

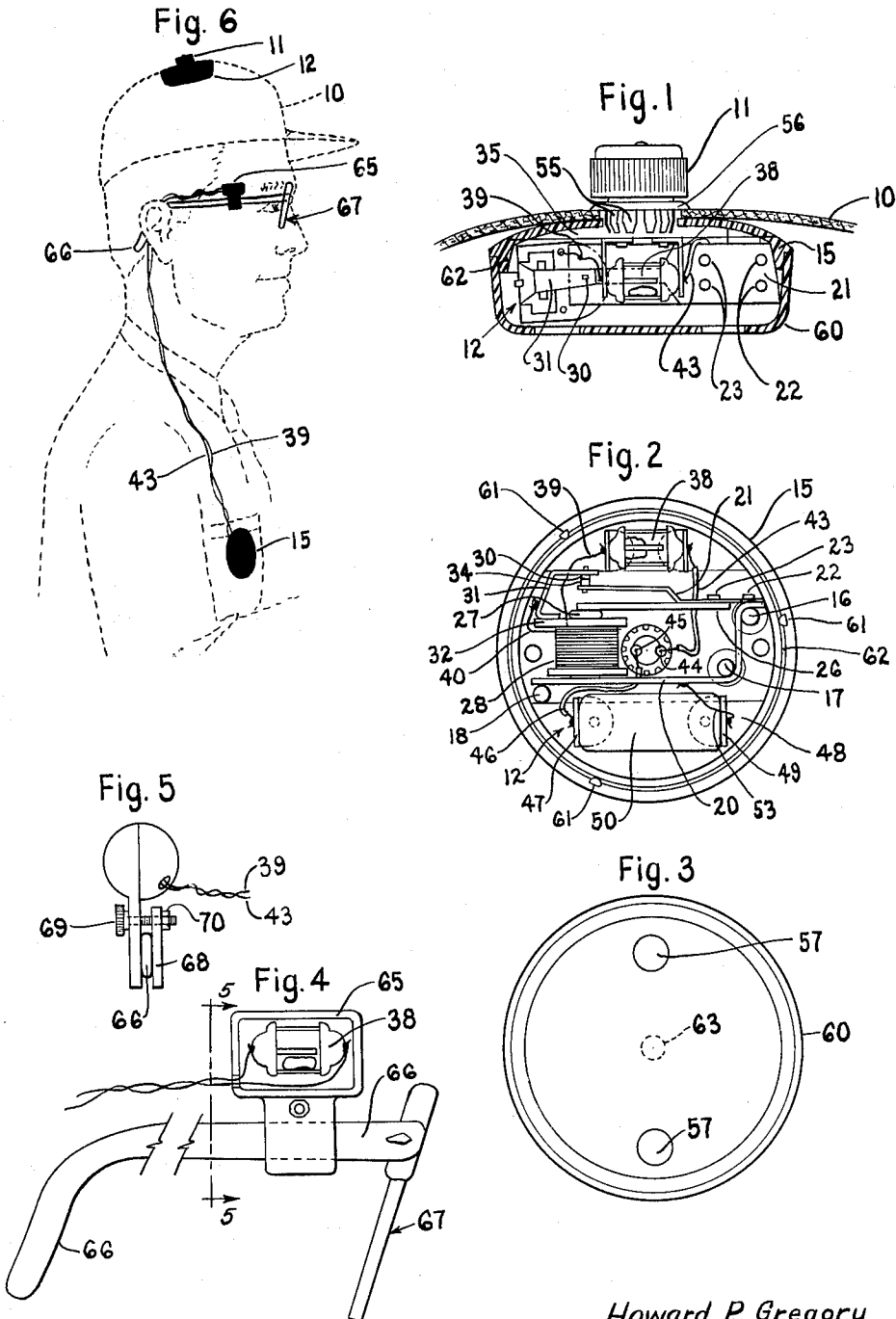
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SIGNAL DEVICES FOR ALERTING PURPOSES

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This invention pertains to warning devices for alerting persons to avoid undesirable situations such as surgical patients moving into harmful positions, drivers of moving objects becoming drowsy, and students slumping into involuntary sleep.

An object of the invention is to provide a compact signaling device which is light in weight and which will remain inoperative so long as the user remains in a predetermined position but will be activated to send out signals when the user moves out of said predetermined position.

Another object of the invention is to provide a readily adaptable signal device that can be worn on a cap or hat, on a head band similar to a telephone head set, on spectacles, or on a part of the body of the user, etc.

Another object is to provide an economical and efficient alarm device having a minimum of parts which may be readily and quickly attached to a user to inhibit involuntary sleep or to notify others of an improper position of the user.

Still another object of the invention is to provide a small, self-contained unit, which is an electrically controlled alarm to alert a person out of drowsiness.

Other objects and advantages of the invention will become apparent by reference to the following detailed description and the accompanying drawing illustrating a preferred embodiment of the invention, in which:

FIG. 1 is a front elevational view partly in section showing the device of the invention as a complete operative unit installed in a portion of a cap or hat;

FIG. 2 is a bottom view of the device with the cover removed;

FIG. 3 is a plan view of the open side of the cover;

FIG. 4 is a partial side view of another embodiment of the invention wherein the mercury switch of the device is enclosed and attached to a temple stem of spectacles or eye glasses;

FIG. 5 is an end view of the mercury switch looking in the direction of the arrows 5-5 of FIG. 4, and

FIG. 6 is an elevational view showing the two embodiments of the invention as operatively used in a cap (FIG. 1) or on eye glasses (FIGS. 4 and 5) of a person in phantom.

Referring now to the drawings, wherein like reference numerals designate similar parts throughout the several views, 10 is a hat or cap wherein a button like member 11, projecting through the top thereof, is a rotatable switch for manually rendering the signaling apparatus 12 electrically connected thereto operative or inoperative. The signal or alarm apparatus is frictionally held in an arcuate molded plastic base 15 by three upstanding molded studs 16, 17 and 18 (FIG. 2) integral with the base 15. These studs frictionally engage and hold an angular frame member 20 in the position shown in FIG. 2.

The angular frame member 20 has one end of a leaf spring 21 secured to it at 22, and another portion secured at 23 to an armature 26 which extends over an iron core 27 projecting through a wire coil 28 of numerous turns.

A contact 30 is carried by an electrical terminal 31 secured to an insulator head 32 on the coil 28. This contact 30 is normally spaced from but adapted to intermittently touch contact 34 secured to the left end of

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leaf spring 21. Riveted to a raised molded platform 35 integral with molded base 15 is a mercury switch 38 having its left end electrically connected by an insulated wire 39 to one end of coil 28 which has its other end connected by an insulated conductor 40 to the terminal 31 and its contact 30.

The right side of mercury switch 38 is connected by an insulated wire 43 to 44, one of two contacts 44, 45 extending from manually rotatable switch 11. The other contact 45 is connected by an insulated conductor 46 to the left side of battery lug 47 riveted to an elevated molded platform 48 integral with the molded plastic base 15. Another spaced lug 49 for the right end of battery 50 is riveted to the molded platform 48. The right side of battery contacting lug 49 is then connected by wire 53 to the conducting metal frame 20.

The lower part of the switch 11 has a plurality of spring fingers 55 projecting through a metal collar 56. The spring fingers 55 are forced through an opening in the top of base 15 to clamp the cloth of the cap or hat 10 between the top surface of the base 15 and the underside of collar 56 to thus securely hold the signaling device in the cap or hat 10. A molded cup shaped plastic cover 60 (FIG. 3) having a plurality of resonance increasing holes 57 is forced over a plurality of spaced projecting lugs 61 on a lip 62 of the molded base 15 to provide a complete enclosure for the signaling apparatus 12. An optional hole 63, shown in dotted lines in FIG. 3, may be provided for fastening the alarm device to a head band in place of a cap or hat.

In operation, the cap 10 is placed in the desired position on the user's head as shown in FIG. 6 and the manual switch 11 is rotated to bridge the contacts 44-45, then if the user becomes drowsy and nods the mercury in the switch 38 runs to the right end thereof to establish an operative circuit through conductor 43, through switch contacts 44-45, conductor 46, battery 50, conductor 53, frame 20, leaf spring 21, contacts 34, 30, terminal 31, conductor 40, through coil 28, back through wire 39 to the left side of mercury switch 38, thereby completing an electrical circuit through coil 28 which sets up a magnetic pull in iron core 27 to pull the armature 26 toward it thus breaking the circuit by separating contacts 34, 30. The core 27 of the coil 28 then becomes demagnetized and the armature moves away to again close the contacts 34, 30 and the above described circuit is established to again pass current through the coil 28 to once again break the circuit by separating contacts 34, 30. This fast intermittent action of the armature 26 and its leaf spring 21 produces an audible buzzing sound to alert the user from his drowsiness and thus inhibit involuntary sleeping on his part.

Another embodiment of the invention is disclosed in FIGS. 4 and 5 wherein the mercury switch 38 is separately mounted in a housing 65 which is secured to a temple stem 66 of a pair of spectacles 67 by a clamping member 68 held by a bolt and nut 69-70. The conductors 39 and 43 run from the mercury switch 38 on the spectacles 67 into the enclosure 15, 60 to make contact with one end of the coil 28 and the contact 44 of manually operable switch 11, respectively, to operate in the same manner as previously described when the user (FIG. 6) nods because of drowsiness, to cause the mercury to run to the right end of switch 38 on the spectacle stem 66 to establish a circuit and operate the buzzer alarm apparatus 12 as previously described and depicted in FIG. 2.

Either or both of the foregoing embodiments of the invention may be used by students who do not want their studies interrupted by involuntary sleep or by drivers or watchmen who have lives and property to guard in performing their duties.

The device of FIGS. 2 and 3 or by remote connection

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to the device of FIGS. 4 and 5 may also be attached to limbs of hospital patients under traction, or to surgical patients where the nurse may be promptly notified by signal if the patient moves into an incorrect or detrimental position. Applicant's signaling or warning devices may be adapted to many other situations and uses to protect persons from undesirable situations.

In another embodiment, a multiplicity of mercury switches may be used in the alarm or buzzer circuit to signal movement in any direction.

Hence, it is to be understood that the above described arrangements are only illustrative of the application of the principles of this invention. Numerous other arrangements may be readily devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

In an alarm device adapted to be attached to a movable member having an opening, a base having a plurality of integral upright spaced studs and also having a central opening, an angular frame frictionally engaging said studs to secure the frame to the base, an alarm apparatus carried by the frame, a mercury switch, means secured to the base for holding the mercury switch in a fixed position, means secured to the base for holding a battery,

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a quickly detachable on-off switch having a plurality of spring fingers adapted to be forced through the said central opening in the base and through the opening in said movable member to clamp the switch and the base to said movable member, said base having a plurality of projections, a cover having a plurality of resonant increasing openings and forced over the plurality of projections on the base to frictionally hold the cover on the base with sufficient stretching tension to increase the resonance thereof, and means for establishing an electric circuit through the battery and the switches and the alarm apparatus to emit warning signals when the movable member is moved from a predetermined position.

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