

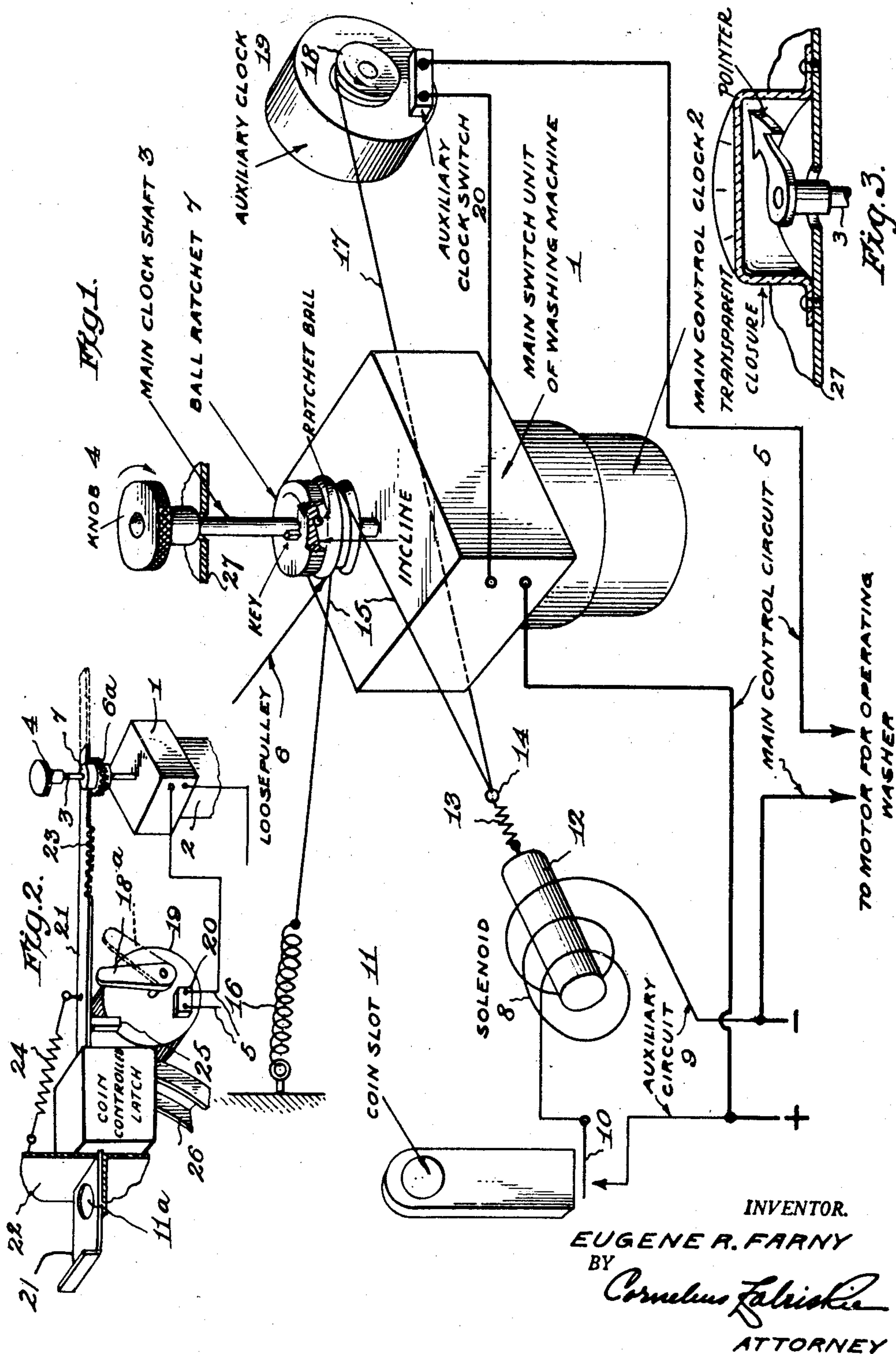
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COIN CONTROLLED WASHING MACHINE

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COIN-CONTROLLED WASHING MACHINE

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This invention relates to washing machines of the so-called "Bendix" or other clock controlled cycle type and is directed more particularly to coin controlled machines of this character.

These machines are conventionally provided with a clock having an associated current switching unit operatively connected to the clock and adapted, in turn, to control the various operating parts of the machine in such manner as to cause the machine to carry out in predetermined sequence a definite cycle of operations in the washing of clothes or other fabrics.

When machines of the "Bendix" type were initially placed on the market, they were intended for household use and were provided with a clock shaft passing through and connected to a main current switching unit and provided, externally of the machine, with a manually operable knob. The switching unit of the machine was electrically connected with the operating motor and also with appropriate valves and other adjuncts of the apparatus, so that, when the knob was set into a position to initiate normal operation, a definite predetermined cycle of operations resulted. This cycle of operations, usually comprised successive steps of preliminary soaking, washing, rinsing and drying, during all of which the fabrics remained within the cylinder of the machine, to be removed only when the conventional predetermined cycle was completed. It was possible, however, by manipulating the knob, to vary the duration of time of individual operations of the cycle or to skip an operation. For example, the knob might be manipulated to skip the soaking period and/or it might be turned by the user to shorten the washing period, where the particular character of the fabrics so required for best results. The knob carried designations of the several operations of the complete cycle and adjacent the knob was a stationary pointer or indicator, so that the knob at all times showed the particular operation through which the machine was passing. It was thus a simple matter for the user to move the knob to obtain the conditions which she desired, for the operation of the knob simply shifted the main switch unit of the machine as required to accomplish this result.

Through the passage of time commercial possibilities were seen in the provision of automatic washing machines of this general type in apartment houses, so that they might be available to a number of families and thus render it unnecessary for each family to have its own individual machine. Inasmuch as these machines were expensive, some means was required to permit the

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machine to pay for itself and consequently certain coin controlled devices were worked out which provided for the insertion of a coin into the machine by a tenant to allow of the use of the machine for a predetermined time. These coin devices, however, required that the control of the clock shaft and current switching unit by the user be eliminated, otherwise the machine could be operated by a user for a period slightly less than that paid for and the control knob thereupon turned back to the point of beginning to obtain a further time period of unpaid-for operation. Consequently, in the so-called apartment house machines which were coin controlled, the manual control by manipulation of the knob was eliminated and the machine was thereby limited, upon insertion of the coin, to one definite cycle of operations, which the user could not vary, irrespective of the type of fabrics being washed or of peculiar conditions which would ordinarily dictate a different procedure.

There has thus existed for a long time the requirement for machines of the type referred to, wherein a definite period of operation could be provided in a coin controlled machine, during which the user would be free to vary the operations of the machine to meet particular requirements. The primary object of the present invention is to provide such a machine.

In carrying out the present invention in one of its practical forms, I employ the general arrangement of the ordinary household machine. That is to say, I use the usual control clock with the usual current switching unit and with the clock shaft provided with the manually operable knob adapted to be freely manipulated by the user to regulate the operations of the machine to particular conditions. However, I incorporate into the main motor control circuit an auxiliary time controlled switch which, in practice, forms part of an auxiliary current switching clock adapted, when set in operation by the insertion of a coin into an appropriate coin slot, to limit the operation of the machine to a predetermined period, say one-half hour. This auxiliary clock switch is in series with the main switch unit in the main control circuit to the operating motor of the washing machine. Cooperating with the coin slot I provide an appropriate coin switch adapted to be momentarily closed by a coin introduced into the machine and this switch is included in an auxiliary circuit which contains a solenoid or other appropriate electrical device. This solenoid is connected, as hereinafter described, to both the main clock shaft and the auxiliary clock, whereby the inser-

tion of the coin serves to properly set both the conventional clock and switch unit and also simultaneously set the auxiliary current switching clock, to close the main operating circuit and to maintain it closed for the predetermined period of operation of the auxiliary clock, during which the knob of the machine may be manually manipulated to control the particular operations of the machine according to the desires of the user, as will be hereinafter explained in detail.

With this arrangement the operations of the machine are limited to a predetermined period of time or duration for the insertion of each coin but the normal cycle operations are capable of manual adjustment to suit the particular characteristics of the fabrics to be washed.

Features of the invention, other than those adverted to, will be apparent from the hereinafter detailed description and claims, when read in conjunction with the accompanying drawing.

The accompanying drawing illustrates different practical embodiments of the invention, but the constructions shown therein are to be understood as illustrative, only, and not as defining the limits of the invention.

In the drawings,

Figure 1 is a schematic perspective view showing the preferred form of the present invention.

Figure 2 illustrates a modified form of the invention.

Figure 3 is a fragmental section perspective of a modified form of the invention.

For the purpose of graphic illustration of the present invention, I have chosen to show the same as associated with the household type of the well known "Bendix" washing machine. This machine comprises a main switch unit 1 with an associated main control clock 2, having a shaft 3 extending to the exterior of the machine and provided with a manually operable knob 4. The main switch unit 1 and the main control clock 2 are at all times under the control of the knob 4, as is conventional in this particular household machine. The main motor control circuit is indicated at 5. This circuit leads to the motor for operating the washing machine. Other conventional circuit connections to the unit 1 are omitted. All of the parts thus far described are entirely conventional and a showing thereof in detail is therefore considered unnecessary.

In equipping a machine of this type with the present invention, I mount on the clock shaft 3, within the confines of the machine, a mechanical shaft setting device which is wholly independent of the manually operable knob 4, so that the shaft may be rotated by either the knob or the setting device, selectively. As shown in Figure 1, this setting device consists of a loose pulley 6 and a ball ratchet 7. The ratchet 7 is fixed to the shaft 3 and cooperates with the loose pulley 6, so that when the loose pulley is rotated in a clockwise direction, the shaft 3 will be likewise conjointly operated, whereas the pulley is free to turn idly in a counter clockwise direction.

Laterally of the pulley 6 is positioned a solenoid, the coil 8 of which is included in an auxiliary circuit 9 adapted to be closed at a switch 10 when a coin is introduced through a coin slot 11. The introduction of the coin serves to momentarily close the circuit at the switch 10 and momentarily energize the solenoid. The core 12 of the solenoid is connected by a spring 13 to a shackle 14. To this shackle a flexible cable 15 is secured

and this cable extends to the loose pulley 6, is given a couple of turns around this loose pulley and then passed to and secured to one end of a take-up spring 16, the other end of which is secured to some rigid support on the machine.

To the shackle 14 is also secured a second flexible cable 17 which passes to and is wound about and anchored to a setting drum 18 secured to the setting shaft of an auxiliary current switching time clock 19. This auxiliary time clock 19 is secured to or has built into it a normally open auxiliary clock switch 20 which is included in the main control circuit to the motor for operating the machine.

Under normal conditions, the main switch unit 1 and main control clock 2 are in the off condition with the machine at rest. To start the machine a coin is deposited in the coin slot 11. It falls through the slot and engages the switch 10, which closes the switch and the auxiliary circuit 9 and energizes the solenoid coil 8. The solenoid core 12 is thereby drawn in, carrying therewith the attached ends of the flexible cables 15 and 17.

As the cable 15 is drawn about the loose pulley 6, this pulley is rotated in a clockwise direction and, through the ball ratchet 7, rotates the main clock shaft 3 into machine starting position, with the main switch unit 1 and main control clock 2 in such conditions as would normally initiate the operation of the machine, but inasmuch as the main control circuit 5 also includes the normally open auxiliary switch 20 of the time clock, the machine will not start until this latter switch is closed. This operation, however, is automatically performed by the cable 17 which is operated simultaneously with the operation of the cable 15. Consequently, by the time the coin has engaged with and rolled off of the switch 10, the auxiliary time clock switch 20 and the main switch unit 1 will have closed the main control circuit and the operations of the washing machine will be initiated.

The machine will continue to operate through continued energization of the main control circuit until the auxiliary time clock 19 is run down whereupon the switch 20 will open, break the main control circuit 5 and stop the machine. During the intervening period, however, the knob 4 may be manually turned at will by the user to vary the operations of the washing machine as may be desired.

The function of the spring 16 is to take up and play out the cable 15 as the solenoid 8 is energized and de-energized for it will be apparent that as soon as the coin leaves the switch 10, the auxiliary circuit will be broken and the spring 16 will be free to rotate the loose pulley in a counterclockwise direction to withdraw the core 12 of such solenoid and condition the parts for operation when the next coin is inserted for a subsequent period of operation of the machine.

In the apparatus shown in Figure 1, flexible cables 15 and 17 are shown for operating the mechanical setting device of the main clock shaft 3 and the setting drum of the auxiliary time clock 19 and these cables are both operated simultaneously by a solenoid in the auxiliary circuit. Instead of cables, however, for connecting the solenoid with these setting devices of the shaft and auxiliary clock I may substitute other appropriate mechanical connections, such as toothed racks, or the like.

In Figure 2 I have shown a construction wherein a rack may be used to operate the me-

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chanical setting device of the shaft from a coin slide, which slide is also provided with a projection for operating a setting device on the auxiliary time clock.

Referring specifically to this figure, 21 designates a slide which extends through one wall 22 of the machine and is provided exteriorly thereof with a pocket 11a to receive a coin. Within the machine, the slide is provided with a series of teeth 23 which form that portion of the slide into a rack, but behind these teeth the slide is smooth, so that when the slide is normally retracted by a spring 24, the teeth will be disengaged from the cooperating teeth of a loose gear 6a which corresponds to the loose pulley 6 of Figure 1 and which has a ball ratchet connection 7 with the shaft.

The auxiliary time clock 19 is positioned between the wall 22 and the main switch unit 1 and instead of having a setting drum 18, its setting device is in the form of a setting arm 18a which lies in the path of a projection 25 on the slide 21.

To operate the machine, a coin is deposited in the opening 11a and the slide is then pushed in. It operates idly for a sufficient distance to permit the coin to pass behind the wall 22 of the machine and thereupon the rack teeth 23 engage the loose gear 6a, while the projection 25 engages the setting arm 18a. Further inward movement of the slide rotates the shaft 3 into machine starting position and at the same time moves the setting arm 18a into the dotted line position to set the auxiliary time clock. When the slide is wholly pressed in, the unit 1 and the main control clock 2 and the auxiliary time clock will be set and at the same time the coin will fall out of the pocket 11a through a chute 26, leading to a coin receptacle.

It will of course be understood that any appropriate means, well known to the art, may be associated with the slide 21 to preclude this operation until a coin is inserted and to insure the release of the coin from the slide into the chute 26 when the operation is completed. This can be done in so many different ways common to the art, that no attempt has been made to show any particular structure for this purpose.

If the slide has been manipulated in the manner stated and is released by the operator, the spring 24 will return the slide into position to receive the next coin and inasmuch as the auxiliary time switch has been closed, the operation of the machine is initiated and will continue through the washing operations of the normal cycle for which the machine is designed. However, if the user desires to vary this cycle in any way to suit particular characteristics of the fabrics being washed, she is free to manipulate the knob 4 at will to obtain the appropriate adjustments or variations, i. e., to wash fabrics for ten minutes instead of twenty minutes or to eliminate the presoaking period, etc.

It will be noted that in both embodiments of the invention which I have described, the mechanical setting device for the main clock shaft is concealed within the casing 27 of the machine and operates upon said shaft wholly independently of the knob, so that the shaft may be manipulated either mechanically as stated or manually by rotation of the knob. So far as I am aware, I am the first to set the main clock shaft of a machine of the cycle type, independently of the knob of such shaft and by means concealed within the machine.

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In prior coin controlled machines the coin mechanism has been associated with the knob in such manner that, when the coin was introduced into the machine, the knob was rotated to rotate the shaft, while said knob was covered to preclude its independent manual manipulation. I therefore consider as novel and forming part of the present invention, the setting of the main shaft by means independent of the knob. The ability to thus rotate the main shaft makes it possible, in a modified form of the invention, to eliminate the auxiliary clock. For example, it is possible to eliminate the auxiliary time clock and its setting device and close the main circuit 5 at the point where the auxiliary clock switch is located.

With this arrangement, however, it is necessary to so arrange the machine that the user cannot manipulate the knob 4. If desired this knob may be removed, but in practice I preferably cover it with a transparent covering so as to render it inaccessible. I may, however, substitute for the knob an indicating pointer covered by a transparent cover or closure, as shown in Fig. 3 whereby the cycle of operations of the machine can be readily observed by the user, while excluding all manual operations of the shaft 3 by her. With such an arrangement, the deposit of the coin into the machine will cause the setting device on the main clock shaft 3 to rotate said shaft into machine starting position and the machine will run through its normal cycle of operations, which the operator cannot vary in any way. I do not consider this latter construction as satisfactory as the structure shown in Figures 1 and 2 of the drawings, but it is operative, and it will satisfactorily accomplish all that the present coin controlled machines can do, and in a better way.

The foregoing detailed description sets forth different forms of the invention and illustrative means for carrying them into effect, but the invention is to be understood as fully commensurate with the appended claims.

In the appended claims, a washing machine of the "cyclic type" means one which in normal operation automatically performs, in a predetermined sequence, a definite cycle of operations, during all of which the clothes or other fabrics remain within the cylinder or tank of the machine, to be removed only upon completion of such cycle.

Having thus fully described the invention, what I claim as new and desire to secure by Letters Patent is:

1. In a motor driven washing machine of the cyclic type, wherein the main control circuit to the motor is governed by a main switch unit and a main clock having a manually operable main shaft; the improvement which comprises an auxiliary current switching time clock provided with a setting device and included in said main control circuit, a setting device connected to the main switch unit and main clock, and coin controlled means for operating both of said setting devices to adjust the main switch unit and main clock to machine starting position and to also set the auxiliary time clock to close the main control circuit at said time clock and maintain it closed at this point for a predetermined period of time during which the main shaft may be rotated at will by the user.

2. In a motor driven washing machine of the cyclic type, wherein the main control circuit to the motor is governed by a main switch unit and

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a main clock having a manually operable main shaft; the improvement which comprises an auxiliary current switching time clock included in said main control circuit and normally opening said circuit at this point, coin controlled means operatively connected to both the manually operable main shaft and to the auxiliary current switching time clock to rotate the main shaft into machine starting position and to also set the auxiliary current switching time clock to close the main control circuit at said time clock and maintain it closed at this point for a predetermined period of time during which the main shaft may be rotated at will by the user.

3. In a motor driven washing machine of the cyclic type, wherein the main control circuit to the motor is governed by a main switch unit and a main clock having a manually operable main shaft; the improvement which comprises an auxiliary current switching time clock included in said main control circuit and normally opening said circuit at this point, an auxiliary circuit operatively connected to both the main shaft and the auxiliary time clock, and a coin controlled switch for closing said auxiliary circuit to rotate the main shaft into machine starting position and set the auxiliary current switching time clock to close the main control circuit at said time clock and maintain it closed at this point for a predetermined period of time during which the main shaft may be rotated at will by the user.

4. In a motor driven washing machine of the cyclic type, wherein the main control circuit to the motor is governed by a main switch unit and a main clock having a manually operable main shaft; the improvement which comprises an auxiliary current switching time clock included in said main control circuit and normally opening said circuit at this point, a solenoid having a core mechanically connected to both the main shaft and the auxiliary time clock, and an auxiliary circuit including the coil of said solenoid, and a coin controlled switch adapted when closed by a coin to energize the solenoid to rotate the main shaft into machine starting position and to set the auxiliary current switching time clock to close the main control circuit at said time clock and maintain it closed at this point for a predetermined period of time during which the main shaft may be rotated at will by the user.

5. In a motor driven washing machine of the cyclic type, wherein the main control circuit to the motor is governed by a main switch unit and a main clock having a manually operable main shaft; the improvement which comprises an auxiliary current switching time clock included in said main control circuit and normally opening said circuit at this point; a loose pulley having a ratchet connection with said main shaft, a setting drum on the auxiliary time clock, a solenoid, the core of which is attached to cables respectively wrapped about the loose pulley of the

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main shaft and the setting drum of the time clock, and the coil of which solenoid is included in an auxiliary circuit having therein a coin controlled switch adapted when closed by a coin to energize the solenoid to rotate the main shaft into machine starting position and to also set the auxiliary current switching time clock to close the main control circuit at said time clock and maintain it closed at this point for a predetermined period of time during which the main shaft may be rotated at will by the user.

6. In a motor driven washing machine of the cyclic type, wherein the main control circuit to the motor is governed by a main switch unit and a main clock having a manually operable main shaft; the improvement which comprises an auxiliary current switching time clock provided with a setting device and included in said main control circuit, a setting device connected to the main switch unit and main clock, and a manually operable coin controlled means for operating both of said setting devices to adjust the main switch unit and main clock to machine starting position and to also set the auxiliary time clock to close the main control circuit at said time clock and maintain it closed at this point for a predetermined period of time during which the main shaft may be rotated at will by the user.

7. In a motor driven washing machine wherein the main control circuit of the motor includes a main switch having a manually operable shaft and adapted to normally open the main control circuit at one point; the improvement which comprises: a normally open auxiliary switch also included in the main control circuit and adapted to normally open said circuit at another point, coin controlled means for simultaneously closing both the main switch and the auxiliary switch, and an auxiliary clock connected to the auxiliary switch to maintain said auxiliary switch closed for a predetermined period after it has been thus closed.

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