April 28, 1953 S. R. BENOW 2,636,981

AUTOMATIC RADIO DIALING DEVICE

Filed Dec. 8, 1948 4 Sheets-Sheet 1

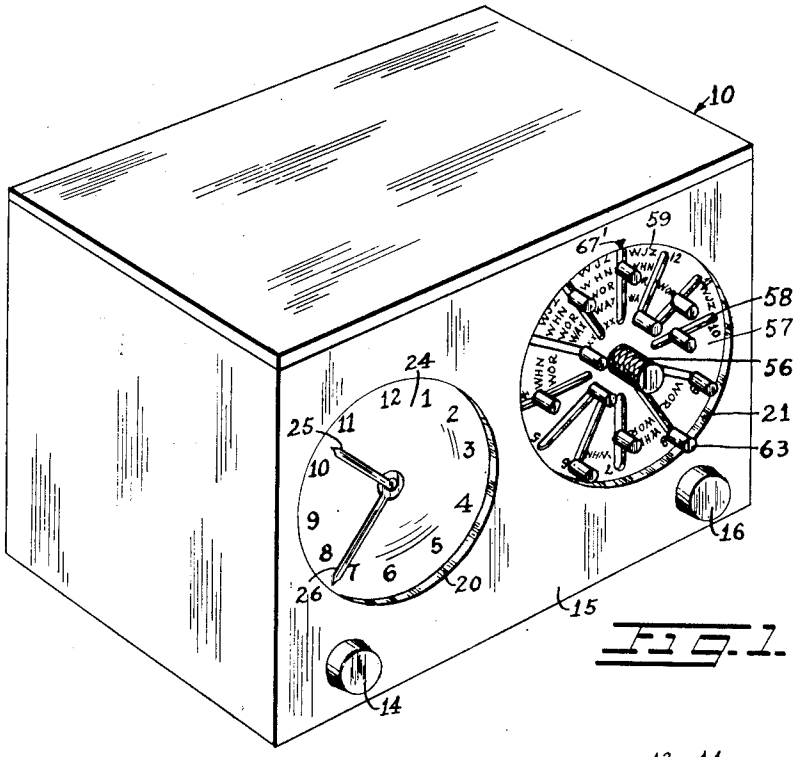


Fig. 1.

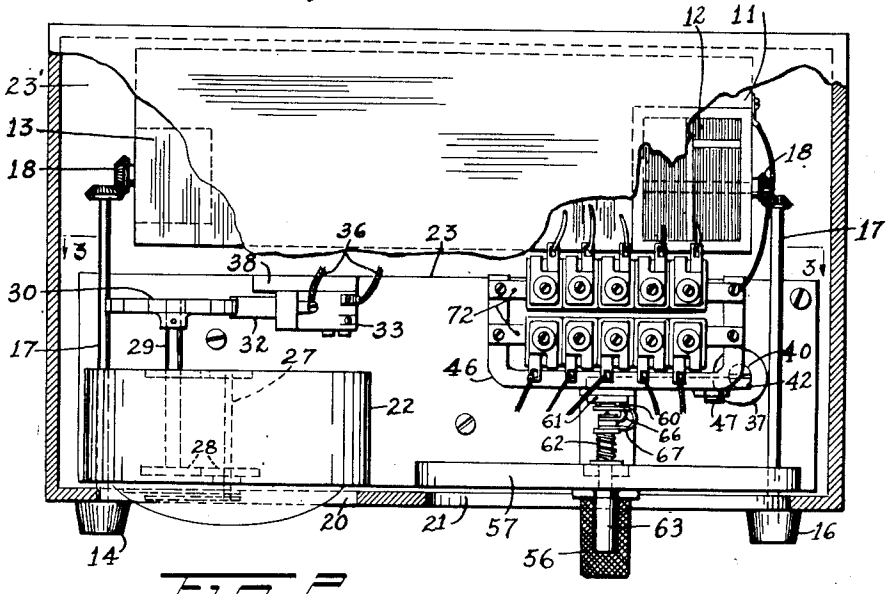


Fig. 2.

INVENTOR
SIDNEY R. BENOW
BY Dalton & Holcombe
ATTORNEY

April 28, 1953 S. R. BENOW 2,636,981

AUTOMATIC RADIO DIALING DEVICE

Filed Dec. 8, 1948 4 Sheets-Sheet 2

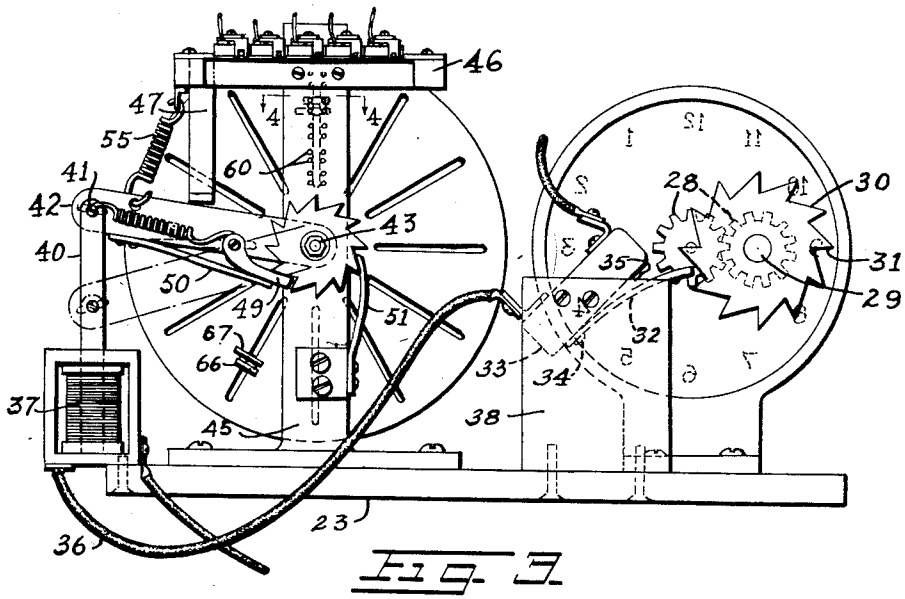


Fig. 3.

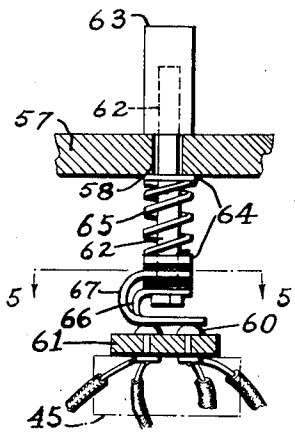


Fig. 4.

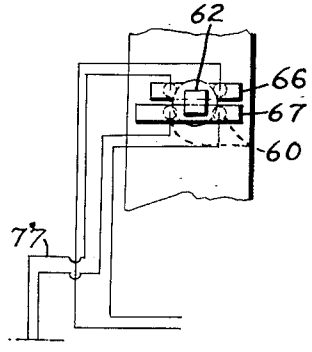


Fig. 5.

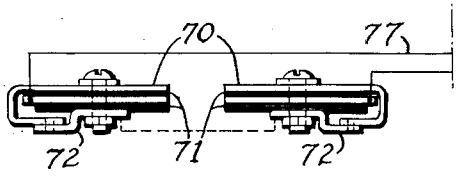


Fig. 6.

INVENTOR
SIDNEY R. BENOW
BY Dalton Holcheb
ATTORNEY

April 28, 1953 S. R. BENOW 2,636,981

AUTOMATIC RADIO DIALING DEVICE

Filed Dec. 8, 1948

4 Sheets-Sheet 3

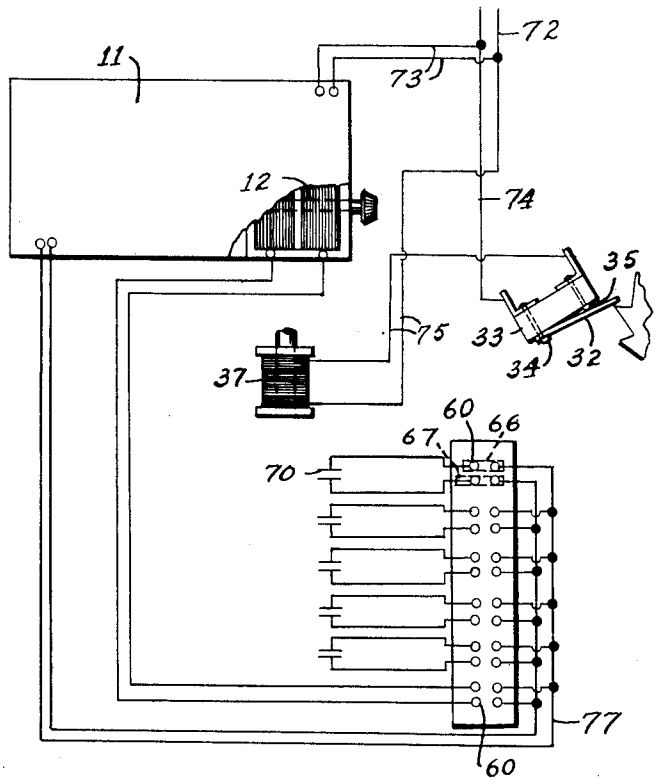


FIG. 7.

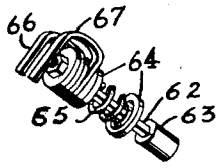


FIG. 8.

INVENTOR
SIDNEY R. BENOW
BY
ATTORNEY

April 28, 1953 S. R. BENOW 2,636,981

AUTOMATIC RADIO DIALING DEVICE

Filed Dec. 8, 1948

4 Sheets-Sheet 4

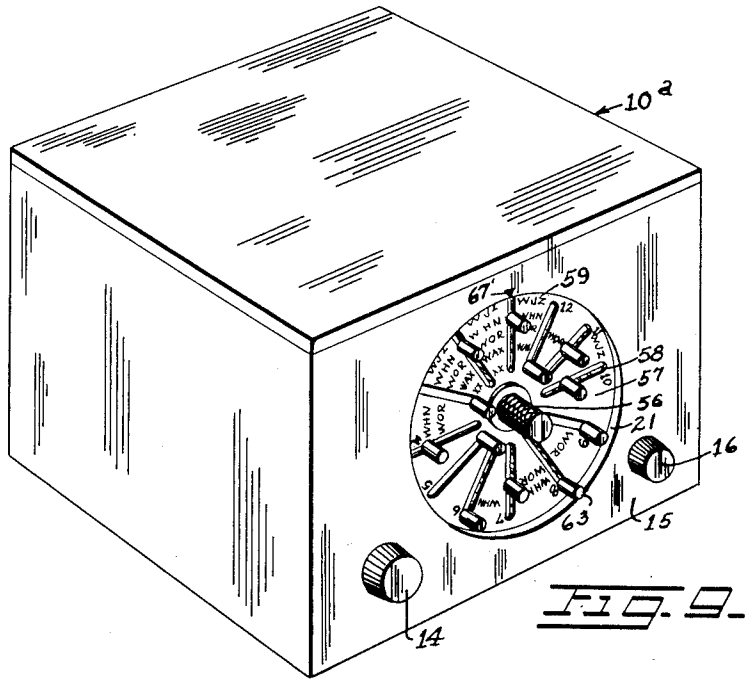


FIG. 9

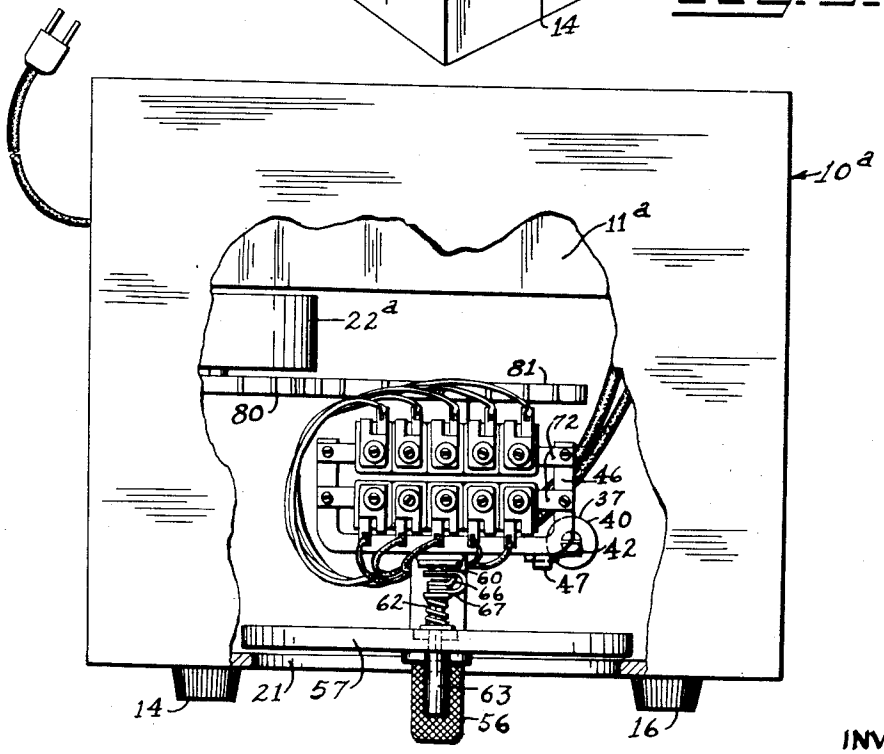


FIG. 10

INVENTOR
SIDNEY R. BENOW
BY
ATTORNEY

Patented Apr. 28, 1953

2,636,981

UNITED STATES PATENT OFFICE

2,636,981

AUTOMATIC RADIO DIALING DEVICE

Sidney R. Benow, New York, N. Y.

Substituted for abandoned application Serial No. 663,900, April 22, 1946. This application December 8, 1948, Serial No. 64,187

3 Claims. (Cl. 250—20)

1

This invention relates to radio sets and in particular to the automatic selection of broadcasting stations. This is a substitute for my abandoned application, Serial Number 663,900, filed on April 22, 1946.

A particular object of the invention is to provide a simplified structure in which a plurality of settable members are used in such a manner that preselected stations are automatically tuned in for varying periods of time depending upon the length of the programs and without attention on the part of the listener.

A further object of the invention is to provide a mechanism having few parts for timing the operation of the station selector so that said operation can be synchronized with an electric clock forming a part of the radio set.

Other important objects of my invention include the use of a station selecting set of contacts into register with which may be successively brought, adjustable selector pins which may be set in advance to successively tune in the selected stations; to connect the clock mechanism in a circuit for operating the selector dial with few moving parts so that the operation of the device is positive and mechanical trouble is kept at a minimum.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawing forming a material part of this disclosure:

Fig. 1 is a view in perspective of a radio set in which is incorporated an electrical clock and an automatic tuning device constructed in accordance with the invention.

Fig. 2 is a plan view of the set illustrated in Fig. 1, a portion of the top thereof being broken away to disclose the interior construction.

Fig. 3 is a section of the line 3—3 of Fig. 2 showing the operating mechanism that connects the clock and the station selecting device.

Fig. 4 is an enlarged section taken on the line 4—4 of Fig. 3 showing the construction of a selector pin and its association with the contact or selector plate.

Fig. 5 is a section on the line 5—5 of Fig. 4 showing the relative alignment of the contact strips with the contacts.

Fig. 6 is an enlarged section taken on the line 6—6 of Fig. 3 showing the arrangement of the condensers used in the automatic tuning operation.

2

Fig. 7 is a schematic view of a wiring diagram showing the electrical connection of the parts of the invention.

Fig. 8 is a view in perspective of the slide button or pin employed in preselecting the stations to be listened to.

Fig. 9 is a similar view to Fig. 1, showing a modified form of the invention.

Fig. 10 is a top plan view of Fig. 9 shown partly in section.

The automatic dialing device, according to the first form of the invention shown in Figs. 1 to 8, is shown housed within the housing 10 of a radio receiver, which housing also encloses any standard radio receiving set 11 including a variable condenser 12 and volume control 13, the latter of which is manipulated from a button 14 on the front panel 15 of the casing 10 while the variable tuning condenser 12 is controlled from a button 16 also disposed on the front panel 15. The buttons 14 and 16 through the medium of the shafts 17 and bevel gear combinations 18 afford operation of the volume and condenser controls.

The housing 10 is provided in the front panel 15, thereof with a clock opening 20 and a dial opening 21 in the former of which is suitably positioned an electric clock 22 of usual construction mounted for support in the opening 20 on a base 23 secured in any suitable manner to the bottom 23' of the housing.

The electric clock includes the usual time dial 24, hour hand 25, minute hand 26 and the minute hand shaft 27, which, together with the usual hour hand shaft, is driven in the well known manner of electric clocks. It is sufficient for the purpose of this invention to note that the minute hand shaft 27, through the medium of gears 28, actuates a timing ratchet shaft 29 to the outer end of which is secured a timing ratchet 30. The peripheral edge of the ratchet is provided with teeth 31 and the ratio of the gears 28 is such that the timing ratchet shaft 29 and the ratchet 30 will revolve once every three hours. There are 12 teeth in the ratchet and the space between each of the teeth corresponds to a period of 15 minutes.

The teeth 31 of the timing ratchet are arranged to successively engage a circuit closing contact strip 32 mounted on an insulating block 33 in which the contact ends of wires 34 and 35 are held. Contact 35 when engaged by the contact strip 32, which is connected to wire 34, closes a circuit through the wire 36 to energize a solenoid coil 37 when the strip is moved by a tooth 31 of the ratchet. The contact block 33 is supported from the base 23 on a bracket 38 while the hous-

ing of the coil is secured in any suitable manner to the base.

The solenoid is provided with a core 40 whose upper end, through the medium of a pin and slotted connection 41, is connected to the outer end of a pawl arm 42 which, at its opposite end is pivoted on a dial shaft 43. This dial shaft 43 is mounted for free rotation in a frame 45 secured in any suitable manner to the base 23 and including an upper U-shaped portion 46 and a depending stop projection 47. The inner end of the shaft 43 has secured thereto a ratchet wheel 48 which is arranged to be actuated by a pawl 49 suitably pivoted on the pawl arm 42 and yieldably maintained in contact with the teeth of the ratchet 48 by a leaf spring 50. Overthrow movement of the ratchet wheel 48 is prevented by the leaf spring 51 mounted on a boss of the frame 45. The spring 51 also prevents backlash of the ratchet wheel and maintains a dial, carried on the forward end of the shaft 43, in properly adjusted position.

Each time that the switch arm 32 is closed, it is done so momentarily, by reason of the fact that the action of the teeth 31 lifts the spring arm 32 against the contact 35 and the snap back action of the spring breaks the circuit. This momentary contact energizes the solenoid 37 and causes downward movement of the core 40 to operate the ratchet 48 and the dial shaft, 43 a predetermined distance against the resistance of a spring 55, which connects the arm 42 with the frame 45 and yieldably maintains said arm against the bottom of the stop 47. The outer end of the shaft 43 is provided with a knurled sleeve 56 which abuts the face of a dial 57 radially slotted as at 58 and bearing radio station indicia 59 arranged in the spaces between the slots 58 throughout the area of the dial. Each of the station designations 59 corresponds to contacts 60 which are arranged in sets of four and disposed vertically on a selection plate 61 which is suitably secured on the front of the frame 45 behind the dial.

In each of the radial slots 58 of the dial 57 there is provided a selector button or pin which consists of a square shaft 62 having an outer finger knob 63 and carrying spaced washers 64 between which is disposed a compression spring 65. The inner end of the shaft 62 or pin carries the vertically spaced upper and lower flexible contact strips 66 and 67 respectively, each of which are looped to provide contact between the upper and lower contact pins respectively, that make up each set 60 of the contacts. By pulling action on the finger piece 63 of the selector button against the resistance of the spring 65, the contact end of said selector button may be withdrawn from the contacts 60 so that the button can be moved longitudinally of the slot 58. Each selector button can therefore be placed in alignment with the station designation of the broadcasting station to be selected and the buttons 63 may be set at different positions about the dial depending upon the sequence in which the stations are to be heard. The space between each slot 58 corresponds to a 15 minute interval and any number of these slots may be provided depending on the capacity of the dial. If a program is of 15 minutes' duration one selector plug will be set at the desired station designation, but if the program is of one-half hour's duration then in the next adjacent slot, a button will be placed opposite the same station designation, etc., so that a program of any time duration may be selected.

The dial 57 adjacent the outer end of each slot, bears a suitable numeral which may be brought into register with an indicating mark 67' on the casing 10 so that when the programs for the day are to be set, manipulation of the finger piece 56 will position the dial so that the numeral "1" registers with indicator 67' and the dial in its clockwise operation will bring the slots 58 successively to register with the indicating mark 67' and also position the contact button 63 of each slot against the contacts 60 corresponding to the station at which the plug is set.

In the wiring diagram illustrated in Fig. 7, the sets of contacts 60 are connected in pairs with condensers 70 of fixed capacity to correspond with the wave length of a selected station, and are circuited through the wire 77 leading from the radio set 11. The lowermost group of contacts 60 are provided for use in connection with the variable condenser 12 so that any station may be selected that is not provided for on the dial. The source of current 72 to the set 11 through wires 73 also provides a source of current through the wires 74 to the switch 32 and through the wires 75 to the solenoid 37. It is not believed that any explanation of the radio circuit is necessary because the use of fixed or variable condensers is well understood and the invention is particularly directed to the mechanical operation and selection of the stations successively. The fixed condensers 70, as shown in Fig. 6, each consist of the upper and lower condenser plates 71 suitably insulated and mounted on the cross bars 72 which are secured at their ends to the U-shaped portion 46 of the frame 45.

In the operation of my device, when the timing ratchet 33 closes the switch 32, the energized solenoid 37 causes ratchet 48 to bring one of the slots 58 of the dial 57 into vertical position so that a contact button unit carried in said slot will bridge the set of contacts 60 to close the circuit between one of the condensers of the radio set to tune in the predetermined station. This operation, repeated at the end of 15 minute intervals, will bring each slot 58 of the dial successively to position, to maintain the same station tuned in or to tune in different stations depending upon the setting of the selector pins or buttons 63.

In Figs. 9 and 10, the electric clock 22a is shown to be completely enclosed in the housing 10a which is adapted to control the radio receiving set 11a through the pinion 80 and gear 81.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. An automatic radio dialing device comprising a cabinet having a wall, a radio receiver having a tuning condenser disposed in said cabinet, a plurality of openings in said wall, dial disposed at one of said openings, a control shaft passing through another of said openings and connected to said tuning condenser, contact buttons disposed in said dial, contacts arranged to be bridged by said buttons to complete a radio circuit, said contacts being arranged in vertical groups, an elongated plate mounted behind said dial and extending radially of said dial, said dial being formed with a plurality of equally spaced

radially extending slots, a shaft connected to said dial, a ratchet on said shaft, a ratchet pawl, a pawl arm pivoted to said shaft, a solenoid including a core to which said pawl arm is attached, means for yieldably resisting movement of the core in pawl arm operating direction, a clock, a timing ratchet mounted on a shaft driven by said clock, a spring arm disposed for movement by the timing ratchet, a solenoid switch in circuit with the solenoid actuated at predetermined time intervals when the spring arm is moved by the timing ratchet, condensers in circuit with said contacts and said tuning condenser, means for adjusting said buttons longitudinally of the slots, for successive engagement with various groups of contacts as the dial is rotated, and means yieldably mounting said buttons in the dial slots for retractile movement whereby they may be

disengaged from said contacts for movement longitudinally of the slots.

2. The device of claim 1 in which the clock is disposed at another of said openings in said wall.

3. The device of claim 1 in which said wall is a front panel of the cabinet.

SIDNEY R. BENOW.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,979,107	Huggins	Oct. 30, 1934
2,034,254	Stenerson	Mar. 17, 1936
2,060,546	Allen, Jr.	Nov. 10, 1936
2,068,227	Cutler et al.	Jan. 19, 1937
2,234,668	Davenport	Mar. 11, 1941
2,545,553	Lolli et al.	Mar. 20, 1951