March 8, 1927.

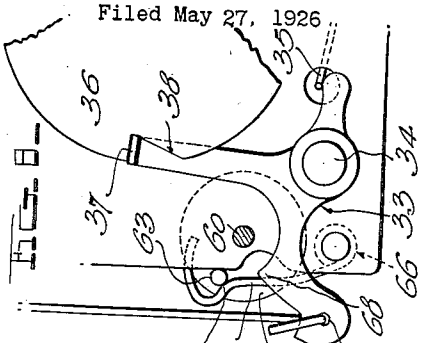
C. R. GAINS

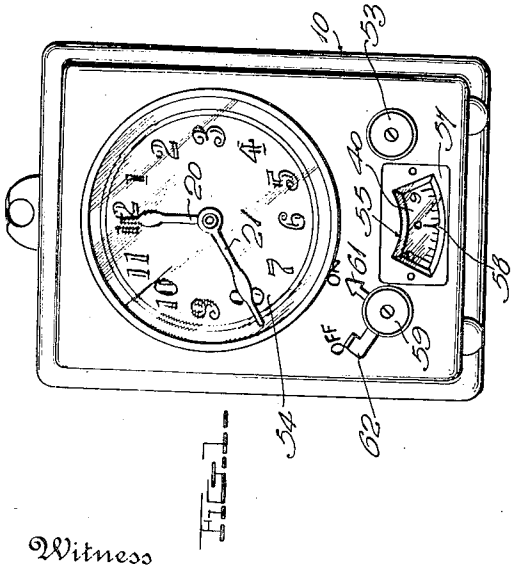
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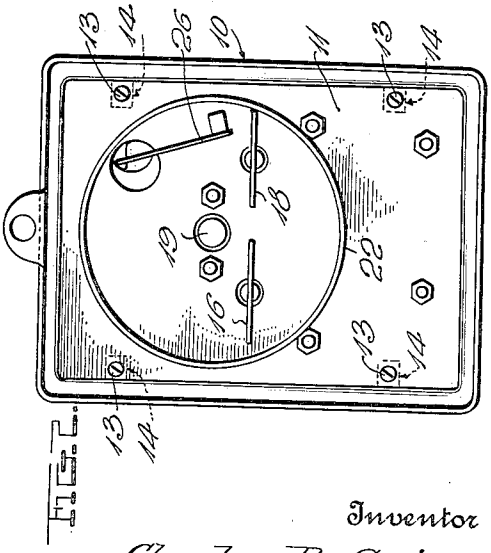
REMINDER CLOCK

Filed May 27, 1926

3 Sheets-Sheet 1







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REMINDER CLOCK

Filed May 27, 1926 3 Sheets-Sheet 2

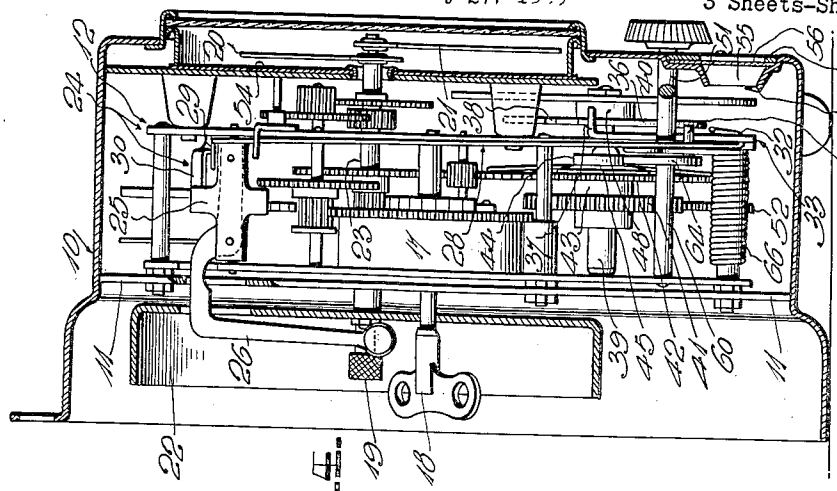


Fig. 5.

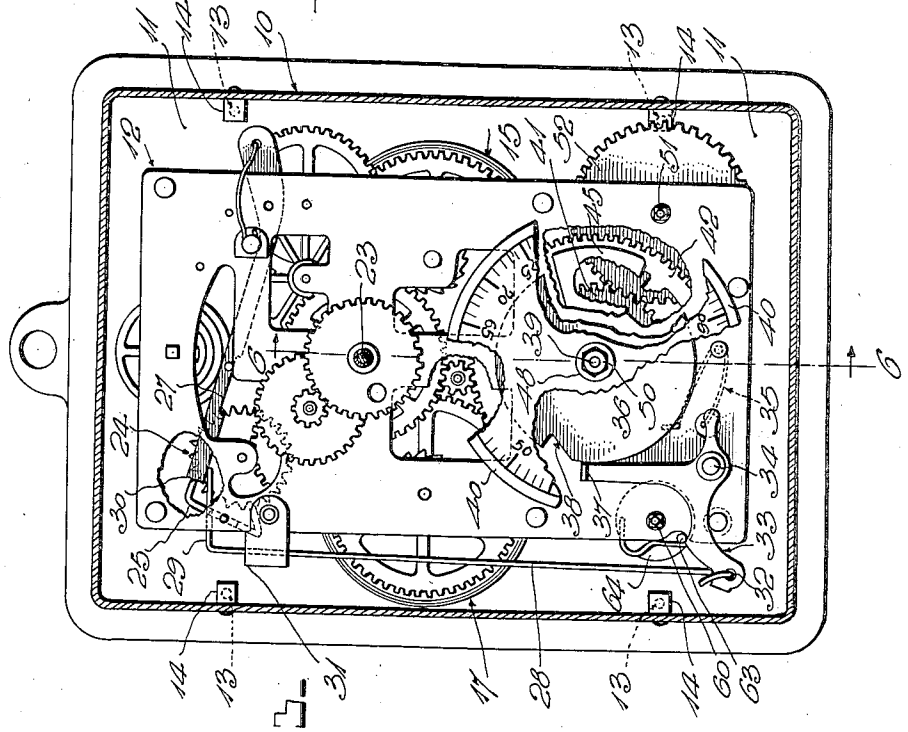


Fig. 7.

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Filed May 27, 1926 3 Sheets-Sheet 3

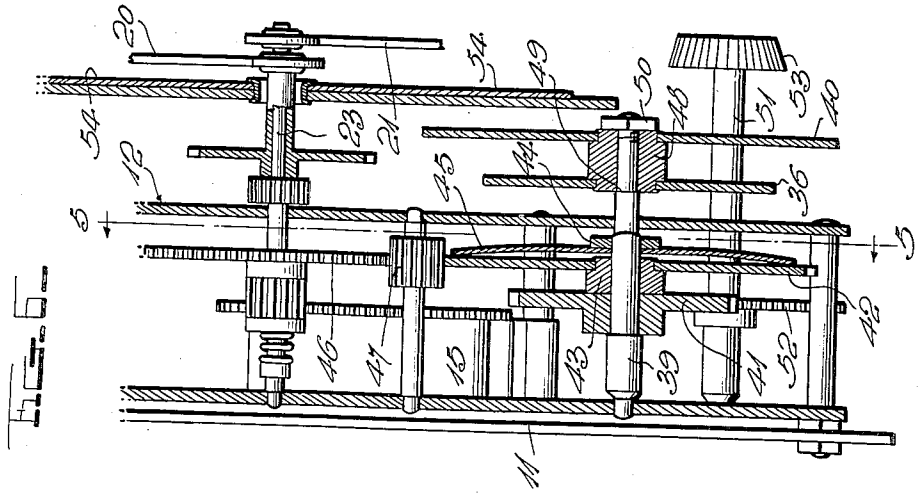


Fig. 5.

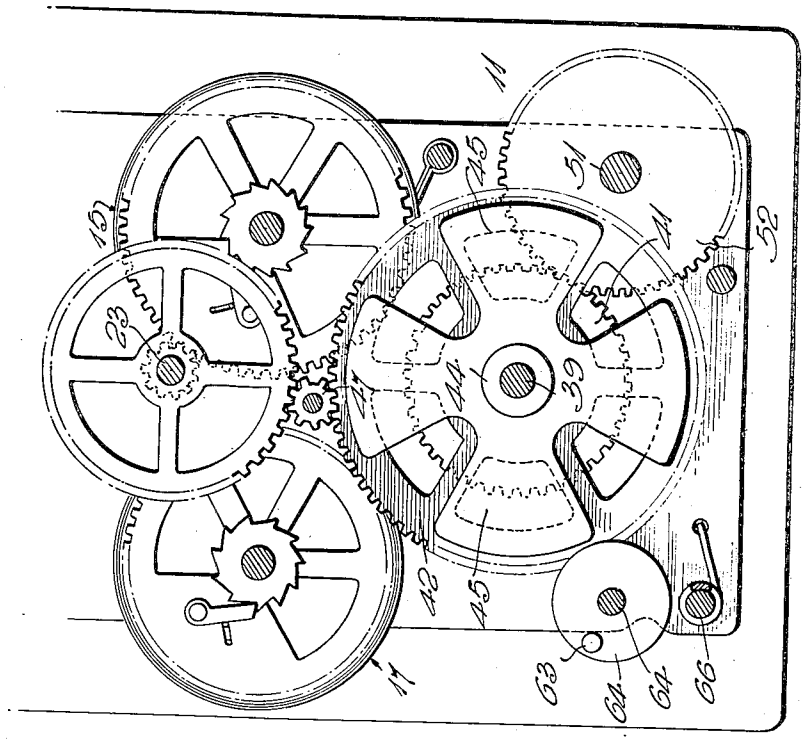


Fig. 5.

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UNITED STATES PATENT OFFICE.

CHESTER R. GAINS, OF MUSCATINE, IOWA.

REMINDER CLOCK.

Application filed May 27, 1926. Serial No. 112,106.

This application is a continuation in part of my U. S. application Serial No. 12,645, filed March 2, 1925.

The invention relates to improvements in reminder clocks which may be so set at any desired time, as to sound an alarm at the expiration of a predetermined time interval. While clocks of this general nature have heretofore been devised, my experience in the art has shown that they are subject to simplification and general improvement, and it is the intent of the present invention to provide a new, improved and generally simplified construction which will be highly efficient and in every way desirable.

In making provision for setting the clock, according to the time interval which is to elapse before sounding of the alarm, it has been a further aim of the invention to provide a large disk bearing all time interval numbers necessary, to provide a large view opening in the clock casing through which the numbers are successively visible for coaction with a fixed pointer to attain the desired setting, and to provide a setting knob which is offset from said opening, so that when it is rotated to set the dial and the associated alarm-tripping mechanism, the hand of the user, employed to operate the knob, will in no manner obscure the time interval numbers or the stationary pointer.

In carrying the invention into effect, I make use of a conventional alarm mechanism provided with a detent for normally holding the clapper against operation, and a further object is to provide simple and inexpensive yet efficient mechanism for releasing this detent when the desired time interval has elasped after setting of the above mentioned dial.

The mechanism just referred to, includes a member fulcrumed on the frame of the clock mechanism and preferably in the form of a bell crank, and a further object is to provide novel means, controlled by a manually rotatable shaft, for the purpose of moving this member to alarm-silent position when it is desired to throw the alarm mechanism out of play, after automatic sounding thereof.

With the foregoing and minor objects in view, the invention resides in the novel subject matter hereinafter described and claimed, the description being supplemented by the accompanying drawings.

Figures 1 and 2 are respectively front and rear elevations of a reminder clock constructed in accordance with the invention.

Figure 3 is a vertical sectional view through the clock casing, showing internal parts in elevation, portions of these parts being broken away to disclose other parts which would otherwise be obscured.

Figure 4 is a vertical sectional view through the casing and the alarm bell, disclosing most internal parts in elevation.

Figure 5 is a vertical sectional view substantially on the plane of line 5—5 of Fig. 6, the latter being a detail section on line 6—6 of Fig. 3. Parts are omitted in both of these views for sake of clearness.

Figure 7 is a perspective view showing more particularly the mechanism for releasing the alarm-holding detent at the expiration of a given time interval.

Figure 8 is a fragmentary elevation similar to a portion of Fig. 3, but showing the manner in which the above-named movable member or bell crank moves to effect release of the detent and consequent alarm sounding.

In the drawings above briefly described, 10 designates an appropriate clock casing whose rear side is closed by a plate 11 which carries the entire frame structure 12 for the time and alarm mechanisms, said plate being secured within the casing by a plurality of screws 13 which pass through said plate and are threaded into lugs 14, the latter projecting inwardly from the casing walls. By merely removing these screws, after first removing certain control knobs to be hereinafter described, the entire frame structure 12 and all working parts of the clock may be removed from the casing. This construction is not only of great advantage when making repairs, but also in manufacture and assembly.

The frame structure 12 carries time mechanism driven by a spring motor 15 whose winding key is shown at 16, and also carries

an alarm mechanism driven by a spring motor 17 having a winding key 18. These two keys and the setting knob 19 for the hour and minute hands 20 and 21 respectively, are preferably located within the alarm bell 22, the latter being secured at the rear side of the back plate 11.

The time mechanism may be of any desired or conventional form and no specific description thereof will be necessary, although attention may be directed to the fact that 23 designates the minute shaft.

The alarm mechanism may be of any desired or preferred construction and in the present disclosure, includes an escapement 24 whose verge 25 is secured to the bell clapper 26, a pivoted, self-applied detent 27 being carried by the frame 12, to normally engage said verge and hold the alarm against actuation. Novel provision however is made for automatically releasing this detent at the expiration of any time interval, within limits of course, so that automatic sounding of the alarm will be effected. In describing this releasing means for the detent 27, while I may use such terms as "vertical", "horizontal", etc., it is to be understood that by so doing, I do not limit myself to the exact positioning and location of parts which have been disclosed in this particular embodiment of the invention.

28 designates a vertically disposed releasing rod for the detent 27, said rod having a horizontally bent upper end 29 which underlies the outer portion 30 of said detent, so that when the rod is raised, said portion will be disengaged from the verge 25. The upper portion of the rod 28 passes slidably through an appropriate guide 31 carried by the frame 12, and the lower end of said rod is suitably pivoted at 32 to a movable member 33 fulcrumed at 34 upon one corner portion of the frame. This member 33 is preferably in the form of a bell crank and will be so termed hereinafter. A suitable spring 35 acts upon the bell crank 33 to shift this bell crank to alarm-sounding position, that is, to the position in which it raises the rod 28, whenever such movement of said bell crank is permitted. A controlling disk 36 is provided for the bell crank 33 however, and a lateral shoe 37 on the end of said bell crank remote from the pivotal connection 32, normally engages the peripheral edge of said disk, so that the spring 35 can not so move said bell crank as to cause the latter to actuate the rod 28 and release the detent 27. The disk 36 however, is formed with a peripheral notch 38 and whenever this notch reaches a position opposite the shoe 37, the bell crank 33 is freed for movement under the action of the spring 35 so that tripping of the alarm mechanism will take place.

The disk 36 is driven from the clock mechanism at a predetermined speed, and if this disk is set so that the notch 38 is a short distance from the shoe 37, only a short interval of time will elapse before the alarm will be tripped. However, setting of the disk 36 so that the notch 38 is a greater distance from the shoe 37, will permit the elapse of a longer time interval before sounding of the alarm. Novel provision is made for setting the disk in the required manner and for driving it from the clock mechanism.

Rotatably mounted upon the frame structure 12 and extending from front to rear thereof, is a shaft 39 upon which the control disk 36, a setting disk 40, and a setting gear 41 are rigidly secured, the disk 36 being behind the disk 40 and the setting gear 41 being spaced a considerable distance behind said disk. Between this disk and the setting gear 41, is a driving gear 42 for the shaft 39, said driving gear having a hub 43 which is rotatable upon said shaft and contacts frictionally with the setting gear 41. At the side of gear 42, remote from gear 41, a collar 44 is secured upon the shaft 39, and a spring 45, preferably of the clover-leaf type herein disclosed, is mounted on the shaft 39 between gear 42 and said collar 44. This spring engages the gear 42 and re-acts against the collar 44 and by its provision, a frictional driving connection is normally established between said gear 42 and the shaft 39, and as said gear 42 is driven from the minute shaft 23, through the instrumentality of appropriate gearing 46—47, it will be seen that the rotation of the shaft 39 is synchronized with that of said minute shaft 23, so that the disk 36 which is secured upon said shaft 39, will be driven at a predetermined and uniform rate of speed. This disk and the setting disk 40 are preferably carried by a single hub 48, which hub may be secured upon shaft 39 by any suitable means. In the present disclosure, this hub is clamped against a shoulder 49 on shaft 39, by a nut 50.

A setting shaft 51 is provided for rotating shaft 39 and the disks 36—40, to set the clock according to the time interval which is to elapse before sounding of the alarm. This shaft 51 is rotatably mounted upon the frame 12 and is provided with a gear 52 meshing constantly with the setting gear 41 of the shaft 39, and the front end of said shaft 51 which projects through an opening in the front of the casing 10, is provided with a knob 53 to be rotated by hand. When such rotation is effected, the gears 52—41 drive the shaft 39 so as to set the disk 36 with its notch 38 any desired distance from the shoe 37, and during this setting, the frictional driving connection between the shaft 39 and the gear 42, allows slippage

of said shaft within said gear. Nevertheless, as soon as the knob 53 is released after proper setting of the clock, the aforesaid frictional driving connection comes immediately into play to again effect driving of said shaft 39 and parts thereon, by means of the gear 42.

The setting disk 40 is rather large and in the present disclosure, for economy in space, it is disposed in overlapping relation with the dial 54 which co-acts with the hands 20 and 21, The front face of this setting disk or dial 40 carries all time interval numbers necessary for setting of the alarm mechanism to trip at any desired time, and these numbers are successively visible through a view opening 55 in the clock casing 10, said view opening being preferably in the front of said casing and under the dial 54, as shown. In the present disclosure, the view opening 55 is formed by cutting an opening in the casing 10 and stamping the surrounding metal inwardly, and this opening is covered by a sheet of glass, celluloid or other transparent material 56, which may well be held in place by an appropriate clamping frame 57. Within the confines of the opening 55, is a stationary pointer 58 which is co-operable with the time interval numbers on the setting disk or dial 40.

If it is desired that the alarm mechanism shall trip and sound, say five minutes from any given time, the knob 53 is rotated at that time, so that the numeral 5 on the disk or dial 40 is alined with the pointer 58. This so sets the control disk 36 as to place its notch 38 "five minutes" from the shoe 37, that is, the disk 36 is so set that in five minutes of its rotation, the notch 38 will come opposite the shoe 37, thus freeing the bell crank 33 and permitting the spring 35 to so move said bell crank as to upwardly force the rod 28 and release the detent 27, allowing the escapement 24 to actuate to in turn operate the clapper 26. The alarm mechanism may be similarly set for any time interval within the limits dictated by the time interval numbers on the setting disk or dial 40. In the present disclosure, these time interval numbers run successively from 5 to 90. The zero appearing in line with the fixed pointer 58 in Fig. 1, reaches this particular position only when notch 38 is positioned to receive the shoe 37.

Attention is directed to the fact that not only is the disk or dial 40 rather large so that the time interval numbers may be conspicuous thereon and easily seen, but the view opening 55 is of such size as to distinctly display these numbers to view, as the disk or dial 40 is rotated by means of the knob 53 when setting the alarm mechanism. Moreover, it will be observed from Fig. 1 that the setting knob 53 is considerably offset from the view opening 55. Thus, the user's fingers, while turning said knob to set the alarm mechanism, will in no manner obscure the time interval numbers on the disk or dial 40, or the stationary pointer 55, so that there is no chance of erroneously setting the device.

I provide means whereby the alarm mechanism may be thrown out of play after it has sounded, said means including a control knob 59 on a shaft 60. This knob is preferably disposed at the end of the opening 55, remote from the setting knob 53, so as to well balance the parts which are visible at the front of the clock. Suitably secured to shaft 60 or knob 59 is a pointer 61 co-operable with the words "Off" and "On", which words are displayed at the front of the clock casing. The shaft or knob may also be provided if desired with a laterally projecting finger-piece 62 which if desired may be used independently of or in connection with said knob in turning the same to either alarm-sounding or alarm-silent position. When the pointer 61 is opposite the word "On" the alarm mechanism will be permitted to operate as soon as notch 38 reaches shoe 37. When sounding of the alarm has been effected however, turning of shaft 60 until pointer 61 is opposite the word "Off" will effect such movement of the bell crank 33 as to permit the detent 37 to again come into play to silence the alarm.

Within the clock casing, the shaft 60 is provided with an eccentric portion 63 which is preferably in the form of a wrist pin projecting from a disk 64 carried by said shaft. This wrist pin is co-operable with the upper edge of the horizontally extending arm of the bell crank 33, for the purpose of so depressing said arm as to move the bell crank to the position of Figs. 3 and 7 and hold it in such position as long as desired. This movement of the bell crank takes place when shaft 60 is turned until its pointer 61 is adjacent the word "Off" on the clock casing 10, and it will be seen that if the alarm has just sounded, turning of the shaft 60 to the position just referred to, will return the lever 33 to alarm-silent position.

Means are provided for quickly snapping the shaft 60 in one direction or the other, after it has been moved to a predetermined point by turning of the knob 59. In the present disclosure, this means comprises a spring arm 65 projecting from one end of a frame-carried torsion spring 66, said arm contacting with the wrist pin 63 and having between its ends a cam portion 67. As the shaft 60 is turned, the wrist pin engages said cam portion 67 and tensions the spring arm 65, and when said wrist pin passes the crest of said cam portion, said spring arm comes into play to effect quick snapping or rotation of the shaft 60 beyond this position.

The upper portion of the arm 65, it will also be observed, serves to yieldably hold the wrist pin 63 in the position of Fig. 8, so that there will then be no possibility of it interfering with proper tripping of the bell crank 33. When this pin-holding function is being performed by the spring arm 65, the pointer 61 will be opposite the word "On" on the casing 10.

The snap action imparted to shaft 60 by the spring arm 65 is not sufficient to cause the wrist pin 63 to swing the bell crank 33 to alarm-silent position, but it does effect engagement of the wrist pin with an upstanding lug 68 on the horizontal arm of said bell crank. Then, by means of the knob 59 or the finger piece 62, preferably the latter, the shaft 60 may be further turned until said wrist pin 63 snaps past said lug 68 as shown in Figs. 3 and 7. Thus, the bell crank 33 is moved to alarm-silent position and by snapping past the lug 68, the pin 63 is held against possible release, until the knob 59 is later turned.

It will be seen from the foregoing that I have provided a generally improved and simplified reminder clock, yet one which will be very sensitive and efficient, and will be in every way desirable. Particular attention is directed to the simple, inexpensive, and easily manufactured construction, which also insures a clock free from unnecessary complication and consequently one which is not liable to cause trouble when in use. I also wish to invite special attention to the unusual visibility with regard to the time interval numbers on the setting disk or dial 40, and to the location of the knob 53 at a point offset from the view opening 55, so that in setting the alarm mechanism, the user's hand cannot obscure the stationary pointer 58 or any of the time interval numbers.

Excellent results have been obtained from the details of construction herein disclosed, in the actual manufacture and marketing of the invention, and while these details are preferred, it is to be understood that within the scope of the invention as claimed, slight variations may be made.

I claim:—

1. In a reminder clock, an enclosing casing having a view opening, alarm tripping means including a clock-driven control member instrumental to trip the alarm when said control member arrives at a predetermined position, an indicating dial rotatable simultaneously with said control member and mounted on an axis offset from said view opening, the peripheral portion of said dial extending behind said view opening and bearing all time interval numbers necessary in setting said control member, said numbers being successively visible through said view opening, a fixed pointer co-operable with said time interval numbers to permit proper setting of the control member, and a setting knob for said control member disposed at the exterior of the casing and offset from said view opening to prevent obscuring said time interval numbers or said pointer when setting the control member.

2. In a reminder clock, time and alarm mechanisms having a carrying frame, controlling means for the alarm including a member fulcrumed on the frame and movable to a predetermined position to effect alarm sounding, a rotatable disk whose periphery normally contacts with said member to prevent movement thereof to said predetermined position, said disk having a peripheral notch to free said member for action, a driving gear for said disk having a frictional driving connection therewith, said driving gear being driven by the time mechanism of the clock, a setting gear for said disk having a positive driving connection therewith, a manually rotatable setting shaft mounted on the aforesaid frame and having a gear meshing with said setting gear, and indicating means instrumental in setting said disk with its notch any desired distance from said member.

3. In a reminder clock, time and alarm mechanisms having a carrying frame, a self-applied detent for normally holding the alarm mechanism against actuation, a releasing rod for said detent, an actuator for said releasing rod fulcrumed on said frame, spring means for moving said actuator to effective position, a rotatable control disk whose periphery normally contacts with said actuator to hold it against movement to said effective position, said disk having a peripheral notch to free said actuator, a driving gear for said disk having a frictional driving connection therewith, said driving gear being driven by the time mechanism of the clock, a setting gear for said disk having a positive driving connection therewith, a manually rotatable setting shaft mounted on the afore-aid frame and having a gear meshing with said setting gear, and indicating means instrumental in setting said disk with its notch any desired distance from said actuator.

4. A structure as specified in claim 3; said actuator consisting of a bell crank having one end connected to said rod, the other end of said crank having a shoe co-operable with said control disk.

5. In a reminder clock, a shaft, a setting gear, a peripherally notched disk and a setting indicator all secured upon said shaft, a driving gear loose upon said shaft and having a hub contacting with one side of said setting gear, a spring surrounding the shaft and bearing against the side of said driving gear remote from said setting gear, and a collar on said shaft against which said

spring re-acts, producing a frictional driving connection between the driving gear and shaft; alarm mechanism controlled by said notched disk, and a manually rotatable setting shaft having a gear in mesh with said setting gear.

6. In a reminder clock, an alarm controlling member movable to alarm-sounding and alarm-silent positions, a manually rotatable shaft adjacent said member having an off-center portion to engage said member and move it from alarm-sounding to alarm-silent position, and spring means active on said shaft for rapidly snapping it past a predetermined position when turned by hand to such position.

7. A structure as specified in claim 6; said spring means comprising an arm transverse to the shaft and spring-pressed against said off-center portion thereof, said arm having a cam portion to the crest of which said off-center portion must be moved by turning of the shaft before said rapid snapping will take place.

8. A structure as specified in claim 6; together with a lug on said controlling member past which said off-center portion snaps when the shaft is turned to alarm-silent position.

9. A reminder clock comprising a casing having an open rear and provided in its front with a clock face opening and with a relatively small view opening, said front being also formed with a shaft opening offset from said view opening, a closure plate detachably connected with the casing and closing the open rear end thereof, time and alarm mechanisms supported solely by said closure plate, the time mechanism including a clock face and hands visible through the first named opening in the casing front, the alarm mechanism including a numbered disk whose numbers are visible through said view opening, a setting shaft for said disk passing forwardly through said shaft opening, and an operating knob on the front end of said shaft.

In testimony whereof I have hereupon affixed my signature.

CHESTER R. GAINS.