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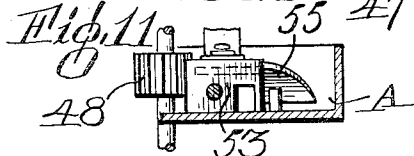
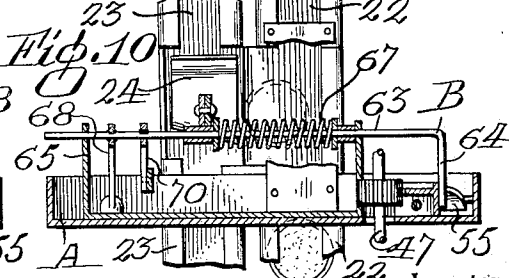
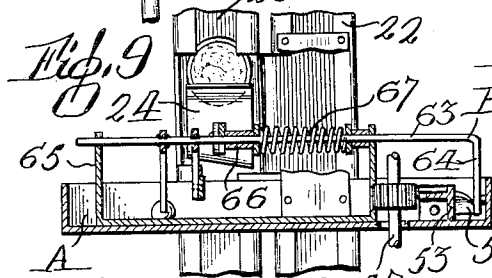
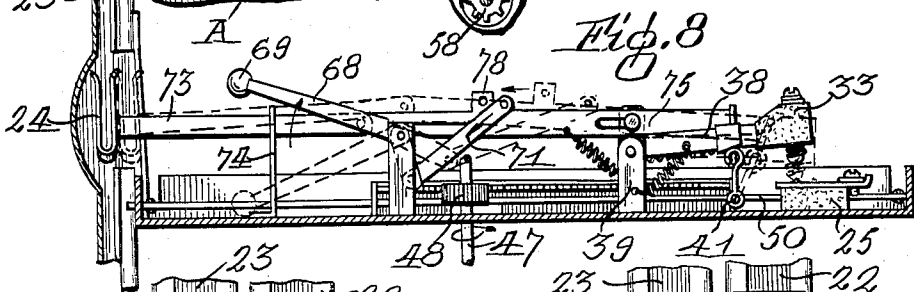
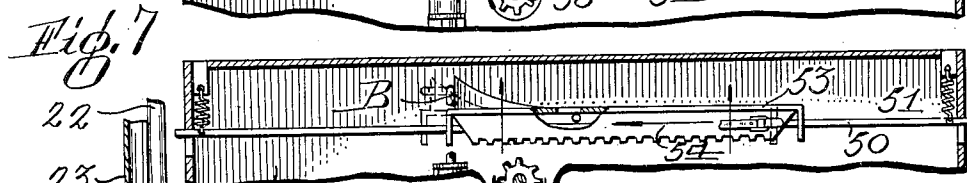
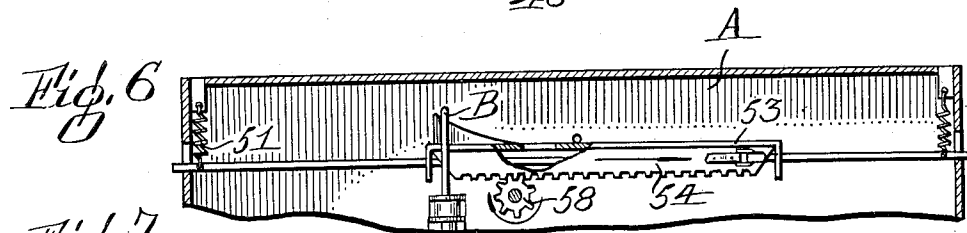
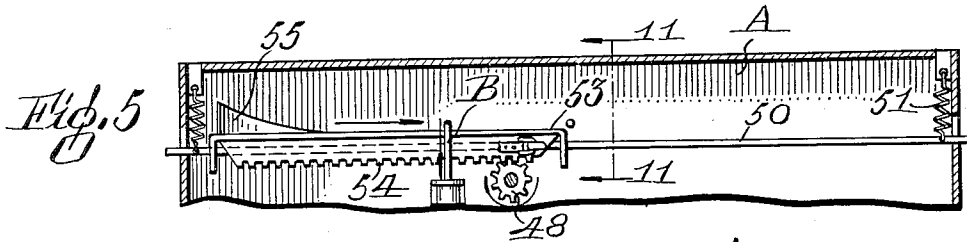
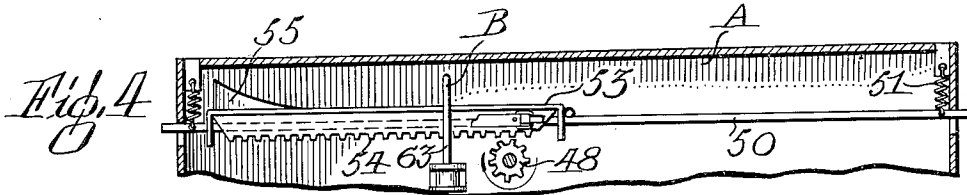
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1,966,136

SWITCH OPERATING MECHANISM

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2 Sheets-Sheet 2



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# UNITED STATES PATENT OFFICE

1,966,136

## SWITCH OPERATING MECHANISM

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Quebec, Canada

Application February 23, 1933, Serial No. 658,036

2 Claims. (Cl. 194—9)

The present invention relates to switch operating mechanism and has particular reference to mechanism for operating a light circuit controlling switch.

5 An important object of the invention is the provision of mechanism whereby an electric switch may be closed for a predetermined period of time.

10 A further object of the invention is the provision of mechanism of the above character designed so as to automatically cause opening of the switch upon expiration of the selected time period.

15 Another object of the invention is the provision of switch operating mechanism of the above character which may be controlled by the insertion of a coin.

20 Still another object of the invention is the provision of mechanism of the above type particularly adaptable for the operation of electric lights for religious purposes.

Other objects and advantages of the invention will become apparent as the description progresses.

25 In the accompanying drawings forming a part of this specification and in which like reference characters are employed to designate corresponding parts throughout the same:

30 Figure 1 is a perspective view of the mechanism with the control switch in open position,

Figure 2 is a similar view with the switch in closed position,

Figure 3 is a vertical longitudinal section along one side of the mechanism,

35 Figure 4 is a fragmentary plan view showing the time regulating slide member in its normal non-operating position,

Figure 5 is a similar view showing the slide member in its initial operating position,

40 Figure 6 is a similar view showing the slide member in an advanced operating position,

Figure 7 is a similar view showing the slide at its initial returning position,

45 Figure 8 is a vertical longitudinal section at a different position through the mechanism,

Figure 9 is a vertical transverse section showing the introductory position of the control coin,

Figure 10 is a similar view showing the passage of the coin through the mechanism, and

50 Figure 11 is an enlarged section taken on the line 11—11 of Figure 5.

Referring to the drawings, wherein for the purpose of illustration is shown a preferred embodiment of the invention, the letter A generally designates the lower section of a housing includ-

ing a flat elongated base plate 20 and vertical side and end walls 21. The housing A will normally assume a horizontal position and has attached to one end thereof a vertically extending channel-shaped coin guide 22. Connected with the coin guide 22 and disposed adjacent thereto is a complementary master guide 23. At the intermediate portion, the coin guide 22 is formed to provide an enlargement, designed to receive therein a substantially U-shaped coin receptacle 24. The receptacle 24 may be moved to coincide with the guide track of the master guide 23 or to an offset position with respect to the latter guide to assume a position at one side of and in registration with a slot in the complementary guide 22.

Adjacent one end of the housing is secured an insulating block 25 having fastened thereon a pair of parallel switch contact bars 26 and 27. Screws 28 are adapted to connect electric conductors 29 and 30 to the respective bars 26 and 27. A flexible wire 31 is securely fastened to the switch bar 27 and to a contact member 32 carried in the outer end of an insulating contact block 33. When the block 33 is lowered, the contact element 32 is adapted to engage the bar 26 and to become electrically connected with the complementary switch bar 27 through the medium of the connecting wire 31.

The conductor 30 extends to and connects with an electric lamp 35. The conductor 29 is extended to and connects with a battery or other source of electrical current 36.

The movable switch contact block 33 is connected to the end of a lever 38 pivotally connected with the upstanding portion of a bracket 39. A coiled tension spring 40, connected with the lever and the bracket, tends to normally urge the lever to a downward position wherein the contact element 32 will assume a circuit closing contact with the bar 26.

The movable switch contact may be elevated to assume an open position through the medium of a rocker mechanism including a rocker shaft 41 having a trip arm 42 secured to one end portion and a lever raising arm 43 attached thereto at a spaced position. When the rocker mechanism is swung to one position, the upper rolled end of the arm 43 is disposed to engage with the lower edge of a cam lug 44 attached to the lever 38 to swing the lever upwardly. When the rocker is swung to its reverse position, the arm 43 disengages the cam lug and the lever drops to effect contact of the element 32 with the bar 26. The rocker is normally urged to a lever elevating position by means of a tension spring 45 having one

end connected to the trip arm 42 and the opposed end connected to the bracket 39 which tends to swing the arm 42 to an approximately vertical position. Extending vertically through the base plate 20 of the housing is a rotary drive shaft 47 having fixed thereon a toothed pinion 48.

In one side of the housing is mounted a horizontally extending rod 50 having the ends fitted in slots in the end walls of the housing to permit transverse shifting of the rod. Tension springs 51 are connected to the ends of the rod 50 and tend to normally retain the same in an outwardly shifted non-operating position.

Slidably fitted on the rod 50 is an elongated rack structure 53 having a bar formed at the inner edge with rack teeth 54 designed to mesh with the teeth of the drive pinion 48. The rack 53 is designed to periodically engage the drive pinion 48 and to slide longitudinally on the rod 50. At the outer end portion of the rack is formed a tapering cam rib 55, the purpose of which will be later described.

On one end of the housing is mounted an enclosed annular casing 57 having a drum 58 rotatably supported therein. A helically wound spring 59 is disposed between the drum shaft and the circumferential wall of the drum and is secured to these elements. A flexible strip or tape 60 is wound about the exterior of the drum 58, one end of the tape being secured to the drum while the opposed end extends through a slot in the casing and is fastened to a hook 61 on the outer end of the rack 53. This spring drum mechanism is adapted to normally urge the rack to a starting position at one end of the housing and to restore the rack to this position upon completion of its gear driven movement. A rotatable and transversely slidable member B is adapted to shift the rack to a gear engaging position, this member embodying a shaft 63 and a right angular arm 64 at one end of the shaft. The shaft 63 is rotatably and slidably supported in upstanding bearing sections 65 of a support rack. Rigidly secured on the shaft 63, between the bearing elements, is a tubular sleeve 66 provided at one end with an enlarged shoulder. Coiled about the shaft, between the shoulder and one of the bearing elements, is a coiled compression spring 67 tending to normally urge the shaft to a predetermined position on the bearings.

To an intermediate portion of the shaft 63 is connected a lever 68 projecting radially from the shaft and having attached to the outer end a weight ball 69. A crank 70 is also connected to the shaft 63 and extends radially therefrom, the outer end of the crank being pivotally connected to one end of a link 71.

Secured to the coin receptacle 24 and extending longitudinally in the housing of the mechanism is an actuating bar 73. The intermediate portion of the actuating bar extends through and is fulcrumed on a slotted support bracket 74.

The inner end of the actuating bar 73 is pivotally connected to the end portion of a longitudinally projecting trip bar 75 provided at its intermediate portion with an elongated slot 76. A pivot pin, attached to the bracket 39, extends through the slot 76 to support the bar 75. Adjacent one end, the bar 75 is formed in its underside with a tapered notch 77 operable to engage over the shaft 63. Adjacent the notch 77, the bar 75 is also provided with an upstanding lug 78.

To operate the mechanism, that is, to light a lamp 35 for a predetermined period of time, the patron inserts a coin of specified denomination

into the top of the master coin guide or chute 23. During passage through the guide, the coin will drop into the intercepting receptacle 24, and, by force of gravity and the impact of the coin, cause depression of the receptacle. The lowering of the receptacle will cause the actuating bar 73 to swing vertically on the fulcrum 74 and cause elevation of the connected ends of the bars 73 and 75.

This operation will cause the notch 77 to disengage the shaft 63 so that a tension spring 80 will slide the articulated bars 73 and 75 longitudinally to what will hereinafter be termed the rear end of the mechanism. The rear extremity of the bar 75 will force the trip arm 42 rearwardly and cause the complementary arm 43 to disengage the lug 44 and permit the spring 40 to depress the lever 38 and contact block 33 downwardly. The movable contact 32 carried by the block will engage the switch bar 26 and thereby close the circuit between the source of electrical energy 36 and the electric lamp 35. The tilting of the actuating bar 73 will also, by the elevation of the notch 77 of the complementary bar 75, disengage the sleeve 66 so that the spring 67 is free to slide the shaft 63 transversely in the bearings. When the shaft 63 is thus actuated the arm 64, which assumes a depending position at this period of the operation, will engage and slide the rack 53 inwardly and into contact with the revolving drive pinion 48.

After the coin drops into the receptacle 24, the receptacle is moved forwardly until it assumes a position at one side of the auxiliary coin guide 22 and in registration with a slot thereof. The bottom of the receptacle 24 is inclined so that the coin is transferred therefrom into the chute 22 and dropped into a cash receiving container at the bottom of the guide. It will be apparent that the coin serves to break the pivot joint between the bars 73 and 75 and that the spring 80 immediately presses the joint ends of these bars downwardly on the sleeve 66.

The drive pinion, rotating at a selected speed, will move the rack through a forward timing stroke. As the rack approaches a completion of the timing stroke, the cam rib 55 will engage the arm 64 to slide the member B transversely against the action of the spring 67 so that the pivotally connected ends of the bars 73 and 75 slide off the sleeve 66 and onto the shaft, thereby holding the shaft in an extended arrangement. Upon completion of the timing stroke the arm 64, now disposed in an outwardly extended position, assumes a position against the rear edge of the cam rib so that the springs 51 move the rod 50 and rack 53 outwardly out of engagement with the drive pinion. At this stage of the operation, the spring rotated drum will act, through the medium of the tape 60, to slidably return the rack to its initial starting position at the forward end of the housing. During the restoring movement of the rack the arm 64 will, through the medium of the cam 55, be swung upwardly causing rotation of the shaft 63. As the shaft 63 is rotated, the weight 69 at the end of the lever 68 will be elevated from the bottom of the housing and the crank 70 likewise swung about the axis of the shaft. As the crank swings forwardly, it slides the connecting link 71 in the same direction and a pin 81 is slid along the bar 75 against the lug 78 and thereby forces the articulated bars 73 and 75 forwardly until the notch 77 engages the shaft 63.

As the cam is moved forwardly it releases the arm 64 so that the weighted lever 68 will drop

downwardly by force of gravity to restore the arm 64 to its normal vertically depending arrangement.

This operation of the mechanism will enable the spring 45 to elevate the rocker mechanism and, as previously described, result in elevation of the movable contact carrying lever 38 so that the contact 32 is thus automatically moved out of engagement with the switch bar 26, thus opening the electric circuit and extinguishing the light.

Variation in the duration of the switch closing and lighting period may be effected by regulating the operating speed of the rotary drive shaft 47 so that, upon the insertion of the coin a lamp may be lit for one hour, or other suitable period, and thereafter automatically extinguished. It is also contemplated to employ a plurality of switch operating mechanisms for operation of a series of lights, in which case the mechanisms could be arranged in vertically spaced positions controlled by coins inserted into the master guide or chute 23. As will be noted, the displacement of the coin receptacle 24 will cause a coin to drop uninterruptedly through the master guide at the station corresponding to an operating mechanism and proceed downwardly until it drops into the receptacle of a non-operating mechanism.

It is to be understood that the form of my invention herein shown and described is to be taken as a preferred example of the same, and that various changes as to the shape, size and arrangement of parts may be resorted to without depart-

ing from the spirit of the invention or the scope of the subjoined claims.

Having thus described by invention, I claim:—

1. In switch operating mechanism the combination of a switch having a movable contact element, a rotary drive member, a movable rack adapted to effect a timing stroke upon engagement with the drive member, coin controlled mechanism for actuating the switch contact element to a circuit closing position, spring means for shifting the rack into engagement with the drive member upon closing of the circuit, means for automatically restoring the rack to its starting position, and means for automatically moving the switch contact element to an open position upon completion of the timing stroke.

2. In switch operating mechanism the combination of a switch having a movable contact element, a rotary drive member, a movable rack adapted to effect a timing stroke upon engagement with the drive member, coin controlled mechanism for actuating the switch contact element to a circuit closing position, spring means for shifting the rack into engagement with the drive member upon closing of the circuit, means for automatically restoring the rack to its starting position, and means co-operatively associated with the coin controlled mechanism for moving the switch contact element to an open position upon completion of the timing stroke.

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