United States Patent

Ishijima

[15] **3,660,998**

[45] **May 9, 1972**

[54] AUTOMATIC TIME-UNLOCKED CIGARET CASE

[72] Inventor: **Yoshihiro Ishijima,** Osaka, Japan

[73] Assignee: **Sogawa Machineries & Supplies,** Osaka, Japan

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[21] Appl. No.: **115,624**

[52] **U.S. Cl.** **70/269,** 70/273

[51] **Int. Cl.** **A24f 15/12**

[58] **Field of Search** ..... 70/269, 272, 273; 206/41 C

[56] **References Cited**

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Primary Examiner—Albert G. Craig, Jr.
Attorney—Ernest A. Greenside

[57] **ABSTRACT**

A timer-controlled cigaret case which is automatically unlocked after the lapse of a preset period of time, in which a push rod provided on the inner surface of the cover is adapted to press down turning arms pivotally supported inside the case body, thereby winding a flat spiral spring of a timer and starting the timer and bringing a locking pawl formed at the front end of a leaf spring into engagement with a locking groove of a projection from the cover so as to accomplish locking, said leaf spring being adapted to be pressed by a side surface of a criterion cam which is rotatably and slidably fitted to the shaft of a second wheel of the timer, and a pin provided on the shaft of the second wheel is adapted to fit in a notch formed in the criterion cam to cause axial sliding of the cam so as to release the pressure of the leaf spring and allow the locking pawl to move out of the groove to accomplish unlocking, said criterion cam being rotatable as desired to shift the position of the notch for the purpose of timing control.

1 Claim, 24 Drawing Figures

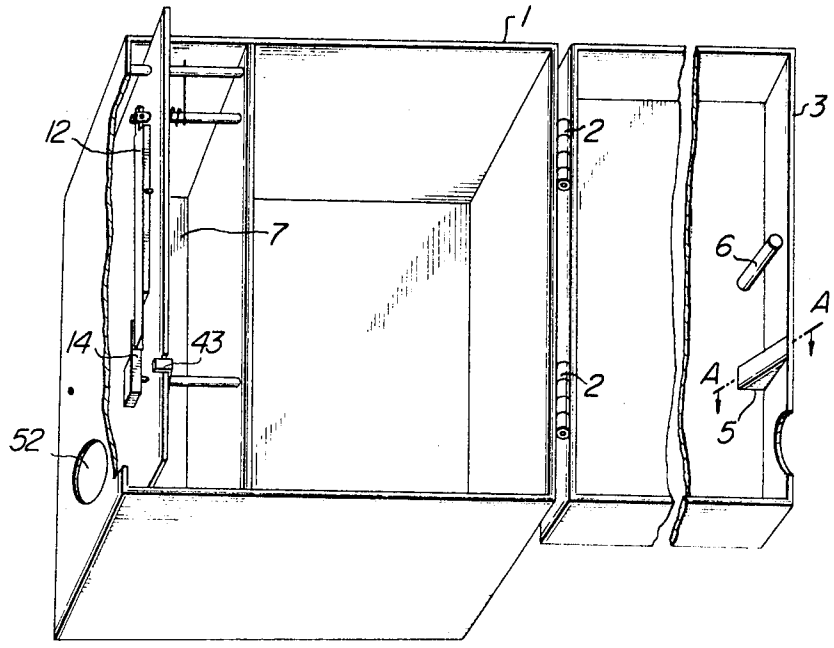


FIG. 1

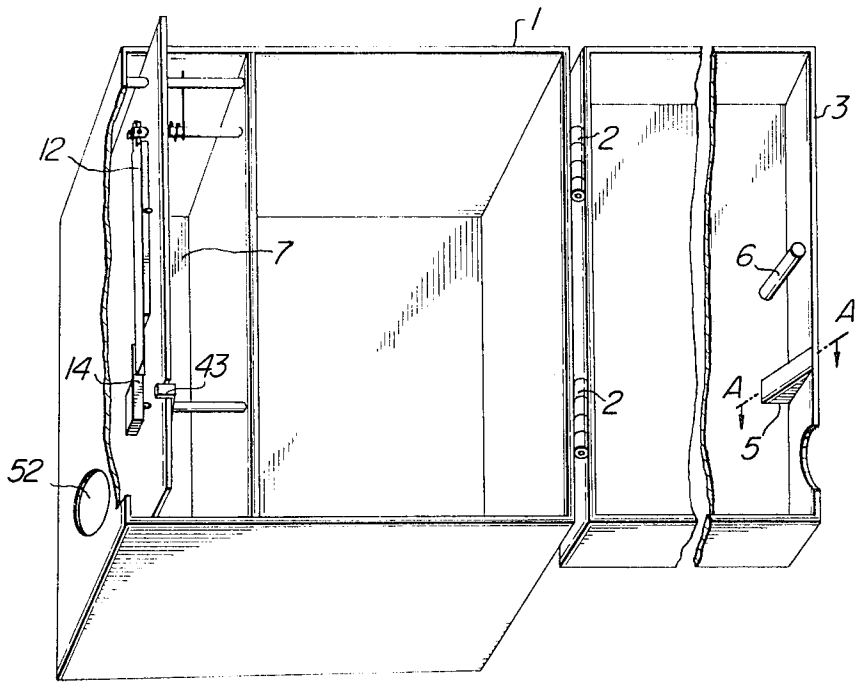


FIG. 3

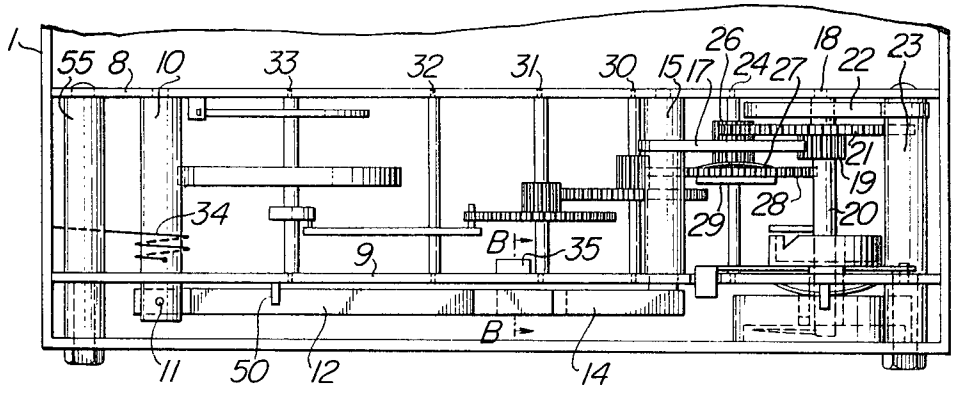


FIG. 2

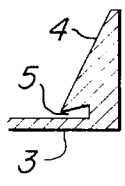


FIG. 4

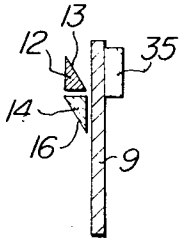


FIG. 5

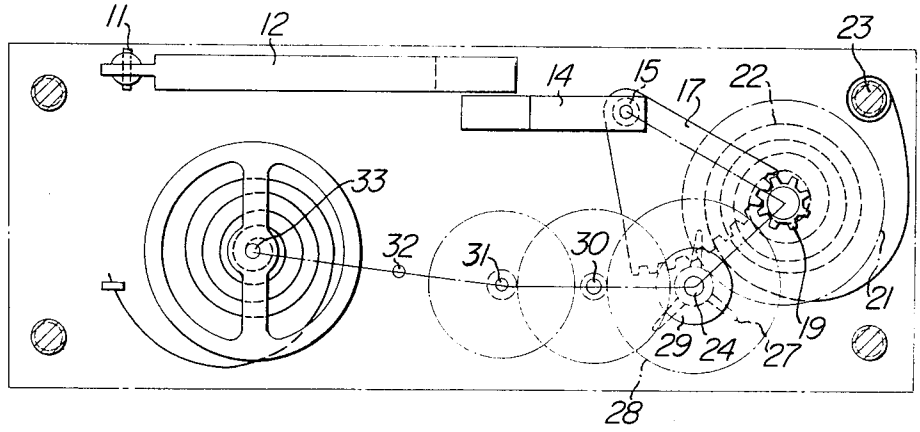


FIG. 7A

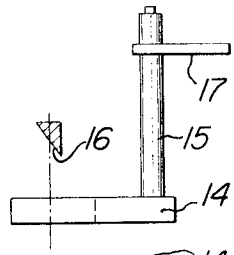


FIG. 7B

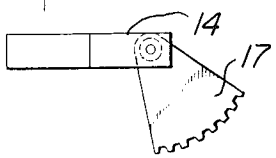


FIG. 6

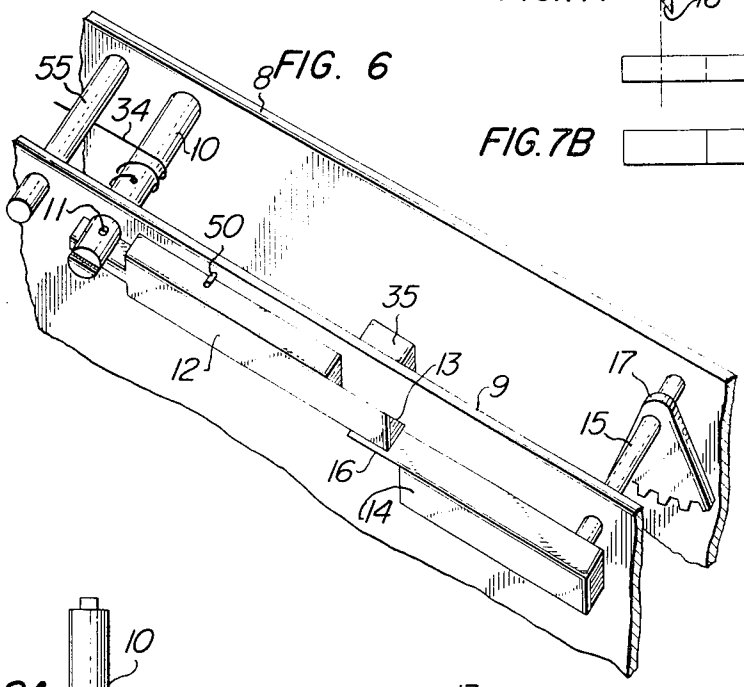


FIG. 8A

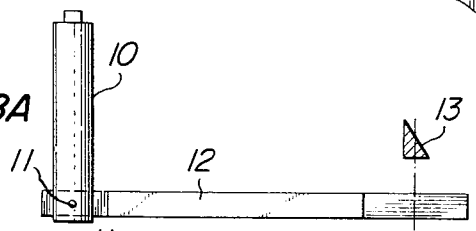


FIG. 8B

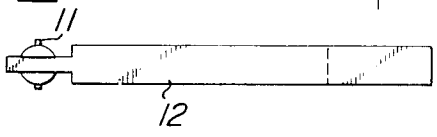


FIG. 10

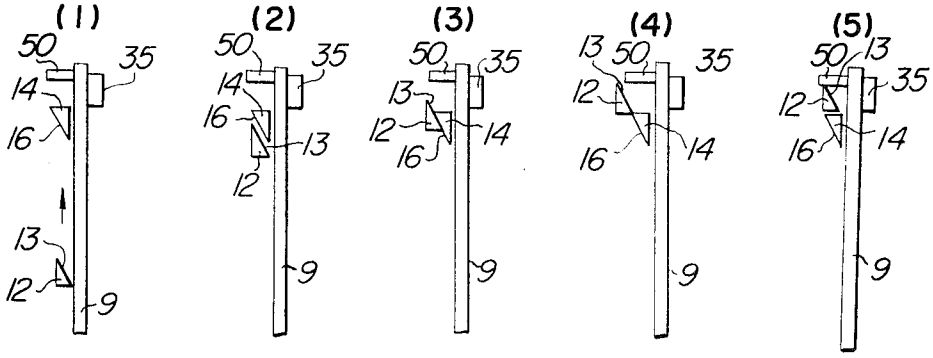


FIG. 9A



FIG. 9B

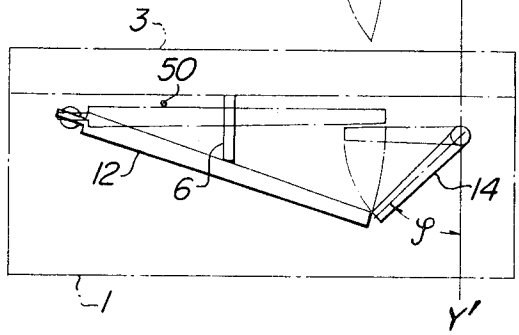


FIG. 11

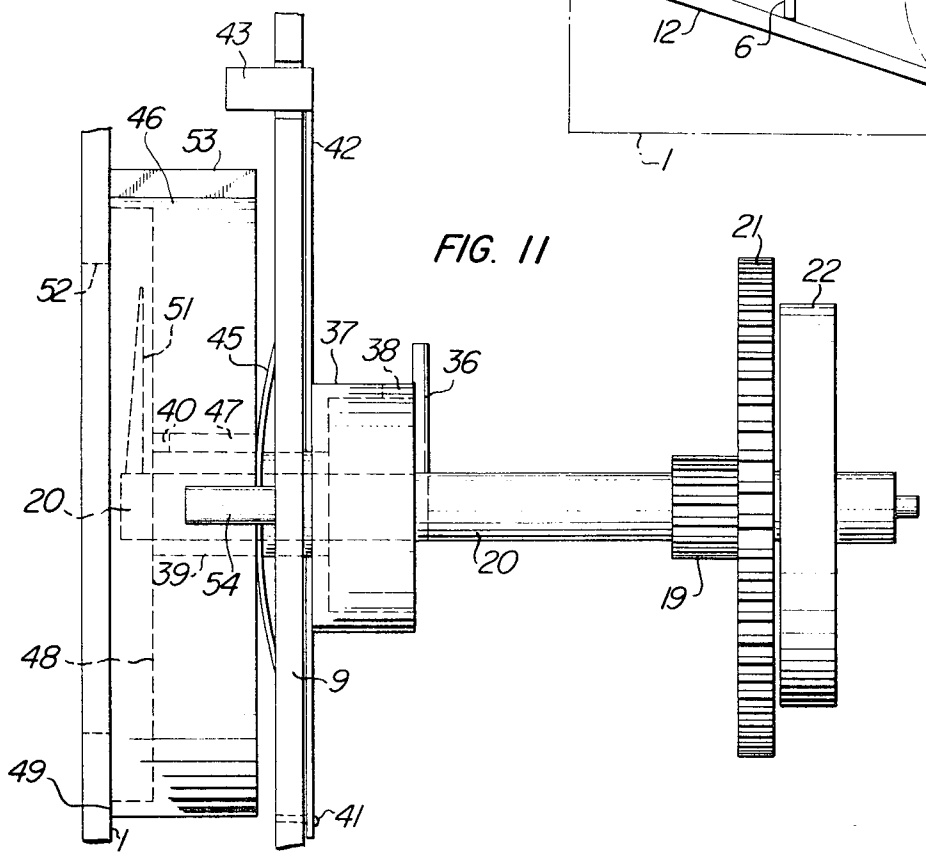


FIG. 12A

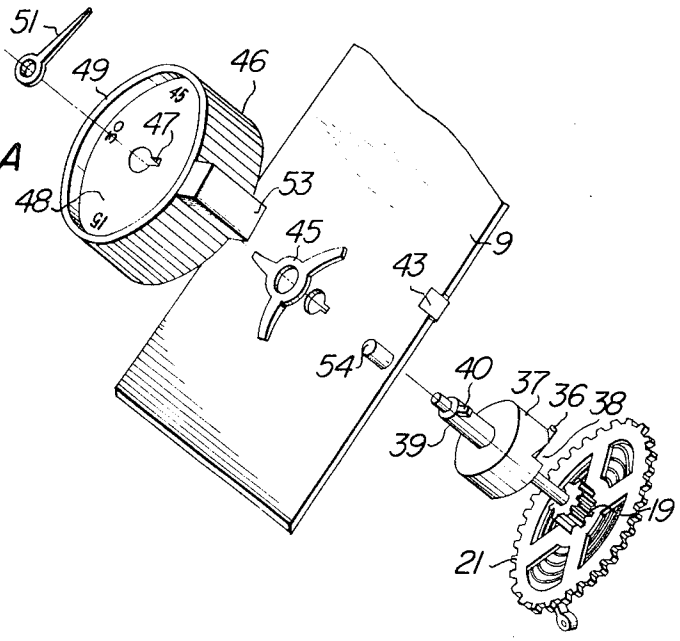


FIG. 12B

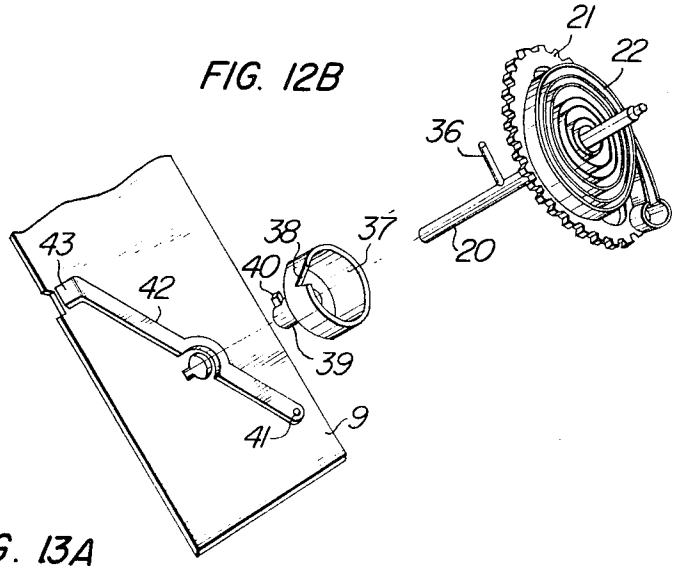


FIG. 13A

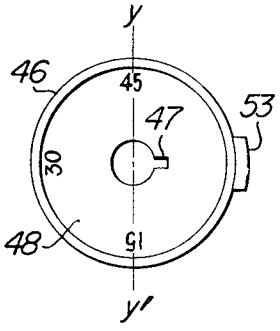


FIG. 13B

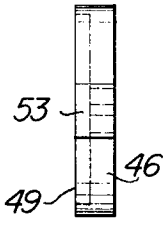
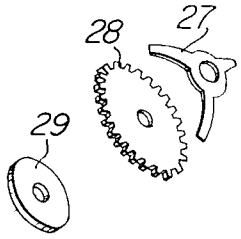


FIG. 16



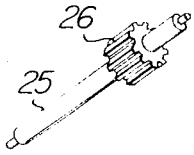


FIG. 14A

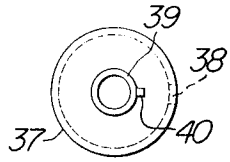


FIG. 14B

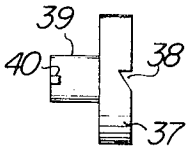


FIG. 17

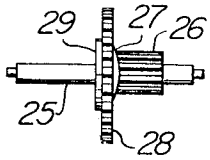


FIG. 15

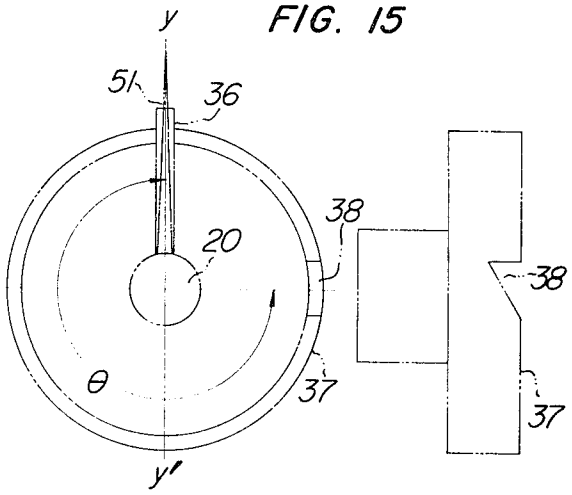
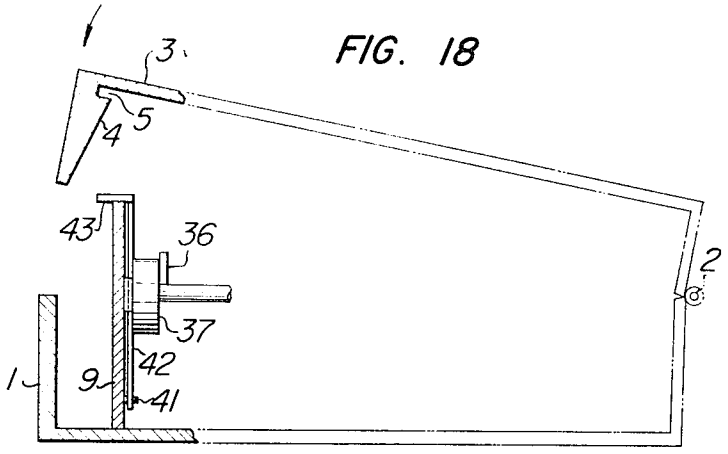


FIG. 18



AUTOMATIC TIME-UNLOCKED CIGARET CASE

SUMMARY OF THE INVENTION

This invention relates to a cigaret case of time unlocked type which provides an aid to those who wish to practice temperance in smoking because, once a smoker picks out a cigaret and closes the cover, the case is kept locked until a certain length of time has elapsed.

Conventional devices of this type use spring-driven timers, and are cumbersome to handle in that the storing of spring energy, and setting and adjustment of timing, has all to be made by hand each time the case is opened. Thus, the smokers often forget the procedure and make the cigaret savers unable to work as such.

The present invention provides an automatic time-unlocked cigaret case which automatically follows the above procedure upon closing of the case cover, thereby eliminating the foregoing disadvantages, and which is simple to handle and is capable of achieving a positive smoking-restricting effect.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a partly broken perspective view of a cigaret case embodying the invention, as opened;

FIG. 2 is a sectional view taken along the line A—A of FIG. 1;

FIG. 3 is a plan view of the main mechanism;

FIG. 4 is a sectional view taken along the line B—B of FIG. 3;

FIG. 5 is a front view showing both of turning arms in engagement with a train of wheels;

FIG. 6 is an enlarged perspective view showing the both turning arms in engagement;

FIGS. 7A and 7B are a plan view and a side view, respectively, of a main turning arm;

FIGS. 8A and 8B are a plan view and a side view, respectively, of an auxiliary turning arm;

FIGS. 9A and 9B are front views showing the auxiliary turning arm in different operating positions;

FIGS. 10(1) to (5) are side views explanatory of the sequence of motions in which the front ends of the main and auxiliary turning arms are reset to the original state;

FIG. 11 is an enlarged side view of a timing control mechanism;

FIGS. 12A and 12B are exploded views, respectively, of the front and rear sides of the timing control mechanism;

FIGS. 13A and 13B are a plan view and a side view, respectively, of a timing control disk;

FIGS. 14A and 14B are a front view and a side view, respectively, of a criterion cam;

FIG. 15 is a front view explanatory of the operation of the timing control mechanism;

FIG. 16 is an exploded view of a third wheel;

FIG. 17 is a side view of the third wheel as assembled; and

FIG. 18 is a partly sectional side view explanatory of the locking function.

As shown, a case body 1 has a cover 3 which is openable attached to the body by means of hinges 2. On the inner surface of the cover 3, there is held a push rod 6 parallelly to a side wall of the cover. On the same side of the cover is fixedly provided a triangular protuberance having a locking groove 5 under an inclined plane 4. Inside the case body 1 is provided a mechanical compartment 7. The compartment is defined on both sides by a pair of non-magnetic bearing plates 8, 9, in which a shaft 10 is journaled. At one end of the shaft 10 is fixed an auxiliary turning arm 12 of iron with a pin 11. A coil spring 34 secured at one end to the shaft 10 is restricted at the other end by a connecting bolt 55, so that the auxiliary turning arm 12 is urged anti-clockwise until it is stopped by a projection 50. On another shaft 15 is securely mounted a sector wheel 17, and to one end of the shaft 15 is fixed one end of a main turning arm 14 in such a manner that the front end portion of the arm 14 is overlaped with that of the auxiliary turning arm 12. The both front end portions are finished to be triangular in section. A permanent magnet 35 is fixed to the inner surface of the bearing plate 9 opposite to the overlapped arm portions.

On a shaft 20 are integrally secured a gear 21 and a pinion 19, and also the inner end of a flat spiral spring 22 is fixed. As a second wheel 18, the pinion 19 is in mesh with the sector wheel 17. Then, as shown in FIG. 5, a third wheel 24, a fourth wheel 30, an escape wheel 31, an ankle 32, and a balance wheel are engaged with one another, in the order mentioned. As better shown in FIGS. 16 and 17, the third wheel 24 comprises a pinion 26 formed integrally with a shaft 24, an end piece 29, a spring washer 27 and a gear 28 both mounted between the shaft and end piece rotatably with respect to the shaft 25, the pinion 26 and gear 28 being adapted to engage with each other by dint of the frictional resistance of the spring washer 27.

The second wheel 18 comprises, as shown in FIGS. 11 and 12, a gear 21, a pinion 19 formed integrally with a shaft 20, and a flat spiral spring 22 anchored at the inner end to the shaft 20 and fixed at the outer end to a bolt 23. A pin 36 is secured to the shaft 20 at right angles thereto, and a hollow cylindrical part 39 contiguous to a cylindrical criterion cam 37 formed with a notch 38 is fitted on the shaft 20 in such a way that it can slide slong, and revolve around, the axis of the shaft. A spring washer 45 is loosely fitted on the portion of the hollow cylindrical part 39 which has passed through the bearing plate 9 and is exposed beyond that plate so that the washer can slide axially and revolve about the cylindrical part. Further, on the spring washer 45 is fitted a timing control disk 46. A projection 40 on the hollow cylindrical part 39 is provided in the same direction as the notch 38 of the criterion cam 37 with respect to the common axis, and are both fitted in a groove 47 of an axial center hole of the timing control disk 46, with the consequence that the disk 46 is slidable with respect to the criterion cam 37 and is adapted to rotate therewith. On the outer surface of the timing control disk 46 is provided a dial 48 which indicates how much time is left before the case is reopened. To the front end of the shaft 20 which protrudes beyond the disk, a pointer 51 is secured at the root. The end periphery 49 of the timing control disk 46 is kept parallelly in contact with the inner surface of the case body 1 and is pressed securely against the surface under the urgings of a spring washer 45.

A leaf spring 41 anchored at one end to the bearing plate 9 is located between the criterion cam 37 and the bearing plate 9 and urges the cam 37 at all times in the right upward direction (as viewed in FIG. 12B) against the pin 36 on the shaft 20. The free end of the leaf spring 42 is bent at a right angle to form a locking pawl 43, which protrudes outwardly of the bearing plate 9. The timing control disk 46 is provided with a rib 53 on its periphery, which engages with a projection 54 on the bearing plate 9 to restrict the rotation of the disk 46.

The operation of the mechanism incorporated in the case of the invention will now be described. As the cover 3 is closed, the push rod 6 on the inner surface of the cover descends until its front end comes into contact with the upper surface of the auxiliary turning arm 12 associated with the case body 1 and presses it further downward, so that the arm 12 turns clockwise pivotally about the shaft 10. As a result, the front end portion of the arm 12 depresses the corresponding portion of the main turning arm 14, so that the arm 14 turns anticlockwise about the shaft 15 (as shown in FIGS. 9A and 9B), thus causing the sector wheel 17 secured to the shaft 15 to wind the flat spiral spring 22 via the second wheel 18. Of the train of gears, the gear 28 of the third wheel 24 and subsequent gears are stopped at this time by the ankle 32, while the pinion 26 of the third wheel rotates in sliding contact with one side of the gear 28.

Immediately before the cover is closed down, as shown in FIG. 9A, the front ends of the both turning arms 12, 14 form a certain angle with respect to each other, and then go out of engagement, when the flat spiral spring 22 becomes reversible in action. This shifting in arrangement is so quickly accom-

plished that the spiral spring almost instantaneously repulses the plays in engagement of the individual gears constituting the wheel train and gives a sufficient impact to the balance wheel 33 via the ankle 32 to get it start positively.

Meanwhile, as the case body 1 is closed with the cover 3, the inclined plane 4 of the locking groove 5 comes into contact with the tip of the locking pawl 43 at the front end of the leaf spring 42. With further descent of the inclined plane 4, the locking pawl 43 is forced back against the urgings of the leaf spring 42 until it is forced into the locking groove 5 upon complete closing of the case with the cover 3. In this manner the case is locked up. Since the periphery of the criterion cam 37 excepting the notch 38 is in contact with the pin 36 on the shaft 20 thereby pressing the leaf spring 42, the cover will not be released open before a predetermined period of time elapses.

Once the timer has started, the main turning arm 14 gradually turns clockwise as the flat spiral spring 22 runs down, while the auxiliary turning arm 12 alone is kept depressed by the push rod 6 of the cover. Accordingly, when the predetermined period has been elapsed and the cover is turned open, the front end portions of the both turning arms 12, 14 are conversely overlapped, i.e., the auxiliary turning arm 12 is located below the main turning arm 14. When the cover has been completely turned open and the depression by the push rod 6 has been removed, the auxiliary turning arm 12 is turned clockwise by virtue of the spring 34 and, in the sequence illustrated in FIGS. 10(1) to (5), the front end portion of the arm continues to go up with its inclined plane 13 in contact with the front end portion of the main turning arm 14. The auxiliary turning arm slightly turns about the pin 11, and the inclined plane 13 slides up along the inclined plane 16, bypassing the latter leftwise, until it is stopped by the projection 50. Then, attracted by the magnet 35, the auxiliary turning arm 12 is brought back to the original position immediately above the main turning arm 14, so that the front end portions of the both arms are disposed as shown in FIGS. 5 and 6, wherein the front end portion of the auxiliary turning arm 12 rests on that of the main arm 14, ready to start the next locking motion upon covering of the case.

Simultaneously with the starting of the timer, the second wheel 18 begins turning anti-clockwise. Accordingly, the pin 36 fixed to the shaft 20 for the second wheel 18 turns in contact with the contour of the criterion cam 37. When the pin 36 has fitted in the notch 38, the cam 37 is caused to slide along the shaft by the elasticity of the leaf spring 42, whereby the locking pawl 43 is urged inwardly of the bearing plate 9 out of the locking groove 5 and the case is thus unlocked. The cover is now free to be turned open. The pin 36 is kept unmovably by the vertical wall of the notch 38 of the criterion cam 37.

In order to control the limit time, or the period of time from the closing of the cover and locking till unlocking after the lapse of a predetermined length of time, it is necessary to turn the timing control disk 46 so that a desired point of time on the time dial 48 on its surface is set to the pointer 51. The mechanism for this timing and its operation will now be explained. The moment when the both turning arms 12, 14 are turned by the push rod 6 upon closing of the cover 3 and their front end portions are about to be disengaged, or the moment when the timer begins to work, the angle which the main turning arm 12 makes with the reference line Y–Y' (FIG. 9A) is constant. Hence the angle of the pin 36 fixed to the shaft 20 of the second wheel 18 to the reference line *y–y'* (FIGS. 13 and 15) is also constant. In such a manner that this angle is kept at zero the pin 36 is secured to the shaft 20. It means that the pin 36 is on the reference line *y–y'* at the moment when the timer is started and, with the lapse of time, it turns at a constant speed. If, therefore, the timing control disk 46 is turned a desired angle with the cover kept open, the criterion cam 37 turns, too. Since the angle θ of the recess 38 with respect to the reference line *y–y'* is accordingly shifted, the timing can be controlled. The dial on the timing control disk 46 indicates the length of time to be elapsed before the case is reopened, in the following way. In the state where the projection 40 of the criterion cam fits in the groove 47 of the shaft hole, the time required for the revolution of the pin 36 on the basis of the recess 38 position of the cam is indicated at the point of a corresponding angle. FIG. 13 shows an example wherein controllable timing range is between 0 and 60 minutes. Only if the timing control disk 46 is turned until the desired time on the time dial 48 comes to a setting point, the criterion cam 37 will revolve, too, and the angle of its recess 38 to the reference line will correspond to the desired time. With this setting the cover is closed down, when the pointer 51 fixed to the front end of the shaft 20 for the second wheel 18 at the same angle as the pin 36 rotates with the pin 36 to indicate how much time is left to be elapsed. At the zero point the pin 36 fits in the notch 38 of the criterion cam and thereby unlocks the case.

The time dial 48 that indicates the length of time to be elapsed and the pointer 51 are both visible through a peep window 52 formed in the front panel of the case body. The timing control disk 46 is securely pressed against the inner wall surface of the case body 1 under the urgings of the spring washer 45, and therefore it remains steadily in the adjusted position and is not in the least turned by vibration or shock. Accordingly, the preset time is positively kept and the length of time for which the case is to be kept locked is never made irregular as by the loosening of the hinges connecting the case body and the cover. Once the case is set to a desired time, there is no longer the need of manual control; the timer will automatically work each time the cover is opened and closed.

While the present invention has been described as applied to a cigaret case, it is applicable to containers of other articles as well without departing from the spirit and scope of the invention.

What is claimed is:

1. A timer-controlled cigaret case which is automatically unlocked after the lapse of a preset period of time, comprising a case body having a cover, a push rod provided on the inner surface of the cover, turning arms pivotally supported inside the case body and which are adapted to be turned by the push rod, a timer having a flat spiral spring which is wound and started as the turning arms are turned down, a projection formed in the interior of the cover and which has a groove for locking use, a leaf spring having a locking pawl at the front end which is adapted to fit in said groove to accomplish locking, a criterion cam rotatably and slidably fitted to the shaft of a second wheel of the timer and which presses said leaf spring on one side, and a pin provided on the shaft of the second wheel and which is adapted to fit in a notch formed in the criterion cam to cause axial sliding of the criterion cam so as to release the pressure of the leaf spring and allow the locking pawl to move out of the groove to accomplish unlocking, said criterion cam being rotatable as desired to shift the position of the notch for the purpose of timing control.

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