

July 14, 1964

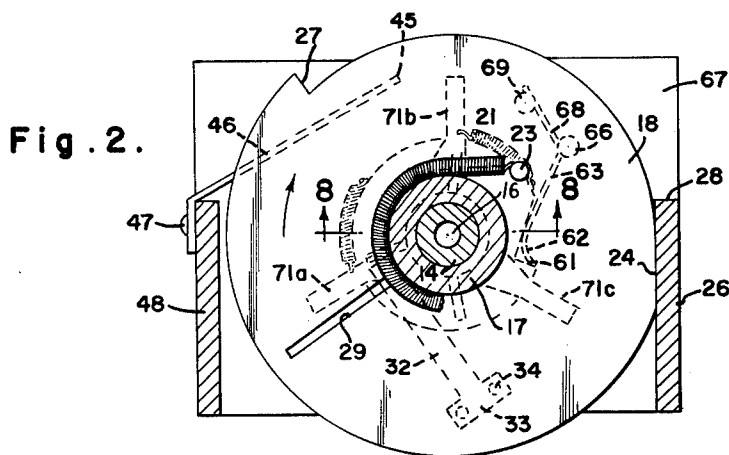
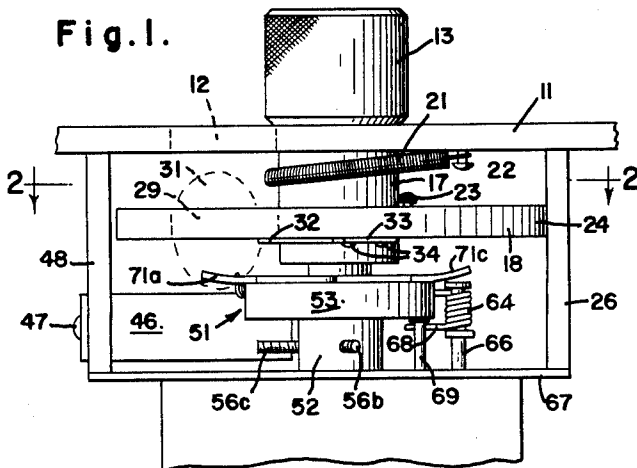
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3,140,766

COIN CONTROLLED METERING DEVICE

Filed June 4, 1962

3 Sheets-Sheet 1



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Fig. 4.

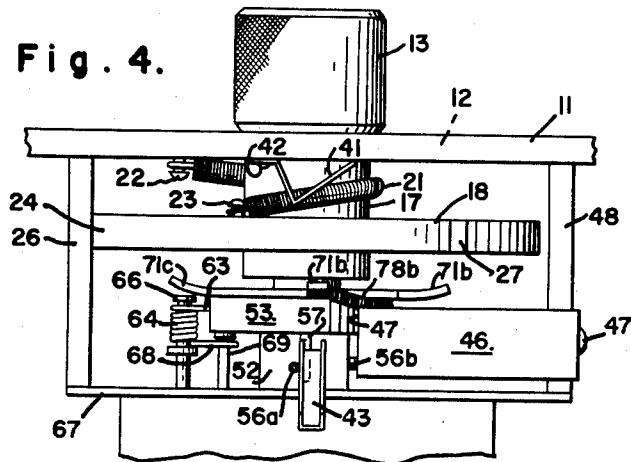
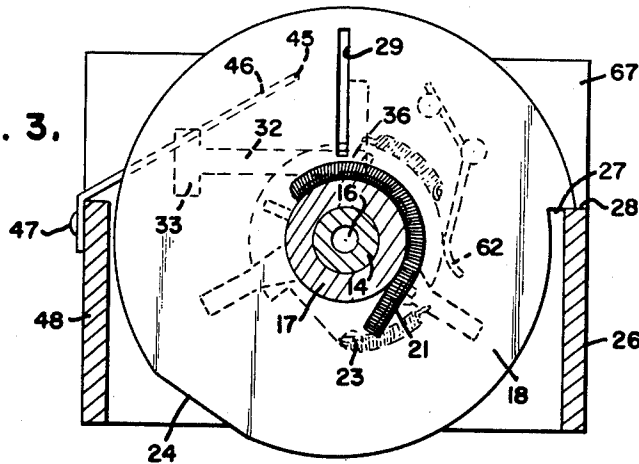


Fig. 3.



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Fig. 5.

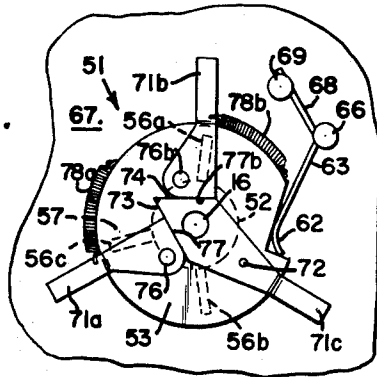


Fig. 6.

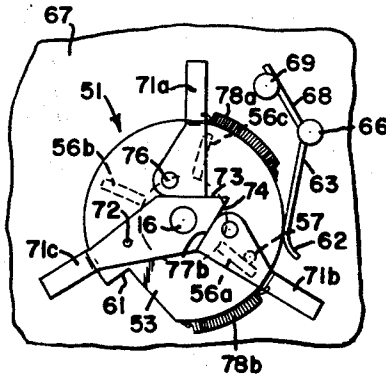


Fig. 8.

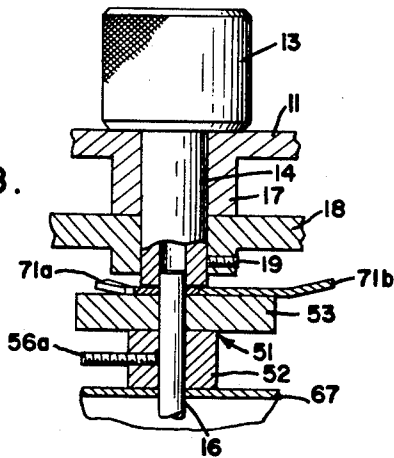
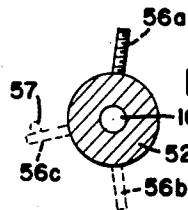


Fig. 7.



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3,140,766

COIN CONTROLLED METERING DEVICE

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7 Claims. (Cl. 194—84)

This invention relates to a new and improved coin metering device. More particularly, the invention relates to a device used as an attachment to a conventional timer and relay system for coin operated machines, such as washing machines, drying machines and dry-cleaning machines, and the like.

A particular feature and advantage of the device hereinafter described is the fact that it may be set to accept a single coin or a plurality of coins to actuate the timer mechanism, and by simple adjustment of the device the number of coins required to actuate the mechanism may be changed. Thus, assuming that the machine is to be set to accept quarters, in the form of the invention hereinafter described the device may, by simply adding or removing pins in the mechanism, start the machine in operation after the deposit of one, two, or three quarters, as desired. It will be understood that a greater number than three coins may be used by simple design changes in the device.

A particular advantage of the invention is the fact that the changes in the number of coins required to actuate the timer mechanism may be made in the field, in that no radical redesign of the device is required, nor is the adjustment required such that the device must be returned to a repair shop. Further, the change may be made by unskilled labor.

A further feature of the invention is the fact that the device is simple in operation and inexpensive to manufacture and maintain. Thus, the mechanism consists of few parts, all of rugged construction, thereby contributing to the aforesaid low cost of manufacture and maintenance.

A still further feature and advantage of the invention is the fact that the coin is visible in the mechanism at all times, and is not concealed in a housing. Hence, if the mechanism jams it is simple for a repair man to determine the reason for the jammed condition and to remedy the same.

A still further feature of the invention is the fact that provision is made for a coin stop so that a dishonest patron cannot actuate the timer mechanism and then by manipulation of the device obtain a return of one or more coins. Additionally, a pressure spring is provided which prevents intentional or unintentional vibration of the machine from advancing the coin device so that fewer coins than the desired number will energize the timer. Another feature is the fact that coins smaller than the desired coin are ejected and coins larger than the desired coin are not accepted by the device.

Other objects of the present invention will become apparent upon reading the following specification, and referring to the accompanying drawings in which similar characters of reference represent corresponding parts in each of the several views.

In the drawings:

FIG. 1 is a side elevational view of the device.

FIG. 2 is a horizontal sectional view taken substantially along the line 2—2 of FIG. 1, showing the position of the device at rest.

FIG. 3 is a view similar to FIG. 2, showing the coin-receiving turntable advanced in a clockwise direction of 120° from the position of FIG. 2.

FIG. 4 is a view similar to FIG. 1, taken from the opposite side of the device.

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FIGS. 5 and 6 are fragmentary plan views of the clutch mechanism at different positions of movement.

FIG. 7 is a schematic fragmentary view showing the clutch collar and its radial drive pin.

FIG. 8 is a fragmentary vertical sectional view taken substantially along the line 8—8 of FIG. 2.

The present invention is used on a coin-operated machine of the type heretofore mentioned, and is located at a convenient position at or near the machine to be operated.

Commercially available timing relay and timer motor of a type well understood in this art are used in conjunction with the device. Reference is made to Patent No. 2,677,776 as illustrating a timer motor of this general type. When the motor is advanced by manually turning its shaft (shown partially in FIG. 8) in a clockwise direction, through an angle of approximately 30°, the timer motor begins to operate. Operation continues through the remainder of a 360° cycle, whereupon the timer motor stops. Connected to the timer shaft is a series of relays which control the cycle of operation of the machine with which the device is used. Hence, in a washing machine, the timer relays control the admission of water, rotation of the washing drum for washing, rinsing and drying, pumping of water, and the like. The construction of the timer motor and the relays which it operates forms no part of the present invention. There are numerous such timers and relays commercially available and the present invention may be used in many of such components as will be well understood by one skilled in the art.

The device, which is the subject of this invention, has a top cover plate 11, in which is formed a slot 12 having a length and width to accept coins no larger than a predetermined size, here assumed to be a U.S. 25¢ piece. It will be understood, however, that by changing cover 11 and, more particularly, the dimensions of the slot 12 formed therein, the device may be adapted to receive coins of other denominations. From time to time, it may be desirable to adjust the machine so that it will operate on one 25¢ piece, two 25¢ pieces, or three 25¢ pieces, and it is a feature and advantage of the machine that this adjustment may be made rapidly by unskilled workmen in the field.

Projecting out through cover 11 is a turning knob 13, which is manually actuated by turning in a clockwise direction through an angular travel of approximately 120°. Knob 13 has a hollow spindle portion 14, which extends into the interior of the device and receives the upper end of shaft 16 of the timer relay and provides a bearing therefor. There is no driving connection between spindle 14 and shaft 16. To support spindle 14, a collar 17 is formed on the interior of cover 11, all as best shown in FIG. 8. Turntable 18 is fixed by set screw 19 to spindle 14, the turntable 18 turning with knob 13. A garter spring 21 is fixed by means of pin 22 at one end to the underside of cover 11, and by means of screw 23 to turntable 18. The function of spring 21 is to return knob 13 and turntable 18 to the starting position illustrated in FIG. 2. Turntable 18 is formed with a flat 24, which bears against vertical projection 26 extending downward from cover 11 to hold the turntable 18 in the exact position shown in FIG. 2 when it is at rest. A notch 27 is formed in the periphery of turntable 18, which bears against shoulder 28 on projection 26 to limit the turning movement of turntable 18 to 120°, all as shown in FIG. 3.

Turntable 18 is formed with a slot 29 of the same dimensions as slot 12. In the position of rest shown in FIG. 1, slot 29 is directly under slot 12, so that when a coin 31 is deposited in slot 12, it will drop through slot 12 and lodge in slot 29. If the coin is oversize, it will not be accepted by slot 12. If the coin is undersize, it will drop through both slots and be discarded.

A thin leaf spring 32, having a tab 33 fixed to the underside of turntable 18 by means of rivets 34, is so positioned that one edge portion 36 thereof underlies the inner edge of slot 29. Spring 32, therefore, tends to retain a coin 31 approximately upright in slot 29, so that when turntable 18 is twisted, the coin moves with the turntable until it is forcibly dislodged therefrom, whereupon spring 32 flexes to permit the dislodgment of the coin.

Positioned 120° from the position of rest of slot 29, shown in FIG. 1, is a coin dislodging cam 41 of irregular shape fixed to the underside of cover 11 by screw 42. Cam 41 is slanted downwardly in a clockwise direction of movement so that when the upper edge of coin 31 carried around in slot 29 of turntable 18, contacts cam 41 as it is turning, the cam forces the coin downwardly out of slot 29, whence it is directed by chute 43 into a coin box (not shown). During the downward movement of the coin, the spring 32 flexes to accommodate escape of the coin from the slot 29 and, also, to start its initial movement along downwardly inclined chute 43. To prevent a dishonest patron from manipulating the device to energize the timer and return the coin, a leaf spring coin-return blade 46 is provided fixed by means of screw 47 to projection 48 on the underside of cover 11. Blade 46 is disposed at an angle which is somewhat inwardly slanted from a tangent to the lower edge of coin 31. As the coin passes from the position shown in FIG. 2 to the position shown in FIG. 3, the bottom edge of the coin flexes spring 46 outwardly to permit passage of the coin. Upon the return movement of turntable 18, if a coin tends to remain in slot 29, the point 45 of spring 46 engages the coin and prevents such return.

Interposed between turntable 18 and timer shaft 16 is a clutch mechanism 51, consisting of a bottom collar 52 fixed to shaft 16, a generally cylindrical cam 53 above collar 52, and irregularly shaped pointed cam members 54a, 54b, 54c. Projecting radially from collar 52 are pins 56a, 56b, 56c, which are threaded into collar 52 and are removable therefrom. Pins 56 may be engaged and collar 52 rotated by vertical pin 57 on cam 52. Pin 56c is permanent in the sense that it is not removed and if only one coin is to be used to energize the timer, pin 56c is that pin which is used for such purpose. Pin 56c is located approximately 330° in a clockwise direction in advance of the position of slot 29 in its position of rest illustrated in FIG. 2. Pin 56a is located approximately 120° in a clockwise direction ahead of pin 56c. When only two coins are required to energize the machine, pin 56a is removed by unscrewing it from its socket in collar 52. Pin 56b is located approximately 120° in a clockwise direction in advance of pin 56a. Both pins 56a and 56b are removed when only one coin is to actuate the timer mechanism.

Collar 52 is turned by means of vertical pin 57 which extends down from cam 53, contacting one of the pins 56a, 56b, 56c, and turning collar 52 and shaft 16 in a clockwise direction. The normal position of pin 57 is slightly ahead of pin 56c in a clockwise direction.

Cam 53 is generally cylindrical, but is formed with a notch 61, which is engaged by the end 62 of pressure spring 63. The midpoint of spring 63 is wound in a coil 64 around pin 66 to the base 67 of the mechanism and the tail 68 of spring 63 is wound around a second pin 69, likewise fixed to base 67. The function of the spring is to bias point 62 against the cylindrical surface of cam 53 to prevent, by friction, the unintentional movement of cam 53 and also to lodge in notch 61 to hold the cam in a position of rest, shown in FIG. 1, to prevent starting of the mechanism in a counter-clockwise direction.

Mounted on the upper surface of cam 53 are radially projecting points 71a, 71b, 71c. The elevation of points 71 relative to turntable 18 is such that the lower edge of a coin held in slot 29 of turntable 18 engages one of the

radial flats 71a, 71b, 71c, and hence as the knob 13 is twisted the coin itself causes rotation of cam 53.

It will be understood that the number of radial points 71a, 71b, 71c is related to the number of pins 56a, 56b, 56c. If the device is to be designed to accept a maximum of four coins, then the number of such pins and points is correspondingly increased.

To reduce tendency of coins to jam in the mechanism, several of points 71 may be pivotally mounted on the top of cam 53. Thus, as best shown in FIGS. 5 and 6, point 71c, is fixed by pin 72 and shaft 16 to cam 53, so that it cannot pivot. The inner end of point 71c has two abutment surfaces 73, 74. Point 71a is pivoted by pin 76 to cam 53 and has a surface 77 which normally abuts surface 73 to maintain point 71a extending radially. Spring 78 fixed at one end to point 71a and at the other to cam 53 biases point 71a to radial position with surfaces 73, 77 in firm contact with each other. However, spring 78 can stretch to permit point 71a to pivot out of the way in a counter-clockwise direction about pin 76 as a center on the counter-clockwise return movement of cam 53, thereby preventing a coin stuck in the slot from interfering with the return of the mechanism.

Similarly, point 71b is pivotally mounted by pin 76b to cam 53 and has a surface 77b which normally abuts surface 74 and is biased against such surface by spring 78b.

Assuming that the machine is set to energize the timer upon deposit of a single coin, all of the pins 56a, 56b, 56c are in place. Deposit of the first coin in slot 12 and its dropping into slot 29 enables the patron to twist knob 13 through 120° of travel. Such twisting movement causes the bottom edge of the coin to engage flat 71a, thereby turning collar 53 a corresponding 120° of travel. As the knob 13 enters the last 30° of its 120° turning movement, pin 57 depending from cam 53 contacts pin 56a and turns collar 52 and hence timer shaft 16 through the required 30° of travel to energize the timer and start the relay. When coin 31 contacts ejector cam 41, it is dropped out of slot 29 and into chute 43. Spring 21 returns knob 13 to its original position. The energization of the timer causes shaft 16 to turn through a full 330° of travel and then stop. When pin 56c contacts pin 57, it turns cam 53 around to the position of start. However, such movement does not cause movement of turntable 18, because there is no direct connection between turntable 18 and the clutch mechanism 51 in the absence of a coin being positioned in slot 29.

If the machine is to accept two coins before the timer is energized, the installer removes pin 56a. Thereupon, deposit of the first coin in slot 12 advances member 53 through 120°. Contact of end 62 of spring 63 with the surface of cam 53 prevents retraction of the cam when spring 21 returns knob 13 to its original position. Thereupon, the second coin inserted by the patron in slot 12 then drops into slot 29. Twisting of knob 13 then brings pin 57 into contact with radial pin 56b and advances the latter through the required 30° to cause the timer motor to commence the timing cycle. The machine shuts off in initial position exactly as is the case if a single coin energizes the machine.

When the machine is set so that it is necessary for three coins to be deposited before the cycle commences, the installer removes both pins 56a, 56b. Thereupon the insertion of the first coin in slot 12 results in a turning movement of clutch 51 through 120°, but no turning movement of collar 52. Deposit of the second coin causes an additional 120° movement of clutch 51, but no movement of collar 52 because there is no contact between pin 57 and any radial pin from collar 52. Again the spring end 62 bearing against the peripheral surface of member 53 prevents retraction of member 53 when knob 13 returns to the initial position. The deposit of the third coin and twisting of knob 13 brings pin 57 up behind pin 56c in a clockwise direction and completion of the turning movement of knob 13 causes pin 57 to move col-

lar 52 through the required 30° of travel to energize the timing motor.

It will thus be seen that simply by removing one or two of pins 56a, 56b, the device may be set up to energize the timing cycle of the machine for either one, two or three coins. At the end of each timing cycle, the end 62 of spring 63 lodges in the notch 61 of cam surface 53 and holds the clutch 51 in initial position.

Although the foregoing invention has been described in some detail, by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be practiced within the spirit of the invention and scope of the appended claims.

What is claimed is:

1. In a coin metering device, a shaft, means forming a coin-receiving first slot, a manually rotatable turntable formed with a second slot, means mounting said turntable for rotation concentric with said shaft between a first position in which said slots are substantially vertically aligned and a second position, a cam, means mounting said cam for rotation concentric with said shaft, a plurality of coin-engaging points on said cam positioned below said turntable and arranged to fit ahead of a coin held in said second slot in the direction of movement of said turntable from first to second positions and to be engaged by a coin turned with said turntable to turn said cam, a collar fixed on said shaft, a plurality of removable first projections on said collar, single second projection on said cam extending into the path of movement of said first projections, means for discharging a coin from said second slot in second position of said turntable, said first projections being individually removable.

2. A device according to claim 1 which further comprises flexible means carried by said turntable for holding a coin in said second slot during travel of said turntable between first and second positions.

3. A device according to claim 1 which further comprises flexible means stationarily mounted near second position of said second slot and projecting into the path of travel of a coin in said second slot to prevent return of a coin to first position after it has turned past said flexible means.

4. In a coin metering device a timer motor, a relay, said relay having a shaft driven by said motor, contacts in said relay and on said shaft for energizing said motor when said shaft is externally turned through a predetermined angular first travel and for maintaining said motor energized until said shaft has been turned by said motor through a predetermined angular second travel, said first

and second travel comprising a full rotation of said shaft, a casing formed with a first coin slot, a turntable below said casing mounted for oscillatory movement relative to said shaft between a first position and a second position, said turntable formed with a second coin slot positioned aligned with said first coin slot when said turntable is in first position, means for turning said turntable between first and second positions, resilient means for holding a coin of pre-selected size in said second slot while said turntable travels between first and second positions, means for disengaging a coin from said second slot when said turntable has reached second position, a cam mounted for rotative movement relative to said shaft below said turntable, a plurality of radially extending points on said cam, each said point being positioned to be engaged and rotated by a coin in said second slot and turned along with said cam as said turntable is moved between first and second positions, whereby turning said turntable with a coin in said second slot between first and second positions advances said cam through a corresponding movement, a drive pin on said cam, a collar on said shaft, a plurality of driven pins on said collar, at least some of said driven pins being removable, said drive pin projecting into the path of movement of said driven pins, whereby turning said cam through a predetermined travel brings said drive pin into engagement with one of said driven pins to turn said shaft through said first travel to energize said timer motor for one turning cycle.

5. The device of claim 4 in which deposit of a plurality of coins and turning of said turntable through a plurality of movements between first and second position is required to bring said drive pin into contact with one of said driven pins to energize said motor when one or more of said driven pins is removed and deposit of each coin and subsequent turn of said turntable from first to second position brings said drive pin into contact with one of said driven pins when all of said drive-in pins are in place to energize said motor on deposit of each coin.

6. The device of claim 1 which further comprises braking means to restrain reverse motion of said cam as said turntable returns from second to first position.

7. The device of claim 1 which further comprises means pivotally mounting at least one of said points on said cam and resilient means biasing said point toward radially extending position.

References Cited in the file of this patent

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