

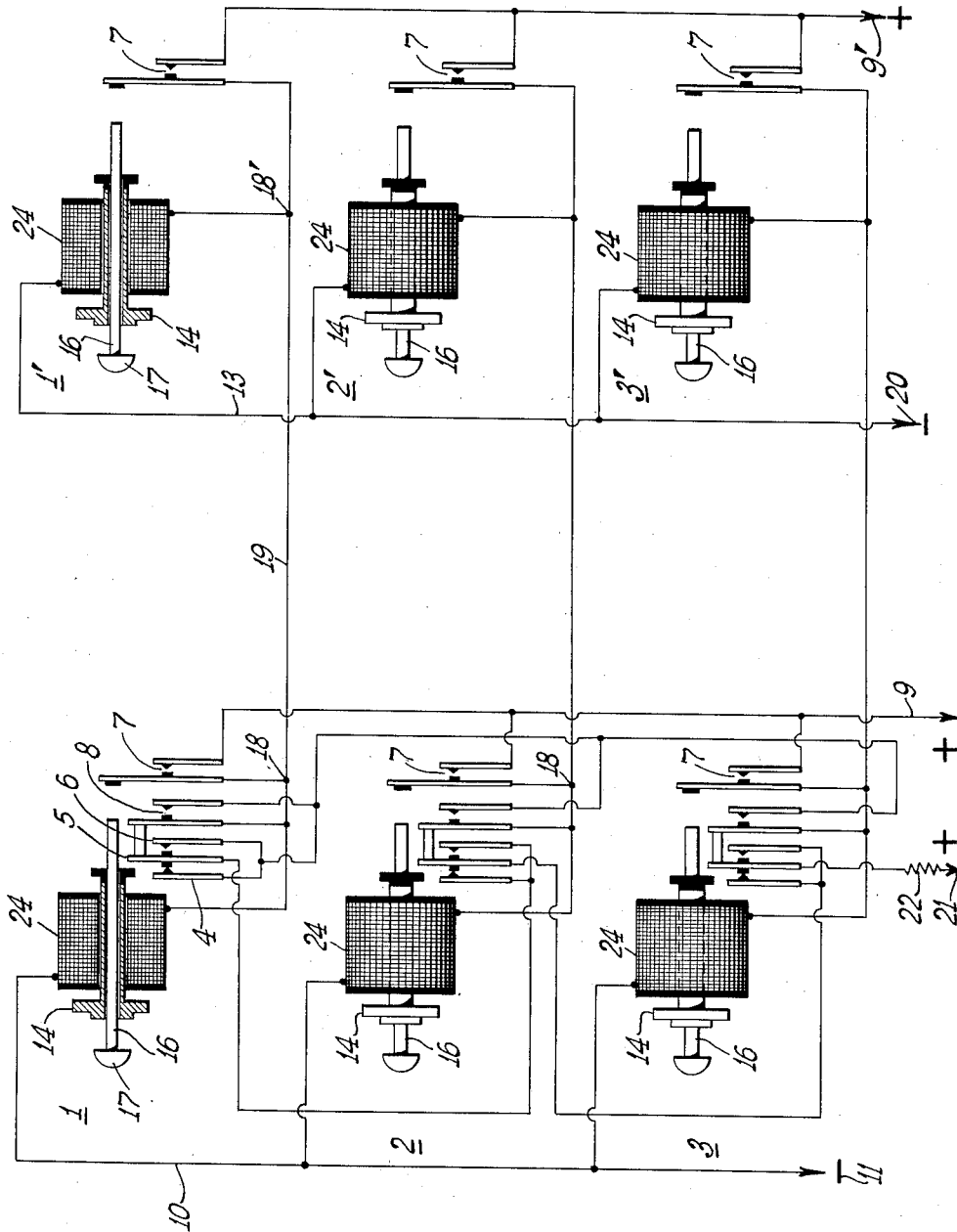
June 22, 1943.

W. A. BRUNO

2,322,563

REMOTE CONTROL

Filed Aug. 27, 1941



INVENTOR
WILLIAM A. BRUNO
BY *Mock & Blum*
ATTORNEYS

UNITED STATES PATENT OFFICE

2,322,563

REMOTE CONTROL

William A. Bruno, Astoria, Long Island, N. Y., assignor to Bruno Patents Inc., Long Island City, N. Y., a corporation of New York

Application August 27, 1941, Serial No. 408,428

3 Claims. (Cl. 175—320)

The present invention relates to improvements in coordinated control devices for the remote and local operation of electric circuits and more specifically to a system of coordinated control devices of the type described in my co-pending application Ser. No. 377,858 filed on February 7, 1941.

In the preferred embodiment of the system of coordinated control devices for local and remote operation of electric circuits, described in my above named co-pending application, said control devices are provided with depressible members and operating on a closed circuit. Upon manually depressing one of the depressible members, resetting of any previously set up combination takes place in said control devices, this resetting being caused by the interruption of the flow of the steady current in said circuit. The manual depression of said depressible member, by the electromagnetic action of a working current, also causes actuation in the operative position of the depressed member, and actuation in the operative position of the depressible member corresponding to said depressed member in the coordinated control devices. The manually depressed member, and the corresponding members of the coordinated control devices are retained in their operative position by the electromagnetic action of the steady current, upon relieving the manual pressure exerted on said depressed member. Finally, means are provided for actuating local circuits in the system to be controlled.

It is one object of my present invention to reduce the number of electric leads which are necessary for the proper electric interconnections in my above mentioned system and to reduce the number of electric resistances included in said system. Another object of the invention is to reduce the number of switches in the individual push button sets of the system, and to arrange the elements forming said sets in the smallest possible space. Other objects and advantages will appear from the following specification in conjunction with the accompanying drawing.

The drawing shows the wiring diagram of an arrangement of two coordinated devices according to my present invention.

In the wiring diagram shown, two push button units are interconnected, each of these units consisting of 3 push button sets of substantially identical construction, generally designated with reference numbers 1, 2, 3 and 1', 2', and 3'. The unit consisting of sets 1, 2 and 3, is denoted in this application as a "first unit." Each of these push button sets comprises a push button 17

which is provided with a push button rod 16, and can be manually pressed from the left to the right, viewed in the drawing. Upon relieving the manual pressure exerted on a push button, it tends to return into its original or rest position under the action of suitable means, such as spring means, which are not shown in the drawing. Each push button set also comprises an electromagnet 24 and an armature 14 which is attracted by said electromagnet when energized with a suitable current, and can be retained in its attracted position when said electromagnet is energized with a weaker current. As will be explained in detail further below, each push button may occupy three different positions, i. e. the rest position, the depressed position when actuated manually until it comes to a stop, and the position, in which it is held by the electromagnetic action of the electromagnet on the armature contained in the push button set, upon relieving the manual pressure exerted on the push button.

Each of the sets 1, 2 and 3 comprises a throw-over switch which consists of springs 4, 5 and 6. The switch formed by springs 4 and 5 is closed in the rest position, while the switch formed by springs 5 and 6 is open. As shown in the drawing, springs 4 and 6 are electrically connected with each other. Furthermore, each of the push button sets 1, 2, 3 and 1', 2', and 3' comprises a pair of springs 7. Each of the sets 1, 2 and 3 also comprises a spring pair 8. The units are electrically interconnected by means of 3 leads 19.

If a push button is manually depressed until it comes to its stop, the corresponding switch 7 will be closed. Such manual actuation of a push button does not cause any change in the position and functioning of springs 4, 5 and 8.

The operation of the device is as follows:

For actuating push button set 1 and its counterpart 1', the operator in set 1 presses push button 17 until it comes to its stop. Thereby, as explained above, switch 7 will be closed, and a current will flow from the positive terminal 9 through the closed switch 7, said current being branched at 18 in two parallel paths, one flowing through the coil of set 1, and the other through the coil of set 1', through leads 10 and 13, respectively, to their respective negative terminals 11 and 20. Thereby the coils of sets 1 and 1' will be energized, and the respective armatures 14 will be attracted by the coils. The manual pressure exerted on push button 17 is now relieved. When the armature is attracted

by its coil in set 1, the throw-over switch formed by springs 4, 5, 6, is brought from its rest position into another position, in which contact between springs 4 and 5 is broken, and contact between springs 5 and 6 is closed soon after such interruption. During this short period of interruption, the flow of current in the system is stopped, whereby the previously selected settings will be cancelled, as the attracted armatures in the selected sets will move from their electrically attracted position to their rest position. Since springs 4 and 6 are electrically connected, this new position of the throw-over switch is electrically equivalent to the rest position of the same. At the same time, switch 8 will be closed by the action of armature 14, and a reduced electric current will flow from the positive terminal 21, through resistance 22, and the spring pairs 4, 5 of the push button sets 3 and 2, respectively. This reduced or holding current then flows through spring pairs 5, 6 of the throw-over switch of push button set 1, and through the switch 3, which is closed now, to the coil of push button set 1 and lead 10 to the negative terminal 11. The current is branched at the left spring (viewed in the drawing) of switch 8, and a part of the current flows through lead 19 to the coil of set 1', and then through lead 13 to the negative terminal 20.

The beforementioned holding currents are relatively weak, because they flow through resistance 22, they are, however, strong enough for retaining the armatures of sets 1 and 1' in the attracted position. The full current, which is necessary to cause attraction of the armatures by the coils, acts for a short period of time only during the manual depression of the push button, and closing of switch 7 in order to reduce the heating of the system by electric currents.

The same procedure takes place if, instead of the push button of set 1, the push button of set 1' is manually depressed. In this case, an electric current flows from the positive terminal 9' through the closed switch 7 of set 1' to 18', where the current is branched in two parallel paths, one flowing through the coil of set 1', and the other through the coil of set 1, through leads 13 and 10 respectively to their respective negative terminals 20 and 11. The full current causes both armatures in sets 1 and 1' to be attracted, and the above described procedure takes place.

Actuation of the other sets 2, 3 and 2', 3' may be effected by depressing the push button in one of the respective sets. Sets 2 and 2' may be, for example, actuated by depressing the push button in set 2 or 2'. Actuation of these push buttons causes attraction of the armatures in both sets 2 and 2'. Upon the attraction of these armatures by the respective coils, the electric contact between springs 4 and 5 is interrupted, and contact between springs 5 and 6 is established soon after such interruption. During the short period of interruption, the flow of current from the positive terminal 21 through resistance 22 to the coils of sets 1 and 1' is stopped, if the sets 1 and 1' were previously selected. This interruption is sufficient for causing the armature of sets 1 and 1' to move from their electrically retained position to their rest position.

As sets 1', 2' and 3' contain only one spring pair each, there is ample space in these sets for housing further spring pairs which serve for the actuation of local circuits.

The push button sets used in the units shown in the wiring diagram, may be constructed in a

manner substantially similar to that shown in Fig. 6 of my above mentioned copending application Ser. No. 377,858.

The system according to my present invention has the important advantage that two sets can not be operated at the same time, because the reduced current flowing through the system is not sufficient for supplying enough voltage in parallel to more than 2 push button sets. Instead of two units, three or more units may be coordinated according to my invention.

This invention is not limited to the embodiments shown, but may be embodied in various equivalent forms and arrangements as may be desired, reference being had to the appended claims for a definition of the limits of the invention.

I claim:

1. In a system of coordinated control devices for local and remote operation of electric circuits, said system comprising a first unit of control devices and at least one further unit of control devices, said control devices being provided with depressible members and adapted to be electrically connected in a circuit, means for supplying current to said circuit, means housed by said first unit of control devices, and adapted to interrupt the flow of current in said circuit and resetting any previously set up combination in said devices, upon depressing one of the depressible members in one of the devices of said first and the further units, means for actuating the depressible members corresponding to said depressed member of the coordinated device by the electromagnetic action of a full current, and means for retaining said depressible members in their operative position by the electromagnetic action of a reduced current.

2. In a system of coordinated control devices for local and remote operation of electric circuits, said control devices being adapted to be electrically connected in a first circuit and a second circuit of lower intensity; means for supplying current to said circuits; said system comprising a first unit, and at least one further unit, each of said units comprising push button sets; each of said push button sets being provided with electromagnetic means for actuating an armature adapted to act on a push button rod of said push button set; each of the push button sets of said first unit comprising a first switch controlled by the push button rod of the respective push button set, a second switch controlled by the armature of the respective push button set, and a throw-over switch controlled by said armature; each of said push button sets of said first and further units being adapted to cause interruption of the flow of current in said circuits, and resetting of any previously set up combination in said system by actuation of said throw-over switch of the control devices of said first unit, by manually depressing one of the push buttons in one of said push button sets; each of the push button sets in said further units containing only one remote control switch controlled by the push button rod of the respective push button set; each of the push button sets in said further units being adapted to actuate local circuits in the device to be controlled.

3. In a system of coordinated control devices for local and remote operation of electric circuits, said control devices being adapted to be electrically connected in a first circuit and a second circuit of lower intensity; means for

supplying current to said circuits; said system comprising a first unit, and at least one further unit, each of said units comprising push button sets; each of said push button sets being provided with electromagnetic means for actuating an armature adapted to be attracted by said electromagnet; each of the push button sets of said first unit comprising a first switch controlled by the push button rod of the respective push button set, a second switch controlled by said armature of the respective push button set, and a throw-over switch controlled by said armature; each of said push button sets of

said first and further units being adapted to cause interruption of the flow of current in said circuit by actuation of said throw-over switch upon manually depressing one of the push buttons in one of said push button sets; each of the push button sets in said further units containing only one remote control switch controlled by the push button rod of the respective push button set; each of the push button sets in said further units being adapted to actuate local circuits in the device to be controlled.

WILLIAM A. BRUNO.