March 6, 1951 G. RIPLEY, III 2,543,938

COIN CONTROLLED ELECTRIC CIRCUIT

Filed April 8, 1948 2 Sheets-Sheet 1

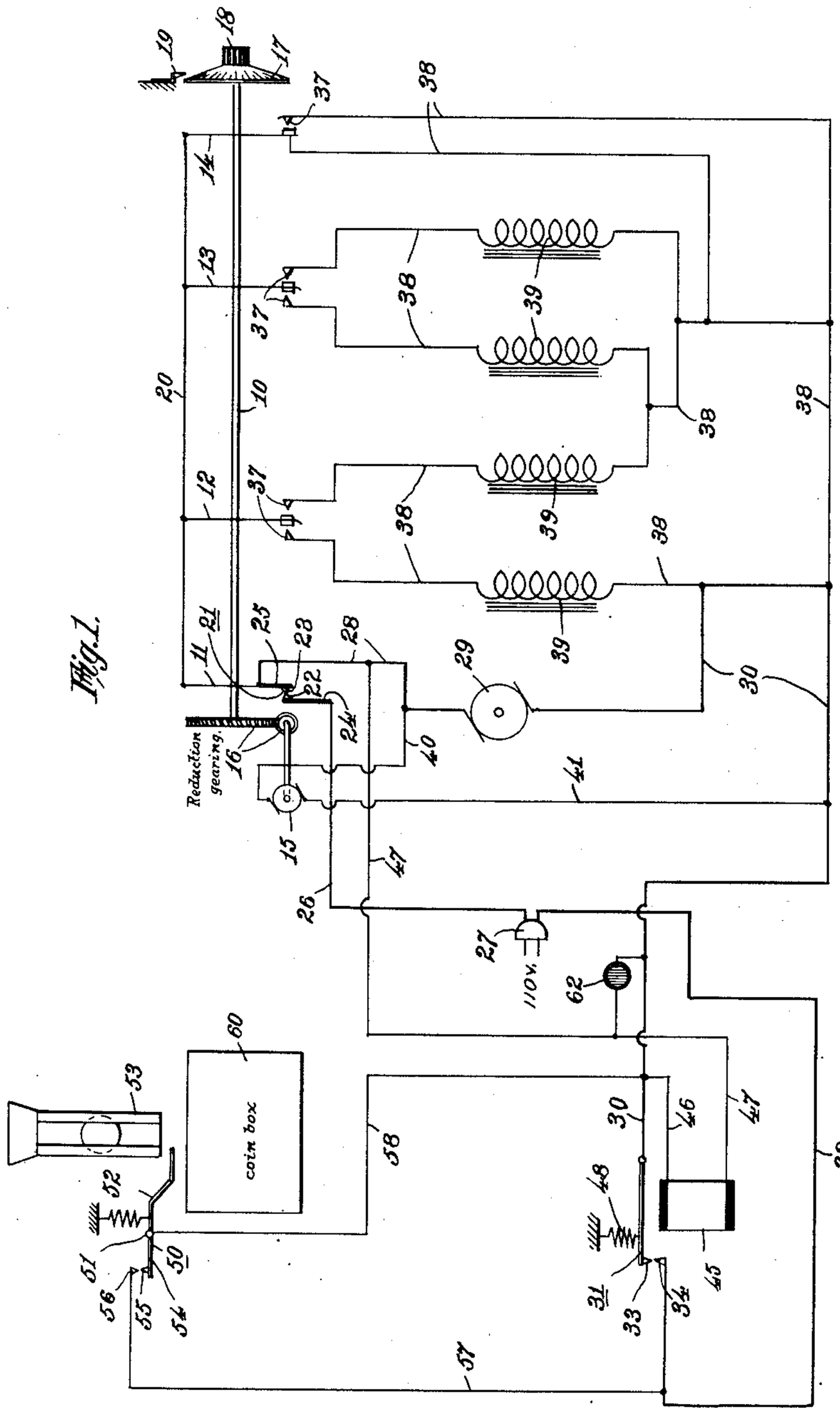

Fig. 1.

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Fig. 2.

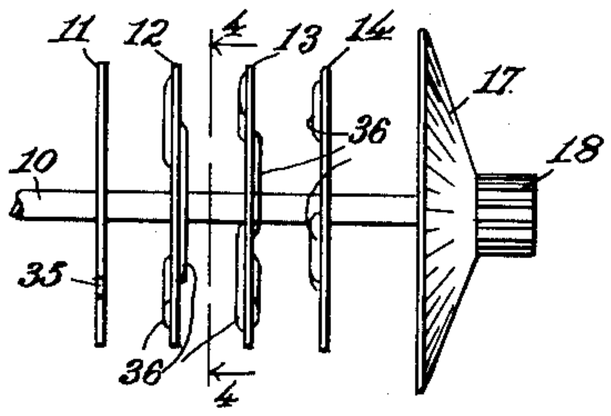


Fig. 3.

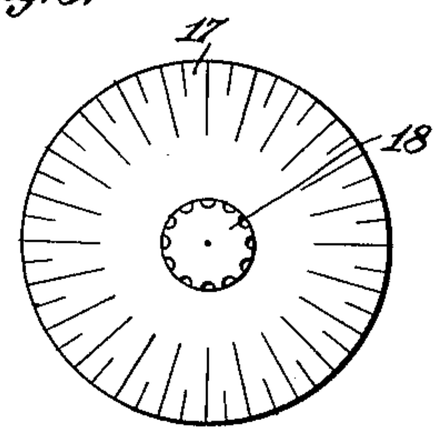


Fig. 6.

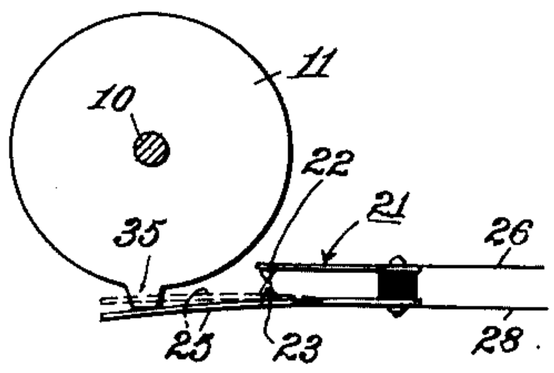


Fig. 4.

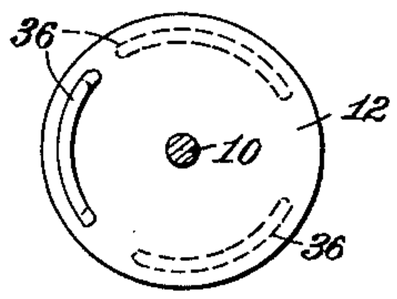
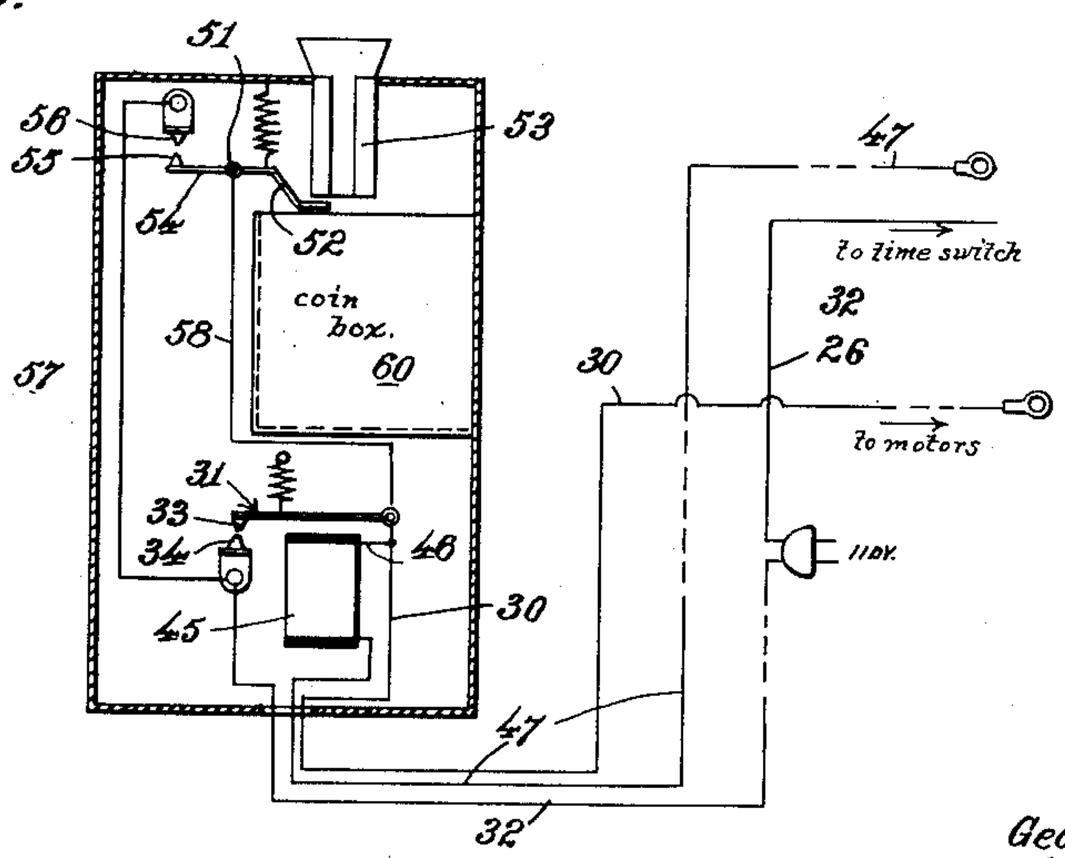


Fig. 5.



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Patented Mar. 6, 1951 2,543,938

UNITED STATES PATENT OFFICE

2,543,938

COIN CONTROLLED ELECTRIC CIRCUIT

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Application April 8, 1948, Serial No. 19,851

5 Claims. (Cl. 161—1)

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This invention relates to coin controlled circuits for automatic electric apparatus, and particularly to a coin controlled circuit for an electrically operated and controlled machine having a plurality of successive, timed operations.

With the use of some machines of the class above mentioned, it is desirable or necessary to vary the time of one or more of the operations, which frequently materially shortens the total time consumed in completing the work; but as the machine is timed to run for a fixed maximum period of time before it can be again started on another cycle of operations, considerable time is lost between the completion of the work and the stopping of the machine. This is particularly undesirable in laundry washing machines, wherein after one batch of laundry has been completed, a loss of time is unavoidable before the next batch can be started.

In a laundry equipped with coin controlled machines of the character stated, the element of time is an important factor; and the loss of time as above described is a material loss to the establishment. This is also true where a multiplicity of washing machines are provided for community use, as in apartment buildings.

In automatic laundry washing machines, the clothes are first soaked for a predetermined time in water containing a detergent, and then agitated for a given time, after which the wash water is drained or drawn off and fresh water added and the laundry agitated to rinse the same. The rinse water is then drawn off, and a second rinsing is given and the water drawn off. The water remaining in the laundry is then expelled, usually by centrifugal action. Each of these steps require one or more definite operations of the machine.

Some of the steps above mentioned require more or less time according to the degree to which the articles are soiled, and the materials of which they are made; that is, articles which are badly soiled require a longer period of initial soaking than do but slightly soiled ones; and woolen goods should be agitated for a considerably less time than most other materials. For this reason automatic laundry machines are provided with means for setting the same prior to each of the several operations wherein the variation of time is essential; but it is also necessary to provide a total operating time sufficient to include the sum of the maximum times for each of the several steps.

It is therefore obvious that some batches of laundry will require considerably less time to complete the work than will others. For example, a batch of woolens will require approximately eighteen minutes to complete, whereas a batch of badly soiled cotton or liner articles will require approximately thirty-five minutes. A coin controlled machine will therefore run for the maximum time, say thirty-six minutes; so that after the washing of a batch of woolens has been completed in eighteen minutes, there is a loss of seventeen minutes before the machine can be started to operate upon the succeeding batch.

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Although the invention forming the subject matter of this application is designed primarily for use in conjunction with automatic laundry washing machines, it is to be understood that it is applicable to various automatic, timed electrically operated machines.

The object of the present invention is to provide, in combination with a coin controlled, electrically operated apparatus having a maximum period of operation, means for automatically cutting off the current to the machine upon completion of the effective period of operation.

A further object of the invention is to provide, in combination with a coin controlled electrically operated apparatus having a maximum period of operation, and controlling means for varying the effective period of operation, means for automatically cutting off the current to the apparatus when the effective period of operation has been completed, and resetting the same for a succeeding operation.

Other objects will appear hereinafter.

The invention will be more readily understood by reference to the accompanying drawings forming a part of this specification and in which

Figure 1 is a diagram of a circuit embodying the present invention, and including a diagrammatic illustration of the timing mechanism of an electrically controlled apparatus;

Figure 2 is an enlarged detail side elevation of a conventional timing element;

Figure 3 is an end elevation of the same illustrating the graduated time setting disk;

Figure 4 is a section on the line 4—4 of Figure 2;

Figure 5 is a diagrammatic vertical section of a device adapted to be electrically connected to the circuit of an automatic, timed electric apparatus to convert the same into an apparatus embodying my invention, and including the coin controlled starting means; and

Figure 6 is a detail of the switch for breaking the circuit to the machine at the conclusion of the cycle of operations.

Referring to the drawings, the timing device for the apparatus to be controlled, includes a motor driven shaft 10 upon which is mounted a plurality of cam disks, the number of which will vary according to the type of machine with which the invention is used, and the number of operations in the complete cycle of the machine. In the present instance four such cam disks are illustrated and designated by the reference numbers 11, 12, 13 and 14, respectively. The shaft 10 is driven by a timing motor 15 connected thereto by reduction gearing 16 which may be of any preferred type. Fixed to the shaft 10 is a graduated disk 17 having a knob 18 to facilitate turning the same, for a purpose hereinafter described. A fixed pointer 19 is provided in conjunction with the disk 17 to aid in properly setting the latter. The cam disks 11 to 14 inclusive are electrically connected, as indicated at 20, to the source of electric energy.

The disk 11 constitutes the timing disk and operates the main timing switch 21 which comprises contact members 22 and 23 mounted respectively on arms 24 and 25, which are insulated from each other and interposed in the main circuit of the machine, the arm 24 being connected directly to the source of electric supply through a conductor 26 and plug 27, and the arm 25 being connected to the opposite side of the circuit through a conductor 28 leading to both the timing motor 15 and the main operating motor 29 of the machine, thence through conductor 30 to a sustaining relay switch 31, having contact points 33 and 34, and then through a conductor 32 to the plug 27.

The contacts 22 and 23 of the timing switch are normally in contact and remain in contact during the entire cycle of operations of the machine. As soon as the operations are completed, a lug 35 on the disk 11 engages the arm 25 and separates the contacts 22 and 23, thereby breaking the circuit to the motor 29 and stopping the machine.

The disks 12, 13 and 14 are provided with arcuate cams 36 which, as the disks rotate, operate switches 37 to close the circuits 38 which parallel the motor circuit 28—30, and connect various operative elements of the machine, such as the solenoids 39 and/or other devices, to the source of current supply, and to time the operations thereof. The timing motor 15 is connected in parallel with the motor 29, through the conductors 40 and 41.

The coil of the relay magnet 45 is connected at one end to the motor conductor 30 by a conductor 46, and at the other end is connected back of the motors 15 and 29 by a conductor 47, so that when the current to the motor is broken by the timing switch 22—23, the circuit to the magnet 45 will be broken, whereupon the relay switch will be opened by the spring 48.

A spring loaded starting switch 50 is provided whereby the machine is started into operation upon the insertion of a suitable coin or token. This includes a lever pivotally mounted at 51 and comprising the arms 52 and 54, the arm 52 projecting beneath the end of a coin chute 53. The opposite arm 54 of the lever 50 is provided with a contact 55 adapted to engage a contact 56 which is electrically connected by a conductor 57 to the contact point 34 of the relay switch 31. A conductor 58 connects the switch arm with the conductor 30.

The coin operated switch 50, the coin chute 53, coin box 60, and relay 31 may be arranged in a

suitable box 61, and supplied as a unit for attachment to or electrically connected to the apparatus to be controlled thereby. A signal lamp 62, to caution against inserting another coin into the machine until the same has completed its work and is reset for further use, is usually shunted in the circuit to the motors, and may be arranged either on the box 61 or directly on the machine. A line 32 extends from one side of the sustaining switch 31 to the source of supply 27; a line 30 extends from the opposite side of said switch for connection to the motor circuits; and a third line 47 extends from the relay coil 45 to be connected to the opposite sides of the motors.

The operation of the device is as follows: When the machine is at rest the timing switch 21, relay switch 31 and coin operated switch 50 are all open. The dial 17 is first turned to close the timing switch 21. At this time, if it is deemed desirable to shorten the time of the first operation from the maximum time provided for the same by the machine, the dial 17 may be turned sufficiently for this purpose, although this adjustment may be made after the machine begins to operate. A coin is then inserted in the chute 53 and as it passes to the coin box 60 it actuates the switch 50 to momentarily close the circuit to the relay magnet 45, the circuit being from the plug 27 through the conductors 32 and 57, switch 50, conductors 58 and 46 to the relay magnet 45, thence by conductors 47 and 28 to the timing switch 21 and conductor 26 to the plug 27. This energizes the magnet 45 and closes the relay switch 31 thereby closing the circuit to the main motor 29 and timing motor 15 thereby setting the machine into operation. The circuit to the motor 29 is from the plug 27, through the conductor 32, relay switch 31, conductor 30 to motor; then through conductor 28 to timing switch 21 and conductor 26 back to plug 27. While the machine is in operation, the time of any of the several separate operations of the machine may be shortened to suit the conditions as explained hereinbefore with relation to a laundry washing machine, by merely advancing the timing disk 17 and the cam disks connected thereto. The cams 36 on the several disks are arranged so as to maintain the proper sequence of operation irrespective of the alteration of the timing of any one or more of the several steps.

While the machine is in operation the signal light 62 will glow indicating that no coins should be inserted. As soon as the last step or operation is completed, the lug 35 on disk 11 opens the timing switch 22, thereby breaking the circuit to the motors and deenergizing the relay magnet 45. The switch 31 is then opened by the spring 48, the lamp 62 extinguished, and the device reset for another operation.

It is obvious from the above description that the machine will be automatically reset for further immediate use as soon as the work has been completed, without waiting for the lapse of any specific set time.

It is also obvious that various modifications may be made in the details of the device without departing from the invention as defined by the accompanying claims.

I claim:

1. A coin controlled, electrically operated machine including a plurality of means for performing a cycle of relatively timed operations, a driving motor for said machine, a timing mechanism for selectively controlling the duration of the several operations, said mechanism includ-

ing a switch normally open when the machine is at rest, cam operated switches for closing the circuits to the several operating means and a timing motor in parallel with the driving motor for actuating said timing means, a relay comprising a relay magnet in parallel with said motors and a relay switch in circuit between said motors and the source of electric supply, coin actuated means for energizing said relay magnet and closing the relay switch, and manually operable means associated with said timing mechanism to close said normally open switch to close the circuit to said relay magnet and for automatically opening said switch upon completion of the cycle of operations of the machine.

2. In a coin controlled, electrically operated machine, a plurality of means for performing a cycle of relatively timed operations, a driving motor for said machine, an electrically actuated timing mechanism for selectively controlling the duration of said operations, said timing mechanisms including a timing motor, a normally open switch in the circuit of said motor, and cam operated switches for controlling the circuits to the several operating means, a relay comprising a relay magnet and a relay switch in the circuit between the source of electric supply and said motor, coin actuated means for energizing said relay magnet and closing the relay switch, and manually operable means associated with said timing mechanism for closing said normally open switch to close the circuit to said motor, and for automatically opening said switch upon completion of the cycle of operations of the machine.

3. In a coin controlled, electrically operated machine, a plurality of means for performing a cycle of relatively timed operations, a main motor for actuating said means, a timing mechanism for selectively controlling the duration of said operations, said timing mechanism including a plurality of cam operated switches for controlling the circuits to the several operating means, a timing motor for actuating said switches, and a normally open switch in the circuit of said motors, a relay comprising a relay magnet and a relay switch, said magnet and switch being in

parallel and in the circuit between the source of electric supply and said motors, coin actuated means for energizing said relay magnet to close said relay switch, and manually operable means associated with said timing mechanism for closing said normally open switch to close the circuit to said motors, and for opening said switch upon completion of the cycle of operations of the machine.

4. An attachment for a motor driven machine having a cycle of timed operations, a main motor, a timing motor and a main switch; said attachment comprising a normally open sustaining switch, a solenoid for closing said switch for the duration of operation of the machine, a coin controlled switch for momentarily closing a circuit to said solenoid, leads leading from said starting switch to connect the same in parallel with said motors, and a lead from said sustaining switch and said coin controlled switch to the source of electric supply.

5. In a motor operated machine having a cycle of relatively and adjustably timed diverse sequential operations a main operating motor for the same, and a timing motor for controlling the period of each operating in the cycle, in combination with a sustaining switch and a solenoid adapted to maintain said sustaining switch in closed position during the entire cycle of operation, said solenoid being in parallel with said motors, and a coin actuated switch for initially closing the circuit to said solenoid.

GEORGE RIPLEY, III.

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Certificate of Correction

March 6, 1951

Patent No. 2,543,938

GEORGE RIPLEY, III

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows:

Column 6, line 26, for "operating" read *operation*;

and that the said Letters Patent should be read as corrected above, so that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 18th day of September, A. D. 1951.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.