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ELECTRO-MECHANICAL WATCH

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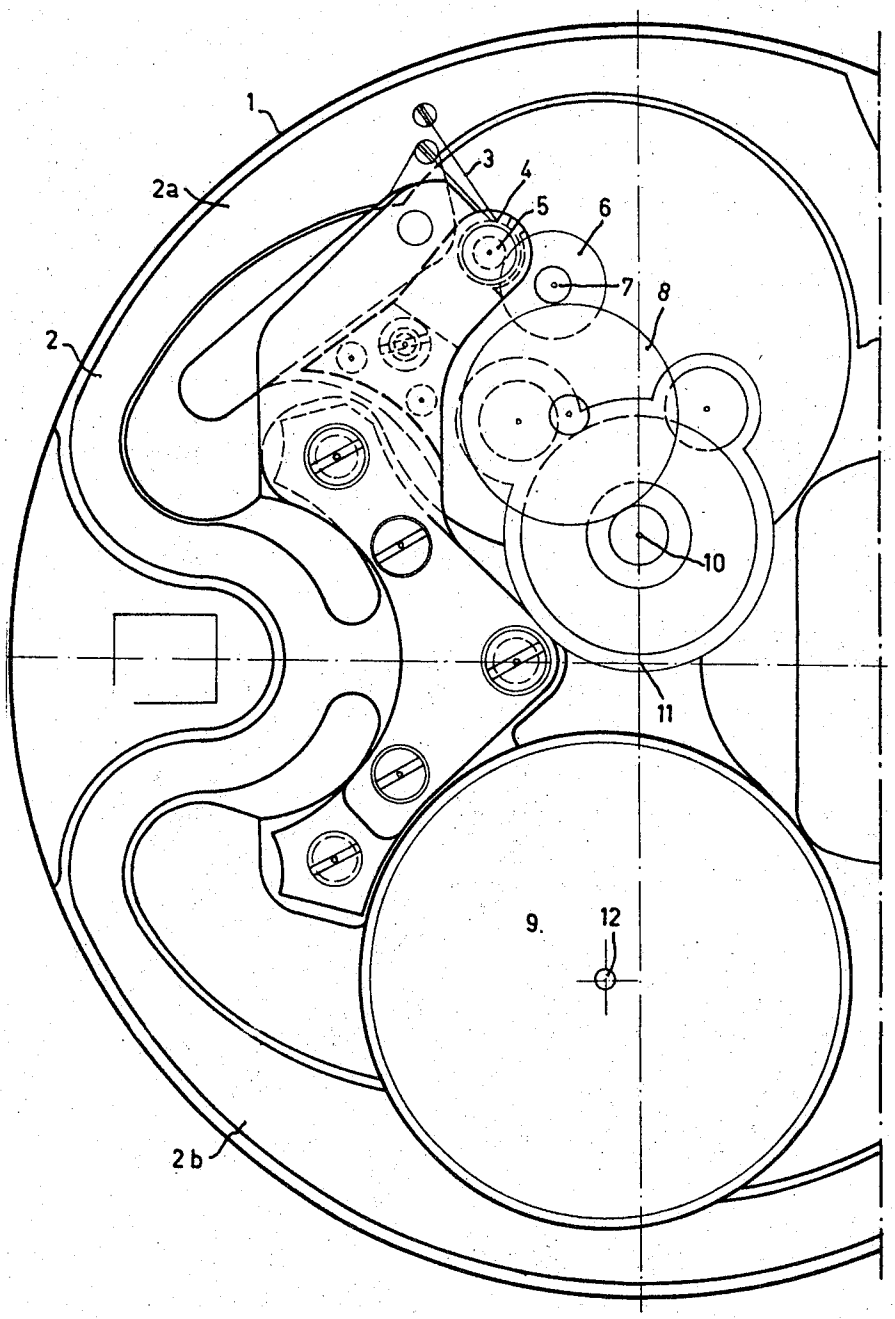

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ELECTRO-MECHANICAL WATCH

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The present invention relates to an electro-mechanical watch comprising an electro-mechanical oscillator, a battery generally in the shape of a shallow cylinder for supplying the oscillator and a gear train driven by the oscillator.

Numerous watches of this type have been proposed. The batteries generally in the shape of a shallow cylinder (or pill-box) are used by preference because of their good tightness. The dimensions of batteries actually on the market, although reduced, are nevertheless relatively large with respect to the dimensions of a wrist watch in which this battery must be mounted. Wherever this battery is disposed, the space remaining between the periphery of the battery and the centre of the watch, through which passes the axle of the hour and minute hands, is very reduced. This necessitates the use of wheels of very small dimensions which are consequently difficult to make and relatively expensive, since the battery and the gear train cannot be superposed without causing an unacceptable increase in the thickness of the watch.

The present invention has precisely for its object to provide an electro-mechanical watch of the type mentioned above, not having this disadvantage. The invention is characterized by the fact that viewed in normal projection in the direction of the axle of the hands, the centre of the battery and the axle of the hands are situated on either side of the straight line traced through the geometrical centre of the watch perpendicular to the straight line connecting the centre of the battery to said geometrical centre.

The annexed drawing represents, by way of example, one embodiment of the object of the invention.

On a bottom plate **1** is mounted a resonator **2**, partially shown, of which the oscillation is maintained electromagnetically by a circuit and some transducers (not shown). This resonator drives the gear train by means of a click device constituted by a click **3** driving a ratchet wheel **4** of which the axle carries a polar wheel **5** driving magnetically a second polar wheel **6**. The pinion **7** of the polar wheel **6** drives the intermediate wheel **8**, driving in turn the other wheels of the gear train disposed in a continuous chain and comprising in particular coaxial wheels of seconds, minutes and hours whose axle disposed at **10** carries respectively the hands of seconds, minutes and hours. The battery **9** is disposed between the branches **2***a* and **2***b* of the resonator near the branch **2***b*.

The axle **10** of the hands occupies an eccentric position on a straight line passing through the centre **11** of the movement and approximately through the centre **12** of the battery. This arrangement permits the use of wheels of sufficient diameter, of easy fabrication and of low cost price. Numerous variations are possible, the essential condition to be fulfilled in order to be able to use gears of sufficient size, being that the centre of the battery and the axle of the hands be situated on either side of a straight line perpendicular to the straight line connecting the centre of the battery and the geometrical centre of the watch. The eccentric position of the axle **10** implies an eccentric arrangement of the hands on the dial which gives the watch a novel esthetic appearance.

In the example shown, the battery is disposed at the side of the branches of the resonator, but if the resonator is constituted by a tuning fork with rectilinear branches, the battery and the tuning fork will be situated in superimposed planes. The expressed condition remains nevertheless perfectly valid for this construction.

It is also valid for all other shapes of electro-mechanical oscillators using a resonator working either by flexion or by torsion, in which the battery and the wheels of the hands cannot be superimposed without increasing considerably the thickness of the watch.

What is claimed is:

1. Electro-mechanical watch comprising:

(i) an electro-mechanical oscillator,

(ii) a battery generally in the shape of a shallow cylinder for supplying current to the oscillator,

(iii) a gear train adapted to be driven by the oscillator, and adapted to drive an hour hand and minute hand in rotation about an axis.

(iv) characterized by the fact that viewed in projection in the direction of the axis of the hands, the centre of the hands, the centre of the battery and the axis of the hands are situated on either side of a straight line traced through the geometrical centre of the watch perpendicularly to the straight line joining the centre of the battery to the said geometrical centre.

2. Watch according to claim **1**, characterized by the fact that the centre of the battery is situated at least approximately on the prolongation of the line joining the axis of the hands to the geometrical centre of the watch.

3. Watch according to claim **1** in which the electro-mechanical oscillator comprises a resonator having two symmetrical branches, characterized by the fact that the branches extend beside the battery.

4. Watch according to claim **1** in which the electro-mechanical oscillator comprises a resonator having at least one oscillating mass, characterized by the fact that the oscillating mass oscillates in a plane not containing the battery.

5. Watch according to claim **4**, characterized by the fact that the oscillating mass extends above the battery.

6. Watch according to claim **4**, characterized by the fact that the oscillating mass extends below the battery.

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