

March 10, 1970

RAOUL-HENRI ERARD
WINDING AND SETTING PINIONS MOUNTED IN CASE
INDEPENDENT OF MOVEMENT

3,499,280

Filed May 12, 1967

2 Sheets-Sheet 1

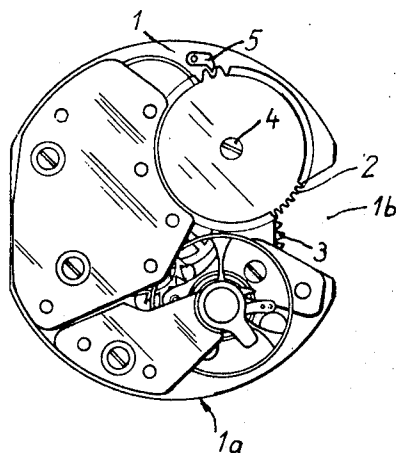


FIG. 1

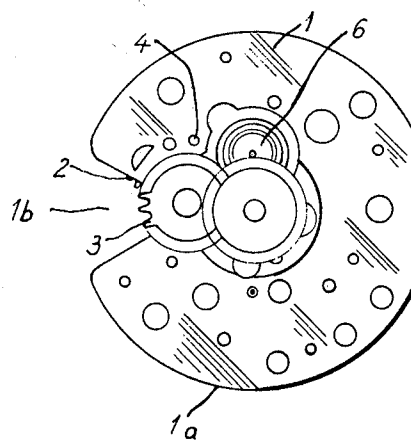


FIG. 2

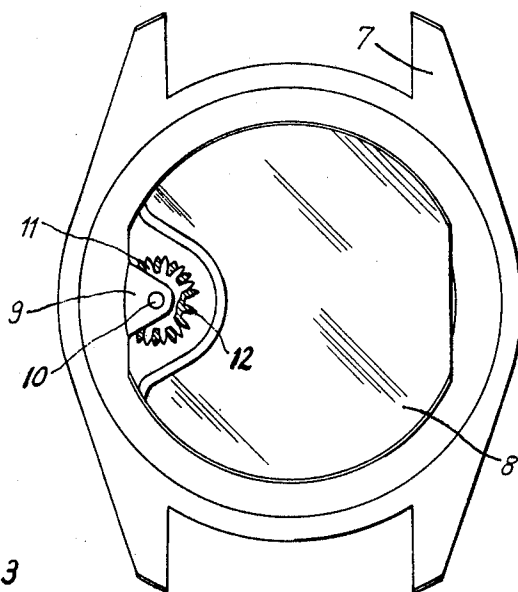


FIG. 3

INVENTOR

Raoul - Henri ERARD

BY Kenwood Ross
ATTORNEY

March 10, 1970

RAOUL-HENRI ERARD

3,499,280

WINDING AND SETTING PINIONS MOUNTED IN CASE
INDEPENDENT OF MOVEMENT

Filed May 12, 1967

2 Sheets-Sheet 2

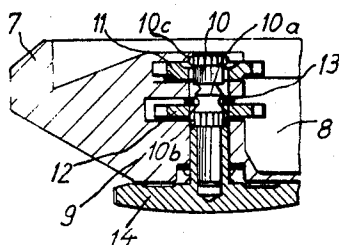


FIG. 4

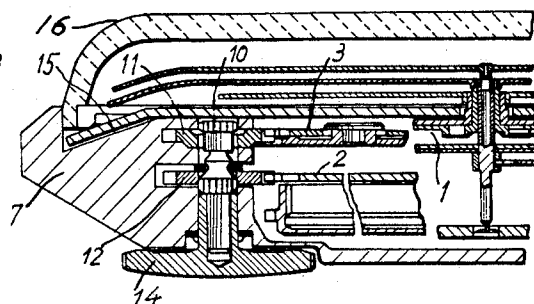


FIG. 5

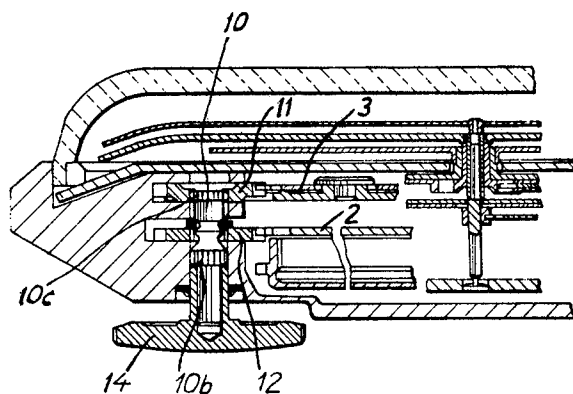


FIG. 6

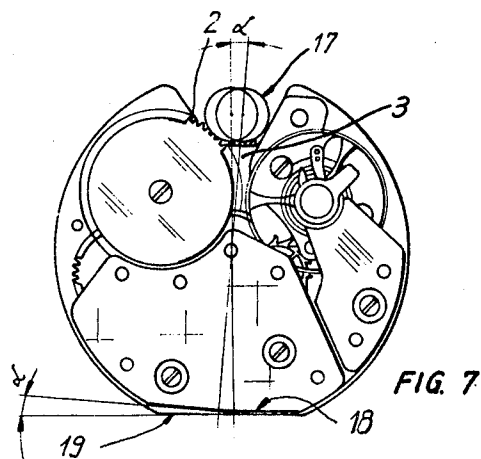


FIG. 7

INVENTOR

Raoul-Henri ERARD

BY *Kenwood Ross*
ATTORNEYS

1

3,499,280

WINDING AND SETTING PINIONS MOUNTED IN CASE INDEPENDENT OF MOVEMENT

Raoul-Henri Erard, 82 Boulevard des Endroits,

La Chaux-de-Fonds, Switzerland

Filed May 12, 1967, Ser. No. 638,052

Claims priority, application Switzerland, May 13, 1966,
6,940/66

Int. Cl. G04b 27/02

U.S. Cl. 58—63

1 Claim

ABSTRACT OF THE DISCLOSURE

A timepiece including a recessed casing and a clockwork free of any winding and setting mechanism and being receivable in the recess of the casing.

The present invention relates to watchmaking, and more particularly, but not exclusively, to watches adapted to be carried on the wrist, i.e., to wristwatches.

The object of the primary invention is to provide a timepiece comprising a clockwork located in a casing, characterized by the fact that the clockwork comprises no winding and setting mechanism, this mechanism being carried by the casing.

The drawing shows, by FIGS. 1 to 7, several particulars of one embodiment given by way of example.

FIGS. 1 and 2 represent the clockwork respectively on the bridges and on the dial sides.

FIG. 3 is a view of the casing without the clockwork.

FIG. 4 is a fragmentary sectional view of the casing showing a detail of the winding and setting mechanism.

FIGS. 5 and 6 show sectionally the operation of the winding and setting mechanism, respectively in the winding and in the setting positions.

FIG. 7 is a plan view of the clockwork showing the detail of a particularity of the mounting of this clockwork in the casing.

In FIGS. 1 and 2 can be seen the clockwork characterized by the fact that it comprises no winding and setting mechanism and is constituted by a homogeneous complex of relatively simple elements absolutely necessary for driving, transmission and regulation.

So far as the object of the invention is concerned, a base plate 1 can be seen, the periphery 1a of which defines the general shape of the clockwork and more particularly a free portion 1b in which is seated, when the clockwork is located within the casing, the part of that casing carrying the winding and setting mechanism. The clockwork includes a ratchet wheel 2 mounted on the barrel shaft rotating on the axis 4 and prevented from rotating in the direction opposite to the winding direction by a pawl 5. An intermediate wheel 3 meshes directly with the minute wheel 6.

This clockwork constitutes a perfectly homogeneous and functional whole, ready to be connected by the intermediate wheel 3 and the ratchet wheel 2 to the winding and setting mechanism located in the casing.

FIG. 3 shows the casing 7 with the recess 8 intended to receive the movement and including a projecting part 9 disposed to carry the winding and setting stem 10, the setting pinion 11 and the winding pinion 12.

FIG. 4 shows the winding and setting mechanism located in the casing 7, recess 8 for the clockwork, the inner projection 9 in which a hole and two recesses permit the location of a winding stem 10, the setting pinion 11 and the winding pinion 12, and the crown 14 rigid with the stem and located in a recess provided in the bottom of the casing. The winding stem comprises a profiled portion 10a cooperating with a jumper 13 ensuring two axial distinct positions of the stem. In the position repre-

2

sented in the FIG. 4, a flute 10b of the winding stem cooperates with a corresponding flute of the winding pinion 12, so that this pinion is angularly rigid with the stem while the flute 10c is out of mesh with the corresponding flute of the setting pinion 11 which then rotates freely on a cylindrical part of the stem.

FIG. 5 represents, in a partial sectional view, some details of the complex clockwork-stem, the winding and setting mechanism being represented in the winding position.

The base plate 1 of the clockwork which comprises the ratchet wheel 2 and the intermediate wheel 3 meshing respectively with the winding pinion 12 at this time rigid with the winding and setting stem 10, and with the setting pinion 11 rotating then freely on this stem 10. The clockwork is held in the recess 8 of the casing by a dial 15 itself maintained by a glass 16 provided with a rim 16a forced in an opening of the casing 7.

FIG. 6 distinguishes from FIG. 5 only by the fact that the winding and setting mechanism is represented in the setting position, with the crown 14 pulled and the winding stem 10 made angularly rigid with the setting pinion 11 driving the intermediate wheel 3, while the winding pinion 12 rotates freely on the stem 10, without acting on the ratchet wheel 2.

It is to be noted that in the embodiment as disclosed the winding is carried out in only one direction of rotation of the winding stem, this stem being locked against any rotation in the opposite direction by the pawl 5 acting on the ratchet wheel. It is the most simple embodiment of the invention. However, the crown 14 can be mounted on the winding and setting stem in such a way that the crown can be acted in the two directions, in a reciprocal movement, either by frictionally coupling the crown and the stem, or by a pawl and ratchet coupling. Obviously, in this case, it is necessary to produce however a sufficient resistance of the pawl and ratchet mechanism in the free direction for allowing to nevertheless carrying out the setting in the two directions.

FIG. 7 shows a detail of the clockwork permitting, when it is put into the casing, to occupy two different positions, one, the initial position, permitting to introduce the clockwork perfectly concentrically to the recess of the casing, but angularly displaced of an angle α with respect to the definitive position, so that the whole circumference 17 of the toothing of the winding and setting pinions 12 and 11 passes out of meshing with the teeth of the ratchet wheel 2 and of the intermediate wheel 3. This initial angular position is limited by a wall 18 of the clockwork bearing on a wall 19 of the recess 8 of the casing. In this initial position, the clockwork can be introduced into the casing until its position, in height, is close to the definite position. This intermediary position being limited by the bearing of the overpart of the base plate on a suitable bearing surface of the casing. Then, by putting the clockwork into its definitive angular position, one brings the winding and setting pinions to mesh with the ratchet wheel and with the intermediary wheel, after which one moves still slightly the clockwork in height so that it occupy its definitive position and comes located, by the periphery of the base plate, in a suitable recess of the casing ensuring its locking in its definitive position.

For bring the clockwork out of the casing, the same operations have to be carried out, but in the reverse order.

This detail of manufacture is provided essentially so as to prevent the toothings from being deteriorated and almost the toothing of the barrel which is generally substantially on the same diameter as the toothing of the ratchet wheel and which could be deteriorated by the winding and setting pinions when the clockwork is introduced into the casing.

3

The embodiment disclosed having the axis of the winding and setting stem parallel to the axis of the hands is the most convenient and is particularly adapted to the modern concept of the so-called "monobloc" casings (that is to say the casings comprising a bottom and a rim of case-band made of one piece). On the other hand, this embodiment permits to use elements identical for the winding stem and the crown, independently of the modification in the diameter of the casing. This embodiment also allows a larger variety of shapes and of profiles of the rim or case-band and permits also special executions with thin case-band and protruding glass.

It is however to be noted that one can also provide a mechanism controlled by a winding stem having its axis parallel to the plane of the movement, i.e. similar to the most conventional mechanisms in the field of the wrist-watches.

However, whatever can be the embodiment, it is particularly useful to provide the fact that the part of the casing carrying the mechanism protrudes into the inner recess of the casing so as to locate itself in a recess provided to this effect in the periphery of the clockwork, thus permitting a construction especially homogeneous and concentrated. At last, it is to be noted that the timepiece according to the invention is particularly adapted to a division of the mounting operations. The mounting of the clockwork is simplified due to the fact that the number of the operating elements is reduced and due to the fact that recesses particularly favourable are provided for these elements. On the same way, the fact of mounting entirely the winding and setting mechanism in the casing permits to check the mounting, the finishing and even the tightness of the watch, without entailing a later dismantling of the crown and of the winding stem for mounting it into the casing. This feature is also particularly important if one takes into account the problems of putting the clockwork into the casing, the problems of the tightness and of the checking.

What I claim is:

1. In a timepiece comprising:
 - a casing,
 - and a clockwork located within the casing,
 - and a winding and setting mechanism carried by the casing,
 - the clockwork including:
 - a recessed base plate,
 - and a ratchet wheel,

4

and a barrel shaft for mounting the ratchet wheel for rotation in a winding direction,
and a pawl for precluding ratchet wheel rotation in a nonwinding direction,
and an intermediate wheel,
and a minute wheel meshing with the intermediate wheel,

the casing including:

- a clockwork-receiving recess,
- and a projecting part extending into the recess,

the winding and setting stem mechanism supported by the projecting part and including:

- a pinioned winding and setting stem,
- and a crown rigid with the winding and setting stem,
- and a setting pinion,
- and a winding pinion,

said setting stem supported on both ends by the casing, with the setting pinion and winding pinion located between said ends,

with the clockwork being seated within the recess of the casing and with the projecting part of the casing being receivable in the recess of the base plate of the clockwork for positioning the winding and setting stem astride the clockwork,

the clockwork being connected to the casing by the interengagement of the intermediate wheel and ratchet wheel to the pinions of the winding and setting stem.

References Cited

UNITED STATES PATENTS

2,589,052	3/1952	Chiffelle	58—63 X
3,303,641	2/1967	Egger et al.	58—85.5
1,845,440	2/1932	Piguet	58—63
2,944,384	7/1960	Rabinow	58—63 X
3,064,415	11/1962	Polo	58—63
3,120,096	2/1964	Caussignac	58—63

RICHARD B. WILKINSON, Primary Examiner

GEORGE H. MILLER, Jr., Assistant Examiner

U.S. Cl. X.R.

58—88