

Oct. 27, 1959

J. J. FIECHTER

2,909,893

WATCH CASE

Filed June 14, 1955

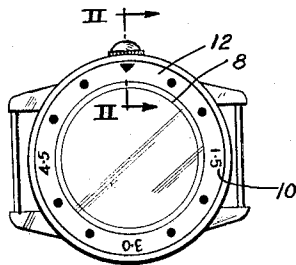


FIG. 1.

FIG. 2.

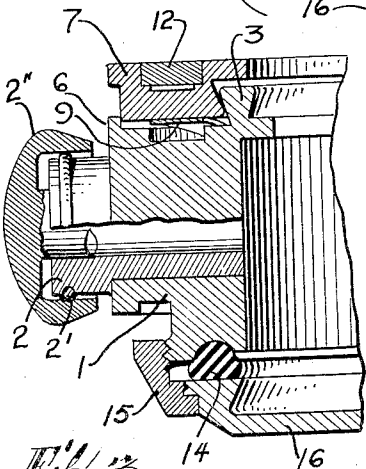
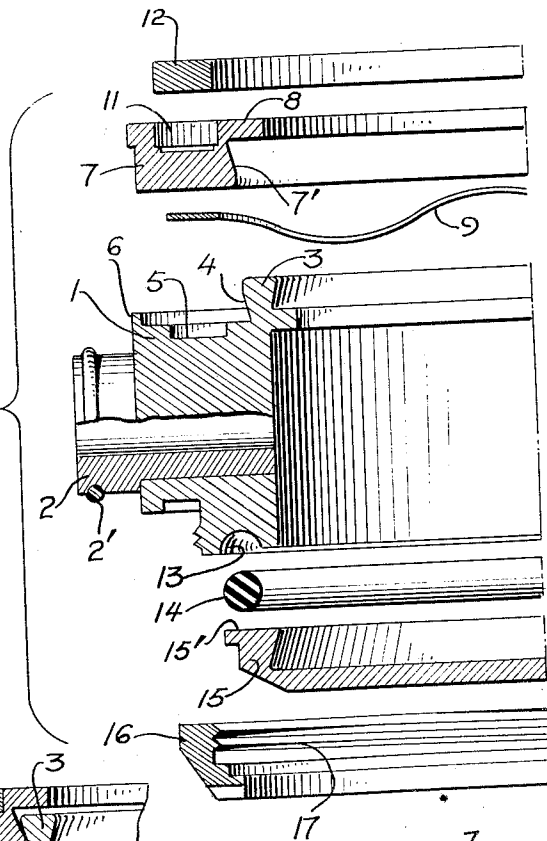


FIG. 3.

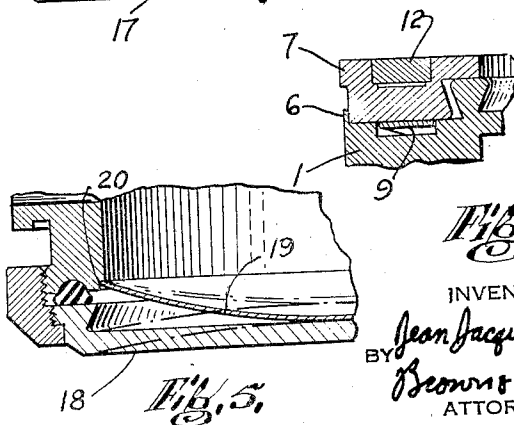


FIG. 4.

INVENTOR

Jean Jacques Fichter

BY Brown & Howard

ATTORNEYS

FIG. 5.

1

2,909,893

WATCH CASE

Jean Jacques Fiechter, Villeret, Switzerland

Application June 14, 1955, Serial No. 515,460

Claims priority, application Switzerland June 19, 1954 10

4 Claims. (Cl. 58—90)

This invention relates to a watch case, specially adapted 15
for use by deep-sea divers.

An object of the invention is to provide a watch case
which is sufficiently leak-proof to resist the entrance of
water at any depth to which a human diver may descend.

Another object is to provide such a watch case having 20
a settable and easily visible indicator or interval timer
to show the user how long he has been submerged, for
instance.

A further object is to provide such an indicator which 25
is easy to set and yet is proof against subsequent accidental
displacement.

A still further object is to provide certain improve- 30
ments in the form, construction, arrangement and mat-
erials of the several parts by which the above-named
and other objects may effectively be attained.

In the type of diving wherein the diver descends to 35
considerable depths unprotected against water pressure
but equipped with a portable air supply, accurate infor-
mation as to the passage of time is of great importance.
This is so, first, because the air supply is only designed
to last for a limited time and the diver's life depends
on returning to the surface before the air supply is
exhausted. As a second, but also vital, consideration
the return from high-pressure depths to the surface must 40
be effected gradually enough so that the body can ad-
just to lower pressures, without causing "bends" or sim-
ilar serious conditions. Thus the diver must know ac-
curately when to start his return trip, how long to take
in completing it and when it must be completed.

Ordinary "waterproof" watches are rarely, if ever, able 45
to withstand the pressures to which some divers are
now able to descend, and ordinary "luminous" dials—
with or without interval indications—are not capable of
being seen in the darkness of the depths frequently at-
tained. These difficulties are overcome in the highly
leak-proof case with clearly visible interval indicator
herein disclosed.

A practical embodiment of the invention is shown in
the accompanying drawings wherein:

Fig. 1 represents a plan view of the front of the case;

Fig. 2 represents an exploded sectional view, taken on
the line II—II of Fig. 1, on an enlarged scale;

Fig. 3 represents a sectional view corresponding to Fig.
2, with the parts assembled;

Fig. 4 represents a detail sectional view showing the
indicating ring pressed into its position for free rotation
and setting; and

Fig. 5 represents a detail sectional view showing a
modified back structure, parts being broken away.

Referring to the drawings, the watch case comprises a
main frame 1 adapted to contain the watch movement
(not shown) and provided with the tubular bushing 2
for the setting and winding stem; an O-ring 2' is located
on the bushing in a position to seal tightly the clearance
between the bushing and the interior of the stem crown 2"
2", replacing the customary packing or the like and en-

2

sureing water-tightness in any axial position of the crown.
On the front of the frame 1, around the dial, is provided
an annular rib 3 undercut around its inner periphery to
receive the beveled edge of a crystal (bonded to the case
in the customary manner) and also undercut around its
outer periphery to form the slanting wall 4. Outward
from the base of the wall 4 the flat surface of the frame
is cut by an annular groove 5, and at the peripheral edge
of the front of the frame there is formed an upwardly
extending rim 6. It will be understood that the annular
parts 3, 4, 5 and 6 are concentric.

The indicating ring 7 is shown as having a flat bottom
surface, a cylindrical outer surface and a downwardly
and inwardly tapered inner surface 7', having approxi-
mately the same angle of slope and vertical height (below
the horizontal inner rim 8) as the wall 4. The smallest
diameter of the surface 7' has a value between the small-
est and largest diameter of said wall 4. The cylindrical
outer surface of the ring 7 has a free sliding fit within
the rim 6. The spring 9, which may conveniently be in
the form of an undulated ring of resilient material, is of
a size to fit freely in the groove 5 and to extend, in its
expanded position, above the top of said groove. A plu-
rality of small coil springs could, if desired, be substi-
tuted for the undulated spring shown. In assembling
these parts, the spring 9 is placed in the groove 5 and
the indicating ring 7 is snapped over the rib 3, bringing
the surface 7' in a position to bear against the slanting
wall 4. The spring 9 urges the ring 7 upward to hold
said surface against said wall, as shown in Fig. 3, in which
position the ring is frictionally locked against rotation.
When pressed toward the frame (against the spring ac-
tion), as shown in Fig. 4, the ring 7 can readily be turned
to any desired adjusted position.

In order to serve its purpose as an interval timer, the
ring 7 is provided on its face with suitably located,
prominently displayed, indicia 10 which are preferably,
for the greatest security, engraved in the bottom of an
annular slot 11 and covered by a protective ring 12 of
transparent material, such as a clear plastic. Alterna-
tively the indicia may be applied (as by painting or print-
ing) to the back of the ring 12; in either case the ring
provides certain and durable protection for the indicia
under all conditions. The indicia 10 should comprise or
be treated with reflecting or luminescent material in order
to have the highest possible visibility even in the obscurity
of deep water.

The back of the frame 1 is provided with a groove 13
in which is seated a sealing ring 14 (preferably O-ring).
A back plate 15 has a peripheral flat surface 15' adapted
to bear against the ring 14. The back plate is held firmly
in place by the lock ring 16 which engages it and is
screwed onto the frame by means of the threads 17.

In operation, it is intended that the diver shall, at
the beginning of his dive, set the "zero" point of the
ring 7 opposite the (luminous) minute hand of the watch.
Thereafter, at any time during the first hour (or subse-
quent hours, if necessary) the elapsed time of submerg-
ence can be read at a glance without need for calcula-
tions of any kind. The indicia on the indicating ring can
easily be made large and clear, because the ring is nec-
essarily larger than the face of the watch which it sur-
rounds. Accidental movement of the ring is extremely
unlikely; even if one side of it is depressed and so re-
leased. The frictional engagement of the slanting sur-
faces on the opposite side wall will remain effective to
prevent rotation, which can only be effected when the ring
is pressed in all the way around. It will be noted that
the movability of the ring has no effect on the water-
tight sealing of the case itself, which is adequate to pre-

vent the penetration of moisture at all depths (and pressures) in which the watch may be worn.

In the modified back structure shown in Fig. 5, the outer back plate 18 is given progressively increasing support against high pressures (such as water pressure at great depths) by the provision of a domed inner back plate 19, the peripheral edge of which is seated in the rabbet 20 of the main frame and the center of which rests lightly against the center of the plate 18. Upon deformation of the latter under pressure (dot-dash lines), the plate 19 resists strongly and increasingly, while also providing, at its periphery, a second very tight seal against leakage. (The deformation shown is exaggerated.)

It will be understood that various changes may be made in the construction, form and arrangement of the several parts without departing from the scope of my invention and hence I do not intend to be limited to the particular embodiment herein shown and described except as set forth in the appended claims.

It is clear that, for instance, the above described indicating ring can also be fixed on a stop watch for airmen or on a chronograph in order to indicate more clearly the elapsed time even in darkness.

What I claim is:

1. A watch case comprising, a main frame having front and back openings and a space for the watch movement, a back plate secured to the back of the frame to water-tightly close the back opening, a crystal secured to the front of the frame to water-tightly close the front opening, an indicating ring rotatably mounted on the front of said frame and bearing high-visibility indicia, and manually releasable means for locking said ring against rotation, said frame and said indicating ring being provided with complementary continuous annular non-

cylindrical surfaces, and said releasable means including a spring located between the frame and the ring and acting to urge the ring in a direction to bring said surfaces into engagement.

2. A watch case according to claim 1 in which the non-cylindrical surface on the frame is approximately frusto-conical and overlies a complementary frusto-conical surface on the ring.

3. A watch case according to claim 2 in which the frusto-conical surface on the frame forms the outer wall of an annular rib on the front of the case and in which the maximum diameter of said surface is greater than the minimum diameter of the complementary surface on the indicating ring.

4. A watch case according to claim 1 in which the front of the frame is provided with an annular groove having a free fit with the indicating ring and in which the spring rests in said groove.

References Cited in the file of this patent

UNITED STATES PATENTS

1,322,770	Eastwood	Nov. 25, 1919
2,332,459	Muney et al.	Oct. 19, 1943
2,341,271	Ditesheim	Feb. 8, 1944
2,462,839	Brown	Mar. 1, 1949
2,716,829	Huguenin	Sept. 6, 1955
2,733,567	Zellweger	Feb. 7, 1956
2,736,164	Piquerez	Feb. 28, 1956

FOREIGN PATENTS

239,785	Switzerland	June 17, 1946
258,776	Switzerland	May 16, 1949
281,492	Switzerland	June 16, 1952