

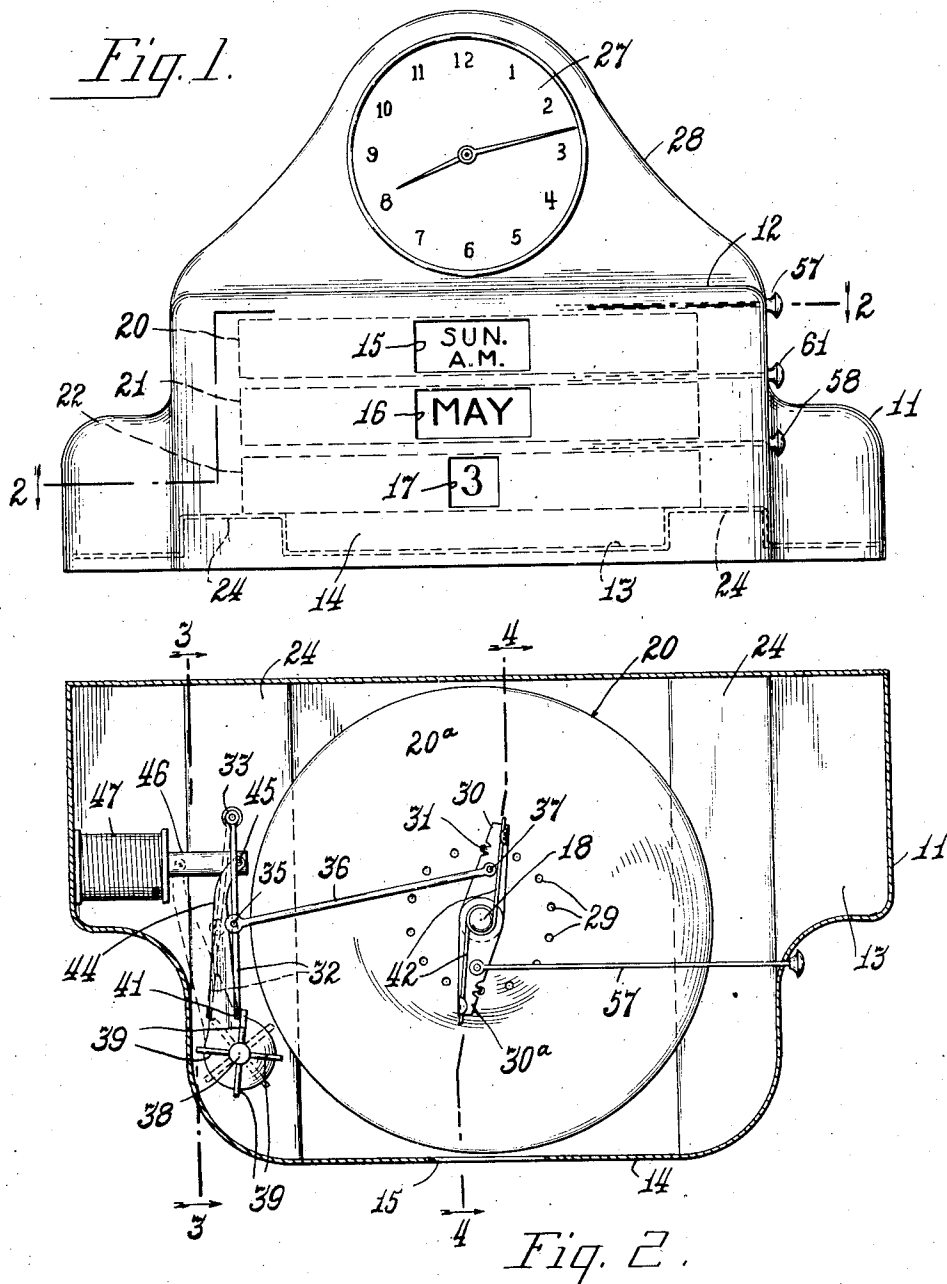
Jan. 4, 1949.

J. C. MORRIS
INTERMITTENTLY AND PAWL DRIVEN, SINGLE
AXIS, MULTIPLE DRUM CALENDAR

2,458,092

Filed Feb. 22, 1945

2 Sheets-Sheet 1



INVENTOR.
JOSEPH C. MORRIS
BY *Maurice Bayne*
ATTORNEY

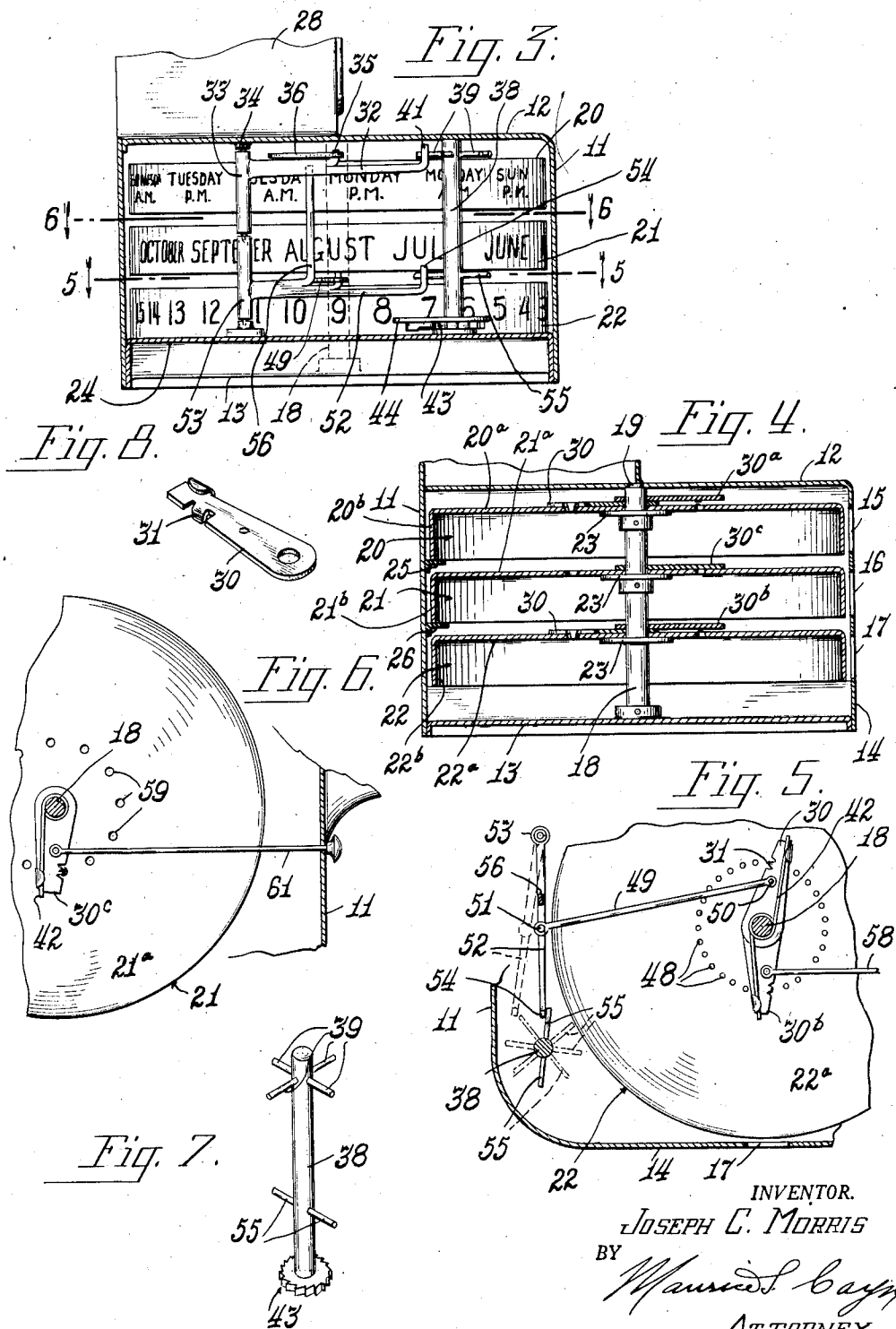
Jan. 4, 1949.

J. C. MORRIS
INTERMITTENTLY AND PAWL DRIVEN, SINGLE
AXIS, MULTIPLE DRUM CALENDAR

2,458,092

Filed Feb. 22, 1945

2 Sheets-Sheet 2



INVENTOR.

JOSEPH C. MORRIS

BY

Maurice C. Morris
ATTORNEY

UNITED STATES PATENT OFFICE

2,458,092

INTERMITTENTLY AND PAWL DRIVEN,
SINGLE AXIS, MULTIPLE DRUM CAL-
NDAR

Joseph C. Morris, Chicago, Ill.

Application February 22, 1945, Serial No. 579,184

1 Claim. (Cl. 40-112)

1

The invention relates to improvements in mechanical calendars and more particularly to a novel perpetual calendar of a kind including elements enclosed within a casing and carrying day of the week, month, and day of the month representations, independently movable to successively carry the representations past window openings in the casing.

An object of the present invention is to provide a novel and efficient calendar of the kind described which may be operated automatically through association with an ordinary clock mechanism or manually.

Another object of the invention is to provide a calendar of the character referred to which when operated automatically, as by the operation of associated clock mechanism, will require no attention other than such manual setting as may be required at the end of each calendar month.

Another object of the invention is to provide a novel calendar which involves but few working parts, is efficient, positive, and accurate in operation and not expensive to manufacture.

Other and further objects of the present invention will be apparent from the following description and claims and are illustrated in the accompanying drawings which illustrate a preferred embodiment and the principle thereof, and which is considered to be the best mode contemplated for applying that principle. Other embodiments of the invention embodying the same or equivalent principle may be used and structural changes may be made as desired by those skilled in the art without departing from the spirit of the present invention and the purview of the appended claim.

In the drawings:

Fig. 1 is an elevational view of the improved calendar.

Fig. 2 is a horizontal sectional view taken substantially on line 2-2 of Fig. 1.

Fig. 3 is a vertical transverse sectional view taken substantially on line 3-3 of Fig. 2, but omitting the armature.

Fig. 4 is a transverse central sectional view taken on line 4-4 of Fig. 2.

Fig. 5 is a fragmentary sectional detail view taken substantially on line 5-5 of Fig. 3.

Fig. 6 is a fragmentary sectional view taken substantially on line 6-6 of Fig. 3.

Fig. 7 is a perspective view of the rotatable trip lever actuating member.

Fig. 8 is a perspective view of one of the pawls.

As best shown in Figs. 1, 2 and 4 the mechanism of the calendar embodying the features of

2

the present invention is enclosed within a suitable casing 11 which includes a top wall 12 and a removable bottom wall 13, preferably fashioned from sheet material and provided in its front wall 14 with a plurality of window openings 15, 16 and 17. The bottom wall 13 has a spindle 18 (Fig. 4) firmly mounted thereon, which extends upwardly into the casing and may be steadied at its upper end in the casing top wall 12, as at 19, so as to be firmly held against displacement. The spindle 18 constitutes a mounting for a plurality of drums 20, 21 and 22 which are loosely fitted thereon for free rotation so as to be movable about the spindle independently of one another.

The drums 20, 21 and 22 preferably are each fashioned from sheet material and each includes a circular top wall 20a, 21a or 22a respectively, terminating in a downwardly turned circumferential flange 20b, 21b and 22b respectively. The drums are supported upon the spindle 18 in superposed relation, one above the other, and they are spaced apart as shown so that operating mechanism associated with each drum, and to be described presently, may be arranged between said drums so as to cooperate with the circular wall portions thereof. Such spacing of the superposed drums may best be effected by providing flanges 23 on the spindle 18, which flanges provide seating surfaces against which the bottom faces of the circular walls of the respective drums may rest. If desired, the flange 23 supporting the drum 22 may be integral with the spindle 18 while the remaining flanges 23 may be pinned or otherwise removably secured in place.

The drums 20, 21 and 22 are, as aforesaid, adapted to rotate freely about the spindle 18 and means is provided to cooperate with each drum at its peripheral edge to stabilize said drums and thereby prevent them from wobbling or otherwise assuming positions out of the horizontal. To this end the bottom wall 13 of the casing 11 is formed with portions 24 elevated above the main plane of said bottom wall on either side of the spindle 18. The elevated portions 24 extend transversely on the bottom 13 from the front to the rear of the casing 11 and they are of sufficient height to enable segments of the peripheral margin of the lower drum 22 to rest thereon and slide freely thereover when said drum is rotated. The intermediate drum 21 and the upper drum 20 may be stabilized by providing lips 25 and 26 respectively at one or more places on the inside face of the vertical walls of the casing 11, as shown in Fig. 4, and upon which the marginal edge of the respective drum rests.

The drums 20, 21 and 22 each are adapted to carry selected designations on the outside circumferential face of their respective circumferential flanges 20b, 21b and 22b. In the operation and use of the calendar these designations are successively located in alignment with the respective window openings 15, 16 and 17. Accordingly, the lower drum 22 is provided with numerical designations successively arranged to represent the days of a thirty-one day month, that is, said drum carries the numerals one to thirty-one in proper succession equally spaced apart over its entire peripheral area. This drum will hereinafter be referred to as the "day of the month" drum.

The designations on the intermediate drum 21 are representative of the twelve months of the year, said drum having the circumferential face of its circumferential flange 21b suitably divided into twelve equal divisions, each bearing the designation of one month of the year. For the purpose of the present description this drum will hereinafter be referred to as the "month" drum.

The upper drum 20 carries representations of the days of the week and accordingly the circumferential face of its circumferential flange 20b is divided into seven like spaces and each of said spaces is further divided into two like divisions so that two successive divisions constituting one space will bear the representation of one day of the week and each division thereof will contain ante-meridian (a. m.) or post-meridian (p. m.) representations. Upon reference to the Fig. 1 disclosure it will be noted that a calendar including the various representations as have been mentioned hereinabove will indicate the day of the month, the month and day of the week, as well as a. m. or p. m. designations.

In operation, the day of the month drum 22 is adapted to be advanced step-by-step about the spindle 18, a distance sufficient to carry a date representation visible through the window 17 away from said window and locate the date representative of the next succeeding day within said window opening, once every twenty-four hours.

Similarly, the month drum 21 is intended to be rotated manually step-by-step about the spindle 18 a distance sufficient to carry the designation of a month aligned with the window opening 16 out of alignment and align the next succeeding month representation with said window opening. Accordingly, the month drum 21 is advanced $\frac{1}{12}$ of a revolution each time the designation visible through the window opening 16 is to be varied.

The day of the week drum 20 likewise is adapted to be advanced step-by-step about the spindle 18 a distance sufficient to carry the representation aligned with the window opening 15 out of alignment therewith and to locate the next succeeding designation in alignment therewith. Accordingly, the day of the week drum 20 is adapted to be advanced $\frac{1}{7}$ of a revolution every twelve hours.

Step-by-step rotation of the drums independently of each other about the spindle 18 preferably is accomplished upon actuation of either manual or power operated mechanism. In the latter event, the mechanism may be operatively associated with the clock works of an ordinary time piece such as is indicated in Fig. 1 at 27. As shown, the time piece 27 may be mounted within a portion 28 of the casing 11 which extends upwardly from the top wall 12 and, in the present instance, said clock works is operatively associated with the mechanism for moving the drums

20 and 22 only, through suitable electrically operated means associated therewith.

The operation of the day of the week drum 20 is accomplished by the mechanism best shown in Figs. 2 and 3. As there illustrated, the circular wall 20a of the drum 20 is provided with a ratchet in the form of an annular series of equally spaced apart openings 29, which openings in the present instance are each representative of one of the fourteen day of the week divisions on the circumferential flange 20b thereof.

A pawl 30, best shown in Fig. 8, is mounted at an end for rotation about the spindle 13. This pawl carries a dog 31 adjacent its free end adapted to selectively engage in the openings 29 in the drum 20 when said pawl is reciprocally rotated about its mounting. Such reciprocable rotation of the pawl 30 is effected at predetermined intervals responsive to operation of the clock works 27. To this end suitable trip mechanism is associated therewith which, as best shown in Fig. 3, includes a trip lever 32 including a bearing portion 33 journaled at its upper end in a bearing 34 carried on the bottom face of the casing top wall 12. The trip lever 32 is provided, inwardly of its free end, with an integral bearing portion 35 having one end of a link 36 connected thereto. The link extends across the face of the drum 20 and has its other end pivoted, as at 37, to the pawl 30. It should be evident at this time that movement of the trip lever 32 about its axis outwardly away from the day of the week drum 20 will impart movement of the pawl 30 whereby said pawl is effective to advance said day of the week drum a distance corresponding to the distance of movement of said pawl.

The trip lever 32 is adapted to be moved in the manner aforesaid in response to operation of trip mechanism including a rotatable shaft 38 journaled at its ends in the casing bottom 13 and top wall 12, respectively. The shaft 38 carries a plurality of equally spaced apart circumferentially arranged radial fingers 39 adjacent its upper end, which fingers cooperate with an upwardly turned extension 41 on the free end of the trip lever 32. In the present embodiment of the invention four such fingers 39 are provided so that upon each quarter revolution of the shaft 38 one of the fingers 39 will engage the extension 41 and carry the trip lever 32 from the full position shown in Fig. 2, into the dotted line position illustrated. A spring 42 having one of its ends clamped firmly to the end of the pawl and its other end anchored to a companion pawl 30a then returns the pawl and trip lever to their initial positions. The return movement of the pawl and trip lever to such positions is limited by the abutment of the trip lever with a radial finger 39. The movement of the trip lever 32 is thereby effective to move the pawl 30 a distance necessary to rotate the day of the week drum 20 sufficiently to carry the "date" representation aligned with the window opening 15 out of alignment therefrom and align the next succeeding "date" representation with said opening.

Rotation of the shaft 38 is best accomplished by means of dog and ratchet mechanism, indicated generally at 43, which includes a lever 44 connected at its free end, as at 45, to the armature 46 of a solenoid 47. The solenoid 47 is suitably connected with a source of electric current and with electric contacts associated with the clock works 27, so as to be energized momentarily every six hours. Inasmuch as any means may be utilized to momentarily energize the sole-

noid 47 and because the particular means described is not essential to actuation of the calendar mechanism, a specific description of the clock work contact construction is not thought to be required. The ratchet mechanism 43 preferably is of such construction that each time the solenoid 47 is energized to move the lever 44, the shaft 38 is rotated $\frac{1}{2}$ of a revolution. When the solenoid is de-energized, spring means (not shown) returns the armature to its initial position. It will thus be apparent that the solenoid 47 must be actuated twice each time one of the fingers 39, on the shaft 38, is brought into contact with and moved past the pawl actuating trip lever 32, and consequently said trip lever and its pawl 30 are actuated once during each twelve hour period.

The day of the month drum 22 is actuated in a manner like that described with regard to the day of the week drum, but in this instance, the day of the month drum is moved $\frac{1}{31}$ of a revolution for each twenty-four hour period. To accomplish this step-by-step rotation, the circular wall 22a is provided with an annular series of thirty-one equally spaced apart openings 48 adapted to be selectively engaged by the dog 31 on a pawl 30 associated therewith. As best shown in Fig. 5, a link 49 is pivotally connected at one end as at 50 to the pawl 30 and its other end is pivotally mounted on a lug 51 extending upwardly from a trip lever 52 including a bearing portion 53 journaled in axial alignment with the bearing portion 33 of the trip lever 32. The free end of the trip lever 52 includes an extension 54 located closely adjacent the shaft 38 and said shaft carries a pair of diametrically opposed fingers 55 extending outwardly radially therefrom for selective engagement with the extension 54.

This association of elements is effective to rotate the day of the month drum 22 step-by-step distances sufficient to carry a date representation aligned with the window opening 17 out of such alignment and position the next successive date representation in alignment therewith once every twenty-four hours. Such periodic operation of the pawl 30 is accomplished once for every four periods of energization of the solenoid 47.

If desired, the trip lever 52 may include an upwardly directed extension 56 which terminates in alignment with and in back of the trip lever 32 so as to insure joint operation of both trip levers 32 and 52 each time the trip lever 52 is actuated. This intermittent association between the two trip levers, while not essential to the operation of the device, affords a safety element to avoid any likelihood of the day of the month drum advancing more than two steps without the day of the week drum being advanced one step.

The mechanism insofar as it has been described hereinabove is entirely automatic in its operation and it should be understood at this time that it may be operated manually and that other means may be provided to impart electrical impulses to the solenoid 47 without association with the clock works generally indicated.

Inasmuch as some months of the year have fewer than thirty-one days, auxiliary means is provided in the present mechanism for manually advancing the day of the month drum 22. To this end, a second pawl 30b is operatively associated with the day of the month drum 22 and this pawl carries an operating stem 58 having its free end extending outwardly through the casing 11, so as to be engaged manually for actuating the pawl 30b to rotate the drum 22. Manual

means is provided also to advance the day of the week drum 20 should such be required upon initial starting or restarting of the mechanism after stoppage resulting from an interruption in the operation of the clock control. A second pawl 30a is therefore associated with the day of the week drum 20, which pawl also carries a stem 57 extending to the outside of the casing 11 for manual operation.

A similar mechanism is provided to effect step-by-step rotation of the month drum 21 at the end of each month so as to locate the next successive month designation in alignment with the window opening 16 in the casing 11. As best shown in Fig. 6 the month drum 21 has its circular wall 21a provided with an annular series of twelve equally spaced apart holes 59 which are selectively engaged by a dog on a pawl 30c for free rotation about the spindle 18. A stem 61 is operatively connected with the pawl 30c and this stem extends to the outside of the casing 11 for manual engagement so as to actuate the pawl 30c and advance the month drum the required distance.

As mentioned hereinbefore, the pawl 30 associated with the day of the week drum 20 carries a spring 42 to return it to its initial position after being tripped. Similar springs also identified by the numeral 42 are provided for each of the remaining pawls 30 and pawls 30a, 30b and 30c to return these pawls to their initial positions after each effective actuation thereof. In the instance of the pawl 30c, the spring 42 is anchored to the spindle 18.

It should be understood that the calendar illustrated in the accompanying drawings and described herein may embody a variety of modifications in detail construction and that it may be arranged in a position other than the horizontal position illustrated such as for example, the drums may be aligned on a horizontal axis for rotation in a vertical plane without departing from the spirit of the invention and the scope of the appended claim.

I claim:

In a calendar mechanism, a spindle, a series of drums carrying day of the month, month, and day of the week designations respectively loosely mounted on said spindle, a ratchet on each drum, pawls one operatively associated with each of the ratchets on the day of the month drum and on the day of the week drum, trip levers one operatively connected with each pawl, a shaft adapted for intermittent step-by-step rotation, means operable to rotate said shaft, and means on said shaft effective to trip the lever operatively associated with the pawl on the day of the week drum twice as frequent as the lever operatively associated with the pawl on the day of the month drum.

JOSEPH C. MORRIS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
203,640	Paddock	May 14, 1878
389,212	Fowle	Sept. 11, 1888
395,385	Elsom	Jan. 1, 1889
704,916	Peatfield	July 15, 1902
1,694,918	Horix	Dec. 11, 1928

(Other references on following page)

UNITED STATES PATENTS

Number	Name	Date
1,985,388	Stephens -----	Dec. 25, 1934
1,989,410	Graham -----	Jan. 29, 1935
1,996,701	Germundson -----	Apr. 2, 1935
2,056,532	Neyhart -----	Oct. 6, 1936
2,126,469	Huston -----	Aug. 9, 1938
2,146,981	Paulin -----	Feb. 14, 1939

Number
2,246,883
2,259,603
2,286,000

5

Number
451,506

Name	Date
Harrison -----	June 24, 1941
Balinski -----	Oct. 21, 1941
Neyhart -----	June 9, 1942

FOREIGN PATENTS

Country	Date
Great Britain -----	Aug. 6, 1936