July 11, 1950 W. M. SHAW 2,514,807

PORTABLE ELECTRIC FIRE ALARM DEVICE

Filed April 5, 1948

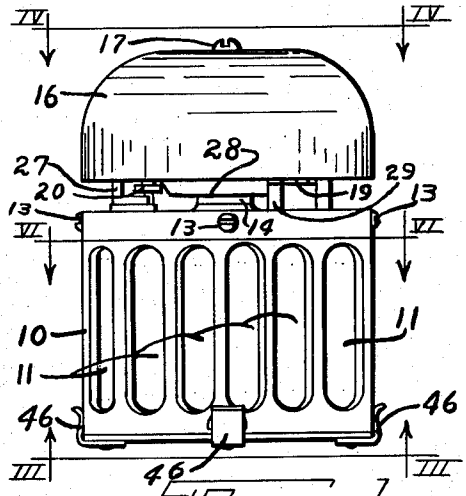


FIG. 1

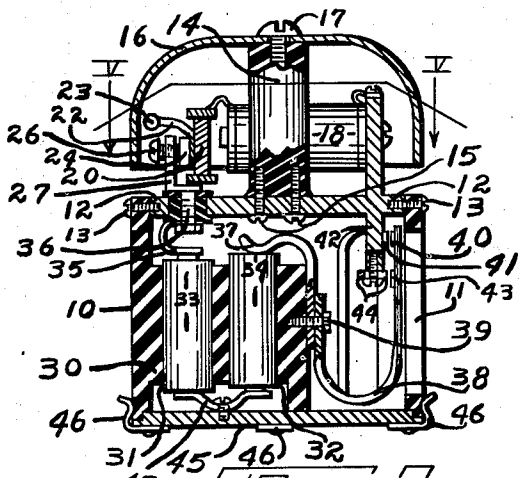


FIG. 2

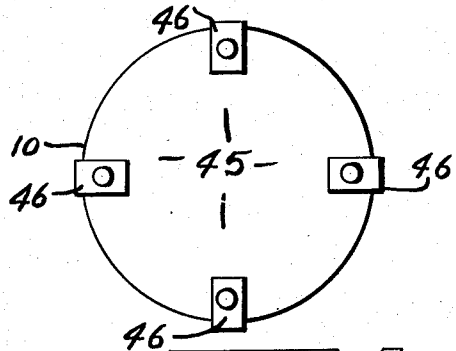


FIG. 3

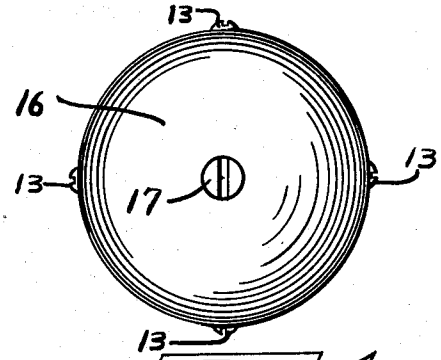


FIG. 4

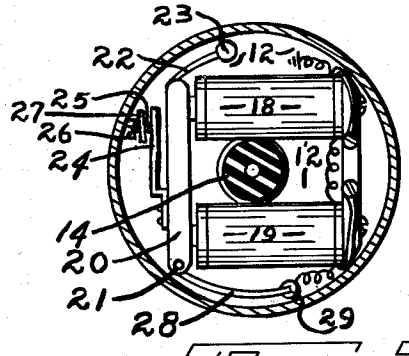


FIG. 5

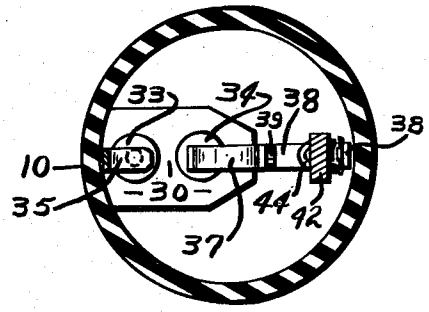


FIG. 6

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PORTABLE ELECTRIC FIRE ALARM DEVICE

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2 Claims. (Cl. 177—311)

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My invention relates to a portable electric fire alarm device. The object of the invention is to provide a fire alarm device that can be carried in a traveler's suitcase or the like.

Another object of the invention is to provide a fire alarm device of the kind mentioned that can be moved from place to place so as to be located in what would be the most advantageous, selected location for the fire alarm to be located.

A further object of the invention is to provide an alarm device of the kind mentioned that is small and compact so that it will not occupy much space in one's luggage.

A still further object of the device is to provide a fire alarm of the kind mentioned that is simple, sturdy in construction, durable and long lived and one that will be operated by increases in temperature above normal temperatures. These and other objects will be more fully explained as this description progresses.

Now referring to the accompanying drawings in which similar numerals of reference designate the same parts throughout the several figures of the drawings,

Fig. 1 is a detail side elevational view of the fire alarm device.

Fig. 2 is a vertical sectional detail view through the fire alarm device.

Fig. 3 is a bottom plan view of the device, the view being as seen from the line III—III in Fig. 1 and looking in the direction of the arrows.

Fig. 4 is a top plan view of the device, the view being as seen from the line IV—IV in Fig. 1 and looking in the direction of the arrows.

Fig. 5 is a detail cross sectional view of the device, the view being as seen from the line V—V in Fig. 2 and looking in the direction of the arrows.

Fig. 6 is a cross sectional view of the alarm device, the view being as seen from the line VI—VI in Fig. 1 and looking in the direction of the arrows.

In the drawings is shown a hollow cylindrical shaped housing or casing 10, having a series of elongated vertically positioned and closely spaced together openings 11 in the vertical wall 10 thereof. The housing 10 is preferably made of material that is a nonconductor of electricity, such as hard rubber, fiber, pottery, plastic material or the like.

The upper end of the casing 10 is provided with a metallic closure plate 12 that is rigidly attached thereto by means of screws 13 that pass through the upper edge of the casing wall 10 and are threaded into the closure plate 12. The closure

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plate 12 is provided with an upwardly extending stud 14 that is centrally positioned thereon and may be made as an integral part thereof or may be attached thereto by means of screws 15 which may pass through the plate 12 and are threaded into the stud 14 to rigidly hold the stud 14 on the plate 12.

An alarm bell 16 rests on the upper end of the stud 14 and is rigidly held by means of a screw 17 that passes through the center thereof and is threaded into the upper end of the stud 14. The bell is substantially the same diameter as the casing 10 and the lower edge of the bell is spaced a little above the closure plate 12 on the closure plate 12 and housed within the ball 16 is a standard electric bell tapper device comprising the electromagnetic coils 18 and 19, vibrator plate 20, one end of which is pivotally carried on an insulated pin 21 and on the other end of the plate 20 is rigidly mounted the bell tapper arm 22 and tapper 23. The vibrator plate 20 is provided with a spring leaf element 24, one end of which is rigidly attached to the vibrator plate 20 at a point adjacent the pivotal mounting of the vibrator plate 20 on the pin 21. The other end of the leaf spring 24 is provided with an electrical contact point 25 that bears against an adjustable screw contact element 26 that is carried on a bracket 27 that is rigidly carried by the closure plate 12 and is insulated therefrom. The vibrator plate 20 is provided with a second leaf spring element 28, one end of which is rigidly attached thereto at a point adjacent the pivotal mounting 21, the other end of which bears against a pin 29 that is rigidly carried on the closure plate 12 and is insulated therefrom, the leaf spring 28 being so tensioned as to rock the vibrator plate 20 outwardly, thereby causing the contact point 25 to stand in engagement against the end of the contact screw 26, one end of the wire of the coil 19 connects with the metallic pin 29, against which the spring 28 bears, the other end of the wire of the coil 19 connects with one end of the wire of the coil 18 and the other end of the wire of the coil 18 is grounded or connects with the closure plate 12.

Within the casing 10 is a battery case or holder 30 that is preferably integrally formed thereon and is provided with a pair of parallel and spaced apart bores 31 and 32 in which is slidably and removably positioned a pair of small dry cell electric batteries 33 and 34. The upper end of the center carbon element of the dry cell 33 bears against one end of a U-shaped spring leaf element 35, the other end of which is rigidly held

by and connected with the contact bracket 27 by means of a screw 36 which passes through the other end of the leaf spring 35 and is threaded into the foot of the contact bracket 27, the leaf spring 35 and screw 36 being insulated from the plate 12.

The upper external metallic end of the second dry cell battery 34 bears against one end of a metallic L shaped leaf spring 37, the other end of which is positioned against the side wall of the battery holder element.

One end of a U-shaped bi-metal thermal element 38 rests against the second said end of the leaf spring element 37 and a screw 39 passes through the two engaging or contacting ends of the element 37 and 38 and is threaded into the body of the battery holder 30. The other leg of the bi-metal thermal element 38 extends upwardly and the extreme upper end thereof is provided with an electric contact point 40 that is adapted to engage or contact a second contact point 41 that is carried on a metallic ear like element 42 that is an integral part of the metallic closure plate 12. The bi-metal thermal element 38 is positioned in close relationship to the one or more of the openings 11 so that it will be readily effected by heat around or in reasonably close proximity to the case 10.

The upper end of the movable leg of the bi-metal thermal element 38 is provided with a piece of magnetic material such as soft iron 43 that is rigidly attached thereto and is in attractable relationship to a permanent magnet 44 that is rigidly carried on the lower end of the ear element 42. The magnet 44 is so positioned that when it attracts the magnetic element 43, the electric contact points 40 and 41 will contact each other before the magnetic material 43 will engage the magnet 44.

The casing 10 is provided with a bottom closure plate 45 that has spring clips 46 thereon, the upper ends of which are curved and will slide along the outer surface of the casing 10 as the bottom 45 is advanced toward the case 10 and as the bottom 45 engages the bottom edge of the case 10, the upper ends of the spring clips 46 will sink into indentures in the outer face of the case 10 and serve as a means of detachably holding the bottom plate 45 on the case 10.

The upper face of the closure plate 45 is provided with a double ended leaf spring 47 the central portion of which is rigidly attached to the bottom plate 45 and when the bottom plate 45 is in place on the case 10, one end of the leaf spring 47 will engage the lower external metallic end surface of the dry cell battery 33 and the other end of the leaf spring 17 will engage the lower end of the carbon center element of the dry cell battery 34.

The operation of the device is as follows. The free end of the bi-metal thermal element 38 normally stands so that the electric contact points 40 and 41 are in a spaced apart position. Now if a fire occurs, the heat therefrom will pass through the case openings 11 and heat the bi-metal thermal element 38, whereupon the upper end of the free leg 38 will slowly move toward the contact point 41 and as the two contact points come into close relationship with each other, the magnetic material will move into close relationship to the permanent magnet 44 and the attraction of the magnet 44 of the magnetic material 43 will be sufficiently attracted by the magnet 44 and the contact points 40 and 41 will be brought into contact with each other with a snap action,

whereupon the electric circuit will be completed and the coils 18 and 19 will be magnetized and the vibrator plate 20, toward the cores of the coils 18 and 19, to a point where the contact points 25 and 26 will eventually separate, whereupon the coils 18 and 19 will be demagnetized and the spring 28 will rock the vibrator plate 20 outwardly, whereupon the tapper 23 will strike the bell and ring it and simultaneously the contact points 25 and 26 will engage each other to again move the vibrator plate toward the cores of the coils 18 and 19, whereupon the foregoing described action will be repeated and the vibrator plate 20 will thereby assume a vibrating motion and the tapper 23 will be set into a vibrating motion to achieve a continual ringing of the alarm bell. While the device as shown in the drawings and described in the foregoing specification is probably the preferred form of the device it is to be understood that such modifications of the invention may be employed as lie within the scope of the appended claims without departing from the spirit of the invention. Now having fully shown and described my invention, what I claim is:

1. In a portable fire alarm device of the kind described; said device having in combination a casing, a demountable closure element for both the upper and lower ends of said casing, said closure element for the upper end of said casing having a bell and an electric bell ringing mechanism supported thereon, said casing having a battery holder therein, and carried thereby, said battery holder having a plurality of cylindrically shaped holes therethrough and in parallelism with and immediately adjacent each other, said holes being large enough to loosely receive and hold a dry cell battery, a thermostat for making and breaking an electric circuit, said thermostat being carried on said battery holder and adjacent the wall of the casing, said casing having openings therethrough to admit the passage of heated air through the casing to contact the thermostat for the operation thereof, a pair of battery contact elements, one end of the first of said contact elements being in contact with the stationary end of the thermostat leg and also rigidly supported on the battery holder, the other end of the first of said contact element being positioned over the adjacent battery holder opening and over the center axis of the said opening of the battery holder, the other of said contact elements by the said upper closure element and one end of the second said contact element being positioned over the other of said holes and over the center axis of the hole, a third contact element, said third contact element having two ends, and being carried by the said lower closure element and the ends of the third contact element being yieldably positioned one under each of said holes and over the center longitudinal axis of each hole, said casing having an electric circuit therein in which is included the bell ringing device, batteries carried by said battery holder and the thermostat for the control of said circuit.

2. In a portable electric fire alarm device of the kind described, said device having in combination a hollow casing having openings in the side thereof for the passage of heated air therethrough for operating the device, an upper and a lower closure plate for said casing, said plates being detachably attached one to each end of the casing, means in said casing and rigidly attached thereto for receiving batteries and holding the batteries in parallelism and spaced apart posi-

tion, and with their ends exposed for contact purposes, said casing also having a thermostat controlled electric switch contained therein, an alarm bell and an electric bell ringing mechanism for ringing said alarm bell, said alarm bell and electric alarm bell ringing mechanism being carried on the said upper casing closure plate and outside the casing, said electric alarm bell ringing mechanism being housed within the hollow of the bell, an electric circuit, said electric circuit including batteries carried in the battery holder, said thermostat operated electric switch, electric alarm bell ringing device, and contact elements for contacting the tops and bottoms of the batteries to form a part of the electric circuit, the contact elements for contacting the bottoms of the batteries being a yieldable element carried by

the bottom closure plate for the casing and having two ends positioned one under and contacting the lower ends of each of said batteries.

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