

PATENT SPECIFICATION

DRAWINGS ATTACHED

1.182.398

1.182.398



Date of Application and filing Complete Specification: 4 June, 1968.

No. 26587/68.

Application made in Japan (No. 63987) on 26 July, 1967.

(Patent of Addition to No. 1140930 dated 15 Dec., 1967).

Complete Specification Published: 25 Feb., 1970.

Index at acceptance: —G3 TC1B

International Classification: —G 04-b 19/24

COMPLETE SPECIFICATION

Calendar Timepiece

We, KABUSHIKI KAISHA SUWA SEIKOSHA, a Japanese company of 5—19, 4-chome, Ginza-Nishi, Chuo-ku, Tokyo, Japan, do hereby declare the invention, for which we

5 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:—

10 This invention relates to calendar timepieces of the type having date and day indicating means, and is an improvement in or modification of the invention described and claimed in our Patent No. 1,140,930.

15 In the embodiment shown on Figures 6 to 8 of the said Patent there is shown a calendar timepiece having a crown and a stem settable to a plurality of positions in one of which the time-indicating hands of the timepiece could be set, and in another of which the

20 crown and the stem were operatively connected to a date and day indication correcting mechanism in such a way that the rotation of the crown in one direction causes a date correction to be effected, while rotation

25 of the crown in the opposite direction effects a correction of the day indication. This same crown and stem also constitute the winding mechanism for the watch and thus no extra buttons or crowns were needed for effecting a date or day indication correction. However, in Figure 8 of the said Patent, which

30 shows the arrangement of the calendar timepiece in the time-indicating hands setting position, either the date ring or the day star wheel is in engagement with a correcting wheel at all times which causes relatively large torques to be transmitted and as a result the date and day indications do not change as smoothly as might be desired.

40 The present invention seeks to eliminate the above defect.

According to the present invention there is provided a calendar timepiece having data and day indicating means including, respec-

tively, a date ring and a day wheel, a correct- 45 ing 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 50 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 55 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 correct- 60 ing member is out of engagement with both the said date ring and the said day wheel.

65 Preferably, said setting device includes a crown and an associated stem.

Preferably, said correcting member is rotatable, and locking means are provided to maintain the axis of rotation of said correcting member against displacement, when said setting device is in the hands setting position. 70

Said setting device may be pivotally connected to a setting lever, movement of said setting device to its hands setting position causing pivoting movement of said setting lever which movement simultaneously actuates said locking means to maintain the axis of rotation of the correcting member and effects 75 coupling between the setting device and a minute wheel of the timepiece, whereby to enable setting of the time-indicating hands of the timepiece.

Said correcting member may be a correcting wheel pivotally mounted on a pivotable correcting lever, said locking means including an intermediate pivotable lever located 85

[Price 5s. 0d.]

SEE ERRATA SLIP ATTACHED

between said setting and correcting levers and being shiftable between two positions respectively to prevent or permit pivotal movement of said correcting lever in response to the magnitude of movement of said setting device.

Preferably, the coupling between the setting device and said minute wheel includes a plurality of gear wheels one of which is in permanent mesh with the said correcting wheel.

One of said plurality of gear wheels may be mounted on a pivotable coupling lever whereby, when pivotal movement of said correcting lever is permitted, rotation transmitted from the setting device via said one gear wheel causes the correcting wheel to mesh with either the date ring or the day wheel in dependence on the direction of said rotation, and when pivotal movement of said correcting lever is prevented, said coupling lever is in a position to cause said one gear wheel to mesh with said minute wheel so as to transmit drive thereto from the setting device.

Said stem may be a winding stem of a manually wound timepiece for winding up the mainspring thereof in a further or winding position of said setting device, in which position the setting device is disconnected from said correcting mechanism and from said minute wheel.

Preferably, said setting device has a further or winding position in which the correcting member is disconnected from said date ring and from said day wheel.

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

Figure 1 is a partial plan view of a calendar timepiece in accordance with the present invention, shown in the winding position,

Figure 2 is a view similar to Figure 1, but shown in the date correcting position,

Figure 3 is a view similar to Figures 1 and 2, but shown in a day correcting position, and

Figure 4 is a view similar to the preceding Figures, but shown in a time-indicating hands setting position.

Referring to the drawings, there is shown a calendar timepiece 100 having a casing 101 through which extends a crown 1 and an associated stem 2.

A setting lever 6 is pivotally connected to the stem 2 and pivotal movement of the lever 6 controls the movement of a yoke 21. Movement of the yoke 21 in turn controls a clutch 3 which is in the form of a wheel and which may be engageable with a setting wheel 4 forming part of a gear train including gear wheels 12, 13 and 14. Also mounted on the stem 2 is a winding pinion 5 which is engageable with a crown wheel and a ratchet wheel (neither of which is shown), which are

connected to the mainspring (not shown) of the timepiece.

In the position shown in Figure 1, in which the clutch wheel 3 is disengaged from the setting wheel 4, rotation of the crown 1 causes rotation of the winding pinion 5 and thus causes the mainspring to be wound up.

It will be observed that the setting lever 6 has a nose 105 which abuts a nose 107 of a pivotally mounted intermediate lever 7. The intermediate lever 7 is formed with another nose 108 which abuts nose 109 formed on a correcting lever 9 pivoted at 10. At the other end of the correcting lever 9 is mounted the gear wheel 13.

In the position shown in Figure 1, the correcting lever 9 is substantially prevented from oscillation by the abutting engagement therewith of the intermediate lever 7, the nose 108 constituting a locking means. The gear wheel 13 is, in fact, a correction transmitting wheel and is mounted co-axially with a correcting wheel 14 for rotation therewith, the wheels 13 and 14 being pivotally mounted on the correcting lever 9.

Figure 1 also shows in phantom lines a data ring 15 which is fixed to the data dial (not shown) of the timepiece. The calendar timepiece is also provided with a day dial (not shown) which is connected to a day star wheel 17 meshing with a day correction transmitting wheel 16. The correcting wheel 14 is engageable, as will be described below, with either the day correction transmitting wheel 16 or with the date ring 15, but in the Figure 1 position the correcting wheel 14 is disengaged from both said ring 15 and wheel 16.

Referring now to Figure 2, the setting device comprising the crown 1 and the stem 2 has been moved to another position, e.g. it has been pulled out somewhat from the casing 101, when compared to its Figure 1 position. This position of the setting device may be termed the date and day indication correcting position in which the setting device is operatively connected to a correcting mechanism for correcting the indication of the date and day indicating means, as described below.

By pulling out the stem 2, the lever 6 is rotated from its position shown in Figure 1, owing to its pivotal connection to the stem 2. Rotation of the setting lever 6 will cause rotation of the yoke 21 so as to engage meshingly the clutch wheel 3 with the setting wheel 4. It will thus be observed that rotation of the crown 1 will cause this rotation to be transmitted via the clutch wheel 3, the setting wheel 4, intermediate wheel 12 and correction transmitting wheel 13 to the correcting wheel 14, the wheels 13, 14 together with correcting lever 9 constituting said correcting mechanism. It will be observed that the set-

ting wheel 4 and the intermediate wheel 12 are mounted on a pivotable lever 11 which in the Figure 2 position abuts the setting lever 6 at one end thereof and is spring biased by a spring 102 at the other end thereof.

Rotation of the setting lever 6, which is in the clockwise direction as viewed, also causes rotation of the intermediate lever 7 which is biased by a spring 8. The intermediate lever 7 is provided with a cam slot 103 through which extends a screw 104 to limit pivotal movement of the intermediate lever 7. Thus, clockwise rotation of the setting lever 6 from its Figure 1 position to its Figure 2 position causes the intermediate lever 7 to pivot under the action of spring 8, and the screw 104 will thus travel relative to the intermediate lever 7 from one end of the cam slot 103 to its other end. This displacement of the intermediate lever 7 releases the locking engagement of the intermediate lever 7 and the correcting lever 9, which latter can now rotate to a limited angular extent both clockwise and counterclockwise.

In order to effect a correction of date indication, it is necessary to bring the correcting wheel 14 into engagement with the date ring 15. If the crown 1 is turned counterclockwise (as viewed) this rotation will be transmitted to the setting wheel 4 which will then turn clockwise. Since the setting wheel 4 meshes with the intermediate wheel 12 which in turn meshes with the correction transmitting wheel 13, the latter will turn clockwise together with the correcting wheel 14. Owing to the fact that the wheels 13 and 14 are mounted pivotally on the correcting lever 9, the latter will turn clockwise and bring the correcting wheel 14 into meshing engagement with the date ring 15. Thus, rotation of the crown 1 in a counterclockwise direction enables a date correction to be made.

Turning now to the arrangement shown in Figure 3, the setting device is exactly in the same position as was shown in Figure 2. The positions of the setting lever 6, the intermediate lever 7, the clutch wheel 3, the setting wheel 4 and the intermediate wheel 12 are unchanged. However, if now the crown 1 is rotated clockwise, as viewed, it will be observed that the directions of rotation of the various gear wheels 4, 12, 13 and 14 are reversed. As a result, the correcting lever 9 will now pivot in a counterclockwise direction and thus bring the correcting wheel 14 into meshing engagement with the day correction transmitting wheel 16, which in turn meshes with the day star wheel 17. Thus, rotation of the crown 1 clockwise will effect a correction of the day indication.

Thus, it will be observed that in the calendar timepiece of the present invention,

correction of date or day indications can easily and substantially instantaneously be effected merely by setting the crown and the winding stem to a correcting position and by turning the crown clockwise or counterclockwise.

Referring now to Figure 4, the calendar timepiece of the present invention is illustrated in its (time-indicating) hands setting position. In this position, the setting device has been pulled out a stage further from the casing 101, when compared to its position shown in Figures 2 and 3. This results in the setting lever 6 rotating clockwise even further from its position shown in Figures 2 and 3, the yoke 21 maintaining the coupling between the clutch wheel 3 and the setting wheel 4.

However, the lever 11 on which setting wheel 4 is mounted is rotated in a clockwise direction on its pivot, owing to the abutting engagement of the lever 11 with nose 105 of the setting lever 6. Another nose 106 of the setting lever 6 abuts with nose 107 of the intermediate lever 7 to cause rotation of the intermediate lever 7 in a counterclockwise direction so as to bring into engagement nose 108 therein with the correcting lever 9. This abutting engagement of the nose 108 with the correcting lever 9 locks the latter in a position in which the correcting wheel 14 is disengaged from both the date ring 15 and the day correction transmitting wheel 16.

Owing to the displacement of the pivoted lever 11 against its spring 102, caused by rotation of the setting lever 6, the intermediate wheel 12 will now meshingly engage an idler wheel 18 which in turn meshingly engages with a minute wheel 19. Mounted coaxially on, and for rotation with the minute wheel 19 is another gear wheel 109 mounted coaxially thereon which meshes with an hour wheel 20, the gear wheel 109 forming part of a minute gear train of the timepiece (not shown).

It will therefore be understood that in the Figure 4 position rotation of the crown 1 will cause rotation of the minute wheel 19 and the hour wheel 20 so as to set the time-indicating hands of the time-piece. Moreover, in this Figure 4 position, the correcting wheel 14 is disengaged from the date ring 15 or the day correction transmitting wheel 16 and therefore the date and day changes may occur smoothly.

It will be appreciated that the gear train arrangement could be made such that the idler wheel 18 and the day correction transmitting wheel 16 are made redundant by an appropriate disposition of the various members of the arrangement.

It is to be understood that the invention is equally applicable to an automatically wound timepiece in which, of course, there

5

10

15

20

25

30

35

40

45

50

55

60

65

70

75

80

85

90

95

100

105

110

115

120

125

130

is no need for the mainspring to be wound.

Thus, it will be seen that the present invention provides a calendar timepiece, e.g. a watch, which has a relatively small number of parts and in which a date or day indication correction is extremely simply and instantaneously effected without the use of an additional button.

WHAT WE CLAIM IS:—

1. 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.

2. A timepiece as claimed in claim 1 wherein said setting device includes a crown and an associated stem.

3. A calendar timepiece as claimed in claim 1 or claim 2 wherein said correcting member is rotatable and locking means are provided to maintain the axis of rotation of said correcting member against displacement, when said setting device is in the hands setting position.

4. A calendar timepiece as claimed in claim 3 wherein said setting device is pivotally connected to a setting lever, movement of said setting device to its hands setting position causing pivoting movement of said setting lever which movement simultaneously actuates said locking means to maintain the axis of rotation of the correcting member against displacement and effects coupling between the setting device and a minute wheel of the timepiece, whereby to enable setting of the time-indicating hands of the timepiece.

5. A calendar timepiece as claimed in claim 4 wherein said correcting member is a correcting wheel pivotally mounted on a pivotable correcting lever, said locking means including an intermediate pivotable lever located between said setting and correcting levers and being shiftable between two positions respectively to prevent or permit pivotal movement of said correcting lever in response to the magnitude of movement of said setting device.

6. A calendar timepiece as claimed in claim 4 or claim 5 wherein said coupling between the setting device and said minute wheel includes a plurality of gear wheels one of which is in permanent mesh with the said correcting wheel.

7. A calendar timepiece as claimed in claim 5 and claim 6 wherein one of said plurality of gear wheels is mounted on a pivotable coupling lever whereby, when pivotal movement of said correcting lever is permitted, rotation transmitted from the setting device via said one gear wheel causes the correcting wheel to mesh with either the date ring or the day wheel in dependence on the direction of said rotation, and when pivotal movement of said correcting lever is prevented, said coupling lever is in a position to cause said one gear wheel to mesh with said minute wheel so as to transmit drive thereto from the setting device.

8. A calendar timepiece as claimed in any of claims 2 to 7 wherein said stem is a winding stem of a manually wound timepiece for winding up the mainspring thereof in a further or winding position of said setting device, in which position the setting device is disconnected from said correcting mechanism and from said minute wheel.

9. A calendar timepiece as claimed in any of claims 1 to 7 wherein said setting device has a further or winding position in which the correcting member is disconnected from said date ring and from said day wheel.

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

J. MILLER & CO.,
Agents for the Applicants,
Chartered Patent Agents,
262 High Holborn,
London, W.C.1.

is no need for the mainspring to be wound.

Thus, it will be seen that the present invention provides a calendar timepiece, e.g. a watch, which has a relatively small number of parts and in which a date or day indication correction is extremely simply and instantaneously effected without the use of an additional button.

WHAT WE CLAIM IS:—

1. 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.

2. A timepiece as claimed in claim 1 wherein said setting device includes a crown and an associated stem.

3. A calendar timepiece as claimed in claim 1 or claim 2 wherein said correcting member is rotatable and locking means are provided to maintain the axis of rotation of said correcting member against displacement, when said setting device is in the hands setting position.

4. A calendar timepiece as claimed in claim 3 wherein said setting device is pivotally connected to a setting lever, movement of said setting device to its hands setting position causing pivoting movement of said setting lever which movement simultaneously actuates said locking means to maintain the axis of rotation of the correcting member against displacement and effects coupling between the setting device and a minute wheel of the timepiece, whereby to enable setting of the time-indicating hands of the timepiece.

5. A calendar timepiece as claimed in claim 4 wherein said correcting member is a correcting wheel pivotally mounted on a pivotable correcting lever, said locking means including an intermediate pivotable lever located between said setting and correcting levers and being shiftable between two positions respectively to prevent or permit pivotal movement of said correcting lever in response to the magnitude of movement of said setting device.

6. A calendar timepiece as claimed in claim 4 or claim 5 wherein said coupling between the setting device and said minute wheel includes a plurality of gear wheels one of which is in permanent mesh with the said correcting wheel.

7. A calendar timepiece as claimed in claim 5 and claim 6 wherein one of said plurality of gear wheels is mounted on a pivotable coupling lever whereby, when pivotal movement of said correcting lever is permitted, rotation transmitted from the setting device via said one gear wheel causes the correcting wheel to mesh with either the date ring or the day wheel in dependence on the direction of said rotation, and when pivotal movement of said correcting lever is prevented, said coupling lever is in a position to cause said one gear wheel to mesh with said minute wheel so as to transmit drive thereto from the setting device.

8. A calendar timepiece as claimed in any of claims 2 to 7 wherein said stem is a winding stem of a manually wound timepiece for winding up the mainspring thereof in a further or winding position of said setting device, in which position the setting device is disconnected from said correcting mechanism and from said minute wheel.

9. A calendar timepiece as claimed in any of claims 1 to 7 wherein said setting device has a further or winding position in which the correcting member is disconnected from said date ring and from said day wheel.

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

J. MILLER & CO.,
Agents for the Applicants,
Chartered Patent Agents,
262 High Holborn,
London, W.C.1.

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1970.

Published by the Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies may be obtained.



* C L H S *