air, when the apparatus is out of the presence of gases, without the application of heat; but by heating the coating the gases

will be driven out more quickly. This heating may be effected by passing a current through the heating coil, or by applying heat in any other way.

5 In Fig. 3, I have shown an arrangement wherein the adsorption material is applied to the thermo-couple as a heating element, and does not itself form a part of the electric circuit. Referring to Fig. 3, *c* indicates
10 a thermo-couple to which is applied at the joint between its elements, a coating *b'* of adsorption material. The thermo-couple is connected in an electric circuit 16—17, which includes a milli-voltmeter 18. In the
15 presence of gases or vapors the material *b'* adsorbs the gases and thus causes heat at the joint in the thermo-couple and the generation of an electric current which flows through the circuit and is indicated on the
20 milli-voltmeter.

What I claim is:

1. A gas detecting apparatus comprising an insulating body, a coating of adsorption material thereon, an electric circuit including
25 said material, and an indicator controlled by the current flow in said circuit.

2. A gas detecting apparatus comprising

a cylindrical insulating body, a coating of adsorption material thereon, an electric circuit including said material, and an indicator
30 controlled by the current flow in said circuit.

3. A gas detecting apparatus comprising an adsorption material, an electric circuit including said material, an indicator controlled
35 by the current flow in said circuit, and an electrical heating element adjacent said material.

4. A gas detecting apparatus comprising an insulating body, a coating of adsorption
40 material thereon, an electric circuit including said material, an indicator controlled by the current flow in said circuit, and a heating element associated with said body.

5. A gas detecting apparatus comprising
45 a hollow cylinder of insulating material, a coating of adsorption material thereon, an electric circuit including said material, an indicator controlled by the current flow in said circuit, and a heating resistance in said
50 cylinder.

In testimony whereof I affix my signature.

SAMUEL RUBEN.