Aug. 26, 1941. H. SCHRÖDER 2,253,654

SYSTEM FOR REMOTELY CONTROLLING REGULATORS

Filed Oct. 19, 1937

Fig. 1

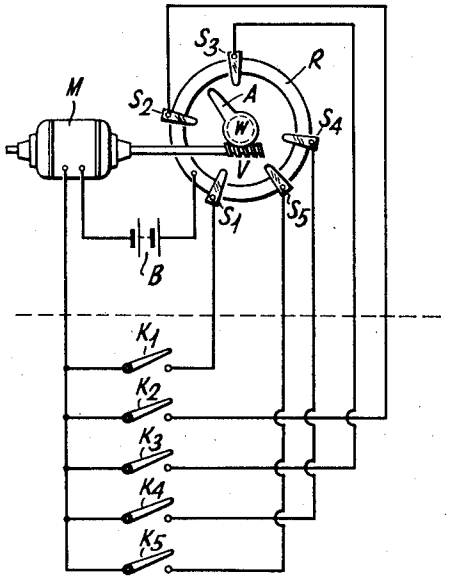


Fig. 2

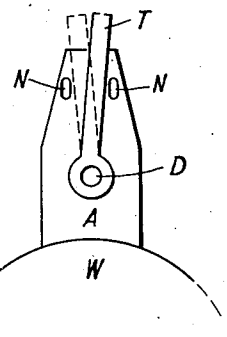
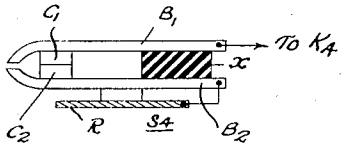


Fig. 3



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SYSTEM FOR REMOTELY CONTROLLING REGULATORS

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In Germany September 23, 1936

1 Claim. (Cl. 200—6)

For the electrical remote control of regulators, particularly of tuning means in transmitters and receivers, a number of proposals already has been made. Thus, e. g., one has provided on the apparatus to be controlled from a distance a shifting motor acting on the shaft of the regulator, which is switched on by actuating switch contacts placed at the control device and is automatically disconnected as soon as the desired adjustment is reached

It has been found, however, that the devices of the prior art are quite complicated and in addition require considerable space for proper mounting and operation thereof. This has been found to be a great disadvantage in some types of installations where it is essential to mount the controlling apparatus in a small space.

It is an object of the present invention to provide a remote control tuning arrangement which overcomes the disadvantages mentioned above. Other objects of the invention will be apparent from the following description when considered in connection with the accompanying drawing.

In the drawing, Figure 1 illustrates in schematic form a preferred embodiment of the invention showing a motor controlled shaft; Figure 2 is a detailed showing of the switch operating arm of the arrangement shown in Figure 1; and Figure 3 is a diagrammatic illustration showing the construction of one of the station switches.

In accordance with this invention an arm is coupled to the regulator which opens in passing-by one or more switches arranged according to predetermined desired settings. Each of these switches is joined in series to the associated switch contact placed at the control device and the shifting motor as well as the operating voltage source.

The invention renders possible an accurate remote control by simple means of little energy consumption and very small dimensions.

In Figure 1 of the drawing, W represents the shaft of the regulator, e. g. of a tuning means (condenser), or a shaft coupled to it by a gear. This shaft is driven by the shifting motor M through the intermediate gearing V. The shaft W carries an arm A consisting wholly or at least at its end remote from the shaft of insulating material. Concentrically to the axis a rigid metal ring R is mounted supporting five switches S_1 to S_5 at positions corresponding to the predetermined settings of the regulator. Each switch consists of two elastic straps of sheet metal with one contact member each, C_1 and C_2, (Figure 3) which normally touch one another. One of the springs or elastic straps preferably B_2 is conductively connected to the ring R, while the other is insulated from it by insulator means X and is connected to the associated of the five switch contacts K_1 to K_5, namely, K_4 by a transmission line. The return path runs through the motor and the operating voltage source B back to the ring R. In Figure 1 the apparatus below the dotted line comprises the control device which includes the five switch contact elements K_1 to K_5, and which may be located at a point remote from the receiver. If desired, the voltage source B may also be located at the control point.

The operation is as follows: As soon as one of the switch contacts, e. g. K_2, is depressed, a circuit for the shifting motor is completed. The shaft W is turned until the arm A has reached the switch S_2 and passes through between the elastic straps B_1, B_2 of the switch whereby the contact members C_1, C_2 associated therewith are separated from each other by bending-off and the motor circuit is interrupted. In this way the motor and the regulator are stopped thus tuning in the desired transmitting station.

In the present arrangement it will be noted that the torque required of the motor is comparatively small since the shaft runs substantially unloaded (apart from the friction of the regulator itself) except at the moments when the arm A passes through a switch, while in contrast thereto in systems heretofore used, all contact springs sweep the commutator at all times. Accordingly, with the present arrangement it is possible to employ a motor having very small dimensions and very low current consumption.

While the invention has been described in connection with a motor which operates in one direction only, it should be understood that the various features of the invention may be applied to systems wherein the motor is reversible, such as shown in the Gunther et al. United States Patent No. 1,911,021 issued May 23, 1933.

In the event that the invention is applied to an arrangement such as shown in the above mentioned patent, great care must be taken to assure that the point at which the motor is desired to be stopped is independent of the direction of approach of that point. For this purpose, it is desirable to arrange the arm A as shown in Figure 2 wherein the part of the arm which is connected to the shaft carries an insulating lever arm T pivoted on the journal D which is limited

as regards to its movements by a pair of stop pins N, N. The lever arm is thus permitted to shift in the direction of rotation of the arm by a distance approximately equal to its width. The tip of the lever arm T cooperates with the switches S_1 to S_5 in such a way that when the lever arm T comes in contact with one of the switches, the lever arm first moves back to the stop pin and then acts to spread the elastic straps apart from each other so as to open the contact elements C_1, C_2 (see Figure 3). In this way it is assured that the adjustment is always exactly the same irrespective of whether the arm A approaches a switch from the right or the left.

What is claimed is:

In a remote control system for radio receiving apparatus and the like, including a control shaft, a selector control mechanism comprising a curved member concentrically mounted with respect to the shaft, a plurality of operable switches positioned on said member according to predetermined settings, a radial arm device connected to said shaft and rotatable therewith, said arm including a pivoted member mounted near the end thereof away from the shaft, said pivoted member having a predetermined limited movement about its pivot point, said switches being arranged so as to be in the path of said pivoted member and so that any one of said switches is contacted and opened by said pivoted member when the shaft is rotated to a position which brings the pivoted member into contact with that particular switch, the amount of movement of said pivoted member being adjusted so that the connection between any particular switch and the pivoted member is made and the switch opened at substantially the same position of said shaft whether the arm approaches the contact from one side thereof or the other.

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