

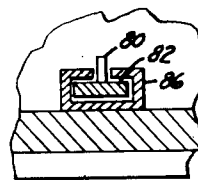
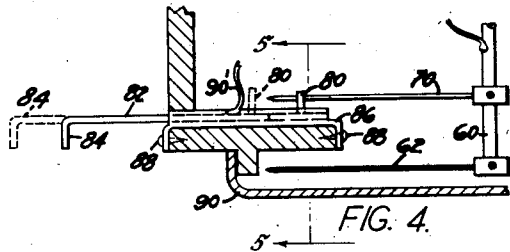
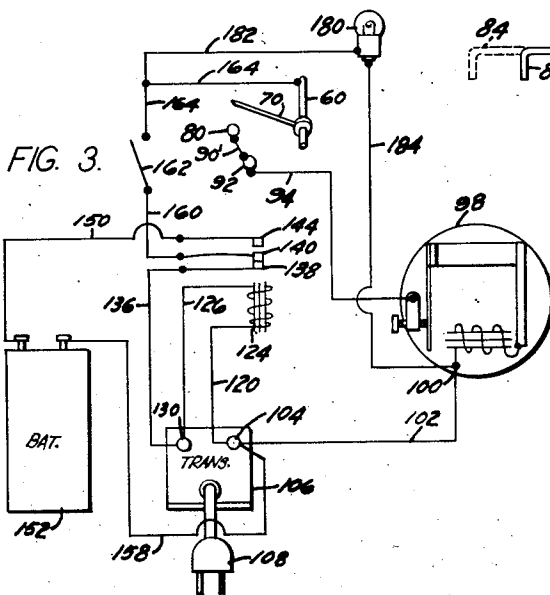
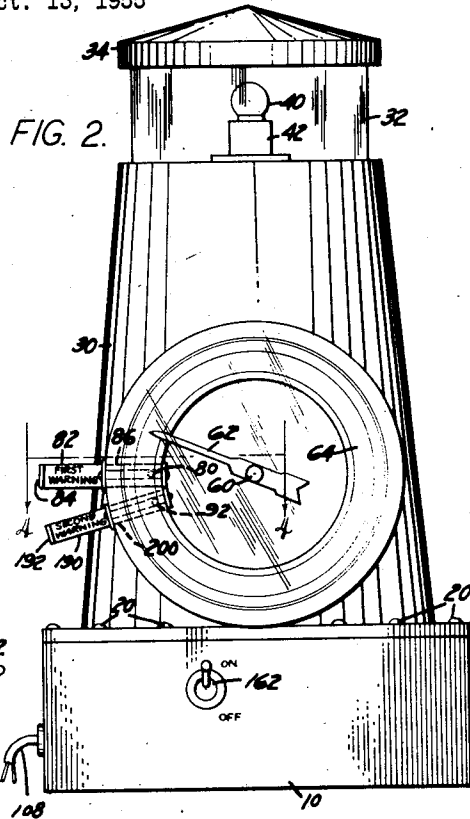
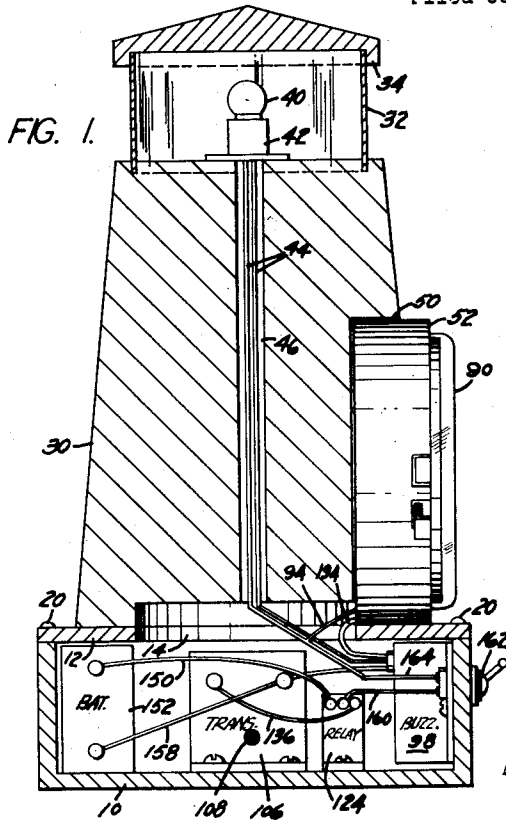
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TORNADO WARNING DEVICE

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TORNADO WARNING DEVICE

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8 Claims. (Cl. 340—236)

This invention relates to warning devices and particularly to a tornado warning device for sounding an alarm or a plurality of alarms when an area is in danger of tornados.

Another object is to provide two alarms, a first alarm to serve as an alert and a second and later alarm to sound a danger warning after the danger has increased.

Another object is in the provision of an alarm system as above described interworking with a barometer whereby variation in barometric pressure will cause an arm, which is operably interconnected with the barometer diaphragm, to touch a contact member which closes an electrical circuit for causing the alarm to sound.

Another object of this invention is to have the contacts for the needle set at a predetermined position for allowing sufficient time after the danger point to seek shelter.

A further object is to provide the said arm in addition to the indicator needle usually found on a barometer whereby the electrical contact for the arm can be concealed from view.

Yet another object is to provide the device with a light to indicate that power is available for operation to avoid the danger that the device might be depended upon at a time when it was not in operation.

A particular object is to provide the tornado warning device with both a battery and a power line connected source of power, and further with automatic means for utilizing the battery only when power through the power line has failed or the device has become unplugged.

Other and further objects and advantages of the present invention will be apparent from the following detailed description, drawings and claims, the scope of the invention not being limited to the drawings themselves as the drawings are only for the purpose of illustrating a way in which the principles of this invention can be applied.

Other embodiments of the invention utilizing the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims.

In the drawings:

Fig. 1 is a side elevation of the tornado warning device of this invention with portions removed and other portions shown in sections for convenience of illustration;

Fig. 2 is a frontal elevation of the tornado warning device;

Fig. 3 is a diagram of the circuit of the tornado warning device of Fig. 1 with parts shown in a position for receiving power from a transformer;

Fig. 4 is a view-in-section taken along the line 4—4 of Fig. 2 and of a forward portion of the device;

Fig. 5 is a view-in-section taken along the line 5—5 of Fig. 4.

The tornado warning device of this invention preferably has a hollow base portion 10 substantially of a box shape and having an opening 14 on the upper side thereof for receiving certain wires as later described.

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It will be seen that the base 10 has lowermost points arranged in a plane whereby the base is adapted to support the device upright on a horizontal surface such as a table.

5 The upper side 12 of the base 10 is removably secured to the remainder of the base 10 by means of screws 20 whereby access can be had to the interior of the base 10 by removal of the screws 20. The base 10 forms a lower portion of the frame of the device and the center or upright portion of the frame is indicated at 30 and extends upwardly from and suitably attached to the top 12 of the base. The center portion 30 is preferably round in cross section and tapers inwardly to a narrower upper end upon which a circular transparent member 32 is mounted having a cap 34 on its upper side.

10 The member 32 is transparent for permitting viewing a light 40 disposed with its base 32 mounted on the top of the center portion 30 and with wires 44 extending downwardly through an opening 46 in the center portion 30 to the base portion 10 and as later described.

15 The center portion 30 has a recess 50 in the forward side thereof in which a barometer 52 is mounted. The barometer 52 is suitably secured to the center portion 30 by means not shown.

20 The barometer 52 can be of any suitable type and is preferably of a type having a shaft 60 rotatable responsive to variations in the atmospheric pressure. Such barometers normally have an indicator needle 62 on the outer end of the shaft 60 for the purpose of indicating atmospheric pressures on a dial 64, best seen in Fig. 2. For convenience of illustration, the indicia normally found on the dial are not shown in Fig. 2.

25 In accordance with this invention an arm 70 is suitably secured to and mounted on the shaft 60 in a position spaced behind the needle 62.

30 The indicator arm 70 is adapted to swing freely except at times when it comes in contact with a first contact member 80 added to the barometer as a part of this invention. The first contact member 80 is best seen in Fig. 4 and is suitably mounted on a slidable bar 82 having a handle 84 on its outer end.

35 The bar 82 is slidably mounted in a suitable fitting 86 which latter is fixed to the barometer sidewall in the manner shown in Fig. 4 with screws 88. The barometer 52 has a transparent cover shown at 90 through which the needle 62 is clearly visible.

40 Further in accordance with this invention the fitting 86 is provided with a wire 90 suitably electrically secured to it for conducting current from the contact member 80 at times when the latter is contacted by the arm 70.

45 Referring now to Fig. 3, it will be seen that the wiring diagram of the tornado warning device includes the wire 90 connected to the contact member 80. The wire 90 is also in contact with a further contact member 92 which will be later described. From the contact member 92 a wire 94 leads to one terminal of a buzzer or other suitable audible alarm 98. The other contact 100 of the buzzer 98 has a wire 102 leading from it to a terminal 104 on a transformer 106. The transformer 106 has a plug 108 for plugging into an electrical receptacle of the wiring circuit of a home or building.

50 A wire 120 leads from the terminal 104 of the transformer to a relay having an electromagnet 124 and a wire 126 leads from the other terminal of the electromagnet 124 to the other terminal 130 of the transformer.

55 A wire 136 leads from the other terminal 130 to one contact member 138 of the relay.

60 The relay further has a contact member 140 which latter has a resilient arm portion whereby the contact member 140 is normally held in an upper position in contact with an upper contact member 144 except at times when the electromagnet 124 is energized at which time

the contact member 140 is pulled downwardly in contact with the contact member 138.

The upper contact 140 is connected by a wire 150 to a terminal of a battery 152. Another terminal of the battery 152 is connected by a wire 158 to the terminal of 104 to the transformer so as to make a contact with the wires 102 and 120.

The center contact 140 of the relay has a wire 160 leading from it to switch 162 which latter is to be seen in Fig. 2 on the forward side of the device. The switch 162 has a further wire 164 leading from it to a point of contact with the shaft 60 whereby current can pass through the shaft 60 to the arm 70.

The circuit further has a light 180 which is connected by wires 182 and 184 to the wire 164 and to the terminal 100 of the buzzer 98 respectively.

As thus described it will be seen that when the arm 70 touches the contact 80 a circuit is closed between the terminals of the transformer and the terminals of the buzzer 98. The buzzer 98 then sounds a warning signal.

If at this time the plug 108 has come out of its receptacle or if the power lines are down or for any other reason power does not come from the transformer 106, then the electromagnet 124 is not energized and the contact 140 springs up into engagement with the contact 144. In this position, power from the battery 152 is available as a substitute for the power from the transformer 106.

It is desirable that the first contact 80 serves as a first warning or an alert signal and so I have provided a second contact 92 at a point disposed in the path of the arm 70 and in a position in the path indicative of a still lower barometric pressure than the position of the first contact 80. However, it is necessary that before the arm 70 can reach the contact 92 that the contact 80 be removed from the path of the arm 70.

This is accomplished by pulling outwardly on the handle 84 of the bar 82 on which the contact 80 is mounted until the contact 80 is out of the way of the arm 70.

The arm 70 then swings further downward and counter-clockwise as shown in Fig. 2 until it reaches the contact 92 whereupon a second warning signal is given. It is possible for the second contact 92 also to be slidable upon a bar 190 having a handle portion 192 similarly to the bar 82. The second contact 92 also has a member, not shown except in dotted line at 200 in Fig. 2, similar to the member 86. When the second warning contact 80 is pulled outwardly the arm is free to swing still lower although it is wise if every precaution against the tornado has been taken by the time of the second warning.

From the foregoing description, it is thought to be obvious that a tornado warning device constructed in accordance with my invention is particularly well adapted for use, by reason of the convenience and facility with which it may be assembled and operated and it will also be obvious that my invention is susceptible of some change and modification without departing from the principles and spirit thereof, and for this reason I do not wish to be understood as limiting myself to the precise arrangement and formation of the several parts herein shown in carrying out my invention in practice, except as claimed.

I claim:

1. A storm danger warning device comprising: a barometer having an electrically conductive arm operably connected to said barometer for moving in a path as barometric pressure falls, and an electrical contact member disposed in the path of said arm at a position in said path indicative of tornado danger, a source of power, an electrical warning device, and an electrical circuit operably connecting said arm and said contact member to said source of power and said warning device whereby when said arm touches said contact member said warning

device is actuated for giving a warning, means for movably mounting said contact member on the frame of said barometer whereby said contact member can be moved from said position in said path to a release position not in said path for the release of said arm for further movement responsive to still lower barometric pressures, and in further combination with a second contact member disposed in the path of said arm in a position in said path indicative of a still lower barometric pressure than the position of said first-mentioned contact member, said second contact member being connected in said circuit similarly to said first mentioned contact member, and a base attached to said frame and supporting said warning device, the base having lowermost points arranged in a plane whereby the device is adapted to be disposed on the top of a horizontal surface such as a table.

2. A storm danger warning device comprising: a barometer having an electrically conductive arm operably connected to said barometer for moving in a path as barometric pressure falls, and an electrical contact member disposed in the path of said arm at a position in said path indicative of tornado danger, a source of power, an electrical warning device, and an electrical circuit operably connecting said arm and said contact member to said source of power and said warning device whereby when said arm touches said contact member said warning device is actuated for giving a warning, means for movably mounting said contact member on the frame of said barometer for movement toward and away from said contact point and for supporting said contact member when the latter is in a contact position and also when the latter is in a release position whereby said contact member can be moved from said position in said path to a release position not in said path for the release of said arm for further movement responsive to still lower barometric pressures, and in further combination with a second contact member disposed in the path of said arm in a position in said path indicative of a still lower barometric pressure than the position of said first-mentioned contact member, said second contact member being connected in said circuit similarly to said first-mentioned contact member, and a base attached to said frame and supporting said warning device, the base having lowermost points arranged in a plane whereby the device is adapted to be disposed on the top of a horizontal surface such as a table.

3. The combination of claim 2 in further combination with a battery, a source alternating current, a transformer, said transformer being connected to an alternating current source, a relay, and a switching circuit connected to said battery transformer and relay for normally using current from said transformer as said source of power and for automatically using said battery as said source of power when power through said transformer is not available.

4. The combination of claim 2 in further combination with: an indicator light and means operably connecting said light to said source of power whereby said light burns constantly except during a failure of said source of power whereby power failures are indicated.

5. The combination of claim 2 in which said movable contact member has a member attached to it in a position protruding outwardly from adjacent portions of said device for manual operation and movement of said first-mentioned contact member.

6. A storm danger warning device comprising: a barometer having an electrically conductive arm operably connected to said barometer for moving in a path as barometric pressure falls, and an electrical contact member disposed in the path of said arm at a position in said path indicative of tornado danger, a source of power, an electrical warning device, and an electrical circuit operably connecting said arm and said contact member to said source of power and said warning device whereby when said arm touches said contact member said

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warning device is actuated for giving a warning, means for movably mounting said contact member on the frame of said barometer for sliding movements of said contact member whereby said contact member can be moved from said position in said path to a release position not in said path for the release of said arm for further movement responsive to still lower barometric pressures, said contact member being at all times supported by said movably mounting means for sliding movement and support at all times whether in contact or release positions, and in further combination with a second contact member disposed in the path of said arm in a position in said path indicative of a still lower barometric pressure than the position of said first-mentioned contact member, said second contact member being connected in said circuit similarly to said first mentioned contact member.

7. The combination of claim 1 in which the contact members are elongated and in which said means for movably mounting said contact members on said frame are adapted to slidably support said contact members in a position that outer ends thereof protrude outwardly from said contact member mounting means where they can be manipulated, other portions of said contact members being slidably held within and securely supported by said contact member mounting means.

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8. The combination of claim 1 in which the contact members are elongated and in which said means for movably mounting said contact members on said frame are adapted to slidably support said contact members in a position that outer ends thereof protrude outwardly from said contact member mounting means where they can be manipulated, other portions of said contact members being slidably held within and securely supported by said contact member mounting means, the outer ends of said contact members having portions extending transversely to the direction of sliding motion of said contact members and adapted to be gripped by the fingers for the pulling of said contact members inwardly and outwardly.

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