Aug. 7, 1945. J. B. KIRBY 2,381,545

LAUNDRY MACHINE

Filed Nov. 24, 1941 3 Sheets-Sheet 1

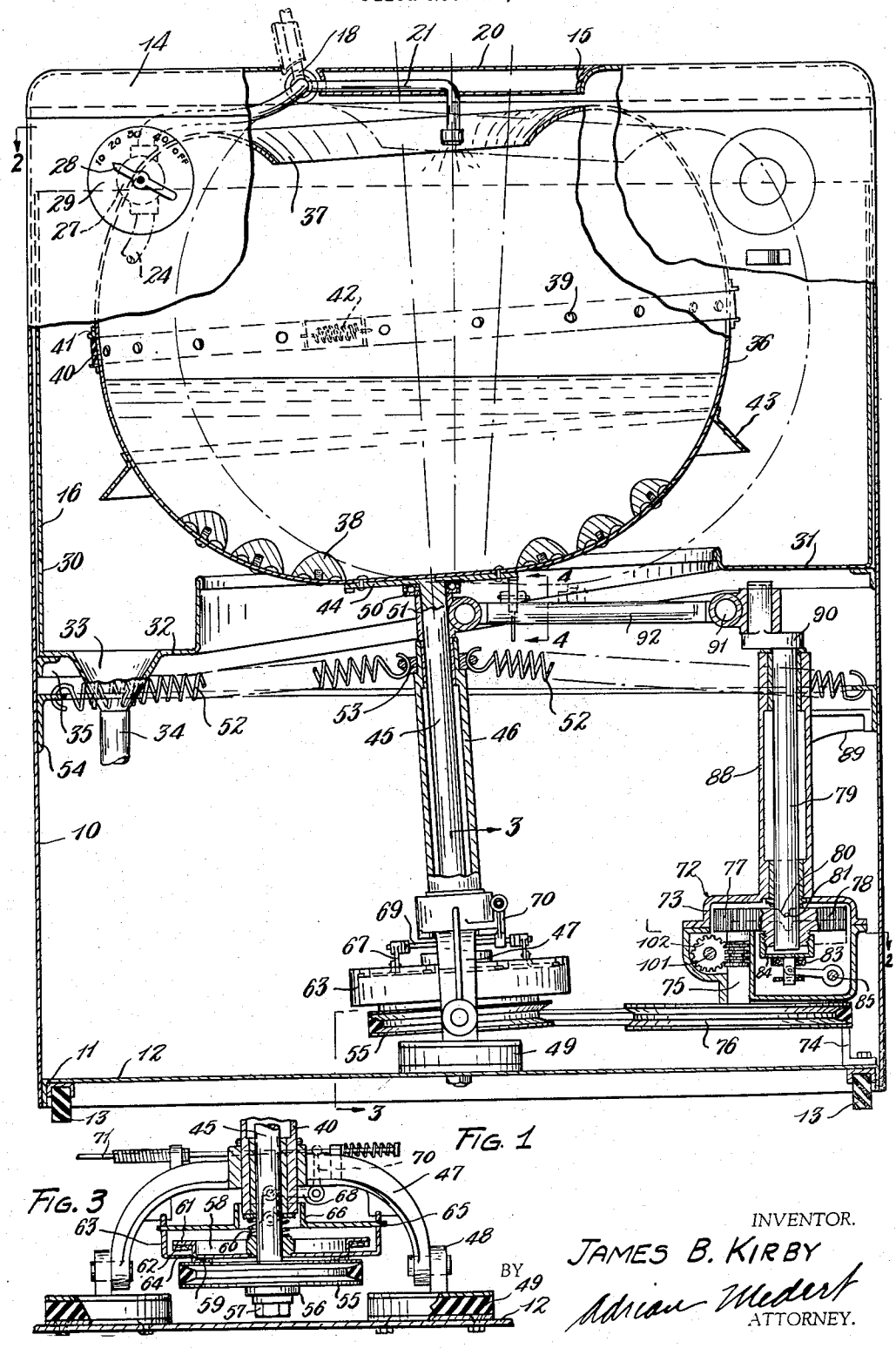


FIG. 1

FIG. 3

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LAUNDRY MACHINE

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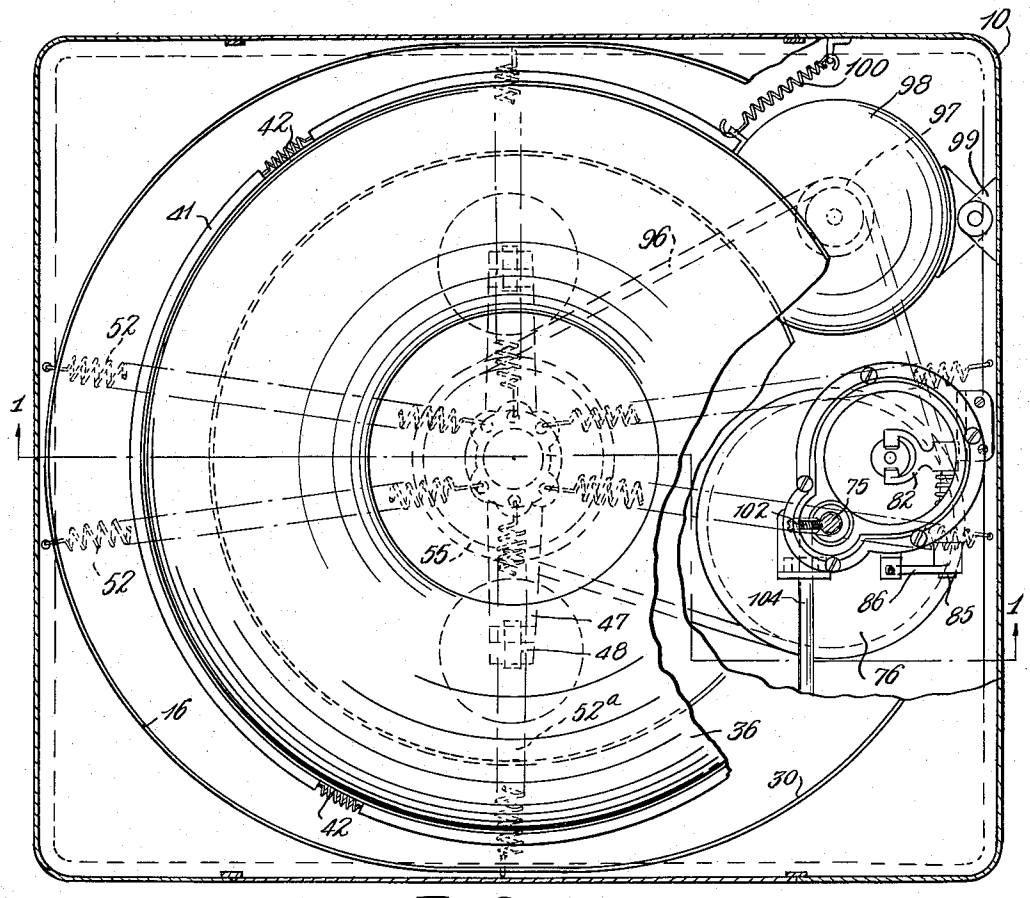


FIG. 2

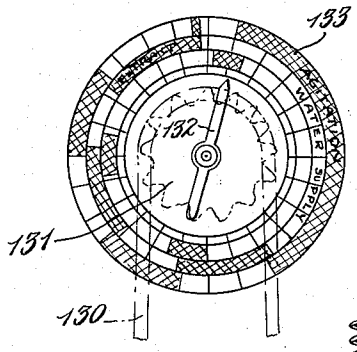


FIG. 16

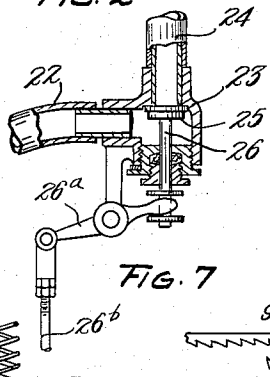


FIG. 7

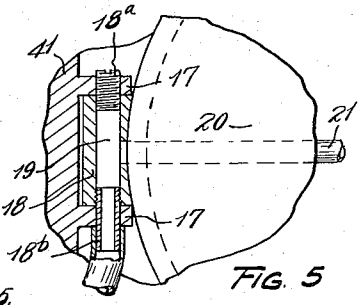


FIG. 5

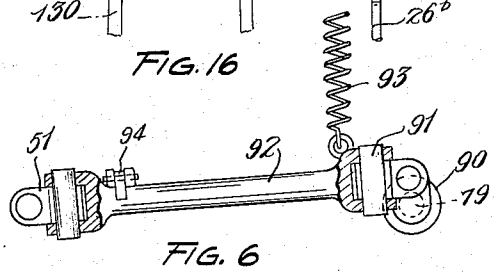


FIG. 6

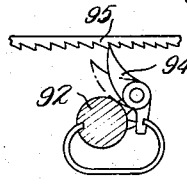


FIG. 4

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LAUNDRY MACHINE

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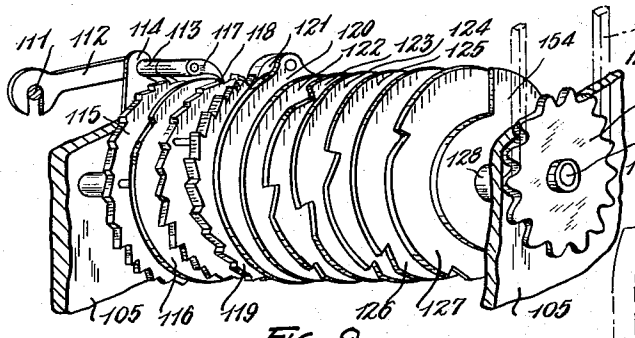


FIG. 9

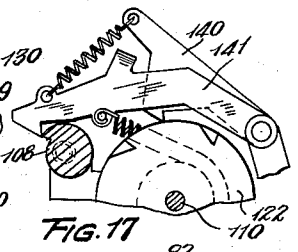
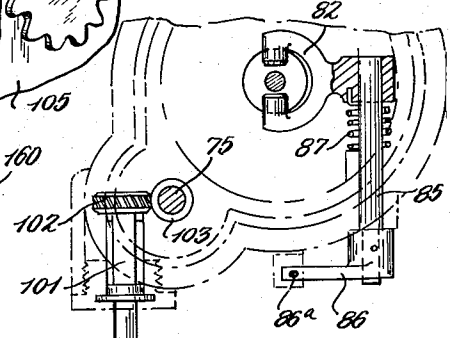


FIG. 17



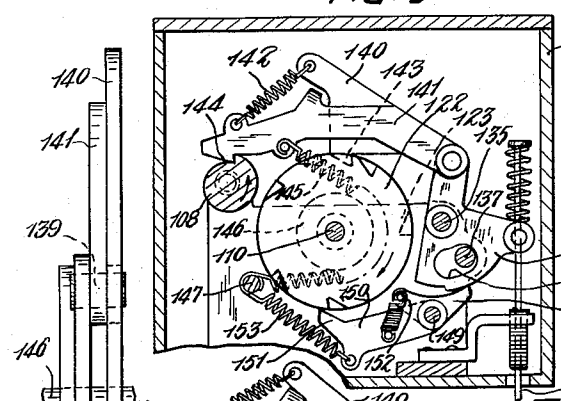


FIG. 10

FIG. 13

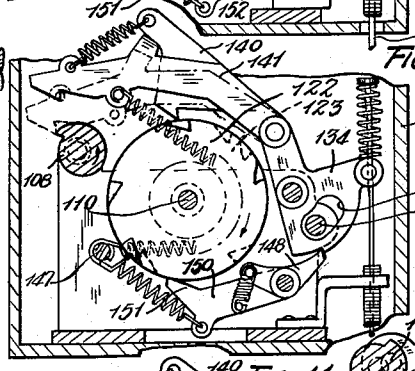


FIG. 11

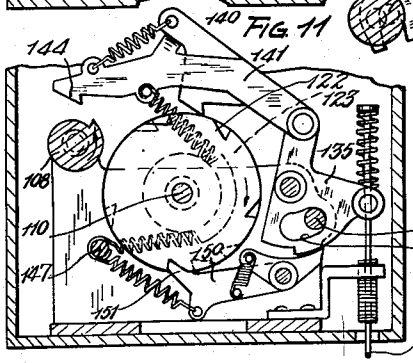


FIG. 12

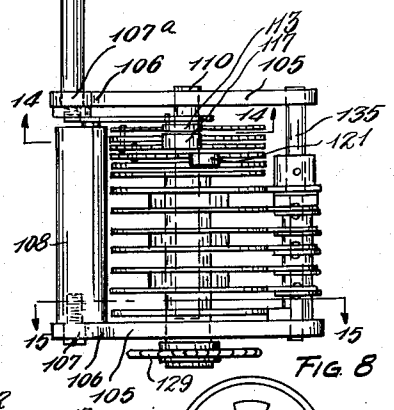


FIG. 8

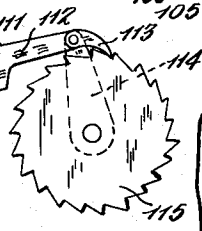


FIG. 14

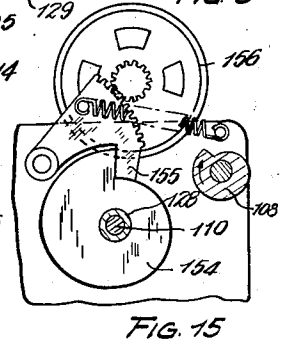


FIG. 15

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UNITED STATES PATENT OFFICE

2,381,545

LAUNDRY MACHINE

James B. Kirby, West Richfield, Ohio, assignor to The Apex Electrical Manufacturing Company, Cleveland, Ohio, a corporation of Ohio, as trustee

Application November 24, 1941, Serial No. 420,242

11 Claims. (Cl. 192—139)

This invention relates to domestic laundry machines, and more particularly to an improved machine wherein washing, rinsing and extracting operations are performed in a single tub, and which includes novel time control mechanism for automatically starting and stopping the various operations in proper sequence and at proper time intervals. This application constitutes a continuation in part of my copending applications, Serial No. 364,902, filed November 8, 1940, and Serial No. 377,693, filed February 6, 1941.

It is among the objects of my invention to provide a laundry machine having a single tub wherein washing, rinsing and extracting operations may be performed upon a batch of clothing disposed therein, and including a new and improved timing mechanism for controlling said operations for predetermined periods of time and in a predetermined sequence.

It is a still further object of my invention to provide a laundry machine having a power unit to effect a washing of the clothes in a basket, and thereafter centrifugally extract the water from the clothes in said basket, wherein the washing and extracting operations are controlled by a timer which is driven by the power unit and wherein the force required to operate the clutches for the washing and extracting operations is transmitted directly to said clutches from the power unit without being carried through the timer itself.

It is a further object of my invention to provide a timer according to the preceding object in which a rotating member connected directly to the power unit is arranged alongside a series of timer discs and power transmitting links are adapted to be moved by the timer discs into the path of said rotating member so that the force of operating the clutches of the laundry machine is carried directly from the rotating member to the clutches through said links without being transmitted through the timer discs.

The foregoing and other objects of the invention will become more apparent and better understood after consideration has been given to the following detailed description taken in conjunction with the accompanying drawings, wherein like reference characters denote corresponding parts, and wherein:

Figure 1 is a fragmentary sectional view through laundry apparatus constructed according to my invention, taken generally on the line 1—1 of Figure 2 and embodying a combined washing and extracting container;

Figure 2 is a sectional view taken on the line 2—2 of Figure 1 with parts thereof broken away to illustrate the drive for the reciprocating mechanism for the combined washing and extracting container;

Figure 3 is an enlarged sectional detail taken on the line 3—3 of Figure 1;

Figure 4 is an enlarged fragmentary sectional detail of a portion of the bottom of the container taken on the line 4—4 of Figure 1;

Figure 5 is an enlarged sectional detail illustrating the water supply conduit through the hinge construction of the cover of the casing of the machine;

Figure 6 is a detail view of the crank arm for reciprocating the container.

Figure 7 is an enlarged sectional detail of the valve construction controlling the flow of water to the machine;

Figure 8 is a top plan view of the timing and control mechanism illustrating its relative position with respect to the driving mechanism of the machine, with parts thereof omitted.

Figure 9 is a fragmentary perspective view of a portion of the timing and control mechanism, illustrating the cam discs thereof;

Figures 10, 11 and 12 are fragmentary detail views of the elements of the timing and control mechanism illustrating one set of cam discs in different operating positions;

Figure 13 is an enlarged fragmentary side elevational detail of the elements of the timing mechanism positioned as shown in Figure 11;

Figure 14 is a sectional view taken on the line 14—14 of Figure 8;

Figure 15 is a sectional view taken on line 15—15 of Figure 8;

Figure 16 is a plan view of the dial and indicating handle for the timing and control mechanism, and

Figure 17 is a fragmentary detail illustrating one position of the actuating levers with respect to its associated cam disc.

With reference to the accompanying drawings and particularly to Figures 1 and 2, the present invention is directed to a laundry machine including a substantially rectangular casing 10 suitably secured to and supported by the depending flange 11 of a base plate 12. The plate 12 may be supported in any suitable manner, as for example, by the cushion elements 13, as illustrated in Figure 1. The casing 10 is provided with a top 14 having a centrally disposed flanged opening 15 therein affording access to the inside of the casing in which there is mounted a shell or tub 16. Formed integrally with the top 14 at

one side of the opening 15 are a pair of spaced hinge lugs 17 (see Figure 5), adapted to rotatably receive therebetween a hinge member 18 attached to a closure or lid 20 for the opening 15. The hinge member 18 is provided with a duct 19 suitably closed at one end by the hinge pin 18a, and is provided with hinge tube 18b at the other end. Leading from the duct 19 and terminating in a downturned nozzle adjacent the central part of the opening 15 is a conduit 21 which serves to direct a spray of water into a container positioned within the shell 16.

For supplying water to the machine, one end of an intake conduit 22 may be connected to a source of water supply, and the other end to the intake port of a control valve 23 (see Figure 7), which controls the flow of water to the spray nozzle projecting into the casing. The valve 23 includes a valve member 25 suitably mounted on the end of a valve stem 26, which is adapted to be actuated by the timing and control mechanism hereinafter described through the lever 26a and wire rod 26b. In the conduit 24, there is provided a regulating needle valve 27 which is manually controlled by an indicating lever 28 mounted on the side wall of the upper portion of the casing 10, which lever has a dial 29 associated therewith. The valve 27 serves to regulate the volume of water flowing through the conduit 24 and to compensate for different pressures on the supply line so that when the valve 23 is opened for a predetermined time interval, a definite volume of water will be introduced into the container positioned within the casing.

The shell 16 is formed with a wall portion 30 which is substantially oval in cross-section, having an inwardly extending trough 31 formed on the lower edge thereof. The bottom 32 of the trough is downwardly inclined toward one side and terminates in an outlet 33, which may be connected by a conduit 34 to any suitable drain. The shell 16 is supported on angles 35 secured to the inner wall of the casing 10.

Disposed within the shell 16 is a combined washing, rinsing and extracting container 36, which is generally spherical in contour having a flanged opening 37 in the top thereof, through which clothing and washing fluid are introduced into the container. Mounted on the lower inner surface of the container are suitable washing projections 38 against which the clothing is adapted to be rubbed and scrubbed during the washing operation. Extending through the wall of the container at the line of greatest diameter are a plurality of apertures 39 disposed in a ring about the container and through which fluid is adapted to be expelled from the container by centrifugal force upon rapid rotation of the container. The apertures 39 are normally sealed by a resilient band 40 mounted on the exterior surface of the container and maintained in position by angular members 41. Circumferentially spaced springs 42 tighten the band to seal the openings until centrifugal force counteracts the spring tension and releases the fluid through the openings 39. An inclined drip rim 43 secured to the outer surface of the container below the apertures 39 directs fluid flowing therefrom into the trough 31.

The container 36 is secured to the upper surface of a plate 44 formed on the end of a drive shaft 45 rotatably mounted within a tubular housing 46. The lower end of the housing is supported by a yoke 47, the ends of which are pivotally connected to spaced bracket members 48 mounted on the base plate 12. Resilient pads 49 are disposed between the base of the bracket members 48 and base plate 12 to provide a resilient support for the housing 46. On the shaft 45 between the upper end of the housing 46 and the lower surface of the plate 44 are positioned roller bearings 50 and a coupling member 51. For facilitating the oscillating movement of the container, there is provided a plurality of coil springs 52 extending radially from a ring 53 encircling the upper end of the housing 46, to bracket members 54 secured to the inner walls of the casing 10. These springs serve to urge the return of the container at the end of each reciprocating stroke. Transverse springs 52a cooperate with springs 52 to maintain the container in equilibrium during the extracting operation.

The lower end of the drive shaft 45 extends below the housing 46 and has freely rotatable thereon a pulley wheel 55 which is maintained on the shaft by means of a thrust bearing 56 and a nut 57. Slidably splined to the shaft 45 between the pulley 55 and the end of housing 46 is a drum 58 having a friction shoe 59 on the lower surface thereof and engageable with the face of the pulley 55. The drum 58 is normally urged into operative engagement with the pulley wheel 55 by means of a coil spring 60 encircling the shaft 45 between the hub of the drum 58 and the end of the shaft housing 46, to effect a driving connection between pulley 55 and shaft 45 for rotating the latter. The drum 58 is provided with an outwardly extending flange 61 having a friction shoe 62 secured to the lower surface thereof. A cylindrical member 63 encircling the drum 58 is formed with an inturned flange 64 against which the friction shoe 62 bears when it is desired to retard or stop the rotation of the shaft 45 and to disengage the shaft from the pulley 55. The member 63 which serves to move the drum 58 along the shaft 45 against the force of the spring 60 is actuated by a disc 65 formed with a central sleeve 66 which encircles the lower end of the housing 46. The disc 65 is supported on the lower ends of links 67 pivoted to the ends of the crank arms 68 on the rod 69 which is journalled in a suitable bearing formed on the yoke 47. Rotative movement is imparted to the rod 69 by a lever 70 adapted to be actuated by a wire 71 leading from the timing and control mechanism to be hereinafter described.

For washing clothing, the container 36 is oscillated within the shell 16 by applying a reciprocating force to the upper end of the shaft 45 to rock or oscillate the shaft about its pivotal support. This movement is carried out by suitable driving mechanism 72 which through associated linkage serves to reciprocate the shaft 45 about the pivots 48. This driving mechanism (see Figure 1) comprises a casing 73 supported in a bracket 74 mounted on the base plate 12. Disposed within the casing 73 is a vertical drive shaft 75 which extends downwardly through the wall of the casing and has mounted thereon a pulley wheel 76. The upper end of the shaft 75 carries a pinion 77 which is adapted to mesh with a gear wheel 78 freely rotatable on the lower end of a shaft 79. The upper surface of the gear wheel 78 is provided with a diametrically extending slot 80 which is adapted to receive the opposite ends of a pin 81 extending diametrically through the lower end of the shaft 79. The gear wheel 78 is slidably in mesh with the pinion 77 and rotates continuously during the operation of the machine, and the shaft 79 is operatively connected to the gear

wheel 78 by bringing the slot 80 into engagement with the pin 81. For shifting the gear wheel longitudinally of the shaft, there is provided a yoke 82 engageable with an extension 83 formed on a cap 84 threaded on the hub of the gear wheel 76. The yoke 82 is actuated by means of a rod 85 having a crank arm 86 on its outer end which is operatively connected to the timing mechanism by means of a wire 86a. A spring 87 encircling the rod 85 normally urges the yoke 82 upwardly to engage the gear wheel and shaft 79.

The shaft 79 is journalled in an upwardly extending housing 88 formed integrally with the gear case 73. A bracket 89 extending from the housing 88 to the wall of the casing 10 serves to support the upper end of the housing 88. Formed on the upper end of the shaft 79 is a crank arm 90 which has associated therewith a universal coupling member 91. A connecting rod 92 extends between the coupling member 51 on the shaft 45 and the coupling 91 on the crank 90. A spring 93 (Figure 6) extending transversely from the end of connecting rod 92 to the wall of the casing 10 serves to urge the crank arm out of alignment with the shafts 79 and 45 to permit longitudinal free movement of the connecting rod 92. A spring pressed pawl 94 (see Figure 4) mounted on the connecting rod 92 and engageable with a rack 95 formed on the lower surface of the plate 44 effects a step by step rotation of the container 36 during the linear reciprocation thereof. This rotative movement of the container changes the position of the clothing therein with respect to the path of reciprocation to insure that all of the clothing within the container may be uniformly washed.

The pulley wheel 55 on the shaft 45 and the pulley wheel 76 of the reciprocating mechanism are operatively connected by means of a belt 96 to the driving pulley 97 mounted on the lower end of the armature shaft of a motor 98. Motor 98 is pivotally mounted in a bracket 99 secured to the wall of the casing 10, and the belt 96 is tensioned by a spring 100 extending between the motor 98 and a bracket secured to the casing wall.

With reference to Figures 8 to 16, inclusive, there is illustrated timing mechanism for controlling the actuation of the container 36 within the shell 16 and the supply of water thereto through the valve 23. Journalled in the gear case 73 (see Figure 1), is a shaft 101 having a worm wheel 102 attached to the inner end thereof and adapted to engage a worm 103 formed on the drive shaft 75. The outer end of the shaft 101 has connected thereto a rod 104 serving to connect worm 102 for driving the timing and control mechanism which is suitably supported between spaced bracket members 105. On one side of the bearing plates 105 are formed aligned upstanding ears 106 between which is mounted an elongated actuating cam 108 which is adapted to be rotated in a counterclockwise direction, and supported at each end on stub shafts 107 and 107a. The shaft 107a is connected by means of a threaded shank on the end of driving rod 104. Mounted on a shaft 110 which is supported in the bearing plates 105 are a series of ratchets and cam discs for timing and controlling the sequence of operation of the various washing steps carried out in the container 36.

Attached to and driven by an eccentric 111 mounted on the shaft 107a is a rod 112 which actuates a pawl 113 (see Figure 14), supported on the upper end of an arm 114. The pawl 113 serves to rotate a ratchet wheel 115 on the shaft 110, which is operatively connected to disc 116 having a single notch in the periphery thereof. Associated with the pawl 113 for movement therewith is a second pawl 117 which normally rides on the peripheral surface of the disc 116 and is adapted to engage the teeth of a second ratchet wheel 118 and rotate the same the distance of one tooth upon each rotation of the disc 116.

Attached to the ratchet wheel 118 for rotative movement therewith is another ratchet wheel 119 with the teeth thereof extending in a reverse direction. Ratchet wheel 115 and disc 116 and ratchet wheels 118 and 119 rotate as pairs freely upon the shaft 110, the driving connection therebetween being the pawl 117. Adjacent the ratchet wheel 119 is a disc 120 supporting a spring pressed pawl 121 adapted to engage and be driven by the ratchet wheel 119. The disc 120 together with a group of cam disc elements 122, 123, 124, 125, 126 and 127 are keyed on a sleeve 128 to rotate as a unit about the shaft 110. The drive through pawl 121 permits the set of discs fixed to sleeve 128 to be manually advanced through the operating cycle. The sleeve 128 extends through the bearing plates 105 and has mounted thereon a sprocket wheel 129. The sprocket wheel 129 by means of a chain 130 and a second sprocket 131, is connected to the indicating lever 132 associated with an indicating dial 133 (see Figure 16) mounted on the upper portion of the side wall of the casing 10. An appropriate ratio between the ratchet members is employed so that the sleeve 128 and cam disc elements carried thereby are rotated by the mechanism once in twenty-four minutes, which constitutes a complete cycle of operation, as indicated on the dial 133 of Figure 16. The cam disc elements 123 and 122 serve to control the starting and stopping of the mechanism for oscillating the container 36; discs 124 and 125 similarly control the mechanism for rotating the container for extracting operations, and discs 126 and 127 control the operation of the valve 23 regulating the flow of water into the container. The foregoing pairs of control discs are substantially similar, differing only in the relative positions of the cam notches formed in the peripheries thereof. Furthermore, the sets of levers which are actuated by each pair of discs are similar and accordingly, for purposes of brevity and simplification, only one set of levers will be described herein.

In Figures 10, 11 and 12, there is disclosed the three positions of the levers actuated by any one pair of cam discs. With reference to these figures, the control levers comprise a toggle arm 134 pivotally mounted on a shaft 135 extending between the bearing plates 105. An elongated slot 136 through which extends a rod 137 supported between the bearing plates 105 defines the extent of movement of the toggle arm 134. Pivoted to the toggle arm 134 as at 139 are a pair of arms 140 and 141, which extend over their associated control discs, and are connected to operate together by means of a spring 142. The arm 140 is provided with a finger 143 which normally rides on the peripheral surface of its associated disc and drops within the notches formed therein as the discs are slowly rotated into position. Disc-like washers may be secured to each side of the cam disc of greater diameter to form therewith a grooved peripheral surface for receiving and guiding the cam engaging fingers of the levers. The arm 141 is formed with a finger 144 which, when the finger

143 drops into a notch, is lowered into position to be engaged by the rotating cam shaft 108. The cam shaft 108, which is rotating in a counterclockwise direction pulls the arm 141 into the position shown in dotted lines in Figure 11, and moves the toggle arm 134 from the position shown in Figure 10 to that shown in Figure 11. As the link 141 is moved from the position shown in Figure 10 to its dotted line position shown in Figure 11, the portion 143 on member 140 rides up the cam surface out of the notch so as to raise the member 140 to position shown in Figure 11. The spring 142 then is effective to raise the end of the finger 144 out of the path of the rotating cam 108. The arms 140 and 141 are normally urged into actuating position with respect to the timing disc and cam shaft 108 by means of a spring 145 extending from the arm 141 about a spacer disc 146 on the shaft 110, and anchored to a rod 147 extending between the bearing plates 105. The spring 145 also serves to return the arms 140 and 141 to the position shown in Figure 10, when the finger 144 is disengaged from the cam shaft 108. When the toggle arm 134 is shifted into the position illustrated in Figure 11, a pawl 148 pivotally mounted on a rod 149 is caused to engage a notch in the lower surface of the toggle arm 134, and maintain it in its extended position. Associated with the pawl 148 is an arm 150 having one end pivoted to the rod 149 extending between plates 105, and the other end formed with a finger 151 adapted to ride on and drop into notches formed in the periphery of a timing disc. The pawl 148 and arm 150 are operatively connected together by means of a spring which maintains a pin 152 in engagement with the edge surface of arm 150. A tensioned spring 153 extending between the arm 150 and the rod 147 serves to maintain the finger 151 in engagement with the periphery of the disc 122. When the finger 151 drops in one of the notches of its associated disc 122, the arm 150 rocks clockwise and through pin 152, the pawl 148 is disengaged from the toggle arm 134, permitting the toggle arm to return to its initial position, as illustrated in Figure 12. The timing mechanism may be suitably enclosed within a housing 160 which is in turn supported in any suitable manner within the casing 10.

Mounted on the sleeve 128 is a cam element 154 controlling a segment arm 155 (see Figure 15 which actuates a three way snap switch 156. The switch 156 serves to open the electric circuit to the motor 98 upon the completion of a cycle of operation of the machine. A manually operated three way toggle switch 157 on the wall of the casing below the dial 133 is interconnected with the switch 156 to control the motor circuit, so that after the circuit is manually closed by switch 157, it may be automatically opened by switch 156.

While I have described a preferred embodiment of my invention, it is to be understood that various changes and modifications may be made therein without departing from the scope or spirit of the invention as defined in the appended claims.

What I claim is:

1. A timer comprising a rotating driver element, a cam disc arranged adjacent said driver element, a clutch control, a link connected to said clutch control mounted to have one part thereof arranged to bear against the periphery of the cam disc and a second part thereof adapted to be brought into engagement with said driver, means to rotate said cam disc, said second part being brought into engagement with and moved by said driver in response to disc rotation whereby the clutch control is moved by said link and driver and the force effecting such movement is not transmitted through said cam disc, means operable independently of the driver element and cam disc for holding the clutch control in moved position, and continued disc rotation effecting release of said holding means.

2. A timer comprising a rotating driver element, a cam disc arranged alongside of said driver element, a clutch control, a link connected to said clutch control mounted to have one part thereof bearing on the periphery of the cam disc and a second part thereof adjacent said driver, means to rotate said cam disc, said second part being brought into engagement with and moved by said driver in response to disc rotation whereby the clutch control is moved by said driver and link independently of the disc, means operable independently of the driver element and cam disc for holding the clutch control in moved position, and continued disc rotation effecting release of said holding means.

3. A timing mechanism for a laundry machine comprising a continuously rotated driver element, a plurality of cams mounted adjacent said driver, means to progressively advance said cams by driven rotation, a plurality of levers each mounted to bear against a different one of said cams, a portion of each lever being movable into and out of engagement with said driver by variations in cam contour, controls for said laundry machine operatively connected to said levers, means operable independently of the cams and driver element for holding the controls in actuated positions, and means operable by variations in cam contour for releasing the holding means.

4. A timing mechanism for controlling the various operations of a laundry machine comprising power means, operating levers adapted to be connected to the operating elements of the laundry machine, cam means for selectively connecting said levers to said power means to advance the lever to actuate the said operating element, means operable independently of the cam means and power means for maintaining the lever in its advanced position, and cam means effective to release the lever and return it to its normal position upon the expiration of a predetermined time interval.

5. Timing mechanism for actuating in predetermined sequence and at predetermined intervals the control elements of a laundry machine comprising a driver element continuously rotating in one direction, a cam disc mounted on an axis parallel to the axis of the driver element and rotatable in the opposite direction, a pivotally mounted lever operatively connected to one of the said control elements, a link serving to connect the lever to said driver element, means responsive to variations in cam contour for moving said link into and out of engagement with said driver element, means operable independently of said driver element and cam disc for holding the control elements in actuated position, and continued rotation of said cam disc effecting release of its associated holding means by variation in cam contour.

6. Timing mechanism for actuating in predetermined sequence and at predetermined intervals the control elements of a laundry machine comprising a driver element continuously rotat-

ing in one direction, a cam disc mounted on an axis parallel to the axis of the driver element and rotatable in the opposite direction, means for connecting said cam disc to said driver element for rotating said cam at a reduced speed, a pivotally mounted lever for actuating one of the said control elements, a link member serving to connect the driver element to said lever to advance the latter, means responsive to variations in cam contour for moving said link into and out of engagement with said driver element, means operable independently of said driver element and cam disc for holding the control element in actuated position, and means operable by continued rotation of the cam disc moving the holding means to an inoperative position.

7. Timing mechanism for actuating in predetermined sequence and at predetermined intervals the control elements of a laundry machine comprising a driver element continuously rotating in one direction, a cam disc mounted on an axis parallel to the axis of the driver element and rotatable in the opposite direction, means for connecting said cam disc to said driver element for rotating said cam at a reduced speed, a pivotally mounted lever for actuating one of the said control elements, a link serving to connect the driver element to said lever to advance the latter, means responsive to variations in cam contour for moving said link into and out of engagement with said driver element, means operable independently of the driver element and cam disc for maintaining the lever in its advanced position, and cam means effective to release the lever and return it to its normal position.

8. Timing mechanism for actuating in predetermined sequence and at predetermined intervals the control elements of a laundry machine comprising a driver element continuously rotating in one direction, a plurality of cam discs mounted on an axis parallel to the axis of the driver element and rotatable in the opposite direction, means for driving said cam discs as a unit from said driver element and at a reduced speed, pivotally mounted levers operatively connected to the said control elements, links serving to connect said driver element to said levers to advance the latter, means responsive to variations in cam contour for moving said links into and out of engagement with said driver element, and means independent of said cam discs and driver element for maintaining said levers in an advanced position.

9. A timer comprising a continuously rotating cam, a rotating timer disc having a notch with an inclined side wall, a pair of connected links overhanging said disc and cam, one of said links having a portion to bear on the disc to lower said pair as the disc is turned to lower said portion in said notch, the other of said links having a portion to engage said cam in said lowered position, the rotating movement of the cam in said last named position being effective to move said pair of links longitudinally and cause said first named portion to ride up said inclined side wall and raise said second link out of the path of said cam, means operable independently of the disc and cam for holding the second link in raised position, and said holding means having a portion engageable with a second notch in the disc permitting movement of the holding means to an inoperative position.

10. A timer comprising a moving power operated means, a power transmitting member, an indexing device to control the position of said member and move the same into the path of said means whereby said member is moved in one direction, and means to move said member out of the path of said first named means subsequent to said movement in one direction, and means operable independently of the power operated means and indexing device to hold said member out of the path of the power operated means for a predetermined period.

11. A timer for automatically controlling the time during a cycle at which a controlled mechanism is actuated and the duration of such actuation, said timer comprising a rotatable driver element, a cam disc arranged adjacent the driver element, link means operatively connected to the controlled mechanism and adapted to engage the driver element, the link means including a part engaging the cam disc and movable by disc rotation to bring the link means into engagement with the driver element whereby the controlled mechanism will be actuated solely by power transmitted through the link means from the driver element, means independent of the driver element and cam disc engageable with the link means to hold the controlled mechanism in an actuated position, means operable by the cam disc for disengaging the link means from the driver element while maintaining the controlled mechanism in actuated position, and means operable by the cam disc for moving the link engageable means to an inoperative position permitting the controlled mechanism to return to its non-actuated position.

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