

May 13, 1969

E. L. DAVIS

3,443,331

PERPETUAL CALENDAR MACHINE

Filed July 21, 1967

Sheet 1 of 5

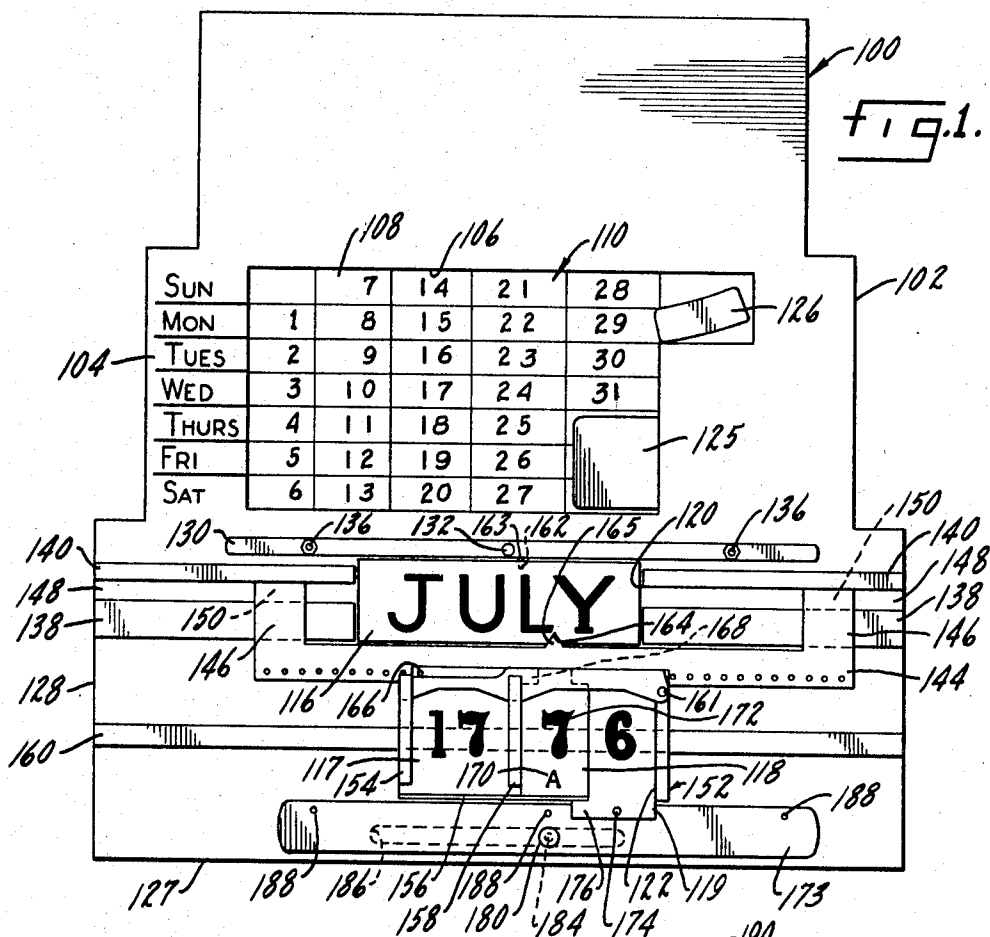
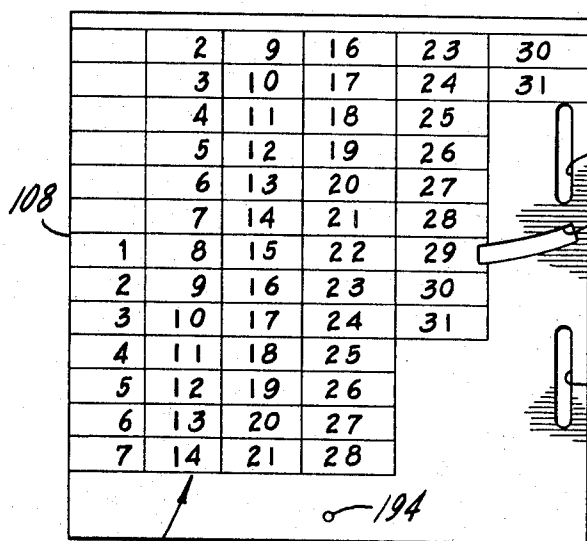
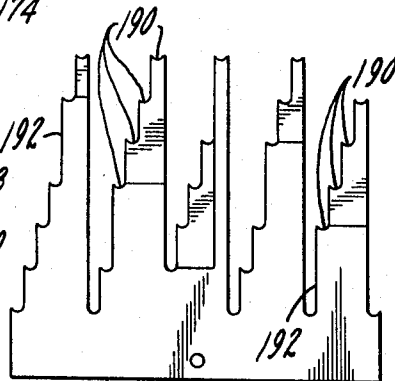


fig. 7.

fig. 6.

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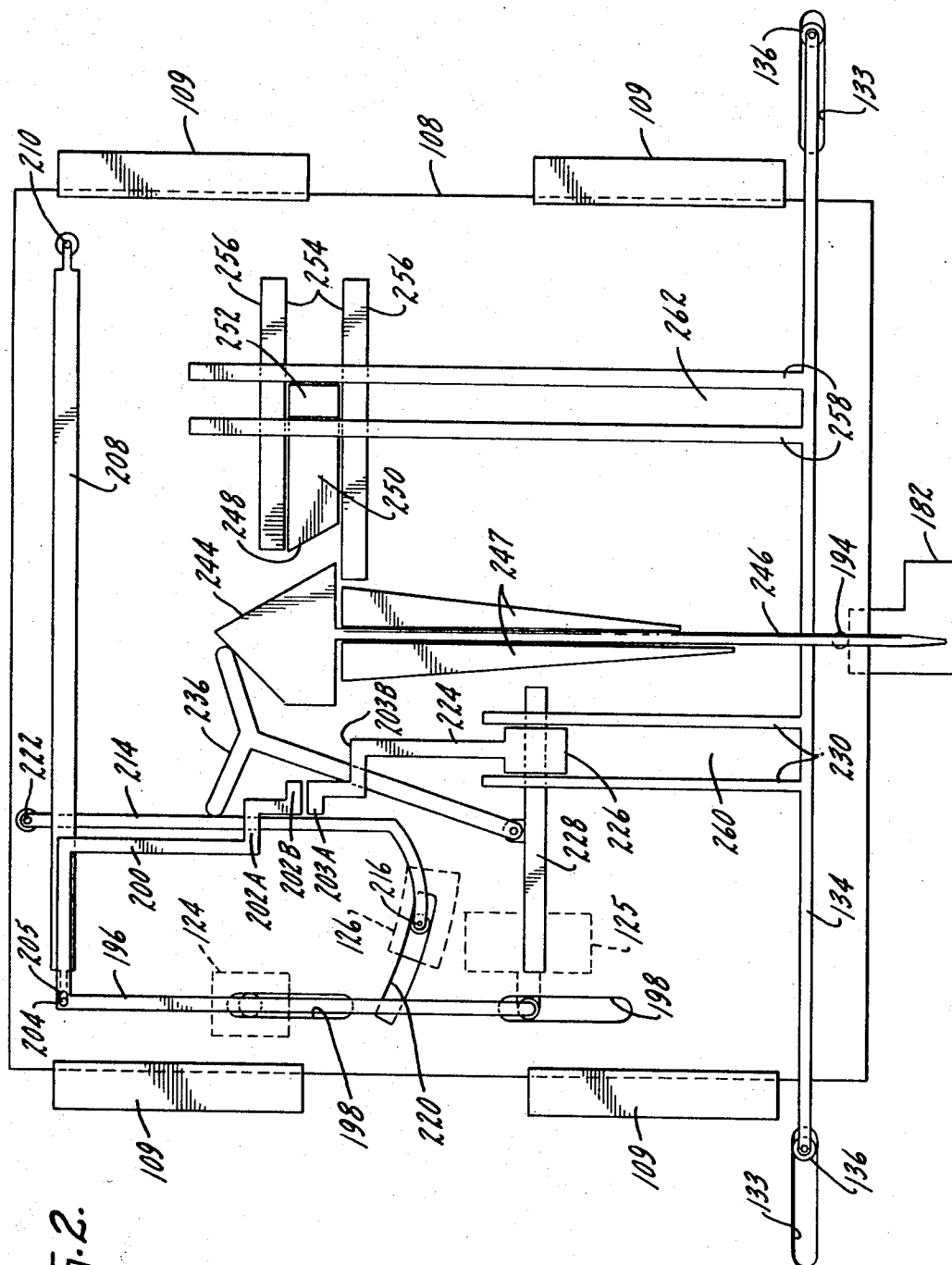
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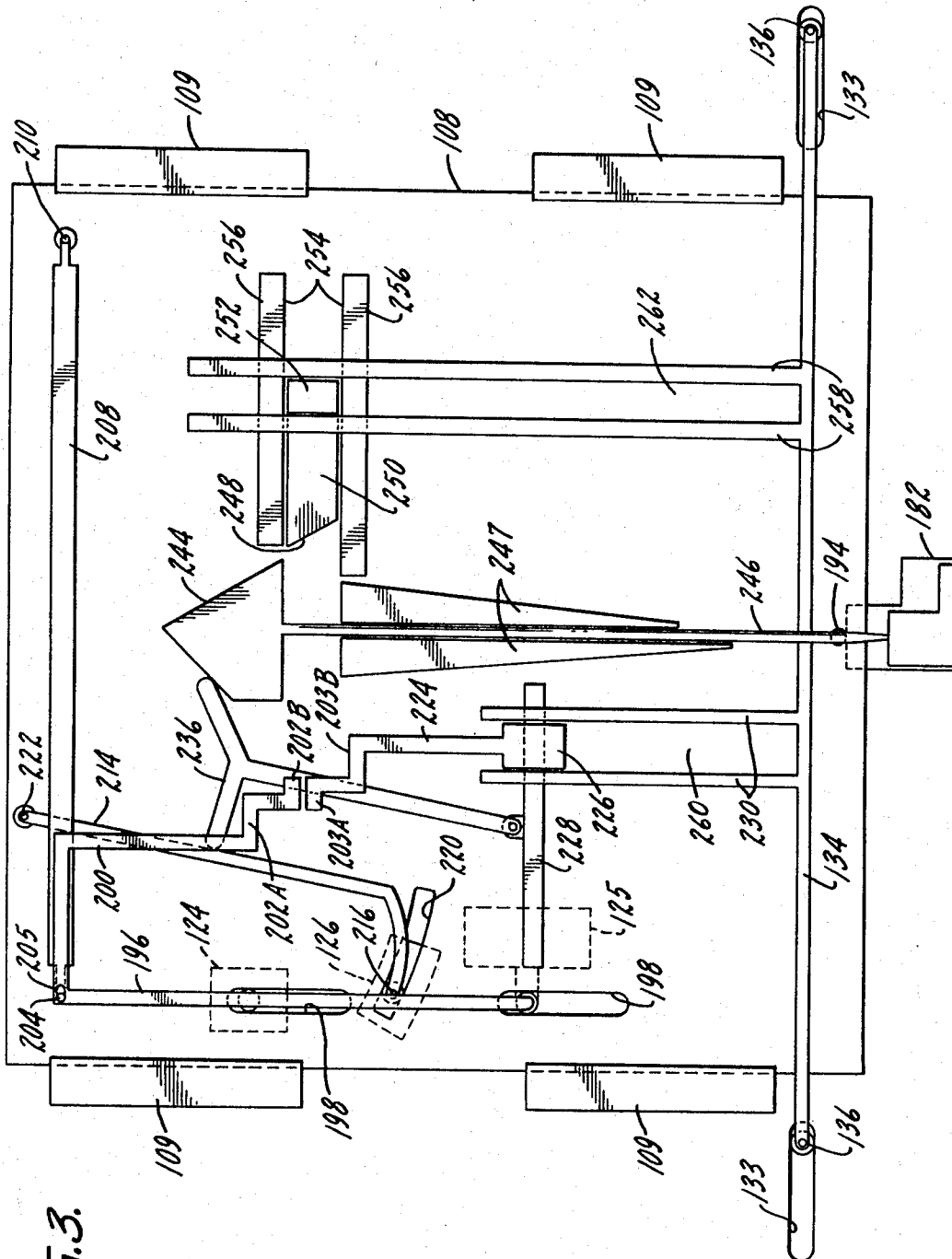
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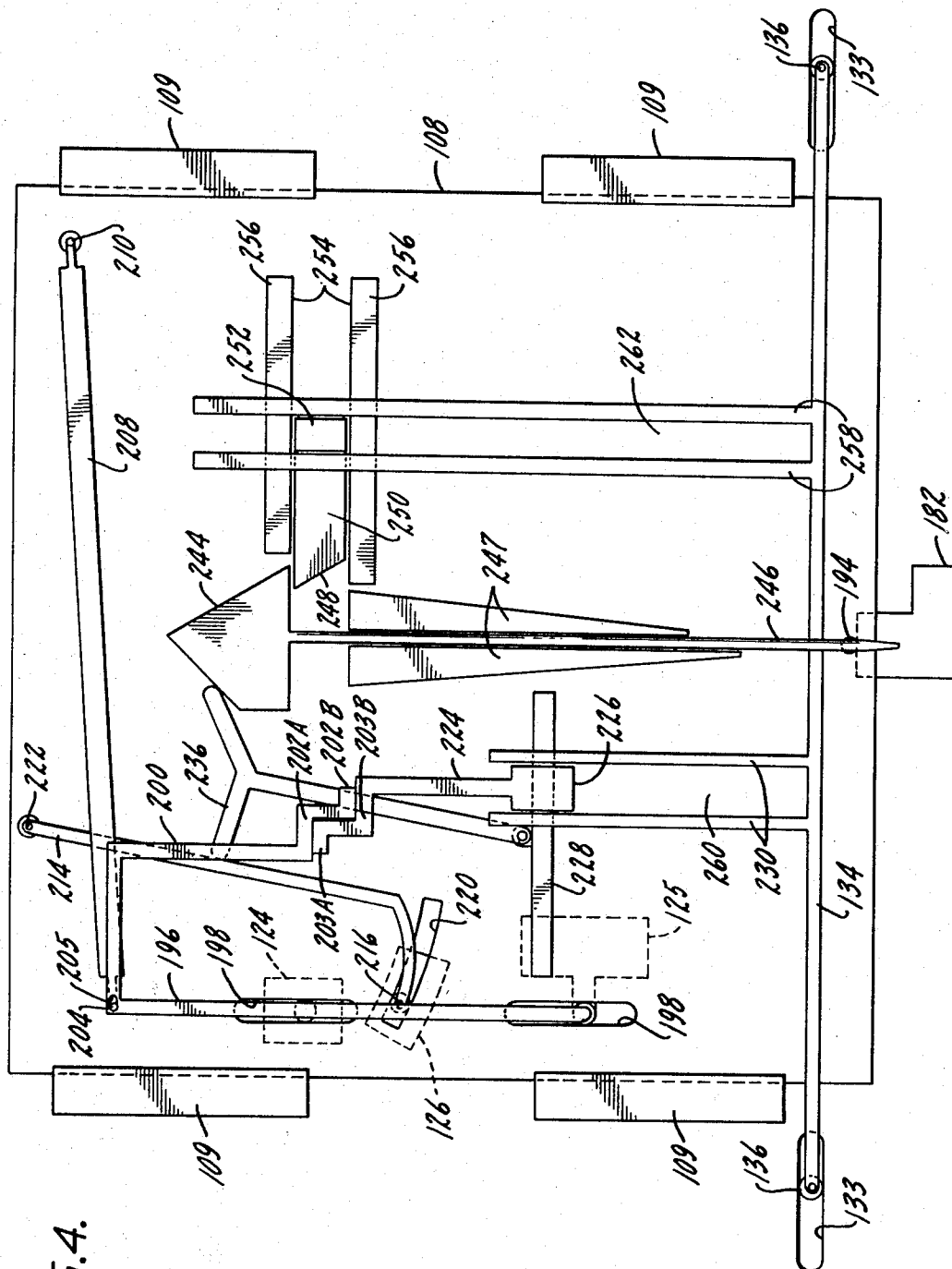


FIG. 4.

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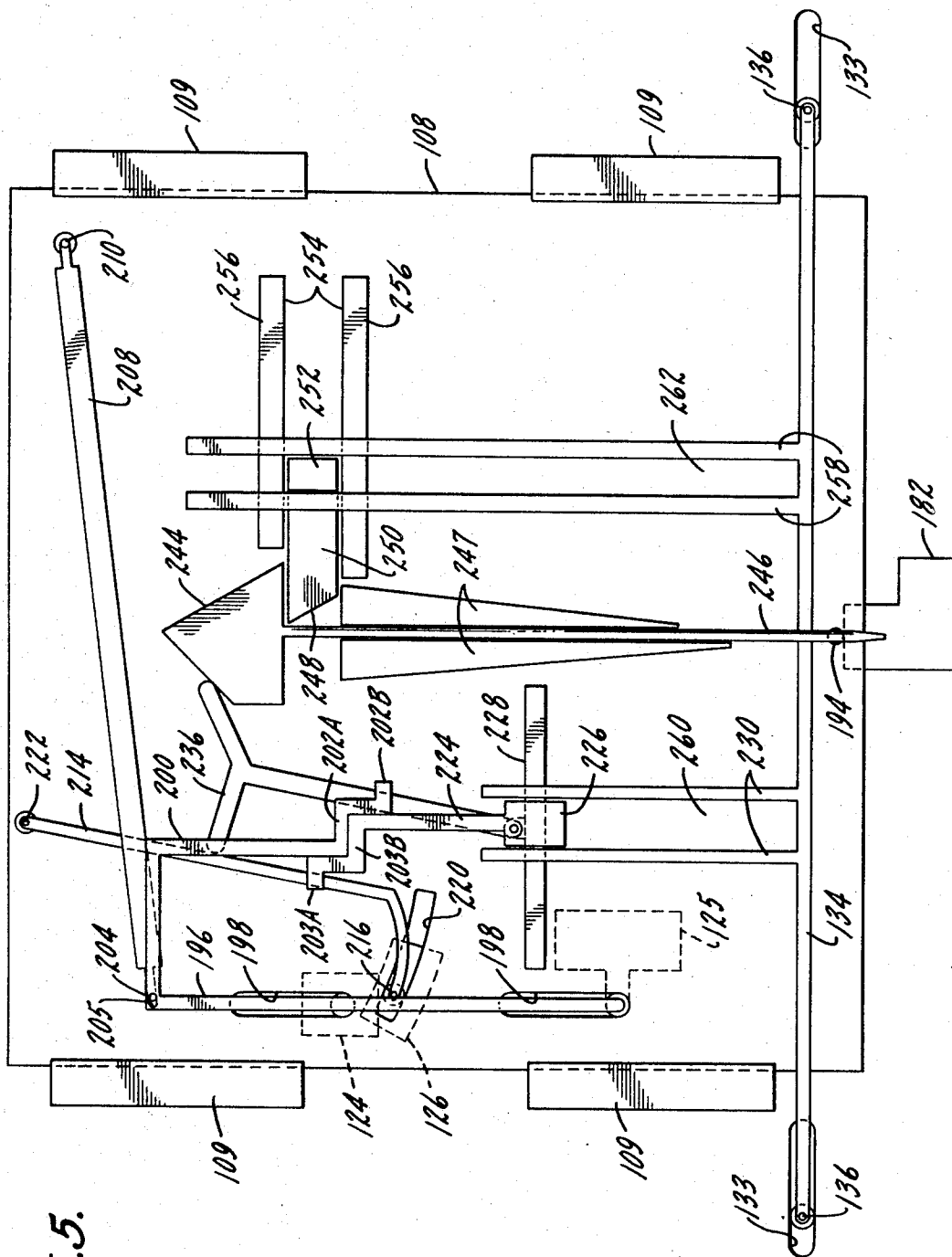
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3,443,331

PERPETUAL CALENDAR MACHINE

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8 Claims 5

ABSTRACT OF THE DISCLOSURE

An automatic calendar including a days of the month slide which is positioned to show the correct desired month by programming means which includes a series of coded cards and means responsive to said programming means to correctly position the said slide.

This invention relates to a perpetual calendar machine and more specifically to a perpetual calendar machine that indicates the proper number of days, and day to day-of-the-week relationship for any month of any year, past, present or future in the Gregorian calendar system.

In ordinary use a calendar's main functions are to indicate to its user upon which day of the week a particular date falls and to indicate the number of days contained in any month. Ordinary calendars serve these purposes for dates and months within a particular year. However, the ordinary calendar does not serve the historian who might wish to know if the discovery of America on October 12, 1492, took place on a Monday, Tuesday or Wednesday, or the astronomer who might wish to know if a certain comet, expected twenty years hence, will be visible on a weekday or week-end evening. Historians, astronomers, lawyers, executives and others seeking analogous information must resort to calendar tables.

In providing a perpetual calendar that will supply the same information as calendar tables many variables must be contended with. The number of days in the months vary. The day of the week upon which a date falls changes from year to year and a leap year occurs every four years except for those centesimal years not exactly divisible by 400 which, although following four years after a leap year, are not leap years themselves.

The usual perpetual calendar takes the form of a wheel or slide board having series of integers thereon and means for aligning a particular series with a day-of-the-week indicator. In usual practice the operator must set this wheel or board so that the correct day to day-of-month relationship is indicated by the calendar. Often he must resort to a key table to obtain the initial setting. However, because so many variables must be contended with, calendars often fail to picture the precise number of days in the month, or fail to make proper leap year adjustments, including adjustments for a specific date included in the year of the calendar's use.

It is an object of this invention to provide a perpetual calendar that will quickly and easily supply to its operator a correctly designated calendar month of his choice for any chosen year.

It is another object, related to the foregoing to provide a perpetual calendar which properly depicts the correct month of any year without prior knowledge of any specific day to day-of-the-month relationship for that year, or initial reference to a chart, table or the like.

Calendars have great usefulness in the advertising trade and can also be of decorative value in homes and offices. A perpetual calendar, because of its long useful life could well become a pleasant aesthetic fixture, adding permanent beauty to a home or an office, or it can be used by advertisers to present a message which can be

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changed yearly or which can remain permanently before the calendar user.

Accordingly, it is a further object of my invention to provide a calendar of the type herein characterized, that will be useful, alternatively or both as an advertising tool, or as a permanent ornamental fixture in a household or office.

Other objects and advantages will become apparent as the disclosure proceeds and the description is read in light of the accompanying drawings in which:

FIGURE 1 is a front view of the perpetual calendar machine of this invention;

FIGURE 2 is a schematic representation of certain mechanical parts as viewed from the back of the calendar, illustrating their relative positions to provide for a 28 day February month of a non-leap-year;

FIGURE 3 is a schematic representation similar to that of FIGURE 2 illustrating the relationship of mechanical parts for any 29 day month;

FIGURE 4 is a schematic similar to FIGURES 2 and 3 illustrating the relationship of mechanical parts for any 30 day month;

FIGURE 5 is a schematic similar to FIGURES 2, 3 and 4 illustrating the relationship of parts for any 31 day month;

FIGURE 6 is a full front elevation illustrating the day character slide board used in the perpetual calendar of this invention; and

FIGURE 7 is a rear pictorial view of a camming template used in the perpetual calendar of this invention.

While the invention is susceptible of various modifications and alternative constructions, a certain embodiment has been shown in the drawings and will be described below in considerable detail. It should be understood, however, that there is no intention to limit the invention to the specific form disclosed but, on the contrary, the intention is to cover all modifications, alternative constructions and equivalents falling within the spirit and scope of the invention as expressed in the disclosure and appended claims.

In a perpetual calendar shown in FIGURE 1 it can be seen that the calendar 100 has a frame 102, which includes a front cover portion and a day indicating chart 104, which is located to the left of window 106. A numerical day character chart is drawn on a day character slide board 108. A portion of the chart is visible through the window 106. Window 106 is dimensioned so as to expose seven rows and up to six columns of numbers, 110, which are framed to represent the specific days of a chosen month.

As can be seen in FIGURE 6 the day character slide board 108 contains 13 rows and 6 columns numbered 1 through 31 arranged in such chronological order in the columns beginning with the numbers 1, 2, 9, 16, 23 and 30, respectively. Except for the first and last column, each column runs for the full length of 13 rows. The first column contains the numbers 1 through 7 starting with 1 at row 7. The last column contains only the numbers 30 and 31, which are based in the first and second rows. It can be appreciated with the numbers arranged in this manner, and with the window 106 dimensioned to expose only seven rows and up to six columns that 7 different spacial orders of the number set 1 through 31 are possible as the slide board is moved to different positions within the frame and portions thereof are exposed in the window 106.

In keeping with the invention a series of cards 116, 117, 118 and 119 are supplied to program the board 108 position with respect to the window 106. The cards establish the arrangement of the calendar's mechanical elements so that the slide board 108 will come to rest at

a predetermined place corresponding to a preselected month. A correctly designated month will then be formed in the window 106 as can be seen in FIGURE 1.

The perpetual calendar machine 100 of this invention must be programmed to give the correct date. In a step-by-step process, the operator selects date cards 116 through 119 corresponding to his pre-selected date, and places the cards in repositories 120 and 122 located on the calendar frame 102. In so doing, the device is automatically programmed to provide for a correctly framed month.

For manufacturing purposes, the calendar 100 and all of its parts with the exception of the day character cover plates 124, 125 and 126 may be constructed of plywood. The day character cover plates 124, 125 and 126 are preferably sheet metal. It will be appreciated, however, that any suitable material may be used without departing from the invention.

It will also be appreciated that the calendar frame 102 can be shaped in any manner as long as it is of sufficient dimensions to house the calendar mechanisms and to provide for the viewing window 106. The top portion of the frame 102 can be made into almost any desired configuration for use in the display of permanent or annual advertising material or for aesthetic purposes. Furthermore, it can be noted here that the alignment holes referred to throughout the specification to come can be replaced by equally suitable alignment arrows or other like suitable indicators.

Returning now to FIGURE 1 the calendar 100, as shown, has a flat base area 127 of sufficient depth to house the calendar parts and to allow the calendar to stand upright on a flat surface. The portion above the base designated generally at 128 is the month setting area wherein the user programs the device, through the use of the cards 116 through 119, for the month which he desires to view.

Located at the top of the month setting area 128 beneath the window 106 is a month shift bar 130 including shift knob 132. The month shift bar is rigidly connected through slots 133 to a prop guide base bar 134 behind the frame (best shown in FIGURES 2 through 5, inclusive) by connecting bolts 136 which ride in the slots 133. The month shift bar 130, as shown in FIGURE 1, is thus mounted for limited sliding movement with respect to the calendar frame. Notice here that the connecting bolts 136 can also be used as a shift knob in place of shift knob 132.

Beneath the shift bar 130 are month card positioning bars 138 and 140. These bars are rigidly attached to the calendar frame and serve to hold a month card 116 in position. The month card positioning bars 138 also serve as a rail for a coded position indicating bar 144 which is slidably mounted by bar supports or brackets 146. A groove 148 between the bars 138 and 140 accepts the inwardly extending flanges 150 of the indicator bar supports 146. The position indicating bar 144 is thus mounted to slide horizontally along positioning bar guide rails 138.

The bars 138 and 140 and the card carrier rack 152 form the repositories 120 and 122 for the month cards 116 and the year cards 117, 118 and 119. The year card carrier rack 152 includes sidewalls 154, bottom rail portion 156 and mid-bracing wall 158 and has a retaining bar pivoted at 161 to allow any combination of century year cards 117, decade year cards 118 and unit year cards 119 to be placed and secured in the card carrier rack 152 forming repository 122. The card carrier rack as a unit, with or without cards placed therein, is mounted on the support rail 160. The card carrier rack 152 is mechanically supported in any suitable manner so that it may slide horizontally along the support rail 160. The mid-bracing wall 158 separates the century year card 117 and decade year card 118 and is shortened at the top and bottom to accommodate the century year card 117 which has dog ear 168.

Each month card has a month card hole 162 located on the top portion and a shift bar notch 164. A pin 163

fixed in the month shift bar 130 must be positioned by moving the month shift bar so that the hole 162 in the top of the month card 116 will accept the pin 163 in the month shift bar. Thus the hole 162 in the top of the month card determines the position of the month shift bar 130 which, with the century cards properly positioned, positions the mechanical elements which determine the programmed month and causes it to be properly framed within the window.

The notch 164 in the bottom of each of the month cards is provided to accept a protrusion 165 of the indicator bar 144 and to thus properly set the slidable indicator bar 144 in position for the particular pre-selected month. The indicator bar 144 is coded and provides indicia for proper positioning of the card carrying rack 152.

Exemplary year cards are shown in FIGURE 1. The century year card 117 has an alignment hole 166 and dog ear protrusion 168. An alignment hole 166 is located in each century card, in accordance with the invention, to position the card carrier rack 152 along the card carrying rack indicating bar 144. The dog ear 168 is to provide an extended portion for locating the hole 166 on the card to enable the proper scaling of the mechanism. When the hole 166 is located other than on the dog ear, the dog ear protrusion 168 serves to position century card properly. The decade year card is held in place by retaining bar 160.

Located in the card carrier rack 152 next to the century card is the decade card 118. Each decade year card has a code letter 170 located beneath the decade year character 172. This code letter corresponds to a similar code letter located on the carrier rack position indicating bar 144. To position the card carrying rack correctly on its slide support rail 160 for the century year card 117 and decade year card 118 which has been selected, the positioning hole 166 located in the century card 117 must be placed beneath the code letter of the indicator bar 144 which corresponds to the code letter found on the decade card 118.

Located to the right of the decade card 118 is the unit year card 119. Similar to the century card 117, the unit year card has an indicating hole 174 and a dog ear protrusion 176. Here, too, the dog ear is for the purpose of providing extra length for the positioning of an indicating hole 174 along the bottom of the unit year card 119. The position of the indicating hole 174 varies from card to card.

In the Gregorian calendar counting system only century years (1900, 2000, 2100) divisible by 400 such as 1600, 2000 and 2400 etc. are leap-years. Other century years such as 1300, 1400, 1500, 1700 etc. are not leap-years. To compensate for this circumstance, a single double-aught combination decade and unit year card is used in place of the usual separate decade card 118 and unit year cards 119. Each century is, of course, a non-leap-year or a leap-year.

To prevent the selection of the wrong double-aught card by the operator, a notch protrusion system similar to that employed between the month card 116 and indicating bar 144 may be employed between the century and double-aught card and set up in such a way that a protrusion in a double-aught card, which corresponds to a non-leap-year, will cooperate only with a notch made in century cards representing century year not divisible by four hundred while a similar, but differently positioned protrusion, in the double-aught card which corresponds to a leap-year will be made to coincide with a corresponding notch, appropriately positioned in the century cards representing century years divisible by four hundred. By appropriate dimensioning from a central point a single reversible double-aught card may be utilized.

Beneath the card carrier rack 152 is located a camming template shift bar 173 having a shift knob 180. This shift bar is rigidly attached to and operates a camming template 182 through connecting bolt 184. The bolt 184 extends through and rides in elongated slot 186 and the

template shift bar is movable horizontally along the base of the calendar.

The shift bar 173 contains three shift bar alignment holes 188 at the upper portion thereof. The holes 188 provide indicia for the proper positioning of the slide bar beneath the unit year card 119 which contains an indicator hole 174.

In order to program the calendar for a desired month, the operator first sets the calendar mechanism in neutral by disengaging all movable parts and then selects a month, century, decade and unit card corresponding to his pre-selected date (July of 1776 is illustrated in FIGURE 1). He then positions the month shift bar 130 with pin 163 and the coded carrier rack indicator bar 144 with protrusion 165 so that the month card with hole 162 and notch 164 may be placed between placement bars 138 and 140. Next the century, decade and unit year cards are inserted in the year carrier rack. Then, in accordance with the code on the decade card 118, in this exemplary case a letter of the alphabet, the indicator hole 166 on the century card 117 is aligned beneath the corresponding code letter on the code bar 144. The card carrier rack, containing the century card 117, is thus positioned on the carrier rail 160.

Next the operator adjusts the template shift bar 173 so that one of the three alignment holes 188 coincides with the indicator hole 174 found on the unit year card. This shifts the camming template 182 to program the calendar for the date indicated on the selected month and unit year cards.

When the calendar mechanism is disengaged from its neutral position the board moves to a position determined by the camming template, and a correctly designated month will be framed in the calendar window 106.

The camming template 182 which determines the position of the day character slide, comprises a pair of templates rigidly bolted to the template shift bar. The front part of camming template 182 is formed with camming surfaces 190 arranged at seven different levels to provide for seven possible settings of the character slide board 108 within the window 106. The camming surfaces vary from one level to the next giving the general appearance of a stairway. While in use, one level is skipped each fourth year to provide for a double step change of position of the day character board, thus compensating for a leap-year wherein the day to day-of-the-week relationship progresses by two instead of one. This skip is found in every fourth step of the camming surface series and is indicated at 192.

The rear part of camming template 182 contains similar but differently arranged camming surfaces which provide for a character cover plate response in leap year situations. This portion of the camming template contains raised portions set in a periodic four year cycle to act contemporaneously with the front portion of camming template 182.

The day character slide board 108 in this exemplary case reciprocates within the calendar 102 to position the day character slide within the frame in response to the camming template position. A stop pin 194 is provided as a cam follower and protrudes from the day character slide in a position to engage the camming template 182, which has been pre-set by the operator in accordance with the date cards selected.

In order to selectively block out the 29th, 30th or 31st day of a given month, day character cover plates or shutters 124, 125 and 126 are provided and operate in response to the position of the template and the month shift bar. The day character cover plates 124, 125 and 126 selectively cover the 30th, 31st and 29th day characters located on the character slide board 108 to adjust the board to show the appropriate number of days in the chosen month. Positioning of the cover plates is effected by the mechanism depicted in FIGURES 2 through 5, which automatically arranges the shutters in any one of

of four combinations in response to the placement of the month shift bar 130 and the camming template 182.

Referring to FIGURES 2 through 5, the cover plates 124 and 125 are attached to a positioner bar 196 through the slots 198 in character board 108. A lever arm 200 having camming surfaces 202A and B is integral with the positioner bar 196 at point 204. The positioner bar 196 and lever arm 200 are raised and held in place by support bar 208 which fits in notch 205 in positioner bar 196 also at point 204. The other end of support bar 208 is pivotally secured to the back surface of the day character slide board at point 210.

The 29th day cover plate 126 is attached to a positioning lever arm 214 at point 216 through slot 220. The lever arm 214 is pivotally secured to the back of the day character slide board at point 222, and is moved by a positioning cam 236.

The 30th, 31st day character cover plate positioner bar lever arm 200 is held in place by prop 224 having a prop base 226 mounted to slide on a guide rail 228 and is constrained to move thereon by the guide bars 230. The guide bars 230 are attached to a base bar 134 which is directly controlled by the month shift bar 130 as seen in FIGURE 1.

In FIGURE 2 and 3 the lowermost support surface 202B of lever arm 200 is supported by the uppermost supporting surface 203A of prop 224. In this position the 30th and 31st day character cover plates are positioned so as to cover the 30th and 31st to provide for either a 28 or 29 day February. The two cover plates 124 and 125 are utilized because the numbers 30 and 31 appear, of necessity, in two columns on the day character board and two shutters must be provided, one for each of the 30 and 31 day series appearing in each column on the calendar face.

In FIGURE 4 the month shift bar 130 is in its centered position and in this position the camming or support surface 203A of prop 224 interacts with surface 202A on lever arm 200 and the cover elements 124 and 125 are lowered on the calendar face so as to expose the number 30 while covering the number 31.

FIGURE 5 in a similar manner indicates the appropriate settings of the 30th and 31st day character cover plates for any 31 day month. In this position the month shift bar 130 is moved to its far right position as viewed from the front and camming surface 203B of prop 224 supports surface 202A of lever arm 200 which allows for the positioning of the day character cover plate support bar 196 in its lowest position, thus exposing the 30th and 31st day characters on the front of the character slide board.

The cam 236 can take two positions. When the triggering cam 244, having cam shaft 246 and shaft guides 247, is in its lowered position cam 236 is in a right pivot position which allows the lever 214 to hang free allowing cover plate 126 to cover the 29 day character on the character slide board. When the triggering cam 244 is raised from its lowered position in response to the position of the camming template 182, positioning cam 236 pivots to the left pushing lever arm 214 to the left causing the 29 day cover plate 126 to move away from the front of and to expose the 29 day character on the character slide board. This position is required for all 30 and 31 day months as well as for leap-year Februarys as illustrated in FIGURES 3, 4 and 5. It can be noted that positioning cam 236 acts in conjunction with other elements as an amplifying lever in that it moves cover plate 126 more than the corresponding movement of triggering cam 244.

FIGURE 1, on the other hand, illustrates the mechanical arrangement where the cover plate 126 covers the 29 day character for those non-leap-year February months during which the trigger cam 244 is raised. The triggering cam 244 in a similar manner must also be held in a raised position for all 30 and 31 day months. This is

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done in one of two ways. For 29 day months the trigger cam 244 is held in its raised position by the back portion of camming template 182 which supports the trigger head by its shaft 246. This is shown in FIGURE 3. For all 30 and 31 day months the trigger cam 244 is held in position by prop 248 having shaft 250 and base 252 constrained to move in a track 254 formed by guide rails 256 which are attached to the day character slide board 108. The prop is moved in its track 254 by bars 258 which are attached to the same bar 134 that the bars 130 are attached to and the bars 258 are positioned by the month shift bar 130 of FIGURE 1 in the same manner as bars 230 are positioned.

FIGURE 3 illustrates a February leap-year month. When this occurs the shift bar 130 is moved to the far left, as viewed from the front. There the support prop 248 is not positioned beneath the trigger cam 244 which would be free to fall but for the fact that in a leap-year situation the back portion of the camming template 182 will be automatically set beneath the trigger cam shaft 246 and will support the trigger cam 244 via its shaft in a raised position.

When the month shift bar 130 is positioned in accord with a month card representing a 30 day month the month shift bar 130 will be in its mid position. With the month shift bar 130 in this position, the prop 248 will be moved beneath the triggering cam 244 maintaining it in a raised position and thus providing for the exposure of the 29 day character on the calendar face. Likewise, when the month shift bar 130 is moved to its far right position indicating a 31 day month the prop 248 will remain beneath the trigger cam 244 also providing for the exposure of the 29 day character on the character slide board.

It will be appreciated that the character slide board is free to move vertically within its brackets 109, the bar sets 230 and 258 providing channels 260 and 262 for the prop bases 226 and 252. Likewise, the bar sets 230 and 258 are free to slide along the top of guide rails 228 and 256, respectively. Thus, the mechanical features remain operative for all possible positions of the character slide board and month shift bar.

A perpetual calendar machine has been illustrated. It is to be understood the changes and variations and other equivalent embodiments of this invention may be made by those skilled in the art without departing from the spirit and scope of the appended claims.

I claim:

1. A perpetual calendar comprising a frame, a day character chart having an array of successive numbers representing days of the month, said frame defining a window of a size to expose a portion of said character chart and having a day of the week chart located adjacent said window means for programming the calendar to display a preselected month, means responsive to said

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programming means, including a camming template having a plurality of cam surfaces, for positioning said day character chart relative to said window, and day character cover plates to selectively cover certain of said numbers so that the designated calendar month is correctly shown in said window.

2. A perpetual calendar as set forth in claim 1 wherein certain of said day character cover plates are operated by said camming template.

3. A perpetual calendar as set forth in claim 1 wherein said day character chart is disposed on a board slidably mounted within the calendar frame, said programming means being connected to said camming template and being operable to position the same with respect to said board.

4. A perpetual calendar as set forth in claim 3 wherein said programming means includes a series of coded cards adapted to be assembled in position to indicate a selected month, and said carrying template position being determined by such assembly.

5. A perpetual calendar as set forth in claim 3 wherein said camming template has a front section and a rear section, said front section adapted to position said day character chart in relation to said window, and said rear section adapted to operate certain of said day character cover plates.

6. A perpetual calendar as described in claim 5 wherein said day character chart is provided with a cam follower comprising a stop pin said pin being selective-engagable with a surface on said front section of said camming template.

7. A perpetual calendar as set forth in claim 5 wherein one of said day character cover plates covers the 29th day character located on said day character chart, said 29th day character cover plate being operated by said rear section of said camming template.

8. A perpetual calendar as set forth in claim 5 wherein certain of said day character cover plates cover the 30th and 31st day characters located on said day character chart, said 30th and 31st day character cover plates being operated by said programming means, said means including a month shift bar.

References Cited

UNITED STATES PATENTS

2,338,377	1/1944	Gatewood	40—111
2,542,683	2/1951	Lang	40—109
2,523,206	9/1950	Fluette	40—109
2,791,850	5/1957	Noble	40—107

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