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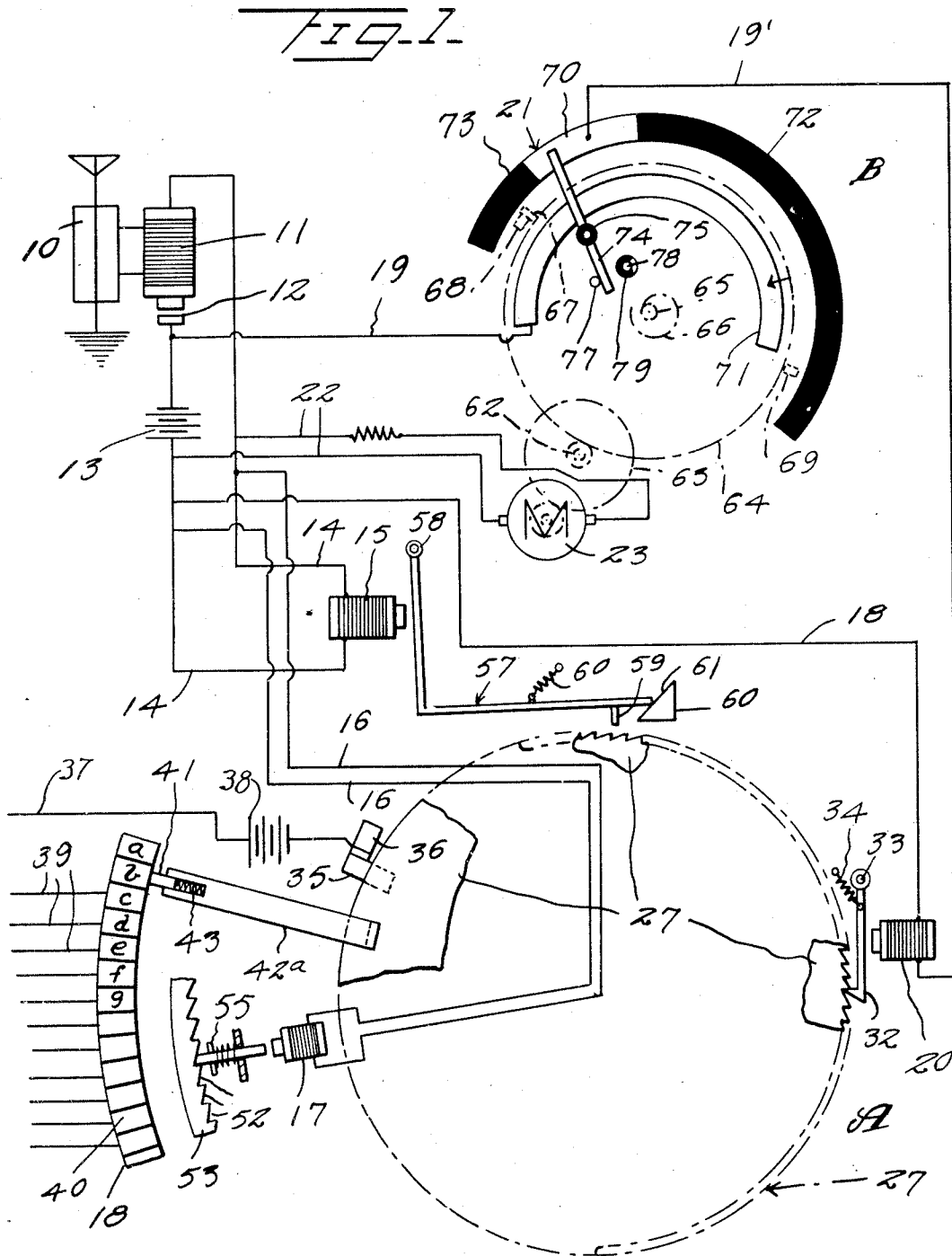
R. T. McCLELLAND

2,365,284

REMOTE CONTROL MECHANISM

Filed Nov. 19, 1942

3 Sheets-Sheet 1



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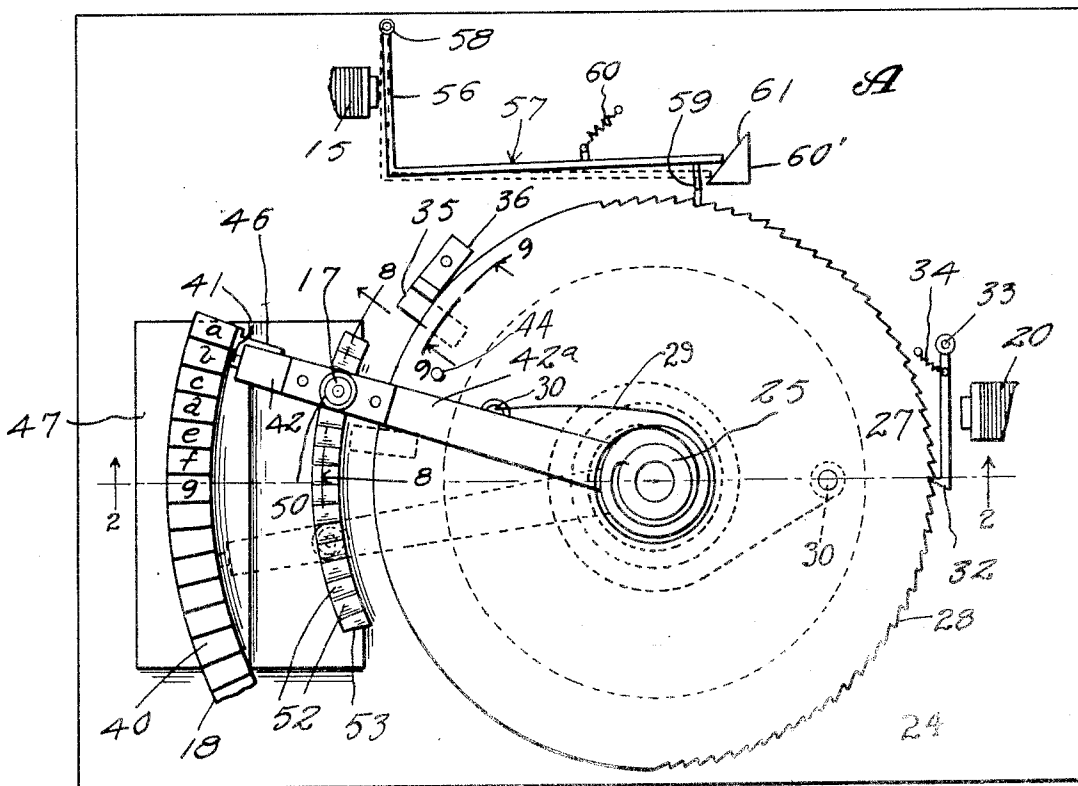
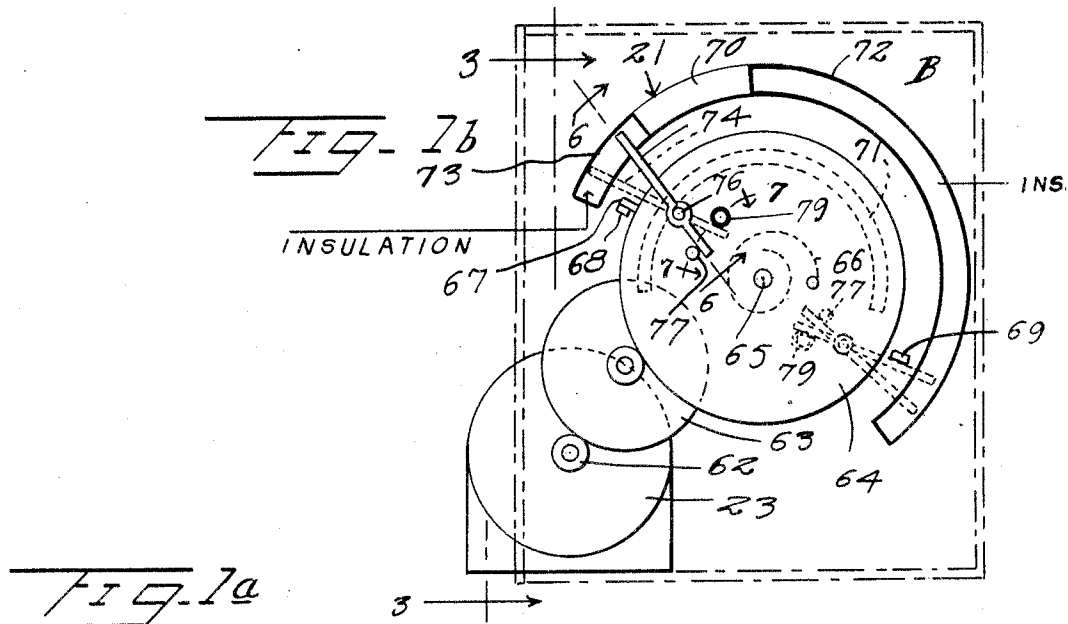
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REMOTE CONTROL MECHANISM

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3 Sheets-Sheet 2



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REMOTE CONTROL MECHANISM

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3 Sheets-Sheet 3

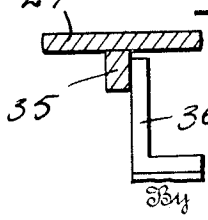
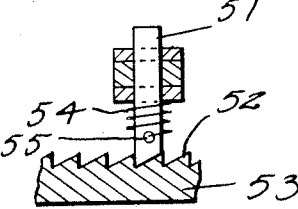
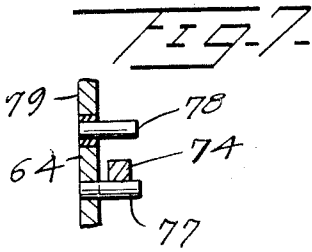
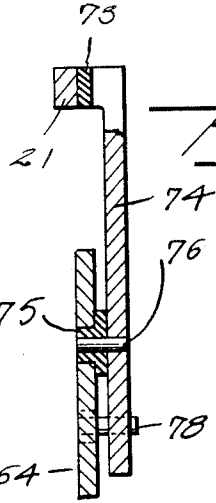
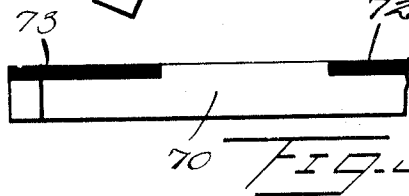
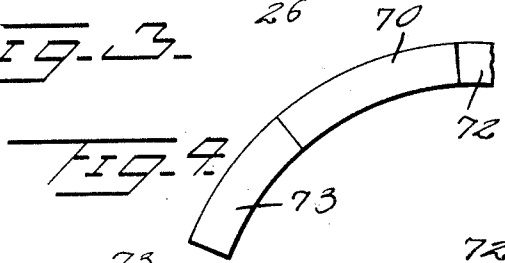
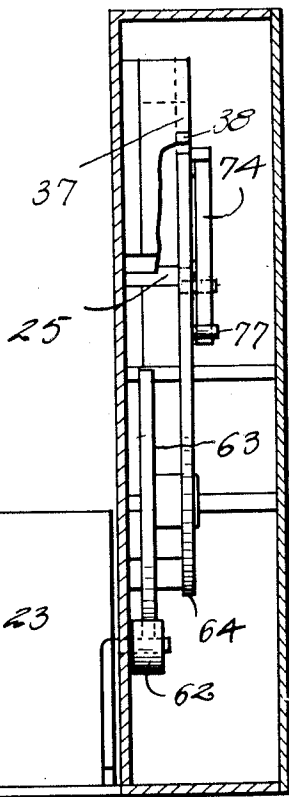
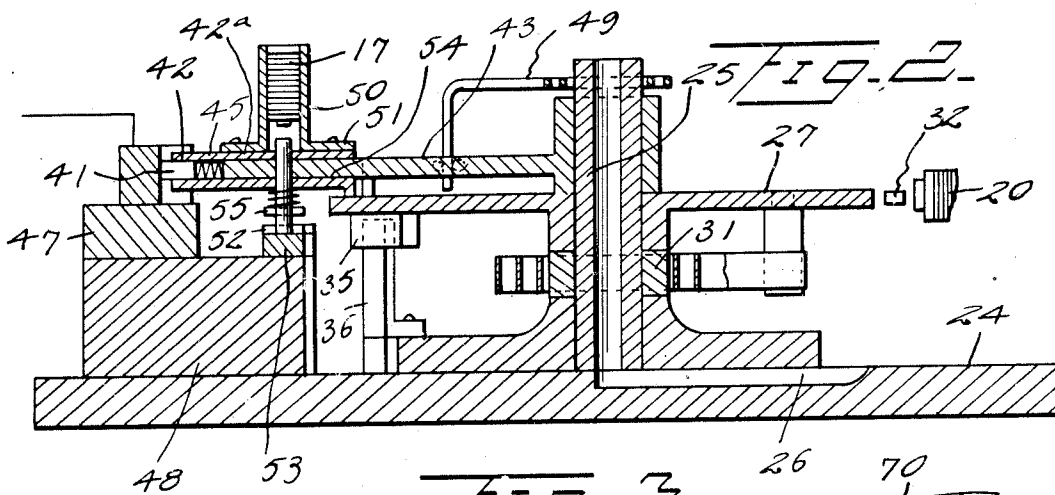


Fig. 9.

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UNITED STATES PATENT OFFICE

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REMOTE CONTROL MECHANISM

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Application November 19, 1942, Serial No. 466,192

1 Claim. (Cl. 177—353)

This invention relates to a remote control mechanism.

It is particularly aimed to provide a construction which is operable through the transmission of radio impulses, which avoids individual transmitting and receiving sets for each of the final controls desired.

It is also an object to provide a novel controlling mechanism and a novel delay device therewith.

Generally, it is aimed to provide a structure or parts which are sturdy, relatively simple and inexpensive.

The more specific objects and advantages will become apparent from a consideration of the description following taken in connection with accompanying drawings illustrating an operative embodiment and wherein—

Figure 1 is a view of the apparatus primarily in diagram;

Figure 1a is a plan view of the control device;

Figure 1b is a plan view of the delay mechanism;

Figure 2 is a vertical section taken on the line 2—2 of Figure 1a;

Figure 3 is a vertical section taken on the line 3—3 of Figure 1b;

Figure 4 is a fragmentary plan of the mounting of the contact for the delay device;

Figure 5 is an elevation of the parts of Figure 4;

Figure 6 is a section taken on the line 6—6 of Figure 1b;

Figure 7 is a section taken on the line 7—7 of Figure 1b;

Figure 8 is a section taken on the line 8—8 of Figure 1a; and

Figure 9 is a section taken on the line 9—9 of Figure 1b.

Referring specifically to the drawings, wherein like reference characters designate like or similar parts, the apparatus is operable by the transmission of radio impulses through a receiving set disclosed at 10, and which actuates an electromagnet 11 associated with a relay contact 12 and which electromagnet closes in an electric circuit including a battery 13, conductors 14 connected to an electromagnet 15, conductors 16 leading from the conductors 14 to an electromagnet 17, conductors 18 and 19, leading from conductors 14 through the electromagnet 20 and a contact 21, and conductors 22 leading from the conductors 14 to a special electric motor 23.

The electromagnets 15, 17 and 20 are associated with a control mechanism generally des-

ignated A, the operation of which will close selected electric circuits. The electric motor 23 and contact 21 are associated with a delay device generally designated B, which coacts with the selective controller mechanism A.

Mechanism A may be mounted on a suitable base 24, on which a hollow vertical post or shaft 25 is mounted and from the hollow of which and a slot 26 in base 24, conductors 16 are adapted to pass. Journaled on the post 25 is a relatively large metallic disc 27 having peripheral ratchet teeth 28 urged to move clockwise by a clock spring 29 fastened thereto at 30 and to an element 31 rigid on post 25. Ratchet disc 27 is normally held against rotation by a detent 32 pivoted at 33 to the base and urged to such position by a spring 34 connected to the detent and to the base. Detent 32 is adapted to be attracted by the magnet 20 in order to release the ratchet disc 27 for clockwise rotation.

Rigid on and depending from disc 27 is a contact 35 adapted for engagement with a contact 36, under the urgency of said spring 29, in order to close a controlled circuit which includes a conductor 37 connected to contact 36 including a battery 38, and any one of the series of conductors 39 each leading to a different contact or segment 40 of a group of them, and which contacts or segments 40 are insulated from each other. A contact 41 is adapted to wipe or move over the contacts 40 and the same is radially slidable, being accommodated in a socket 42 in the outer end of a metallic sleeve 42^a wiping disc 27 and mounted on and forming part of an arm 43, which is journaled for movement on the post 25, both independently of and with the ratchet disc 27, at times, in the latter instance because of the abutment of a pin 44 on the ratchet disc 27 against such arm 43. An expansion spring 45 in the socket or recess 42 urges radial outward movement of contact 41 against the segments 40. This arm 43 is limited in movement clockwise by abutment with a stop 46 secured to a mounting 47 in turn fastened to a mounting or block 48 rigid on a support or base 24. A clock spring 49 fastened to the axle 25 and to the arm 43 urges movement of the arm 43 into engagement with the stop 46.

The aforesaid electromagnet 17 is located in a holder 50 carried by the sleeve 42^a and it coacts with an armature or pawl 51, which is vertically slidable in openings provided in holder 42^a and 43. Pawl 51 is urged downwardly into contact with ratchet teeth 52 of a rack bar 53

fastened on the mounting 48, by means of an expansive coil spring 54 surrounding the pawl and abutment of sleeve 42^a and a pin 55 carried by the pawl. Energization of electromagnet 17 will elevate the pawl 51 to disengage it from the pawl 52.

The aforesaid electromagnet 15, when energized, attracts the armature portion 56 of a generally L-shaped lever or actuator 57 for the aforesaid ratchet disc 27. Actuator or lever 57 is pivoted at 58 and has a depending lug at 59 which is engageable with the teeth 28 in order to move the ratchet disc 27 counterclockwise the extent of one tooth through each actuation. A contractile spring 60 attached to the lever or actuator 57 causes its rear end to ride on an inclined surface 61 of a block 60', in order to retract the lug 59 out of the path of the teeth 28 when electromagnet 15 is deenergized.

With more specific reference to the time delay structure B, the same is operated by the aforesaid electric motor 23. This motor is of the high speed type and through the medium of a pinion 62 or the equivalent, either immediately or mediately through a chain of gears 63, peripherally engages and drives a disc or plate 64 journaled on a shaft or post 65. A clock spring 66 is attached to the plate 64 and to the shaft or post 65 to urge the plate counterclockwise to the limit permitted by the engagement of a lug 67 of plate 64 with a fixed stop or abutment 68. At the other extreme of movement, namely, clockwise, lug 67 is engageable with a fixed stop or abutment 69. Concentric with the shaft 65 and fixed relatively thereto is the aforesaid arcuate contact 21, to which one end of section 19' of conductor 19 is fastened, the adjacent end of conductor 19 being fastened to an arcuate contact 71 wiped by the metallic plate 64. Portions of the upper surface of contact 21 are removed and filled with strips of insulation 72 and 73, thus leaving but a portion 70 of contact 21 exposed at the top and the surface of which is flush with that of portions 72 and 73. Adapted to wipe across the upper surface of contact portion 70 and insulation strips 72 and 73 is a movable conductor arm 74. Plate 64 has an opening occupied by a bushing 75 of insulation to which a pin or lug 76 is fixed and on which pin arm 74 is pivoted. Conductor arm 74 at its inner end is movable to the extent permitted between the contacting post or contact 77 rigid on plate 64 and a stop 78 also rigid on plate 64 but insulated therefrom as by means of a bushing 79.

The geared parts 62, 63 and 64 may be toothed or may be merely in frictional contact, as preferred.

In the operation of the structure, transmitted radio impulses are received by the set 10, which energize and actuate the magnet 11, sending electric current simultaneously through all wires of the system. Each impulse will result in moving the actuator 57 to turn the selector disc 27 the extent of one tooth 28, which, in turn, pushes the arm 43 to a different final control or segment 40 due to lug 44 abutting against the arm 43. When the part 35 disengages contact 36 through counterclockwise movement of selector disc 27, no circuit exists through the conductor 37 and any of the conductors 39 and of segments 40. When arm 43 at its contact 41 reaches and engages any of the segments 40, it is held therein against return movement due to the spring action of latch 51 with the teeth of rack 52. For instance, if arm 43 has been pushed by lug 44 to the dotted line

position in Figure 1, it remains there due to co-action of latch 51 with teeth 52 and will not be released until a new series of impulses disengages the same from the rack. Simultaneously, as magnets 15 and 17 were operated, motor 23 was energized and wound the spring 66 through turning of the geared parts 62, 63 and 64. Thus, as the series of impulses left arm 43 in the dotted line position, they wound the delay device B. Said delay device B in unwinding energizes the contacting parts 70, 19', 20, 18 and 13, since, at that time, the conductor 74 will be in contact with the lug 77, while in winding of the spring 66 and plate 64, the conductors last mentioned will not be energized because conductor 74 will be in engagement with insulated stop 78. The frictional engagement of conductor 74 with the plate 64 and insulation 72 and 73 causes such conductor to have a slight independent movement of its pivot into engagement with contact 77 or stop 78 through and according to the direction of movement of plate 64. When such current last traced flows, it causes magnet 20 to actuate pawl or detent 32 from engagement with teeth 28, allowing the selector disc 27 to return to rest under action of spring 29, in which position contacts 35 and 36 engage to complete a circuit through other segment 40 with which contact 41 is engaged, arm 43 remaining in the dotted line position.

The first impulse of any series of impulses received by the set 10 must of necessity be a long impulse. Such long impulse allows time for the motor 23 to wind the delay structure B, each additional short impulse keeping delay structure B wound until the series of impulses is terminated, whereupon the delay structure B slowly unwinds under action of spring 66. Said long impulse also gives arm 43 a snap back against stop 46 due to the action of spring 49 anchored to arm 43 and axle 25, latch 51 being disengaged from the teeth 52 due to the magnet 17 constantly maintaining latch 51 retracted throughout the length of the time of the long impulse. Arm 43 does not snap back against pin 44 which is one tooth length behind stop 46, which prevents the snap back action from interfering with the pull of the actuator 57. Plate 64, turning clockwise, causes conductor arm 74 to assume such a position that one end thereof touches insulated abutment or pin 78 and, hence, no current flows when conductor arm 74 travels across conductor 21. Said contact arm 74, when plate 64 turns counterclockwise, touches conductor or contact 77 and, thus, when crossing conductor 21, the circuit is made which operates solenoid or magnet 20.

The parts may be conveniently contained within a housing or casing, such as suggested at 80 in Figure 3, motor 23, preferably, being accommodated on the exterior thereof. The post 24 may constitute one wall of the said housing 80. If desired, also, the delay device B could be positioned on an extension of the post or shaft 25.

Various changes may be resorted to provide they fall within the spirit and scope of the invention.

I claim as my invention:

A multi-circuit selector variably responsive to variable number impulse series comprising a movable element having a normal position, means responsive to impulses of a series for advancing said element from normal position a step for each impulse, an off-normal contact means opened when the element is advanced from said normal position, means to urge said element to normal position, a movable circuit closing arm and in-

dividual circuit selecting contacts cooperating therewith in its different positions, means to move said arm over its contacts in one direction only by the advance movement of said element, means for urging movement of the arm in the other direction independently of the element, means for holding the element in its advanced positions, means for independently holding said circuit closing arm in its advanced position, time delay means responsive to the impulses and responsive to the termination of an impulse series for returning the element to normal position and thereby reclose the off-normal contact means, a

5 circuit connection including the off-normal circuit closing means in series with the movable circuit closing arm, and means responsive to the impulses of a series for releasing the means for holding the circuit closing arm in its advanced positions, the driving connection between the movable element and the circuit closing arm being such that the release of the holding means for the circuit closing arm is effective to cause 10 restoration of the arm at the initial portion of the movement of the rotatable element.

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