

[54] APPARATUS FOR DETECTING SNOW,
WATER OR HEAT

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[58] Field of Search..... 340/420, 227.1, 244 R,
340/224; 337/3, 300; 200/61.04

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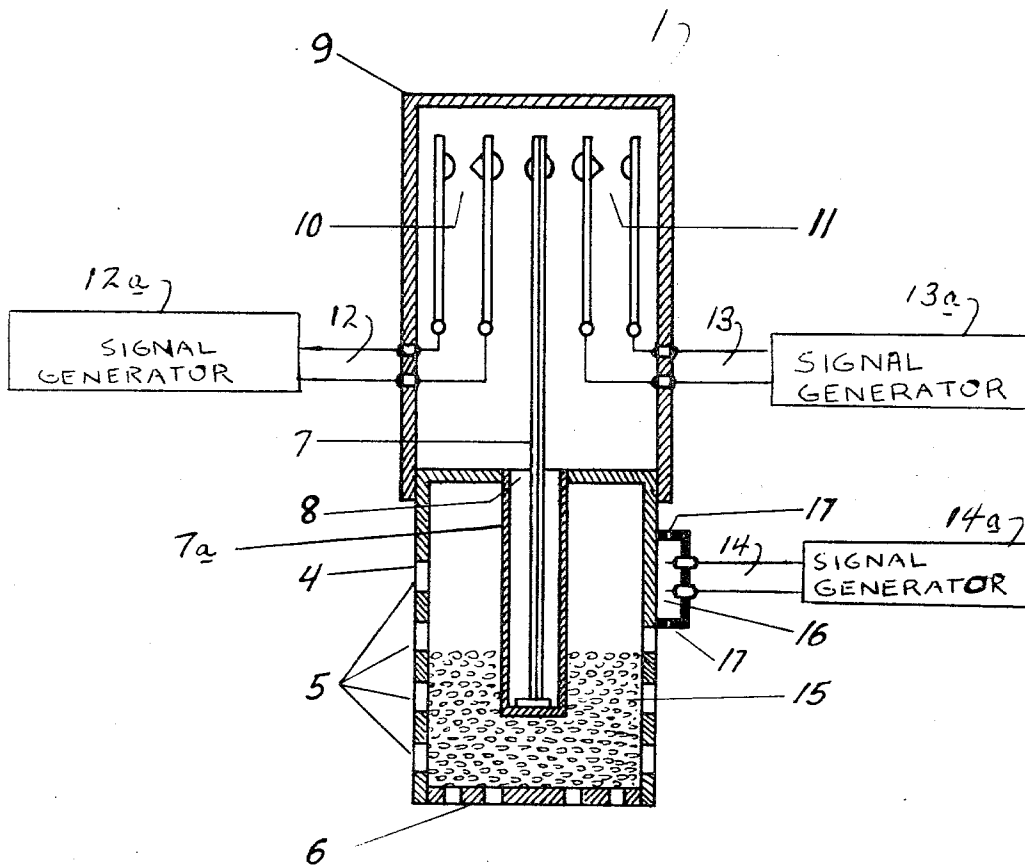
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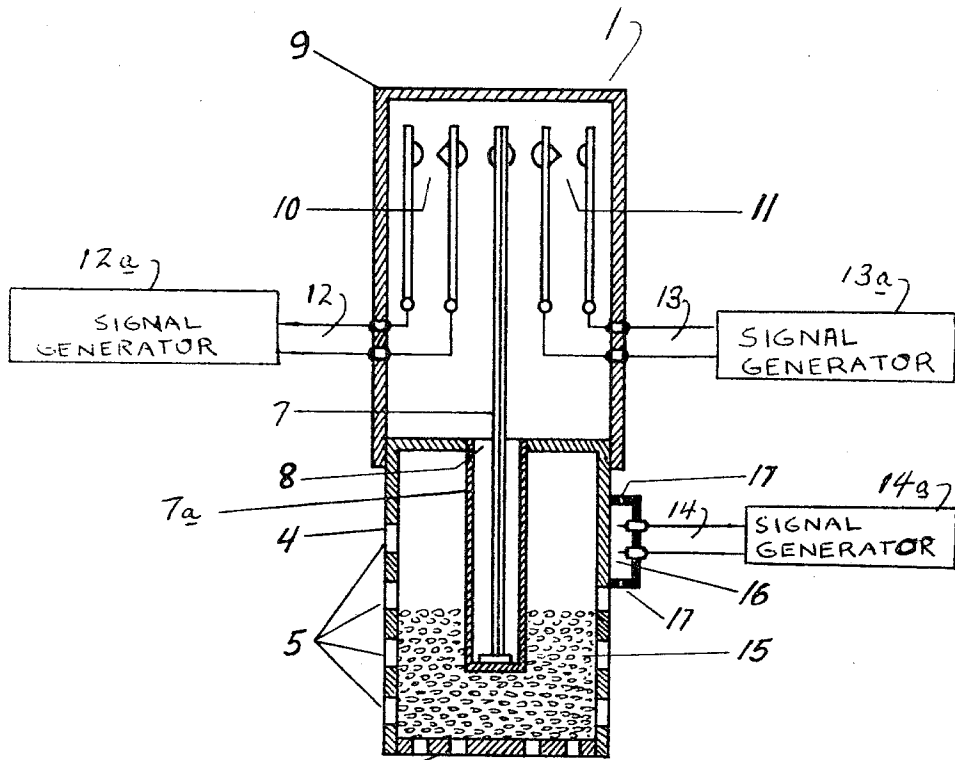
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[57] ABSTRACT

An indicator for detection of snow, water or extreme heat comprising a bimetallic thermostat element arranged in a receptacle to close a first relay when the receptacle is in snow or a second relay when the receptacle is exposed to intense heat, the relays being connected to first and second signal generators, respectively, that are activated when their respective relays are closed to transmit a characteristic radio signal. A third signal generator is activated when a chamber on the receptacle is flooded with water.

2 Claims, 2 Drawing Figures





6 Fig. 1A

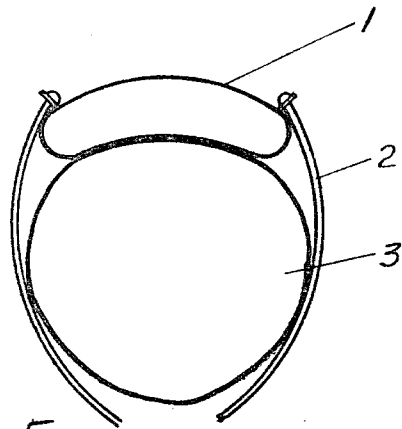


Fig. 1B

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APPARATUS FOR DETECTING SNOW, WATER OR HEAT

BACKGROUND AND SUMMARY OF THE INVENTION

The invention relates to an apparatus that may be used to locate persons lost in snow slides, drowning accidents and the like. The apparatus may also be employed as a stationary aid in remote detection of snow, water or intense heat.

The general purpose of the invention is to provide an apparatus that will serve as a wireless direction-finding station and at the same time indicate the meteorological conditions to which the bearer of the apparatus, or the apparatus itself, is exposed.

The use of manual or automatic emergency transmitters in hazardous situations, as well as direction-finding of such transmitters, is known in the prior art (cf. Norwegian Pat. No. 96067 and French Pat. No. 1,318,282). The disadvantages of the prior devices are that they are large, complicated units, they are intended to be served by an operator, and they fail to indicate the weather conditions prevailing at the station. If the person equipped with the emergency transmitter should have an accident where he is unable to operate the transmitter, there is no provision in a conventional transmitter to provide for automatic start-up.

The specific purpose of the present device is to provide a portable apparatus of light weight and small size that will go into operation automatically and indicate by radio the environment where the apparatus is located, e.g. snow, water or heat above 60°C. The apparatus consists of an enclosed chamber in which is accommodated a thermorelay that will deflect to either side when exposed to severe cold or heat, closing contacts to a radio transmitter that will emit characteristic signals accordingly. If the apparatus is immersed in water, a corresponding closure of contacts will trigger a different radio signal.

The advantages of the invention are the following. If for example a skier carrying the apparatus has an accident and is lying in the snow unconscious, the apparatus will automatically start transmitting a characteristic signal continuously. That signal informs the receiver that an accident has occurred and that the victim is in a snow area. The signals may then be used as direction-finding signals. If the victim falls into water or a swamp, a different characteristic signal will be emitted. The same will happen if the apparatus is exposed to severe heat (for example, above 60°C.) in the case of fire.

A special advantage of the device is that neither the indicator transmitter is consuming current before the actual emergency arises, and that the emergency signal then will be triggered automatically.

The apparatus may also be employed as a stationary transmitter for automatic remote indication of snow, water or severe heat in predetermined locations.

BRIEF DESCRIPTION OF THE DRAWING

The present invention may be illustrated by reference to the accompanying drawing, in which:

FIG. 1A is a diagrammatic view in section of the transmitter of the invention; and

FIG. 1B is a schematic view of the transmitter secured to a limb of the user.

DETAILED DESCRIPTION

Referring now to FIG. 1B, the transmitter 1 may be secured by straps 2 to an arm or leg 3 of the bearer of the transmitter.

As shown in FIG. 1A, the transmitter 1 comprises a receptacle 4 provided with holes 5 around the periphery thereof and filled with a hygroscopic material 15 e.g. NaCl of a size as to be retained in the receptacle 4. A perforated plate 6 is screwed to the receptacle 4. A bimetallic thermostat element 7 is mounted at the bottom of depending chamber 7a and projects through an opening 8 in the top of the receptacle 4. On the top of the receptacle 4 is arranged a cover 9, in which are mounted by means not shown a set of switches 10 and 11, with outgoing leads 12 and 13, respectively. Attached to the side of receptacle 4 is a smaller receptacle 16 having a plurality of holes 17 therein of a size that will enable the receptacle 16 rapidly to fill with water in the event the transmitter 1 is submerged. A pair of leads 14 passes through receptacle 16, leads 14 being open in receptacle 16.

Leads 12, 13 and 14 are connected to signal generators 12a, 13a and 14a, respectively, which are of any conventional design, for transmitting signals, such as radio waves, over long distances without wires. A source of energy for generators 12a, 13a and 14a may suitably be an energy cell (not shown) as used in hearing aids, electrical wrist watches and other small electrical and electronic devices. Where transmitter 1 is used as a stationary apparatus, larger size equipment can be used, and larger energy cells, such as dry or wet cell batteries may be employed. Since the signal generators 12a, 13a and 14a may be of any design, they are not discussed in detail herein. However, generators 12a, 13a and 14a must each generate a different signal so that the person detecting the signal may immediately know which generator has been activated and hence which danger has been encountered, i.e. snow, fire or water.

The operation of the apparatus is as follows. If the bearer of the transmitter 1 suffers an accident and finds himself lying in or under the snow, the hygroscopic material 15 in the receptacle 4, under the influence of the snow, will produce an intense cooling effect which will cause the bimetallic element 7 to deflect towards switch 10, thereby activating signal generator 12a, which is preferably in the form of a radio transmitter. The signals are emitted from generator 12a in the form of a continuous characteristic signal, for example with the aid of an electric motor (not shown) that begins to drive a shaft on which is arranged a contactor making a certain number of signals per revolution. If the victim falls into water, water will enter the receptacle 16 through the holes 17 and close the lead 14, triggering signal generator 14a to generate a different signal from the above mentioned signal from generator 12a (the said electric motor, for example, now rotating at a higher speed). If the transmitter 1 is exposed to severe heat, for example 60°C. or more, in the case of a fire, the bimetallic element 7 will deflect towards switch 11 and close its contact. Then a signal is emitted from signal generator 13a, differing from the aforementioned signals. If water should penetrate into the receptacle 4 through the holes 5, signal generators 12a and 13a are not triggered, since the water will not provide enough

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cold or heat to cause the bimetallic strip to close either switch 10 or 11.

The signals emitted from generators 12a, 13a and 14a are transmitted continuously, and can therefore be used as direction-finding signals by the parties searching for the persons to be rescued. The signals can be stopped manually by the bearer of the transmitter, should this be desirable, by disconnecting the energy source.

I claim:

1. Apparatus for the detection of environmental extremes comprising a receptacle having a perforated first chamber operative to retain a snow-activated coolant material and to admit snow through said perforations, a sealed second chamber, a portion of said second chamber extending into said first chamber, first and second normally open switch means disposed in said second chamber, a bimetallic element mounted in the extended portion of said second chamber and disposed between said first and second switch means, said

bimetallic element being operative at the reduced temperature resulting from contact of said coolant material with snow in said first chamber to close one of said switch means and at abnormally elevated temperature to close the other of said switch means, and first and second broadcasting means having distinct signals electrically connected to and activated by said first and second switch means respectively.

2. Apparatus according to claim 1 wherein said receptacle includes a third chamber sealed from said first and second chamber, said third chamber being perforated to admit water when said receptacle is submerged, a third broadcasting means having a signal distinct from the signals of both first and second broadcasting means, and pair of contacts disposed in said third chamber and electrically connected to said third broadcasting means, said contacts being operative upon the admission of water to said third chamber to activate said third broadcasting means.

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