June 18, 1963 F. MEYER 3,093,958

WATCH WITH JUMP OPERATED INDICATOR

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FIG.1

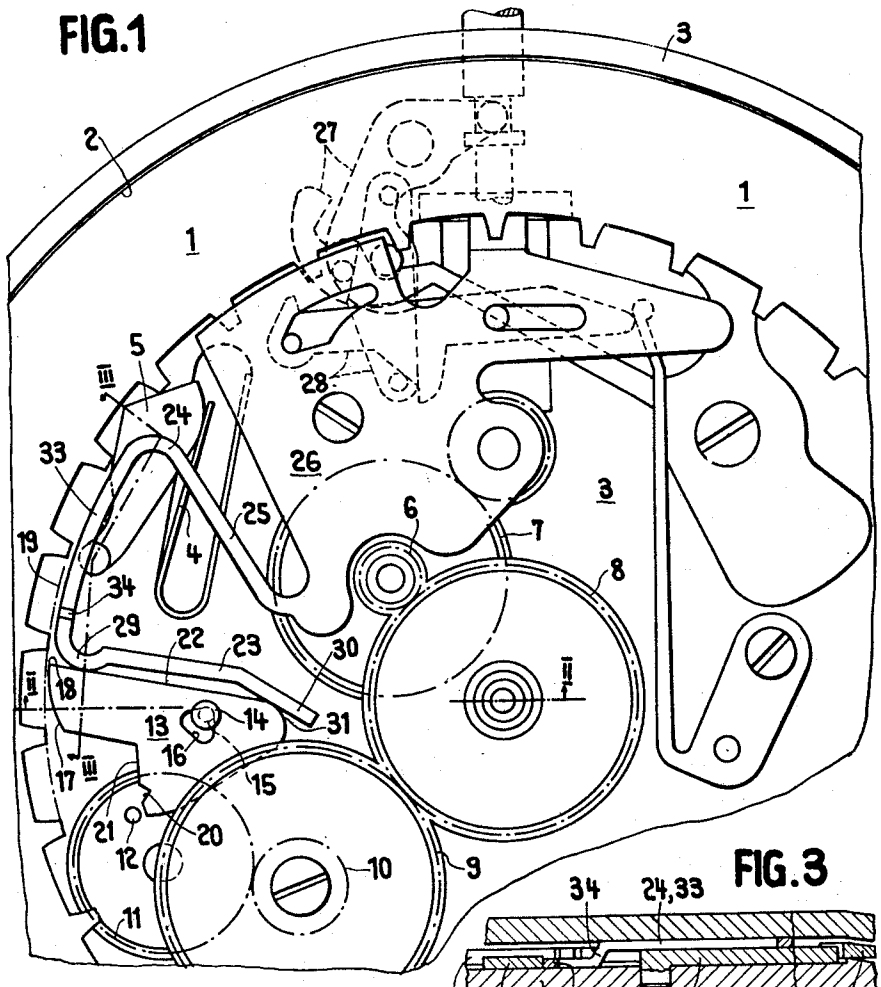
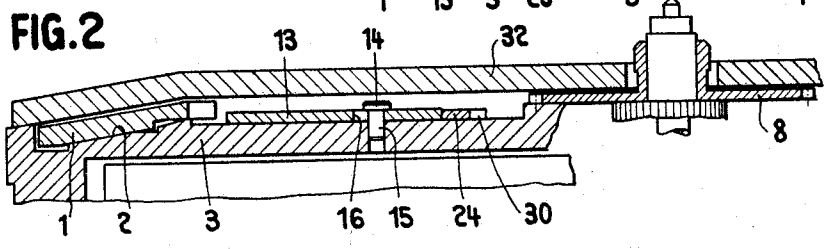


FIG.3

FIG.2



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FIG.4

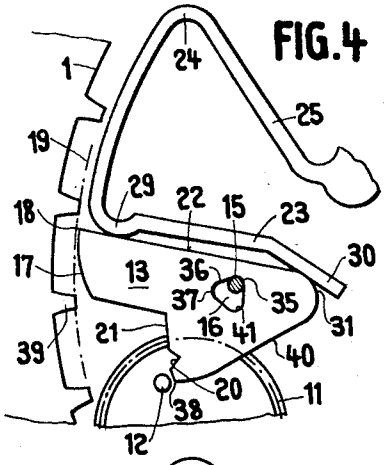


FIG.5

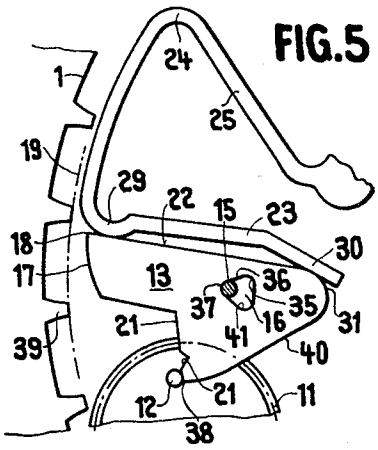


FIG.6

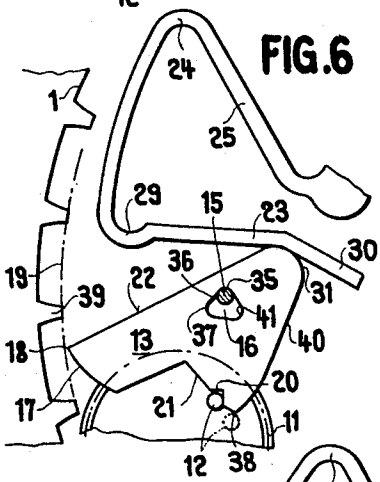


FIG.7

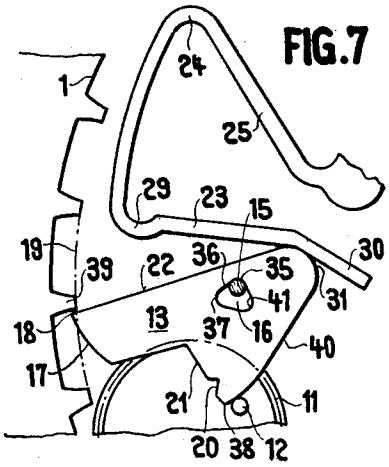
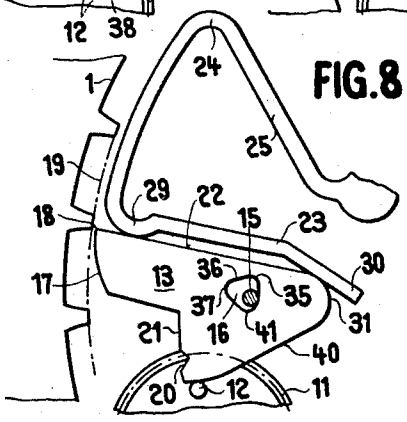


FIG.8



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3,093,958

WATCH WITH JUMP OPERATED INDICATOR

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5 Claims. (Cl. 58—58)

This invention concerns calendar or date watches having an impulse member controlled by a date indicator driving wheel and provided for discontinuously driving a toothed date indicator disc.

In prior calendar watches the date corrector cannot work during an operation of the impulse member. Furthermore, in the hitherto known structures, an inadvertent turning back of the date indicator driving wheel causes damage to the mechanism.

It is an object of the invention to remedy these inconveniences.

Another object of the invention is to provide a calendar watch of simple and reliable construction.

A further object of the invention is to avoid the thickness of the watch movement from being increased by the provision of the date mechanism.

Another object of the invention is to provide a calendar or date watch in which, for obtaining an only instantaneous transient engagement of the spring-loaded impulse member in a tooth-gap of the date indicator disc, the spring-loaded impulse member is mounted by a means or means enabling the impulse member to carry out not only rotation but also translatory movement.

Other objects and features of the invention will be apparent as the following description proceeds, reference being had to the accompanying drawings illustrating by way of example one embodiment of the invention and in which

FIG. 1 is top view from the dial side,

FIG. 2 is a section along the line II—II in FIG. 1,

FIG. 3 is a section along the line III—III in FIG. 1, and

FIGS. 4 to 7 illustrate operating positions of the impulse member during an operation of the date indicator driving wheel.

FIG. 8 shows a position of the impulse member on rotating back the date indicator driving wheel.

The internally toothed date indicator disc 1, provided with numbers or figures (not shown) for the days of a month, is rotatably mounted in an annular recess 2 of the pillar plate 3. The ring-shaped disc 2 is held in angular position by a day jumper 5 engaging tooth gaps of the internal teeth row of the disc 1, the day jumper 5 being loaded by a spring 4.

The pinion 6 of the minute wheel 7 is in engagement with the hour wheel 8 which is in mesh with the intermediate day wheel 9 whose pinion 10 engages the date indicator driving wheel 11 executing one revolution in 24 hours. A driving pin 12 carried by the date indicator driving wheel 11 is to cooperate, in a manner described later on, with the impulse or day member 13.

The impulse member 13 is plate-shaped and disposed on the pillar plate 3 in such a way that it does not require any increase of the ordinary thickness of the watch movement (FIG. 2). It is movably mounted by means of a pin 15 with head 14, the pin 15 being driven into

the pillar plate 3 and going through a triangular hole 16 of the member 13, said hole 16 forming a slot and having rounded corners. Pin 15 and triangular hole 16 constitute together a means enabling the member 13 to execute not only a rotational but also a translatory movement in order to obtain only a transient engagement of the member 13 in a tooth gap of the internally toothed date indicator disc 1. In a modified performance the pin 15 may be fixed to the member 13 and engage a triangular cut-out 16 of the pillar plate 3. The curved face 17 of the member 13 is "undercut," i.e., in the position of the member 13 as shown in FIG. 1 the distance of the face 17 from the crest circle 19 of the date indicator disc 1 increases from the impulse point 18 towards the bottom in FIG. 1. The member 13 has a shoulder 21 notched as at 20, said shoulder cooperating with the driving pin 12 in a manner described later on. The free leg 23 of a stirrup-shaped spring 24 bears against a guide edge 22 of the member 13, this edge lying at the side of the pin 15 opposite to the shoulder 21 and extending in a direction across the shoulder 21. The other leg 25 of the spring 24 is made in one piece with the corrector bridge 26. The date corrector device 28 cooperating with parts of the setting mechanism 27 is shown roughly in dotted lines in FIG. 1 and will not be described in detail. In another embodiment of the invention, the spring 24 may be independent from the corrector bridge 26. Near the impulse point 18 of the member 13 the free leg 23 of the spring stirrup 24 has a rounded root 29 supported on the guide edge 22 of the member 13 while, at the other end, the leg 23 has a bent portion 30 bearing against the member 13 in reach of a rounded portion 31 of the latter. In order to avoid an increase of the ordinary thickness of the watch movement the web 33 of the stirrup 24 is offset between the dial 32 and the day jumper 5 as at 34 (FIG. 3) so that the leg 23 lies deeper than the remaining part of the stirrup 24 and the impulse member 13 can be disposed within the ordinary thickness of the pillar plate 3.

In another embodiment of the invention the round root 29 may be replaced by a support pin fixed to the pillar plate 3, while the spring, which must no longer be stirrup-shaped, bears against the member 13 only in reach of the rounded portion 31.

The manner of operation of the device as described above and illustrated in the accompanying drawings is as follows:

The hour wheel 8 executing one revolution in twelve hours imparts the date indicator driving wheel 11 one revolution in 24 hours by means of the intermediate day gear train 9, 10. Therefore, once in 24 hours, the driving pin 12 rotating in the clockwise direction (FIGS. 4 to 7) arrives in the position shown in FIG. 4 and, soon afterwards, comes into contact with the shoulder 21 at a point outside the notch 20, the impulse point 18 in the position of FIG. 4 lying inside the crest circle 19 and, therefore, outside the tooth gap of the date indicator disc 1 which is just in front of the point 18. Since the edge 22 of the member 13 is guided by the spring leg 23 and the pin 15 bears against the right-hand corner 35 of the triangular hole 16 (FIG. 4), i.e., since a stationary center of rotation is lacking, on further movement of the pin 12 the edge 36 of the triangular hole 16 glides along the pin 15 until the latter bears against the left-hand corner 37 of the triangular hole 16 as shown in FIG. 5.

Therefore, the member 13 is translatorily displaced along the spring leg 23 from the position of FIG. 4 towards the right to the position of FIG. 5 whereby the impulse point 18 is still more removed from the crest circle 19 and from the tooth gap. It is understood that during this movement the spring 24 allows the member 13 to also carry out a slight rotational movement. On further rotation of the wheel 11 with the driving pin 12 in the clockwise direction, the member 13 has at first a stationary center of rotation due to the support of the left-hand corner 37 on the pin 15 and now a pure anticlockwise rotation of the member 13 lying completely inside the crest circle 19 occurs at first whereby mainly the leg 23 and, of course, also the remaining parts of the spring 24 are tightened. As soon as during this rotation the bent portion 30 of the free spring leg 23 comes into contact with a determined point of the rounded portion 31 of the member 13, the driving pin 12 jumps into the notch 20 of the shoulder 21 of the member 13 and the left-hand corner 37 is again removed from the pin 15 which, after some time, bears again against the corner 35 of the triangular hole 16 (FIG. 6). The said translatory motion taking place during rotation would also occur under the influence of the tightened spring leg 23 and in a determined angular position of the member 13 if there were no notch 20. From the position shown in FIG. 6 the member 13 continues rotating with its corner 35 supported on the pin 15 until the driving pin 12 has reached the position shown in a dotted circle in FIG. 6 with regard to the member 13. The complete movement hitherto described of the member 13 has been accomplished entirely on the inside of the crest circle 19; that is, the impulse point 18 never entered a tooth gap of the date indicator disc 1, even not in the position of FIG. 6. Now, as soon as the driving pin 12, on its further rotation, leaves the corner 38 of the member 13, this member 13 is solely under the constraint of the tightened spring 24, particularly of the free leg 23. The leg 23 makes the member 13 jump in a pure rotation in the clockwise direction (FIG. 7) during which the right-hand corner 35 of the hole 16 is supported on the pin 15 by the relaxing spring 24. During this suddenly accomplished rotation of the member 13 the impulse point 18 only for a moment steps out of the crest circle 19 and thereby strikes against the tooth 39 of the disc 1 lying in front of it, while leaving the tooth gap suddenly after having given the impulse to the tooth 39 in order to go back into the space inside the crest circle 19 to the position shown in FIG. 4 so that throwing the disc 1 forward by one pitch is not prevented by the next following tooth striking against the member 13. After the lapse of 24 hours the above-described process is repeated.

The triangular shape of the hole 16 would not be necessary for executing the above-described translatory and rotational movements of the member 13. An elongated slot formed by the corners 35 and 37, the edge 36 and an edge parallel to edge 36 would be sufficient provided that the width of the slot is made larger than the diameter of the pin 15 by the necessary sliding clearance. However, the triangular shape of the hole 16 offers the advantage of enabling an anticlockwise return movement (FIG. 8) of the date indicator driving wheel 11 in any operating position of the device without running the risk of having disadvantageous consequences for the mechanism. Furthermore, the triangular hole facilitates the mounting of the member 13 since the pin head 14 securing the member 13 in axial direction can be passed through the triangular hole 16. As may be seen in FIG. 8, the member 13 on an anticlockwise backward rotation of wheel 11 is translatorily moved upwards by the pin 12 bearing against the back edge 40, the member 13 during this movement tightening the spring 24. The translatory movement of the member 13 towards the top is continued until the lower edge 41 of the triangular hole 16 strikes against the pin 15 and the pin 11 glides off the back 40 whereupon the member 13 is brought back to the position of FIG. 4 by the constraint of the tightened spring 24. Also during this movement the impulse point 18 permanently remains inside the crest circle 19, that is, outside a tooth gap of the disc 1.

As the impulse point 18 of the impulse member 13 always enters a tooth gap of the disc 1 for a very short moment only, operating the corrector of the watch is possible at any time and without particular attention.

While I have described and illustrated one embodiment of my invention I do not wish to be limited thereto but reserve the right to make such modifications and rearrangements of the several parts that may come within the purview of the appended claims.

I claim:

1. A watch including a rotatable indicator member adapted to be jump operated, an indicator member driving wheel, a driving pin carried by the driving wheel, an impulse member for jump rotation of the indicator member responsive to rotation of the driving wheel, the impulse member having a triangularly shaped opening therein provided a plurality of bearing surfaces, a carrying pin alternatively adapted to engage the bearing surfaces, and spring means urging the impulse member into position so that it is carried by one of said bearing surfaces, a portion of the periphery of the impulse member forming a cam surface adapted to be contacted by the driving pin of the driving wheel to shift the position of the impulse member so that it is carried from one to another of the plurality of bearing surfaces and the impulse member is normally operatively spaced from the indicator member but is moved into operative contact therewith solely during the period of jump operation of the impulse member for jump movement thereof.

2. A watch including a rotatable indicator member having a toothed inner surface and adapted to be jump operated, an indicator driving wheel powered by the watch, a driving pin carried by the driving wheel, an impulse member having a tooth to engage the toothed inner surface of the indicator member, the impulse member having a triangularly shaped opening therein providing pivoting positions at least at two of the apexes of the triangularly shaped opening and a sliding bearing surface therebetween, a carrying pin extending into the opening for the support of the impulse member, a spring urging the impulse member against its carrying pin, a portion of the periphery of the impulse member forming a cam surface adapted to be contacted by the driving pin of the driving wheel during at least a portion of a rotation of the driving wheel to shift the position of the impulse member from one to another of the apexes of the triangularly shaped opening, normally the impulse member held against one of its pivoting positions by the spring and its tooth held away from contact with the toothed surface of the indicator member, the movement of the carrying pin against the cam surface causing the impulse member to be slid inwardly along the sliding bearing surface and be carried by the other pivoting position, further movement causing the impulse member to slide back to said one bearing surface and become cocked, still further movement releasing the impulse member so that its tooth contacts the toothed surface of the indicator member causing a jump operation thereof.

3. A watch including a rotatable internally toothed indicator member adapted to be jump operated, the inner tips of the indicator member teeth defining a crest circle, an indicator member driving wheel, an impulse member for jump rotation of the indicator member responsive to rotation of the driving wheel, mounting means for the impulse member, means on the driving wheel cooperating with means on the impulse member to move the impulse member radially and rotatively with respect to said mounting means, and normally holding the impulse member away from operative engagement with the indicator member and entirely within the crest circle excepting at the moment of impulse, and means

adapted to move the impulse member radially and rotatively with respect to the mounting means into operative engagement with the indicator member during the period of jump operation of the impulse member.

4. A watch according to claim 3 in which the mounting means for the impulse member includes a plurality of bearing surfaces, and in which the means on the driving wheel cooperating with means on the impulse member is a pin cooperating with a cam surface so that the impulse member is carried from one bearing surface to another.

5. A watch according to claim 3 in which the mounting means for the impulse member includes means forming at least one opening therein, the walls thereof providing a plurality of bearing surfaces, and a supporting pin to successively engage the bearing surfaces so that the impulse member is moved radially and rotatively as described.

References Cited in the file of this patent

UNITED STATES PATENTS

695,217	Lanckton	Mar. 11, 1902
1,458,528	Emery	June 12, 1923
2,682,775	Thomas	July 6, 1954
2,917,933	Harris	Dec. 22, 1959

FOREIGN PATENTS

338,766	Switzerland	July 15, 1959
339,129	Switzerland	July 31, 1959