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AUTOMATIC CLOCK-CALENDAR

Filed Aug. 26, 1964

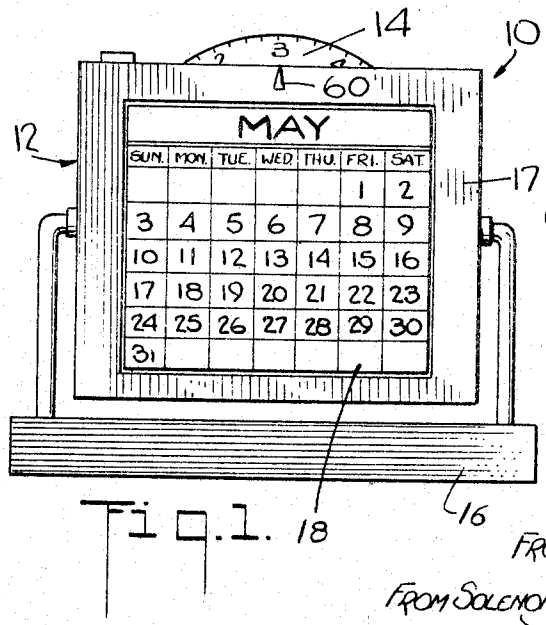


Fig. 1.

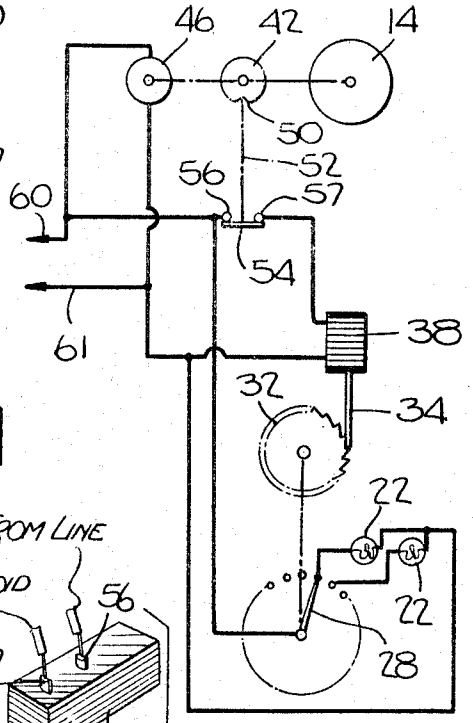


Fig. 3.

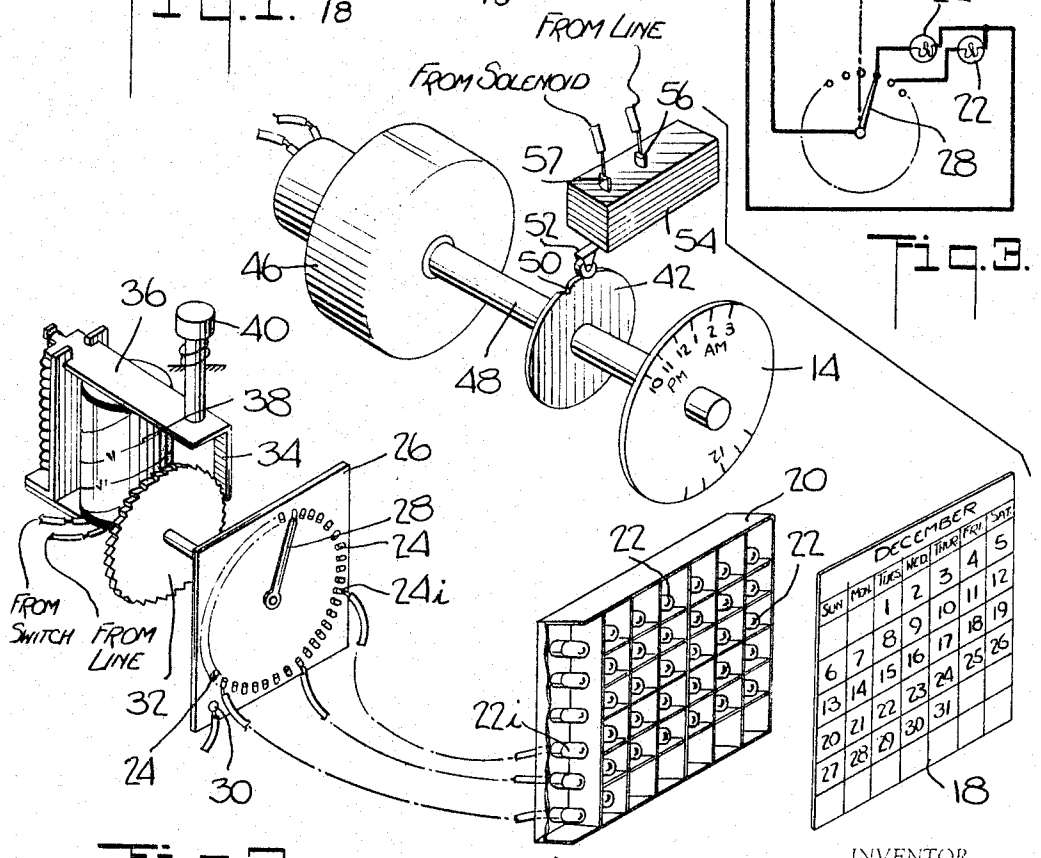


Fig. 2.

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AUTOMATIC CLOCK-CALENDAR

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6 Claims. (Cl. 58—4)

This invention relates in general to a combination clock and calendar and in particular to a clock-calendar which automatically indicates both the time of day and the day of each month requiring setting only once a month.

The major purpose of this invention is to provide a very simple automatic device for indicating both the day of the month as well as the time of the day.

It is a further purpose of this invention to indicate the day of the month by lighting up the day on a monthly calendar display so that the calendar for an entire month may be viewed at the same time that the particular day of the month is automatically lit up.

The purposes of this invention are achieved, in brief, by a synchronous motor device which operates off a sixty cycle line to rotate a time display disc once a day. On the same motor shaft is located a circular cam that has a single notch. A cam follower rides on the cam and is connected to a snap-action switch which in turn operates a solenoid. Once a day the cam follower rides into the notch thereby energizing a solenoid. The solenoid then operates a ratchet which ratchet, in turn, steps a wiper arm around the series of contacts to light in sequence individual lamps which are located behind a translucent calendar panel. Thus, once a day, the notch on the cam operates the switch which operates the solenoid and steps the wiper arm by one contact to light up the next successive lamp. Each successive lamp is in a separate cubicle behind a separate date so that each step of the wiper arm lights a separate day on the calendar panel.

Other objects and purposes of this invention will become obvious from the following detailed description and drawings, in which:

FIG. 1 is a front elevation view of the clock-calendar of this invention;

FIG. 2 is a perspective mechanical blow-up of the FIG. 1 calendar; and

FIG. 3 is an electrical-mechanical schematic of the arrangement for advancing the lamp that is lit once each day.

The clock-calendar **10** of this invention will appear, as in FIG. 1, with a calendar portion **12** and a clock face portion **14**, all mounted on a stand **16**. The calendar portion **12** includes a frame **17** which holds a replaceable translucent date mask **18**. The date mask **18** is replaced at the beginning of each month and the lamp set to light the first date of the month at its appropriate position. That is all that need be done. The rest of the operation of the clock-calendar **10** is automatic.

As may be seen in FIG. 2, the translucent date mask **18** is backed up by a thirty-seven lamp rack **20**; the rack **20** being constituted by six rows of seven cubicles. Each lamp **22** is placed in a separate cubicle so that when it is lit only the corresponding date panel directly in front of it will be lit. Six rows of lamps are employed because the arrangement of the calendar during certain months may require the use of date panels in six rows such as is true for the month of May 1964 as shown in FIG. 1. The longest month has thirty-one days and the date on which the first day of the month can fall can only be displaced, at the most, by six additional places. Thus the total number of lamps needed is only thirty-seven. In effect, it is only when the first day of the month falls on either a Friday or a Saturday that a thirty-one day month will have one or two days in the sixth row. Accordingly, the last five cubicles in the sixth row need not include a lamp.

Each lamp **22** is connected to a separate contact on a thirty-seven contact rotary switch **26**. The wiper arm **28** connects one contact **24** at a time to a common terminal **30** at which power is fed into the unit. Thus if the wiper arm **28** were on the contact **24***i*, power would be fed from the terminal **30** through the wiper arm **28** and the contact **24***i* to the lamp **22***i* to light the date panel which represents the 20th of December on the calendar mask **18** shown in FIG. 2.

The wiper arm **28** is stepped around the various contacts **24** by a ratchet **32** and pawl **34** arrangement. The ratchet **32** is a thirty-seven tooth ratchet and the pawl **34** is conveniently made part of the normally raised solenoid armature **36**. Thus whenever the solenoid coil **38** is energized, the armature **36** will be pulled down and the pawl **34** will index the ratchet **32** one step so that the wiper arm **28** is indexed by one contact.

A spring loaded push button **40** is provided to permit manually indexing the wiper arm **28**. The manual indexing is required whenever the monthly date masks are changed. The button **40** permits manually advancing the wiper arm **28** to whatever position is required for the appropriate lamp **22** to light directly behind the first date of the new monthly date mask **18**.

The solenoid coil **38** is normally not energized and thus all that is needed for the ratchet **32** and pawl **34** mechanism to operate is a means for energizing the coil once a day so as to index the wiper arm **28** once a day and thus light the lamp **22** behind the appropriate date. The appropriate indexing is automatically achieved throughout the month by means of a simple cam **42** which is mounted on the same shaft as is the clock face **44**. Both cam **42** and clock face **44** are rotated through one complete revolution each day by the motor **46**. This motor **46** may be a synchronous motor very similar to the ones employed in the typical electrical clock and may be geared to the shaft **48** in much the same fashion as it is geared to the hour hand in the typical electrical clock, which hour hand rotates twice a day. All that is necessary in this invention is to establish a motor **46** to shaft **48** arrangement such that the clock face **44** rotates once a day.

A notch **50** in the cam **42** is positioned so that the actuating arm **52** on the normally open snap-action switch **54** rides into the notch **50** at exactly midnight. When the actuating arm **52** rides into the notch **50**, the contacts **56**, **57** in the switch **54** are closed so that power from the line is passed through the switch **54** to the solenoid coil **38** thereby indexing the wiper arm **28** one step. As soon as the actuating arm **52** rides out of the notch **50**, the switch **54** opens, power is removed from the solenoid coil **38** and the pawl **34** returns to its normal position.

The operation just described is shown in electrical schematic form in FIG. 3. Lines **60**, **61** from a source of power lead through the normally open switch **54** to the solenoid coil **38**. When the notch **50** on the cam **42** is in the position shown in FIG. 3, the actuating arm **52** will close the normally open switch **54** so that the condition shown in FIG. 3 will obtain and power will be supplied to the solenoid coil **38**. The energized solenoid **38** causes the pawl **34** to travel downwardly (as seen in FIG. 3) and index the thirty-seven tooth ratchet **32** by one tooth. Since the ratchet **32** and wiper arm **28** are mounted on the same shaft, the wiper arm **28** indexes the corresponding amount to bring power to the lamp **22** behind the next succeeding date panel.

The arrangement described permits a very simple combination clock-calendar that automatically tells both time and date throughout the month once it has been set. The

device **10** need be set only once a month. It provides a combination clock-calendar in which the entire month may be displayed while the particular date of the month is illuminated. By the use of separate contacts **24** connected to separate lamps **22** (each lamp **22** being in a separate cubicle in the rack **20**), one and only one date is illuminated so that there is an unambiguous indication of the date of the month.

It is convenient to arrange the clock face **14** behind the calendar frame **17** so that only a portion of the clock face **14** shows at a time. By means of a pointer **60** the time can be read as well as the date of the month and both can be read at a glance.

For convenience, the date mask **18** can be a separate item from the strip which indicates the month. The arrangements of dates within each month will vary from year to year and the number of panels **18** necessary can be reduced by having an interchangeable label indicating the month separate from the interchangeable translucent date panel **18**.

A standard slip clutch may be incorporated in the motor shaft **48** so that the cam **44** and clock face **14** can be moved manually even while the power is on. This would be desirable as a protective feature and for convenience in adjusting the clock face **14** whenever power has been removed from the entire item for some period of time. However, the arrangement described is such that it normally will not be necessary to adjust the clock face **14** when a new monthly panel is inserted.

One specific embodiment of the invention has been described in detail and certain variations indicated. Other variations in details will be obvious to those skilled in this art. It shall be understood that the following claims encompass such variations and are directed to the combination that constitutes the invention.

What is claimed is:

1. An automatic calendar comprising:
a rack of lamps including a separate enclosure for each lamp, each one of said enclosures having an open front face,
a translucent calendar panel for a month having each date of said month separately set out and visible from the face of said panel whether illuminated from the rear or not, said panel being flush against said open faces of said enclosures, whereby a separate one of said lamps is located behind each one of said dates of said panel and whereby the lighting of a given lamp will illuminate solely the date and the translucent portion of the panel therearound which is flush with the cubicle containing said given lamp, and
means for lighting said lamps individually and in sequence.

2. An automatic calendar comprising:
a translucent calendar panel for a month having each date of said month separately set out and visible from the face of said panel whether illuminated from the rear or not,
a rack of lamps behind said calendar panel, each date of said month having a separate one of said lamps positioned behind it and adapted to illuminate said date and the surrounding translucent portion of the panel only,
first switch means for lighting each one of said lamps individually and in sequence,
stepping means for stepping said first switch means once a day,
a cam,
means for rotating said cam once a day, and
second switch means operable by said cam and coupled to said stepping means to actuate said stepping means once for each rotation of said cam,
whereby the daily rotation of said cam will operate said second switch means once a day and thus actuate said stepping means to step said first switch means and light the next successive lamp once each day.

3. An automatic clock-calendar comprising:
a translucent calendar panel for a month having each date of said month separately set out and visible from the face of said panel whether illuminated from the rear or not,
a rack of lamps behind said calendar panel, each date of said month having a separate one of said lamps positioned behind it and adapted to illuminate said date and the surrounding translucent portion of the panel only,
first switch means for lighting each one of said lamps individually and in sequence,
stepping means for stepping said first switch means once a day,
a clock face,
means for rotating said clock face once a day, and
second switch means responsive to the midnight position of said clock face and coupled to said stepping means to actuate said stepping means once for each midnight position of said clock face,
whereby the daily rotation of said clock face will operate said second switch means once a day and thus actuate said stepping means to step said first switch means and light the next successive lamp once each day at the midnight position of said clock face.

4. An automatic clock-calendar comprising:
a translucent calendar panel for a month having each date of said month separately set out and visible from the face of said panel whether illuminated from the rear or not,
a rack of lamps behind said calendar panel, there being at least thirty-seven lamps, each of said lamps being set in a separate cubicle and positioned so that each date of said month and the surrounding translucent portion of the panel only is illuminable by a separate one of said lamps,
first switch means for lighting each one of said lamps individually and in sequence,
stepping means for stepping said first switch means once a day,
a clock face,
motor means for rotating said clock face once a day,
cam means connected to said clock face to rotate once a day, and
second switch means operable by said cam means and coupled to said stepping means to actuate said stepping means once for each rotation of said cam means,
whereby the daily rotation of said cam means will operate said switch means once a day and thus actuate said stepping means to step said switch means and light the next successive lamp once each day.

5. An automatic clock-calendar comprising:
a clock face,
motor means to rotate said clock face once a day,
a replaceable translucent calendar panel for a month having each date of said month separately set out and visible from the face of said panel whether illuminated from the rear or not,
an array of lamps positioned behind said calendar panel, each one of said lamps being in a separate cubicle and positioned so that each date of said month and the surrounding translucent portion of the panel only is illuminable by a separate one of said lamps,
a multi-position contact switch having a wiper arm and as many contacts as there are lamps, each one of said contacts being connected to a separate one of said lamps and said wiper arm being connected to a source of power whereby the indexing of said wiper arm to any one of said contacts will cause the corresponding one of said lamps to light,

a ratchet and pawl arrangement, said ratchet being connected to said wiper arm, whereby the actuation of said pawl will cause said wiper arm to index to the next succeeding one of said contacts,

solenoid means connected to said pawl to actuate said pawl when said solenoid means is energized,

a normally open switch connecting said solenoid to a source of electrical power, and

a cam connected to said clock face to rotate once a day, said cam being set to close said normally open switch at one position during each rotation of said cam,

whereby the daily rotation of said cam will close said normally open switch to energize said solenoid and actuate said pawl thereby indexing said ratchet and wiper arm once a day to light the next successive lamp each day.

6. The invention of claim 5 wherein said array of lamps comprises thirty-seven lamps arranged in five rows of seven lamps each and a sixth row of two lamps.

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