

May 7, 1968

M. JEANMONOD ETAL

3,381,468

WATCH MOVEMENT

Filed Nov. 8, 1965

FIG. 1

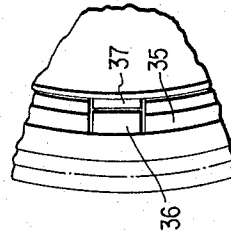
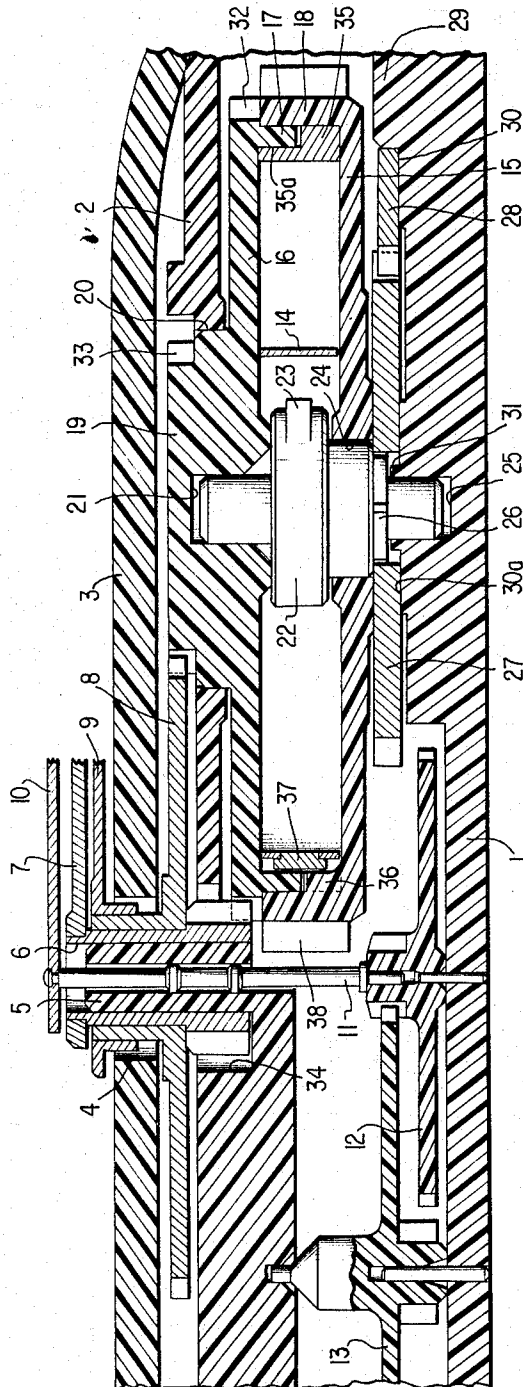


FIG. 2

INVENTORS
MAURICE JEANMONOD
JEAN-CLAUDE SCHNEIDER

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WATCH MOVEMENT

Maurice Jeanmonod and Jean-Claude Schneider, La Chaux-de-Fonds, Switzerland, assignors to Fabrique d'Horlogerie Chs. Tissot et Fils S.A., Le Locle, Switzerland, a limited company of Switzerland

Filed Nov. 8, 1965, Ser. No. 506,701

Claims priority, application Switzerland, Nov. 19, 1964, 14,913/64

12 Claims. (Cl. 58—86)

The present invention relates to a watch movement with a motor spring, the going barrel of which comprises a drum provided exteriorly with a toothing meshing with one of the wheels of the gear train and a cover mounted for rotation with respect to the drum.

The invention aims to realize a watch movement of small height having a smallest possible number of pieces and adapted to be manufactured and assembled rapidly and rationally.

To this end the watch movement according to the invention is characterized in that the cover is coupled to the drum by a friction coupling normally entraining the cover with the drum, the cover being provided with a pair of coaxial toothings, one of which ensuring driving of an indicating member for the hours and the other of an indicating member for the minutes.

Other features and advantages of the invention will appear from the description now to follow, of an embodiment thereof, given by way of example only, and in which reference will be made to the accompanying drawings in which:

FIG. 1 is a partial axial section through the movement showing the barrel, and

FIG. 2 shows, in a plan view with some parts broken away, a portion of the barrel without its cover.

Referring now more particularly to the drawings, FIG. 1 thereof shows a watch movement, the frame of which comprises a base plate 1 and an upper bridge 2, both these frame elements being connected with each other by pillars in a manner not shown in the drawing. Above the bridge 2 extends the dial 3 provided with a central opening 4, from the center of which protrudes a sleeve 5 of one piece with the bridge 2. This sleeve serves as a pivoting element for a cannon-pinion 6 carrying, at its upper end, the minutes-hand 7 and rotatably receiving an hour wheel 8 carrying an hours-hand 9.

A seconds-hand 10 is secured to a central shaft 11 connected with a seconds or fourth wheel 12 placed in a gear train comprising a third wheel or "petite moyenne" 13 and an escape wheel (not shown). The driving of the gear train is effected by a motor spring 14 lodged in a barrel 15, 16 driving, by means of a toothing 38 an excentered center wheel (not shown). The barrel is formed of a drum 15 and of a cover 16. The latter presents at its periphery a cylindrical wall 17 mounted for free rotation but without play in the wall 18 of drum 15. In its center the cover 16 comprises a projecting portion 19 laterally limited by a cylindrical step 20 of relatively large diameter ensuring the pivoting of the barrel in an opening of bridge 2. A recess 21 in the projecting portion 19 opens to the interior of the barrel and receives the upper pivot of a shaft 22 having a collar provided with a hook 23 to which is secured the inner end of spring 14. The shaft 22 has a shoulder 24 traversing a corresponding opening of drum 15. Between the shoulder 24 and the lower pivot of shaft 22 which is engaged in a cylindrical housing 25 of the base plate 1, extends a square 26 the dimensions of which are such that it laterally overlaps the said lower pivot. The square 26 couples the shaft 22 to a ratchet wheel 27 cooperating on the one hand with an intermediate wheel 28 ensuring

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the winding of the motor spring 14 and on the other hand with a retaining pawl (not shown) which normally locks the shaft 22 and produces the rotation of the drum 15 under the action of spring 14.

It is to be noted that the intermediate wheel 28 pivots on a collet 29 projecting from the inner face of the base plate 1 and rests on a shoulder 30 of annular shape and feeble height which surrounds the collet 29. The housing 25 is similarly enclosed by a shoulder 30a supporting the ratchet wheel 27. An annular collar 31 the outer diameter of which is approximately equal to the length of the side of the square 26 protrudes from the center of shoulder 30a so that the square, opening in the center of the ratchet wheel 27, fits without friction on said collar the height of which is smaller than the thickness of the ratchet wheel 27.

The cover 16 presents a pair of toothings 32 and 33. Toothing 32 extends at the periphery of the cover and beyond the wall 18, while toothing 33 has a diameter smaller than the step 20 and extends above the bridge 2. Toothing 32 meshes with cannon-pinion 6 while toothing 33 meshes with the hours-wheel 8. The toothing of cannon-pinion 6 is engaged in a housing 34 manufactured in the upper face of bridge 2 around sleeve 5 but which pierces this bridge in the zone extending in the vicinity of the periphery of the barrel. The cover 16 of the barrel thus plays the role of the minutes-wheel and the toothing 32 meshes on a portion of its periphery that is not shown with an intermediate setting wheel pivoted on a collet of bridge 2.

In order to afford for the cover of the barrel to conveniently ensure the functions that are imparted to it, it is thus necessary to couple it by a friction coupling to the drum 15 so that it normally rotates with the latter under the action of spring 14 but may be displaced at will with respect to this drum in order to set the hands. To this end the wall 17 is formed so as to support the pressure of a resilient ring 35, the profile of which is visible at the extreme right in FIG. 1 and which is engaged within the drum 15. This resilient ring is split as visible on FIG. 2 and both its ends extend to both sides of an inner projection 36 of wall 18. The upper portion of ring 35 radially bears against the wall 17 of cover 16 so that the friction between these two elements ensures the driving of the cover 16. Since the ring 35 is connected with the drum 15 it also ensures the driving of the drum by spring 14. As seen in FIG. 2 the projection 36 does not extend over the whole of the thickness of spring 35 but lets free the place for the engagement in the slot of ring 35 of a rivet 37 which is secured to the outer end of spring 14. The rivet 37 transmits the force of spring 14 to the ring 35 and tends to open the latter. The projection 36, which retains ring 35, consequently supports through this ring the tangential force developed by spring 14.

The ring 35 is pressed against wall 18 and thus ensures the coupling of the cover with the drum. As seen in FIG. 2 the rivet 37 tends to drive ring 35 in counter-clockwise direction while the center wheel meshing with the outer toothing 38 of drum 15, as well as the cannon-pinion 6 are driven in clockwise direction as seen in FIG. 2.

The ring 35 which couples the cover 16 to the drum 15 has in its upper portion an outer flange 35a with an upwardly directed slightly conical opening, while the inner flange of wall 17 also has a slight taper directed in the same direction. Thus the radial force exerted by ring 35 onto wall 17 axially connects the ring and the cover.

The base plate 1, the upper bridge 2, the cover 16 and the drum 15 are made of plastic material. This affords for making the step 20 of a relatively large diameter

superior to that of the toothing 33 without resulting in exaggerated friction so that both toothings of the barrel cover may be placed respectively above and underneath of bridge 2.

In addition, the use of plastic material makes it easy to give to the described elements the required shapes to fulfill the functions they have to ensure. All these elements may be produced by injection moulding in the desired shape. Thus, for example, the presence of projection 36 within the wall 18 does in no way complicate the manufacture of the drum 15.

The same is valid for the collar 31, the collet 29 and the shoulders 30 and 30a which support the intermediate wheel 28 and the ratchet wheel 27, respectively.

Plastic materials suitable for the described elements are nylon and certain nylon-derivatives, Delrin and other thermoplastics suitable for injection moulding. The basic material may further be provided with a charge of lubricant.

The barrel shaft 22, ring 35, the ratchet wheel 27 as well as the hours-wheel 8 and the cannon-pinion 6 are made of metal.

The arrangement described above has the further advantage of facilitating to a large extent the assembling of the watch movement; for example in order to position the barrel it is possible to proceed in the following manner: After having placed the base plate 1 with its inner face upwardly turned the ratchet wheel 27 is placed on the shoulder 30a and the intermediate wheel 28 on the collet 29. Thereby the ratchet wheel is centered owing to the collar 31. The barrel assembled so that the square 26 and the lower pivot of its shaft project downwardly from the drum 15 may then be placed with the lower pivot of shaft 22 engaged in its housing 25. The square 26 penetrates a corresponding opening in the ratchet wheel 27. This operation is effected by a simple descending vertical movement. The barrel rests on the ratchet wheel 27, which in turn is supported by the shoulder 30a thereby facilitating the correct placing of bridge 2, the opening thereof corresponding to the step 20, being engaged on this step also by a vertical downwardly directed movement.

We claim:

1. A watch movement having a frame, hour and minute indicating members, a gear train containing toothed wheels, and a going barrel including an exteriorly toothed drum having base and side walls housing a motor spring and meshing with one of the wheels of the gear train and a cover having an upper wall mounted for rotation with respect to the drum, comprising a friction coupling normally entraining the cover with the drum, and a pair of coaxial tooth structures carried by said cover in driving relationship with said indicating members respectively.

2. A watch movement as claimed in claim 1, wherein said cover has a side wall engaged for free rotation in the drum, and a split resilient ring containing a slot is re-

ceived within and urged to rotate by the barrel to frictionally engage said wall.

3. A watch movement as claimed in claim 2, wherein the drum has an inner wall provided with a projection engaged in the slot of the ring so as to connect the ring with the drum during rotation of the barrel.

4. A watch movement as claimed in claim 2 wherein the motor spring has an outer end engaged in said slot.

5. A watch movement as claimed in claim 2, wherein the resilient spring and the side wall of the cover present truncated surface portions of similar dimensions with tapering towards the upper wall of the cover.

6. A watch movement as claimed in claim 5, the truncated surface portion of the ring extending shoulder on the lower portion of the cover side wall, and a portion of the ring extending beyond said shoulder engaging the base and side wall of the drum.

7. A watch movement as claimed in claim 1, wherein at least one of the barrels is formed of plastic material.

8. A watch movement as claimed in claim 1, wherein the cover has a central projecting portion confined by a cylindrical step received in an opening of said frame to ensure pivoting of the cover.

9. A watch movement as claimed in claim 1, wherein said toothed structures are disposed respectively above and below said step.

10. A watch movement as claimed in claim 9, wherein the outer diameter of the upper toothed structure is smaller than the diameter of the said step.

11. A watch movement as claimed in claim 9, wherein the lower toothed structure extends exteriorly of said side wall of the cover above the side wall of the drum.

12. A watch movement having hour and minute indicating members comprising a going barrel having a drum providing a side wall and a cover providing upper and side walls, said cover being rotatably mounted relative to said drum, a pair of coaxial tooth structures carried by said cover in driving relationship with said indicating members respectively, a motor spring disposed in said drum for imparting rotation thereto, said spring having an outer end connected to the side wall of said drum and an edge extending close to the upper wall of said cover, and means responsive to said spring frictionally coupling said cover and drum.

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GERALD F. BAKER, *Examiner.*

S. A. WAL, *Assistant Examiner.*