

[54] **ALARM CLOCK CONTROLLED PILL DISPENSING DEVICE**

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 851,178, Aug. 19, 1969, abandoned.

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Feb. 25, 1969	GermanyP 19 09 237.6

[52] U.S. Cl.221/3, 221/4

[51] Int. Cl.**B65g 29/00**
[58] Field of Search.....221/3, 4, 7, 8, 15

[56] **References Cited**

UNITED STATES PATENTS

3,395,829 8/1968 Cogdell et al.....221/15

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[57] **ABSTRACT**

An alarm clock controlled pill dispensing device comprises an alarm signal mechanism for producing a continuing alarm signal beginning every 24 hours from a settable time. Unless shut off manually, this signal continues constantly or intermittently for a set fraction of 24 hours. Manually operable signal shut-off means is so arranged that operating access thereto is blocked unless a pill is removed from a pill dispensing station.

7 Claims, 17 Drawing Figures

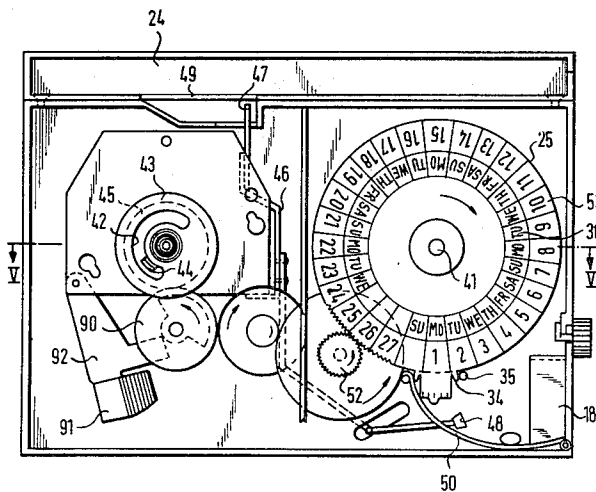


Fig.1

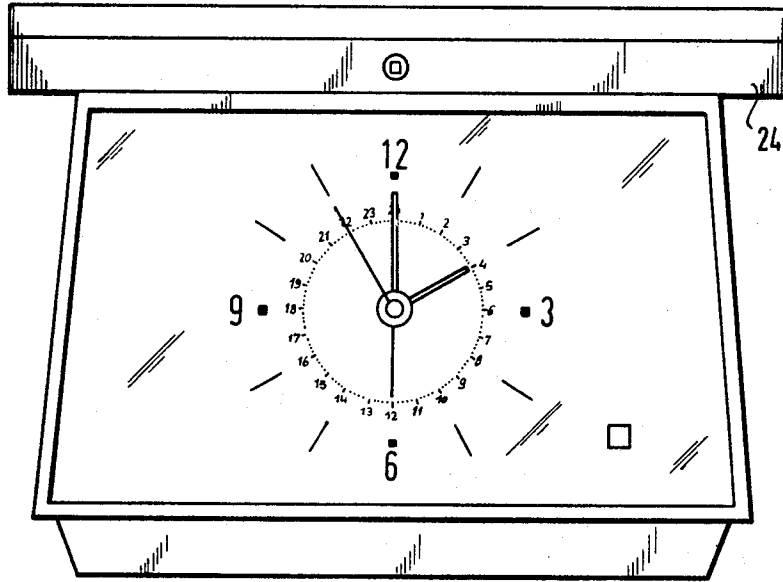


Fig.2

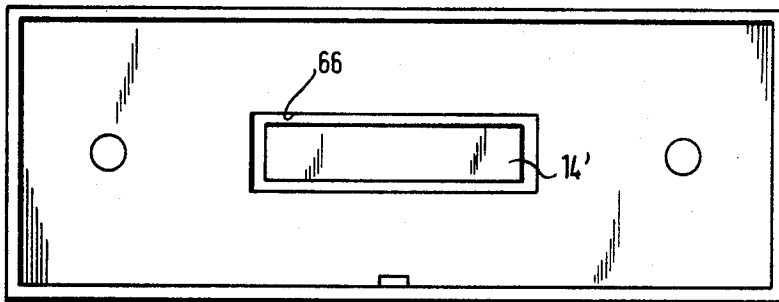
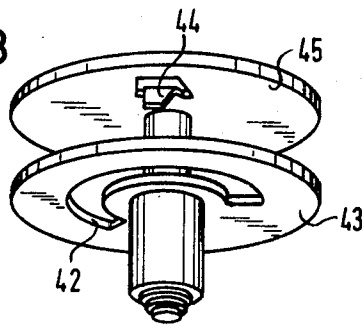


Fig.3



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Fig. 4

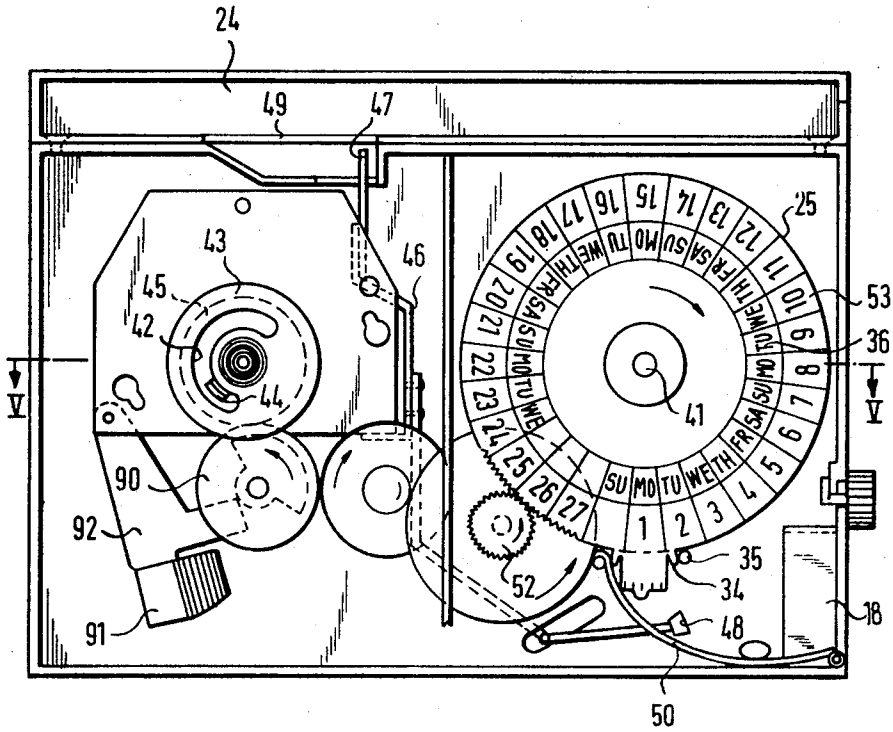
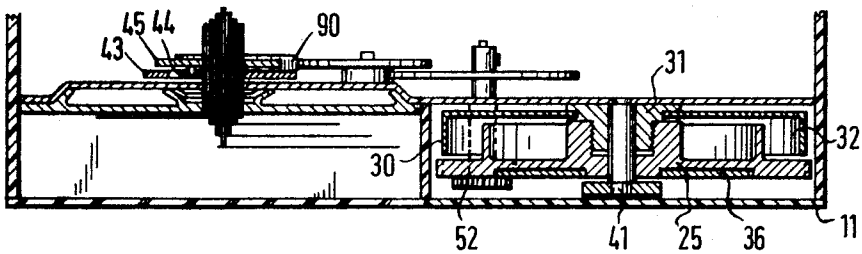
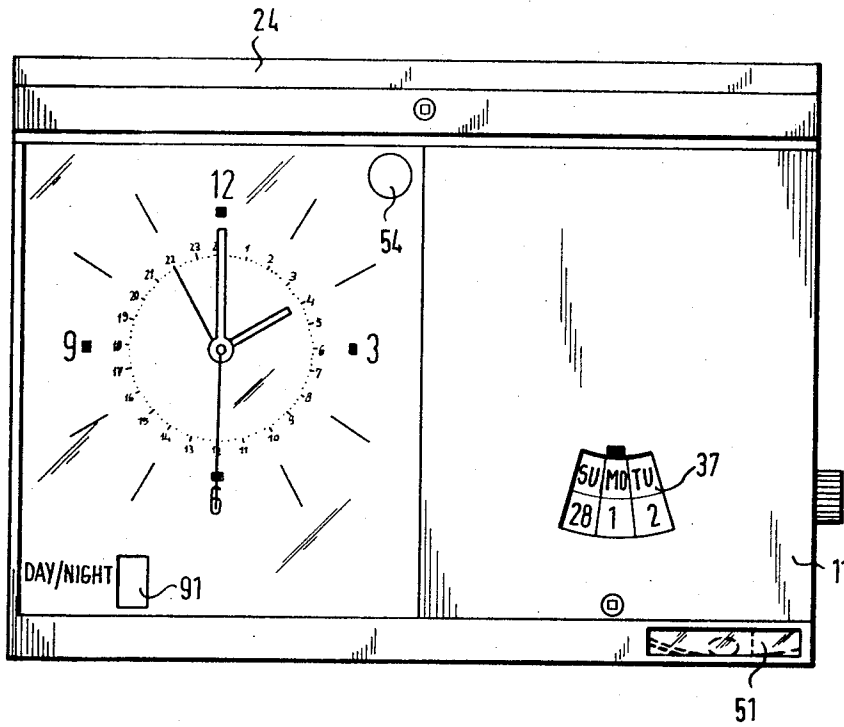


Fig. 5



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Fig. 6



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Fig.7

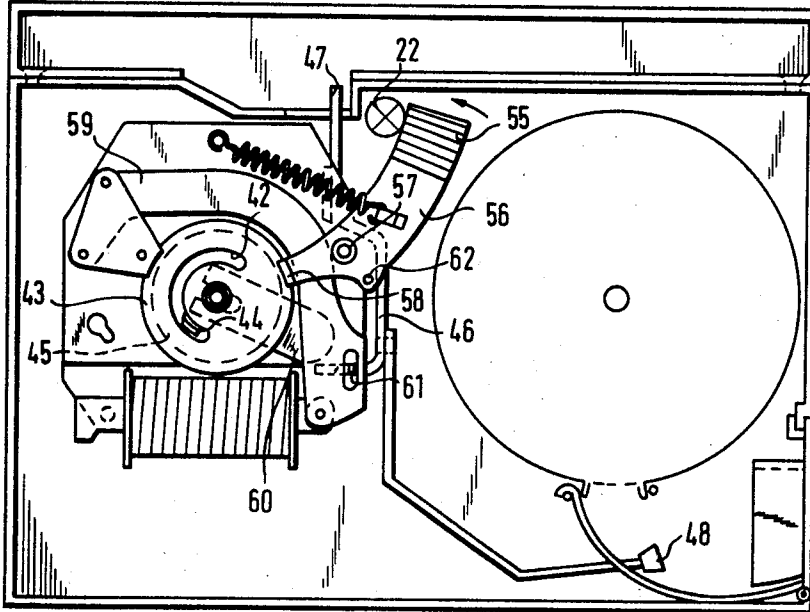
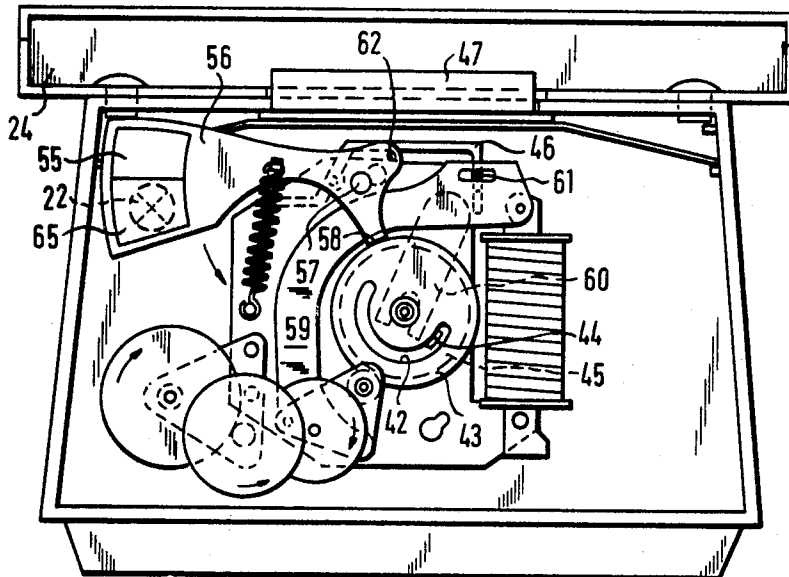


Fig.8



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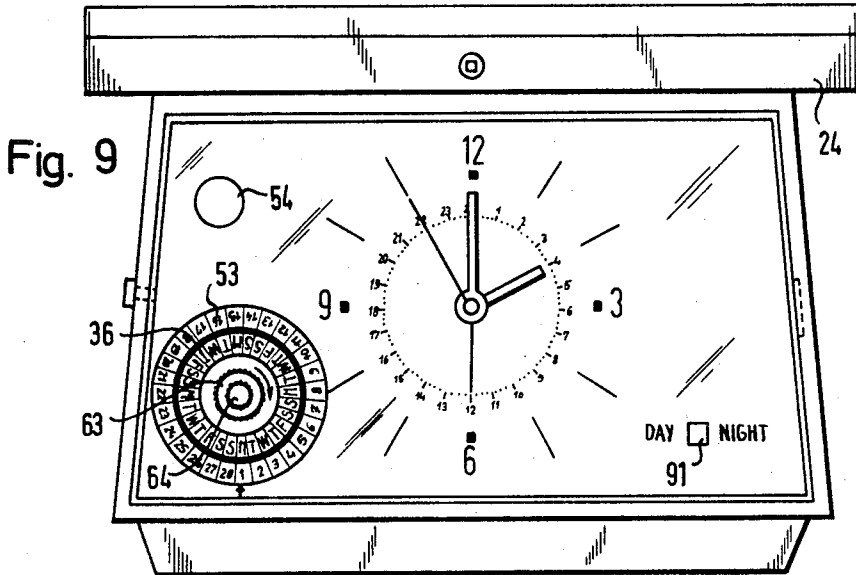


Fig. 10

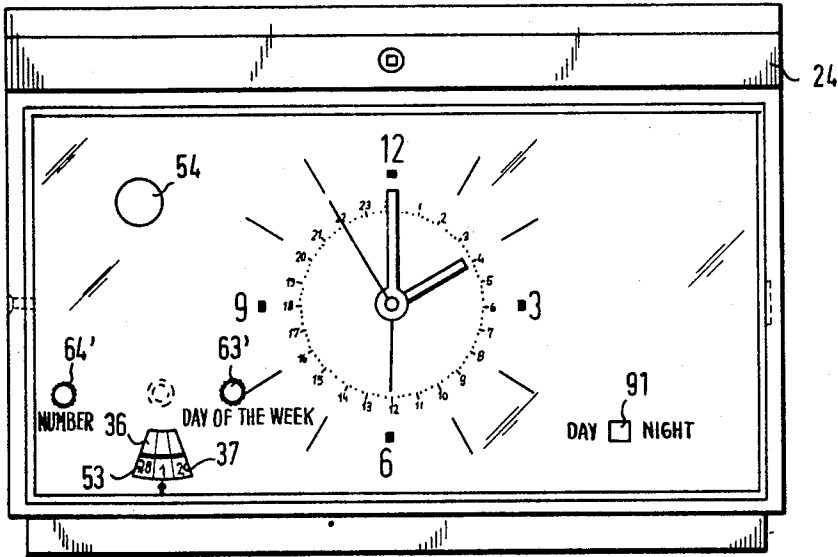


Fig. 11

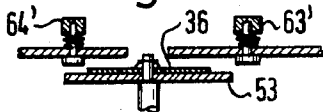
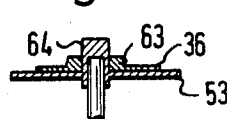


Fig. 12



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Fig. 13

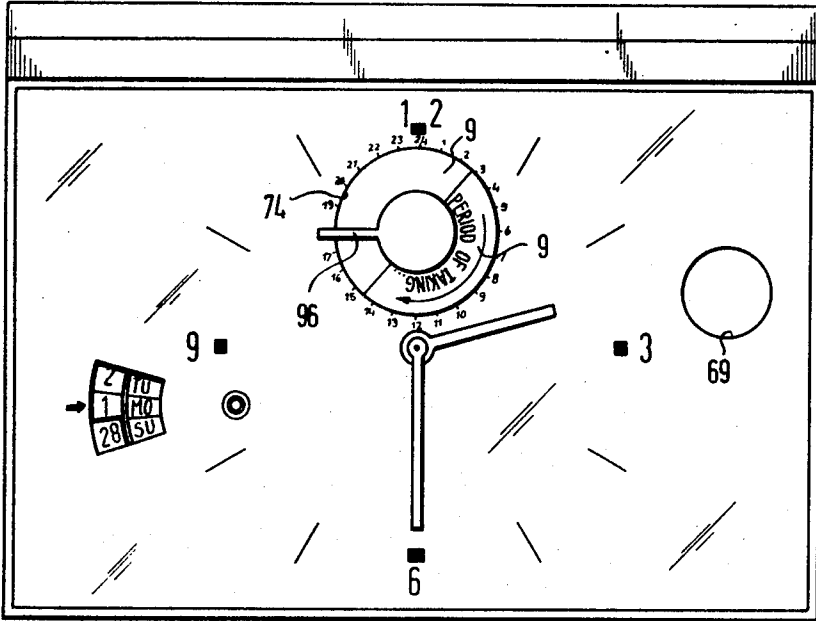
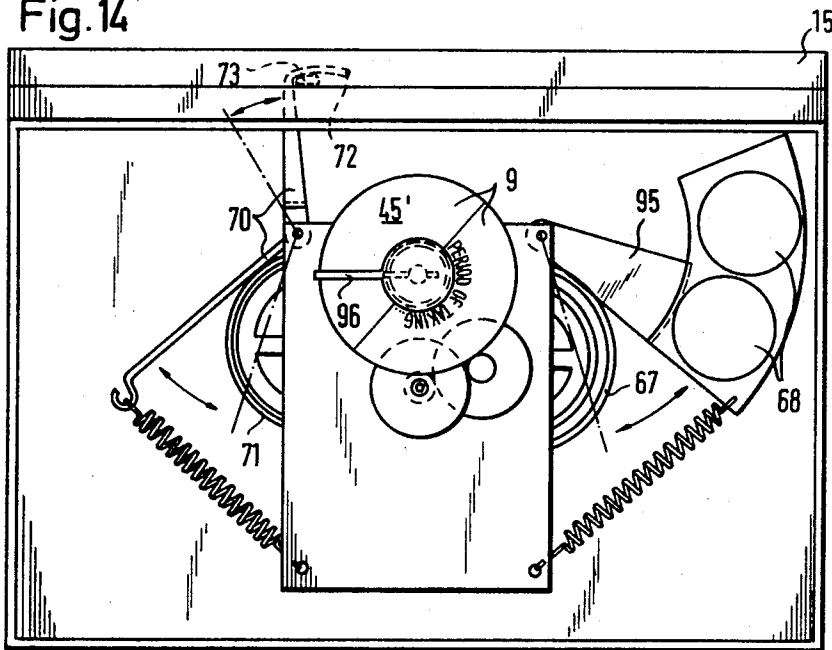


Fig. 14



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Fig.15

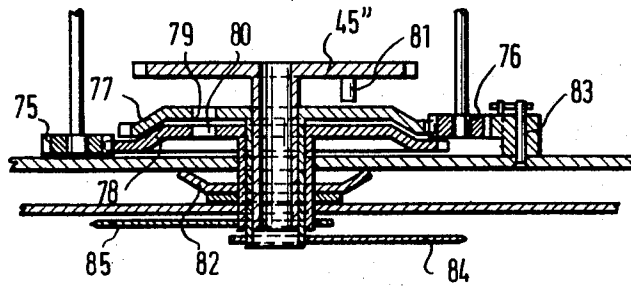
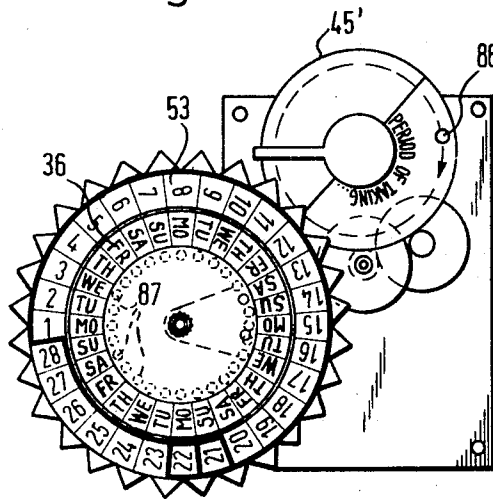
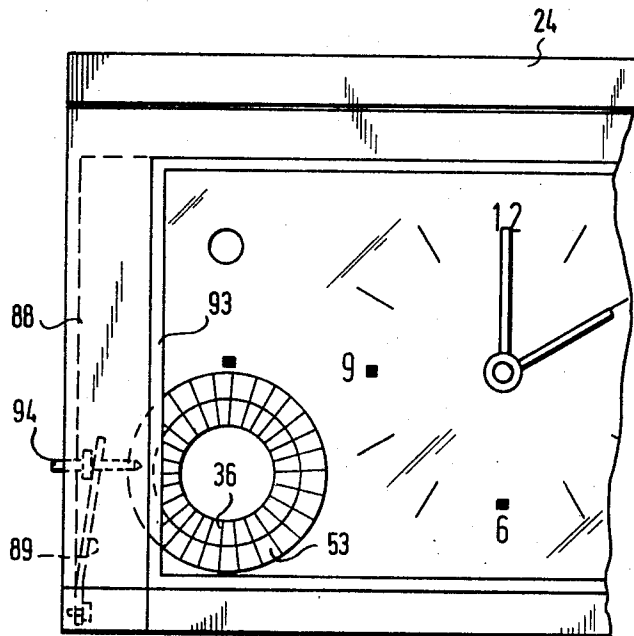


Fig.16



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Fig. 17



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ALARM CLOCK CONTROLLED PILL DISPENSING DEVICE

A device of this type is disclosed and claimed in my copending application Ser. No. 851,178, filed Aug. 19, 1969, and now abandoned, of which this is a continuation-in-part.

The present invention relates to an alarm clock device of the type which emits warning signals over a given period of time every 24 hours, and may be used in conjunction with receptacles for storing and dispensing birth control pills so as to alert the user to take each pill on time.

A device of this type is disclosed and claimed in my copending application Ser. No. 851,178, filed Aug. 19, 1969, and now abandoned, of which this is a continuation-in-part. As therein described, the alarm clock device has a clockwork and a dial face, and comprises an alarm signal mechanism setttable to produce an alarm signal every 24 hours and manually operable means for shutting off the warning signal. A shaft making one full rotation in an integral multiple, preferably 28, of 24 hours carries a first indicator disc with an indicator of all the integers of the multiple, i.e., the numbers 1 to 28, and a second indicator disc with an indicator of the days of the week. The shaft may also carry a pill dispensing drum for dispensing one pill a day during the indicated days of the menstrual cycle. The warning signal may be shut off only after a pill has been removed either from the dispensing drum or a pill storage receptacle mounted on the housing of the device over the manually operable means.

It is an object of the present invention to improve such a device by using commercially available, electrically or spring-operated alarm clocks with a 24-hour alarm system and to modify the same so that the alarm signal will last acoustically or visibly for 12 hours from the time set for taking the pill each day. The warning signal can be shut off only by access through the pill storage receptacle and/or the pill dispensing chamber. Thus, the invention provides a warning signal control or indicator means for producing a warning signal for a fraction of 24 hours, i.e., 12 hours.

The above and other objects, advantages and features of the present invention will become more apparent from the following detailed description of now preferred embodiments thereof, taken in conjunction with the accompanying drawing wherein

FIG. 1 is a front view of an alarm clock device according to one embodiment of this invention;

FIG. 2 is a top view of the device, with the pill box cover removed;

FIG. 3 is a perspective view a signal actuating mechanism for the alarm clock device;

FIG. 4 is a top view of another embodiment of an alarm clock device, with the cover removed;

FIG. 5 is a section of FIG. 4;

FIG. 6 is a front view of the alarm clock device;

FIG. 7 illustrates an optical warning signal mechanism;

FIG. 8 shows another embodiment of a modified electrical alarm clock device with a pill box, an optical warning signal mechanism, the actuating or triggering mechanism for the acoustical signal emitter, and the gear train for the cycle indicator;

FIG. 9 is a front view of such an alarm clock device;

FIG. 10 is a front view of another type of alarm clock device;

FIGS. 11 and 12 are sections of the monthly cycle indicator mechanism;

FIG. 13 is a front view of a spring-actuated alarm clock device;

FIG. 14 is a similar view, with the cover removed;

FIG. 15 is a sectional view of an actuating or triggering mechanism;

FIG. 16 shows another embodiment of a monthly cycle indicator mechanism; and

FIG. 17 is a partial elevational view of another embodiment.

The embodiment illustrated in FIGS. 1 to 3 illustrates a conventional alarm clock slightly modified according to the present invention. Such an alarm clock has an alarm control

wheel 43 mounted on the axle of the clockwork, which wheel defines an arcuate slot 42 which is engaged during the alarm signaling period by the nose 44 on trigger wheel 45 rotating with the clockwork axle once every 24 hours. When the nose 44 is brought into engagement with slot 42, it takes along the alarm control wheel 43 to cause an alarm signal to be emitted in a known manner. This conventional mechanism is modified according to this invention by extending the length of arcuate slot 42 from the usual 2 hours to an effectiveness of 12 hours.

Also, the shut off lever 14' for this alarm control mechanism extends through a slot 66 in the bottom wall of a pill box 24 which is mounted in any suitable manner on a side wall of the alarm clock housing, the pill box being closed by a hinged cover and, if desired, locked. In this manner, the shut-off lever is accessible only after the box has been opened to remove a pill therefrom, after which the lever may be actuated to discontinue the alarm signal.

In the alarm clock device of FIGS. 4 to 7, a carrier plate in the clock housing supports the clockwork, the clock hands, a day and night indicator mechanism, the dial illumination, the modified alarm signal control mechanism of an otherwise conventional electrical alarm clock with an automatic 24-hour alarm system, and the a drum storage receptacle, the arrangement being such that the alarm signal shut-off lever 46 is mounted between the clockwork and the storage receptacle.

The top of the clock housing carries the pill box 24 wherein packages of birth control pills may be stored. The actuating knobs are mounted on the rear wall of the housing. The alarm signal duration is brought to 12 hours in the manner discussed in connection with FIGS. 1 to 3. The signal trigger wheel 45 drives a cam wheel 90 which rotates once around its axis every 24 hours and operates a lever 92 which actuates a visual day and night indicator 91.

The shut-off lever 46 has one extension 47 projecting through or towards a slot 49 in the bottom wall of pill box 24 while another extension 48 of the lever 46 projects from the opposite end thereof into the pill removal chamber of the drum receptacle which is defined by arcuate chute 50. In this manner, the shut-off lever may be operated either through the opened pill box or from the pill removal chamber, i.e., after a pill has been removed.

A set of exchangeable pill boxes may be provided for cooperation with the alarm clock device, individual boxes being so dimensioned as to receive pill packages of a given shape or form in such a manner that the packages cover the shut-off lever and including a box adapted to receive packages of the largest dimension and including inserts for supporting pill packages. Each pill box has a cover and may be locked, the bottom of each box being apertured to receive the extension of the shut-off lever. The pill boxes are preferably of plastic or any other suitable material which may be readily mounted on the clock housing by bonding, bolting, screwing or otherwise. If no pill box is used at all, the housing opening to which the extension 47 projects may be closed by a plate.

A drum receptacle for dispensing a supply of pills for a 28-day menstrual cycle is mounted in the housing. It is keyed to shaft 41 which fully rotates once every 28 days, being driven by the clockwork through a suitable gear train more fully described in my copending application Ser. No. 851,178, filed Aug. 19, 1969. During the period when the birth control pills are to be taken, the receptacle dispenses a pill each day into the pill removal chamber defined by chute 50, a window 51 being provided in pivotal lid 18 which may be opened to remove the pill from the chamber.

The drum receptacle comprises two cooperating circular portions 25 and 30, the cover portion 30 fitting over bottom portion 25 and the two portions being connected by threaded hub 31 for rotational movement in respect to each other. Radially extending dividing walls within bottom portion 25 divide the same into 28 like compartments 32 which are circumferentially open. The compartments are labeled with the numbers of the days of the menstrual cycle, indicating the days when a pill has to be taken and the days when no pill is to be

taken. The bottom portion 25 of the pill dispensing drum carries a smaller dial 36 which has an annular indicator showing, in abbreviation, the names of the days of the week four times. The drum cover portion 30 covers the open side of the pill compartments 32 and has one circumferentially arranged pill removal slot with a lid which is opened after the pill dispensing drum has been positioned in the device. Two retaining lugs 34, 34 cooperate with the pins 35, 35 in the pill dispensing chamber. A cover 11 with a window 37 is placed over the pill dispensing drum, the indicators on the drum being visible through window 37 so that the day of the cycle and the corresponding day of the week may be read. The circumference of the drum portion 25 meshes with the driving pinion 52 which is part of the gear train operating the dispensing drum.

The alarm clock device of the present invention may be operated with or without a pill storage box, as well as with or without a pill dispensing drum. If the latter is omitted, a pill may be removed, when required, from the storage box and, in this case, the invention provides merely a cycle day indicator consisting of toothed dial 53 and day-of-the-week indicator dial 36 mounted on shaft 41, a spacer being inserted on the shaft where the drum is otherwise mounted.

As best seen in FIG. 7, the optical alarm signaling mechanism comprises a constantly burning lamp 22 which is mounted behind an opening 54 (see FIG. 9) in the dial of the clock. When an alarm signal is to be visually conveyed, the lamp is covered by a transparent red disc 55 so as to produce a red warning light. The disc 55 is mounted at the end of the long arm of control lever 56 which is pivotal on shaft 57 and is retained by lug 58 on the shorter control lever arm engaging the buzzer lever 59. Twelve hours before the pill is to be taken, the warning trigger wheel 45 causes the clutch 60 to lift the buzzer arm 59 and thus releases the nose 61 of the spring-biases shut-off lever 46. At the beginning of the pill taking period, the clutch 60 releases the buzzer lever 59 again, disengaging the lug 58 and releasing the spring-biased control lever 56. After the pill is taken, the extension 47 or 48 of the shut-off lever 46 is manually operated to move the control lever 56 back into its inoperative position by engaging it with pin 62.

In the embodiments of FIGS. 8 to 12, the same type of conventional alarm clock with an alarm system effective every 24 hours is modified with a 12-hour acoustical warning signal, a pill storage box 24, an optical warning signal, a cycle indicator 53 and a day indicator 36, as in the above-described embodiments, but with the following variations.

The control lever 56 carries at one end a transparent red disc 55 and a transparent green disc 65 to over constantly burning lamp 22 or, if desired, no such lamp need be provided and the lever may carry a red and a green light. At the beginning of the period for taking the pill, the red light appears behind aperture 54 and remains there even after the 12-hour acoustical warning signal period has expired unless the shut-off lever 46 has meanwhile been operated to return the control lever 56 into the position where the green light appears behind aperture 54.

The cycle indicator dial 53 and the day-of-the-week indicator dial 36 are mounted by a slip clutch on an axle which rotates about its axis once in 28 days. If arranged on top of the clock dial, the indicator dials are completely visible; if behind the clock dial, they are partially visible through window 37. The indicator dials are set either directly by knobs 63 and 64 or indirectly by spring-biased pinions. Preferably, the adjusting knobs for the dials are positioned behind the crystal of the clock so that an unintentional adjustment of the dials is avoided.

FIGS. 13 and 14 illustrate an alarm clock device with a spring-operated clockwork. The helical spring of the alarm signal mechanism is wound up and the optical warning signal control lever is moved in the following manner.

The optical signal control lever 66 carries at one end two differently colored discs 68 which selectively appear behind an aperture 69 in the dial face of the clock, depending on the pivotal position of lever 66. The helical spring 67 of the alarm

signal mechanism increases in diameter when its tension is released to move the lever 66 in one direction, and a return spring pivots the lever in the opposite direction. To assure winding of the helical spring 67 and the corresponding operation of the device according to the invention, the lock of the pill storage box is coupled to a winding mechanism so that the box may be opened to remove a pill therefrom only when the helical spring is wound up.

Thus, the helical clockwork operating spring 71 increases in diameter when its tension is released to move the actuating lever 70 in one direction, and a return spring pivots the actuating lever in the opposite direction. The actuating lever 70 has an end hook 72 whose length corresponds to the pivoting stroke of the lever and which is arranged to engage a keeper 73 on the inside of the pill box cover 15.

Since it is practically impossible to provide spring-operated clocks with a 12-hour acoustical warning signal, the latter is replaced by an optical warning signal. The alarm signal triggering wheel 45', which makes one full rotation in 24 hours, is mounted visibly behind aperture in the clock dial face. The wheel 45' carries two semicircular annular indicators 9, 9 of different colors or appearance, each indicator corresponding to a given after-period for taking a pill and a period in which no pill is to be taken. The superposed pointer 74 is set for a given hour of alarm and indicates one or the other period for taking or not taking the pill.

FIG. 15 illustrates the control mechanism for an acoustical signal of an electrically operated alarm clock and takes into account the possibility of birth control preparations permitting different makeup times for taking the preparation if it has not been taken during the required period. In this embodiment, the acoustical signaling time may be adjusted.

The acoustical signal control mechanism comprises two superposed alarm signal setting discs 77 and 78 which may be turned in relation to each other by setting pinions 75 and 76. The discs define elongated arcuate slots 79 and 80, respectively, wherein moves the nose 81 of the signal control wheel 45'' during the warning signaling period, the control wheel rotating about its axis once in 24 hours. The disc 77 and 78 are retained in the set position by a resilient lock ring 82 and a ratchet 83. Two differently colored or appearing pointers 84 and 85 indicate the set signaling period, the pointers being coupled by axially extending tubes to the respective discs 77 and 78.

FIG. 16 shows an indicator mechanism for the day of the cycle which takes into account preparations which must be taken 20, 21 and 22 days, respectively. The indicator dial 53 carries the numbers 21 and 22 in a manner distinguishing the same from numbers 1 to 20 and 23 to 28. The pin 86 on the warning signal triggering wheel 45', which turns once every 24 hours, moves the indicator dial 53, which has 28 teeth or indentations around its periphery, once a day, the day-of-the-week indicator dial 36 being mounted on dial 53 and being moved therewith. The dials are then retained in position by suitable stops 87 of hemispherical shape.

In the embodiment of FIG. 17, the alarm clock device is mounted in an outer casing 88. The indicator dials 53 and 36 project through a slit in a side wall 93 to expose a circumferential portion thereof. A leaf spring element 89 is fixed to the casing 88 and carries a pin 94 at its free end to retain the day-of-the-week indicator dial 36 so that the cycle indication may be set.

What is claimed is:

1. An alarm clock device with a clockwork and dial face, comprising an alarm signal mechanism settable to produce an alarm signal every 24 hours, a signal control means for producing a warning signal for a fraction of the 24 hours, manually operable means for shutting off the warning signal, a shaft making one full rotation in an integral multiple of 24 hours, a first indicator disc on said shaft carrying an indicator of all the integers of said multiple, and a second indicator disc on said shaft carrying an indicator of the days of the week, said signal control means comprising an alarm signal setting wheel

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defining an elongated arcuate slot, a signal triggering wheel rotating about its axis once in 24 hours, and a nose on said signal triggering wheel in engagement with said slot during the warning signal period, said slot being long enough to engage the nose for 12 hours.

2. The alarm clock device as defined in claim 1 further comprising a housing having a wall with an aperture, a pill storage receptacle mounted on the housing wall, the receptacle having a wall with an aperture in registry with the aperture in the housing wall, said manually operable means including a shut-off lever extending towards the apertures and manually operable therethrough, and a pill dispensing drum mounted on said shaft within said housing, the shaft being rotated by said clockwork, and a pill removal chamber being defined inside said housing adjacent the pill dispensing drum, an opposite end of the shut-off lever extending into said pill removal chamber and being manually operable from said chamber.

3. The alarm clock device as defined in claim 1 wherein said multiple is 28 whereby the device may be used as an alarm for regularly taking birth control pills in a menstrual cycle, the indicator on the first indicator disc carrying the numbers 1 to 28, the indicator on the second indicator disc carrying the days of the weeks in four successive segments, said discs being rotatable with respect to each other, means for rotating the discs with respect to each other to set them in a desired relationship, window means for making at least portions of the indicators visible, a housing having a wall with a slit, circumferential portions of said indicator discs projecting through the slit, and means for temporarily retaining one of the discs when

the indicator discs are set.

4. The alarm clock device as defined in claim 1 further comprising a housing having a wall with an aperture, said manually operable means including a shut-off lever extending towards the aperture and manually operable therethrough, and a removable closure plate over the aperture.

5. The alarm clock device as defined in claim 1 wherein the signal indicator means is an optical signal visible through a window in the dial face of the clock device, said indicator means including a spring-biased lever carrying said optical signal, the lever having means for moving it into a selected position wherein the signal is visible and for being moved into a position wherein the signal is not visible by the manually operable means.

6. The alarm clock device as defined in claim 1 wherein the signal indicator means is an optical signal visible through a window in the dial face of the clock device, said indicator means including a spring-biased lever carrying said optical signal, the lever being movable in a direction opposite its spring operating the alarm signal.

7. The alarm clock device as defined in claim 6, further comprising a helical spring operating the clockwork, a receptacle with a hinged cover mounted on said device, the cover having an inwardly projecting keeper, a spring-biased locking lever movable in a direction opposite its spring bias by unwinding of the helical clockwork spring, and a locking hook on said lever for engagement with the keeper.

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