Sept. 7, 1926. 1,599,171

G. T. FYFE

CALENDAR

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FIG. 1.

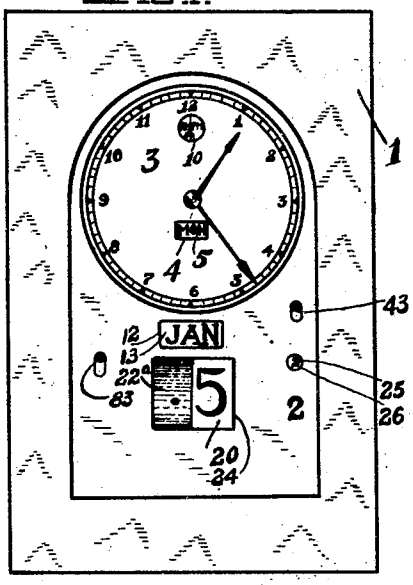


FIG. 2.

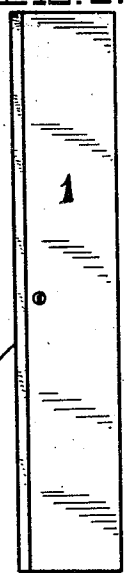
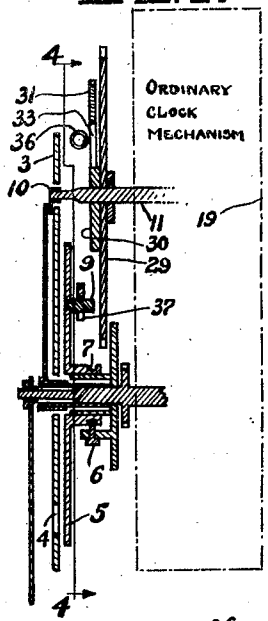


FIG. 3.



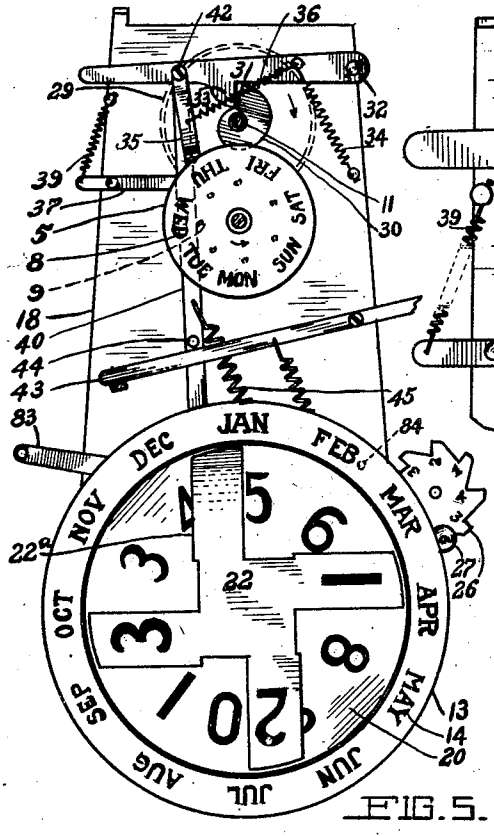


FIG. 5.

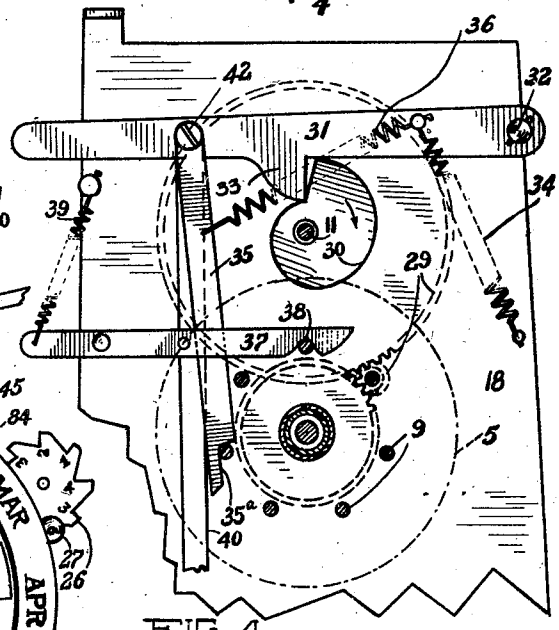


FIG. 4.

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CALENDAR

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FIG. 6.

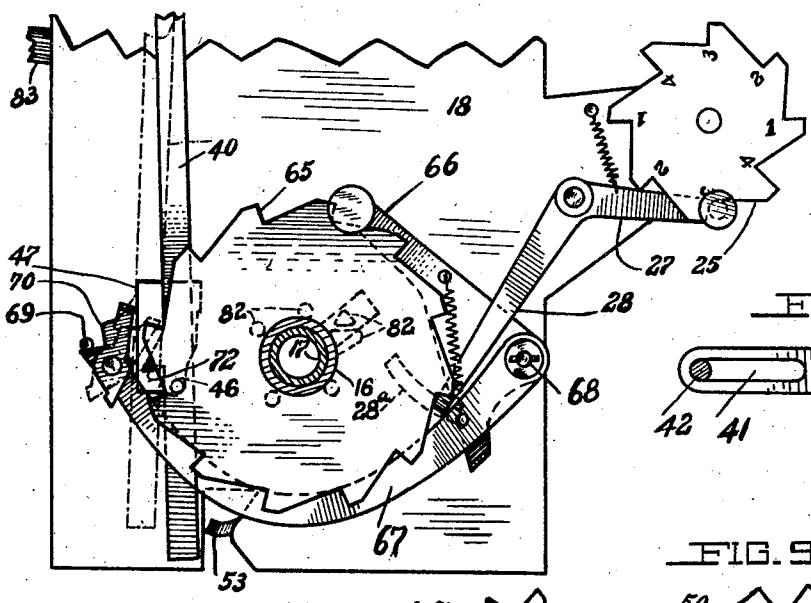


FIG. 7.

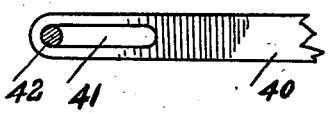
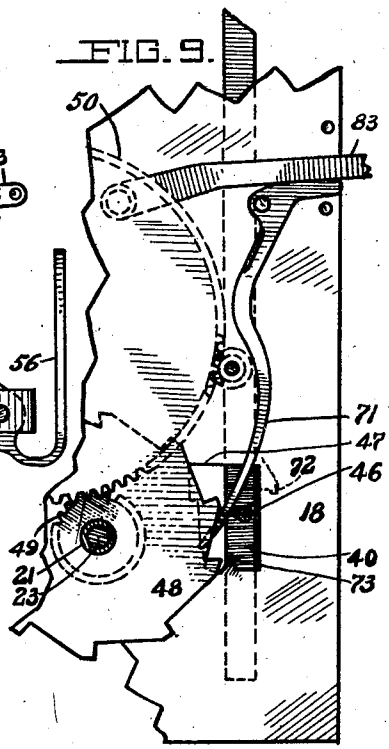


FIG. 9.



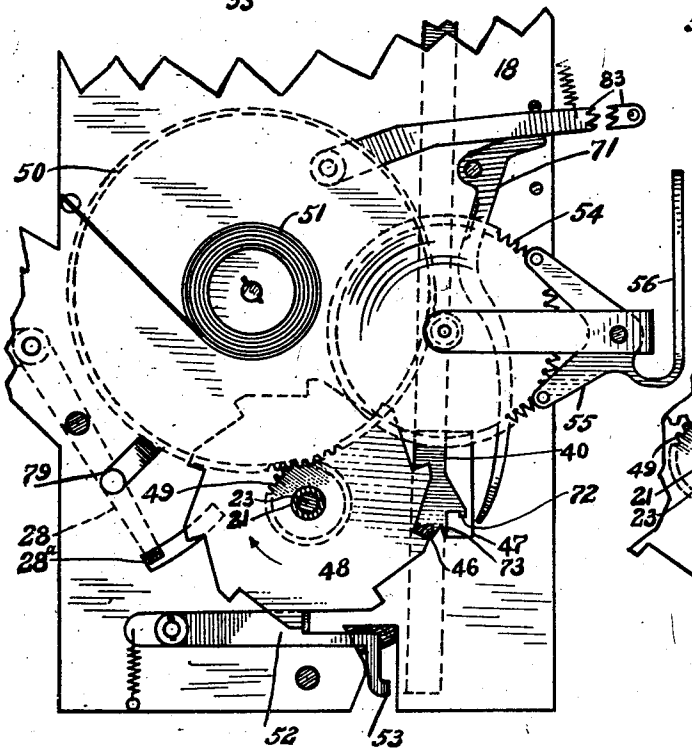


FIG. 8.

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FIG. 10.

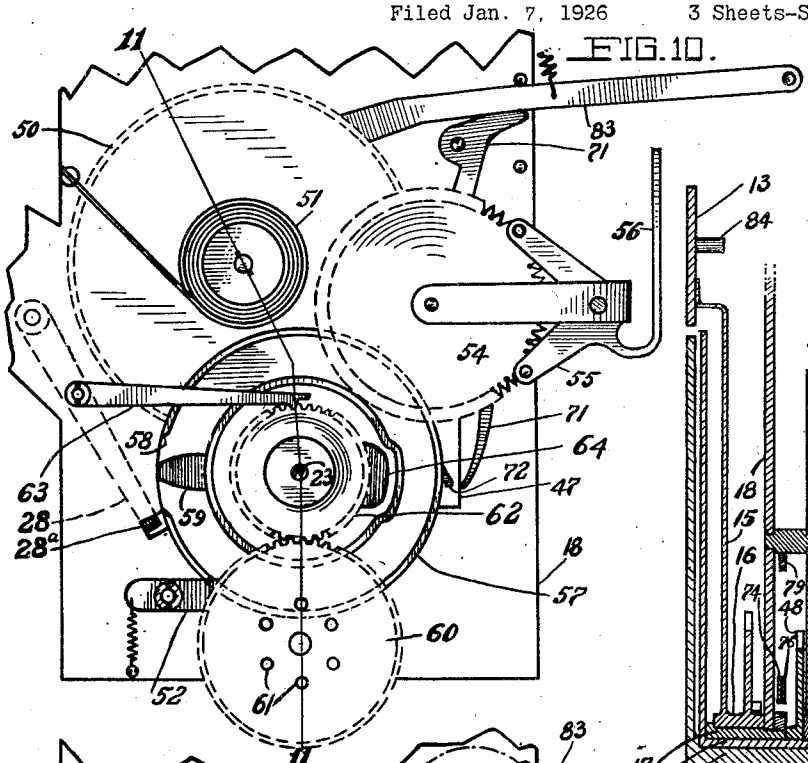
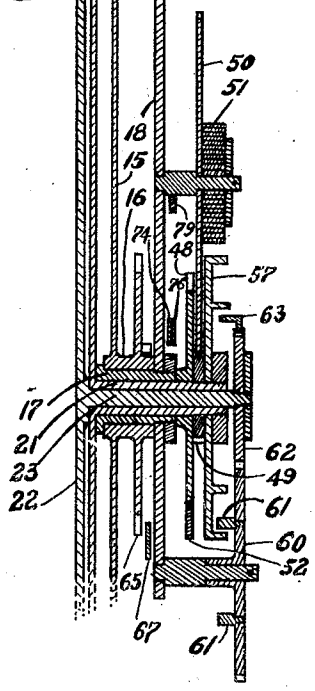


FIG. 11



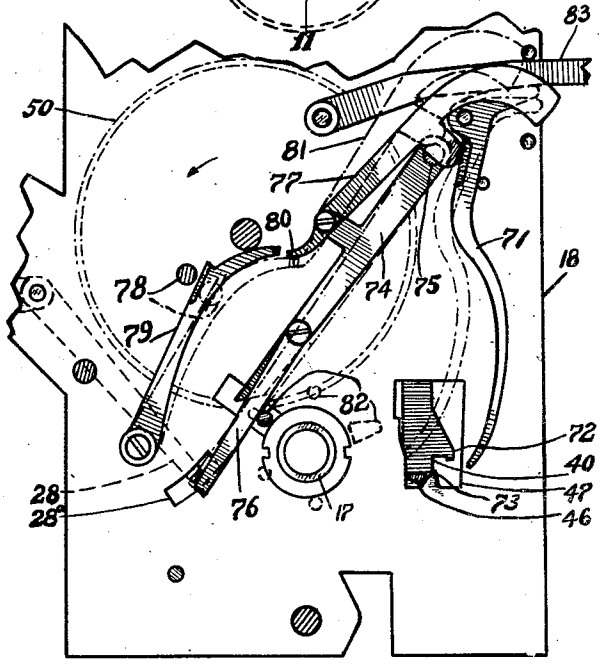


FIG. 12.

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Patented Sept. 7, 1926. 1,599,171

UNITED STATES PATENT OFFICE.

GEORGE T. FYFE, OF TORONTO, ONTARIO, CANADA.

CALENDAR.

Application filed January 7, 1926. Serial No. 79,768.

The invention relates to improvements in calendars as described in the present specification and shown in the accompanying drawings, which form part of the same.

The invention has for its object to provide a novel calendar clock which in addition to indicating the time of the day, whether ante-meridian (a. m.) or post-meridian (p. m.), will also register the day of the week, the month and the day thereof.

The invention consists mainly of the novel construction and arrangement of parts as hereinafter described in detail and subsequently claimed in the claims hereinafter appended.

Referring to the drawings:

Figure 1 is a front view of the clock.

Figure 2 is a side elevation thereof.

Figure 3 is a vertical sectional view of the clock dial showing the mechanism located behind the dial for indicating the days of the week.

Figure 4 is a front view of the mechanism shown in Figure 3 with the dial and the hands of the clock removed.

Figure 5 is a front view of the entire mechanism of the clock and the various dials for indicating the day of the week, the day of the month and the month itself, together with a dial for indicating the number of years from the last leap year, as will be later described in detail.

Figure 6 is a detail of the ratchet mechanism for operating the month dial, the leap year dial being also shown in this view.

Figure 7 is a detail of the upper end of the actuator.

Figure 8 is a rear view of the ratchet mechanism for operating the unit dial of the days of the month.

Figure 9 is a similar, but partial view of this mechanism showing the actuator shifted into a second position, or, in other words, out of engagement with the unit dial ratchet.

Figure 10 is a similar view to Figure 8 showing in additon thereto the mechanism for operating the dial bearing the tens of units of the days of the month.

Figure 11 is a vertical sectional view taken on the line 11—11 of Figure 10.

Figure 12 is a detail of the release mechanism which returns the unit dial and tens of units dial to their starting point at the end of each month ready for a recurrence of the operation.

Like numerals of reference indicate corresponding parts in each figure throughout the drawings.

Referring more particularly to Figures 1, 2 and 3 of the drawings, the reference numeral 1 indicates in a general way the case of the clock which is provided with a front 2, preferably opaque, the upper half of which is provided with a substantial conventional clock-dial 3; beneath the spindle of the hands of which is a small aperture 4, and behind its dial a disk 5 concentrically and loosely mounted upon the spindle of the hour hand, such as by a setscrew 6 engaging in an annular groove 7 formed in the boss of the disk. On the outer face of this disk are borne abbreviations of the days of the week spaced circularly as at 8, so that as this disk is fractionally rotated, as hereinafter described, the days of the week will each register with the aperture 4 in the clock dial in their successive rotation and thus indicate the days of the week: this disk 5 is hereinafter referred to as the "day dial", which dial is best discernible in Figure 5 of the drawings. On the opposite side, or rear face, of this dial are a series of pins 9 spaced circularly, there being one pin for each day of the week.

A small circle is inscribed upon the clock dial 3 and divided diametrically, one half representing ante-meridian (a. m.) and the other half post-meridian (p. m.). 10 is a pointer carried by the spindle 11 for rotation around this circle in order to indicate whether a. m. or p. m. It will be self-evident that on account of this clock indicating dates (yet to be described in detail) it is necessary to have this a. m. and p. m. indication, as, in the event of the clock stopping, in starting up again it is essential that the clock is at the correct meridian in order that the date mechanism may work correctly.

12 is an aperture in the front of the clock beneath the aperture 4, through which the months of the year are indicated, and 13 is a large ring bearing abbreviations of each month of the year according to the rotation in which they follow one another, as shown at 14. This ring is hereinafter referred to as the "month dial".

As the month dial is rotated, the months of the year successively appear within the aperture 12. This dial is carried by arms 15 extending from a boss 16 journalled on the outside of a stud 17 which is borne by the main frame 18 upon which all the calen-

dar mechanism is carried. This main frame consists of a metal plate extending from the ordinary clock mechanism generally indicated in Figure 3 by the numeral 19.

20 is a disk positioned within the ring 13 and having a hollow spindle 21 journalled in the bore of the stud 17. The outer face of this disk bears units from 1 to 9 inclusive and zero (0), and is used for indicating the units of the month date and will be hereinafter referred to as the "unit dial".

In front of this dial is a further dial for indicating the tens of units, hereinafter referred to as the "tens dial". This latter dial comprises four radial arms successively bearing the numerals 1, 2 and 3 on three of its arms, the fourth arm being left blank. In the drawings, the numeral 22 indicates the arms and 23 their spindle which extends thru the spindle 21 of the unit dial and is rotatable independent thereof. A further aperture, as at 24, is formed in the face of the clock whereby the monthly date may be read, sufficient space being provided by this aperture for inclusion of both the units and tens, and it will be observed, as shown in Figure 1, that the blank arm 22^a is used for covering the tens portion of this aperture until the date has reached the tenth of the month.

On one side of the month dial 13 is a small ratchet shaped eight toothed disk 25 journalled in the main frame, which bears the numerals 1 to 4 circularly arranged, one at each tooth, upon one half of its diameter and a repetition of these numerals upon the other half. These numerals are for the purpose of indicating how many years have elapsed since the last leap year, the figure "4" denoting the leap year itself. These numerals appear upon the face of the clock through a minute aperture 26, as seen in Figure 1, the change of the numerals taking place annually at the end of the month of February, in order that the machine may automatically compensate for the day less in that month during a leap year; the mechanism of which will be described in detail hereinafter.

27 is a spring-pressed click for preventing the leap-year dial from inadvertently being shifted. Integral with this click is a finger 28 which has its extremity offset and projecting through a slot 28^a in the main frame 18 for the purpose hereinafter described.

Referring now to the day dial, this dial is operated by mechanism comprising meshing gears 29 connecting the hour spindle of the clock to the spindle 11 of the meridian pointer 10 at such a ratio that this latter spindle makes one revolution to every two turns of the hour hand, or, in other words, this spindle makes one complete revolution every twenty-four hours.

Keyed to this spindle 11 is a quick-drop cam 30 and positioned above this cam is a horizontal lever 31, fulcrumed at 32, and having a follower 33 pressed in contact with the cam by a spring 34. Depending from the lever 31 is a pawl 35, the lower end of which is recessed to receive one of the pins 9, as at 35^a, borne by the day dial 5. This pawl is spring-urged in the direction of the axis of the dial by means of a spring 36.

37 is a pivoted ratch having a slot 38 for receiving the uppermost pin of the dial in order to hold said dial against movement when unactuated. This ratch is pressed into engagement with said pin by a spring 39.

It will be seen by this construction that as the cam 30 revolves it will gradually raise the lever to its uppermost position and coincidentally the pawl 35 will be raised so that its recess 35^a will engage the succeeding pin of the day dial. Upon the crest of the cam passing the follower the lever 31 will instantly fall by reason of its spring pressure, and as the pawl 35 is carried by said lever it will rotate the said dial one-seventh of a complete turn and bring into view the succeeding day.

40 is the actuator, which comprises a long bar extending downwardly on the front side of the main frame, which actuator has a slot 41 by which it is connected to the lever 31 by passing a pivot 42 of the pawl 35 through the said slot. By this construction it will be seen that the actuator can be reciprocated independently of the lever 31 by simply moving a spring urged lever 43 so that it engages a pin 44 and raises said actuator.

45 is a spring secured to the actuator at one end and to the main frame at its other so as to urge the actuator downwardly and inwardly towards the axes of the dials at the lower end of the frame. It will be observed from this construction that as the lever 31 is raised it will coincidentally raise the actuator 40 and upon falling, as heretofore described, will permit the spring 45 to instantly return this actuator to its lowermost position, thus completing one reciprocation of the actuator. 46 is a pin extending from the lower end of the actuator and passing through a slot 47 in the main frame, see Figures 8 and 9. This pin engages the running ratchet 48 keyed to the spindle 21 of the unit dial. This ratchet is possessed of ten teeth in order that upon movement of a single tooth it will bring the succeeding digit of the unit dial into view. It will be seen that in the upward movement of the actuator the pin 46 will be raised sufficiently to click into engagement with the succeeding ratchet tooth, so that, upon subsequent lowering of the actuator, the ratchet will be turned one tenth of a complete revolution.

49 is a pinion keyed upon said unit dial spindle adjacent to the ratchet 48 and mesh-

ing with a large gear 50 which carries a clock spring 51 so that as the gear revolves in the operation of the clock, such spring winds up in order to store energy for returning the unit and tens dials to their starting point at the end of the month.

52 is a click which is spring pressed into engagement with the ratchet in order to prevent retrogression thereof. The free end of this click is extended and bent laterally in order that it may project through a slot in the main frame as at 53.

54 is an escapement wheel geared to the gear 50 and engaging an escapement arm 55 that is weighted as at 56 for the purpose of controlling the speed of the unit and tens dials when reversing. Also keyed to the spindle 21 of the unit dial is a plate cam 57 having a peripheral flange slotted as at 58 and situated intermediate of said slot is a tooth 59. 60 is a gear journalled upon the frame overlapping the plate cam and having a series of pins 61 extending from its near side. One of these pins engages on the inner side of the flange so that as the cam revolves its tooth 59 will engage this pin and eject it from one side of the slot 58, whilst simultaneously the ensuing pin will take its place on the inner side of the flange, thus imparting partial rotation to the gear upon each revolution of the cam plate. Meshing with the gear 60 is a gear 62 that is keyed to the spindle 23 of the tens dial. The two gears just mentioned are of such relative proportions that the tens dial makes one-quarter of a revolution to one full turn of the unit dial.

63 is a click engaging the gear 62 between a pair of adjacent teeth so as to hold the tens dial against accidental movement. This click 63 may be spring or gravity actuated. 64 is a cam so positioned relative to the tooth 59 that upon the same approaching the pin in its path it will raise the click 63 out of engagement with the gear 62 so that this gear may turn through its connections heretofore recounted. It will be seen that upon each reciprocation of the actuator 40 the ratchet 48 will be turned one-tenth of a revolution, each complete reciprocation of the actuator effecting a single movement of the unit dial, which will cause the numerical designation of the next day to be displayed within the aperture 24.

Since the cam 57 and gears 60 and 62 rotate the tens dial one-quarter of a revolution to every complete revolution of the unit dial it will be seen that the numerals designating the tens of units of the tens dial will appear in the aperture 24 alongside of the single units.

65 is a twelve toothed ratchet constructed integral with the boss 16 of the month dial. 66 is a click for holding said ratchet against inadvertent movement, which click is spring pressed in the usual manner. 67 is an arched bar pivoted at 68 and having its free end normally pressed against a pin 69 by spring pressure. This free end carries a rocker 70 pivoted in such a manner that it may partially turn (see Figure 6) so as to swing over and engage a tooth of the ratchet 65. 71 is a depending finger having its weight so distributed that it will swing into the path of the actuator pin 46 when unrestrained, means being provided to normally hold this finger out of the path of the pin until the end of each month, which means will be hereinafter described in detail.

At the end of the month, upon the finger swinging over into the path of the pin, it shifts the actuator away from the ratchet of the unit dial so that as the actuator is raised its enlargement 72 will engage the rocker 70 and swing it over into engagement with a tooth of the ratchet 65, so that upon subsequent depression of the actuator the said ratchet will be rotated one-twelfth of a complete revolution in order to change the month indicated.

It will be seen that the actuator in its lowered position will be held away from the ratchet 48 by the engagement of the pin 46 with the projection 73, but, upon subsequent raising of the actuator, it will revert into engagement with the ratchet 48 for reoperation of the unit dial. Simultaneously with the depression of the bar 67 the click 52 is disengaged from the ratchet 48, which allows the spring 51 to revert both the unit and tens dials to their starting points.

Referring more particularly to Figure 12, the mechanism for holding the finger 71 out of the path of the actuator pin 46 until the end of the month, comprises, a jointed bar 74 pivoted at 75, the jointed end being indicated by the numeral 76. Pivotally mounted upon this bar is a pusher 77 which bears against the finger 71 and by its own weight holds same in its normal position. Upon one side of the gear 50 is a pin 78, which, as the gear revolves, contacts with a trip 79 at the end of the month and thus urges the trip forwardly. The forward movement of this trip engages the end 80 of the pusher, and thus raises the same to the position shown in dotted outline at 81. When the finger 71 is thus freed from engagement with the pusher it swings by its own weight into the path of the pin 46, so that, upon the same being raised by the ensuing reciprocation of the actuator the pin will be deflected out of engagement with the ratchet 48 of the unit dial as heretofore recounted.

To compensate for the different days in each month of the year a series of pins 82 are provided on the ratchet 65 of the month dial, which pins are arranged at various distances from the centre of rotation of the ratchet, that is to say a pin for the thirty-

one day month is closer to the axis of the ratchet than a pin for the thirty day month. These pins successively engage the jointed end 76 of the bar 74 as their months are displayed to view and thus hold it in various positions according to their respective radii. By so doing, in the event of a thirty-one day month, the end of the pusher 77 will be held at a greater distance from the trip 79 than if it were a thirty day month, so that the pin 78 and its gear will have a greater travel before the trip raises the pusher 77; the inverse being of course the result in the event of the month being a shorter one.

83 is a manual lever pivoted to the frame and spring held out of engagement with the finger 71. This lever is employed for the purpose of operating the finger independently of the automatic means just described when it is desired to change the monthly dial when setting the clock.

The mechanism for compensating for the one day less in February of a leap year, comprises a pin 84 mounted upon the monthly dial 13 so that once every year, at the end of February, it will contact with a tooth of the leap-year dial 25 and fractionally rotate the same in order to change the number designating the number of years from the last leap-year. When actually arriving at the end of February of a leap-year, the dial tooth for this year being of a greater depth than the teeth for other years, the click 27 sinks to a greater depth thus moving the finger 28 out of engagement with the jointed end 76 of the bar 74 and allowing the bar to straighten from its normally bent position shown in Figure 12. This straightening of the bar is sufficient to shift the end 80 of the pusher 77 farther from the trip 79 in order that it will actuate the finger 71 one day later.

It is of course understood that the pin engaging the bar at this time will be the pin for the month of February, so that it will make this month one day shorter.

What I claim is:—

1. In calendar mechanism, a unit dial spindle, a tens dial spindle journalled concentrically therein, a plate cam keyed to the unit dial spindle, said cam being provided with a slotted flange and a tooth positioned medially of the slot, means for rotating the cam plate, a spur gear overlapping said plate cam and having a circle of spaced pins which project from its inner side, one of said pins being located on the inner side of the cam flange in the path of the tooth, a spur gear meshing with said gear and keyed to the tens dial spindle for imparting a fractional turn to same at every complete turn of the unit dial spindle.

2. In calendar mechanism, a running ratchet for operating a unit dial, a reciprocal actuator carrying a projection for engagement with the ratchet-teeth, a pivotal finger for shifting the projection out of engagement with the ratchet, a pivotal pusher normally constraining said finger, a trip for disengaging the pusher, gearing operably connected to the aforesaid ratchet, and a pin carried by the gearing for gyratory movement to operate the trip at a predetermined point in rotation of the ratchet.

Signed at the city of Toronto, in the Province of Ontario, in the Dominion of Canada, this 28th day of December, 1925.

GEORGE T. FYFE.