

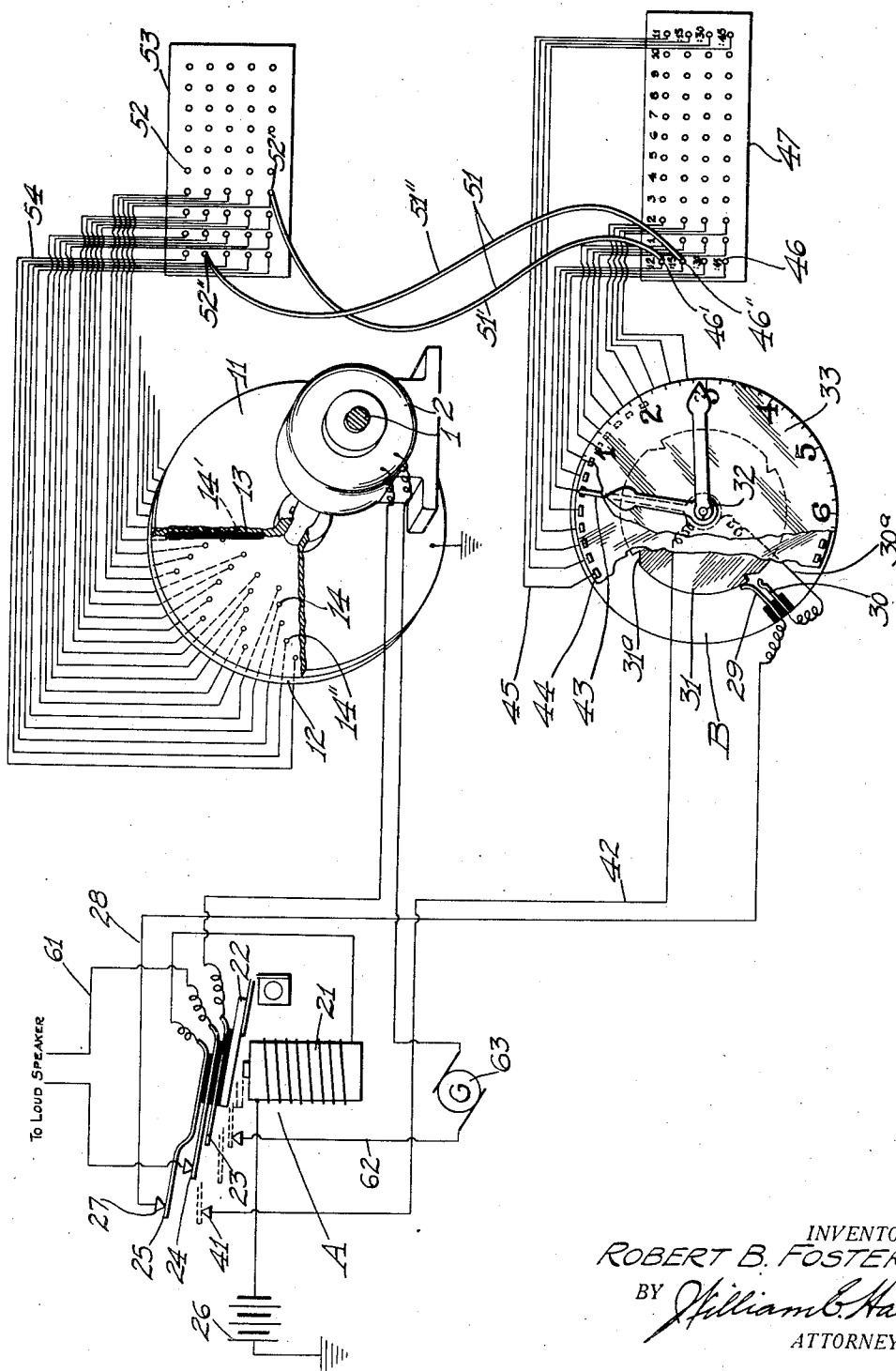
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TIME CONTROL SWITCH MECHANISM

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TIME CONTROL SWITCH MECHANISM

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My present invention relates to time control switch mechanism, particularly adapted for the control of automatic radio reception.

One of the principal objects of this invention is to provide a time control switch mechanism of this class whereby the control of the beginning and termination of a program period, or the change of a program in radio reception, is reduced to an extremely small interval of time so that no appreciable portion of a program is lost.

Another important object of this invention is to provide a mechanism of this class whereby no arc takes place during the make and break of electric contacts in electric circuits, thereby not only prolonging the life and efficiency of operation of the mechanism, but also eliminating undesirable noises in the radio reception.

A further and necessary object also is the provision of a novel, simple, and economical structure for effecting these functions.

With these and other objects in view, as will appear hereinafter, I have devised a switch mechanism of this class having certain novel features of construction, combination, and arrangement of parts and portions, as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawing and to the characters of reference thereon, which forms a part of this application, in which:

The figure is a diagrammatic view showing my new switch mechanism of my radio control apparatus.

The present invention is confined particularly to the electromagnetic switch mechanism, designated A in the drawing, and the time switch mechanism, designated B.

The general combination of my radio control apparatus is disclosed in my copending patent application, Serial No. 687,217, entitled Control apparatus for radio receiving sets, filed August 28, 1923, and terminating in United States Letters Patent No. 2,075,809. Reference will be had to the specification of the same for detailed description of devices, apparatus and functions not specifically described herein.

The tuning condenser, not shown, of the radio receiving set, for which my control apparatus is adapted, is operated by the shaft 1 rotated by the motor 2, which is controlled directly and initially by the electromagnetic switch mechanism A. To the shaft is operatively connected the selective tuning means disclosed in my copending application. It consists essentially of a rotary disc 11 and a concentric stationary disc 12, the

former carrying an insulating strip 13 and the latter a plurality of electric contacts 14 insulated from the disc 12 and arcuately spaced to correspond to the broadcast station spaces on the tuning condenser (not shown). The contacts 14 normally contact the disc 11, but are sequentially insulated therefrom by the insulating strip 13 as the disc 11 is rotated.

The electromagnetic switch mechanism A comprises a coil or magnet 21 and an armature 22 which carries a plurality of three flexible switch members 23, 24, and 25, insulated from each other and from the armature. The latter switch member is permanently electrically connected through the coil with a source of energy, such as a battery 26. When the coil is deenergized the leaf or member 25 engages a contact 27 which is connected by wire 28 with a brush 29 which normally engages the periphery of an insulating member, such as a fibre disc 31, mounted on the minute shaft 32 of a clock 33. This disc has four equal-arcuately spaced notches 31^a into which the free end of the brush 29 may drop during the rotation of the disc. When the brush drops into a notch it engages a grounded finger 39. The grounding of the finger 39, however, is effected only at predetermined periods, as will be described hereafter. For this purpose, it is connected by a wire 30^a, to an arm 43, mounted on but insulated (not shown) from the hour shaft of the clock 33. Thus the circuit to the coil is completed and the armature attracted, but energizing of the magnet, instantly breaks the aforementioned circuit.

Such energizing of the magnet causes the switch member 25 to engage another contact 41 which is connected by wire 42 to the switch arm 43. This clock carries a plurality of contacts 44 circumferentially elongated and circumferentially spaced about the axis of the clock, and spaced at fifteen minute intervals from each other. These contacts form holding switches with the contact arm 43. Each of the contacts 44 is connected by a wire 45 to a separate jack 46 in the panel or jack board 47. This board is shown provided with 48 jacks, one for each 15-minute interval during a 12-hour period.

The jacks 46 may be connected by cables or cords 51 with jacks 52 on a panel or board 53. Each of the latter jacks is connected by a wire 54 to a contact 14 on the disc 12. The disc 11 is grounded, and effects the ground previously referred to in connection with the finger 39. Thus, at the designated time, and with the proper connections by the cords 51, the circuit will be

continued through the magnet, holding the armature in the attracted or dotted line position.

As the armature is attracted by the magnet the loud speaker is disconnected by the switch member 24, breaking the circuit 61. At the same time the circuit 62 from the generator 63 to the motor 2 is closed. This rotates the disc 11 until the insulating strip 13 engages the contact 14 which corresponds to the broadcast station or tuning condenser marking desired.

In the drawing, I have shown the tuning condenser and the selective tuning means adjusted by the contact 14' which has engaged the insulating strip 13, during the interval from 12:00 to 12:15. The disc 11 was so rotated by reason of the cord 51' having connected jacks 46' and 52'. At 12:15, the magnet will attract and hold the armature, as described above. The cord 51'', connecting the jacks 46'' and 52'', will hold the armature until the motor 2 rotates the disc 11 until the insulating strip 13 engages the contact 14'', shifting the tuning condenser to the corresponding station.

Though I have shown and described a particular construction, combination, and arrangement of parts and portions, I do not wish to be limited to the same, but desire to include in the scope of my invention the construction, combination, and arrangement, substantially as set forth in the appended claims.

I claim:

1. A time control switch mechanism for automatic radio reception, comprising a clock having a uniformly revolving shaft with a notched disc having uniformly spaced notches, a switch having opposed flexible fingers, one being longer than the other and adapted to engage the disc and thereby to be held disengaged from the other finger, the long finger adapted to drop into one of the notches upon the rotation of the disc and contact the short finger, an electromagnet, a circuit for the electromagnet and the switch, an armature normally closing said circuit and arranged to break the circuit when the electromagnet is energized, a second circuit for the electromagnet, said armature, when said magnet is energized, closing said second circuit, and a motor controlled switch for automatically breaking said second electromagnet energizing circuit after predetermined operation.

2. A time control switch mechanism for automatic radio reception, comprising a clock having a uniformly revolving shaft with a notched disc having uniformly spaced notches, a switch having opposed flexible fingers, one being longer than the other and adapted to engage the disc and thereby to be held disengaged from the other finger, the long finger adapted to drop into one of the notches upon the rotation of the disc and contact the short finger, an electromagnet, a circuit for the electromagnet and the switch, an armature normally closing said circuit and arranged to break the circuit when the electromagnet is energized, a second circuit for the electromagnet, said armature, when said magnet is energized, closing said second circuit, a motor controlled switch for automatically breaking said second electromagnet energizing circuit, a motor for the latter switch, and a switch in connection with the armature for energizing the motor when the magnet is energized, said electromagnet being deenergized by the motor controlled switch after predetermined operation of the motor.

3. In a time control switch mechanism for automatic radio reception, the combination with

a radio tuning motor circuit, of a clock, a switch means in connection with a uniformly revolving member of the clock for closing the switch at a predetermined period, an electromagnet, a circuit for the electromagnet and the switch, an armature normally closing said circuit and arranged to break the circuit when the electromagnet is energized, a second circuit for the electromagnet, said armature, when said magnet is energized, closing said second circuit and said motor circuit, and a motor controlled switch having a controlling motor in the motor circuit, the latter switch automatically breaking said second electromagnet energizing circuit after predetermined operation of said motor controlled switch.

4. In a time control switch mechanism for automatic radio reception, the combination with a radio tuning motor circuit and a loud speaker circuit, of a clock, a switch means in connection with a uniformly revolving member of the clock for closing the switch at a predetermined period, an electromagnet, a circuit for the electromagnet and the switch, an armature normally closing said circuit and arranged to break the circuit when the electromagnet is energized, said armature, when the electromagnet is energized, also breaking the loud speaker circuit and closing the motor circuit, a second magnet energizing circuit closed when the magnet is energized for continuing the energizing of the magnet, a motor in the motor circuit, and a tuning switch operated by the motor and connected with the second magnet energizing circuit for breaking the latter magnet energizing circuit and the motor circuit when the tuning means in connection with the tuning switch is operated the desired amount.

5. In a time control switch mechanism, a clock, a switch means in connection with a uniformly revolving member of the clock for closing the switch means at a predetermined period, an electromagnet, a circuit for the magnet and the switch means, an armature normally closing said circuit when the switch means is closed by said member, said armature being arranged to break the circuit when the electromagnet is energized, a second circuit for the electromagnet, said armature, when said magnet is energized, closing said second circuit, a motor controlled switch for automatically breaking said second electromagnet energizing circuit, a motor for the latter switch, and a switch in connection with the armature for energizing the motor when the magnet is energized, said electromagnet being deenergized by the motor controlled switch after predetermined operation of the motor.

6. In a time control switch mechanism, a clock, a holding switch in the clock consisting of a stationary contact and a revolving contact, an instant switch in the clock, means in connection with a uniformly revolving member of the clock for closing the instant switch at a predetermined period and when the holding switch is closed, an electromagnet, a circuit for the magnet and both switches, an armature normally closing said circuit when said switches are closed by the clock and said means, said armature being arranged to break the circuit when the magnet is energized, a second circuit for the magnet and the holding switch, said armature, when said magnet is energized, closing said second circuit, a motor controlled switch for automatically breaking the latter electromagnet energizing circuit, a motor for the latter switch, and a switch in connection with the armature for energizing the motor when the magnet is energized, said electromagnet being de-

energized by the motor controlled switch after predetermined operation of the motor.

7. In a time control switch mechanism, a clock, a switch means in connection with a uniformly revolving member of the clock for closing the switch means at a predetermined period, an electromagnet, a circuit for the magnet and the switch means, an armature normally closing said circuit when the switch means is closed by said member, said armature being arranged to break the circuit when the electromagnet is energized, a second circuit for the electromagnet, said armature, when said magnet is energized, closing said second circuit, and a motor controlled switch for automatically breaking said second electromagnet energizing circuit after predetermined operation.

8. In a time control switch mechanism, a clock, a holding switch and an instant switch in the clock, means in connection with a uniformly revolving member of the clock for closing the instant switch at a predetermined period and when the holding switch is closed, an electromagnet, a circuit for the magnet and both switches, an armature normally closing said circuit when said switches are closed by the clock and said means, said armature being arranged to break the circuit when the magnet is energized, and a second circuit for the magnet and only the holding switch, said armature, when said magnet is energized, closing said second circuit.

9. In a time control switch mechanism, a clock, a holding switch and an instant switch in the clock, means in connection with a uniformly revolving member of the clock for closing the instant switch at a predetermined period and when the holding switch is closed, an electromagnet, a circuit for the magnet and both switches, an armature normally closing said circuit when said switches are closed by the clock and said means, said armature being arranged to break the circuit when the magnet is energized, a second circuit for the magnet and the holding switch, said armature, when said magnet is energized, closing said second circuit.

ing said second circuit, and a motor controlled switch for automatically breaking said second electromagnet energizing circuit after predetermined operation.

10. In a control switch mechanism, a holding switch, an instant switch, means for closing both switches, an electromagnet, a circuit including the magnet and both switches, an armature normally closing said circuit when said switches are closed by said means, said armature being arranged to break the circuit when the magnet is energized, and a second circuit including the magnet and only the holding switch of the former switches, said armature, when said magnet is energized, closing said second circuit.

11. In a control switch mechanism, a holding switch, an instant switch, means for closing both switches, an electromagnet, a circuit including the magnet and both switches, an armature normally closing said circuit when said switches are closed by said means, said armature being arranged to break the circuit when the magnet is energized, a second circuit including the magnet and only the holding switch of the former switches, said armature, when said magnet is energized, closing said second circuit, and a motor controlled switch for automatically breaking said second electromagnet energizing circuit after predetermined operation.

12. In a control switch mechanism, a switch means, an electromagnet, a circuit for the magnet and the switch means, an armature for the magnet normally closing said circuit when the switch means is closed, said armature being arranged to break the circuit when the electromagnet is energized, a second circuit for the electromagnet and said armature, said armature, when said magnet is energized, closing said second circuit, and a motor operated switch controlled by said second electromagnet energizing circuit for breaking the latter circuit after predetermined operation of the motor.

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