Dec. 18, 1951 A. K. SCHLATTER 2,578,844

SIGNAL SWITCH DEVICE

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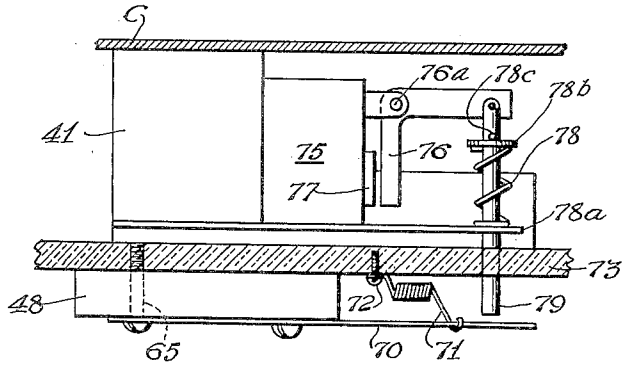


Fig. 1.

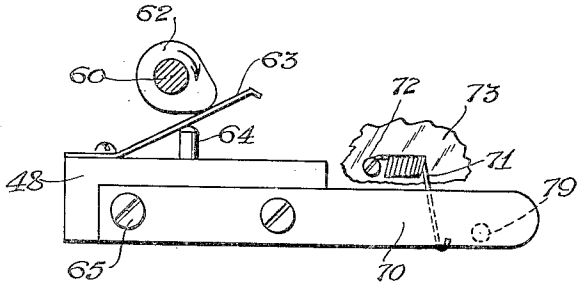


Fig. 2.

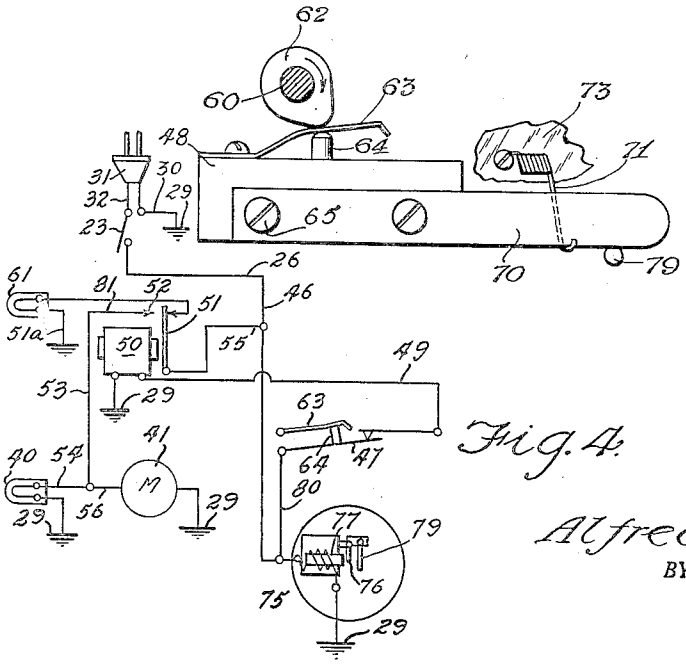


Fig. 3.

Fig. 4.

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SIGNAL SWITCH DEVICE

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4 Claims. (Cl. 161—1)

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My invention relates to signals and deals with the actuation of a timed regular signal and a subsequent special signal, and the object of the invention is to provide a novel control effective to operate the signals by means of an automatic switch device dependent on a single control.

A further object is to include a mechanism which restores the switch control to the original position after it has been actuated.

With reference to the accompanying drawings,

Fig. 1 is a horizontal section of a support, showing the switch device;

Fig. 2 is an elevation of the device in a given position;

Fig. 3 is a similar view, showing a change in the position of the switch device; and

Fig. 4 is a diagrammatic view of an electrical circuit including the switch device.

Referring specifically to the drawings, 40 denotes the lamp comprising the regular signal and 61 a lamp comprising the special one. A current supply plug is shown at 31 and a magnet at 50. The plug is connected with one terminal 30 to a ground 29, while the other terminal 32 leads through a switch 23 to a conductor 26 which connects with the armature 51 of an electromagnet 50, continuing by way of a conductor 51a through the lamp 61 constituting the special signal to the ground. This circuit procures the lighting of the lamp 61 on the closing of the switch 23.

The conductor 26 also forms a branch circuit for the operation of the regular lamp 40 and a motor 41 instead of the lamp 61. Thus, the conductor 26 is combined with an extension 46 leading to the terminal of a switch 48, the other terminal 49 thereof leading to one terminal of the electromagnet 50; and the other terminal of the latter is grounded. The armature 51 is adapted to break contact with the conductor 51a on the energizing of the electromagnet 50 and engage a terminal 52 of a conductor 81 which leads to one of the terminals of the lamp 40 and motor 41, the other terminals of these units being grounded. It is now apparent that the closing of the switch puts in action both circuits described above, but that the operation of the electromagnet 50 breaks the circuit of the special lamp 61, so that only the lamp 40 and motor 41 remain in operation.

While the lamp 40 serves as a steady signal while the device is in operation, the motor serves as a timing medium for the same. Thus, the motor is of a type which is geared very low and calculated to turn its output shaft 60 one revolution during a period of three minutes. The action of the motor is designed in part to control a switch 48 in a manner to cut off the lamp 40 and the motor at the end of a given period and then turn on the lamp 61.

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Figs. 1 to 3 show the manner in which the motor contributes to control the switch 48. It is noted that the output shaft 60 of the motor carries a cam 62. The switch casing 48 has a spring blade 63 above its push-pin 64, such blade being in the rotary path of the cam 62. The switch casing, pivoted at 65 to the motor 41, is normally in the position shown in Fig. 2; and the extended position of the push-pin 64 indicates that the switch is closed, as shown in the circuit diagram. The switch casing is extended with an outwardly flexible arm 70, which is subject to the upward pull of a light spring 71 attached by a screw 72 to a suitable support 73. A relay 75 is located behind the arm 70, the armature 76 of this relay being pivoted at 76a and normally rocked away from its magnet 77 by a spring 78. The armature carries a forwardly projecting plunger 79 which ends immediately behind the arm 70 as shown in Fig. 1, the plunger 79 carrying the spring 78 between a stationary bracket 78a and a collar 78b backed by a cross-pin 78c.

When the switch 23 is closed to turn on the lamp and the motor, the circuit involved extends to a conductor 80 and through the magnet 77 of the relay 75 to the ground 29 with the effect of attracting the armature 76 and advancing the plunger 79. The latter action flexes the arm 70 outwardly. In the meantime, the rotation of the motor cam 62 has brought its point to bear on the spring blade 63, which is sufficiently stiff to swing the switch casing 48 down a slight distance from the position of Fig. 2 while the arm 70 is still in front of the plunger 79 and under its flexing influence. However, as the cam point clears the blade 63, the spring 71 draws the blade up until it rides off the plunger 79—as seen in Fig. 3—and therefore returns to its straight or normal form to assume a position over the plunger instead of in front of the same. Now, when the cam point again engages the blade 63 the switch casing 48 will be locked against depression by the plunger 79, and the influence of the cam point will depress the push-pin 64 and open the switch.

The action just described will—when the circuit diagram is consulted—de-energize the electromagnet 50, allowing the armature 51 to back away from the contact post 52. The lamp 40 and

the motor 41 will thus go out of action; and the circuit will be extended from the armature 51 through the conductor 81 to light the lamp 61. The opening of switch 23 de-energizes the magnet 77 of relay 75, in which event the plunger 79 recedes by force of the spring 78 and resumes its position immediately behind the arm 70. Now, with the motor shaft at rest, the arm 70 yields downwardly to the projecting influence of the push-pin 64, and resumes its position opposite the plunger 79 as in Fig. 2.

While the above action might be accomplished by using the switch 48 in a stationary position and the cam 62 for influencing its push-pin, the depression of the latter would stop the motor by cutting off the current, in which event the cam would keep holding the push-pin down, and manual attention would be required to again close the switch. In the present instance, however, the recession of the plunger 79 allows the switch 48 to yield to the pressure of the cam and allow the push-pin 64 to emerge. Now, the control is back in the original or reset position, and the next operative event finds the switch 48 initially yielding to the cam 62 to permit the motor to run the prescribed period.

I claim:

1. A circuit timer comprising a switch device, said device having an actuating element spring-urged to an extended position when the switch of said device is closed and depressible relatively to said device to open same, a member operable when driven to exert periodic depressing forces upon said actuating element, means controlled by said switch for driving said member, means yieldably supporting said switch device for bodily movement thereof in response to said periodic forces, thereby to prevent depression of said actuating element relatively to said device, and an obstruction movable into a position to obstruct said bodily movement.

2. A circuit timer comprising a switch device, said device having an actuating element spring-urged to an extended position when the switch of said device is closed and depressible relatively to said device to open same, a member operable when driven to exert periodic depressing forces upon said actuating element, means controlled by said switch for driving said member, second means yieldably supporting said switch for bodily movement thereof in response to said periodic forces, thereby to prevent the depression of said actuating element relatively to said device, a spring blade carried by the latter, a spring-backed plunger directed toward the blade, third means in said circuit effective when the switch is closed to project the plunger endwise with a tensioning effect on the blade during said movement, and said second means effective to draw the blade off the end of the plunger during an interval between said periodic forces, whereby to locate the blade over the side of the plunger and render the latter an obstruction to said bodily movement of the switch device.

3. The structure of claim 2, said member including a rotary cam with an eccentric portion, and a follower for said cam serving as an abutment for said actuating element, the depression of the latter at the end of said interval operating to open the switch and de-energize both said driving means and said third means resulting in the self-retraction of the plunger, and the yielding movement of the switch device as the actuating element bears during its closing movement on said follower operating to restore the blade to a position to become tensioned as stated.

4. A circuit timer comprising a switch device, said device having an actuating element spring-urged to an extended position when the switch of said device is closed and depressible relatively to said device to open same, a member operable when driven to exert periodic depressing forces upon said actuating element, means controlled by said switch for driving said member, second means yieldably supporting said switch for bodily movement thereof in response to said periodic forces, thereby to prevent the depression of said actuating element relatively to said device, and means for inducing the depression of said actuating element to open said switch and de-energize the means for driving said member comprising a spring blade carried by the device, a spring-backed plunger directed toward the blade, means in said circuit effective when the switch is closed to maintain the plunger in endwise tensioning engagement with the blade during said movement, and said second means effective to draw the blade off the end of the plunger during an interval between said periodic forces, whereby to locate the blade over the side of the plunger and render the latter an obstruction to said bodily movement of the switch device.

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