Dec. 1, 1959 H. GREENWALD 2,915,692

COIN DEVICE CLOCK MECHANISM

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FIG. 1

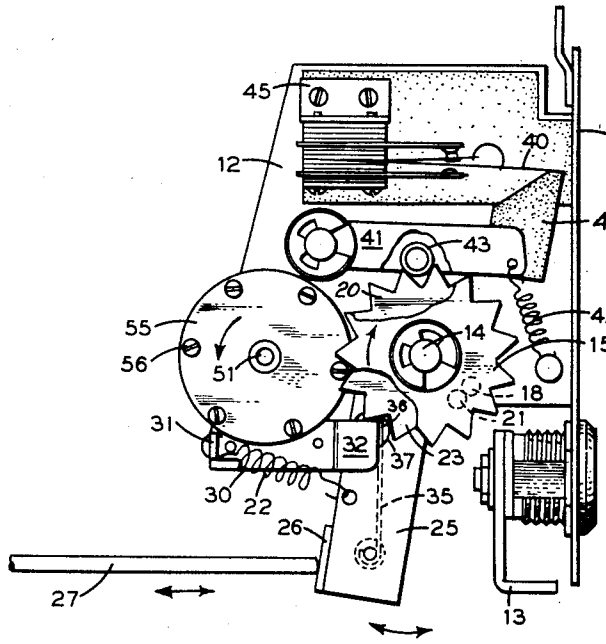


FIG. 3

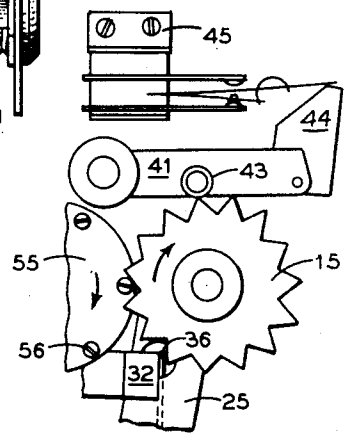
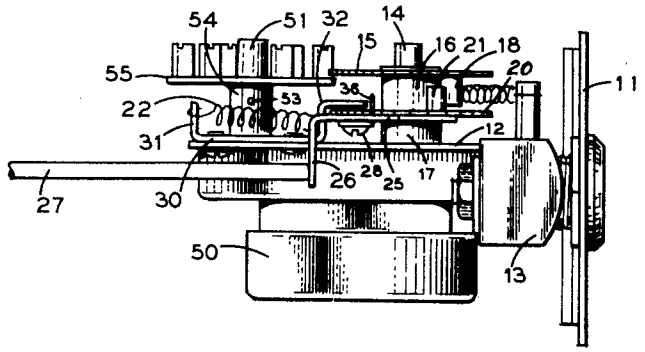


FIG. 2



INVENTOR.

Harry Greenwald

BY Irving Deidman

ATTORNEY

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COIN DEVICE CLOCK MECHANISM

Harry Greenwald, Blauvelt, N.Y., assignor to H. Greenwald Co. Inc., Brooklyn, N.Y., a corporation

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5 Claims. (Cl. 318—470)

This invention relates to coin-controlled mechanisms and, more particularly, to novel and simple means for preventing unauthorized operation of a coin-controlled mechanism after the latter has completed a cycle of operation determined by the number of coins inserted.

In a known type of coin-controlled mechanism used on electric appliances and the like, the length of the operating cycle is determined by the number of coins used. Insertion of the coins one at a time into a reciprocable slide, followed by operation of the slide after each coin insertion, advances a cycle length determining or driven, member by a predetermined amount for each operation of the coin slide. The user then rotates a control knob of a cycle timer a predetermined amount to initiate operation of the timer. The timer operates a driving member which, after a predetermined amount of movement, engages and drives the driven member to open a switch in the timer energizing circuit. When the driving and driven members complete opening of the switch, a lock is automatically operable to obstruct further movement of the driven member until the coin slide is again operated, which can be effected only when a coin is in the coin slide.

In one form of such mechanism, the driving and driven members are ratchet wheels freely rotatable in axially spaced relation on a common shaft. A control or setting arm is oscillatable about substantially the shaft axis immediately adjacent the driven member, and has a free end in the path of movement of the coin slide for operation in one direction thereby. The arm is spring biased in a return direction to engage a fixed stop. This arm has a hole adjacent the periphery of the driven member, and a spring wire is secured at one end adjacent the outer end of the arm. The inner end of the wire is bent to extend eccentrically through the hole in the arm to engage the teeth of the driven member, the wire being biased so that the bent end normally engages one side edge of the hole. Each time the arm is oscillated, the driven member is advanced by one tooth.

The driving and driven members carry eccentrically mounted pins arranged to interengage for driving of the driven member by the driving member. However, before these pins are engaged, the driving member must be advanced the same amount as the driven member. Such advance of the driving member is effected by a disk on the timer shaft carrying circumferentially spaced pins engageable with the teeth of the driving member.

The teeth of the driven member engage a pin or roller on a spring biased arm carrying an operator for opening a normally closed switch in the timer energizing circuit. Each time the driven member is advanced one tooth, this switch is snapped open and immediately reclosed.

When the coin slide is pushed in, the setting arm is swung in such a direction that the bent end of the wire, moving in the hole away from its normal position, slips over one tooth of the driven member. Upon spring return of the arm, the bent wire end, bearing against the edge of the hole, cannot slip over the tooth and consequently rotates the driven member by one tooth. The timer now rotates its driven disk to give successive impulses to the driving member to move the latter to follow the driven member. When the pins engage, the driven member is moved to open the switch and hold it open until a succeeding operation of the arm by the coin slide. The wire, bearing against a flat stop, prevents further movement of the members.

In these devices as presently constructed, it is possible, by forceful turning of the setting knob on the timer shaft to move the driving and driven members further in the same direction by forcing the driven member to bend the bent end of the wire over the stop and slip over the wire end.

In accordance with the present invention, such unauthorized and wire damaging operation is prevented by providing a bracket secured to the stop and partially overlying the surface of the teeth of the driven member opposite the surface overlain by the driving arm. This bracket, in the spring retracted position of the operating arm, overlies the hole a sufficient amount to engage the bent wire end. Thus, if an attempt is made to force the driven member in a switch closing direction, the bent wire end engages the edge of the bracket and is sufficiently reinforced by the latter to prevent such movement of the driven member.

For an understanding of the invention principles, reference is made to the following description of a typical embodiment thereof as illustrated in the accompanying drawing. In the drawing:

Fig. 1 is a plan view of coin-controlled mechanism incorporating the invention;

Fig. 2 is an elevation view of the mechanism; and

Fig. 3 is a partial plan view illustrating the relevant parts in the locked, switch-open position.

Referring to the drawings, the coin-controlled mechanism **10** is illustrated as including a mounting wall **11** from which projects a mounting shelf or base **12**. A key operated catch **13** is provided on wall **11**.

Base **12** has a fixed shaft **14** projecting upwardly therefrom on which are rotatably mounted driving and driven ratchet wheels **15** and **20** axially spaced by a hub element **16**. An arm **25** is oscillatably mounted on shaft **14** and underlies wheel **20**. The arm and wheel **20** are spaced from base **12** by a hub element **17**. Wheel **15** carries a pin **18** arranged to engage a pin **21** on wheel **20**.

Arm **25** is spring biased in a clockwise direction by a spring **22** engaged in arm **25** and in a leg **31** of a bracket **30** secured to base **12** and having an offset extension **32** parallel to and just slightly spaced from wheel **20**. This bracket limits clockwise movement of arm **25**. Arm **25** has a depending ear **26** in the path of movement of a coin slide schematically illustrated at **27**.

A spring wire **35** has one end secured to arm **25** by a bolt **28** near the outer end of the arm. The inner end of wire **35** is bent upwardly at right angles, as at **36**, to extend eccentrically through a relatively large hole **37** in arm **25** adjacent the teeth of driven wheel **20**, wire **25** being biased so that end **26** lies against the edge of hole **37** furthest from offset **32**. End **36** also engages the teeth of wheel **20**.

Coin slide **27** may be any desired construction, and is of a type which is movable inwardly only when a coin is inserted therein. When slide **27** is moved inwardly (to the right in the drawings), either the slide or an abutment thereon engages ear **26** and swings arm **25** counterclockwise. Wire end **36** moves to the left in hole **37** and slips over tooth **23** of wheel **20**. When the coin slide is withdrawn, spring **22** swings arm **25** clockwise. Spring end **36** bears against the right edge of hole **37** and cannot slide over tooth **23**. Hence, wheel **20** is rotated one tooth

clockwise. This action is repeated each time slide 27 is operated with a coin therein.

A second arm 41 is pivoted on base 12 and biased toward wheel 20 by a spring 42 so that a roller or pin 43 carried by arm 41 rides over the teeth of wheel 20. A dielectric cam 44 on the outer end of arm 41 engages the operator 40 of a normally closed snap action switch 45 mounted on base 12. Each time pin 43 rides outwardly on a tooth, switch 45 is snapped open, and as pin 43 rides into the valleys between the teeth, switch 45 is snapped closed. Thus, switch 45 is momentarily closed and opened during each operation of slide 27, arm 25, and wheel 20.

After the last operation of slide 27, roller or pin 43 is in a valley between the teeth of wheel 20 so that switch 45 is closed. Also, pin 21 of wheel 20 has been moved clockwise from the position shown in Fig. 1 an angular amount depending upon the number of actuations of slide 27. The motor of a timer 50, mounted on shelf 12, is energized by closure of switch 45 and rotates a shaft 51. A pin wheel 55 is secured to rotate with shaft 51 by means of a set screw 53 in its hub 54. This disk is rotated counterclockise as viewed in Fig. 1.

At preselected circumferentially spaced locations, disk 55 has mounted thereon pins 56 engageable with the teeth of driving wheel 15. The number and location of pins 56 is selected in accordance with the desired time of operation of the appliance for each coin insertion into slide 27.

As disk 55 is rotated by the timer motor, each time a pin 56 engages a tooth of wheel 15, this wheel is advanced one tooth in a clockwise direction. When the number of such periodic advances equals the total advance of wheel 20 by slide 27 and arm 25, pin 18 engages pin 21. On the next engagement of a pin 56 with a tooth of wheel 15, both wheels 15 and 20 are moved clockwise so that roller 43 rides outwardly upon a tooth of wheel 20 to open switch 45.

However, before roller 43 can ride inwardly, a tooth of wheel 20, engaging bent wire end 36, has moved end 36 against offset extension 32 of bracket 30. Further clockwise movement of wheels 15 and 20 is thus prevented and switch 45 remains open. When slide 27 is again operated to swing arm 25 counterclockwise, wire end 36 rides out along the tooth of wheel 20 and slips over the end thereof to advance wheel 20 clockwise one tooth as slide 27 is retracted and arm 25 is spring biased to engage bracket 30.

While a specific embodiment of the invention has been shown and described in detail to illustrate the application of the invention principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. Coin control mechanism, operable by a reciprocable coin slide, comprising, in combination a substantially flat mounting plate; a shaft projecting from said mounting plate; first and second ratchet wheels rotatably mounted on said shaft in axially spaced relation, each of said wheels having a pin thereon projecting toward the other wheel and said pins being at equal radial distances from the axis of said shaft; a relatively elongated flat arm

oscillatably mounted on said shaft immediately adjacent said first wheel for oscillation of the arm in one direction by the coin slide; spring means biasing said arm in the opposite direction; means on said plate engageable with said arm to limit movement thereof in such opposite direction; said arm having a relatively large hole therein adjacent the teeth of said first wheel and an abutment in the path of inward movement of the coin slide; a wire secured at one end to said arm adjacent the outer end thereof and extending inwardly along said arm, said wire having a bent inner end extending through said hole and engaging the teeth of said first wheel and said wire being so oriented that said bent end is biased to engage the side of the hole in the direction of movement of said arm by the coin slide; whereby, upon movement of said arm in such one direction by the coin slide, said bent end will move toward the other side of said hole and slip over the tooth of said first wheel then engaged by said bent end and, upon spring biased movement of said arm in such opposite direction, said bent end, engaging the opposite side of such tooth and the side of said hole, will rotate said first wheel by the distance of one tooth; a normally closed switch mounted on said plate and having a spring biased operating arm; a follower on said operating arm engaged with the teeth of said first wheel, said switch being opened when said follower is moved to the outer end of a tooth of said first wheel and closed when said follower is between the teeth of said first wheel; an electrically operated timer on said plate having an energizing circuit controlled by said switch; means operable by said timer, when said switch is closed, to rotate said second wheel in the direction of rotation of said first wheel by said flat arm to interengage said pins; and abutment means on said base overlying the surface of said first wheel opposite the surface thereof adjacent said flat arm and adjacent the teeth of said first wheel; said abutment means engaging said bent wire end, when the latter is moved toward said abutment by a tooth on said first wheel, upon rotation of said first wheel by interengagement of said pins to limit such movement of said first wheel to a position wherein said follower is held on the outer end of a tooth of said first wheel to open said switch.

2. Mechanism as claimed in claim 1 in which said abutment means comprises a bracket on said plate having a flat offset overlying said first wheel.

3. Mechanism as claimed in claim 2 in which the shoulder formed by said offset constitutes the means limiting movement of said flat arm.

4. Mechanism as claimed in claim 2 in which said timer operated means comprises stepping means intermittently rotating said second wheel.

5. Mechanism as claimed in claim 4 in which said stepping means comprises a disk rotatable by said timer and having pins at selected circumferential spacings therearound engageable with the teeth of said second wheel.

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