Oct. 24, 1933. W. B. JONES 1,931,548

CONTROL FOR VARIABLE DEVICES

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Fig. 1

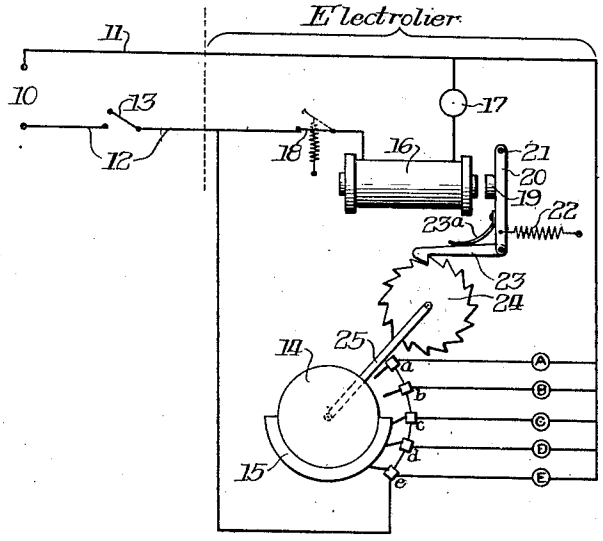


Fig. 2

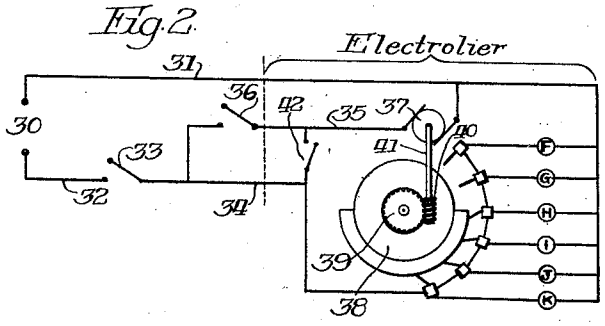
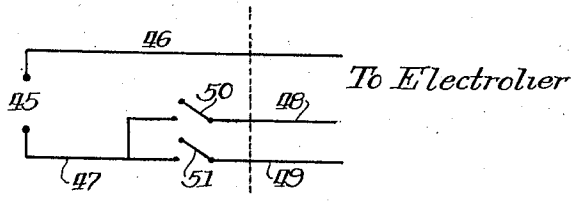


Fig. 3



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CONTROL FOR VARIABLE DEVICES

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10 Claims. (Cl. 171—97)

The present invention relates to control devices and in particular to a variable or plural-circuit device used in combination with a control switch, such as an electrolier and its wall switch.

One object of the invention is to provide for both remote and local control of the device and especially of sub-circuits in the device, such as the outlet circuits of an electrolier.

A particular object of the invention is to provide for such controls of the plural circuits on a two-wire system, such as that commonly used in wiring electroliers.

A more special object is to provide for the remote or local control of an actuating member.

The nature of the invention as well as other objects and advantages of the same will be clearly understood from the following description of the devices shown in the accompanying drawing in which

Fig. 1 represents an electrolier having a plurality of outlet circuits with two wires leading to the electrolier, one of them including at a remote location the wall switch.

Fig. 2 represents a plural circuit electrolier having three wires leading thereto, commonly known as a two-circuit electrolier, with two switches for the circuits, power to one switch being under the control of the other switch.

Fig. 3 is a modified relation of the two-circuit electrolier wall switches with each switch independent of the other.

In Fig. 1 a source of power 10 has one side connected by wire 11 directly to an electrolier. The other side 12 passes through a remote control switch 13 as in a wall. The remainder of the figure is represented as the complete electrolier and it contains a distributor for a plurality of outlet circuits and means to actuate the distributor by power changes in the circuit 11—12 leading to the electrolier.

In the present instance the distributor comprises a rotary contact device illustrated diagrammatically by a disk or drum 14 arranged to close various circuit switches *a*, *b*, *c*, *d*, and *e* which control lamp outlets A, B, C, D and E between the line wires 11 and 12. One half of the disk or drum as a cam-like structure 15 particularly designated in order to indicate that all of said lamp switches may be open at the same time by arranging them semicircularly about the drum or disk in an inoperable relation to the "dead" half of the disk or drum.

Motive power for the switch actuator 14 is supplied by some sort of impulse motor, that is, one which gives an impulse whenever there is a particular sort of power change in the circuit. In the present instance the power change relied upon is the opening and the closing of a local circuit, that is, one within the electrolier in association with the motive device.

An electromagnet 16 is connected across the line 11—12 through a resistance in the form of a lamp 17 in one of the electrolier outlets, and through a local control switch 18, which is of a type normally closed or automatically closing. An armature 19 carried on an arm 20 pivoted at 21 is normally held withdrawn from the electromagnet by a spring 22. The arm carries a pawl 23 which actuates a ratchet wheel 24 step by step. The ratchet wheel turns the disk or drum by a suitable connection such as a common shaft 25.

By repeated operation of either switch 13 or 18 the switch actuator can be moved to change the number of lamps that are lighted from a single one to a maximum in succession or in any combination in which the switches are actuated. Actuation by opening switch 13 will cause all the lights to flicker, but actuation from the local switch 18 will cause only the light 17 to flicker, and when this light used herein as a resistance is dispensed with or the resistance is otherwise provided for, no flickering will occur. The light 17 is desirably used both as a lamp and as resistance for the reason that it serves as a signal that current flows through the impulse motor.

In Fig. 2 two-circuits are provided from the remote control station, one being used as a motor circuit and the other as a lamp circuit. A power source 30 is connected directly to the electrolier to provide a common return 31. Another line 32 passes through a switch 33 and then splits into two branches, one of which is a wire 34 for the light circuit and the other a wire 35 for the motor circuit containing also a control switch 36.

In the electrolier there is a suitable motor, which may be such as that described for Fig. 1, but which is preferably of the continuously operating type as distinguished from the impulse type. Such a motor is designated at 37. As this type is usually of a high speed character, I have illustrated speed reduction gearing between the motor and a switch actuating element 38. The gearing comprises a large gear 39 turned by a worm 40 on a motor shaft 41. Lamp circuits F, G, H, I, J and K with suitable switches are related to the actuator in any desirable

manner. A local motor control switch 42 is connected across the two lines 34 and 35 so that the lights may be changed from the electrolier itself. By this arrangement all lights may be extinguished or lighted from either station independently.

In Fig. 3 a modified circuit is shown for controlling the electrolier. There are illustrated a source 45, two feed wires 46 and 47, the latter forming two branches which are a motor circuit 48 and a light circuit 49 with the respective switches 50 and 51.

It is to be noted particularly that in the device of Fig. 1 there are sixteen teeth on the ratchet wheel and that at each opening of the motor circuit the wheel is advanced one-sixteenth of a revolution, and that this angular advance corresponds with the angular arrangement of the lamp switches about the actuator. Thus, when lighting or extinguishing of the lamps takes place, one operation of the impulse motor will operate on one light, and successive operations of the impulse motor will successively operate on the series of lights.

The present invention may be embodied in a unitary device as a motor-operated distributor for insertion into electroliers already installed, in which case the wall switch would be no part of the added combination. It is to be understood that various changes may be made, such for example, as the substitution of a reciprocable ratchet member or actuator, without departing from the present invention as expressed in the appended claims. It is also to be understood that the invention is not limited to use in electroliers and that devices other than lamps may be operated by the device of the present invention.

I claim:

1. A switching system comprising in combination, a plural circuit device, a plurality of outlet circuits in said device, two power lines leading to said device, a main power switch in one of said power lines, an electromagnet in one outlet circuit, said circuit being connected directly across the power lines to said device and under control of the main power switch, a resiliently movable armature responsive to energization of said electromagnet, a cyclically movable member adapted to be operated step-by-step by motion of said armature in one of its directions of motion, switches in other outlet circuits arranged to be operated by said cyclically movable member, said outlet circuits being connected in parallel across the power lines, and switch-operating means carried by said cyclically movable member, said means and each of said outlet-controlling switches being specially related to predetermine the open and closed status of each switch-controlled outlet circuit by the position of the cyclically movable member.

2. A switching system comprising in combination, a plural circuit device, a plurality of outlet circuits in said device, two power lines leading to said device, a main power switch in one of said power lines, an electromagnet in one outlet circuit, said circuit being connected directly across the power lines to said device and under control of the main power switch, a resiliently movable armature responsive to energization of said electromagnet, a movable rotary member adapted to be operated step-by-step by motion of said armature in one of its directions of motion, switches in other outlet circuits arranged to be operated by said rotary member, said outlet circuits being connected in parallel across the power lines, and switch-operating means carried by said rotary member, said means and each of said outlet-controlling switches being specially related to predetermine the open and closed status of each switch-controlled outlet circuit by the position of the rotary member.

3. A switching system comprising in combination, a plural circuit device, a plurality of outlet circuits in said device, two power lines leading to said device, a main power switch in one of said power lines, an electromagnet in one outlet circuit, said circuit being connected directly across the power lines to said device and under control of the main power switch, a resiliently movable armature responsive to energization of said electromagnet, a movable rotary member, a ratchet wheel movably associated with said rotary member, an engaging pawl for said ratchet wheel carried by said armature, switches in other outlet circuits arranged to be operated by said rotary member, said outlet circuits being connected in parallel across the power lines, and switch-operating means carried by said rotary member, said means and each of said outlet-controlling switches being specially related to predetermine the open and closed status of each switch-controlled outlet circuit by the position of the rotary member.

4. A switching system comprising in combination, a plural circuit device, a plurality of outlet circuits in said device, two power lines leading to said device, a main power switch in one of said lines, an electromagnetic motive device in a circuit connected directly across said power lines and under the control of said main power switch, a motor control switch connected in series with said motive device in its said circuit, a cyclically movable member adapted to be operated by said motive device, switches in some of said outlet circuits arranged to be operated by said cyclically movable member, said outlet circuits being connected in parallel across said power lines, and switch-operating means carried by said cyclically movable member, said means and each of said outlet-controlling switches being specially related to predetermine the open and closed status of each switch-controlled outlet circuit by the position of the cyclically movable member.

5. A switching system comprising in combination, a plural circuit device, a plurality of outlet circuits in said device, two power lines leading to said device, a main power switch in one of said lines, an electromagnetic motive device in a circuit connected directly across said power lines, a motor control switch connected in series with said motive device in its said circuit, a cyclically movable member adapted to be operated by said motive device, switches in some of said outlet circuits arranged to be operated by said cyclically movable member for control, said outlet circuits being connected in parallel across said power lines, and switch-operating means carried by said cyclically movable member, said means and each of said outlet-controlling switches being specially related to predetermine the open and closed status of each switch-controlled outlet circuit by the position of the cyclically movable member.

6. A switching system comprising in combination, a plural circuit device, a plurality of outlet circuits in said device, two power lines leading to said device, a main power switch in one of

said lines, an electromagnetic motive device in a circuit connected directly across said power lines, a motor control switch connected in series with said motive device in its said circuit, a cyclically movable member adapted to be operated by said motive device, switches in some of said outlet circuits arranged to be operated by said cyclically movable member for control, said outlet circuits being connected in parallel across said power lines and under control of said main power switch, and switch-operating means carried by said cyclically movable member, said means and each of said outlet-controlling switches being specially related to predetermine the open and closed status of each switch-controlled outlet circuit by the position of the cyclically movable member.

7. A switching system comprising in combination a plural circuit device, a plurality of outlet circuits for said device, two power lines leading to said device for supplying power to said outlet circuits, a main power switch in one of said lines, an electromagnetic motive device in a circuit empowered by said power lines, a motor control switch for controlling power to said motive device, a cyclically movable member adapted to be operated by said motive device, means including switches for operative control of some of said outlet circuits, said switches being arranged to be operated by said cyclically movable member for control thereby, said outlet circuits being under control of the main power switch, and switch-operating means carried by said cyclically movable member, said means and each of said outlet-controlling switches being specially related to predetermine the open or closed status of said switch-controlled outlet circuits by the position of said cyclically movable member.

8. A switching system comprising in combination a plural circuit device, a plurality of outlet circuits in said device, two power lines leading to said device, a main power switch in one of said power lines, an electromagnet empowered by one of said outlet circuits, said last mentioned outlet circuit being connected directly across the power lines and under control of the main power switch, a resiliently movable armature responsive to energization of said electromagnet, a cyclically movable member adapted to be operated step-by-step by motion of said armature in one of its directions of motion, means including switches for control of power in other outlet circuits arranged to be operated by said cyclically movable member, and switch-operating means carried by said cyclically movable member, said means and each of said outlet-controlling switches being specially related to predetermine the open and closed status of each switch-controlled outlet circuit by the position of the cyclically movable member.

9. A switching device comprising in combination a plurality of circuits in parallel adapted for connection to a switch-controlled power line, an electromagnet in a closed one of said circuits, a resiliently movable armature responsive to energization of said electromagnet, a rotary member having a cam means thereon, switches in other outlet circuits arranged to be operated by said cam means to open and to close at different positions of said cam means, a ratchet wheel for turning said member, and a pawl adapted to be moved by said armature for moving the ratchet step-by-step.

10. A switching device comprising in combination a plurality of circuits in parallel adapted to be connected to a power line, an electromagnet in one of said circuits, a controlling switch in said circuit, a resiliently movable armature responsive to energization of said electromagnet, a rotary member having cam means thereon, switches in other outlet circuits arranged to be operated by said cam means to open and to close at different positions of the cam means, a ratchet wheel for turning said member, and a pawl adapted to be moved by said armature for moving the ratchet step-by-step.

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