

[54] **WRIST WATCH WITH DIAL
ILLUMINATING**

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[22] Filed: Mar. 11, 1971

[21] Appl. No.: 123,336

[52] U.S. Cl. 58/50 R, 58/23 BA, 240/6.43

[51] Int. Cl. G04b 19/30, G04c 3/00

[58] Field of Search 58/23, 23 BA, 50,
58/90; 240/6.43

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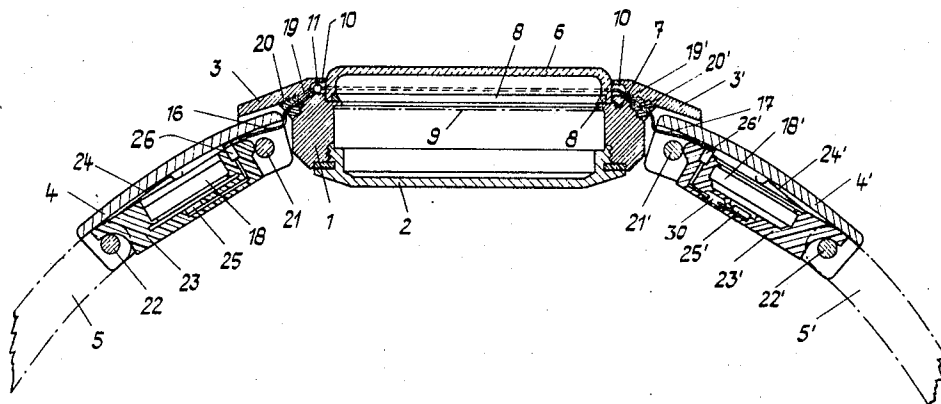
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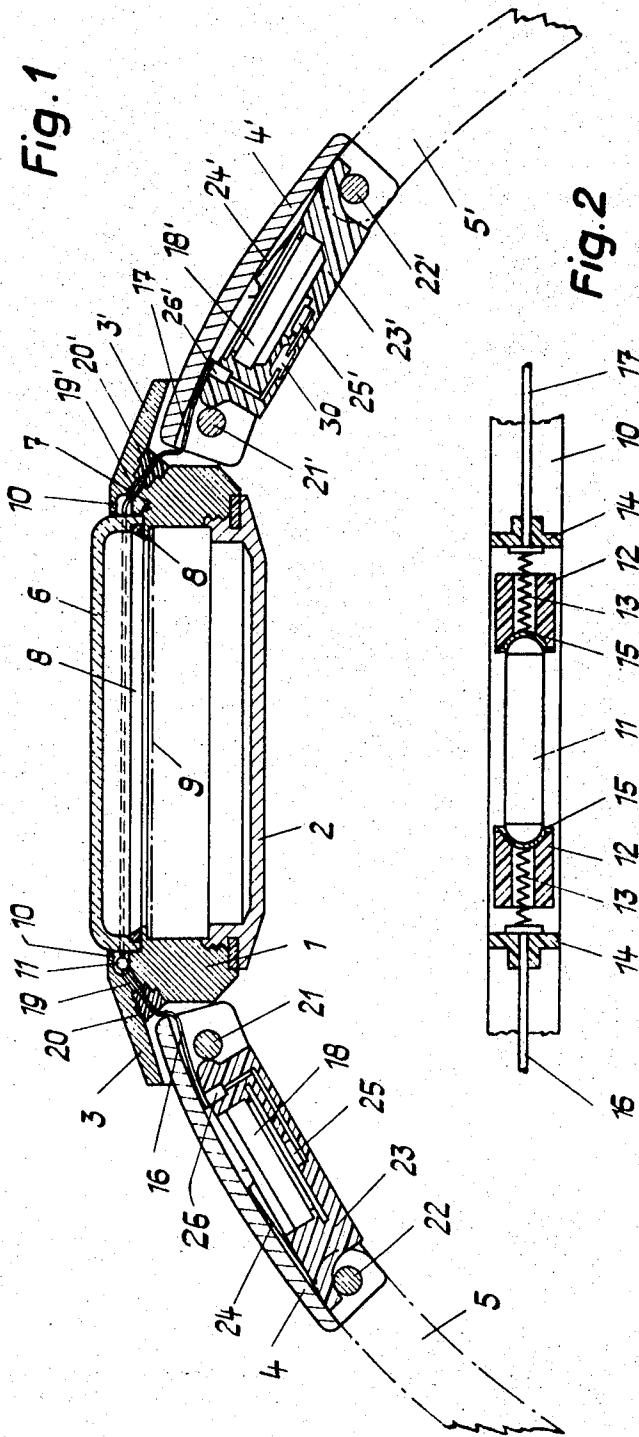
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[57] **ABSTRACT**

A wrist watch has a glass fitted in a snap. An inwardly facing groove in the snap, normally closed by the glass, houses a miniature bulb connected by wires passing through watertightly-closed openings communicating the snap with the outside of the watch case. The wires are connected to batteries housed in extensions to the watch case, said extensions including a switch to enable illumination of the bulb by a pressure on the wearer's wrist.

3 Claims, 2 Drawing Figures





WRIST WATCH WITH DIAL ILLUMINATING

BACKGROUND OF THE INVENTION

This invention relates to wrist watches provided with dial-illuminating means.

It has already been proposed to illuminate the dial of a wrist watch by means of a miniature electric bulb mounted in a cavity of the glass. However, known watches of this type have not given full satisfaction. In particular, it is not possible to change the watch glass without cutting or unsoldering at least one of the conducting wires leading to the bulb.

It has also been proposed to locate micro-batteries in hollow attachments, the attachments including housings for a bulb for illuminating the dial via conduits connecting the housings to a space in the watch case between the dial and the watch glass. In this type, the attachments form an integral part of the watch case and are thus not removable which can constitute a serious drawback. Moreover, there is a loss of available light in the conduits, and the watertightness of the watch may be adversely affected.

In the other known types, the problem of obtaining a good watertightness between the micro-batteries and the electric bulbs is also encountered.

Amongst other propositions for illuminating dials of instruments, it has been suggested to place electrical bulbs in housings provided in a bevel in the case of the instrument to cause light to pass through a plate of transparent material mounted in the bevel. This system is complicated, and consequently costly, and is hardly suitable for application to a wrist-watch.

Generally speaking, these known dial illuminating means are not suitable for underwater diver's watches.

SUMMARY OF THE INVENTION

It is an object of the invention to provide a wrist watch with dial-illuminating means which overcomes the aforementioned drawbacks.

A wrist watch with dial illuminating means according to the invention comprises a glass fitted in a snap. An inwardly facing groove in the snap, normally closed by the glass, houses a miniature bulb connected by wires passing through watertightly-closed openings communicating the snap with the outside of the watch case. The wires are connected to batteries housed in extensions to the watch case, said extensions including a switch to enable illumination of the bulb by a pressure on the wearer's wrist.

Operation of these dial-illuminating means is reliable and is of simple construction, whilst enabling replacement of the glass without disturbing the feed circuit for the bulb. Moreover, the wrist watch according to the invention can be made watertight and can advantageously be used for underwater diving where illumination of the dial is particularly useful.

DESIGNATION OF THE DRAWINGS

The accompanying drawings show, by way of example, an embodiment of a wrist watch according to the invention. In the drawings:

FIG. 1 is a cross-section through the median plane of the wrist watch and bracelet; and

FIG. 2 is a cross-section on enlarged scale of a detail of FIG. 1.

DESCRIPTION OF A PREFERRED EMBODIMENT

The wrist watch shown comprises a case including a middle 1 with a screwed back 2 and two diametrically opposed extensions 3, 3' in which are pivotally mounted two hollow lugs 4, 4' for fixing the ends 5, 5' of a watch bracelet. A glass 6 is mounted in known manner in a snap 7 provided for this purpose in the middle 1. A tension ring 8 holds the edge of the glass 6 tightly against snap 7. The watch is also provided with a dial, schematically represented by reference numeral 9.

An inwardly facing groove 10 is provided around the snap 7 and houses a miniature electric bulb 11 shown in detail in FIG. 2. Groove 10 is normally closed by the glass 6. The bulb 11 is mounted between two electrically insulating blocks 12 each urged by a spring 13 supported on an insulating member 14 fixed in the groove 10. A contact 15 is carried by each block 12 for the supply of current to the bulb 11, via each spring 13 and insulated conducting wires 16 and 17 connected to miniature batteries 18 and 18', as will be described in detail further on.

Passageways 19, 19' are provided through the middle 1 so that the groove 10 communicates with the exterior part of the case under the extensions 3, 3'. Conducting wire 16 passes through the passageway 19, and the wire 17 through passageway 19', and the two passageways are watertightly closed by resilient stoppers 20, 20' respectively. The wires 16 and 17 are connected to the bulb 11, wire 17 passing along and around the groove 10.

The hollow lugs 4, 4' are each pivotally mounted at one end on the case about a pin 21, 21' respectively, the other end being connected to the bracelet by means of a pin 22, 22'. In each lug 4, 4' is housed an interchangeable block 23, 23' in plastic material in which is embedded a micro-battery 18, 18' respectively. The poles of the battery 18 are reversed in relation to those of battery 18' so that the two batteries are connected in series; to complete the circuit, one of the poles of each battery is connected to ground, i.e., to the watch case, by means of a flexible contact 24, 24', the other pole of battery 18 being connected to the wire 16 by a fixed contact 25, and the other pole of battery 18' being connected to the wire 17 when a mobile contact 25' is applied thereagainst.

The wires 16 and 17 each carry a miniature plug, schematically shown by 26, 26', inserted in the blocks 23, 23', so as to come into contact with conductors leading to the contacts 25, 25' when the blocks are placed in the corresponding hollow lug.

To close the circuit of the bulb 11 to illuminate the dial 9, the user can press, with his wrist carrying the watch, the contact 25' against the battery 18'. This is made possible because of the reduced thickness of the material of block 23 at this location. For a diver's watch, this pressure can be applied automatically by the water pressure when the diver plunges below a certain depth.

It would also be possible to provide a mercury contact-breaker incorporated in the block 23 or 23' so that the circuit can only be closed for a particular inclination of the watch. In the illustrated embodiment, a mercury contact breaker 30 is incorporated into the block 23' between a pole of the battery 18' and the corresponding wire 17.

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The bulb 11 can easily be replaced, if necessary, by removal of the glass 6 and interchanging a new bulb in the place of a faulty one, without disturbing the feed circuit for the bulb.

Many modifications are possible to the described wrist watch without departing from the scope of the appended claims. For example, the bulb 11 can be placed at any convenient location around the groove 10, or several bulbs could be connected in series around the groove. The groove 10 need not extend around the entire periphery of the snap 7.

What is claimed is:

1. A wrist watch with dial-illuminating means, comprising a case, two diametrically opposed hollow lugs pivotally mounted on the case, means on the lugs for fixing a watch bracelet, a housing in each lug for an electrical battery enclosed in a mass of plastic material forming a surface for contacting a wrist on which the watch may be worn, one of said mass including a switch actuable by pressure against said wrist, two insulated conducting wires each provided with a contact plug for connection with a pole of the corresponding battery, means for connecting the other pole of each battery to ground, a snap in the case, a glass held in the snap, an inwardly facing groove in the snap, said groove normally being closed by the glass, two openings each for the passageway of one of said wires connecting said groove to the outside of the case, means for fluidtightly closing said passageways, a mercury contact breaker housed in one of said masses of plastic material and connected between a pole of the battery in said one mass and the corresponding wire, and a miniature electric bulb housed in the groove, said two wires connecting the bulb to the batteries.

2. A wrist watch as claimed in claim 1, in which said

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first and second springs and contacts are respectively housed in mobile third and fourth insulating blocks.

3. A wrist watch with dial-illuminating means, comprising a case, two diametrically opposed hollow lugs pivotally mounted on the case, means on the lugs for fixing a watch bracelet, a housing in each lug for an electrical battery enclosed in a mass of plastic material forming a surface for contacting a wrist on which the watch may be worn, one of said masses including a switch actuable by pressure against said wrist, two insulated conducting wires each provided with a contact plug for connection with a pole of the corresponding battery, means for connecting the other pole of each battery to ground, a snap in the case, a glass held in the snap, an inwardly facing groove in the snap, said groove normally being closed by the glass, two openings each for the passageway of one of said wires connecting said groove to the outside of the case, said openings being diametrically opposed and terminating outside said case in the vicinity of said extensions, means for fluidtightly closing said passageways, and a miniature electric bulb housed in the groove, said bulb having first and second ends, the first end of the bulb being located near one of the openings, said two wires connecting the bulb to the batteries, one of said wires passing through said one opening and being connected to the first end of the bulb, and the other wire passing through the other opening, passing around said groove, and being connected to the second end of the bulb, said wires being supported in said groove on first and second insulating blocks, a contact on the first end of the bulb being connected to one wire by a first spring, and a contact on the second end of the bulb being connected to the other wire by a second spring.

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