

[54] **CALENDAR DISPLAY DEVICE**

[76] Inventor: **Ellis Ray Ritchie**, P.O. Box 706,  
Whittiers, Ark. 99502

[22] Filed: **Oct. 13, 1972**

[21] Appl. No.: **297,350**

[52] U.S. Cl. .... **40/107, 58/4**

[51] Int. Cl. .... **G04b 19/24, G09d 3/12**

[58] Field of Search .... **40/107, 116-118,  
40/31, 131 D; 35/1; 58/4 A, 4 R, 6 A**

[56] **References Cited**

**UNITED STATES PATENTS**

|           |         |                           |        |
|-----------|---------|---------------------------|--------|
| 3,276,198 | 10/1966 | Barbera .....             | 40/107 |
| 3,477,222 | 11/1969 | Lau Chun Leung et al..... | 58/4 A |
| 2,170,408 | 8/1939  | Hillcourt.....            | 40/112 |
| 3,333,410 | 8/1967  | Barbella .....            | 58/4 R |

**FOREIGN PATENTS OR APPLICATIONS**

|         |        |                     |        |
|---------|--------|---------------------|--------|
| 235,714 | 2/1910 | Germany .....       | 40/117 |
| 781,613 | 8/1957 | Great Britain ..... | 40/107 |

*Primary Examiner*—Robert W. Michell

*Assistant Examiner*—J. H. Wolfe

*Attorney, Agent, or Firm*—Clarence A. O'Brien; Harvey B. Jacobson

[57] **ABSTRACT**

A calendar display device comprising a housing, a multi-month calendar formed of a sheet of light-transmitting material extending between dispensing and take-up spools to display the appropriate month through an opening in the housing, a plurality of lamps positioned behind the calendar sheet for selectively illuminating individual days of the month, circuit means for sequentially energizing the lamps in a pattern corresponding to the calendar days, control means including means for automatically advancing the calendar sheet at the end of each month to display the calendar of the subsequent month and means for conditioning the circuit means for sequential energization of the lamps in a pattern corresponding to the arrangement of days of the newly displayed monthly calendar.

**3 Claims, 13 Drawing Figures**

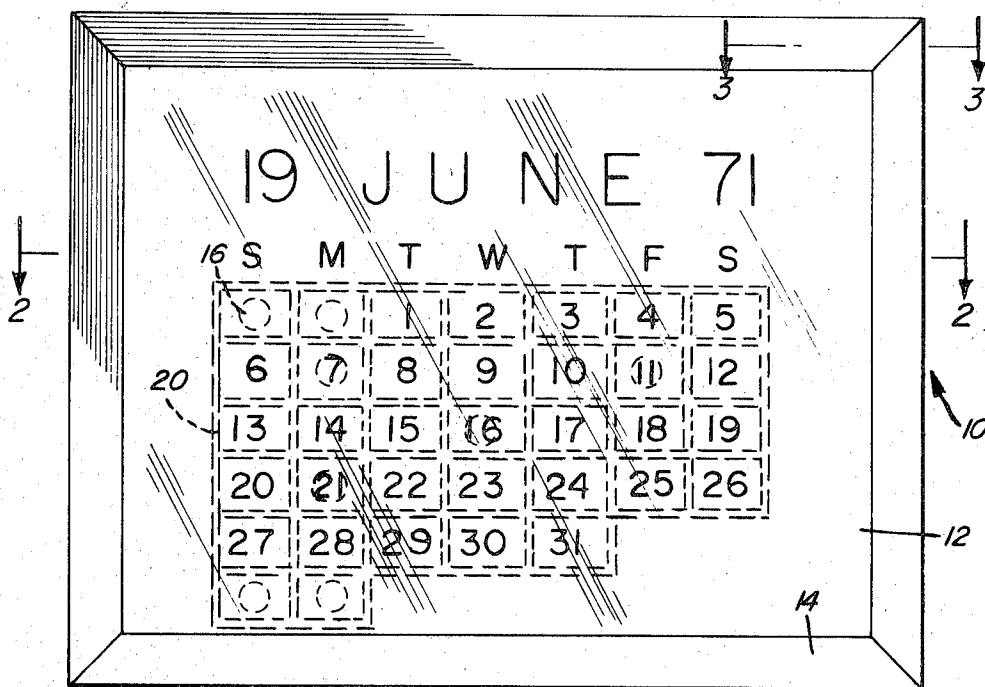


Fig. 1

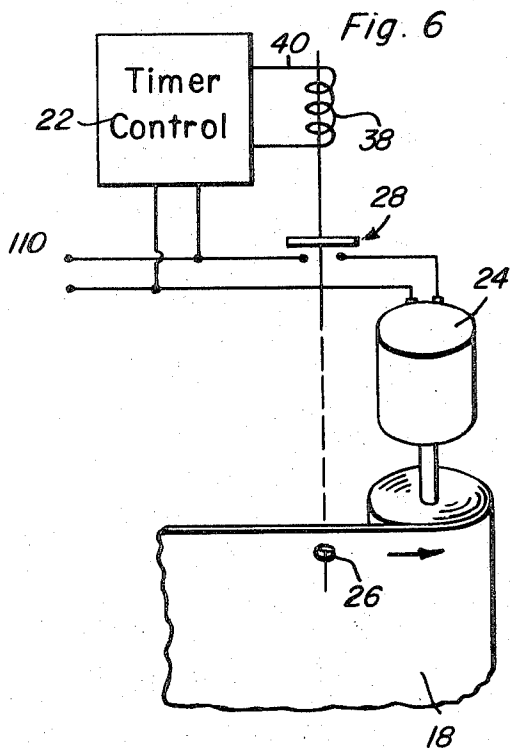
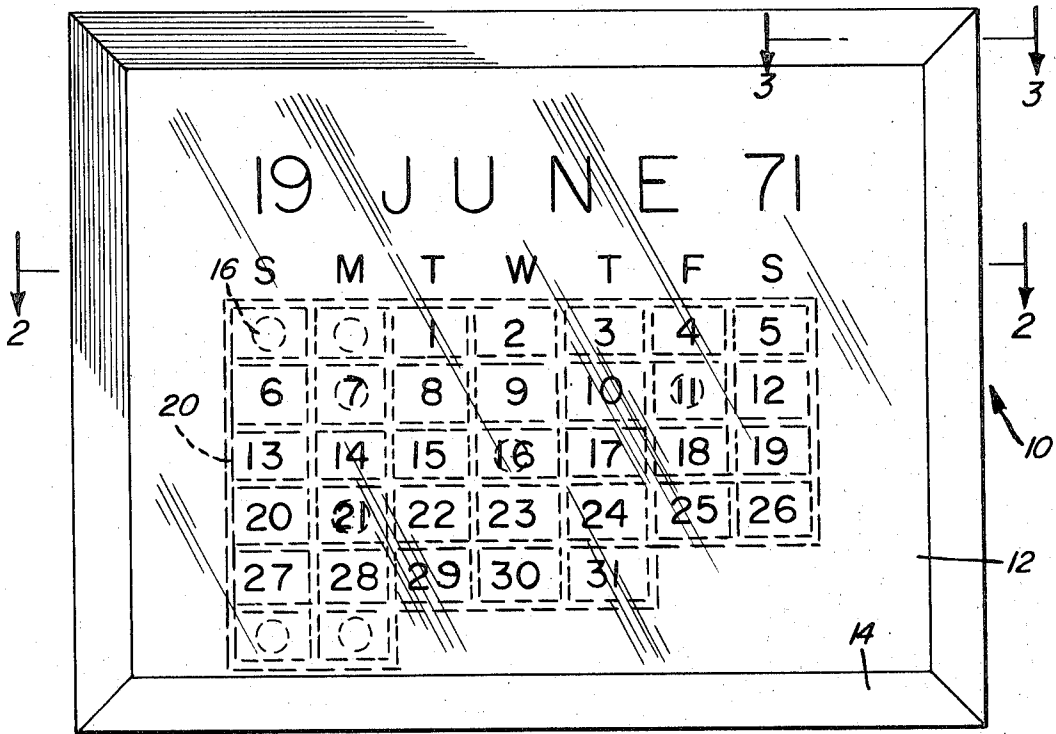
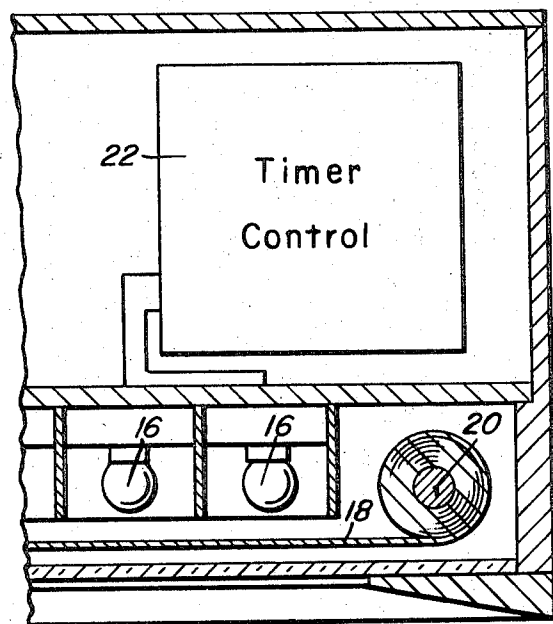
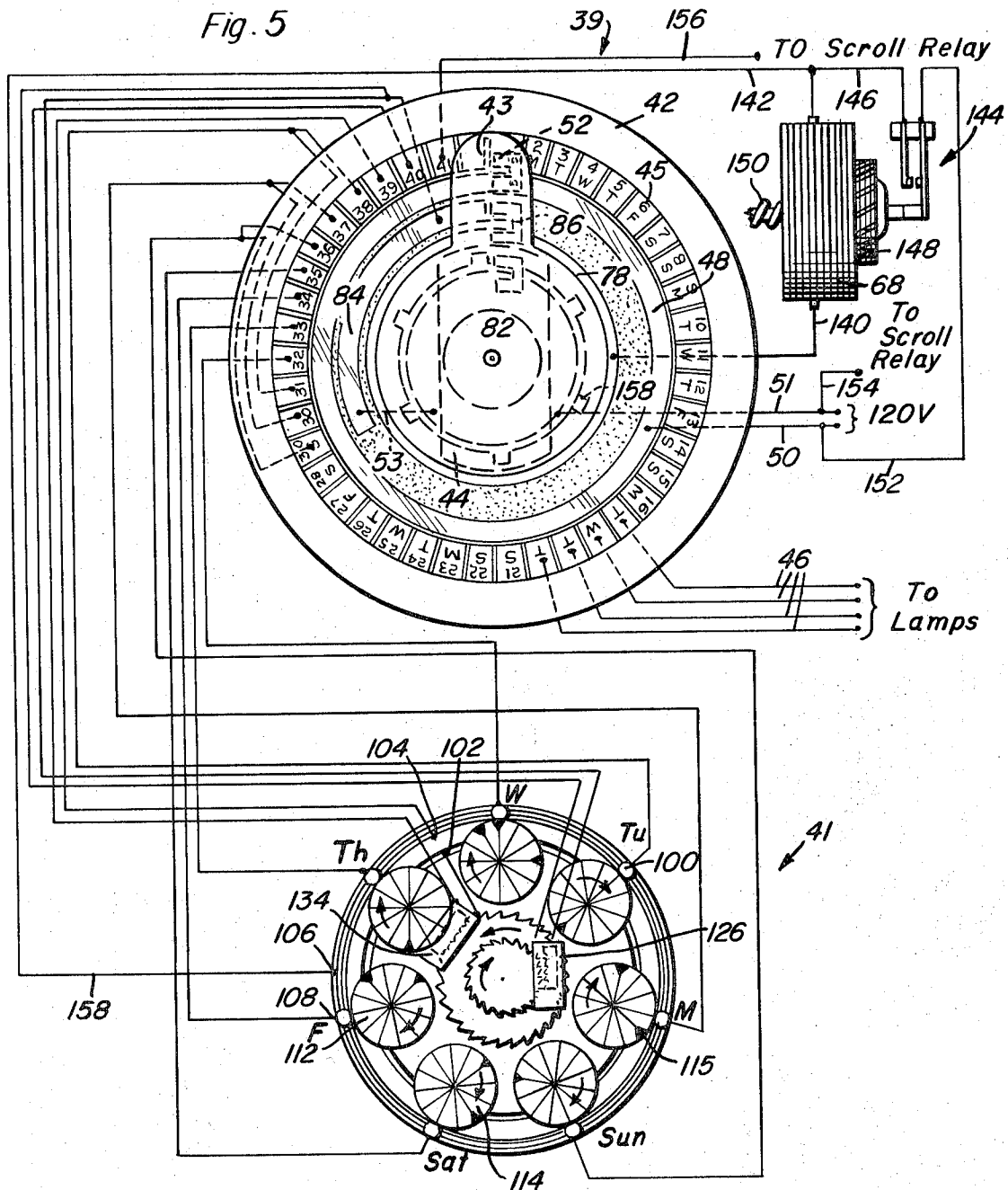


Fig. 2



*Fig. 5*



*Fig .3*

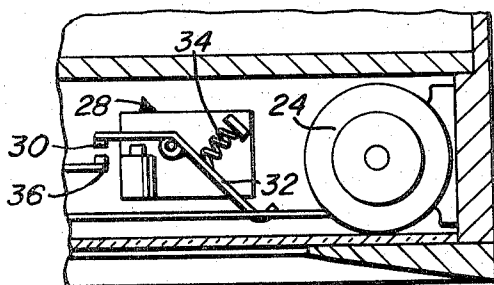


Fig. 4

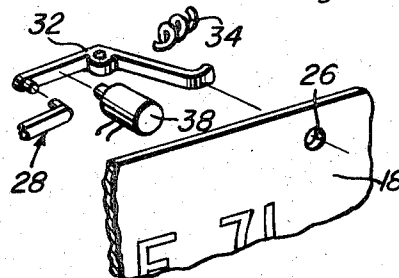


Fig. 7

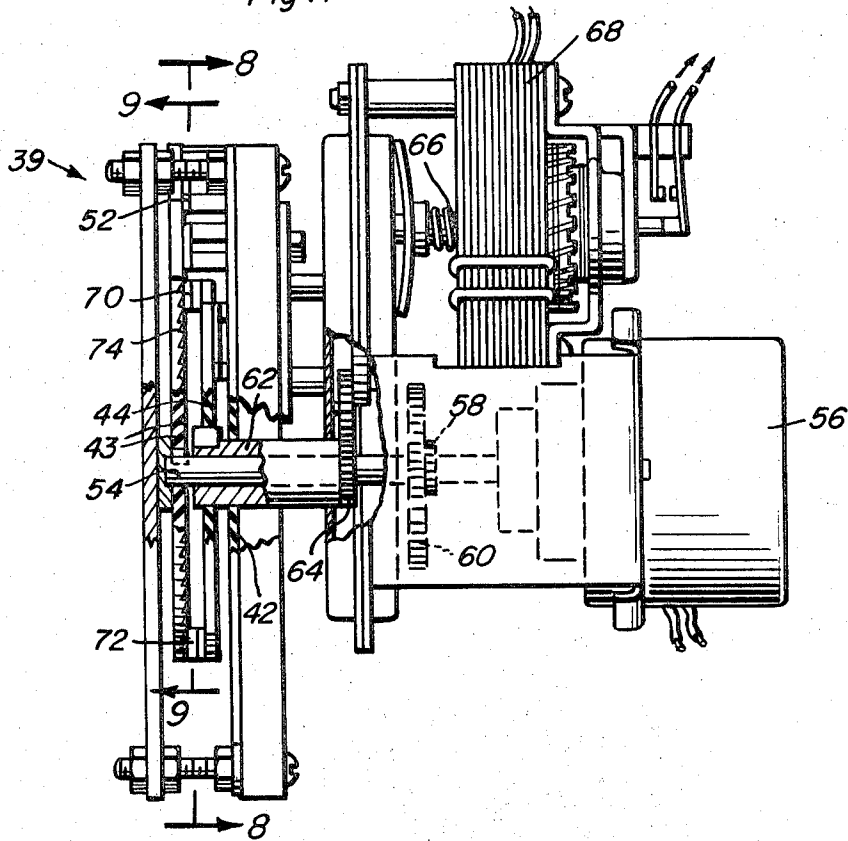


Fig. 9

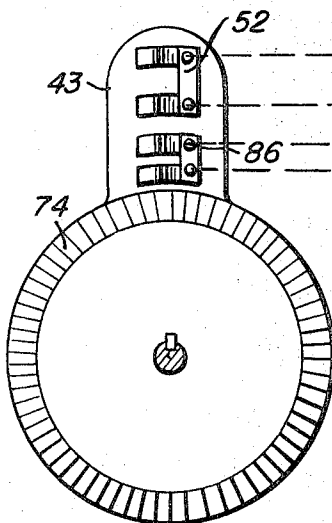
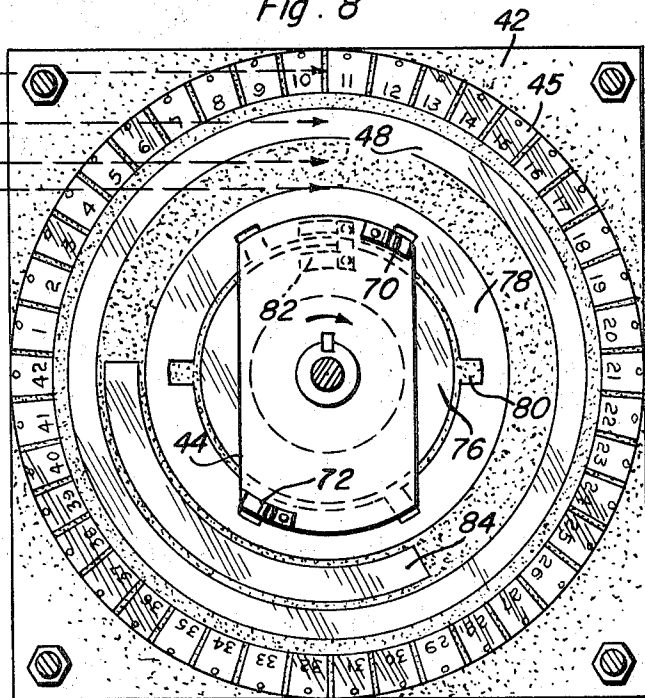


Fig. 8



SHEET 4 OF 4

Fig. 11

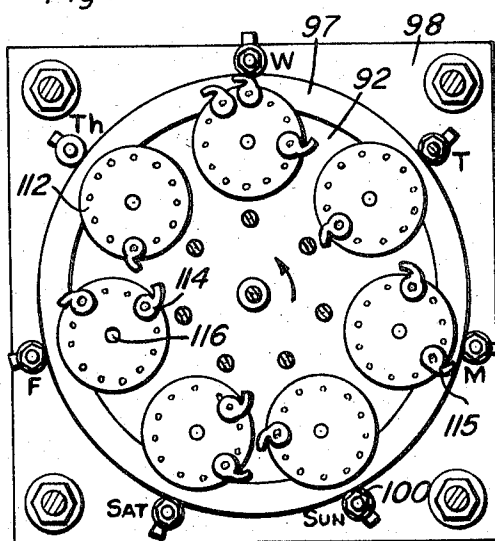


Fig. 10

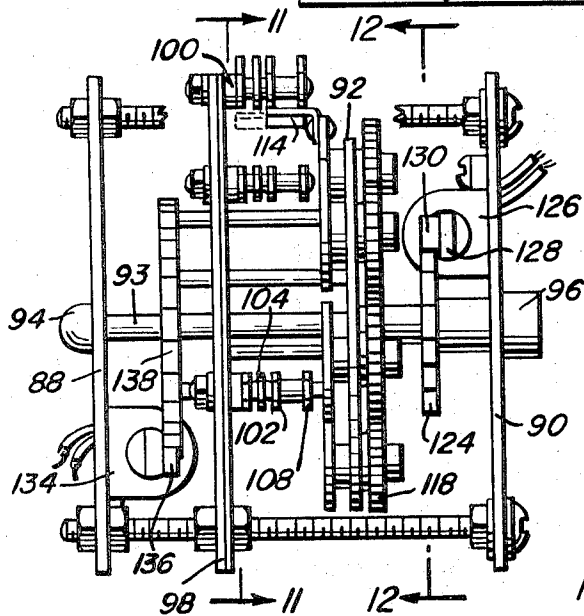


Fig. 13

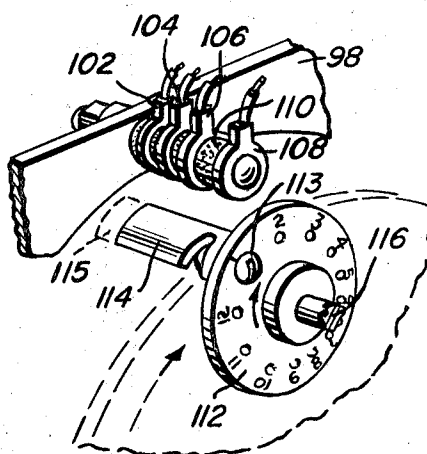
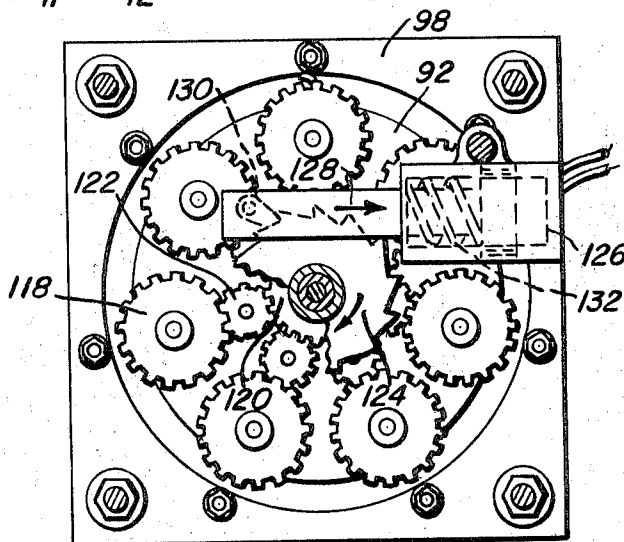


Fig. 12



## CALENDAR DISPLAY DEVICE

The present invention is generally related to calendar devices and, more particularly, to an improved calendar display device which automatically illuminates the proper day of the month and automatically changes the displayed month upon the completion of each month.

In the past, various calendar devices have been proposed to inform persons of the proper date. More recently, various automatic calendar constructions have been provided, for the most part. However, such have been relatively complex in nature and expensive to manufacture, such that they were beyond the financial means of the average homeowner. Furthermore, most such conventional constructions required manual resetting each month or year.

It is an object of the present invention to provide a novel calendar display device which is relatively inexpensive to manufacture and which automatically illuminates the proper day of the month and changes the month displayed without the need for manual adjustment or setting for up to four years.

Another object of the present invention is to provide a unique calendar display device including an elongated sheet or web of light-transmitting material extending between a pair of spools and including 48 monthly calendar sections spaced along its length and means for automatically rotating the spools at the end of each month to display the next monthly calendar section.

It is a further object of the present invention to provide a versatile calendar display device including an elongated calendar web having holes or similar means spaced along its length to actuate switch means for automatically stopping advancement of the web at a proper point in order to display a new monthly section of calendar.

Still another object of the present invention is to provide a unique calendar display device including circuit means for sequentially energizing lamps to illuminate the corresponding days of the month and control means for conditioning the circuit means at the beginning of each new month or energization of the lamps in a sequence corresponding to the daily arrangement of the new monthly calendar to be displayed.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout.

FIG. 1 is a front elevational view of the calendar display device of the present invention.

FIG. 2 is a partial sectional view taken substantially along section 2—2 of FIG. 1.

FIG. 3 is a partial sectional view taken substantially along section 3—3 of FIG. 1.

FIG. 4 is a partial exploded perspective view of the position sensing switch mechanism associated with the present invention.

FIG. 5 is a simplified wiring diagram and diagrammatic illustration of the time controls associated with the present invention.

FIG. 6 is a simplified diagrammatic illustration of the monthly advance mechanism and circuitry associated with the present invention.

FIG. 7 is a side elevation of the day select switch assembly of the present invention with sections removed.

FIG. 8 is a sectional view taken along section 8—8 of FIG. 7.

FIG. 9 is a sectional view taken along section 9—9 of FIG. 7.

FIG. 10 is a side elevation of the month selector switch assembly associated with the present invention.

FIG. 11 is a sectional view taken along section 11—11 of FIG. 10.

FIG. 12 is a sectional view taken along section 12—12 of FIG. 10.

FIG. 13 is an enlarged perspective view of one of the switch members associated with the month select switch assembly shown in FIG. 10.

Referring now, more particularly, to FIG. 1 of the drawings, the calendar display device of the present invention is generally indicated by the numeral 10 and includes a housing which is provided with a display window or opening 12 surrounded by a frame structure 14. The display window is of proper size and configuration to expose a single monthly calendar of the year, such as that illustrated in FIG. 1 for observation by those desiring to know the proper date.

Referring to FIG. 2, it will be noted that the device is provided with an elongated web or sheet of light-transmitting material 18, such as plastic, upon which the calendar indicia appears. Preferably, the web is divided into 12 monthly sections, which together make up an entire year's calendar. The web extends between a dispensing spool or reel, not illustrated, and a take-up spool 20 which is rotatably mounted with respect to the housing.

The housing is provided with a plurality of lamps 16 which are mounted in a grid-like pattern behind the calendar sheet and are separated from each other by panels or walls 20 which define 37 cubicals each surrounding one of the lamps. A monthly section of calendar is positioned in window 12 such that each lamp is located directly behind a corresponding number of the month. An annular timer 22 is mounted in the housing and includes a plurality of outlet leads each of which is connected to a single one of the lamps. As the timer is advanced at the end of each day, the proper lamp is energized to illuminate the corresponding day appearing on the calendar section. In addition, the timer control effects advance of the calendar sheet at the beginning of each month and automatically adjusts the lighting sequence to correspond to the newly displayed monthly calendar.

Referring to FIGS. 3 and 4, it will be appreciated that the calendar web or sheet is automatically advanced upon the completion of each month. This is achieved by way of an electric motor 24, or similar means drivingly connected to take-up spool 20 for rotation thereof when the motor is connected to a source of voltage. It will be noted that the elongated calendar web is provided with a plurality of holes 26 or similar means spaced along its length, each hole corresponding to a monthly calendar section. In addition, a sensing switch 28 is mounted in the housing and is provided with a movable contact 30 carried by a pivotally mounted arm 32, one end of which is adapted to engage a web hole 26, when aligned therewith. A coil compression spring 34 influences the end of arm 32

into engagement with the calendar web and is effective to move the arm pivotally into a web hole when in alignment therewith. A stationary contact 36 is normally maintained in engagement with movable contact 30 unless the end of arm 32 is in engagement with one of the web holes. Thus, it will be appreciated that as the calendar web is advanced by motor 24, switch 28 is effective to provide a signal representative of the completion of advancement of the web to the desired monthly calendar section. Switch mechanism 28 is provided with an electromagnetic coil 38, or similar means, which is in magnetic coupled relationship to a portion of arm 32 formed from iron or other magnetic material. As coil 38 is energized arm 32 is pulled toward it and closure of switch 28 is effected.

With reference to FIG. 6, it will be appreciated that electric motor 24 is connected to a source of voltage, such as 110 volt AC, by way of switch mechanism 28. Timer 22, preferably operated from the same 110 volt source, provides an output signal through leads 40 in order to energize the electromagnetic coil 38. The timer associated with the present invention provides such an output signal upon the completion of each month, which signal is effective to initiate energization of motor 24. Once the calendar web starts moving, switch mechanism 28 is maintained closed by the end of contact arm 32 wiping against the web until the next hole position is reached. When the calendar web is positioned to display the next monthly calendar section, one of the holes 26 aligns with the end of switch arm 32 to effect opening of switch 28, thereby de-energizing motor 24. Thus, it will be appreciated that the timer in conjunction with the electric motor and switch mechanism is effective to advance the calendar web at the end of each month for an entire year.

With reference to FIG. 5, a simplified wiring diagram and diagrammatic illustration of the timer control is shown. The control includes a day select switch assembly generally indicated by the numeral 39 which effects lighting of the calendar lamps, provides signals to electromagnetic coil 38 at the end of each month, and completes other switching functions, as hereinafter explained. The control also includes a month select switch assembly generally indicated by the numeral 41 which is appropriately wired to the day select switch assembly and is effective to condition or reset the day select switch assembly at the beginning of each month to assure proper sequential operation of the lamps. The day select switch assembly is provided with a printed circuit board 42 with a plurality of concentrically arranged conductive rings or segments which cooperate with contacts associated with a day select rotor 43 and month advance rotor 44 which are driven in a manner hereinafter explained. Circuit board 42 is provided with an outer conductive ring 45 divided into 42 segments electrically insulated from each other. The first 37 segments are connected to the lamps behind the calendar display sheet by way of leads as indicated at 46. Several of the lamp leads are not shown for the sake of clarity. A continuous conductive ring 48 is disposed adjacent segmented ring 45 and is connected to a voltage source by way of lead 50. Day select rotor 43 is provided with a first wiping contact 52 which sequentially bridges conductive ring 48 with the day segments associated with segmental ring 45. Thus, the day select rotor is driven in a clockwise direction, wiping contact

52 is effective to sequentially energize the calendar display lamps.

Referring now, more particularly, to FIGS. 7-9, the structure of the day select switch assembly may be seen in more detail. Day select rotor 43 is connected to a timer drive shaft 54 by way of a key or similar means. A timer motor 56 is drivingly connected to shaft 54 by way of a pinion gear 58 and a drive gear 60 affixed to shaft 54. The speed of the timer motor and the gear ratios are selected such that the day select rotor is advanced one segment at the end of each day to light the next lamp associated with the calendar display. This movement may be achieved in many ways. Conventional ratchet mechanisms or escapement mechanisms may be utilized in lieu of the gears illustrated in FIG. 7 so long as a day select rotor is advanced one segment at the end of each day. Month advance rotor 44 is keyed to a sleeve 62, rotatably supported by shaft 54. One end of sleeve 62 is provided with gears 64 which are drivingly connected to the output shaft 66 of a rapid advance motor 68. As hereinafter explained, the rapid advance motor is energized only at the end of each month to rotate month select rotor 44 through an arc of either 60° or 120°. A pair of pawls 70 and 72 are mounted on one side of the month advance rotor and engage ratchet teeth 74 formed on the surface of day select rotor 43. Preferably, each pawl is made of resilient, leaf-spring material and is oriented to transmit clockwise rotation to the day select rotor when the month advance rotor is driven by rapid advance motor 68. However, when the month advance rotor is stationary, the day select rotor is free to rotate in a clockwise direction under the influence of timer motor 56.

With particular reference to FIG. 8, it will be observed that printed circuit board 42 is provided with an innermost conductive ring 76 which is connected to the voltage source by line 51, shown in FIG. 5. Conductive ring 76 is surrounded by and insulated from another conductive ring 78, hereinafter referred to as the monthly advance conductive ring. This ring partially underlies month advance rotor 44 and is provided with six insulation areas 80 spaced 60° apart from each other. Preferably, these insulation areas are arranged in radial alignment with day segments 7, 14, 21, 28, 35 and 42 of the outermost segmental conductive ring 45. Each insulation area 80 is of radial dimension which extends approximately one-half the width of conductive ring 78. The month select rotor carries a pair of bridging contacts 82 in wiping engagement with conductive rings 76 and 78, respectively to effect energization of rapid advance motor 68. One of the bridging contacts 82 is positioned such that it comes in periodic engagement with insulation areas 80 to break the circuit and deenergize the rapid advance motor. Thus, once the rapid advance motor has been energized, it will continue to drive month advance rotor 44 through an angular displacement of at least 60°, at which time one of the bridging contacts 82 comes into engagement with an insulation area 80.

Under certain conditions, it is necessary to displace the monthly advance rotor a total of 120°, rather than 60°. This is achieved by way of an arcuate conductive strip 84 disposed between continuous conductive ring 48 and monthly advance conductive ring 78. The arcuate conductive surface extends an angular distance of 120° between day segments 28 and 1. Day select rotor 43 is provided with a second pair of bridging contacts

86, one of which is adapted to engage conductive surface 84, with the other maintained in wiping engagement with the outer portion of monthly advance conductor ring 78. As will be explained, conductive surface 84 and innermost conductive ring 76 are electrically connected together by an external lead. When bridging contact 86 comes into engagement with conductive surface 84, it is effective to supply current to monthly advance conductor ring 78. This assures that the day select rotor does not stop on a day segment between 32 and 1.

Referring now, more particularly, to FIGS. 10-13, the structure of the month selector switch assembly may be seen in more detail. The assembly comprises a housing including a pair of opposite frame members 88 and 90 which support a rotary disc 92 by way of a shaft 93 extending between a pair of bearing members 94 and 96. A contact support frame 98 is disposed between frame members 88 and 90 and is provided with a circular opening 97 through which shaft 93 passes. Preferably, support frame 98 is made of insulation material and is provided with seven contact posts 100 circumferentially spaced around opening 97. Each post is provided with four axially spaced contacts 102, 104, 106 and 108 which are insulated from each other by insulation members 110, as best illustrated in FIG. 3. The contacts associated with the posts are electrically connected together by way of external leads, not illustrated, or similar means such as continuous conductive rings extending around opening 97. Thus, all of the contacts 102 are connected to a common line as are contacts 104, 106 and 108, respectively.

Rotary disc or member 92 carries seven rotary switch members 112 circumferentially spaced around disc 92 and corresponding to the days of the week. Each switch member is provided with a bridging contact 114 which is appropriately positioned for operative engagement with different contact posts 100 at predetermined intervals during the annual cycle. Each rotary switch member is affixed to a switch actuating shaft 116 for rotation therewith. Each shaft 116 is supported by an appropriate bearing carried by rotary disc 92, with a switch actuating gear 118 affixed to each shaft for rotation thereof.

With particular reference to FIG. 12, it will be observed that gears 118 are drivingly connected to a main drive gear or planet pinions 120 by way of intermediate gears 122, also carried by rotary disc 92. A main drive gear 120 is coupled to an incremental drive assembly including a ratchet 124 for rotation thereby. A month solenoid 126 is mounted to frame member 90 and includes a plunger 128 which carries a pawl 130. The month solenoid is illustrated in the energized position in FIG. 12 and is provided with an internal return spring 132 which moves plunger 128 to the right when the solenoid is de-energized. This rotates ratchet 124 in a clockwise direction to rotate gears 118. The gear ratios and ratchet movement are such that gears 118 are rotated 1/12th of one revolution for each pulse of month solenoid 126.

Referring again to FIG. 13, it will be observed that each rotary switch member 112 is provided with twelve circumferentially spaced apertures corresponding to the months of the year. Each aperture is adapted to receive an appropriate fastener 113 for securing a bridging contact 114 in place. The rotary switch members are arranged such that the bridging contacts which they

carry will engage the contacts associated with posts 100 only when they are positioned at a radially outermost location. For example, the rotary switch member illustrated in FIG. 13 is positioned with aperture 2 in alignment with contact post 100, and if a bridging contact was mounted at this position, it would bridge contacts 104, 106 and 108. If the rotary switch member in FIG. 13 is advanced 1/12th of a revolution by way of the solenoid as explained above, bridging contact 114 (at aperture 1) would engage contacts 104, 106 and 108.

A total of twelve bridging contacts are carried by rotary switch members 112, with 11 of the contacts similar to contact 114, and one of the contacts of greater length, as indicated in dash line at 115 and capable of bridging all four stationary contacts 102, 104, 106 and 108. The contacts are positioned on the rotary switch members as a function of the first weekdays of the months. For example, the Friday switch member indicated at "F" is provided with two bridging contacts which are positioned at the September and December mounting holes, since both September and December begin on a Friday. The large bridging contact 115 is mounted at the January position of that switch member of the appropriate weekday upon which January of the subsequent year begins. This is to advance rotary disc 92 through 1/7th of a revolution at the end of each year.

Rotation of disc 92 upon the completion of each year is effected by way of a year reset solenoid 134, electrically connected to the day select switch assembly through one of the contacts 102. Solenoid 134 is similar to solenoid 126 and is provided with a pawl 136 which engages a ratchet member 138, affixed to shaft 93 to effect rotation of disc 92. Upon the completion of a 12-month period, solenoid 134 is pulsed to rotate disc 92 1/7th of a revolution. This advances the rotary switch members 112 to the next day position. For example, the switch member which was originally at the Sunday position will be moved to the Monday position at the end of the first year, then the Tuesday position at the end of the second year and so on. With this arrangement, it is possible to set up the calendar device of the present invention for automatic operation or a period up to four years (less one day), not including leap years. For example, the device could be set up on Mar. 1, 1972 and would operate continuously until Feb. 28, 1976 without requiring adjustment. It will be appreciated that this is possible since the first day of the corresponding month of a subsequent year falls on the next day of the week. In other words, Mar. 1, 1972 was a Wednesday, Mar. 1, 1973 a Thursday, and so on.

Referring again to FIG. 5, the circuitry and operation of the invention will be explained in more detail. The innermost conductive ring 76 is connected to the voltage source by way of line 51 and connected to arcuate conductive surface 84 by way of line 53. Thus, current may be supplied to month advance conductive ring 78 by way of either the innermost conductive ring 76 or arcuate conductive surface 84. One terminal of rapid advance motor 68 is connected to conductive ring 78 by way of line 140, the other terminal being connected to stationary contact 106 associated with the month selector switch assembly by way of line 142. This terminal is also connected to one contact of an interlock switch 144 by way of line 146. The contacts of the interlock switch are normally maintained open by way of rotor 148 of the rapid advance motor, the rotor being

biased beyond the confines of the motor stator under the influence of a coil compression spring 150. When the motor is energized, the rotor is axially displaced to the left, whereby interlock switch 144 is closed for connection to one terminal of the voltage source through line 152. Such motors with axially movable rotors are commercially available items, and it is not intended that the motor, in itself, constitute a part of the present invention.

Electromagnet 38 associated with the scroll relay described above is connected to one side of the voltage source through line 154 and to the other side of the voltage source through line 156, which is connected to day contact segment 41 of the day select switch assembly. When wiping contacts 52 connect segment 41 with conductive ring 48, the scroll relay circuit is completed to initiate the above-described advancement of the calendar sheet.

Operation of the day and month selector switch assemblies may be explained as follows. Assuming that Jan. 1 of a nonleap year falls on a Sunday, the day and month selector switch assemblies would be set up as illustrated in FIG. 5. The rotary month selector switch members are illustrated in simplified form with triangles representing the positions of contacts 114 and 115 explained above. Also, stationary contacts 102, 104 and 106 are illustrated as being connected to conductive rings rather than individual contacts as illustrated in FIGS. 11-13. This is merely for the sake of simplicity, as the corresponding contacts of each post would be connected together by external wiring, as explained above. When any one of the triangles is in alignment with a stationary contact post, such indicates that the stationary contacts are being bridged to complete the related circuits.

On the first day of the year (Sunday, Jan. 1) bridging contacts 52, 82 and 86 associated with the day select rotor and month advance rotor would be positioned as illustrated in FIG. 5. With timer motor 56 energized, day select rotor 34 is advanced such that its wiping contact 52 sequentially engages the day segments to energize the appropriate lamps on the calendar display.

At midnight of Jan. 31, bridging contact 52 is advanced into engagement with day segment 32. This completes a circuit from the voltage source through conductive ring 48 to the Wednesday switch member of the month selector switch assembly which bridges contacts 104, 106 and 108. This connects the rapid advance motor to one side of the voltage source through line 158, with the other side of the voltage source being connected to the motor by way of innermost conductive ring 76 which is connected to month advance conductive ring 78 by way of wiping contact 82. With the day select rotor at this position, wiping contact 86 also connects motor advance conductive ring 78 with arcuate conductive surface 84 which is electrically wired to the innermost conductive ring by way of lead 53. As the rapid advance motor is energized, motor advance rotor 44 is rotated in a clockwise direction, and the pawls associated therewith engage ratchet teeth 74 of the day select rotor to cause advancement thereof. When the rapid advance motor is initially energized, rotor 148 is axially displaced to the left, whereby the contacts of interlock switch 144 are closed. As wiper 52 moves off of day contact segment 32, the rapid advance motor still continues to run as it is energized by way of the interlock switch.

As wiping contacts 52 engage day segment 40, current is supplied to month solenoid 126 which effects rotation of the gears and month selector switch members, as explained above, placing the second triangle associated with the Wednesday switch member in engagement with the associated contact post. The rapid advance motor continues to run, whereby wiping contact 52 engages day segment 41 to energize the scroll relay to advance the calendar sheet to the next monthly section. As the day select rotor moves past day segment 42, wiping contacts 86 are disengaged from arcuate conductive surface 84. However, the rapid advance motor continues to run, as current is supplied through wiping contacts 82 of the month advance rotor. When the day select rotor arrives at day segment 4, wiping contacts 82 arrive at the third insulation area associated with the month advance conductive ring 78. This area is indicated by the numeral 158 in FIG. 5. With wiping contact 52 in engagement with day segment 4, the proper lamp of the calendar display is energized, as Feb. 1 falls on a Wednesday.

As the annual cycle continues, the rapid advance motor is effective to rotate the month select rotor through a displacement of either 60° or 120° at the end of each month depending upon the relative positions of the wiping contacts. On the last month of the year, enlarged bridging contact 115 is advanced into engagement with the Monday contact post of the month selector switch assembly. At the end of the last day of the year, wiping contact 52 engages day segment 39 and the year solenoid 134 is energized, the circuit being completed by the bridging of contacts 102 and 104 by contact 115. This rotates disc 92 to move each rotor switch member to the next contact post. This movement sets up the contact arrangement for the calendar of the new year and the annual cycle is repeated, as explained above.

From the foregoing description, it will be appreciated that the calendar display device of the present invention provides a unique means by which the proper day of each month is automatically illuminated for convenient observation by those desiring to know the date. In addition, the monthly calendar sheet is automatically advanced at the end of each month to display the calendar of the new month. This is achieved without manual adjustments or setting beyond the initial set up of the device. The calendar display device is of relatively simple construction and is economical to manufacture, such that the device may be purchased at a reasonable price within the means of most homeowners.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed as new is as follows:

1. In an automatic, clock-driven calendar having a first day display device continuously driven at a relatively low speed for indicating the day of the month and a second month display device intermittently driven at a relatively high speed by an incremental amount for indicating the month of the year, wherein the improvement resides in means for driving a control assembly which is operatively connected to said month display

device for programming operation thereof, comprising a rotary member, contact means fixedly mounted and in operative relation to the rotary member and connected to the day display device for operation thereof, a plurality of switching devices engagable with the contact means for controlling said operation of the day display device, a plurality of switch actuators rotatably mounted on said rotary member and carrying said switching devices for sequential engagement of selected ones of said contact means, incremental drive means electrically connected to the day display device for rotation of the switch actuators simultaneously with operation of the month display device to actuate the switching devices, and annual reset means responsive to rotation of said switch actuators by a predetermined amount for incrementally advancing the rotary member to effect actuation of the switching devices and additional operation of the day display device, whereby the day display device is automatically reset each year.

2. The combination of claim 1 wherein said switch actuators include a plurality of planet pinions, a drive gear drivingly connected to said planet pinions, ratchet means engageable with the drive gear for imparting rotation to the planet pinions while the rotary member is stationary, said planet pinions being rotated in response to advancement of the rotor relative to the drive gear, and mounting means connecting the switching devices to the planet pinions for projection radially from the rotary member into engagement with the contact means.

3. The combination of claim 2 wherein each of said switching devices comprises a rotary switch member connected to one of the planet pinions and projecting peripherally beyond the rotor, and at least one contact bridging element mounted on the switch member.

\* \* \* \* \*

20

25

30

35

40

45

50

55

60

65