Nov. 13, 1962 C. T. COONEY, JR 3,063,232

AUTOMATIC CLOCK-CALENDAR

Filed April 7, 1958

Fig. 1.

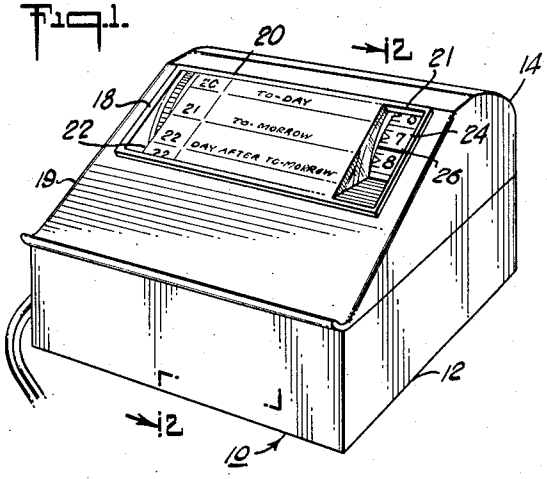


Fig. 5.

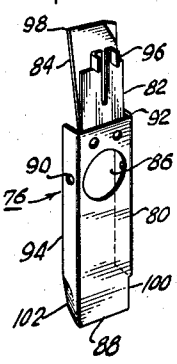


Fig. 4.

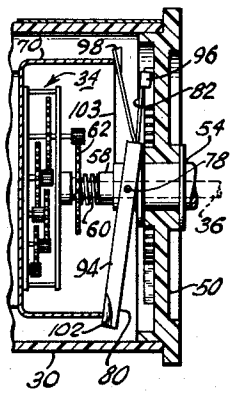
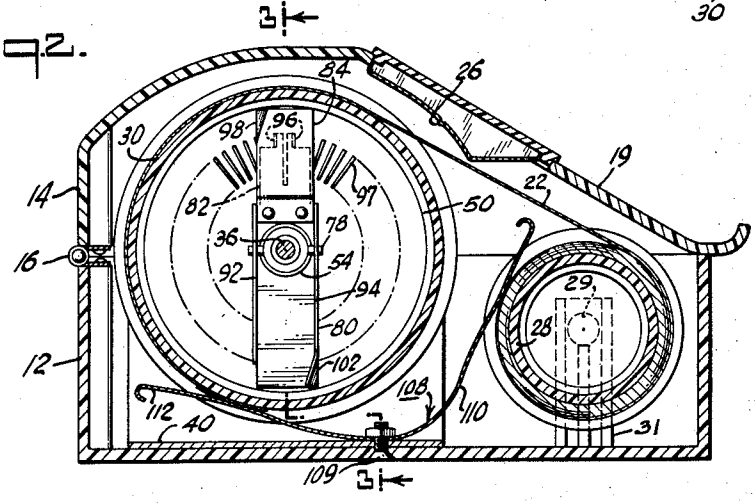
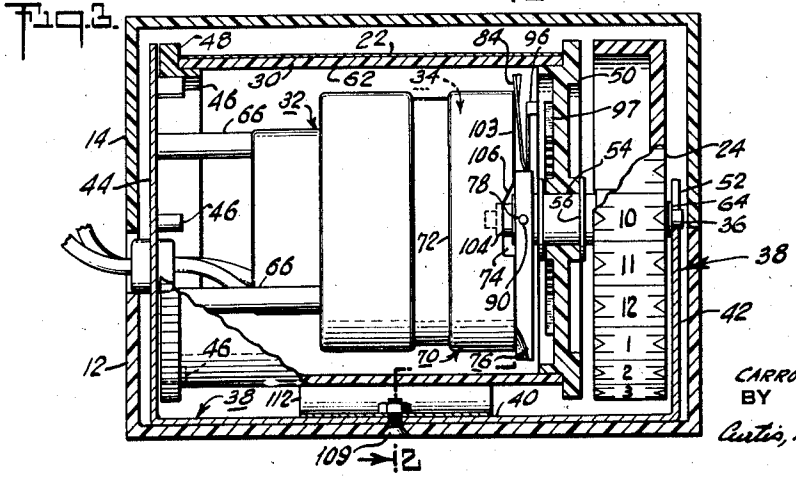


Fig. 2.



12

Fig. 3.



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AUTOMATIC CLOCK-CALENDAR

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The present invention relates to an automatic clock-calendar device; and more particularly to such a device which also serves to provide a daily reminder of special events, appointments and other things that must be attended to each day.

The combination of a clock and calendar has been known and used heretofor. However, these prior devices usually have required intricate and and expensive mechanisms to operate them. In addition, the prior devices have not provided easy access to the calendar for changing it or for marking a notation thereon.

Accordingly, it is an object of the present invention to provide a simple, efficient and relatively inexpensive clock-calendar device. It is another object to provide such a device which automatically unwinds a premarked calendar and memorandum strip a selected increment each day. If desired, this calendar strip may have been marked previously wtih a notation which serves as a reminder of an activity or an appointment planned for the indicated day. A further object is to provide a device of the type described which may be operated by electrical energy and, thus, eliminates daily or periodic manual winding. It is still a further object to provide such a device with a viewing window which not only reveals the calendar strip portion for the present day, but also the strip portions for several other days. Still another object is provided a clock-calendar device which permits quick and easy access to the calendar strip for changing or marking the strip.

In this specification and the accompanying drawings a preferred embodiment of the present invention in clock-calendars is shown and described. It is to be understood that this is not intended to be exhaustive nor limiting of the invention but, on the contrary, is given for the purpose of illustration in order that others skilled in the art may fully understand the invention, its principles and the manner of carrying it out.

In the drawings:

FIGURE 1 is a perspective view of an automatic clock-calendar device in accordance with the present invention;

FIGURE 2 is a sectional transverse view of this automatic clock-calendar device taken generally in the direction of arrows 2—2 of FIGURE 1;

FIGURE 3 is a partially fragmentary, longitudinal section view taken along lines 3—3 of FIGURE 2; and showing by lines 2—2 the location of the sectional view FIGURE 2 in relation to FIGURE 3;

FIGURE 4 is a fragmentary view of a part of the clutch arrangement used to advance the calendar strip; and

FIGURE 5 is a perspective veiw of the pivoted lever assembly of the clutch arrangement of FIGURE 4.

Referring now to the drawings in greater detail, a fully assembled clock-calendar device made in accordance with the present invention is shown in FIGURE 1. As shown therein and in FIGURE 2, a case, generally indicated at **10**, encloses an automatic clock-calendar device. This case **10**, which may be made of any suitable material (e.g. molded styrene plastic), has a lower section **12** and a cover section **14**; the cover section **14** being hinged at **16** to section **12**. Provided in the slanted front portion **19** of the cover **14** is a large window **18**. This large window **18** is divided into two sections **20** and **21**. Section **20** is the larger of the two sections and it provides a view of a calendar strip **22** which is advanced past this window an increment of suitable length each day. The small window section **21** provides a view of clock wheel **24**, which is divided circumferentially into twenty-four equal parts indicating the hours of the day (and each part may be subdivided, if desired). This clock wheel is automatically rotated at a constant speed and moves through only one full revolution each day. The underside of the window section **21** is curved to follow a short portion of the circumference of clock wheel **24**, thus, reducing viewing distortion. On the underside of the small window section **21** a narrow, but outstanding, line **26** causes a refraction of the light and enables this line **26** to serve as a time indicator reference line.

The calendar strip **22** is a printed sheet which is divided into sections, each indicating a day of the year. Each division is preferably of sufficient size to permit a notation to be hand written or otherwise marked on the strip **22**. The notation may be a reminder of an appointment to be kept, a report to be filed, or any similar activity. Since cover **14** is easily lifted by merely swinging it upwardly and about hinge **16**, the calendar strip **22** is readily accessible. When the cover **14** is raised the strip **22** may be removed and be marked well in advance of the day of the required action. If preferred, the strip **22** may be premarked to indicate these important activities even before it is ever installed in the device.

The operation of the illustrated clock-calendar device is simple. Each day a selected portion of the calendar strip **22** is wound onto a hollow drum **30**. As shown in FIGURE 3, within this drum, but not in contact with the drum, is a driving motor **32**. This motor **32** supplies the power to the driving means that continuously turns the clock wheel **24** so that the wheel completes one full revolution each day. By means of a novel clutch arrangement, the normal stationary drum **30** is connected to the driving means for a short period of time each day. During this time the drum is also rotated and a predetermined length of calendar strip is pulled past the viewing window **18**. After a proper amount of strip has been wound onto the drum the clutch is disengaged and the rotation of the drum stops until the next revolution of the clock wheel **24**.

Referring to FIGURE 2, in particular, the strip **22** is initially rolled up and stored on a reel or spool **28** which is mounted on a spindle **29** and supported on a pair of spaced posts **31**. Each day an increment equal to a devision of one day on strip **22** is pulled off spool **28** and an equal amount wound onto a drum **30**.

As stated above (and as shown in FIGURE 3), this drum is hollow, and a small slow speed electric synchronous motor **32** is positioned within it. A reduction-gear **34** is connected to this motor **32** and is also located within drum **30**. Referring to the right hand portion of FIGURES 3 and 4 a driven shaft **36** extends from the reduction-gear **34** and this shaft serves as a driving means for rotating the clock wheel **24** and the calendar drum **30**, as well as cooperating with other elements to serve as a support for these components.

The motor **32**, the drum **30**, and the clock wheel **24** are all supported on a U-shape frame, generally indicated at **38**. This frame **38** has a bottom plate **40**, a short vertical flange **42** on one side and a second, but higher, vertical flange **44** on the other side. Projecting from the inner surface of flange **44** is a series of studs **46** which serve as bearing supports for an annular ring **48**. This ring **48** is tightly fitted into that end of drum **30** which is away from the clock wheel **24**. Near clock wheel **24** a closure or clutch plate **50** is also securely fitted into the other end of drum **30**.

At the top of vertical flange **42** a slot **52** is provided

and the end of shaft 36 is set therein. Thus, the flanges 42 and 44 cooperate to serve as vertical support means for the calendar drum 30 and the clock wheel 24, and maintain these components in a substantially horizontal position freely spaced from the case 10.

Referring to FIGURES 2, 3 and 4, the driven shaft 36 is passed through a bushing member 54 which has an opening therethrough of greater size than the diameter of shaft 36. The clock wheel is secured upon the end of this bushing 54 by means of a tight press fit. Bushing 54 is also passed through an enlarged central opening in clutch plate 50 so that plate 50 is freely rotatable about said bushing 54. However, the free-turning clutch plate 50 is held against longitudinal movement along the bushing 54 by means of a set of split lock washers 56 which are fitted into annular slots in the surface of bushing 54. These washers 56 are spaced apart a sufficient distance so as not to interfere with the free rotation of plate 50, and yet they are sufficiently close together to keep the plate in position on the bushing 54.

As best shown in FIGURE 4, extending inwardly from the clutch plate end of bushing 54, is a hub 58. This hub 58 makes contact with a compressible spring 60 which surrounds shaft 36. Spring 60 abuts a driven gear 62 to which shaft 36 is fixed; this gear 62, being the final gear in the gear train of the reduction-gear 34.

In assembling the device, the clock wheel 24 is secured to shaft 36 by forcibly pressing bushing 54 against spring 60 and then locking the bushing 54 in place with a small split lock washer 64 which is inserted into a slotted annular recess in the clock wheel end portion of shaft 36. Thus, the bushing 54 is held tightly in place against spring 60 so that any rotation of the gear 62 and the shaft 36 is imparted to the bushing 54, which, in turn, carries the clock wheel 24 with it as it rotates once each day. While the bushing 54 is rotating, the free turning clutch plate 50 remains stationary, except for one short period of each day when it becomes engaged with the rotating bushing 54. As stated above, this engagement lasts only long enough to wind one day's increment of calendar strip 22 onto drum 30 and withdraw a similar length of strip 22 from spool 28.

The driving motor 32 which is mounted within drum 30 is fastened to side flange 44 by means of a pair of studs 66 which extend from the casing of motor 32. The reduction-gear 34 is fixedly mounted on the casing of this motor 32. Thus the motor 32 and the reduction-gear 34 are fixedly attached to flange 44 and do not interfere with the intermittent rotation of drum 30 when the calendar strip 22 is being wound thereon.

As shown in FIGURES 2, 3 and 4, surrounding the reduction-gear 34 is a fixed cam, generally indicated at 70. This cam 70 generally comprises an annular cam plate 72 which encircles shaft 36 and is adjacent to clutch plate 50. In the edge portion of this plate 72 a cam recess 74 is provided. Interposed between cam plate 72 and clutch plate 50 is a pivoted lever 76 which is connected to bushing 54 by a set of pins 78 projecting from the sides of bushing 54. These pins 78 do not extend through bushing 54 and, therefore, they do not interfere with the passage of shaft 36 through the bushing 54.

As shown in detail in FIGURE 5, lever 76 is comprised of a channel member 80, a finger 82, and a spring 84. Channel 80 has an eccentrically located hole 86 in its web 88. In the channel flanges 92 and 94 a pair of holes 90 are provided which are in the horizontal plane through a diameter of hole 86. The pins 78 are inserted into holes 90 and, thus, lever 76 pivots about the bushing 54 as shown in FIGURES 2, 3 and 4.

Finger 82 and spring 84 project from the end of channel 80 at a point just beyond hole 86. A pair of parallel end flanges 96 on finger 82 are adjacent to a flat gear ring 97 on the inside surface of the clutch plate 50. Spring 84, at its free end 98, is bent away from finger 82. Flange 92, on channel 80, has a cut off portion 100 and the end of the other flange 94 has a slightly bent-in portion 102.

As shaft 36 rotates through its single revolution each day, thereby turning bushing 54 and the clock wheel 24, the flange end 102 and the spring end 98 ride on the edge 103 of cam plate 72. Finger 82, which extends generally in a straight line from the channel web 88, is positioned so that the flange 96 of finger 82 are out of engagement with the teeth of gear ring 97 when the spring end 98 and the flange end 102 ride on the edge 103. When the flange end 102 passes by the cam recess 74 it drops into the recess 74 and rides on the lower face 104 of this cam recess 74. When this occurs the spring 84 urges the finger 82 away from cam plate 72 and the flanges 96 of finger 82 engage the teeth of gear 97. The flanges 96 remain engaged with the gear 97 while flange end 102 rides on the lower cam face 104.

As long as the gear 97 on the clutch plate 50 is engaged with the finger 82 of the pivoted lever 76, the clutch plate 50 will rotate. Since plate 50 is tightly fitted into drum 30, and plate 50 is constantly turning while engaged with the finger 82, and during such time it will cause drum 30 to also rotate. As drum 30 turns it pulls the strip 22 off the spool 28 and winds the strip around the drum 30. The drum 30 is rotated as long as the flange end 102 rides on the lower cam face 104. At the end of its travel along face 104, the flange end 102 rides on to an inclined cam face 106 which joins the edge 103 of cam plate 72 and face 104. As the flange end 102 rides up face 106, the finger 82 is rocked away from plate 50 and the flanges 96 are drawn out of engagement with the teeth of gear 97. When this occurs the rotation of drum 30 ceases.

During the rotation of drum 30 the length of calendar strip 22 withdrawn from spool 28 is just enough so that the part of strip 22 viewed through window 18 has advanced an amount equal to one day's marking on the strip 22.

As more and more of strip 22 is wound onto drum 30 the diameter of the combined strip and drum is increased. Accordingly, more strip is withdrawn with each successive rotation of the drum. Therefore, the strip divisions are increased in width after a considerable portion of the strip has been wound onto drum 30 in order that the proper day division will be viewable through window 18.

As shown in FIGURE 2, tensioning of strip 22 between spool 28 and drum 30 is maintained by means of an L-shaped spring plate 108 which is fastened to the bottom 40 of frame 38 by a nut and bolt 109. One leaf 110 of spring 108 presses against the portion of strip 22 which is wound onto spool 28 and the other leaf 112 presses against the strip 22 which is wound onto drum 30. Thus, the portion of the strip 22 between the drum 30 and the spool 28 is held taut and easily viewed through the window 18.

From the foregoing it will be appreciated that the present invention provides a unique, and yet simple, automatic clock-calendar device which is economical to manufacture. In addition, the present invention serves as an automatic reminder. The above described embodiment is illustrative of the present invention and is set forth to give a full understanding of this invention and its many benefits and advantages. To those skilled in the art, modifications will occurr which will come within the scope and spirt of the invention as defined in the following claim.

I claim:

A combination clock and automatic calendar of the type described comprising an enclosure, a mounting frame, a calendar strip, a storage holder for said strip, a drum for winding said strip thereon from said storage holder and said drum being rotatably mounted on said frame, a driving motor positioned within said drum and fixedly mounted on said frame, a drive shaft ro-

tatable by said motor, a reduction gear unit connected between said motor and said drive shaft, a clock wheel rotatable by said drive shaft, clutch means for engaging said drum with said driving motor during a minor portion of each revolution of said clock wheel, said clutch means comprising a gear plate fixedly attached at one end of said drum, a pivotable lever fixed on said rotatable shaft, and cam means for pivoting said lever into temporary engagement with said gear plate whereby said gear plate and said drum are rotated during temporary engagement.

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