

Feb. 16, 1937.

C. R. BOWEN ET AL
RADIO TUNE-IN CONTROL DEVICE

2,070,779

Filed Dec. 26, 1933

2 Sheets-Sheet 1

Fig. 1.

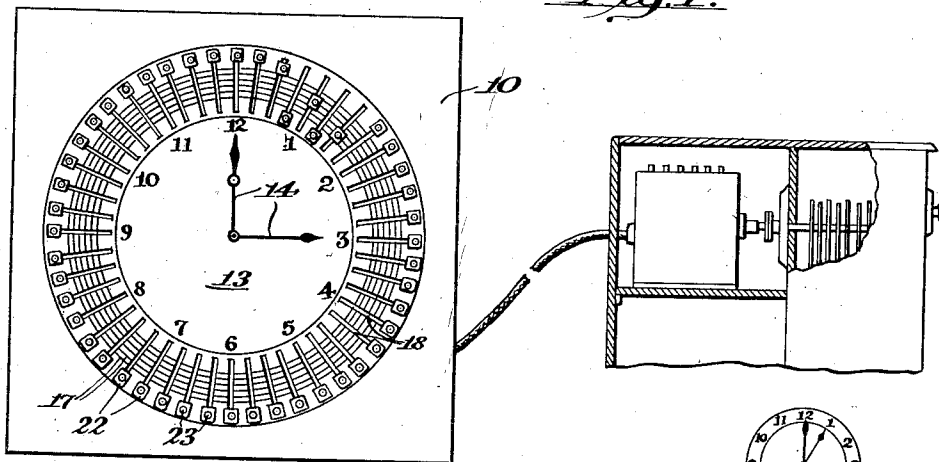


Fig. 2.

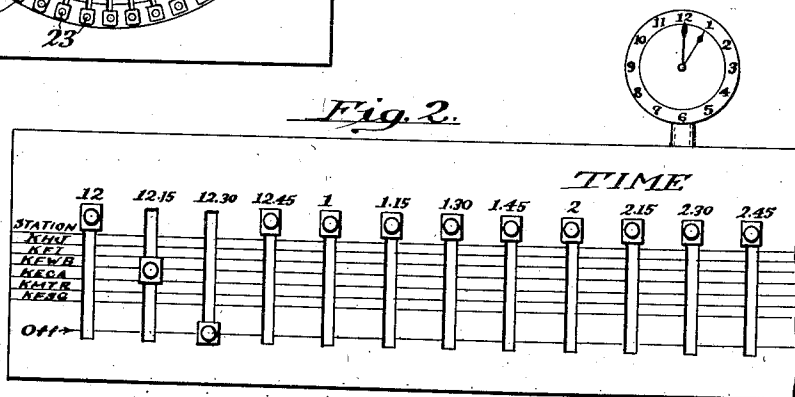
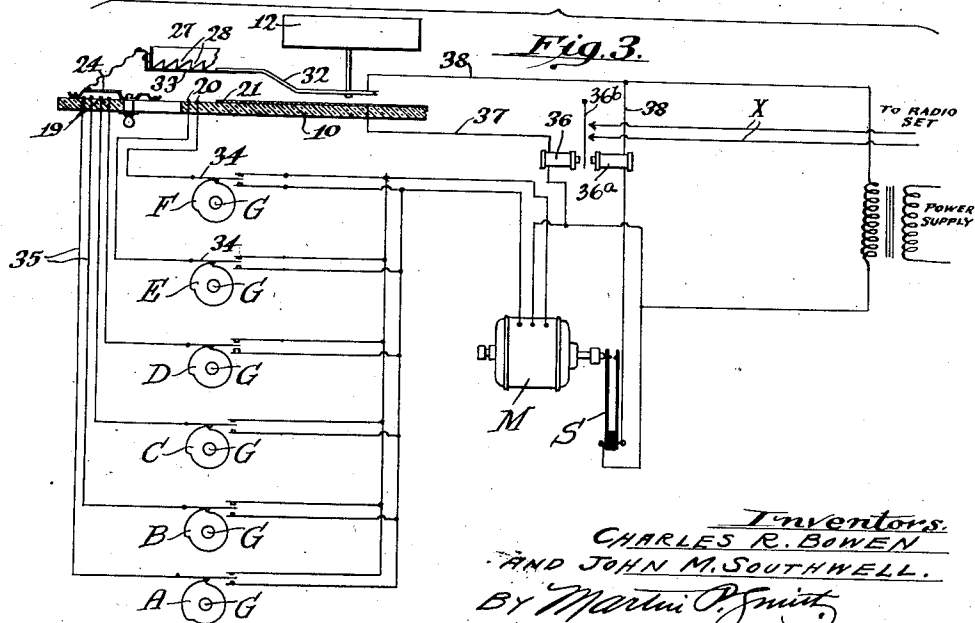


Fig. 3.



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2 Sheets-Sheet 2

Fig. 4.

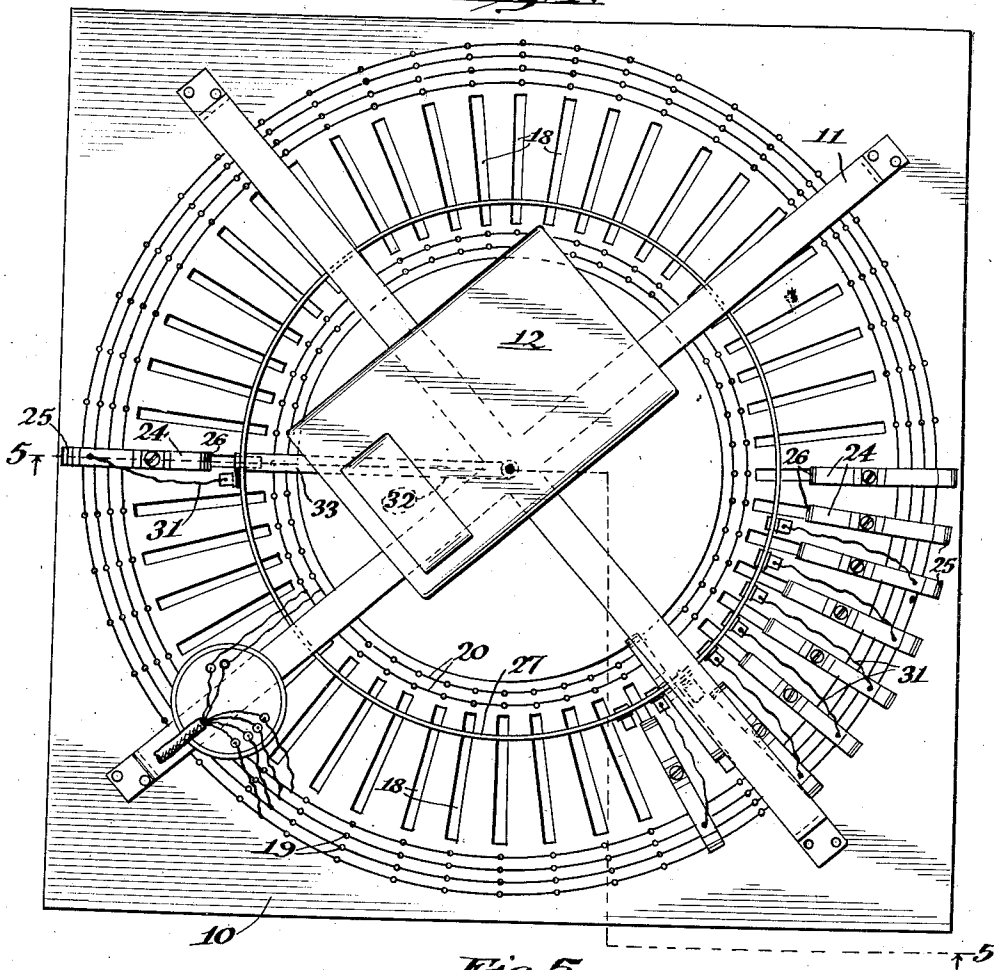


Fig. 5.

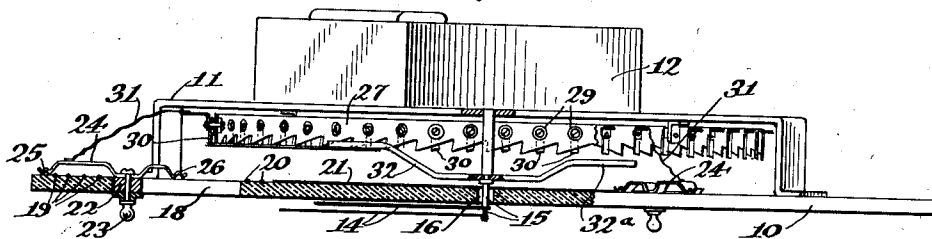


Fig. 6.

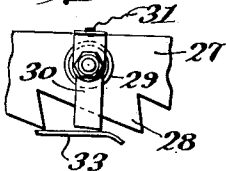


Fig. 7.

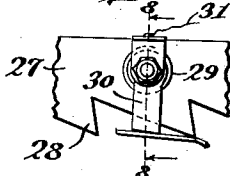
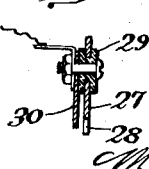


Fig. 8.



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RADIO TUNE-IN CONTROL DEVICE

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Application December 26, 1933, Serial No. 703,980

11 Claims. (Cl. 250—20)

Our invention relates generally to time controlled electric switches and more particularly to a radio tune-in control device and has for its principal object, the provision of a relatively simple, practical and inexpensive time controlled switch that may be conveniently employed with the conventional radio receiving sets for tuning in a number of predetermined programs broadcast by different stations at different time periods throughout the day, thereby enabling the user of the equipped radio set to select in advance the desired programs and set the apparatus so that the equipped radio set will receive the desired programs.

A further object of our invention is, to provide a radio tune-in control device that may be conveniently employed for accurately turning on and off the receiving set with which the device is used so that the set may be turned on at any desired time and will remain in operation for a predetermined period of time.

Further objects of our invention are, to provide a radio tune-in control device of the character referred to that is of compact construction in order that it may be conveniently installed in the cabinets of radio receiving sets and further, to provide in a device of the character referred to means for opening and closing an electric circuit that embodies quick "make and break" of contacts, thus eliminating the arcing between the contacts and the ultimate burning out thereof.

With the foregoing and other objects in view our invention consists in certain novel features of construction and arrangements of parts that will be hereinafter more fully described and claimed and illustrated in the accompanying drawings in which:

Fig. 1 is a front elevational view of our improved radio tune-in control device and showing the same associated with a conventional radio receiving set.

Fig. 2 is a plan view of a modified form of the apparatus.

Fig. 3 is a diagrammatic view illustrating parts of our improved tune-in control and showing the electrical circuits between the control and the conventional dial driving mechanism of a radio receiving set.

Fig. 4 is a rear elevational view of the panel that carries the clock and the manually operable contacts that are utilized for tuning in the different radio broadcasting stations.

Fig. 5 is a cross section taken approximately on the line 5—5 of Fig. 4.

Fig. 6 is an enlarged elevational view of one of the contacts used in the tune-in control apparatus for producing a quick "make and break" and prevent arcing.

Fig. 7 is an elevational view similar to Fig. 6 and showing the contacts in closed position.

Fig. 8 is a cross section taken on the line 8—8 of Fig. 7.

Referring by numerals to the accompanying drawings which illustrate a preferred embodiment of our invention, 10 designates a panel of suitable insulating material, to the rear face of which is secured a skeleton frame 11, preferably X shape and suitably supported on the center of said frame is a housing 12 containing a conventional clock mechanism and which may be operated by a spring or by electric current.

Formed on the center portion of the front face of panel 10, is a conventional clock face 13 and the clock hands 14 are mounted upon conventional arbors 15 that extend from the clock mechanism through an opening 16 that is formed in panel 10 at the center of the clock face.

Formed on the face of panel 10, surrounding the clock face and concentric therewith, is a series of spaced lines 17, which may be differently colored or marked so as to indicate different radio broadcasting stations. Obviously there may be any desired number of these station indicating circles 17 and in the present instance we have shown six rings or circles.

Formed through panel 10 in the area occupied by the concentric circles 17, is a series of radially disposed slots 18, said slots being spaced apart and arranged directly opposite the hour and quarter hour indicating marks that appear on the marginal portion of the clock face.

Suitably secured to the rear face of panel 10, and disposed just outside the outer ends of the radial slots 18, is a series of concentrically arranged contact members 19, preferably wires or narrow strips of metal, that may be set flush with the rear face of the panel and arranged just inside the inner ends of the radial slots 18, is a second set of concentric contact rings 20.

The total number of contact rings 19 and 20 equals the number of station indicating circles 17 appearing on the face of the panel and for convenience and compactness, part of the contact rings are arranged outside the radial slots and the others arranged inside said slots.

Suitably secured on the central portion of the rear face of this panel, inside the contact rings 20, is a contact disc 21.

Arranged for sliding movement through each slot 18, is a block 22 on the outer end of which is mounted a stud or button 23, that may be conveniently engaged by the thumb and finger and secured to the rear face of each block is a radially disposed spring contact member 24.

The outer end 25 of each contact member 24 is adapted as block 22 is moved inwardly through its slot 18, to successively contact the rings 19 and the inner end 26 of said contact member is adapted, when moved inwardly, to engage the contact ring 20.

When block 22 is moved to its limit of movement inwardly through its slot 13, the inner end of spring 23 makes contact with plate 21 and when so positioned, the outer end 25 of the contact member is out of contact with the innermost one of the rings 19.

Suitably secured to frame 11 and arranged between said frame and panel, is a ring 27 and formed on the edge thereof, adjacent to panel 13, is a series of teeth 28, there being forty-eight of such teeth or one for each fifteen minute period throughout twelve hours.

Suitably secured to the outer face of the ring 27, directly opposite the central portion of each tooth and insulated from said ring by washers 29 as illustrated in Fig. 8, is a contact finger 30. Each finger 30 is electrically connected by a short conductor 31 to the outer portion of the corresponding contact member 24.

Suitably secured to the clock arbor that carries the hour hand, between the panel 13 and ring 27, is a cross arm 32, to one end of which is connected a radially disposed resilient contact finger 33. The free end of this finger is adapted to make electrical contact with the ends of fingers 30 and with the lower ends of the teeth 28.

The points of teeth 28 project slightly beyond the plane occupied by the ends of the fingers 30 with which the spring contact member 33 engages and in order to provide a quick contact between the resilient finger 33 and fixed fingers 30, the ends of teeth 28 are undercut at one end, as clearly illustrated in Figs. 6 and 7, so that when the resilient contact finger 33 rides off the points of the teeth, they will move with a quick snapping motion into engagement with the ends of fingers 30 and thereby eliminate arcing during the making of the contacts.

That portion of arm 32 opposite the portion that carries the resilient contact finger 33, is extended as designated by 32^a to provide a counter balance for the opposite portion of the arm and the resilient finger when the panel and clock mechanism are positioned in planes other than horizontal.

Leading from the contact rings 19 and 23 to switches 34, are separate conductors 35, and leading from plate 21 to coil 36 of a relay, is a conductor 37. Leading from the clock arbor that carries the hour hand to the other relay coil 36^a is a conductor 38.

An armature 36^b operates between the relay coils 36 and 36^a and is adapted to make and break contact between conductors X that lead to the radio set.

The switches 34 and relay comprising the coils 36^a and armature 36^b form a part of a conventional dial driving mechanism, for instance, of the type illustrated diagrammatically in Fig. 3. Inasmuch as this dial driving mechanism is standard equipment of practically all radio receiving sets and forms no part of our invention, the same will not be described in detail, although the illustration in Fig. 3 shows a simple form of the mechanism with which our tune-in control device may be associated.

The conventional dial driving mechanism illustrated in Fig. 3 includes cams A, B, C, D, E and F carried by a shaft G that is geared to motor M, the armature of which is mounted to shift lengthwise so as to open or close a switch S, which latter controls the energizing coil of relay coil 36^a. The cams A to F inclusive are frictionally mounted on shaft G so that they may be set to different positions to correspond with the stations that are

selected from which programs are to be received.

The operation of our improved radio tune-in control device is as follows:

Assuming that the user of the receiving set that is equipped with the tune-in control desires to receive a program from a certain broadcasting station and which program runs from 12:30 until 12:45, the button 23 that operates in the slot that is in radial alignment with the mark on the clock face that indicates 12:30, is moved inward through said slot until it coincides with the ring or circle that is marked or colored to indicate the desired station and such action moves contact member inwardly and engages and makes contact with the corresponding contact ring 19 or 23 and following this action the operator moves the next adjacent righthand button 23 and which is in radial alignment with the mark on the clock face indicating 12:45, inwardly to its limit of movement and such action brings the inner end 26 of contact member 24 into contact with plate 21.

Thus the control device is set for causing the radio receiving set with which it is associated to receive the program from a predetermined broadcasting station for the fifteen minute period from 12:30 until 12:45.

When the hour hand of the clock reaches the mark on the clock face indicating 12:30, the arm 32 which occupies the same radial position with the hour hand moves to such a position as that spring contact 33 rides off the tooth 28 or ring 27 with which it has been engaged and due to the resiliency of said contact arm it snaps inwardly as the hour hand reaches the 12:30 mark on the clock face and engages the corresponding contact finger 30, thereby closing the circuit through the corresponding conductor 35 that leads to the dial driving mechanism and the latter operates in the usual manner to operate the receiving set for the reception of the desired program.

Thus the desired program is received for a fifteen minute period or until the hour hand reaches the 12:45 mark on the clock face, at which time the contact finger 33 rides off the corresponding tooth 28 with which it has been in engagement and engages the next adjacent contact finger 30 and which latter is connected to the contact member 24 that has been moved inwardly so that its inner end is in engagement with plate 21.

As soon as this latter contact is made, the relay 36, which is connected to plate 31 by conductor 37, is caused to operate so that the power circuit to the receiving set is opened and thereby turning off said receiving set.

The various buttons 23 surrounding the clock dial may be shifted into position so as to cause the device to function and in turn causing the radio set to receive a predetermined number of programs which may vary in length, for instance, a fifteen minute program from one station may be received, a half hour program from a second station, a fifteen minute program from a third station, an hour program from a fourth station, a half hour program from a fifth station and so on, or the programs from any one station may be received for any predetermined period of time up to twelve hours.

When the contact finger 33 makes contact with one of the fingers 30, the circuit to the motor M of the dial driving mechanism is closed and as the field of the motor shifts the armature lengthwise in the usual manner, switch S adjacent to the motor is actuated to energize relay coil 36^a to attract armature 36^b and close the circuit

X to the radio set, thereby causing the same to operate.

When the corresponding one of the cams A, B, C, D, E or F actuates its switch to break the motor circuit, the motor ceases to operate, thereby stopping the dial at the predetermined point at which the corresponding cam was set.

Thus the user may set the device so as to receive the desired programs throughout a twelve hour period and if it should be desired to manually operate the tuning-in dial of the receiving set in order to receive any other program after the tuning-in device has been set, such action may be accomplished due to the action of the dial driving mechanism that forms a part of the equipment of the standard radio receiving sets.

In our improved apparatus, the control switches are shown and described as being disposed around a conventional clock face and while this is a convenient and practical arrangement, it may be found desirable to arrange the program setting switches in a straight line position, as illustrated in Fig. 2, wherein the names or letters of the broadcasting stations are arranged in a vertical row at one end of a panel with the time divisions in a row across the top of the panel and with the slots through which the setting switches operate extending from the time divisions across the contact strips that lead from the station names or indicating letters.

Thus it will be seen that we have provided a radio tune-in control device that is relatively simple in construction, inexpensive of manufacture, capable of being used in connection with practically all radio receiving sets and which device is very effective in performing the functions for which it is intended.

It will be understood that minor changes in the size, form and construction of the various parts of our improved radio tune-in control device may be made and substituted for those herein shown and described without departing from the spirit of my invention, the scope of which is set forth in the appended claims.

We claim as our invention:

1. In a radio tune-in control device, a panel provided with a plurality of spaced slots, a series of contact members mounted on said panel adjacent to said slots, buttons arranged for sliding movement through said slots, a contact member carried by each button and adapted to engage the contact members on said panel as the buttons are moved through said slots, a notched member mounted on said panel, contact members carried by said notched member with one contact member arranged adjacent to each notch in said notched member, connections between the sliding contact members on the panel and the contact members carried by said notched member and a clock operated contact finger adapted to successively engage the contact members on said notched member.

2. In a radio tune-in control device, the combination with a conventional radio dial driving mechanism, of a panel provided with a plurality of spaced slots, a series of contact members mounted on said panel adjacent to said slots, buttons arranged for sliding movement through said slots, a contact member carried by each button and adapted to engage the contact members on said panel as the buttons are moved through said slots, a notched member mounted on said panel, contact members carried by said notched member with one contact member arranged adjacent to each notch in said notched

member, connections between the sliding contact members on the panel and the contact members carried by said notched member, a clock operated contact finger adapted to successively engage the contact members on said notched member, a contact plate mounted on said panel and adapted to be engaged by the sliding contact members when the same are moved to their limit of movement in one direction and connections leading from said contact plate and the contact members on said panel to said dial driving mechanism.

3. In a radio tune-in control device, a panel provided with a plurality of radially disposed slots, buttons arranged for sliding movement through said slots, contact members carried by said buttons, a series of concentric contact rings mounted on said panel adjacent to said slots, which contact rings are adapted to be engaged by the contacts carried by said sliding buttons, a ring supported by and arranged parallel with said panel, one edge of said ring being provided with teeth, each tooth having an abrupt shoulder at one end, contact fingers mounted on said ring and arranged with one finger opposite each tooth on the ring, connections between said contact fingers and the contact members carried by the sliding buttons and a clock operated contact member adapted to successively engage the contact fingers and teeth on said ring.

4. In a radio tune-in control device, the combination with a conventional radio dial driving mechanism, of a panel provided with a plurality of radially disposed slots, buttons arranged for sliding movement through said slots, contact members carried by said buttons, a series of concentric contact rings mounted on said panel adjacent to said slots, which contact rings are adapted to be engaged by the contacts carried by said sliding buttons, a ring supported by and arranged parallel with said panel, one edge of said ring being provided with teeth, each tooth having an abrupt shoulder at one end, contact fingers mounted on said ring and arranged with one finger opposite each tooth on the ring, connections between said contact fingers and the contact members carried by the sliding buttons, a clock operated contact member adapted to successively engage the contact fingers and teeth on said ring, a contact plate mounted on said panel inside the contact rings thereon, which plate is adapted to be engaged by the inner ends of the contact members carried by the sliding buttons when the same are removed inward to their limits of movement and conductors leading from said contact plate and contact rings to said dial driving mechanism.

5. In a radio tune-in control device, a panel bearing a clock face, a series of concentric circles on the face of said panel surrounding said clock face, which circles are distinctively marked to represent different radio broadcasting stations, said panel being provided with a series of slots that surround the clock face and intersect the concentric rings on the face of the panel, a series of concentric contact rings arranged on the opposite face of the panel adjacent to the slots therein, buttons arranged for sliding movement through said slots, contact members carried by said buttons for making contact with said contact rings, a toothed ring supported by and spaced apart from said panel, contact fingers mounted on said toothed ring with one contact member positioned opposite each tooth of the ring, connections between said contact fingers and the contact members carried by said sliding

buttons and a clock operated contact finger adapted to make successive contact with the contact fingers on said toothed ring and with the teeth of said ring.

5 6. In a radio tune-in control device, the combination with a conventional radio dial driving mechanism, of a panel bearing a clock face, a series of concentric circles on the face of said panel surrounding said clock face, which circles
10 are distinctively marked to represent different radio broadcasting stations, said panel being provided with a series of slots that surround the clock face and intersect the concentric rings on the face of the panel, a series of concentric contact rings arranged on the opposite face of the
15 panel adjacent to the slots therein, buttons arranged for sliding movement through said slots, contact members carried by said buttons for making contact with said contact rings, a toothed
20 ring supported by and spaced apart from said panel, contact fingers mounted on said toothed ring with one contact member positioned opposite each tooth of the ring, connections between said contact fingers and the contact members
25 carried by said sliding buttons, a clock operated contact finger adapted to make successive contact with the contact fingers on said toothed ring and with the teeth of said ring, a contact plate mounted on said panel inside said concentric
30 contact ring, which plate is adapted to be engaged by the contact members carried by said sliding buttons and conductors leading from said contact plate and said concentric contact rings to said dial driving mechanism.

35 7. In a radio tune-in control device, a multiple contact comprising a ring provided in one edge with teeth, contact fingers mounted on said ring with one finger arranged adjacent to each tooth, a clock driven arbor, an arm carried by said arbor,
40 a resilient contact finger carried by said arm for successive engagement with the teeth on said ring, and said contact fingers, a panel provided with a series of slots, contact members located adjacent said slots, members arranged for sliding
45 movement through said slots and adapted to engage the adjacent contact members and electrical connections between said sliding members and the contact fingers on said ring.

8. In a radio tune-in control device, a multiple
50 contact comprising a ring provided in one edge with teeth, each tooth being provided at one end with an abrupt undercut shoulder, contact fingers mounted on said ring and arranged with one finger opposite each tooth, a clock driven arm, a
55 spring contact finger carried by said arm and adapted to successively engage the teeth on said ring, and said contact fingers, a panel provided with a series of slots, contact members located adjacent said slots, members arranged for sliding
60 movement through said slots and adapted to engage the adjacent contact members and electrical connections between said sliding members and the contact fingers on said ring.

9. In a radio tune-in control device, a panel
65 provided with a clock face, a series of concentric circles on the face of said panel surrounding said clock face, said circles being distinctively marked so as to designate different radio broadcasting stations, said panel being provided with a series
70 of radially disposed slots that intersect the circles on said panel, said slots being disposed in

radial alignment with the hour and quarter hour designating marks of the clock face, a series of concentric contact rings arranged on the rear face of the panel adjacent to said slots, the number of which contact rings corresponds with the
5 circles on the face of the panel, buttons arranged for sliding movement in said slots, a contact member carried by each button for engaging said contact rings, a clock controlled multiple switch
10 carried by said panel, contact members on said multiple switch and connections between the contact members carried by said buttons, and the contact members of said multiple switch.

10. In a radio tune-in control device, a panel provided with a clock face, a series of concentric
15 circles on the face of said panel surrounding said clock face, said circles being distinctively marked so as to designate different radio broadcasting stations, said panel being provided with a series
20 of radially disposed slots that intersect the circles on said panel, said slots being disposed in radial alignment with the hour and quarter hour designating marks of the clock face, a series of concentric contact rings arranged on the rear face
25 of the panel adjacent to said slots, the number of which contact rings corresponds with the circles on the face of the panel, buttons arranged for sliding movement in said slots, a contact member carried by each button for engaging said
30 contact rings, a clock controlled multiple switch carried by said panel, contact members on said multiple switch, connections between the contact members carried by said buttons and the contact members of said multiple switch and a contact plate on said panel within said contact
35 rings, which contact plate is adapted to be engaged by the contact members carried by said sliding buttons when the latter are moved to their inner limits of movement.

11. In a radio tune-in control device, the combination with a conventional radio dial driving mechanism, of a panel provided with a clock face,
40 a series of concentric circles on the face of said panel surrounding said clock face, said circles being distinctively marked so as to designate different radio broadcasting stations, said panel being provided with a series of radially disposed slots that intersect the circles on said panel, said slots
45 being disposed in radial alignment with the hour and quarter hour designating marks of the clock face, a series of concentric contact rings arranged on the rear face of the panel adjacent to said slots, the number of which contact rings corresponds with the circles on the face of the panel,
50 buttons arranged for sliding movement in said slots, a contact member carried by each button for engaging said contact rings, a clock controlled multiple switch carried by said panel, contact members on said multiple switch, connections between the contact members carried by said buttons and the contact members of said multiple switch, a contact plate on said panel within said contact rings, which contact plate is adapted to be engaged by the contact members carried by said sliding buttons when the latter are moved
65 to their inner limits of movement, and conductors leading from said contact plate and said contact rings to said dial driving mechanism.

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