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Meylan-Piguet

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[54] **DAY-DATE WATCH CORRECTION MEANS**

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[52] **U.S. Cl.** **58/58**

[51] **Int. Cl.** **G04b 19/24**

[58] **Field of Search** 58/4, 5, 58

[56] **References Cited**

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Attorney, Agent, or Firm—Stevens, Davis, Miller & Mosher

[57] **ABSTRACT**

A day-date watch wherein the setting stem can be axially positioned to adjust a correction wheel-and-pinion meshing with a setting wheel, wherein in one position the day or date can be corrected and in another position the time can be set.

6 Claims, 4 Drawing Figures

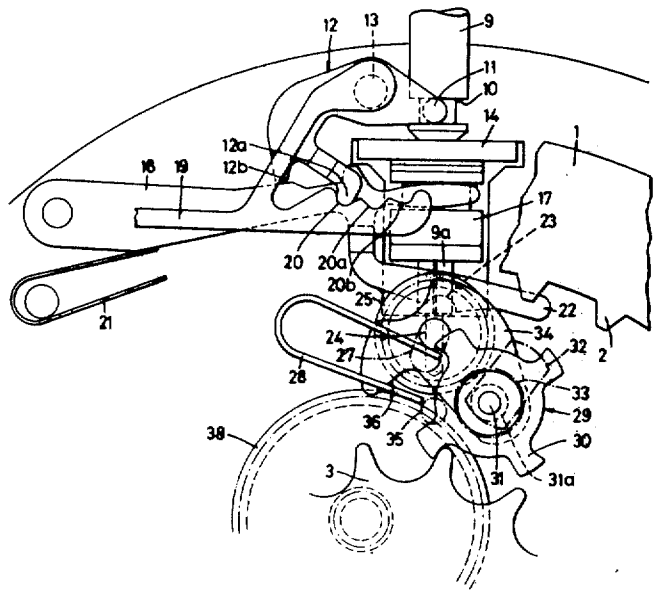

FIG. 1

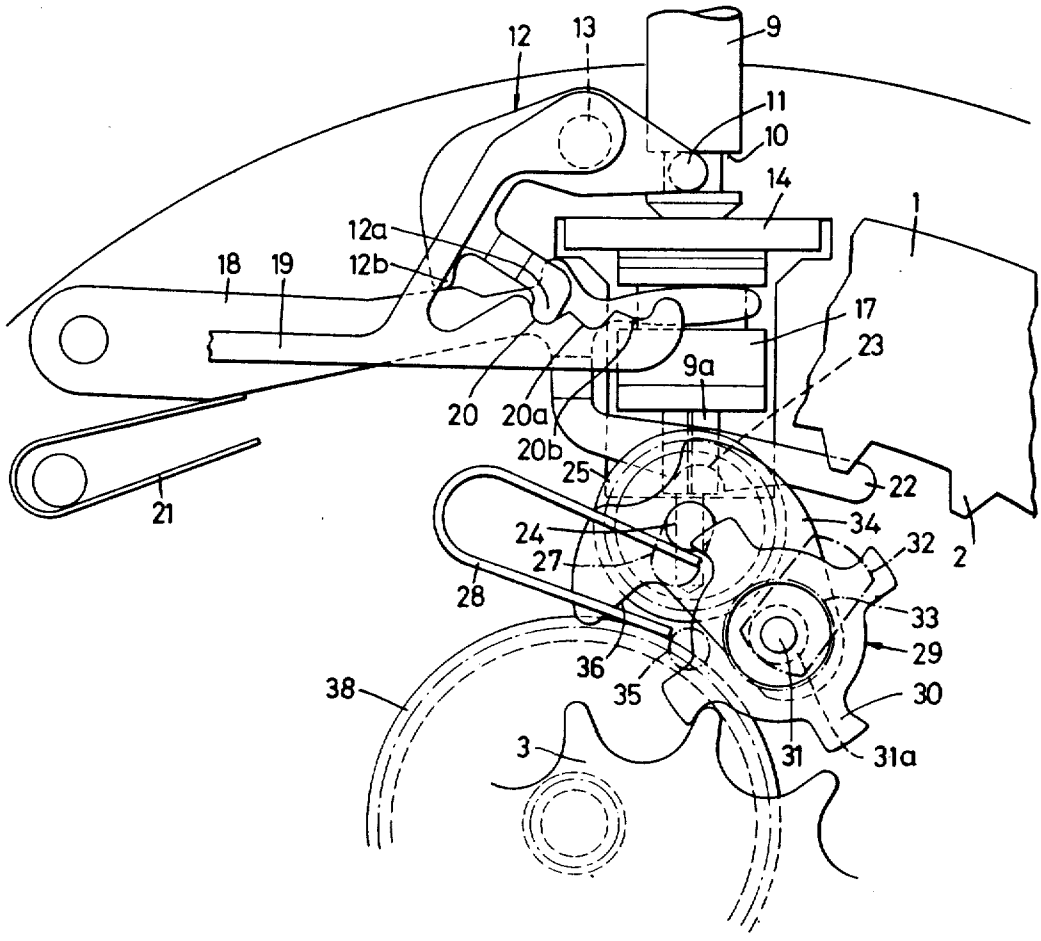
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FIG. 2

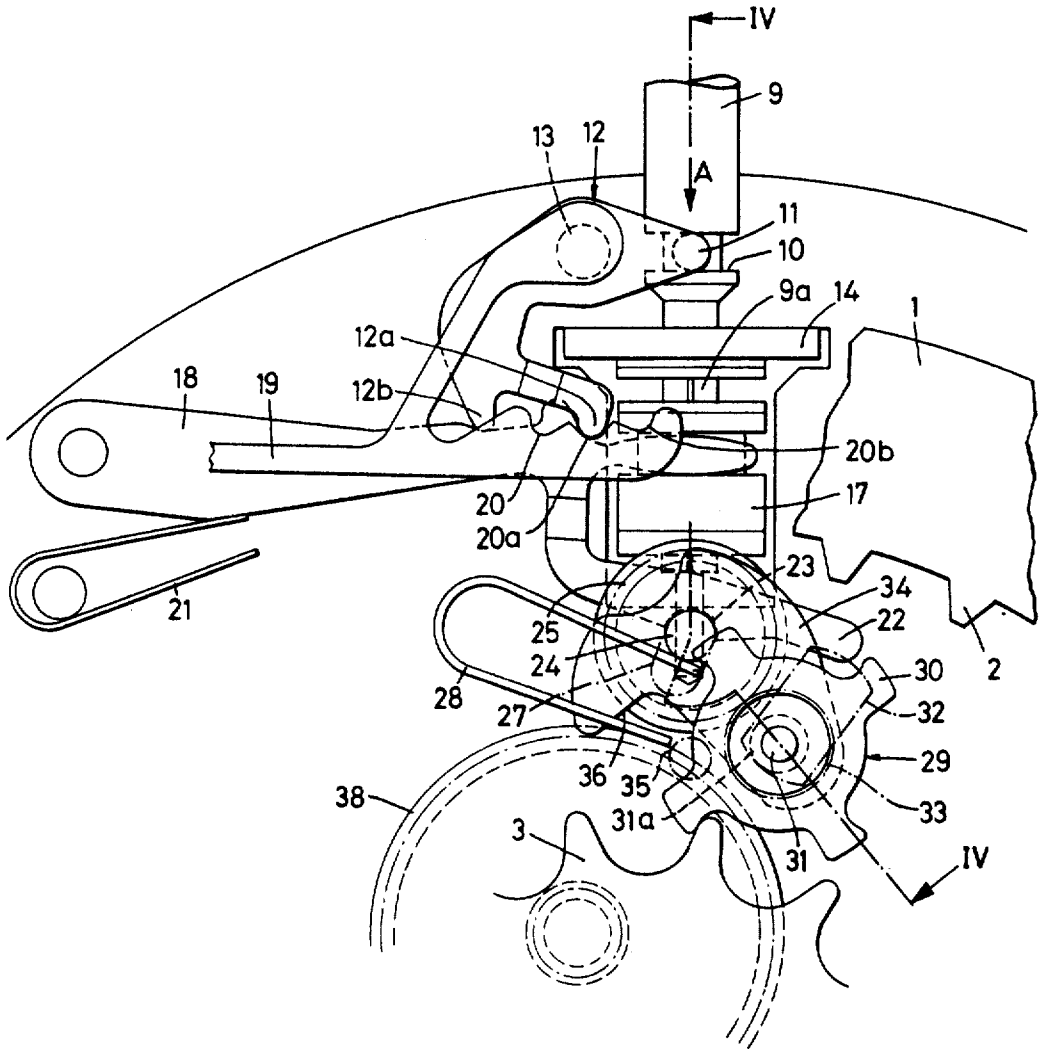
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FIG. 3

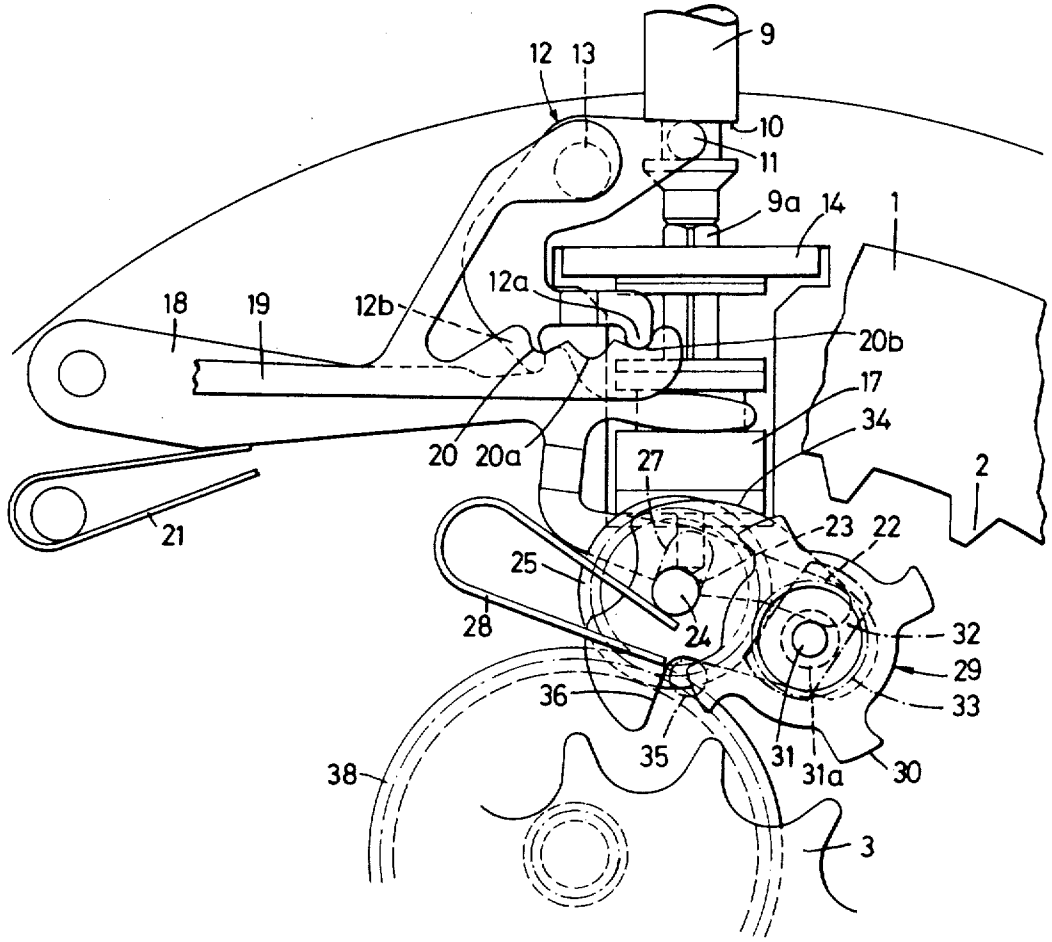
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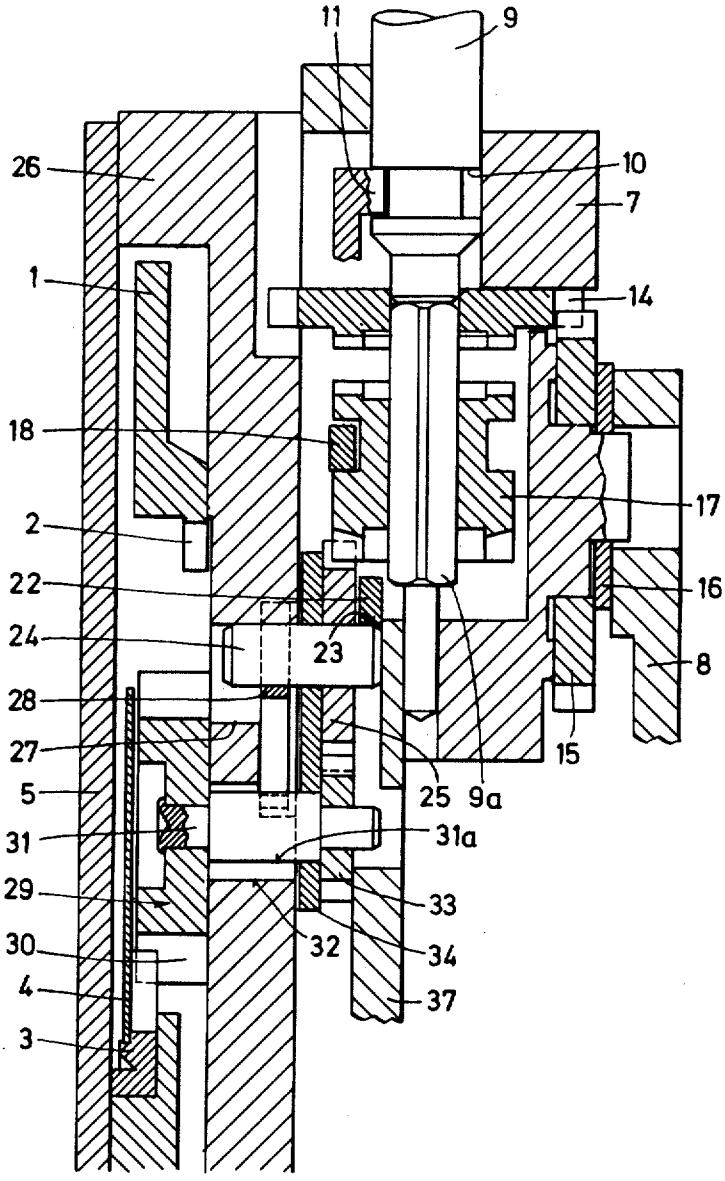
FIG. 4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DAY-DATE WATCH CORRECTION MEANS

This invention relates to a calendar watch movement comprising two coaxial indicator members indicating the day and the date, respectively, a control stem capable of occuping several positions determined by axial displacement, a setting-lever cooperating with the control stem, a clutch-wheel mounted on a square of the stem, a yoke controlled by the setting-lever and controlling the clutch-wheel, and a setting-wheel which is engaged with the clutch-wheel is at least one of the positions of the stem.

It will well known that calendar timepieces, especially those having a day-indicating member and a date-indicating member, are generally equipped with a correction mechanism making it possible to set these two indicating members to the correct day and date quickly and by means of a simple operation. Thus certain day/-date watches are equipped with correction mechanisms which enable the day and date to be set by manipulating only the control stem which, in mechanical timepieces, also serves for winding the mainspring. However, the known mechanisms for carrying out these operations are complicated and bulky. They generally comprise a large number of different parts between the control element and the correction wheel-and-pinion, which increases the cost price and the size of the watch. Moreover, the complicated mechanisms are often less reliable that simple mechanisms.

It is the object of the present invention to provide a correction mechanism, especially for use in calendar wrist-watches, which comprises a minimum number of parts, is easy to mount, and is reliable in operation.

To this end, in the calendar watch movement according to the present invention, the setting-wheel is integral with an arbor which projects from each of its faces, a correction lever pivots by friction fitting on an arbor and carries a correction wheel-and-pinion provided with a toothing engaged with the setting-wheel, the arbor is movable in translation, at least one of its ends being engaged in an elongated slot in a fixed frame element, and cooperates with the clutch-wheel in two positions of the stem, and the yoke has an auxiliary arm which extends at the level of one of the projecting portions of the arbor and which displaces the arbor in the elongated slot when the stem is moved between one of the positions, being the correction position, and the other position, being the setting position.

A preferred embodiment of the invention will now be described with reference to the accompanying drawing, in which:

FIGS. 1, 2, and 3 are plan views of the mechanism in winding position, correction position, and setting position, respectively, certain parts being broken away, and

FIG. 4 is section taken on the line IV—IV of FIG. 2, on a larger scale.

The timepiece illustrated in the drawing is a mechanical calendar wrist-watch comprising a date-indicating member 1, consisting of a ring with an inner toothing 2, and a day-indicating indicating member 3, comprising a 14-tooth star integral with a disc 4 (FIG. 4). The disc 4 bears the indications of the days of the week on its upper face. The members 1 and 3 move beneath a circular dial 5 having apertures (not shown), and above the dial 5 move hands driven by the movement. The wheel-trains of the movement will not be described here. Its frame comprises a base plate 7 and various bridges, among which is a barrel bridge 8. The base

plate 7 has radial openings in it so as to ensure the guiding and pivoting of a winding and setting stem 9 of conventional form which exhibits in particular a groove 10 in which is engaged a stud 11 of a setting-lever 12 mounted on a screw 13. A winding-pinion 14, which meshes with a crown-wheel 15, pivots about the stem 9, turning on a collet protruding from the lower face of the base plate 7. It is held in place by a washer 16 and by the bridge 8. A clutch-wheel 17, controlled by a yoke 18 cooperating with the setting-lever 12, slides on a square 9*a* of the stem 9.

As will be seen further on, the mechanism shown in the drawing is a three-position mechanism, so that a setting-lever spring 19, which holds the setting-lever 12 and the yoke 18 in place in the direction of the axis of the watch, has three notches 20, 20*a*, and 20*b*, into each of which a beak 12*a* of the setting-lever 12 enters in succession when the stem 9 is pulled. The beak 12*a* is bend upwards slightly so as to reach the lever of the setting-lever spring 19. A beak 12*b* of the setting-lever 12 controls the yoke 18, against which a yoke spring 21 presses, and which can assume three different positions according to the position of the stem 9.

The yoke 18 is blanked with lateral arm 22, bent slightly downwards, and passes in front of the clutch-wheel 17 and above the stem 9. Above the axis of the stem 9, the arm 22 has a hollow 23 adapted to engage on the lower end of an arbor 24, consisting of a simple cylindrical pin, onto which a setting-wheel 25 is driven. This latter part may be mounted in a recess in the base plate 7 in such a way that the lower end of the arbor 24 could enter an undercut in the bottom of that recess, in which undercut the arm 22 of the yoke 18 would likewise extend. At its upper end, the arbor 24 is guided by a mechanism bridge 26 fixed on the base plate 7 and extending under the dial 5. This bridge 26 serves for the mounting of the mechanism assembly described. As may be seen in FIG. 4, it carries the date-ring 1 and the day-star 3. For guiding the arbor 24 of the setting-wheel 25, it has an elongated slot 27, the width of which is adapted to that of the arbor 24 and which extends in a direction which is slightly oblique as compared with that of the axis of the stem 9. As will be seen further on, this direction is perpendicular to that of the line joining the center of the slot 27 and the pivoting axis of the yoke 18. The mechanism bridge 26 also carries a hairpin spring 28 which presses against the arbor 24 and tends to push it towards the end of the slot 27 nearest the periphery of the movement.

Also mounted on the mechanism bridge 26 is a correction wheel-and-pinion 29. It is composed of a four-armed 30, of an arbor 31, on the upper end of which the star 30 is clinched and the middle part of which passes through a rectangular opening 32 in the bridge 26, and of a correction pinion 33 driven onto a small-diameter cylindrical bearing surface at the lower end of the arbor 31 at the level of the setting-wheel 25. The lower bearing surface of the arbor 31 is prolonged under the pinion 33 in an undercut which serves to accomodate the lower end of the arbor 24 and the arm 22 of the yoke 18. This unndercut is made in a retaining plate 37 fixed to the base plate 7. The plate 37 might also be made in one piece with the base plate 7. Thus in a certain position, the end of the arm 22 may also come in contact with the lower end of the arbor 31.

As may be seen in FIG. 4, the setting-wheel 25 and the pinion 33 are not situated immediately below the

bridge 26, for a correction lever 34, the plan shape of which is shown in FIGS. 1, 2 and 3, is mounted between those elements. The lever 34 has two circular openings; one is friction fitted on the arbor 24, and through the other the arbor 31 passes freely. These openings are so spaced from one another that the setting-wheel 25 and the pinion 33 are kept constantly engaged with one another.

Before turning to an explanation of the operation of the mechanism described, mention should be made of the presence of a banking 35, consisting of a cylindrical stud projecting downwards from the bridge 26, and a hollow 36 in the edges of the lever 34.

FIG. 1 shows the mechanism in the winding position. The stem 9 is pushed in all the way, so that the beak 12*a* of the setting-lever 12 is engaged in the notch 20 of the setting-lever spring 19. The yoke presses the Brequet toothing of the clutch-wheel 17 into the correspondong Brequet toothing of the winding-pinion 14 owing to the action of the yoke spring 21. These elements of the mechanism are completely conventional parts, and they perform their normal winding function here. The hairpin spring 28 causes the arbor 24 of the setting-wheel 25 to press against the outer end of the slot 27; but in this position, the setting-wheel 25 is disengaged from the winding-pinion 14. The lever 34 may oscillate freely between two positions without its position having an influence of any kind. In FIG. 1, a cylindrical bearing surface 31*a* of the arbor 31 presses against the inner flank of the opening 32, and it will be seen that the toothing of the star 30 meshes with the toothing of the day-star 3. However, inasmuch as the setting-wheel 25 is free to rotate about its axis, if the calendar mechanism is called upon to switch the day-star 3 to a new position, the star 30 will not constitute any hindrance. The lever 34 could likewise rotate about the axis of the arbor 24 until the bearing surface 31*a* of the arbor 31 strikes against the outer flank of the opening 32, which would bring the toothing of the star 30 into engagement with the toothing 2 of the date-ring; but in this position, too, the engagement of the toothings of the star 30 and the date-ring 1 has no influence. It will also be noted that in the position shown in FIG. 1, the lateral arm 22 of the yoke 18 extends in the vicinity of the axial toothing of the clutch-wheel 17, so that the hollow 23 is moved away from the arbor 24. The part played by this hollow 23 will become apparent only in another position, as will be seen later on.

FIG. 2 shows the positions occupied by the various members of the mechanism when the stem 9 has been pulled out into its middle or correction position. The setting-lever 12 is so positioned that its beak 12*a* has passed into the notch 20*a* of the setting-lever spring 19; and its beak 12*a*, sliding along the edge of the yoke 18, has moved the latter so that the axial toothing of the clutch-wheel 17 has come to mesh with the setting-wheel 25. The latter has not undergone any translatory motion. The hairpin spring 28 is therefore still pressing the arbor 24 against the outer end of the slot 27. However, the hollow 23 is now engaged on the lower end of the arbor 24, so that the arbor 24 is guided at least partially by its upper end engaged in the slot 27 and by its lower end engaged in the hollow 23. If, in that position, the stem 9 is turned counterclockwise, as view in the direction of the arrow A in FIG. 2, the setting-wheel 25 is driven clockwise by the clutch-wheel 17, and the correction wheel-and-pinion 29 is driven counterclockwise. At the same time, owing to the friction between the lever 34 and the arbor 24, the lever 34 tends to pivot clockwise and, consequently, to press the bearing surface 31*a* of the arbor 31 against the flank of the opening 32. All these conditions favor the guiding of the setting-wheel 25, which will drive the correction wheel-and-pinion 29 while its toothing remains engaged with that of the day-star 3. Thus the day-star 3 is rotated step by step clockwise, as viewed in FIG. 2, which produces the correction of the day-indicating member.

The normal direction of rotation of the day-star 3 is counterclockwise, i.e, the reverse of the correction direction. Thus it is impossible to correct the day when the calendar-driving mechanism is engaged with the day-star 3; for upon turning the stem 9, a tooth of the corrector 29 is blocked by a tooth of the day-star 3. The star 30 of the corrector 29 is friction-mounted on the arbor 31 connecting it to the pinion 33, which thus enables the wheel 25 and the pinion 33 to rotate without causing any damage.

If, on the contrary, the stem 9 is turned clockwise, as viewed in the direction of the arrow A in FIG. 2, the setting-wheel 25 is driven counterclockwise; and as a result of the friction existing between the arbor 24 and the corresponding opening in the lever 34, the latter will likewise be rotatingly driven in the same direction. This rotation is limited by the bearing surface 31*a* of the arbor 31 striking against the outer flank of the opening 32. The correction wheel-and-pinion 29 will be disengaged from the toothing of the day-star 3 and will enter the toothing 2 of the date-ring 1. At the same time, it is rotatingly driven clockwise and will thus cause the date-ring 1 to turn in the same direction, thus effecting the step-by-step correction of the date-indicating member. The respective positions of the two indicating members for the day and the date are, of course, normally fixed by jumpers, one acting upon the toothing of the member 3 and the other upon the toothing 2. Upon correction of the date-ring 1, too, the spring 28 acts upon the arbor 24 so as to press its upper end against the outer end of the slot 27 and its lower end into the hollow 23 of the arm 22. In this position (not shown) the flank of the hollow 36 of the lever 34 rests against the banking 35, thus keeping the toothings of the setting-wheel 25 and the clutch-wheel 17 engaged during the effort of moving the date-ring 1.

FIG. 3 shows the winding-stem 9 in its outermost position, i.e., in the setting position. The beak 12*a* of the setting-lever 12 has passed into the notch 20*b* of the setting-lever spring 19, and the beak 12*a*, continuing to act upon the edge of the yoke 18, has caused a new rotation of the latter, consequently moving the clutch-wheel 17 closer to the center of the movement than in the position of FIG. 2. During this displacement, the arm of the yoke 18 has caused a displacement of the setting-wheel 25, for the hollow 23 in contact with the arbor 24 has moved this arbor so that its upper end travels the whole length of the slot 27, and this against the counteraction of the spring 28. So that the hollow 23 may be arcuate, the alignment of the slot 27 is perpendicular to the line joining the center of this slot to the pivoting point of the yoke 18. The movement of the setting-wheel 25 obviously results in a displacement of the lever 34. The translation of its pivoting point brings the deepest part of the hollow 36 along its inner edge up against the banking 35, so that at the same time, the

lever 34 makes a rotating movement. On the other hand, once the setting position has been reached, the banking 35 is in contact with the deepest part of the hollow 36, so that any clockwise rotation of the lever 34 is prevented. As may be seen in FIG. 3, the end of the arm 22 of the yoke 18 is likewise in contact with the lower end of the arbor 31, which prevents any counter-clockwise rotation of the lever 34. The arm 22, the hollow 36, and the banking 35 thus constitute means for blocking the lever 34, and in the setting position, they keep the lever 34 in a position such that the setting correction star 30 meshes neither with the day-star 3 nor with the date-ring 1. Thus the lever 34 is blocked in an inoperative position.

A minute-wheel 38 is disposed on the base plate 7 in such a way that the setting-wheel 25 meshes with its wheel-toothing when the wheel 25 is brought into the position shown in FIG. 3. Thus a rotation of the stem 9 is transmitted to the clutch-wheel 17 via the square 9*a*, from the wheel 17 to the wheel 25, and from the wheel 25 to the minute-wheel 38. The stem 9 may be turned in one direction or the other. The lever 34 remains continuously in the position shown in FIG. 3, and the correction wheel-and-pinion 29 idles with the setting-wheel 25.

All in all, the mechanism described comprises just three parts more than a conventional two-position winding and setting mechanism: the correction lever 34, the spring 28, and the correction wheel-and-pinion 29. The mechanism as a whole is so arranged as to operate reliably with no risk of jamming. Moreover, the mechanism may be mounted very simply. In particular, thanks to the mechanism bridge 26 on which the correction wheel-and-pinion 29, the correction lever 34, and the setting-wheel 25 with its return-spring may be mounted in advance, the fitting of the mechanism is considerably simplified.

Although the foregoing embodiment has to do with a mechanical watch, the essential elements of the mechanism described above might also be used in an electrical timepiece. The winding position would then be a neutral or inoperative position.

What is claimed is:

1. A calendar watch movement comprising two coaxial indicator members indicating the day and the date, respectively, a control stem capable of occupying several positions determined by axial displacement, a setting-lever cooperating with said control stem, a clutch-wheel mounted on a square of said stem, a yoke controlled by said setting-lever and controlling said clutch-wheel, and a setting-wheel which is engaged with said clutch-wheel in at least one of the positions of said stem, wherein said setting-wheel is integral with an arbor which projects from each of its faces, a correction lever pivots by friction fitting on said arbor and carries a correction wheel-and-pinion provided with a toothing engaged with said setting-wheel, said arbor is movable in translation, at least one of its ends being engaged in an elongated slot in a fixed frame element, and cooperates with said clutch-wheel in two positions of said stem, and said yoke has an auxiliary arm which extends at the level of one of the projecting portions of said arbor and displaces said arbor in said elongated slot when said stem is moved between one of said positions, being the correction position, and the other of said positions, being the setting position.

2. A movement in accordance with claim 1, wherein said correction wheel-and-pinion comprises a further arbor, engaged in an opening in said correction lever so as to pivot in said opening, and a star integral with said further arbor and situated at the level of said indicator members, and wherein said further arbor passes through an elongated opening in said frame element.

3. A movement in accordance with claim 1, wherein one of the said projecting parts of said arbor cooperates with a spring which tends to keep said arbor in contact with one of the ends of said elongated slot, and the displacement of said arbor by said auxiliary arm is effected against the action of said spring.

4. A movement in accordance with claim 3 wherein, one said spring keeps said arbor pressed against one of the ends of said elongated slot, said correction lever is oscillatingly rotatable about said arbor, the amplitude of the oscillating movement being such that said correction wheel-and-pinion meshes with one of said indicator members in each of the end positions.

5. A movement in accordance with claim 4, further comprising a fixed banking disposed at the level of one of the edges of said correction lever and limiting the oscillating rotation of said correction lever about said arbor, said banking cooperating with said correction lever so as to prevent said correction wheel-and-pinion from actuating one said indicator member when said stem is in the setting position but allowing said correction wheel-and-pinion to actuate said one indicator member when said stem is in the correction position.

6. A movement in accordance with claim 5, wherein said auxiliary arm faces a part of said correction wheel-and-pinion and constitutes a banking element which, in the correction position, allows said correction wheel-and-pinion to become engaged with the other said indicator member, and in the setting position, prevents said correction wheel-and-pinion from meshing with said other indicator member.

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