

TIMEPIECE CALENDAR MECHANISM

This invention relates to a timepiece calendar mechanism for the display of the days of the month and/or for the display of the days of the week in a timepiece.

According to the present invention, there is provided a timepiece calendar mechanism comprising a wheel provided with a plurality of indicator members; a time-indicating dial which overlies said wheel and which is provided with a window through which at any time may be seen at least one indicator member, the time-indicating dial being provided around said window with day indicia; and means for rotating said wheel so that, in operation, the or each appropriate day indicium is directly indicated by an indicator member.

In one form of the present invention, the said wheel is a day-of-the-week wheel, the said window is a day-of-the-week window, and the said day indicia are day-of-the-week indicia.

In this case, the day-of-the-week window may be circular, the indicator members comprising seven equi-angularly spaced apart indicator members which are arranged along the circumference of a circle, said circumference passing through the centre of the day-of-the-week window.

The day-of-the-week indicia may be constituted by abbreviations representing respectively the seven days of the week.

The means for rotating the day-of-the-week wheel may comprise a day-of-the-week rotating pawl provided on a day changing wheel, the latter being driven from a timepiece spindle.

In another form of the present invention which may be provided instead of or additional to the first-mentioned form, the said wheel is a day-of-the-month wheel, the said window is a day-of-the-month window, and the said day indicia are numerals indicating the days of the month.

In the latter case, the numerals are preferably arranged in two concentric rows between which is disposed the day-of-the-month window, there being two diametrically oppositely arranged indicator members. Thus the arrangement is preferably such that the inner row of numerals comprises the numerals 1 to 16, and the outer row of numerals comprises the numerals 17 to 31 and 1, each numeral in the outer row being radially aligned with a numeral in the inner row, the arrangement being such that, in operation, as the day-of-the-month wheel is rotated, a first day-of-the-month indicator member points, one after the other, to the numerals in the inner row, followed by a second day-of-the-month indicator member starting to point to the numerals in the outer row, and so that, after the second day-of-the-month indicator member has pointed to the numeral 31, the first day-of-the-month indicator starts to point to the numerals in the inner row again.

Preferably, the means for rotating the day-of-the-month wheel comprises a day-of-the-month rotating pawl provided on a day changing wheel, the latter being driven from a timepiece spindle.

The invention is illustrated, merely by way of example, in the accompanying drawings, in which:-

Figure 1 is a top plan view of a dial forming part of the present invention;

Figure 2 is a top plan view of a day-of-the-week wheel which may be used in the present invention;

Figure 3 is a top plan view of a day-of-the-month wheel which may be used in the present invention;

Figure 4 is a top plan view of an assembly of the components shown in Figures 1-3, the assembly
 5 constituting an embodiment of a timepiece calendar mechanism which indicates the particular day of the month and the corresponding day of the week;

Figure 5 is a view showing a known mechanism for
 10 changing a display representing days of the month and days of the week in a timepiece;

Figure 6 is a top plan view of a known mechanism which provides a display showing days of the month and of the corresponding week in a timepiece;

Figure 7 is a view illustrating a correction
 15 mechanism when used for the quick correction of a display showing the days of the month; and

Figure 8 is a view of the correction mechanism of Figure 7 when used for the quick correction of a display showing the days of the week.

20 In Figure 5 there is shown a known mechanism for changing the display of the days of the month and a display of the days of the week in a timepiece. As shown in Figure 5, 1 is a spindle for driving an hour hand (not shown). 2 is a day-changing wheel which is
 25 rotated by the spindle 1. 3 is a day-of-the-month wheel rotating pawl mounted on the day-changing wheel 2. 4 is a day-of-the-week wheel rotating pawl provided on the day-changing wheel 2. 5 is a day-of-the-month wheel which is rotated in the direction of an arrow A by the
 30 day-of-the-month wheel rotating pawl 3. 6 is a day-of-the-week wheel which is rotated in the direction of an arrow B by the day-of-the-week wheel rotating pawl 4.

In the Figure 5 mechanism, the torque of the spindle 1 is transmitted to the day-changing wheel 2 to

cause it to perform one complete revolution in every twenty four hours, thereby causing the day-of-the-month wheel rotating pawl 3 to rotate the day-of-the-month wheel 5, and the day-of-the-week wheel rotating pawl 4 to rotate the day-of-the-week wheel 6. The day-of-the-month wheel 5 carries numerals 7 indicating the days of the month, and the day-of-the-week wheel 6 carries abbreviations 8 representing the days of a week from Sunday to Saturday. A time indicating dial 14 overlying the day-of-the-month and day-of-the-week wheels 5 and 6 has a window 9 through which one of the numerals 7 and one of the abbreviations 8 are displayed, as shown in Figure 6.

Figures 7 and 8 are views showing a known correction mechanism when used respectively for the quick correction of the display of the days of a month and the quick correction of the days of the week. A crown 10 is arranged to be pulled out and to be rotated in one angular direction to cause the day-of-the-month wheel 5 to rotate via a drum wheel 11 and a correction wheel 12 so as to correct the display of the day of the month (Figure 7), while the crown 10 is arranged to be rotated in the opposite angular direction to cause the drum wheel 11, the correction wheel 12 and a transmission wheel 13 to rotate the day-of-the-week wheel 6 so as to correct the display of the day of a week (Figure 8).

The known mechanism is, however, so designed as to display only one day of a month and one day of a week, and does not show the relative position of the particular day in the whole month or in the whole week, as a monthly calendar does.

However, in the embodiment of the present invention described below, the days of the month and the

days of the week are displayed in a timepiece in such a way as to enable one to see the said relative position of the day of the month or week as if one were looking at a monthly calendar. In the said embodiment, as more fully explained below, a weekly operating mechanism comprises a day-of-the-week wheel 6 which is rotated by a day-of-the-week wheel rotating pawl 4 provided on a day changing wheel 2 which is rotated by torque from a spindle 1 for driving the timepiece. A time-indicating dial 20, which overlies the day-of-the-week wheel 6 has a circular day-of-the-week window 21 around whose circumference there are abbreviations 22 indicating (in Spanish) the days of the week from Sunday to Saturday. The day-of-the-week wheel 6 is provided with seven day-of-the-week indicator members 27-33 which are equally spaced apart from one another along the circumference 26 of a circle, the circumference 26 passing through the centre of the day-of-the-week window 21, so that, as the day-of-the-week wheel 6 is rotated, the day-of-the-week indicator members 27-33 may appear through the day-of-the-week window 21 one after another and thereby point to the abbreviation 22 indicating the particular day of the week.

There is also a monthly operating mechanism comprising a day-of-the-month wheel 5 which is rotated by a day-of-the-month wheel rotating pawl 3 provided on the day changing wheel 2, the latter being rotated by the torque from the spindle 1 for driving the timepiece.

The time-indicating dial 20, which overlies both the day-of-the-month wheel 5 and the day-of-the-week wheel 6, carries in one portion thereof a circumferentially extending inner row 23 of day indicating numerals 1 to 16 and a circumferentially extending outer row of day 24 indicating numerals 17 to

31 and 1 which is concentric with the inner row 23. The time-indicating dial 20 has an appropriately wide day-of-the-month window 25 between the inner and outer rows 23, 24 of numerals.

5 The day-of-the-month wheel 5 is provided in its portion corresponding to the day-of-the-month window 25 with a first day-of-the-month indicator member 34 for pointing to one of the numerals in the inner row 23, and a second day-of-the-month indicator member 35 for
10 pointing to one of the numerals in the outer row 24. Consequently, as the day-of-the-month wheel 5 is rotated, the first day-of-the-month indicator member 34 points to the numerals in the inner row 23 one after another, followed by the second day-of-the month
15 indicator member 35 starting to point to the numerals in the outer row 24 and, after the second day-of-the-month indicator member 35 has pointed to the numeral 31, the first day-of-the-month indicator member 34 again starts to point to the numerals in the inner row 23.

20 The rotation of the day-of-the-week wheel 6 causes the day-of-the-week indicator members 27-33 on the day-of-the-week wheel 6 to be seen through the day-of-the-week window 21 one after another, and to point to the respective abbreviations 22 encircling the window 21 and
25 each indicating one of the days of the week.

30 The rotation of the day-of-the-month wheel 5 causes the first day-of-the-month indicator member 34 on the day-of-the-month wheel 5 to be seen through the day-of-the-month window 25 and to point to the numerals 1 to 16 in the inner row 23 one after another, and then the second day-of-the-month indicator member 35 to be seen through the day-of-the-month window 25 and to point to the numerals 17 to 31 in the outer row 24 one after another.

As shown in Figure 1, the circular day-of-the-week window 21 has its centre on a straight line connecting the 6 and 12 o'clock points, and is situated towards the 6 o'clock point (below the centre of the dial 20). The dial 20, as mentioned above, carries around the window 21 abbreviations 22 indicating the days of the week from Sunday to Saturday. The inner and outer rows 23, 24 of numerals, which indicate the days of the month, are situated towards the 12 o'clock point (above the centre of the dial 20). The rows 23, 24 lie on the circumferences of two concentric circles, respectively. The inner row 23 consists of numerals 1 to 16, while the outer row 24 consists of numerals 17 to 31 and 1, and in each row, the numerals lie counterclockwise at equal spatial intervals (11.61° in the embodiment shown). The day-of-the-month window 25, which is disposed between the inner and outer rows 23 and 24, has a width allowing either day-of-the-month indicator member 34, 35 to be seen therethrough. The dial 20 has a time indicating face towards the 6 o'clock point for the convenience of the user.

Figure 2 is a top plan view of a day-of-the-week wheel 6 used in the present embodiment. The day-of-the-week indicator members 27-33 each has the shape of an isosceles triangle. They are printed in one and the same direction and at equal spatial intervals (51.428° in the embodiment shown) on the circumference 26 of a circle passing through the centre of the day-of-the-week window 21 shown in Figure 1.

Figure 3 is a top plan view of the day-of-the-month wheel 5 used in the present embodiment. The first day-of-the-month indicator member 34 is printed on the wheel 6 and has a radially inwardly directed pointed end. The second day-of-the-month indicator member 35 has

a radially outwardly directed pointed end. The day-of-the-month indicator members 34 and 35 are each in the shape of an isosceles triangle having a height which is equal to the width of the day-of-the-month window 25 shown in Figure 1. They are both so printed as to be visible through the day-of-the-month window 25, and are so positioned relative to each other that, when the first day-of-the-month indicator 34 points to the first numeral 1 in the inner row 23 of numerals, the second day-of-the-month indicator 35 points to the last numeral 1 in the outer row 24.

Figure 4 shows an assembly of the dial 20, and the day-of-the-month and day-of-the-week wheels 5 and 6, the said assembly providing a display indicating a particular day of a particular month and the day of the corresponding week. Like reference numerals are used to denote like things or parts both in Figures 1 to 3 and in Figure 4.

In operation, the day-of-the-week wheel 6 performs $1/7$ of one complete revolution in every 24 hours and causes each of the day-of-the-week indicator members 27 to 33 to reach the centre of the day-of-the-week window 21 and to have its pointed end point to one of the abbreviations 22 printed around the window 21 and indicating the seven days, respectively, of the week. The day-of-the-month wheel 5 performs $1/31$ of one complete revolution in every 24 hours, and first causes the first day-of-the-month indicator member 34 to point to the numerals 1 to 16 in the inner row 23 one after another, and then the second day-of-the-month indicator 35 to point to the numerals 17 to 31 and 1 in the outer row 24 one after another. The first and second day-of-the-month indicators 34 and 35 are not visible together through the day-of-the-month window 25, except when they

both point to the numeral 1.

The known mechanisms described above may be used for driving the day-of-the-month and day-of-the-week wheels 5 and 6, and the known quick correction mechanisms may be used for correcting the display of days of the month and of the week.

The embodiment described above provides an analog display showing any day of the week by utilizing a known mechanism for changing the display. By making simple changes to a known timepiece calendar mechanism including the provision of the day-of-the-week indicator members 27-33 on the day-of-the-week wheel 6 and the modifications of the dial 20, it is possible to know what day it is in relation to the whole week.

The embodiment described above also provides an analog display showing any day of the month and the corresponding day-of-the-week by utilizing the known mechanism for changing the display. By making simple changes in construction to a known timepiece calendar mechanism it is possible to know what day it is in relation to a whole month, or week, as one would from a monthly calendar. The numerals indicating the days of the month are shown in one portion of the dial, and the remaining portion thereof is available as a time indicating face for the convenience of the user.

CLAIMS

1. A timepiece calendar mechanism comprising a wheel provided with a plurality of indicator members; a time-indicating dial which overlies said wheel and which is provided with a window through which at any time may be seen at least one indicator member, the time-indicating dial being provided around said window with day indicia; and means for rotating said wheel so that, in operation, the or each appropriate day indicium is directly indicated by an indicator member.
2. A timepiece calendar mechanism as claimed in claim 1 in which the said wheel is a day-of-the-week wheel, the said window is a day-of-the-week window and the said day indicia are day-of-the-week indicia.
3. A timepiece calendar mechanism as claimed in claim 2 in which the day-of-the-week window is circular, the indicator members comprising seven equi-angularly spaced apart indicator members which are arranged along the circumference of a circle, said circumference passing through the centre of the day-of-the-week window.
4. A timepiece calendar mechanism as claimed in claim 2 or 3 in which the day-of-the-week indicia are constituted by abbreviations representing respectively the seven days of the week.
5. A timepiece calendar mechanism as claimed in any of claims 2-4 in which the means for rotating the day-of-the-week wheel comprises a day-of-the-week rotating pawl provided on a day changing wheel, the latter being driven from a timepiece spindle.



6. A timepiece calendar mechanism as claimed in any preceding claim in which the said wheel is a day-of-the-month wheel, the said window is a day-of-the-month window, and the said day indicia are numerals indicating the days of the month.

7. A timepiece calendar mechanism as claimed in claim 6 in which the numerals are arranged in two concentric rows between which is disposed the day-of-the-month window, there being two diametrically oppositely arranged indicator members.

8. A timepiece calendar mechanism as claimed in claim 7 in which the inner row of numerals comprises the numerals 1 to 16, and the outer row of numerals comprises the numerals 17 to 31 and 1, each numeral in the outer row being radially aligned with a numeral in the inner row, the arrangement being such that, in operation, as the day-of-the-month wheel is rotated, a first day-of-the-month indicator member points, one after the other, to the numerals in the inner row, followed by a second day-of-the-month indicator member starting to point to the numerals in the outer row, and so that, after the second day-of-the-month indicator member has pointed to the numeral 31, the first day-of-the-month indicator starts to point to the numerals in the inner row again.

9. A timepiece calendar mechanism as claimed in any of claims 6-8 in which the means for rotating the day-of-the-month wheel comprises a day-of-the-month rotating pawl provided on a day changing wheel, the latter being driven from a timepiece spindle.

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



11. A system for making a display showing a day of the week in a timepiece, said system including a weekly operating mechanism comprising a day-of-the-week wheel which is rotated by a day-of-the-week wheel rotating pawl provided on a day changing wheel which is rotated by a driving force from a spindle for driving the timepiece, characterised in that a time indicating dial overlying said day-of-the-week wheel has a circular window (hereinafter referred to as the day-of-the-week window), and carries around said window abbreviated words meaning the days of the week from Sunday to Saturday, and that said day-of-the-week wheel is provided with seven day-of-the-week indicators which are equally spaced apart from one another along the circumference of a circle passing through the centre of said day-of-the-week window, so that, as said day-of-the-week wheel is rotated, said indicators may appear through said window one after another and point to said abbreviated words, respectively.

12. A system for making a display showing a day of a month and the corresponding day of the week in a timepiece, said system including a monthly operating mechanism comprising a day-of-the-month wheel which is rotated by a day-of-the-month wheel rotating pawl provided on a day changing wheel which is rotated by a driving force from a spindle for driving the timepiece, and a weekly operating mechanism comprising a day-of-the-week wheel which is rotated by a day-of-the-week _____



wheel rotating pawl provided on said day changing wheel, characterized in that a time indicating dial overlying said day-of-the-month and day-of-the-week wheels carries in one portion thereof a circumferentially extending row of equally spaced apart numerals 1 to 16 indicating days of the month (hereinafter referred to as the inner row of numerals), and a row of numerals 17 to 31 and 1 (hereinafter referred to as the outer row of numerals) indicating days of the month and radially aligned with said numerals 1 to 16, respectively, said outer row being concentric to said inner row and radially outwardly spaced therefrom, said dial having an appropriately wide window (hereinafter referred to as the day-of-the-month window) between said inner and outer rows of numerals, that said dial has a circular day-of-the-week window in another portion thereof, and carries around said day-of-the-week window abbreviated words meaning the days of the week from Sunday to Saturday, and that said day-of-the-month wheel is provided in its portion corresponding to said day-of-the-month window with a first day-of-the-month indicator for pointing to one of said numerals in said inner row and a second day-of-the-month indicator for pointing to one of said numerals in said outer row, so that, as said day-of-the-month wheel is rotated, said first day-of-the-month indicator may point to said numerals in said inner row one after another, followed by said second day-of-the-month indicator starting to point to said numerals in said outer row, and so that, after said second day-of-the-month indicator has pointed to said numeral 31, said first day-of-the-month indicator may start to point to said numerals in said inner row again, while said day-of-the-week wheel is provided with seven day-of-the-week indicators which are equally spaced



apart from one another along the circumference of a circle passing through the centre of said day-of-the-week window, so that, as said day-of-the-week wheel is rotated, said day-of-the-week indicators may appear through said day-of-the-week window one after another and point to said abbreviated words, respectively.

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