

PATENT SPECIFICATION

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DRAWINGS ATTACHED

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(54) CALENDAR TIMEPIECE

(71) We, KABUSHIKI KAISHA DAINI SEIKOSHA, a Japanese company, of 47, 6-chome, Kameido-cho, Koto-ku, Tokyo, Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to improvements in calendar timepieces, and is an improvement in or modification of the invention disclosed in our Application No. 29186/68, (Serial No. 1,168,745).

In the said Application, there was claimed a calendar timepiece including a date correcting mechanism, a rotary stem, coupling means associated with said stem for selectively coupling the stem either to the hands-setting mechanism of the timepiece, or to the date correcting mechanism so as to permit a direct date correction to be effected by rotation of said stem. However, in that Application no provision was made for day indication correction.

According to the present invention, there is provided a calendar timepiece including date indicating means and day indicating means, a date and day indication correcting mechanism, a rotary stem, coupling means associated with said stem for selectively coupling the stem either to the hands-setting mechanism of the timepiece, or to said correcting mechanism so as to permit a direct date or day indication correction to be effected by rotation of said stem, the arrangement being such that when the stem is coupled to the said correcting mechanism, rotation of the stem in one angular sense effects correction of the date indication only, while rotation of the stem in the opposite angular sense effects correction of the day indication only.

Preferably the said coupling means is a displaceable clutch wheel having a set of teeth meshable with a set of teeth of a gear wheel which forms part of the said correcting mechanism.

Advantageously, said stem is axially movable to a hands-setting position and to a date and day correcting position, there being a setting mechanism which is sensitive to the

movement of said stem to set the coupling means to a position appropriate to the position of the stem.

Preferably, the stem is connected with a setting lever which is provided with a substantially quadrilateral recess, a pivotally mounted corrector wheel lever for controlling a corrector wheel and having a part engagingly received in said recess, the said gear wheel being an intermediate wheel engageable with the hands-setting mechanism and being adapted to mesh with said corrector wheel, the arrangement being such that in the hands-setting position the said intermediate wheel meshes with the hands-setting mechanism and the corrector wheel is out of driving engagement with the date ring or the day wheel, while in the date or day correcting position, the corrector wheel is moved into engagement with the date ring or with the day wheel in dependence upon the sense of rotation of the stem.

The invention will be illustrated, merely by way of example, in the accompanying drawings, in which:

Figure 1 is a plan view of parts of a calendar watch in accordance with the present invention, showing the winding stem in its mainspring winding position,

Figure 2 is a view similar to Figure 1, but showing the winding stem in its date correcting position,

Figure 3 is a view similar to Figures 1 and 2, but showing the winding stem in its day correcting position, and

Figure 4 is a view similar to Figure 1, but showing the winding stem in its hand-setting position.

Referring to the drawings, there is shown parts of a calendar watch including a rotary stem 1, one end of which is adapted to extend beyond the watch case 20, and to which is secured a crown (not shown) for setting the time indicating hands thereof.

A setting lever 4 is pivotally connected to the stem by a pin, the lever 4 being pivotally mounted at 5, and being provided with a fixed pin 4a adapted to co-operate with notches or recesses 7a, or 7b, or 7c formed in a setting lever spring 7.

5 The setting lever 4 is formed with a substantially quadrilateral aperture 4b which is arranged to receive a pin 11a projecting downwardly (as viewed) from the end of one arm of a corrector lever 11 which is mounted pivotally on a pin 14 and which carries on its other arm a corrector wheel 13 which is mounted coaxially with an intermediate gear wheel 12 for rotation therewith. The intermediate wheel 12 is in permanent meshing engagement with a gear wheel 8.

10 A setting wheel lever 9 is pivotally mounted on pin 14 and has at one end thereof a pin 9a which projects downwardly to contact the edge of the setting lever 4. Its other end carries the gear wheel 8.

15 A yoke 6 is provided at one end with a biasing spring 15 and at the other end is fitted into a groove on a clutch wheel 2 axially slidably mounted on the stem 1. Thus the yoke 6 constitutes, with the setting lever 4, a clutch engaging mechanism.

20 The said groove in the clutch wheel 2 separates the clutch wheel 2 into two axially spaced parts the upper of which (as viewed) is provided with an axially extending set of teeth at its upper end adapted to mesh with a set of teeth on the lower end of a winding wheel 3. Moreover, the lower end of the lower part is in the form of a bevel gear adapted to mesh with the gear wheel 8 (Figure 2).

25 Figure 1 also shows a minute wheel 19 forming part of a gear train, a date ring 16 shown in phantom lines and having the date (i.e. date in a month) printed on a date dial (not shown) associated therewith, an intermediate day corrector wheel 17 and a day star wheel 18, also shown in phantom lines and having the days of the week printed on a day dial (not shown) associated therewith.

30 In the position illustrated in Figure 1, the date and day correcting mechanism is shown in its neutral position. That is to say, the corrector wheel 13 is out of engagement both with the date ring 16 and with the wheel 17. In this position, any rotation of the stem 1 is transmitted *via* the clutch wheel 2 to the winding wheel 3 on the stem 1, and from there to a crown-and-ratchet mechanism (not shown) to wind the mainspring (not shown).

35 The stem 1 is movable to three axially spaced positions by pulling it outwardly by means of the crown. Figure 2 illustrates the position where the stem 1 has been pulled slightly outwardly with respect to its Figure 1 position. Whereas in the Figure 1 position the pin 11a was substantially restrained from movement by being held in one corner of the aperture 4b, now outward movement of the stem 1 causes the setting lever 4 to pivot in a clockwise direction (as viewed), and this rotation causes the pin 4a to disengage from

65 the recess 7a and engage in the recess 7b; at the same time the pin 11a moves to an adjacent corner of the recess or aperture 4b and will be free to move diagonally across the recess 4b. Also, the setting lever 4 will push the yoke 6 and the clutch wheel 2 along the winding stem 1 to its Figure 2 or Figure 3 position in which the bevel gear of the lower portion meshes with the teeth of the wheel 8. In this state rotation of the stem 1 in a counterclockwise direction will cause the rotation to be transmitted, as shown by the arrows A in Figure 2, *via* the bevel gear to the wheel 8 and to the wheels 12 and 13 to effect a date correction, the wheel 13 meshing with the date ring 16.

70 If, on the other hand, the stem 1 is turned clockwise (Figure 3), rotation of the various parts will be in the direction indicated by arrows B, the pin 11a having diagonally crossed the aperture or recess 4b and now the wheel 13 is in meshing engagement with the wheel 17 so as to effect a day correction *via* the day star wheel 18 which now meshes with the intermediate wheel 17.

75 Turning now to Figure 4, this shows the position of the parts described so far when the stem 1 is pulled out a further predetermined amount from its position shown in Figure 2 or Figure 3. The result of this movement is that the lever 4 turns clockwise about its pivot 5 and the pin 4a will disengage from the recess 7b and engage in the recess 7c. At the same time, the lever 4 will push the yoke 6 downwardly, and with the pin 11a having moved to the corner of the recess 4b diagonally opposite to the neutral position corner, the gear wheel 8, which is in meshing engagement with the bevel gear of the clutch 2, will be moved into meshing engagement with the teeth of the minute wheel 19. Thus, in the Figure 4 position, rotation of the stem 1 will cause rotation of the time-indicating hands of the timepiece, while the corrector wheel 13 is permitted to return to its neutral position in which it in no way interferes with the motion of either the date ring or the day star wheel.

80 It will be noted that the illustrated embodiment of the present invention provides a calendar watch having a date and day correcting mechanism which involves only very few additional parts not already provided for in conventional watch construction. In other words, the clutch wheel used for transfer between winding and hand setting in conventional, not self-winding, watches is employed for correcting the day and date also. Thus, there is provided an extremely simple and effective mechanism which avoids the expense of and complications resulting from using many additional parts for correcting the day and the date. This clearly simplifies the repair, assembly and dis-assembly of watches compared to those

which have large extra mechanisms added purely for correcting the day and the date.

While the above description has been given with respect of a manually wound watch, it is to be understood that the invention is not so restricted and it can be applied to other timepieces.

British Patent Specification No. 1,182,398 in the name of our associate company claims a calendar timepiece having date and day indicating means including, respectively, a date ring and a day wheel, a correcting mechanism for correcting the indication of said date and day indicating means and including a correcting member selectively engageable with said date ring or with said day wheel, a setting device being settable to a plurality of positions one of which is a date and day indication correcting position and in which said setting device is operatively connected to said mechanism, the arrangement being such that when said setting device is in said position, rotation thereof in one direction causes correction of the date indication only, while rotation of said device in the opposite direction causes correction of the day indication only, another of said positions being a time-indicating hands setting position in which said setting device is disconnected from said mechanism and said correcting member is out of engagement with both the said date ring and the said day wheel.

British Patent Specification No. 1,140,930 in the name of our associate company claims a calendar timepiece having date and day indicating means, a correcting mechanism for correcting the indication of said date and day indicating means, a setting device being settable to a plurality of positions one of which is a date and day indication correcting position and in which said setting device is operatively connected to said mechanism, the arrangement being such that when said setting device is in said position, rotation thereof in one direction causes correction of the date indication only, while rotation of said device in the opposite direction causes correction of the day indication only.

WHAT WE CLAIM IS:—

1. A calendar timepiece including date indicating means and day indicating means, a date and day indication correcting mechanism, a rotary stem, coupling means associated with said stem for selectively

coupling the stem either to the hands-setting mechanism of the timepiece, or to said correcting mechanism so as to permit a direct date or day indication correction to be effected by rotation of said stem, the arrangement being such that when the stem is coupled to the said correcting mechanism, rotation of the stem in one angular sense effects correction to the date indication only, while rotation of the stem in the opposite angular sense effects correction of the day indication only.

2. A calendar timepiece as claimed in claim 1 wherein the said coupling means is a displaceable clutch wheel having a set of teeth meshable with a set of teeth of a gear wheel which forms part of the said correcting mechanism.

3. A calendar timepiece as claimed in claim 1 or 2 wherein said stem is axially movable to a hands-setting position and to a date and day correcting position, there being a setting mechanism which is sensitive to the movement of said stem to set the coupling means to a position appropriate to the position of the stem.

4. A calendar timepiece as claimed in claim 2 or 3 wherein the stem is connected with a setting lever which is provided with a substantially quadrilateral recess, a pivotally mounted corrector wheel lever for controlling a corrector wheel and having a part engagingly received in said recess, the said gear wheel being an intermediate wheel engageable with the hands-setting mechanism and being adapted to mesh with said corrector wheel, the arrangement being such that in the hands-setting position the said intermediate wheel meshes with the hands-setting mechanism and the corrector wheel is out of driving engagement with the date ring or the day wheel, while in the date or day correcting position, the corrector wheel is moved into engagement with the date ring or with the day wheel in dependence upon the sense of rotation of the stem.

5. A calendar timepiece substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

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