

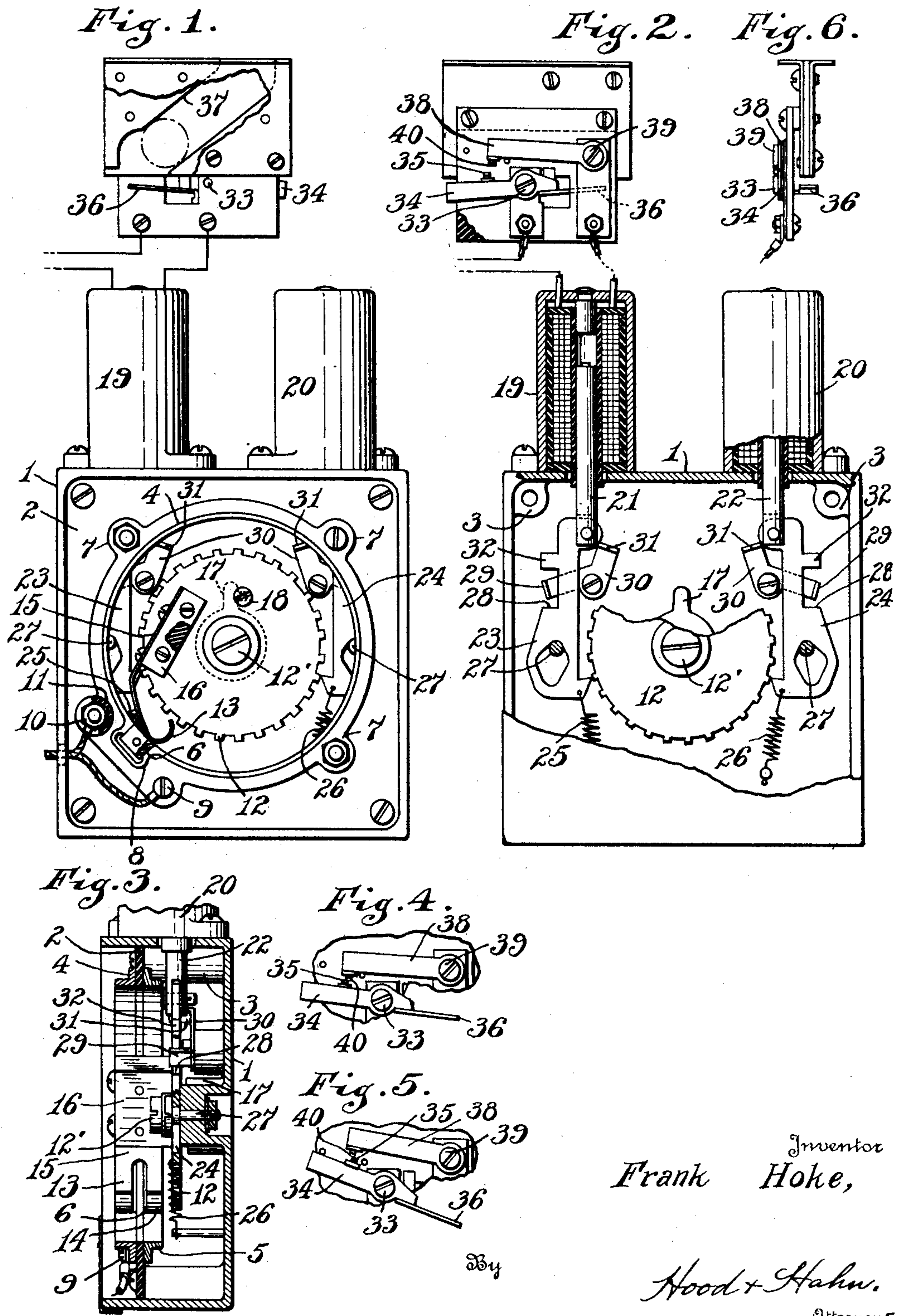
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COIN CONTROLLED SWITCH

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UNITED STATES PATENT OFFICE

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COIN CONTROLLED SWITCH

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My invention relates to improvements in circuit controllers and is particularly designed for a circuit controller of the motor of a phonograph or like instruments operated by coin mechanism.

It is one of the objects of my invention to provide a switch which may be moved from initial non-circuit closing position to initial position and thence through a series of steps throughout the range of which the circuit is maintained closed and adapted to be moved in a reverse direction toward non-circuit closing position until it has been moved an equivalent number of steps, after which the circuit through the motor to be controlled will be opened.

For the purpose of disclosing my invention I have illustrated an embodiment thereof in the accompanying drawing in which—

Fig. 1 is a front elevation of the circuit controlling switch, the front plate being removed, and the coin operating switch therefor;

Fig. 2 is a similar view, parts of the same being shown in section;

Fig. 3 is a longitudinal sectional view of the motor control switch;

Figs. 4 and 5 are detail views of the coin accommodated switch in different positions, and

Fig. 6 is an end elevation of the coin accommodating switch.

In the embodiment of the invention I provide a suitable enclosing casing 1 within which is mounted an insulating support or base 2, this base being secured to suitable lugs are ears 3 formed in the corners of the case. The base is provided with a central opening and supported within this opening and on either side of the base is a pair of contact rings 4 and 5. At one point in their periphery the rings are provided with a dead space filled with insulating material as at 6. These rings are secured to the insulating base by means of bolts passing through ears 7

and while the rings are provided with dead spaces it will be understood that they form continuous conductors due to the bridge sections 8. The two rings are insulated from one another and the outer ring is provided with a binding post 9 to which a lead-in conductor extending to one terminal of the motor is connected. The ring 5 is provided with a binding post 10 to which the opposite lead-in terminal of the motor connection is connected. This post is surrounded by suitable insulating material as at 11 to insulate the same from the bridge portion 8 of the ring 4.

A ratchet wheel 12 is mounted on a suitable pivot 12' extending inwardly from the back of the casing and this ratchet wheel has mounted thereon and movable therewith a pair of contact brushes 13 and 14 adapted to contact respectively with the rings 4 and 5. These brushes are electrically connected together and in the structure illustrated the brushes are merely the bifurcated ends of a conductor plate 15 which is supported upon an insulating block 16 secured on the face of and rotatable with the wheel 12.

On the back of the casing there is provided an ear or lug 17 which is adapted to engage, when the wheel reaches the limit of its movement in either direction, with a limit stop 18 projecting from the rear face of the wheel 12.

The wheel is moved in its respective directions by means of suitable solenoids 19 and 20, the solenoid 19 being adapted to move the wheel toward circuit closing position and the solenoid 20 being adapted to move the wheel toward open circuit position. The cores 21 and 22 of the respective solenoids 19 and 20 are respectively provided with operating dogs 23 and 24 pivotally connected thereto and adapted to engage the teeth of the ratchet wheel as they are moved forwardly when the respective solenoids are energized. These dogs are biased toward their normal positions by means of coiled springs 25 and 26

connected to the ends of the dogs and to pins stationarily mounted in the casing and it will be noted that these springs extend diagonally toward one another so that there is a tendency to hold the dogs against the periphery of the wheel. The dogs are limited in their downward movement by means of stop pins 27 and each dog is provided with a shoulder 28 adapted as the dog is raised to engage one arm 29 of a bell crank lever. The opposite arm 30 is provided with a tooth 31 adapted to engage the teeth of the ratchet wheel 12, the arm being thrown into engagement by the upward movement of the dog and preventing the wheel from over-running as it is moved. A projection 32 on each of the dogs is adapted to engage the arm 29 as the dogs move downwardly to cause the tooth 31 to move to normal disengaged position.

The circuit through the solenoid 19 is controlled by a coin operated switch. This switch comprises a coin operated switch arm pivoted as at 33 and having an arm 34 carrying a contact 35 and a second arm 36 extending in the opposite direction and beneath a coin chute 37 and into the path of a coin as it moves through said chute. A second lever 38 pivoted as at 39 is provided with a contact 40 adapted to be engaged by the contact 35 to close the circuit through the solenoid 19. The circuit through the opposite solenoid 20 is momentarily closed by any suitable switching mechanism adapted to be operated when the device is used in connection with a musical playing apparatus, at the completion of the record, if it be a phonograph, or music roll if it be a mechanical piano.

In operation when a coin is dropped into the chute 37 as it passes out of this chute it comes in contact with the arm 36 momentarily raising the arm 34 and causing the contact 35 to engage contact 40 with a wiping movement. Due to the fact that the two contacts travel for a part of the distance together, the circuit is maintained through the solenoid sufficiently long to energize the same. As soon as the coin rolls off the arm 36 the weight of the arm 34 will cause the parts to drop back into normal or open position.

The energization of the solenoid 19 raises the dog 23 causing the same to move the ratchet wheel 12 one step in a clockwise direction, which moves brushes 13 and 14 off the dead contact 6 and onto the contact rings 4 and 5 thereby closing the circuit through the electric motor. If another coin is dropped through the chute the process is repeated, moving the brushes a second step on the rings 4 and 5. It will be noted, however, that after the initial step the further movement of the brushes step by step will not affect the circuit connections of the motor. After the motor has run for a predetermined period, as in the case of a phonograph after

the record has been played, a suitable switch instrumentality is operated to momentarily close the circuit through the solenoid 20 which will operate the dog 24 to move the wheel 12 in a counter-clockwise direction one step. If the wheel has been moved in a clock-wise direction merely one step the brushes will be moved to the dead contact. If the wheel has been moved a number of steps the circuit relation of the motor will not be disturbed until the wheel has been moved counter-clockwise a number of steps equal to the number of steps it has been moved in a clock-wise direction.

I claim as my invention:

1. In a device of the character described, the combination with a rotatably mounted ratchet wheel, means for rotating said wheel step by step in one direction, means for rotating said wheel step by step in the opposite direction, a pair of circular contacts insulated from one another surrounding said wheel and a brush comprising a bifurcated plate having its base secured to but insulated from said wheel and having its furcations bearing on said respective contacts, one of said contacts having a dead spot.

2. In a device of the character described, the combination with a casing, of an insulating panel mounted within said casing and having a central opening, a pair of circular contacts mounted on opposite sides of said panel within said opening, one of said contacts having a dead spot, a ratchet wheel rotatably supported on one wall of said casing and having its axis coinciding with the axis of said circular opening, a contact brush carried by said ratchet wheel and comprising a bifurcated plate having its base attached to but insulated from said wheel and having its furcations disposed to engage said circular contacts, a dog arranged to engage said wheel and move the same step by step in one direction, a second dog arranged to engage said wheel and move the same step by step in the opposite direction, and a pair of solenoids carried by said casing for operating said dogs.

3. Circuit-controlling mechanism comprising a pair of contact members insulated from each other, a brush adapted to bridge said contact members, and mechanism for moving said brush comprising a spur wheel operatively connected to said brush, a pair of ratchet dogs associated with said wheel, means for selectively operating said dogs to move said wheel, and two independent latches respectively associated with said dogs, each of said latches being independently movable, by wheel-actuating movement of its dog, to engage said wheel to prevent over-run thereof.

4. Circuit-controlling mechanism comprising a pair of contact members insulated from each other, a brush adapted to bridge said

contact members, and mechanism for moving said brush comprising a spur wheel operatively connected to said brush, a dog reciprocally mounted adjacent said wheel, means for moving said dog in one direction to effect movement of said wheel, a latch positively actuated by such movement of said dog to engage said wheel, and means cooperative with said dog to move and hold said dog out of cooperative relation with said wheel at each extremity of the stroke of said dog.

5. Circuit-controlling mechanism comprising a pair of contact members insulated from each other, a brush adapted to bridge said contact members, and mechanism for moving said brush comprising a spur wheel operatively connected to said brush, a dog reciprocally mounted adjacent said wheel, means for moving said dog in one direction to effect movement of said wheel, means for moving said dog in the opposite direction, and a latch associated with said wheel and dog and movable into engagement with said wheel by movement of said dog under the influence of said first-mentioned means, said latch being movable out of engagement with said wheel by movement of said dog under the influence of said second-mentioned means.

6. The combination with a spur wheel of means for imparting step-by-step movement to said wheel, said means comprising a solenoid, a reciprocable core therefor, a ratchet dog operatively associated with said wheel and pivotally carried by said core, means biasing said dog toward cooperative engagement with said wheel, means cooperative with said dog at each extremity of its stroke to hold said dog out of cooperative engagement with said wheel, and means operable positively by wheel-moving movement of said dog to engage said wheel to hold the same against rotation.

7. The combination with a spur wheel, of means for imparting a step-by-step rotation thereto, comprising a dog operatively associated with said wheel, a latch pivoted adjacent said wheel and having a portion disposed in the path of movement of said dog, means for reciprocating said dog whereby, upon wheel-rotating movement of said dog, said dog engages said latch to force said latch into locking engagement with said wheel, and cam means for forcing said dog out of cooperative engagement with said wheel at each extremity of the stroke of said dog.

8. The combination with a spur wheel, of means for imparting a step-by-step rotation thereto, comprising a dog operatively associated with said wheel, means for reciprocating said dog whereby movement of said dog in one direction causes rotation of said wheel while movement of said dog in a return di-

rection leaves said wheel unaffected, a latch, and a lost-motion connection between said latch and dog whereby said latch is forced into locking engagement with said wheel as said dog reaches the limit of its wheel-affecting stroke and said latch is moved out of such engagement as said dog reaches the limit of its return stroke.

It witness whereof I, FRANK HOKE, have hereunto set my hand at Indianapolis, Indiana, this 27th day of March, A. D. one thousand nine hundred and twenty-eight.

FRANK HOKE.

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