July 1, 1969 M. A. CABANTOUS ETAL 3,452,535

DATING MECHANISM

Filed April 12, 1967 Sheet 1 of 4

FIG.1

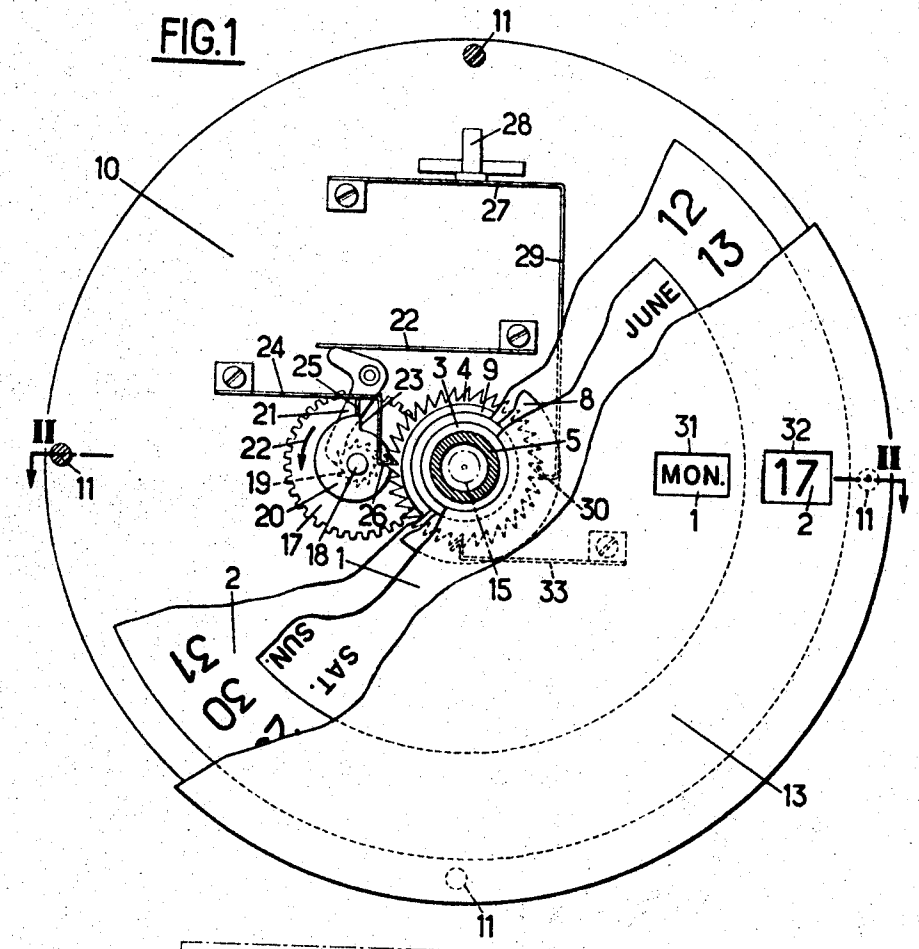
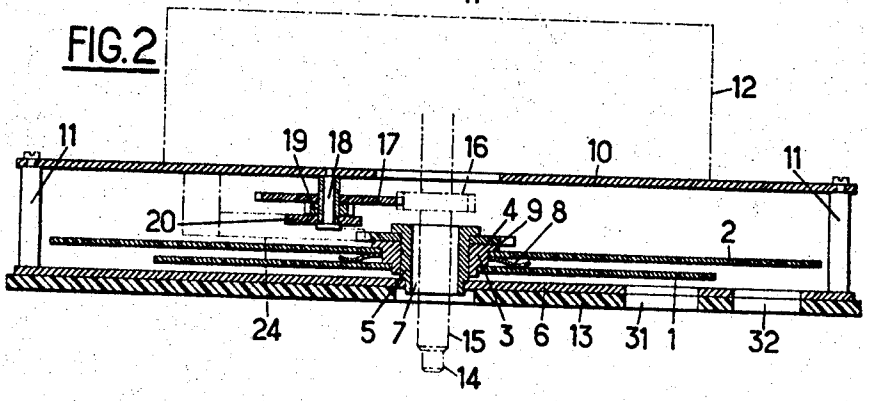
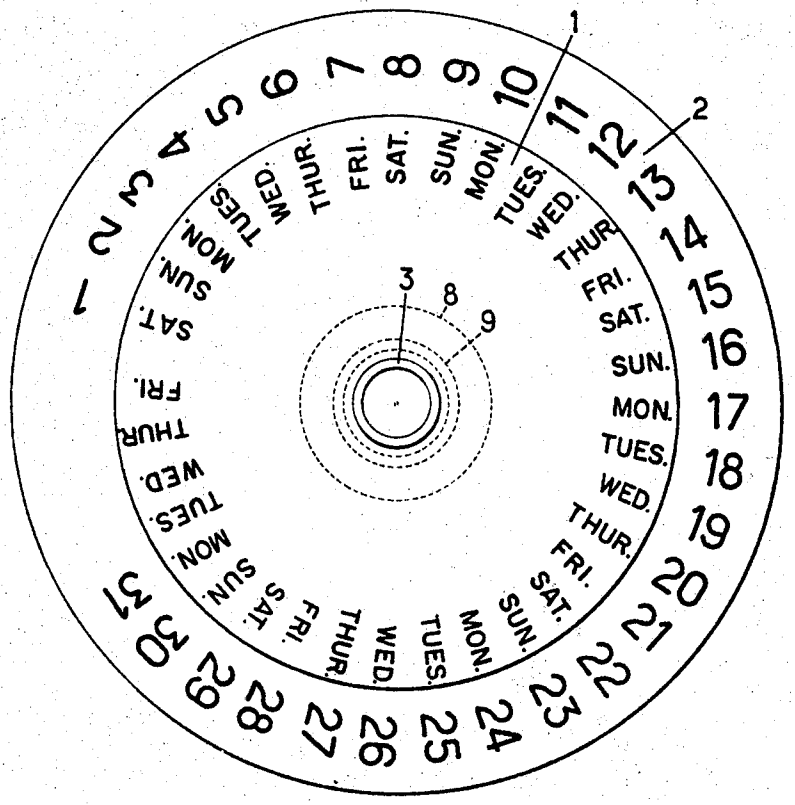


FIG.2



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by Edwin E. Greigg

FIG. 3


1
2
3
8
9
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
SAT. SUN. MON. TUES. WED. THUR. FRI.
TUES. WED. THUR. FRI. SAT. SUN. MON.
SUN. MON. TUES. WED. THUR. FRI. SAT.
MON. TUES. WED. THUR. FRI. SAT. SUN.

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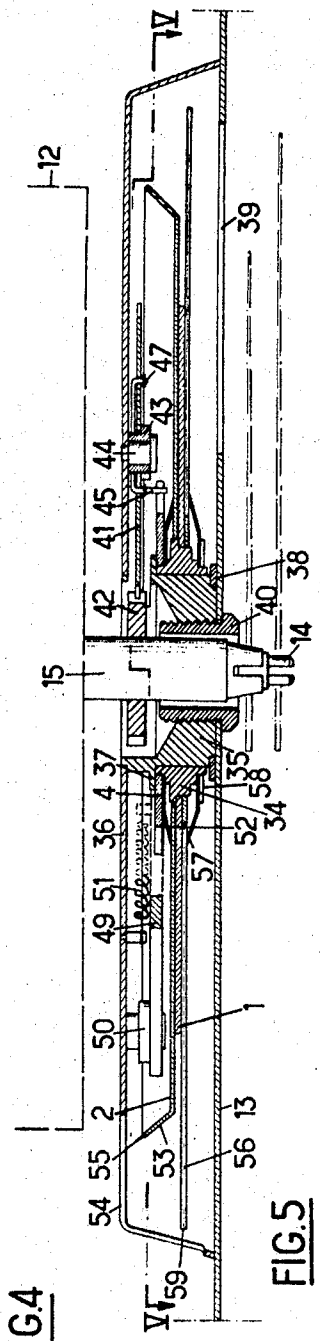


FIG.4

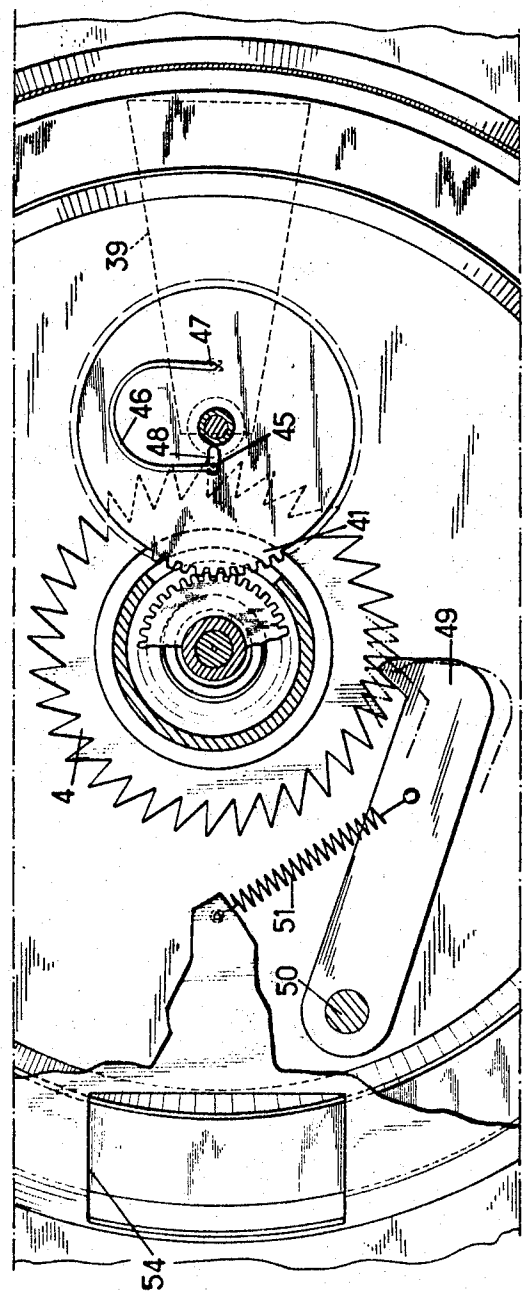


FIG.5

FIG. 6

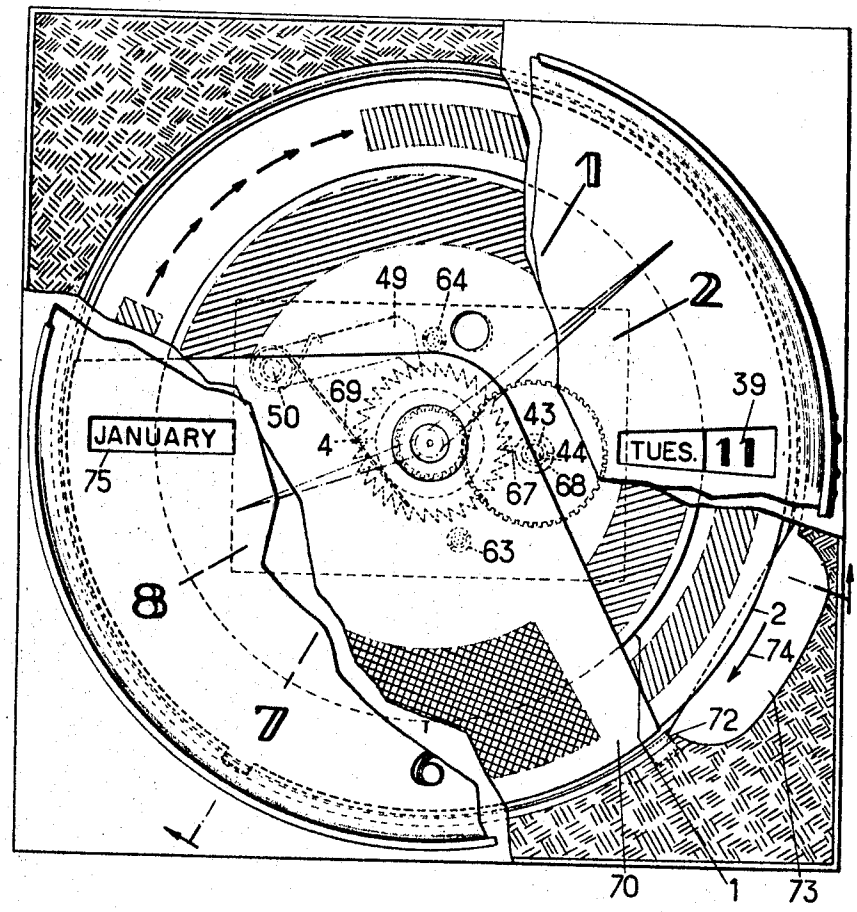
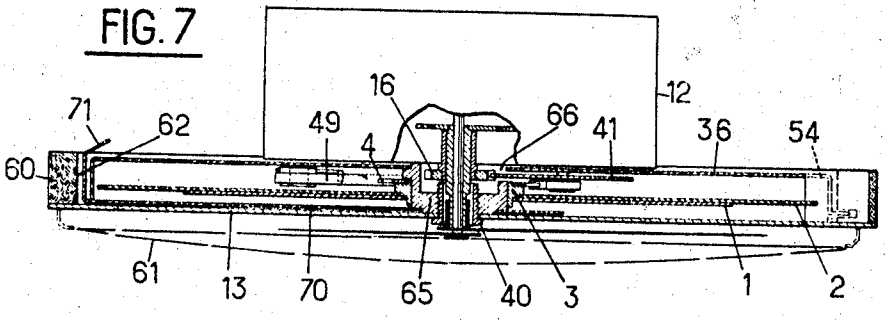

1
2
49
64
69
50
4
43
44
67
68
63
39
JANUARY
75
TUES. 11
8
7
6
2
74
72
70
1
73

FIG. 7


16
12
71
62
49
4
66
41
36
54
60
61
13
70
65
40
3
1
2

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3,452,535

DATING MECHANISM

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Filed Apr. 12, 1967, Ser. No. 630,326
Claims priority, application France, Apr. 13, 1966, 57,486; June 16, 1966, 65,772; Feb. 8, 1967, 94,216
Int. Cl. G04b 19/24
U.S. Cl. 58—4
14 Claims

ABSTRACT OF THE DISCLOSURE

A dating apparatus for indicating the number and name of the day as well as the month. The apparatus is self-contained; includes at least two rotatable disks bearing indicia and mechanism to drive the disks at predetermined intervals to change the day and date. The apparatus may be attached to a clockwork mechanism.

Background of the invention

The present invention relates to mechanisms which are used in watches and clocks particularly for indicating the day of the month and operate in the manner of an automatic calendar. Most of the known devices are limited to the use of a disk which is graduated for thirty-one days and moves ahead by one graduation for every twenty-four hours, which makes it possible to know what date of the month it is, but not the day of the week. When a month has less than thirty-one days, it is necessary to correct the date of the month at the beginning of the latter generally by causing the clock mechanism to execute several revolutions. It is this device which is among the simplest that is most widely used in wrist watches.

Description of prior art

Other known devices show, in addition to the day of the month, also the day of the week and sometimes even the month itself, but these are then considerably more complicated since it is necessary to use, in addition to the disk with thirty-one divisions, a disk having seven divisions corresponding to the days of the week, which multiplies the number of movable gears and of the corresponding driving mechanisms. Moreover, it is necessary, when a month has less than thirty-one days, to effect an adjustment relative to the respective day of the month without affecting the regulation of the day of the week and, consequently, without the possibility of causing the clock mechanism to execute several revolutions, as is the case in the devices mentioned hereinabove. As a result thereof, these necessarily complicated mechanisms are rather rare and always restricted to rather costly calendar-type clocks.

In contrast thereto, it is the object of the present invention to provide for a dating mechanism which allows for the simultaneous indication of the day of the month and of the day of the week while nevertheless being very simple and, more particularly, while utilizing only a single drive mechanism and a very simple correcting means for use at the end of the month.

Summary of the invention

The present invention thus relates to a novel industrial product in the form of a dating mechanism designed for a clock or the like which is characterized essentially in that it comprises two concentric disks, both graduated in thirty-five divisions, the first one comprising seven days of the week repeated five times, and the second one comprising the days of the month from 1 to 31 plus four unused or blank areas, the first disk being driven by one division every twenty-four hours by the time mechanism of the clockwork by means of an appropriate mechanism, such as a ratchet wheel, with the second disk being driven by the first disk due to simple friction.

This mechanism may further comprise the following characteristics, taken either singly or in combination:

(1) It comprises a third disk which is transparent and placed above the two first-mentioned disks; said disk including differently colored sectors as a function of the different phases of a cycle according to the Ogino method.

(2) The ratchet wheel having thirty-five teeth or cogs and being integral with the first disk is driven by an eccentric pin which is mounted preferably elastically on a wheel meshing with the hour axle.

(3) All of the axles of the mechanism are integral with a single plate situated therebehind and are enclosed simply by virtue of the positioning of the dial of the timepiece which is preferably secured by means of a central screw.

(4) It further includes a sector which is manually rotatable to show any month in a window which is positioned diametrically opposite to that indicating the days. This sector is superimposed relative to the two aforementioned disks without being actuated or driven by the latter and without ever appearing in the window showing the days.

(5) The single plate mentioned hereinabove is located behind the dial in a perforation in a panel or frame provided with a dial, all of which is accomplished without increasing the overall thickness of the assembly.

(6) The frame is provided at one edge with a cutaway portion to render it possible for the finger of the user to reach the disk for the respective days of the month and cooperates with a perforation in the plate for the purpose of simultaneously driving or actuating the disk for the days of the week in the direction allowed for by the stop pawl, or only the disk pertaining to the day of the month by causing it to turn in the inverse direction.

In order to render possible a better understanding of the object of the present invention, two embodiments thereof will now be described and are given as examples and for purposes of illustration only without having a limitative character, and which are taken in connection with the accompanying drawings.

Brief description of the drawings

FIG. 1 is a front view with a portion of the mechanism according to the first embodiment of the present invention being shown exposed;

FIG. 2 is a cross-sectional view taken along line II—II of FIG. 1;

FIG. 3 is a front view of the two graduated disks according to the present invention;

FIG. 4 is an axial cross-sectional view of the mechanism according to a modified embodiment of the present invention;

FIG. 5 is a cross-sectional view taken along line V—V of FIG. 1;

FIG. 6 is a front view with a portion of the small clock being equipped with the dating mechanism according to the present invention being shown exposed; and

FIG. 7 is a cross-sectional view taken along line VII—VII of FIG. 6.

Description of the preferred embodiment

As is apparent from FIGURES 1 to 3, the mechanism according to the present invention comprises as essential elements two concentric disks **1** and **2** having differing diameters so that the first disk **1** cannot cover but a portion of the second one. Both of these disks are graduated

according to thirty-five divisions per revolution. The first disk, i.e. disk **1**, comprises the seven days of the week repeated five times. The second disk, i.e. disk **2**, includes thirty-one numbers representing the days of the longest month possible followed by four ungraduated divisions, in other words, areas not provided with any indicia.

The disk **1** is secured to the end of a hub **3** and made integral therewith, with the hub, in turn, being secured to a ratchet wheel **4** having thirty-five teeth. Together these elements comprise a unit which pivots freely on a cylindrical sleeve **5** comprising an axial bore **7**, said sleeve being riveted to the plate or front panel **6**. The disk **2** is loosely mounted on the hub **3** and driven by a slight friction provided by means of an elastic washer **8** which presses the disk against the base **9** of the hub **3**.

The mechanism is constituted by a back panel or second plate **10** connected to the plate **6** by means of struts **11**, and the entire unit is interposed between the conventional clock movement schematically illustrated at **12** and the dial **13** of the timepiece with the two concentric axles of the minute axle **14** and that of the hour hand **15** simply extending through the bore **7** of the cylindrical part **5**.

The hour axle **15** is provided with a pinion **16** which executes one revolution in twelve hours and drives a toothed wheel **17** which has twice as many teeth or cogs and consequently executes one complete revolution within twenty-four hours. This wheel revolves around an axle **18** which is riveted to the plate **10** and carries as an integral part thereof a ratchet wheel **19** and a cam **20**. One end of a pawl **21** engages a spring **22** and is adapted at the opposite end to contact the teeth of the ratchet wheel **19** in such a manner as to permit rotation only as indicated by the arrow A and thus opposing any inverse rotation, particularly when the timepiece is set at the desired hour.

The cam **20** includes a lobe **20'** and abruptly ends in a radial wall **23**. The lobe **20'** drives an elastic blade or spring means **24** through a lug portion **25**, the free end of said spring means terminating in a leg portion **26** adapted for cooperation with the ratchet wheel **4**. The spring means **24** is bent by the cam **20** in the course of twenty-four hours and is thereafter suddenly freed at the rectilinear portion of the radial wall **23** at the end of the day in such a manner that the catch **26** causes the ratchet wheel **4** and therewith the entire unit of disks **1** and **2** to advance by one thirty-fifth of a revolution.

When the timepiece is initially set for operation, it is necessary, of course, to adjust it to the particular hour by checking the position of the cam **20** in order to avoid an error of twelve hours. Thereafter, the disk **1** must be adjusted to the desired day. For this purpose, one could turn the hands carried by the clockwork mechanism several times by twenty-four hours, but it is much simpler to provide a device which comprises a spring blade means **27** including an angular leg portion **29**, the free end of which has a tongue-like extremity **30** which is arranged to drive the ratchet wheel **4** in a counter clockwise direction. The spring blade means **27** is manually actuated that by pressing the button as many times as is desired, the disk **1** may be advanced by the corresponding number of days until the desired day appears in the window **31** which is provided in the dial.

Next, the appropriate number corresponding to the respective day of the month must be arranged so that it will show in another window **32** of the dial. This may be accomplished simply by turning the disk **2** by hand in either one direction or the other, for example, by any instrument which is extended through the opening available. The friction produced by the spring washer **8** is preferably sufficiently slight so that the rotation of the disk **2** in any direction does not actuate or turn the disk **1**. Furthermore, disk **1** is retained by the two pawls **26** and **30** as well as by a further application of force created by the spring-type pawl **33** which also acts on the ratchet wheel **4**. This friction nevertheless does allow for very easily driving the disk **2** which, like the disk **1**, may be made of extremely light weight material.

Once the timepiece has been set in this manner, the disks **1** and **2** turn simultaneously by one division every time the end of the day has been reached so that the day of the week as well as the exact date of the month will constantly show in the windows **31** and **32**. When the end of the month has been reached, that is to say, the 28th, 29th, 30th, or 31st, as the case may be, a manual action suffices by manually rotating the disk **2** as described before, in order to have the latter turn without affecting disk **1** until the number "1" appears in the window **32**, the dating mechanism therewith having been set for the entire following month.

As a matter of fact, by virtue of the teaching of this invention and the use of thirty-five divisions representing an entire number of weeks, the succession of the days of the week is not disturbed.

In the modified embodiment of the invention illustrated in FIGS. 4 and 5, the first disk **1** is identical to the disk previously described herein; in other words, it comprises thirty-five graduations at the rate of seven days of the week repeated five times. This disk is integral with a hub portion **34** which, in turn, is integral with a ratchet wheel **4**. These elements form a unit arranged to rotate freely about an internally threaded central portion **35** which is affixed to the cup-shaped plate **36**. The hub portion **34** abuts at one end against a flange **37** of the portion **35** and is held at the other end thereof by any suitable means such as a washer **38**. Visible at **13** is the dial of the clock which includes an opening **39** in which latter appear the date and the day of the month. The dial **13** provides together with the plate **36** a housing for the mechanism forming this invention. As shown in FIG. 5 the dial **13** is supported relative to the central portion **35** and secured thereto with the aid of an externally threaded sleeve that includes a collar **40**. Shown at **12** is the clockwork movement of the timepiece from which extends the hour axle **15**, which, in turn, telescopes the minute axle **14**, these elements being arranged to extend through the aforementioned sleeve.

The actuation of ratchet wheel **4** is effected by means of a toothed wheel **41** meshing with a pinion **42** which is integral with the hour axle **15**, said pinion having only half as many teeth or cogs so that wheel **41** turns by one revolution every twenty-four hours. This wheel **41** is integral with a hub portion **43** and adapted to rotate on an axle **44** which is suitably affixed relative to the plate **36**. Mounted on wheel **41** and arranged to travel therewith is a U-shaped spring **46** which has one end **47** thereof associated with a perforation in said wheel with the other free end thereof bent at an angle to provide a leg **45** which extends through a radially slotted area **48** in wheel **41** and into engagement with the teeth of ratchet wheel **4**. In this manner, the leg **45** causes the ratchet wheel **4** to advance by one tooth or cog with each turn of the wheel **41**. A catch **49** pivotally mounted, as at **50**, to plate **36** is maintained in contact with ratchet wheel **4** by a spring **51** and thereby keeps the wheel **4** immovable during the remainder of the rotation of the wheel **41**. Conversely, this pin or leg **45** withdraws from the path of one of the ratchet teeth so as to allow the wheel **4** to turn when the rotation of the disk **1** is initiated, for example, by means of a mechanism (not shown).

Mounted in surface contact with the disk **1** is a second disk **2** which is driven through friction by means of an elastic ring or washer member **52** supported on the wheel **4**. As described hereinbefore, this disk **2** comprises the days of the month from 1 to 31 plus four unused divisions, and these graduations appear in the window **39** adjacent to the day of the week. The disk **2** includes advantageously an inclined edge or border **53** which confronts a perforation **54** which is provided adjacent to the edge of the cup-shaped plate **36**. This arrangement makes possible the rotation of disk **2** merely by extending one's finger into the perforation **54**. This allows for proceeding with the adjustment at each end of the month, as already indi-

cated hereinabove with respect to the first embodiment of the invention.

Finally, the apparatus according to the present invention comprises a third disk **56** disposed on the opposite side of disk **1** and is mounted—as in disk **2**—so as to rotate around the hub portion **34** and is driven simply through the medium of disk **1**. This co-action is accomplished by a second elastic ring or washer **57** which is supported on an annulus **58** which is secured to the extremity of the hub portion **34**. The disk **56** is made from a transparent material so as to allow at all times the observation of the day and the date of the month through the window **39**. Also, the disk **56** includes differently colored sectors which allow for the use of the well-known Ogino method, the amplitude of each of the sectors thereof corresponding to the duration of the phases of the cycle. A correction may be applied thereto each month according to the duration of the cycle with respect to the thirty-five graduations by extending one's finger into the perforation **54** and engaging the edge **59** so as to rotate disk **56**.

Depending upon the coloration of the background of disk **56** which appears in the opening **39**, the user of the new device is thus always aware as to the particular phase of a cycle at any given time.

It is apparent, therefore, that the dating mechanism as proposed by the present invention, while being extremely simple it requires only a single drive mechanism, is nevertheless completely automatic and needs at most only a single manual correction at the end of the month which is extremely easy and fast.

In a still further embodiment of the invention as illustrated in FIGS. 6 and 7, the small clock or timepiece has a conventional, preferably electrical, clock movement **12** attached behind a decorative panel **60** with the dial **13** being secured to the front face thereof and may include as well a protective gass lens **61**.

The dating mechanism is disposed entirely within a plate **36** of the type described earlier in connection with the other embodiments of the invention and comprises a stamped element having a substantially cylindrical perimeter which is arranged to be positioned in a circular opening **62** provided within the confines of the panel or frame **60**. This place is secured to the housing of clock movement **12** by means of two threaded screws **64** and **66** (FIG. 6) and comprises an element **65** generally similar to portion **35** shown in FIG. 5 which is adapted to surround the axles, previously described, and is affixed to plate **36** as shown. This element **65** is partially cut away on one side to allow the wheel **41** to mesh with the wheel **16** which is carried by the hour axle.

In contrast to the other embodiment of the invention disclosed herein the U-shaped spring is replaced in this instance by a tooth or cog **67** provided on a sleeve-like element **68** which is driven, due to friction, by means of the hub **43** carried by wheel **41** which latter, in turn, rotates about an axle **44** that is secured to the plate **36**. A comparison of the view in FIG. 5 with that of FIG. 6 will disclose the general similarity of these structures and particularly the pawl arrangement. It will be noted that the teeth on the ratchet **4** are oppositely disposed to those shown in FIG. 5, and a spring **65** holds the pawl **49** in engagement therewith.

A hub **3** is arranged to freely rotate around the element **65**. The ratchet wheel **4** is secured to one flange of the hub and to an oppositely disposed flange; the disks **1** and **2** carrying the days of the week and the month, respectively, are superimposed one upon the other and driven by friction.

A sector **70** which bears the inscription of the twelve months of the year and includes a small lever **71**, best shown in FIG. 7, is adapted to rotate around the element **65**.

The unit formed by the clock movement **12** and the plate **36** is mounted in the perforation **62** of the panel **60** and secured behind the dial **13** by means of an externally

threaded collar **40** which is screwed into the element **65**. A tongue or flange portion **72** (see FIG. 6) integral with the plate **36** additionally serves to immobilize the entire rotating unit in such a manner that the inscriptions of the days of the week appear clearly centered in the window **39**. The panel **60** is provided with a cut-out portion **73** and together with the perforation **54** provided in the plate **36** enables one to extend his finger into the back of the clock in order to reach the edge of the disk **2** to rotate the same when desired as previously explained in connection with the earlier embodiments of this invention.

The operation of the mechanism in all embodiments is precisely the same, and when the end of the month has been reached, the adjustment of the date is effected in a very simple manner. It is sufficient, in fact, to actuate the disk **2** in the direction shown by the arrow **74** in order to drive simultaneously and by friction the disk **1** until the number of the day of the month surpasses that of the date provided for and until the correct day of the week appears in the window **39**. In order to accomplish this, it is generally sufficient to turn the unit by seven notches.

Thereafter, the disk **2** is still actuated, but now in a direction opposite to that indicated by the arrow **74** and in such a manner that the disk **1** is blocked by means of the pawl **49** and only the disk **2** will still rotate while striving to overcome the actuation due to friction thereof. The disk **2** is turned, of course, until the correct day of the month appears in the window **39**.

The combination of these two operations is extremely rapid and easy due to the smoothness of the mechanism and the length of the opening **73**. Finally, it is sufficient, of course, to actuate the sector **70** by actuating the lever **71** thereof as explained hereinbefore in order to have the correct month appear in the window **75**, the latter being disposed diametrically opposite that of the window **39**.

It is thus apparent that all of the indicia, i.e. the days of the month, the days of the week, and the months of the year, may have a maximum dimension without causing the sector **70**, which is provided only with twelve months and covers an area smaller than a half circle, to appear in the window **39**.

Therefore, it is seen conclusively that, with respect to a conventional timepiece comprising the same clock movement **12**, the same panel **60**, and the same dial **13**, the provision of a timepiece with the dating mechanism proposed by the present invention indicating the month, the day of the week and the day of the month is extremely simple and requires only a very small number of additional elements.

On the other hand, the entire unit is extremely easy to use and merely requires an adjusting operation at the end of each month. Lastly, the overall dimension or space of the apparatus as a whole is not increased thereby.

More particularly, the number of divisions, instead of being equal to thirty-five, could be any multiple of seven over twenty-eight. Finally, the different means for the mechanical drive and manual control could be replaced by any equivalent means.

What is claimed is:

1. A dating mechanism comprising spacedly arranged front and rear panels, annularly flanged sleeve means positioned in a perforation in said front panel, a first means abutting said flanged sleeve means, a hub member telescoping said sleeve means and engaging said first means, rotatable disk means associated with said hub member, friction creating means associated with said hub member and interposed between said disk means, axle means offstanding normal to the back panel and in a plane parallel to said hub member, cam means mounted on said axle, spring-like means extending from the back panel adapted to cooperate with said cam means carried by said axle means and the first means, and further means carried by said axle adapted to receive continuous rotational signals from a source and thereupon transmit said signals to said disk means periodically.

2. A dating mechanism according to claim 1, further comprising manually actuated means associated with said back panel and adapted to impart rotational movement to said first means.

3. A dating mechanism according to claim 1, wherein each of said disk means is provided with circumferentially disposed graduations.

4. A dating mechanism according to claim 1, wherein said front panel is provided with plural means defining openings therein.

5. A dating mechanism according to claim 4, wherein a perforated dial is adapted to overlie the front panel, said perforations in the dial corresponding to the means defining openings in the front panel.

6. A dating mechanism according to claim 1, further characterized by being attachable to a continuously driven clockwork mechanism.

7. A dating mechanism according to claim 3, wherein the graduations on one of said disk means progress numerically at least from 1 to 31.

8. A dating mechanism according to claim 1, wherein another of said disk means includes repetitively and in sequence the days of the week at least five times.

9. A dating mechanism according to claim 1, further characterized by a third disk which is rotatably secured relative to the hub member.

10. A dating mechanism according to claim 9, wherein said third disk is transparent.

11. A dating mechanism according to claim 1, wherein the source from which the rotational signals are transmitted comprise telescopically disposed means arranged to rotate the hour and minute hands of a clock.

12. A dating mechanism according to claim 1, wherein an indicia bearing sector is rotatably secured to said hub member between said concentrically arranged disk means and the front panel.

13. A dating mechanism according to claim 12, wherein said sector is provided with lever means adapted for actuation of said sector, said lever extending beyond the rear panel.

14. A dating mechanism according to claim 1, wherein the dating mechanism is positioned in a frame member, said frame member including means defining an access opening which cooperates with an opening provided in the rear panel whereby appropriate disks may be rotated at will by the user of the dating mechanism.

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RICHARD B. WILKINSON, *Primary Examiner.*

EDITH C. SIMMONS, *Assistant Examiner.*

U.S. Cl. X.R.

58—58

PO-1050
(5/69)

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,452,535 Dated July 1, 1969

Inventor(s) M. A. Cabantous et al

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Col. 3, line 56, "manually actuated that by" should read --manually actuated by means of a button 28. It will now be apparent that by--; Col. 5, line 27, after "simple" should be inserted --since--; Col. 5, line 36, "gass" should read --glass--

SIGNED AND
SEALED
NOV 18 1969

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents