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ILLUMINATING DEVICE FOR SWIMMERS

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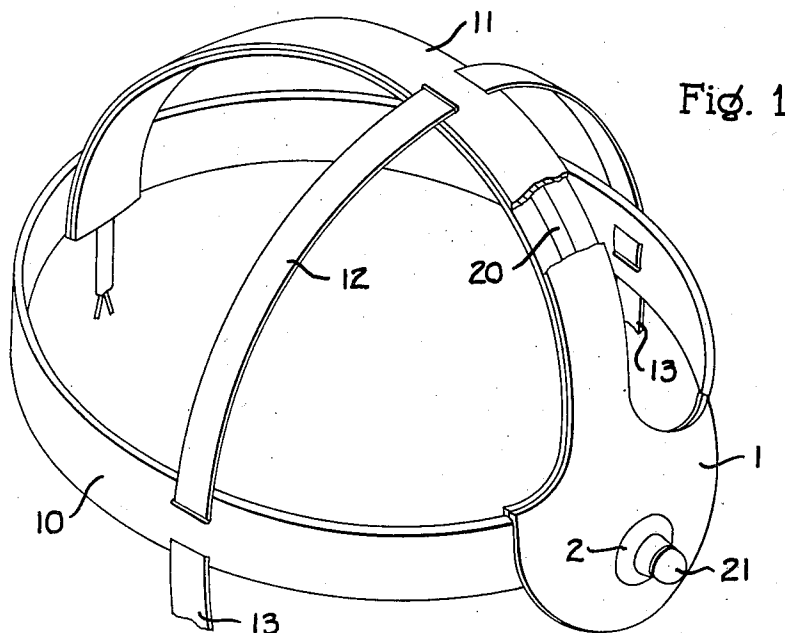


Fig. 1

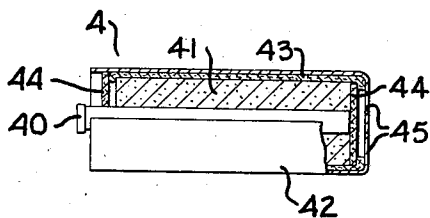
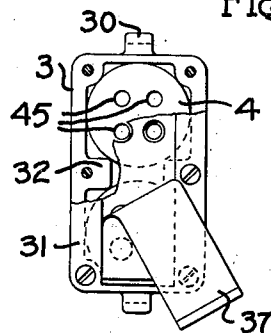
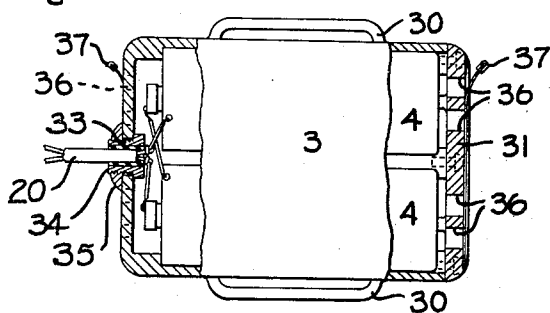


Fig. 4

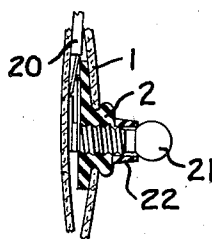


Fig. 5

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ILLUMINATING DEVICE FOR SWIMMERS

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2 Claims. (Cl. 136-114)

My invention relates to swimming or life saving devices, and more particularly to a light which can be worn by a person in the water.

Shipwrecks often occur at night. Passengers on such ships are sometimes forced to jump or are thrown into the sea, there to be sustained by a life belt. Rescue ships, in picking up such passengers, have heretofore had to depend solely upon their searchlights to locate those floating in the water. Especially in case of a storm it is difficult for a searchlight to reveal persons in the water, submerged as they are but for a very small portion of their bodies. As a consequence many who might otherwise be rescued are overlooked by the rescue ship and the life boat crews. By morning only a few survivors who have not been picked up are left.

It is the principal object of my invention, therefore, to provide a device which will make known to rescue crews the presence in the water of a passenger from the wrecked ship. To accomplish this result I provide a light to be worn preferably upon the swimmer's head, so that it will be elevated as much as possible, to attract the attention of the rescue workers.

Another object of my invention is to provide such a light which will not operate until the necessity for its use arises, but which will start to operate instantly and automatically upon the wearer being plunged into the water, without any thought or manipulation on his part.

A further object of my invention is to provide such a light which will be positive and reliable in operation, and which will remain in operation for a considerable period of time without attention by the wearer.

It is a further object to provide such a mechanism which will not deteriorate, however long it may be kept stored, but which will operate reliably and immediately thereafter upon being used, when coming into contact with water.

It is also an object of my invention to provide such a device which is light and compact, and which can be put in place readily, and when in place will not interfere with the swimmer's movement.

Still another object is to provide a device which, if desired, may be equipped with means to turn the light off, so that it will be used only when required, and thus its energy may be conserved. Such a light might be used by any swimmer at night, either to assist him in swimming on the surface of the water, or to illuminate objects beneath the surface.

All these objects are to be obtained by a device

of simple construction, which is economical to manufacture, and the power source of which, when worn out, may readily be replaced.

Other objects of my invention, and more particularly those inherent in the unique construction which I employ, will be pointed out in the detailed description of my device which follows.

My invention consists of the novel parts, and the arrangement and construction thereof shown in the drawing, described hereafter, and defined in the appended claims.

Figure 1 is a perspective view of the head harness which carries the light, and Figure 2 is a plan view, showing parts in section, of the power source which is connected to and energizes the light in Figure 1.

Figure 3 is an end elevation of the power source, showing parts in section.

Figure 4 is a plan view of one of the cells of the power source, with parts illustrated in section.

Figure 5 is a sectional view taken through the light installation shown in Figure 1.

It is preferred that the light be carried upon the head in the region of the forehead. For this purpose any desired head harness may be used to support a socket-carrying portion 1. I have illustrated a form of head harness which has been found to be practical. It includes a band 10 which encircles the head and is held in place by cross bands 11 and 12 extending respectively from front to rear, and from side to side over the head. All three of these bands are suitably interconnected, the band 12 being adjustable with respect to bands 10 and 11, and preferably including suitable end portions 13 which may extend downwardly to be fastened beneath the wearer's chin.

In the socket-carrying portion 1 is mounted a socket 2, which should be made of rubber and securely lodged in the member 1. An electric two-wire cable 20 extends from the back of the wearer's head through the band 11, and is connected to the socket for center and side contact with the globe 21, or which may even be permanently secured to the center button and screw element respectively of the light globe. Where the light is to be used only for life-saving purposes, it may be desirable to have the globe immovably fixed in the socket, and have the electrical connection positively soldered to the globe parts, so that no failure of the light can occur by reason of the unfamiliarity of the wearer with such devices.

Energy for illumination of the light is furnished from a power source, shown in Figure 2, to which the electric cable 20 is connected. It consists of a

case 3 receiving inactive cells 4, the construction of which will be described hereafter. Belt loops 30 may be provided on the side of the case for securing it to a waist belt or a life belt. The cable 20 extending up the back of the wearer can not interfere with his freedom of movement. The cells 4 may be inserted through an end of the case which is closed by a cover 31. Such cells may, of course, be readily replaced when worn out after being used in the manner to be described. Ribs 32 fit snugly against the cells to prevent their movement in the case.

The cells 4 are first connected in series. The cable 20, which has previously been threaded through a hole 33 in one end of the case, is supplied with a bushing 34 slipped over its end. This bushing grips the cable tightly and prevents it from chafing against the case 3 when the batteries have been put in place. The cable may then be attached to the cells. By pulling the cable the cells are slid into the case into the position shown in Figure 2. The bushing 34 is pushed through the hole 33 and a nut 35 is screwed on to hold the bushing and the cable 20 securely in place. The cover 31 may then be secured by screws over the end of the case.

In the cover 31 holes 36 are formed for a purpose which will appear hereafter. For drill purpose only, when the wearer of my device may be out in the rain, tape 37 or any suitable easily removable cover may be used to cover the holes 36, but these are only a precautionary measure, and ordinarily would not be used.

The cells 4 are normally inactive, and will generate no electric current. As shown in Figure 4, they include a carbon rod 40 which acts as a positive pole. About this rod is compressed a hard packed core of depolarizing mixture, including graphite, manganese dioxide, etc., and electrolyte-forming material similar to that normally found in a commercial dry cell except that there is no moisture of any kind present when the core is wrapped and assembled in the zinc casing as explained hereafter. The core mixture, containing electrolyte-forming ingredients in dry form, is therefore only a potential, as distinguished from an operative, electrolyte. Hence there is nothing to migrate between the zinc casing 42 and the rod 40 to carry ions for the production of an electric current.

About the core 41 are wrapped one or more layers of absorbent material 43 of some kind, ordinary blotting paper being a good example of this, unimpregnated with electrolyte-forming materials. Disks of similar material 44 enclose the ends of the core. The end of the zinc shell through which the carbon rod 40 projects may be left open, and holes 45 are cut in the other end of the zinc casing. Provision is made so that water entering by the holes 36 can gain access through the holes 45 to the absorbent material within the shell; for example the holes 45 are located so as to coincide with the holes 36 in the casing 3, although they may be of slightly smaller area.

Normally, as has been pointed out, the cells 4 are inert, and furnish no electricity for lighting the lamp 21 even though a complete circuit is formed between the cells 4 and the light 21. When the wearer jumps into the water, however, assuming that the covers or tapes 37 are not employed or have been removed before the wearer enters the water, water enters the case 30 through the holes 36 provided for that purpose. This water circulates past the cells 4 throughout the

case and penetrates into these cells, both through their open ends and through the holes 45 in their bases. The water is absorbed by the material 43 and saturates the graphite, manganese dioxide, electrolyte-forming ingredients, and the other material of the core 41, to activate the cell. If desired, the absorbent material may have been covered on the side next to the core with a substance having slightly adhesive characteristics, such as flour, to afford better contact when moistened to form a paste, between the material of the core and the absorbent material. A substance such as ammonium chloride may also be applied to the inner surface of the absorbent material. This impregnates the absorbent material the instant water touches it, to hasten the commencement of the cell action by its effect on the zinc casing coincident with moistening of the electrolyte-forming ingredients and penetration of the electrolyte thus formed into the absorbent material. Especially is this precaution desirable when the device is to be used in fresh water which is largely devoid of mineral salts, which latter act somewhat on the zinc to accelerate cell action.

The water, therefore, transforms the cell chemicals, purely by moistening them, from a potential into an operative electrolyte, to carry charged ions from the zinc shell to the carbon pole, and the cell action commences. Power is immediately generated, and the light 21 is illuminated. Ordinarily power will continue to be generated for the light until the active cell materials have been used up. The light, during this procedure, will be kept burning for a period in the neighborhood of twelve hours. Hence a person who has been thrown into the sea in the evening will have a light to indicate to rescuers his whereabouts throughout the entire night. It is to be noted especially that the cells will remain in condition ready for instant use for an almost indefinite period, whereas the commercial dry cells, being actually moist, continually deteriorate and soon become inactive even though not used.

If the device is to be used for only short intervals by swimmers, it may be desirable to have the light burn only for comparatively short intermittent intervals. In that case my normally inactive cells may be used, or ordinary dry cells may be employed if sealed in a waterproof case. In either event, however, it is desirable that some switch means be provided. Mechanism for this purpose is shown in Figure 5. The light globe 21 will, as usual, be screwed into the socket 2, but prior to such insertion a rubber collar, preferably tapered toward the globe end, is slipped over the threaded shank of the globe. As the globe is screwed into the socket the collar 22 will engage the socket 2 before contact is completed. When the globe is screwed farther in, the collar 22 will be compressed and contact will be made.

The globe may be unscrewed slightly, sufficiently to break the contact between the cable 20 and the globe-contact element, while the collar 22 is still engaged between the rubber socket 2 and the globe glass. Thus although the contact between the cable and globe is broken in this position, the globe will still be held both from sidewise movement and from rotation, either inward to again make contact, or outward to free the globe. This collar serves the further purpose of preventing water from penetrating into the socket 2 around the base of the globe, even when it is unscrewed sufficiently to break the electrical contact. My switch mechanism will, of course,

operate equally well either with conventional dry batteries or with an inactive cell of the type described, which has been rendered active by being submerged in water.

5 What I claim as my invention is:

1. A power source for an illuminating device to be worn by a swimmer, comprising a normally inactive cell incorporating a shell open at one end and having apertures in its other end for admission of water to activate the cell, a case adapted to receive said cell having a closed end and having apertures in its opposite end disposed to register with the apertures in said cell's shell when the open end of the shell is disposed ad-

jacent to the closed end of the case, and ribs formed on the inner face of the case and extending lengthwise thereof to engage the shell and to space it from portions of the sides and the apertured end of the case, to leave passages for water entering through the case apertures to flow freely along the cell to the closed end of the case and to enter the cell through the open shell end.

2. The combination of claim 1, and readily removable cover means to prevent unintentional entrance of water through the aperture in the case.

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