

Nov. 12, 1963

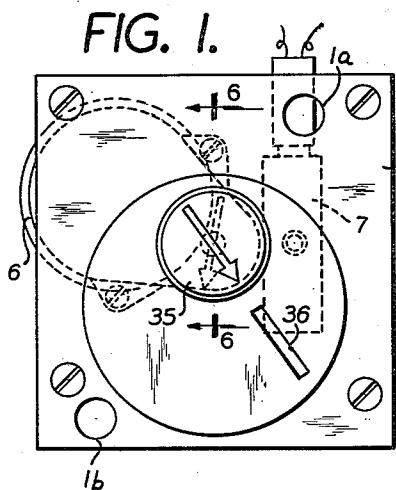
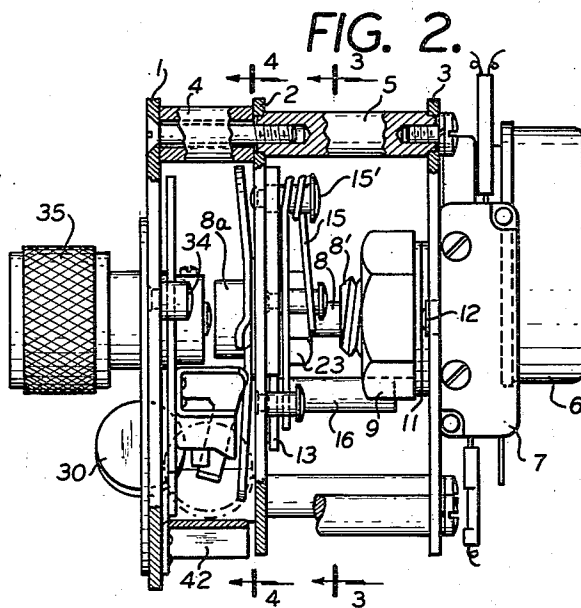
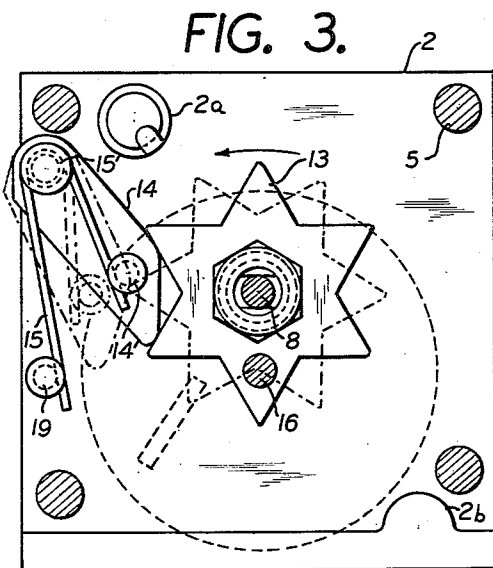
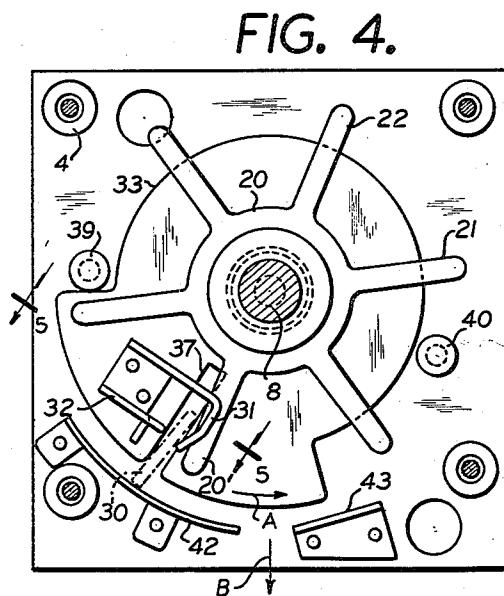
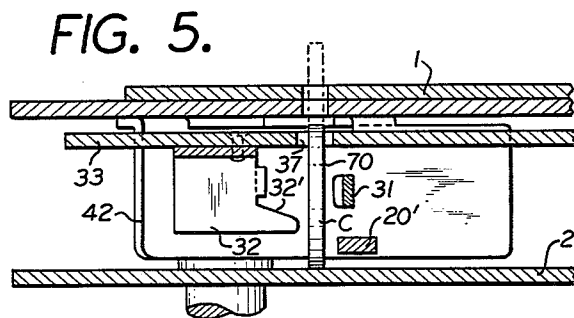
L. EICKHOFF

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COIN OPERATED TIMING MEANS

Filed Sept. 11, 1959

2 Sheets-Sheet 1



INVENTOR
LOUIS EICKHOFF
BY *Samuel J. Lee*
ATTORNEY.

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L. EICKHOFF

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FIG. 6.

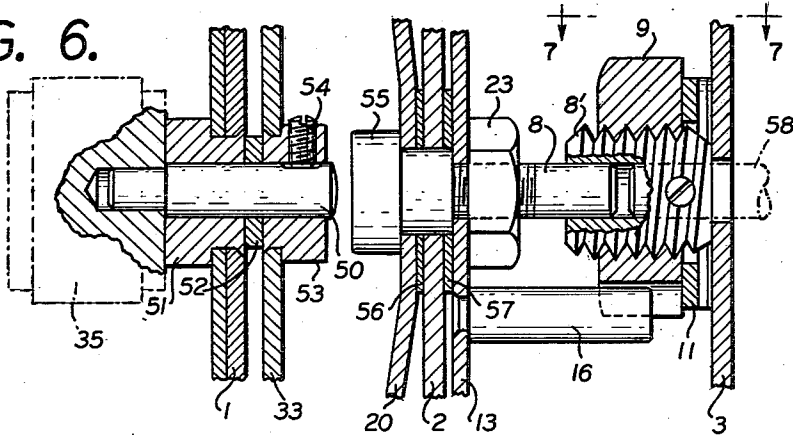


FIG. 7.

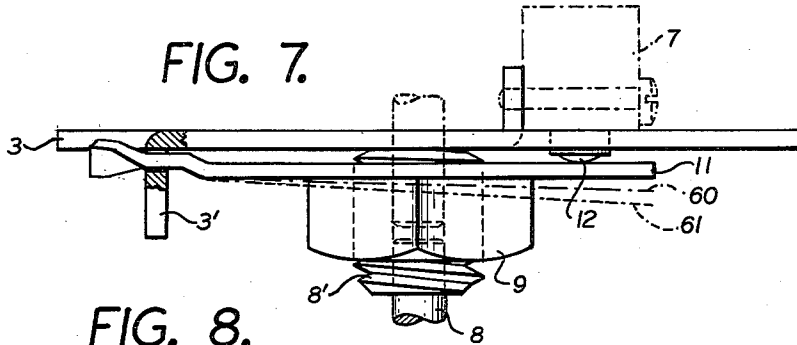


FIG. 8.

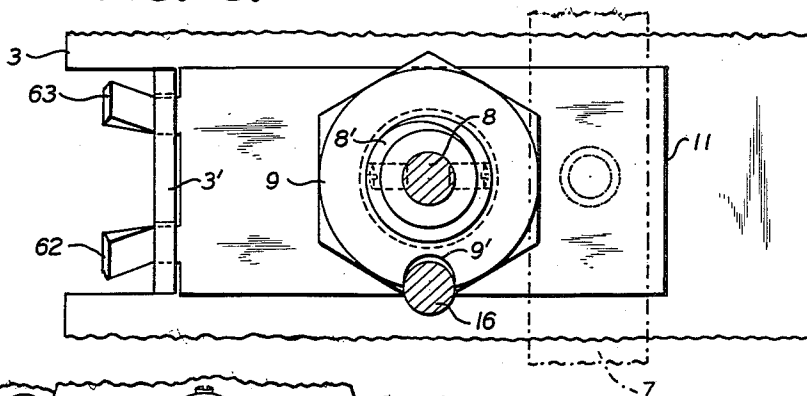
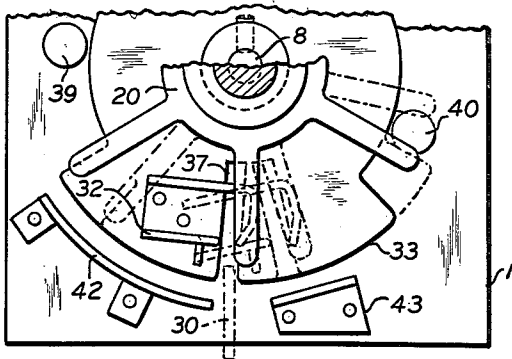


FIG. 9.



INVENTOR
LOUIS EICKHOFF

BY *Samuel J. Stool*
ATTORNEY.

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COIN OPERATED TIMING MEANS
Louis Eickhoff, Westbury, N.Y., assignor to
Robco Corporation, Patchogue, N.Y.
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2 Claims. (Cl. 194-84)

This invention relates to timing means and more particularly to coin operated timing means.

The present invention may be used wherever it is desired to automatically time an operation or machine and is particularly adapted for use as a coin operated timing device. Such timers are used in coin operated machines such as washing or drying machines or in any vending device which is desired to operate a given time in response to the insertion of one or more coins. However, the present invention is not limited to coin operated devices but may be used to time any desired operation.

The present invention generally comprises a threaded shaft operably connected to a synchronous motor, a travelling nut on said shaft adapted to operate the motor switch, and detented handle means adapted to move the nut a measured amount in the direction opposite to the movement of the nut caused by the motor. In operation the nut is manually backed off with a detented handle which may be coin controlled. The motor then starts and tightens up the nut which actuates a switch until the motor is stopped after a predetermined time.

Accordingly, a principal object of the invention is to provide new and improved timing means.

Another object of the invention is to provide new and improved metered timing means.

A further object of the invention is to provide an improved timing means of the character described, in which the life of the synchronous motor which actuates it is greatly increased because of relatively low torque requirements.

A still further object of the invention is the provision of improved timing means of the character described, in which the life of the control switch is greatly increased because it is actuated only once when the operation starts and once when it stops, rather than each time a coin is inserted as is the case with other coin operated timing devices.

The present timing device is adapted to accumulate as many coins as desired, each coin representing a predetermined interval of time and the accumulated coins, in aggregate, representing corresponding multiples of said interval of time. For example, if the timer is adapted to receive dimes as the actuating coins, and if each dime represents a ten-minute interval, it is possible with the present mechanism to insert three dimes for a thirty-minute operation, or six dimes for a sixty-minute operation or any other number of dimes for corresponding time intervals. In one preferred embodiment of the present device as many as twenty-four coins may be accumulated for a single operation, but this is purely illustrative and the present device may be made to accumulate any lesser or greater number of coins.

Another object of the invention is to provide new and improved coin operated timing means.

Another object of the invention is to provide new and improved timing means having a rugged construction without any complicated adjustments.

Another object of the invention is to provide timing means comprising a timing motor, a switch connected to operate said motor, a lever connected to operate said switch, and a travelling nut on a threaded shaft adapted to operate said lever.

These and other objects of the invention will be ap-

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parent from the following specification and drawings, in which:

FIGURE 1 is a detail view of the front panel.

FIGURE 2 is a side view of an embodiment of the invention partially in section.

FIGURE 3 is a sectional view taken along the line 3-3 of FIGURE 2.

FIGURE 4 is a sectional view taken along the line 4-4 of FIGURE 2.

FIGURE 5 is a detail view partially in section illustrating the insertion of a coin.

FIGURE 6 is an enlarged detail view illustrating the threaded shaft assembly.

FIGURE 7 is a sectional view taken along the line 7-7 of FIGURE 6 illustrating the operation of the nut and lever operating the switch.

FIGURE 8 is a side view of FIGURE 7, and

FIGURE 9 is a detail view illustrating the operation of the coin holding means.

Referring now to FIGURES 1, 2, and 3, the mechanism is mounted on three square mounting plates 1, 2, and 3, FIGURE 2, which are spaced apart at the corners by spacers 4, 5, secured by screws in conventional manner. The holes 1a, 1b, 2a and 2b are mounting holes. The main elements of the mechanism are the synchronous motor 6, which is mounted on the plate 3, the motor switch 7, which may be a conventional normally closed microswitch, also mounted on the plate 3, a threaded stud 8' on shaft 8, which is operably connected to the motor, and a travelling nut 9, which is mounted on the threaded stud. A lever 11 is pivotally mounted on the mounting plate 3 and extends between the plate 3 and the nut 9, being apertured to receive the threaded shaft 8.

The switch 7 is connected in series with the motor 6 and is also adapted to be connected in series with utilization apparatus such as a washing or drying machine motor or other work apparatus.

The operation of the mechanism thus far mentioned is as follows: The nut is backed off on the threaded shaft a predetermined amount by a manual knob operated detent mechanism which may be coin controlled as will be explained. This permits the lever to be pushed aside by the spring loaded motor actuating arm 12 thereby closing the switch and starting the motor 6. The motor 6 is operably connected to turn the threaded stud in the direction to tighten the nut against the lever 11 to thereby open the switch and stop the operation. The time is controlled by the amount of travel of the nut 9.

The detent mechanism comprises a star-shaped cam 13, FIGURE 3, mounted on the motor side of the mounting plate 2. The star-shaped cam 13 is affixed to the shaft 8 which is adapted to be manually rotated in the direction of the arrow in FIGURE 3 by a knob as will be explained. The star cam is adapted to be positioned by the detent arm 14 which is pivotally mounted on stud 15' on the mounting plate 2 and which is spring loaded against the cam by means of the spring 15 on stud 15' which bears against stud 19 on plate 2 and stud 14' on detent arm 14. The travelling nut 9 is slotted in the direction parallel to its axis and is connected to the detent cam 13 by means of a shaft 16 which is fixedly connected to the cam at one end and slidably connected in the slot 9', FIGURE 8, of nut 9 at the other end.

FIGURE 4 shows the assembly on the other side of the mounting plate 2. This assembly comprises a wheel 20 having spokes or fingers 21, 22 and so forth. The wheel is mounted on the shaft 8 and is clamped to the detent cam by means of the nut 23. There are spacing washers 56, 57, FIGURE 6, bearing against the mounting plate 2 so that the detent cam and the fingered wheel are clamped together but are free to rotate on the mount-

ing plate 2. They are clamped together between the large head 8a of the shaft 8, and the nut 23.

The purpose of the spokes or fingers on the wheel 20 is that they are moved by a coin 30 when held in the coin holding brackets 31 and 32, which are mounted on a plate 33 which in turn is mounted on the shaft 34 connected to the knob or handle 35, which assembly is rotatably mounted on the front panel 1. The front panel 1 has a slot 36 for inserting a coin, the size of the slot being chosen to receive the proper coin. The plate 33 has a similar slot 37 so that when the two slots are lined up, the coin will be deposited in the brackets 31 and 32. The mounting plates 1 and 2 are so spaced as to just accommodate the diameter of the coin, and then brackets 31 and 32 hold the coin in the position shown in FIGURES 2 and 4 so that part of the coin is held in slot 37 of plate 33. Therefore, as the knob 35 is manually turned in the direction of arrow A, FIGURE 4, the coin will contact one of the fingers or spokes on the wheel 20 and will move the wheel 20 which in turn will move the detent cam 13 and the other mechanism as previously described. The amount of travel of the indented plate 33 is limited by the stop 40 before which point the coin will fall out of the brackets 31 and 32 and between the curved side brackets 42 and 43 and will fall in the direction of the arrow B into a receiving box. The curved guide 42 prevents the coin from falling out of the brackets 31, 32 during the travel. The stop 39 locates the slot in plate 33 with the coin slot in front panel 1. The travel of wheel 20 strips the detent cam 13 one position which accurately controls the travel of nut 9.

FIGURES 4 and 9 illustrate the coin controlled latch travel. In FIGURE 4 the stop 39 locates the slot in plate 33 in correspondence with the coin slot in the front panel so that a coin may be inserted. The knob 35 is then turned counterclockwise in FIGURE 4 so that the coin provides the connection between the knob and the finger 20' of the wheel 20. When the coin gets to the position shown in FIGURE 9, it will fall out of the holding brackets, as illustrated by the dotted line, into a coin box. The stop 40 limits the motion of the indented plate 33 as the extending portion of the plate 33 will come in contact with the stop. The amount of travel of the plate 33 is not critical as the detent wheel 13 accurately governs the amount of travel of the nut 9 and the lever 11.

FIGURE 5 shows a detail enlarged view of the coin holding mechanism. The coin C is pushed through the slot in the front panel 1 which is illustrated as a double thickness and is held by the brackets 31, 32 connected to the plate 33 so that the coin contacts with the finger 20' of the wheel 20 when the knob is turned. The spacing of the plate 2 and plate 33 is smaller than the diameter of the coin 70 so that the top of the coin, FIGURE 5, is always within the slot 37 of the plate 33 as illustrated by the full lines. The portion 32' of the bracket 32 is tapered to guide the coin into the proper position. Several coins may be added in succession at the same time for providing double, triple, and so forth, timing cycles as desired.

FIGURE 6 is a view partially in section illustrating schematically the assembly of the timing mechanism in detail. The knob 35 is fixedly mounted on a shaft 50. The shaft 50 is rotatably mounted with the spacer 51 in the front panel 1 which is shown as having a double thickness. Immediately behind the panel 1 is a spacer 52 followed by the plate 33 which is mounted on the spacer collar 53. The entire assembly from the knob to the plate 33 is clamped together at shaft 50 by means of the collar 53 which is fixed in place with a set screw 54.

On the next mounting plate 2 is rotatably mounted the finger wheel 20 which is mounted on the shaft 8 by means of the spacer or step shaft 55 which is fixedly connected to or integral with the shaft 8. The finger wheel is separated from the mounting plate 2 by means of a washer 56. On the other side of the mounting plate 2

is another washer 57 and then the star cam 13 which is clamped to the finger wheel 20 by means of the nut 23 which is preferably secured by a set screw.

The motor shaft 58 extends through the mounting plate 3 and is fixedly connected to the shaft 8 by means of the threaded stud 8' which is preferably fixedly connected to shaft 8 and shaft 58 by set screws. The travelling nut 9 is mounted on the threaded stud 8' and the lever 11 which operates the switch is pivotally mounted to the mounting plate 3 and adapted to be operated by the travelling nut 9.

FIGURE 7 shows a side view of FIGURE 6 illustrating the operation of the lever 11 which is pivotally mounted to the mounting plate 3, for instance, on a bent extension 3' thereof. The microswitch 7 is mounted on the other side of the mounting plate 3 and has a conventional spring loaded actuating button 12. In the neutral position of the lever 11, shown by the full lines, the switch would be normally closed. When one dime is inserted and the knob turned, the nut 9 will back off so that the lever will assume the position shown by the dotted line 60, in which position the switch will be open until nut 9 tightens up again to move the lever back to the neutral or off position. If two dimes are inserted and the knob turned twice, the knob will back off to the position shown by the dotted lines 61 and the switch will stay open for a double time.

FIGURE 8 shows a side view of FIGURE 7 illustrating the nut 9 on the threaded stud 8'. This view illustrates the slot 9' in the nut 9 which contains the shaft 16 connecting the nut to the start detent 13. FIGURE 8 also illustrates one method of pivotally mounting the lever by bending up a portion 3' of the mounting plate 3 and inserting holding prongs 62 and 63 through apertures in the bent portion. The prongs are then twisted to hold the lever in place. Other equivalent pivotal type connections may be used.

Therefore, the present invention shows a timing apparatus having rugged construction, a minimum number of parts, and no complicated adjustments. Fool-proof coin operated latch means are provided for energizing any number of desired cycles of an operation. The switch may be normally open or closed as desired in particular applications.

Many variations will occur to those desiring to practice the invention without departing from the scope thereof which is defined in the following claims.

I claim:

1. Coin operated timing means comprising a synchronous motor, a switch connected to operate said motor, a lever connected to operate said switch, a threaded shaft extending through said lever and rotatably connected to said motor, a nut on said shaft connected to operate said lever, and a coin operated latch adapted to turn said nut relative said shaft, said coin operated latch comprising a detent cam mounted on said shaft, means connecting said detent cam and said nut for rotation together comprising a shaft fixed to said detent cam, said shaft riding in a slot in said nut, a wheel having extending fingers fixedly connected to said detent cam, a uni-directionally rotatable handle, and coin holding means connected to said handle whereby a coin in said holding means operably connects said handle and said finger wheel and whereby turning said handle will trip said detent cam, said coin holding means being arranged to drop said coin at the end of travel of said coin operated latch, said wheel fingers and cam detents being equal in number.

2. Coin operated timing means comprising a timing motor, a switch connected to operate said motor, a lever connected to operate said switch, a threaded shaft extending through said lever and operably connected to said motor, a nut on said shaft connected to operate said lever, and a coin operated latch adapted to turn said nut relative said shaft, said coin operated latch comprises a

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detent cam mounted on said shaft, means connecting said detent cam and said nut for rotation together, a wheel having extending fingers connected to said detent cam, a uni-directionally rotatable handle, and coin holding means connected to said handle whereby a coin in said holding means operably connects said handle and said finger wheel to trip said detent cam and back off said nut a predetermined amount, said wheel fingers and cam detents corresponding to each other in number.

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