PRELIMINARY
PATENT APPLICATION

"RADIATION MEASURING INSTRUMENT"

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August, 19, 1976

RADIATION MEASURING INSTRUMENT

DESCRIPTION:

This invention relates to instruments, especially portable instruments, used in geophysical prospecting for locating and identifying petrological formations, geological structures, minerals, ores and the like which exist deeply hidden in the earth. Unlike presently known methods such as gravimetric and magnetic surveys, seismic velocity and electrical resistance surveys, the method outlined herein differs from currently-known prospecting methods by detecting and measuring certain natural penetrating radiation emanating from rock-like materials or formations.

The invention utilizes, in combination, a standard type of voltage indicator or recorder together with a petroelectric (voltage) source as described in applicant's co-pending patent application "Electrical Source".

Although research studies have been undertaken by the inventor and his colleagues for a number of years and projects are presently underway to provide a better understanding of the physical principles involved, the facts appear to indicate that rocks (generally) capture and reradiate an as-yet unidentified form of radiant penetrating energy received from the environment and, perhaps, from cosmic space. This reradiation may be described as analogous to optical fluorescence except, of course, the incident radiation is not light or heat but appears to be an extremely penetrating form of energy - apparently not electromagnetic, nor of the nature of well-known cosmic rays. (Optical-frequency gravitational radiation is suspected).

Not enough is known at this time to fully explain the phenomenon, nor is a complete explanation within the province of this patent application. The fact remains that the sensor is effective as a remote-reading geophysical surveying or prospecting device (see supporting affidavits).

Massive high-K dielectrics are recited in the applicant's copending application "Electrical Source" as producing electrical self-potential. This phenomenon is also observed in certain semi-conductors or resistors. Ultra-high (megohm) resistors (wire-wound, metal-film, ceramic or conductive-plastic) are also found to produce emf intrinsically. This phenomenon has not been known to exist heretofore, and there appears to be no reference to such phenomenon in the scientific literature.

While dielectric or resistance self-potential, as a future energy source, may ultimately become possible, an immediate practical application is its use as a sensing device in geophysical prospecting. Associated with conventional voltage or current indicators, such a portable device has valuable utility in conducting petrological surveys and profiles. It is, therefore, an object of this invention to provide a portable prospecting instrument.

It is another object of this invention to provide a remote-sensing instrument for detecting sub-surface features, rock densities and geothermal gradients, for pinpointing mineral or ore deposits and for locating geothermal reservoirs.

It is another object of this invention to provide a meteorological instrument or one useful for the detection of and evaluation of earthquake precursors.

SPECIFICATIONS:

Fig. 1 illustrates the use of an electrical resistive element 1, being a standard type of high-voltage resistor (approx. 100 megohms), together with rectifying diode 2, storage capacitor 3 and indicating millivoltmeter 4. One end of the resistor may be grounded as shown. The entire system should be enclosed in a hermetically-sealed, constant-temperature and electrostatically-grounded shield (Faraday cage) 5 to eliminate extraneous environmental disturbances. Smoothing capacitor 3 may be varied (or eliminated) depending upon response time desired. Diode 2 may also be eliminated if the emf source (resistor 1) has strong electrical polarization. Resistor 1 spontaneously generates self-potential in the same fashion as the active (receptor) material described in my copending application "Electrical Source".

Fig. 2 is a similar circuit to that of Fig. 1, except that a massive high-K dielectric material 1a (such as barium titanate, lead zirconate titanate, lead monoxide-glycerine compound, natural granitic or basaltic rocks or compressed monazite-silica sand) is used as the resistive or potential-generating element. An enclosing environmental shield is desirable in every case, but it is not shown in this or subsequent figures.

Fig. 3 is a Wheatstone bridge circuit using a pair of resistors 6a and 6b with a pair of dielectrics 7a and 7b of the same resistance as 6a and 6b and a nul-reading millivoltmeter 8. Battery 9 may be used to supply additional voltage to continuously polarize the system for increased sensitivity if needed. Normally, the operating potential is supplied by the dielectrics and/or resistors and a battery is not required. Variable resistor 10 is used to balance the circuit to a nul position.

Fig. 4 illustrates the simplest form of the invention. A granitic or basaltic rock 11 is used as the electrical source. When found in nature, rocks are usually electrically polarized due to natural crystal structure alignment. If not, they may be flash-polarized by the momentary application of high voltage 12 (as illustrated). An alternative method of polarization is to heat the rock above its Curie point, apply high voltage and gradually lower the temperature thru the Curie point to normal while voltage is maintained. Electrical polarization is then retained (as in magnetic polarization). Electrodes 13 and 14 are attached to rock 11, the surface of which has been previously ground or cleaned so as to provide good electrical contact. It has been found that electroplating copper

or silver(electrodes) to the prepared surface of the rock provides excellent electrical contact. Contact potential difference does not appear as a significant factor. Wires 15 and 16 conduct the developed emf to a conventional indicating or recording millivoltmeter 17.

The recorded potential (ranging approx. from 1 to 300 millivolts) varies cyclically with time (diurnal cycle) and with location (relative to neighboring rocks of similar composition). Hence, a geophysical profile can be obtained merely by moving the sensing system from place to place.

For the sake of brevity and clarity, only minimum details of the technology of self-potential have been referred to in this patent specification, but it must be appreciated that the practical applications of this newly-discovered phenomenon may be many and varied. Its use as a geophysical prospecting instrument may be only a small fraction of its ultimate usefulness. For the present, however, this patent application will define the "Radiation Measuring Instrument" as being a combination of the above-referenced "Electrical Source" together with a suitable millivoltmeter or strip-chart recorder.

As such, it is a continuation-in-part of the applicant's copending patent application, entitled "Electrical Source".

CLAIMS:

I claim:

1) In combination, a petroelectric source with a voltage indicator.

2) In combination, a petroelectric source with power-indicating recording instrument.

3) A combination according to claim 2 which is portable.

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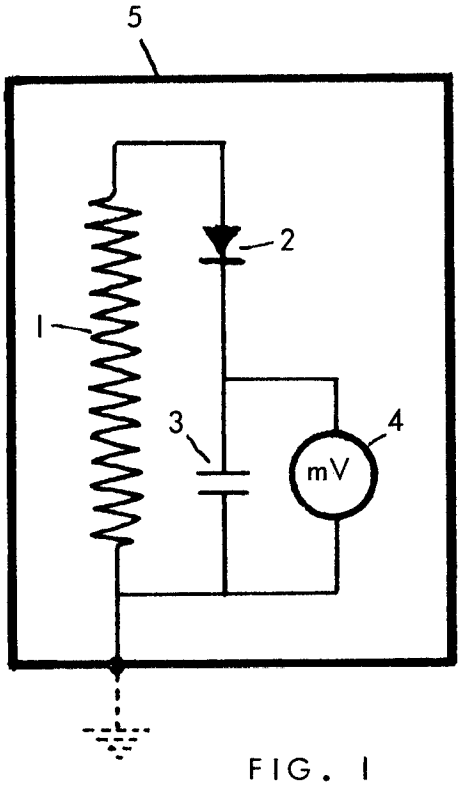

FIG. 1

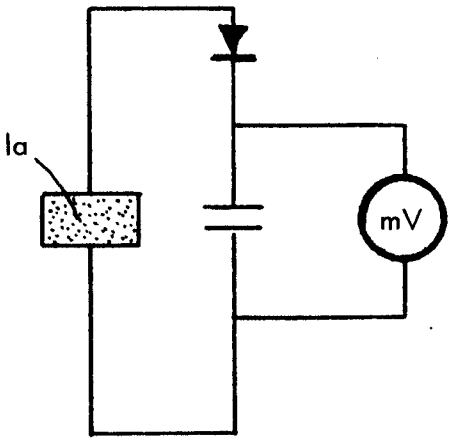

FIG. 2

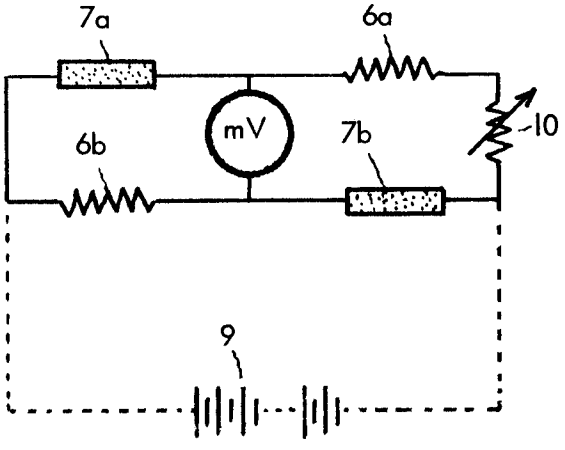

FIG. 3

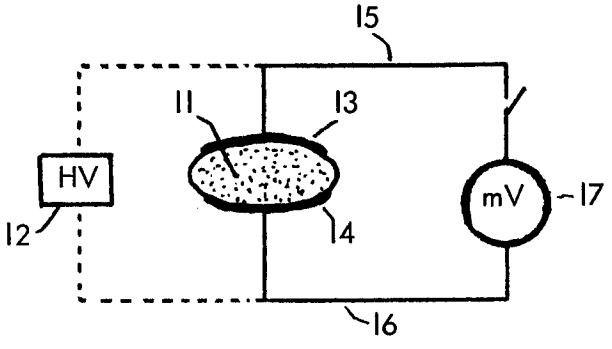

FIG. 4

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Inventor

8/19/76