March 17, 1964 L. BRUNET 3,124,928

INDICATING MEANS FOR SO-CALLED DIVING-WATCHES

Filed May 8, 1962

FIG. 1

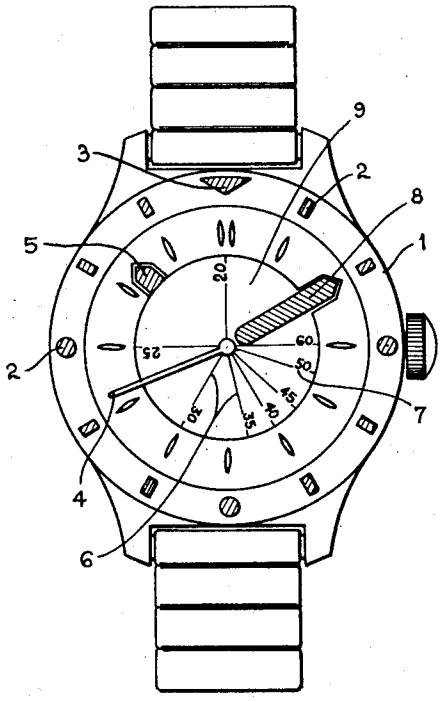
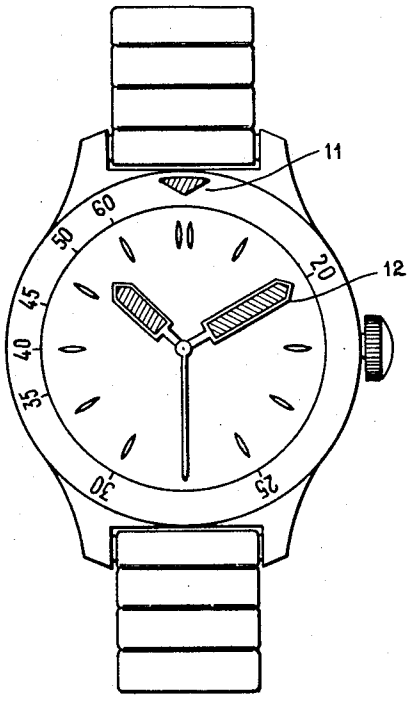


FIG. 2



United States Patent Office

3,124,928

Patented Mar. 17, 1964

1

3,124,928

INDICATING MEANS FOR SO-CALLED DIVING-WATCHES

Louis Brunet, Annecy, France, assignor to Society Zuccolo, Rochet & Cie "Z.R.C.," Annecy, France, a French corporation

Filed May 8, 1962, Ser. No. 193,102
Claims priority, application France June 21, 1961
1 Claim. (Cl. 58—57)

The divers use watertight watches called diving-watches allowing them to know, simply by looking at their watch, how long they still can remain submerged.

For this purpose, one knows already watches which include, round their dial, a rotating concentric rim provided with preferably luminescent reference marks, the position of which, with respect to the minute-hand, also preferably luminescent, will supply the required information.

One knows that, at the moment of his climbing, the diver is to take precautionary measures to prevent the release of the air contained in his blood. These measures consist in dividing the climbing in successive steps—so-called decompression levels—and remaining for some time at each level.

Nevertheless, it has been ascertained that the diver can come up directly from a given depth without stopping at the successive levels, on condition that the duration of the diving at this given depth is smaller than a given value. Diving tables have been established therefore, indicating the duration of the stay at a given depth in relation to the reached depths, but the study of these tables before diving is not practical.

The present invention aims at automatically indicating to the diver the allowable duration of the stay at a given depth, to be able to come up directly without stopping at decompression layers and the time when this climbing is to take place. This result has been obtained thanks to an improvement in the diving watch provided with a rotating rim such as now used.

Therefore, according to the present invention, means are provided which, through the bringing up to a coincidence a reference mark on the rim and a member jointly connected with the minute-hand, will give to the diver, in terms with an experimentally determined graduation, that is to say according to the diving tables, an information on the moment at which he is to stop the diving at a given depth, without having to come up through successive decompression layers.

It is possible, for this purpose, to provide on the rim a distinguishing mark for the end of the diving, which is clearly distinct from the other reference marks on the rim and which, when the minute-hand reaches it, will indicate the end of the diving.

In a form of embodiment of the invention, this mark for the end of the diving is previously brought up in coincidence with the depths graduation which is carried by a disk rotatively jointly connected with the minute-hand.

In another form of embodiment, the rim itself carries the depths graduation and the coincidence between a selected division of this graduation with the minute hand is established beforehand.

These two forms of embodiment have been illustrated, by way of example only, in the annexed drawing in which:

2

FIGURE 1 is a face elevation of the first form of embodiment.

FIGURE 2 is a face elevation of the second form of embodiment.

In FIGURE 1, the rotating rim of the diving watch is designated as 1, the hour-hand as 5, the minute hand as 8 and the second hand as 4. The concentric rotatable rim 1 bears reference marks 2 having any shape and size and, also mark 3 indicating the end of the diving 3, which is clearly distinct and very conspicuous. The mark 3 is of triangular shape in the drawing. The minute hand is rotatably connected with a dial 9 which carries at its periphery a depths graduation, the figures 7 of which indicate the allowed diving depths, the angular variation between these two figures having been previously determined by means of the tables for the diving without levels of decompression, said table having been experimentally established.

The working is as follows:

Assuming that the diver intends to dive at the level of 20 meters, remain at this depth and to come up without stopping at any decompression level:

The diver places first the mark 3, indicating the end of the diving, in front of the numeral 20 in the graduation on the disk 9. The diver is to come up when the minute hand reaches the mark 3 indicating the end of the diving. In the illustrated example, the stay of the diver, at the level of 20 meters—including the duration of the coming down—is to be less than 50 minutes.

During the stay at the level of 20 meters, the consultation of the watch will indicate to the diver, by the distance between the minute-hand and the mark indicating the end of the diving, the time left at his disposal before the coming up.

In the form of embodiment of FIGURE 2, the triangular mark on the rim, for the end of the diving, is designated as 11 and the depths graduations are indicated on the rim preferably by means of luminescent numerals. When using the watch, the diver at the moment of diving, places the graduation 20 in front of the minute-hand (if he intends to dive and stay at 20 meters). He must come up without stopping at any decompression level, at latest, when the minute-hand 12 reaches the mark 11 indicating the end of diving.

What is claimed is:

A device to indicate to a diver the time left before he starts climbing, if he intends to come straight up without stopping at least at one level of decompression, said device including: a watch having a dial with at least a minute hand, a concentric and adjustable rotating rim round said dial, at least a distinguishing reference mark on said rim, a disk mounted to rotate jointly with the minute hand inside the rim, a graduation in depths, experimentally determined and indicated on said disk, whereby the rim may be rotated to establish the coincidence of the depth indicated on the graduation with the distinguishing reference mark on the rim.

References Cited in the file of this patent

UNITED STATES PATENTS

315,322	Nelson	Apr. 7, 1885
998,312	Whitney	July 18, 1911

FOREIGN PATENTS

281,492	Switzerland	June 16, 1952