Oct. 14, 1969 W. A. PAPWORTH 3,472,018

RHYTHM CLOCK

Filed Dec. 1, 1967 2 Sheets-Sheet 1

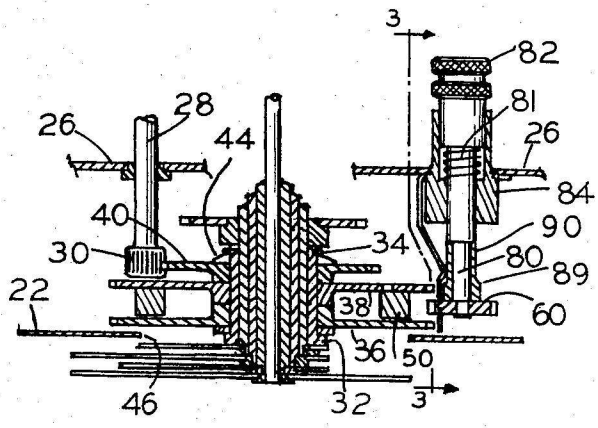

FIG. 2

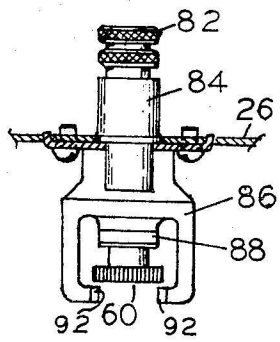

FIG. 3

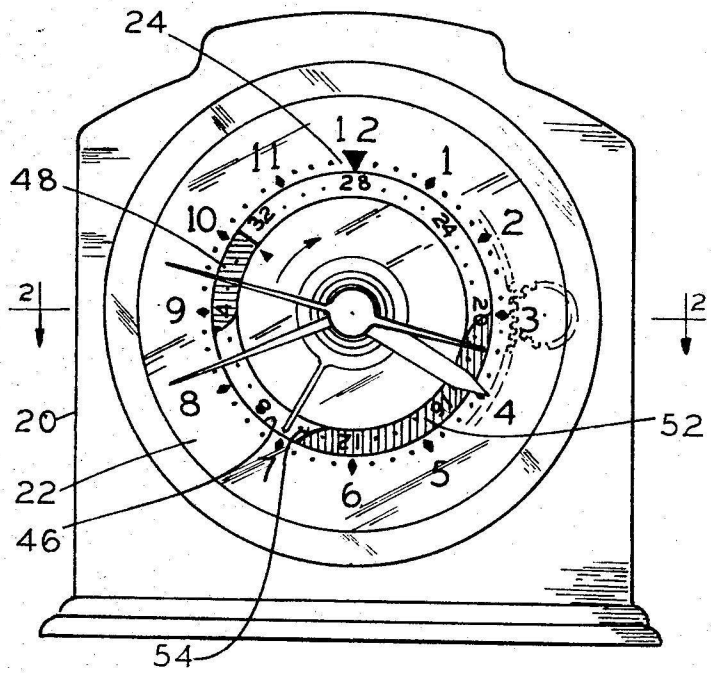

FIG. 1

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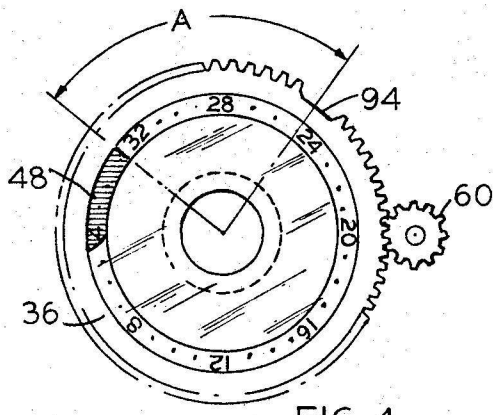

FIG. 4

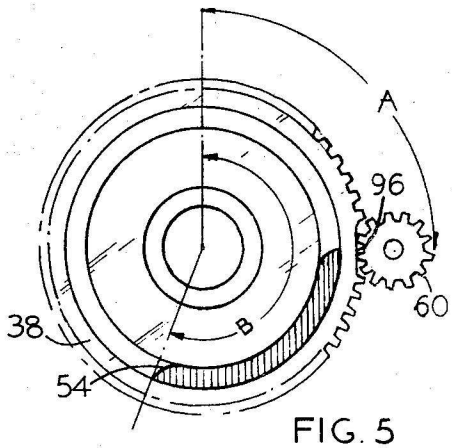

FIG. 5

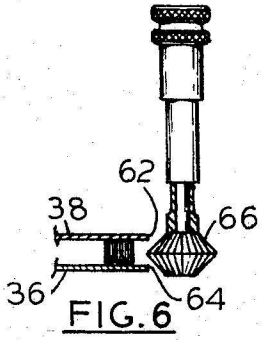

FIG. 6

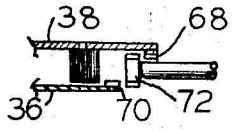

FIG. 7

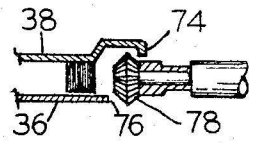

FIG. 8

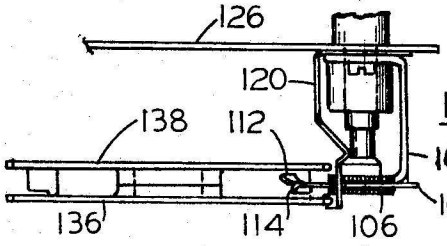

FIG. 11

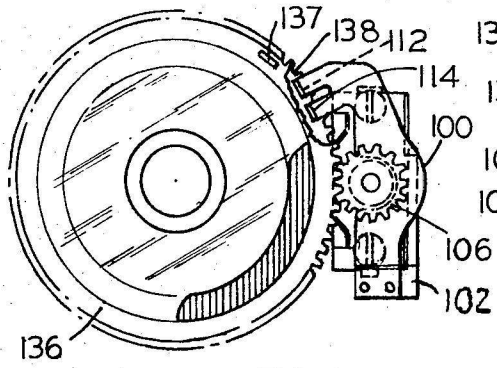

FIG. 9

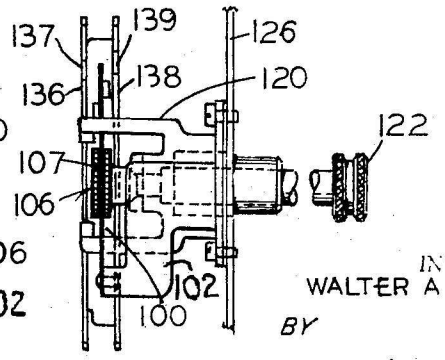

FIG. 10

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RHYTHM CLOCK

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Int. Cl. G04b 19/24
U.S. Cl. 58—4 12 Claims

ABSTRACT OF THE DISCLOSURE

Rhythm clock comprising two settable coaxial dials clock-driven means, for frictionally driving the dials through one revolution in a period sufficient to include the number of days of a menstrual cycle, one dial having indicia representing the days of the period and a mark denoting the menarche of a menstrual cycle, and the other dial having a segment denotating at one end the beginning and length of the fertility period, an index stationary on the clock, and manual setting means for rotating the other dial while braking rotation of the one dial to a position with the beginning end of the segment at a fixed angle from said index sufficient to include not more than the number of days elapsing between a menarche and the beginning of a subsequent fertility period and preventing rotation beyond the position, and manual means to rotate both the dials to a position with the menarche at the index, and means to prevent rotation of both dials beyond the last named position.

This invention relates to clocks, of a type intended to provide visual signals indicating the expected sequential timing of the phases of a woman's menstrual cycle.

Its objects are: to retard the population explosion; to promote the "rhythm method" of birth control, and make the method more convenient and effective to use; to provide such a device in a form that will normally be kept in the bedroom, preferably but not necessarily an alarm clock, of a size and design sufficiently prominent that its message will be clearly apparent to both man and wife without searching examination, and to thereby cause them to share equally the responsibility for following its mechanical and impersonal guidance; to promote marital harmony; and to provide a unit with commercial potential for manufacture and widespread distribution, whose message is so simple that it can be understood by those who have no knowledge of numbers or arithmetic, and operated and used without any need for calculation.

Most importantly, this invention seeks to provide a rhythm clock which will automatically adjust itself for changes and variations in the length of the menstrual cycle, and whose monthly setting involves no more than the simple pull-turn, push-turn of a knob, without reference to any scale, graduations, or visual inspection.

Other points of possibly desirable significance are that resetting may be accomplished by turning randomly in either direction, and that turning more than necessary does no harm.

The other and novel features of the invention will appear more fully hereinafter from the following detailed description when taken in conjunction with the accompanying drawings.

In the drawings, wherein like reference characters indicate like parts:

FIGURE 1 is a front view of the clock showing the appearance of its superimposed signalling dials through a large hole in the center of the clock face, and the location of the setting pinion dotted in. The whole cycle is preferably shown rather than one day at a time through a window, as the objectives as stated will be more fully realized in that way, and certain parts are lined for red and blue;

FIGURE 2 is a fragmentary sectional view taken on the line 2—2 of FIGURE 1;

FIGURE 3 is a fragmentary sectional view of the brake member taken substantially on the line 3—3 of FIGURE 2;

FIGURE 4 is a face view of the outer dial showing its graduations, signalling segment lined for blue, a setting pinion and notch whereby the rotation of the dial in response of the turning of the pinion ends when the notch reaches the pinion;

FIGURE 5 is a similar view of the inner dial with a signalling segment lined for red and a similar notch;

FIGURE 6 shows a knurled member replacing the setting pinion, acting against the edges of the dials which may be knurled. A rubber or resilient friction pinion can be used and may be found preferable to regular toothed gearing;

FIGURE 7 shows a setting pinion arranged radially to the dial. This would permit placing the axis of the setting pinion at about the 5 o'clock position, with the setting knob hidden in the base of the clock;

FIGURE 8 shows a similar arrangement employing a knurled or frictional pinion;

FIGURES 9, 10 and 11 show a variation where the same degree of automation may be obtained on the same general principle by positive stops rather than by notches in the dials. FIGURE 9 is a partial front view, FIGURE 10 is a side view, and FIGURE 11 a partial top view.

Referring to FIGURE 1 there is shown a clock case 20, the clock face 22 with the usual markings for hours and fractions thereof, the usual hands for seconds, minutes, hours, and alarm-set, and an index 24, here shown just under the 12 o'clock position on the clock face. The position of the setting pinion behind the clock face is dotted in at the 3 o'clock position. It could be positioned elsewhere if preferred.

In FIGURE 2 the clock frame is represented by its front plate 26, and is suitably mounted in the case. The clock works including a motor are mounted in the frame and have the conventional tubular sleeves on which the hands are mounted. Extending from the clockworks is also a slow-motion drive shaft 28 and drive pinion 30.

On the outer sleeve of the conventional tubular sleeves, a dial assembly unit is journalled for free rotation. This assembly has a tubular core 32 which has a flange at one end and a snap ring 34 or equivalent at its other end.

On the core are rotatably mounted from front to back, a washer, a front dial or signalling member 36, a rear dial or signalling member 38, a drive gear 40 meshing with the drive pinion 30, a spring washer 44, and the snap ring 34. The snap ring and spring washer hold the assembly together as a unit, and impose endwise friction between its several members. This makes up the dial assembly unit. A hole 46 in the clock face renders the dials 36 and 38 visible to the observer, or the clock face may be transparent in its center portion. It may be noted that the dials could be arranged in the base of the clock, or at its sides or top, in such a way that their edges and signals thereon would be within the intent of the invention.

The front dial 36, called the M-dial for easy identification, is transparent, and its circumference is marked with equal graduations, from 1 to 32 in the example shown. Other scales of graduation could be used, for example 1 to 35, 1 to 36, or 1 to 40. Each graduation indicates one 24-hour day. The drive shaft 28 and drive pinions 30 are so geared within the clockworks that they turn the gear 40 and the dial assembly with it, the space of one graduation each day. That is, in the example shown, the dial assembly will make one revolution in 32 days. The M-dial 36 has a colored or otherwise distinguished portion 48 extending from 1 to 5 and representing the period of

active menstruation. The M-dial is the time measurer of the actual complete menstrual cycle, which may vary considerably from its nominal 28-day length. As shown it is lined for blue.

The inner dial **38**, called the O-dial for easy identification, has an annular raised portion **50**, which extends forward and may contact the M-dial. This raised portion has a colored segment **52** with a leading edge **54** and represents the ovulation phase of the cycle, broadened to include margins of possible fertility period before and after the actual time of ovulation. The leading edge **54** denotes the beginning of the fertility period. In the example, a period of eleven days is set up as the ovulation-fertility period. In this device the eleven day allowance for fertility is held constant, while the variations in the overall length of the rhythm cycle are made by changes in the interval by which ovulation follows the incidence of menstruation. Of course other allowances could be made.

Both dials **36** and **38** have gear teeth on their edges adapted to mesh with the setting pinion **60**, or may have knurled edges **62** and **64** adapted to be operably engaged by a knurled or resilient pinion **66** as in FIGURE 6. No particular ratio or number of teeth are required. If desired, the setting pinion may be disposed on a radial axis as in FIGURES 7 and 8 where the pinion **72** is shown as adapted to drive crown teeth **68** or **70**, or the friction wheel **78** is adapted to drive knurled edges **74** and **76**, respectively.

The dial assembly, if set with its graduation 1 at the index **24** on the day when menstruation begins, will revolve slowly at one graduated space per day and show at the index: first, the 5-day allowance for active menstruation, then a variable and expectedly nonfertile period between the menstruation period **48** and the ovulation-fertility period **52** and then a supposedly nonfertile period, and lastly the end of the whole cycle brought about by the incidence of new menstruation, hereinafter called the menarche. The term menarche is herein employed to designate the monthly incidence of menstruation. The length of the completed cycle is shown by the number on the M-dial **36** which is then at the index **24**. More meticulous users will record these cycle lengths for a long-time average.

A prime requisite in the use of this device is that it be reset for the new period on the day when menstruation begins. Of course it can be manually set at other times, but that involves some care and calculation. The assumption is made that the new period will be the same length as the one just completed. The need thus becomes to set the timing of the ovulation-fertility period with reference to the end of a forthcoming cycle of the forecasted duration, and to let the interval by which ovulation follows menstruation in the program become what it may.

Referring again to FIGURE 2, there is shown a setting knob **82** on a setting shaft **80** journalled in a bushing **84**, mounted in the frame **26**, which has at its front end a setting pinion **60**. This unit is so positioned that the setting pinion may mesh with the gear teeth in the edges of the dials **36** and **38**, and the shaft **80** is shiftable endwise to permit the pinion to selectively engage and turn either of the dials. A brake member **86** attached to the frame has a V-shaped tongue **88** which is engaged by a conical portion **89** of a sleeve **90** when the shaft **80** is shifted backwardly, pressing the prong portions **92** of the brake member against the edge of the M-dial **36** and holding the dial stationary while the shaft **80** is in its backward position.

As shown in FIGURE 4 the M-dial has a notch **94** cut in its toothed edge just large enough so that the pinion **60** can turn freely in it without turning the dial **36**. This notch is located 90° clockwise from the numeral 1 of the graduations on the M-dial. This angle is marked A in FIGURE 4. This location is because the pinion **60** is positioned at 90° clockwise from the index **24** on the frame. Thus when the notch **94** comes to the pinion **60** the M-dial **36** will have its numeral 1 at the index **24**, and will stop there.

As shown in FIGURE 5 the O-dial **38** has a similar notch **96**. This is positioned so that the dial will stop when the leading edge **54** of the fertility signal **52** is a specified number of spaces clockwise from the index **24**. In the example shown the leading edge **54** of the fertility signal **52** arrives at the index **24** eighteen days ahead of the forecasted end of the whole cycle. Thus in FIGURE 5, the leading edge **54** is 18 minus 8, or 10 spaces ahead clockwise from the notch **96**, which is angle B minus angle A in FIGURE 5. The 8 spaces are 90° on the 32-day dial.

In routine operation all the user has to do, on the day when new menstruation occurs, is to pull out the knob, turn it in either direction until it turns free, then push in the knob, turn it in either direction until it turns free, then release it. A spring **81** withdraws the knob **82** and pinion **60** to a neutral position out of engagament with either dial.

For first-time use, the knob must first be pushed in and turned until a known previous length of cycle, or 28 if none is known, appears at index, following which the routine setting as above is followed.

Turning now to FIGURES 9, 10 and 11, a modified version is shown embodying the same general principle but with click-stops falling into punched holes instead of the pinion **60** falling into notches as in FIGURES 4 and 5. A flat spring **100** is mounted on a bracket **102** attached to the frame **126**. This spring has a notch in one edge which rides in a groove **107** in the setting pinion **106** and normally keeps the pinion in neutral position between dials **136** and **138**, but can be bent by endwise movement of the knob **122** to permit the pinion to selectively engage the teeth of either of the dials.

At its upper end the spring **100** has oppositely formed prongs **112** and **114** facing respectively toward the dials **136** and **138**, which have holes as **137** and **139** respectively at the appropriate locations. The brake **120** is similar to that shown in FIGURES 2 and 3. When the knob **122** is pulled out and turned, the groove in the pinion bends the spring **100** and the prong **138** resiliently to ride against the inner surface of the dial **138**. When the hole **138** comes around the prong **112** snaps into it and holds the dial against further rotation, but is released as soon as the endwise pressure on the knob is released. This puts the O-dial **138** in proper relation to the M-dial. When the knob **122** is pushed in and turned the prong **114** rides on the M-dial **136** until it snaps into the hole **137** in the M-dial. This positions the M-dial, and the O-dial with it, for the beginning of the new cycle, with the number 1 on the M-dial at the index **24**. The operation is the same as in the notch-type arrangement except that the turning of the knob is limited by the click-stops instead of being set free by the notches.

While a single form and variations of the invention has been illustrated and described, it is to be understood that the invention is not limited thereto. As various changes in the construction and arrangement may be made without departing from the spirit of the invention, as will be apparent to those skilled in the art.

What is claimed is:

1. A rhythm clock comprising clock driven means, two coaxially mounted signalling members having circular edges, means for frictionally actuating the said signalling members from said driven means through one revolution in a period sufficient to include the number of days in a woman's menstrual cycle, the first of said members having circumferential markings representing the days of the said cycle and a mark denoting the menarche, and the second of said members having a segment denoting the beginning and length of the fertility period, an index stationary on the clock, and manually operable setting means engaging the said circular edges to turn said signalling members adapted to turn the second member

independent of the first member and the driven means to a position where the fertility signal follows the menarche signal by an interval mechanically and automatically controlled by the mechanically registered length of the preceding menstrual cycle, and to turn the two signalling members together independent of the driven means until the menarche signal is at the index position ready for the beginning of a new cycle.

2. A clock according to claim 1 wherein the signalling members include means independent of any uniformly spaced indicia for preventing the movement of said members beyond the said positions by the manual operable means.

3. A clock according to claim 2 wherein the means is effectively operable upon manual rotation of the members in either direction.

4. A clock according to claim 1 wherein the manually operable setting means includes a manually operable setting member mounted for axial and rotational movement to engage one or the other of said signalling members, and brake means for holding the first signalling member upon axial movement of the setting member to actuate the second signalling member, and for releasing said first signalling member upon axial movement of the setting member to actuate the first signalling member and the second signalling member frictionally therefrom.

5. A clock according to claim 4 wherein the signalling members have circular edges, and the setting means when axially moved to actuate one signalling member or the other, engages one or the other of the circular edges, and in which the circular edges each have a notch to prevent engagement of the setting means to limit rotation of the members at the said respective position.

6. A clock according to claim 5 wherein the notches limit rotation of the members at the said positions by the setting means when rotated in either direction.

7. A clock according to claim 1 wherein the setting means includes a brake adapted to hold the first signalling member stationary, a manually operable setting member mounted for endwise and rotary movement, having means adapted in one endwise position to apply the brake to the first signalling member and to engage and turn the second signalling member to an angular position relative to the first signalling member controlled by the amount of angular movement made by the first signalling member during the whole of the preceding menstrual cycle, and adapted in its other endwise position to release the brake and to engage and turn the first and second signalling members together until the menarche signal is at the index signifying the beginning of a new cycle.

8. A clock according to claim 7 wherein the setting member is provided with a spring effective to withdraw the setting member from engagement with the first signalling member.

9. A clock according to claim 8 wherein the second signalling member has a configuration to prevent the means to turn from engaging the second member at one location whereby movement of the second member in either direction beyond said location by the means to turn is prevented.

10. A conventional clock having clock driven means, two coaxially mounted signalling members, means for frictionally rotating said signalling members together

from said driven means in unison at the rate of one revolution in a period sufficient to include the days of a woman's menstrual cycle, the first of said members having circumferential markings representing the days of the said cycle and a mark denoting the menarche, and the second of said members having a segment denoting the beginning and lenth of the fertility period, an index stationary on the clock, a brake adapted to act upon the first of said signalling members; and manually operable setting means mounted for endwise and rotary movement and adapted in one endwise position to apply the brake to the first signalling member and to engage and turn the second signalling member independent of the said first member to a position where the fertility segment follows the menarche signal by an interval mechanically controlled by the mechanically metered length of the preceding menstrual cycle, and in its other endwise position to release the brake, rotatably engage the said first member, and turn the first and second members together to a second position where the menarche is at the index, ready for the beginning of the next cycle.

11. A clock according to claim 10 having means to render the setting means inoperative to turn the second dial beyond the predetermined position, and the first dial beyond the second position.

12. A rhythm clock having clock-driven means, two coaxially mounted signalling members, means for frictionally rotating the said signalling members together in unison by the said driven means in a period sufficient to include the days of a menstrual cycle, the first of said members having markings denoting the menarche and the days of the menstrual cycle, and the second of said members having markings denoting the beginning and length of the fertility period, an index stationary on the clock, and manually operable setting means adapted to turn the second signalling member, independent of the first signalling member and the driven means, to a predetermined position with relation to the index, and to turn the two signalling members together in unison to a predetermined and mechanically stopped position with the menarche signal at index, both of the said turning movements being limited by cutaway conformations of the respective signalling members coacting with stop conformations, the said conformations on each signalling member being so located as to automatically put the fertility marking at a relation with the menarche marking controlled by the length of the previous completed cycle as indicated by the terminal position of the menarche signal with reference to the index.

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U.S. Cl. X.R.

58—5