Aug. 18, 1936. F. J. DWYER 2,051,438

SELECTIVE CONTROL MECHANISM FOR RADIO RECEIVING SETS

Filed March 13, 1933 2 Sheets-Sheet 1

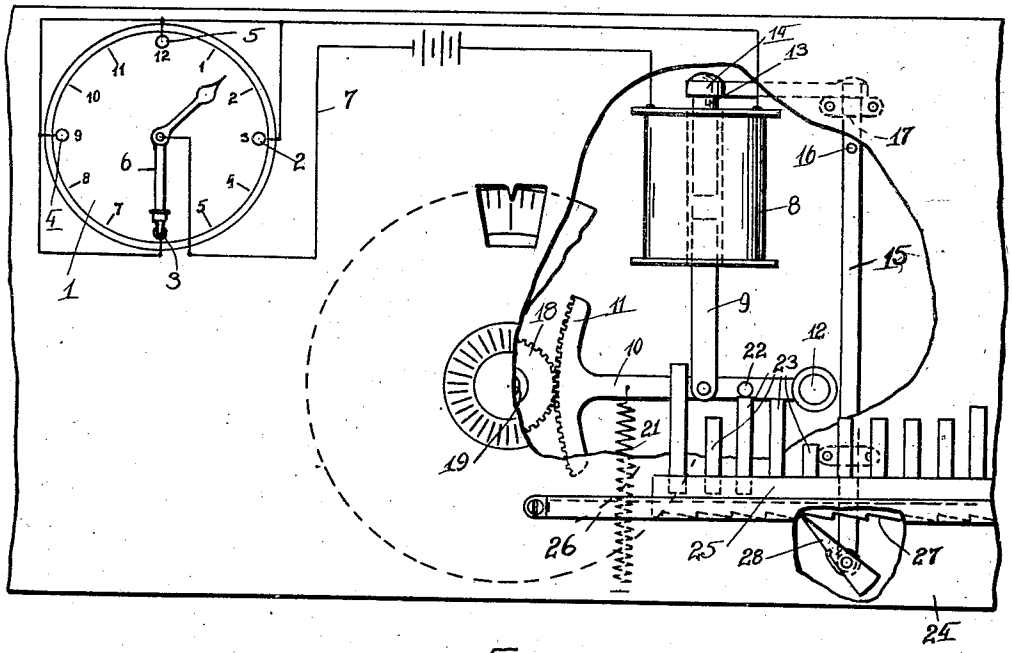

FIG. 1.

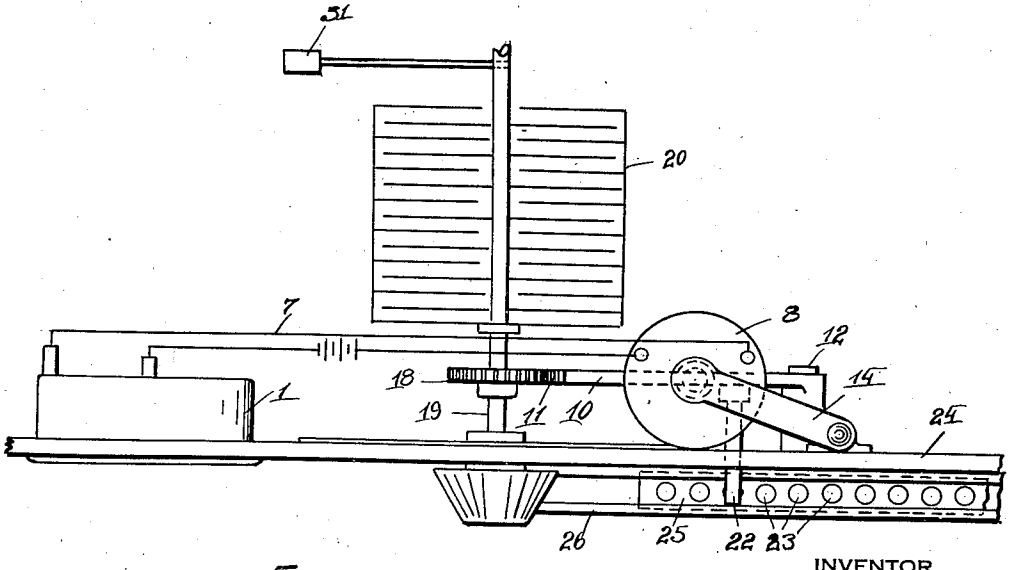

FIG. 2.

INVENTOR
FRANCIS J. DWYER
BY
ATTORNEY

Aug. 18, 1936. F. J. DWYER 2,051,438

SELECTIVE CONTROL MECHANISM FOR RADIO RECEIVING SETS

Filed March 13, 1933 2 Sheets-Sheet 2

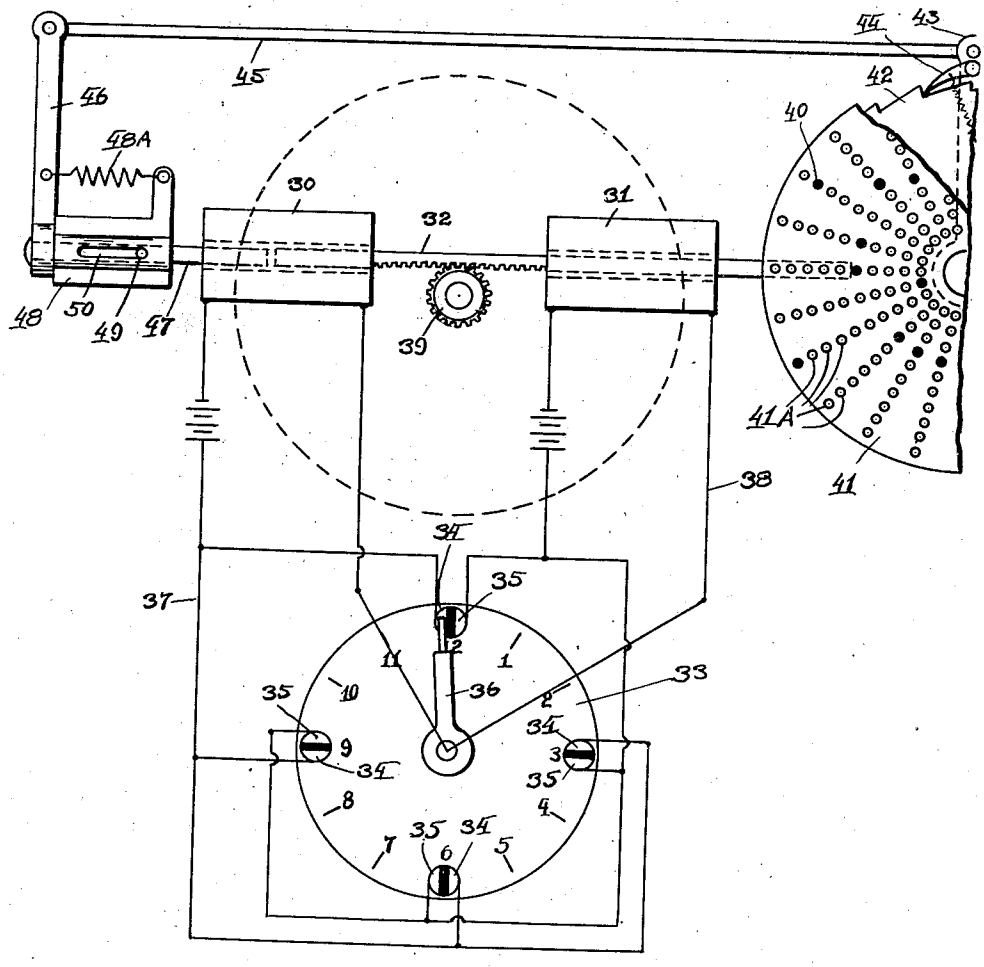

FIG. 3

INVENTOR
FRANCIS J. DWYER
BY
ATTORNEY

Patented Aug. 18, 1936 2,051,438

UNITED STATES PATENT OFFICE

2,051,438

SELECTIVE CONTROL MECHANISM FOR RADIO RECEIVING SETS

Francis J. Dwyer, Rochester, N. Y.

Application March 13, 1933, Serial No. 660,478

7 Claims. (Cl. 250—20)

This invention relates to selective control mechanism for radio sets and has for its object to provide a mechanism whereby the radio set will, at periodical intervals, be automatically tuned to select one or more predetermined programs from any one or any number of broadcasting stations.

A further object of this invention is to provide a very simple construction for this automatic and selective control mechanism in order that it may be manufactured at a low cost and adapted to any radio receiving set.

With these and other objects in view the invention will become more readily apparent from the detailed description thereof which follows, reference being had to the accompanying drawings in which

Figure 1 is a diagrammatic front elevation of a tuning element of a radio receiving set with my selective control mechanism applied thereto.

Figure 2 is a top plan view of the tuning element and selective control mechanism illustrated in Figure 1.

Figure 3 is a diagrammatic front elevation of a modified form of the selective control mechanism.

In the several figures of the drawings like reference numerals indicate like parts.

The automatically operated selective control mechanism for radio receiving sets forming the subject matter of my present invention is adapted to be set to tune in consecutive programs broadcast from any number of radio broadcasting stations. In this way the programs of any number of stations, including consecutive programs of individual stations, may be selected over a period of time and the selective control set to operate the receiving set and tune in the various stations at the time the programs are put on the air by them.

For the purpose of timing the selective control I use a suitably operated clock 1 and provide this clock with a series of four contacts 2, 3, 4 and 5 which are spaced so as to correspond with the fifteen, thirty, forty-five and sixty minute positions of the minute hand of the clock mechanism. The contact arm 6, driven by the clock mechanism in unison with the minute hand or in place of it, will therefore momentarily close the electrical circuit 7 at the end of each fifteen minute period. The electrical circuit, when closed, energizes the solenoid 8 so as to attract and raise the armature 9. This armature is pivotally connected to the arm 10 of the segmental gear 11 which is mounted to swing on the pivot stud 12. As the armature is raised it abuts against the end of the pin 13 carried by the arm 14 and raises it with the sliding rod 15 until the stop pin 16, carried by the sliding rod, is brought in engagement with the under side of the bearing block 17 and prevents a further movement of the sliding rod. In this way both the segmental gear 11 and sliding rod 15 are operated by the armature 9 and are moved to a predetermined elevated position.

The segmental gear 11 meshes with the pinion 18 carried by the condenser shaft 19 and the tuning condenser 20 operated by this shaft is set so that the movement of the segmental gear by the armature will move the condenser to its zero position and hold it in this position until the solenoid is de-energized and releases its armature. This takes place as soon as the contact arm 6 has moved out of contact with one of the four contacts of the clock mechanism and has opened the electric circuit 7 as the result of it.

On the release of the armature a spring 21 draws down the arm 10 until this movement is arrested by the engagement of the stop pin 22 with one of the selector pins 23. The stop pin 22 is carried by the arm 10 and projects thru a suitable opening in the panel 24. The selector pins 23 are mounted in a carriage 25 which is adapted to slide in the guide channel 26. The under side of the carriage 25 is provided with suitable ratchet teeth 27, 27 and a pawl 28, carried on the lower end of the sliding rod 15, is adapted to engage these ratchet teeth in such a manner that on raising the sliding rod 15 the pawl advances the carriage to the left and moves it step by step at each operation of the armature to bring consecutive selector pins 23 into position as stops for the arm 10 and its segmental gear 11.

The distance the selector pins project from the carriage 25 thus determines the length of the movement of the segmental gear 11 so that by varying the length of these pins the segmental gear can be moved to turn the pinion 18 and with it the condenser shaft 19 so as to tune the condenser to any desired tuning position. Selector pins 23 of different lengths may thus be placed into the carriage to tune the radio set to different stations at fifteen minute intervals and selector pins 23 of the same length may be placed into the carriage to tune the radio set to the same station at each fifteen minute interval. The pins are placed into the carriage with relation to the period of time during which the set is to be tuned to the various stations. By starting the set, for

example, at 10:00 o'clock and placing a selector pin into the carriage which will tune the set to station WEAF with the first pin, the set will be tuned to receive the program broadcast by this station from 10:00 to 10:15 o'clock. If the same length of pin is placed for the second pin in the carriage the set will be tuned again for this same station to receive the continuation or the next program broadcast by this station during the following fifteen minutes or until 10:30 o'clock. If a program from another station is desired for the time between 10:30 and 10:45, a pin of a length which will tune to this particular station will be inserted for the third pin in the carriage and so on until the carriage is filled with pins which will tune the set at the end of each fifteen minute interval to the station from which the desired program is broadcast at that particular time.

In Figure 3 I have illustrated a modified form of the selective control mechanism. In this modification two solenoids 30 and 31 are used to shift the rack 32, which is provided at each end with an armature, positively back and forth. These solenoids are alternately energized by the clock mechanism 33 which is provided with four pairs of contacts 34 and 35 which are spaced 90 degrees on the dial. Contacts 34 cooperate with the contact arm 36 to close the circuit 37 and energize the solenoid 30 at the end of each fifteen minute interval, and contacts 35 cooperate with contact arm 36 to close circuit 38 and energize solenoid 31 at the beginning of each fifteen minute interval. The pair of contacts are arranged in each position so that both solenoids will be consecutively energized one after the other with solenoid 30 slightly before each quarter of an hour on the clock 33 and solenoid 31 directly after each quarter of an hour or approximately so. In this way the tuning condenser will be turned to a zero position at the end of each fifteen minute interval by the pinion 39 which meshes with the rack bar 32 but will be turned back to tune in the desired station immediately after the beginning of the following fifteen minute period.

The selector pins 40 which stop the rack bar in its movement to tune the set are carried by the index disc 41 and are placed into the holes 41A which are radially and concentrically arranged in this disc. The disc is shifted to present consecutively arranged pins in line with the rack bar by means of the ratchet wheel 42 which is adapted to turn with the disc concentric thereto. An arm 43, which swings concentrically with the ratchet wheel 42, carries a spring pressed pawl 44 to engage the ratchet teeth of the ratchet wheel. The arm 43 is connected by the link 45 with the arm 46 carried by the sliding pin 47. The sliding pin in turn is mounted in the bearing member 48 and is moved to the left by the armature at the left hand end of the rack bar 32. The movement of the rack bar to set the tuning condenser to a zero position thus at the same time swings the arm 43 to advance the ratchet wheel and with it the index disc to bring the succeeding radially arranged holes in the disc in line with the right hand extension of the rack bar 32. A pin 40 is inserted into one of these holes to stop the rack bar in the desired position. After the ratchet wheel has been advanced, a spring 48A returns the arm 46 to its normal starting position. The movement of the sliding pin 47 is limited by the movement of the pin 49 in the slot 50 provided in the bearing member 48.

The movable plates of the tuning condensers may be counter balanced with a counter weight 51 as illustrated in Figure 2 in order to reduce the power needed for the operation of the condenser to a minimum.

I claim:

1. In an automatic tuning apparatus for radio receiving sets having a tuning element, a selector slide, selecting members of varying lengths carried by said selector slide and uniformly spaced thereon, reciprocating means for intermittently moving said selector slide to move the selecting members to a controlling position and said tuning element to a predetermined detuning position in its movement in one direction and operating the tuning element of the radio receiving set to a tuning position in its movement in the opposite direction with one of the selecting members of said selector slide controlling this movement of said reciprocating means in the latter opposite direction and means for intermittently causing a single reciprocation of said reciprocating means.

2. In an automatic tuning apparatus for radio receiving sets having a tuning element, a selector slide, selecting members of varying lengths carried by said selector slide and uniformly spaced thereon, reciprocating means for intermittently moving said selector slide to simultaneously move the selecting members to a controlling position, and said tuning element to a predetermined detuning position in its movement in one direction; means associated with the reciprocating means for limiting the movement of the selector slide to a fixed position in its movement in the said one direction and means controlled by the lengths of the selecting members for limiting the movement of the reciprocating means in the opposite direction and the position of said tuning element.

3. In an automatic control for radio receiving sets having a movable tuning member, the combination of reciprocating means for operating said tuning member, stop means for limiting the movement of said tuning member to a uniform fixed detuning position and operated by said reciprocating means in its movement in one direction, interchangeable stop means operated by said reciprocating means jointly with said tuning member during its first movement in one direction, said interchangeable stop means limiting the return movement of said reciprocating means and means controlled by said reciprocating means for positioning the interchangeable stop means, and means for intermittently causing a single reciprocation of said reciprocating means.

4. In an automatic control for radio receiving sets having a movable tuning member, the combination of a reciprocating operating member for moving said tuning member, movable means operated by said reciprocating operating member in its movement in one direction for limiting the movement of said operating member in the opposite direction with a lost motion connection provided between the operating member and the movable stop member so as to permit a variable movement of said operating member and the tuning member in that direction, a control member operated by said reciprocating member to uniformly and intermittently move in one direction on its movement to move said movable stop member; a series of interchangeable stop means carried by said control member for limiting the return movement of said reciprocating operating member and the tuning member; and means for intermittently causing a single reciprocation of said reciprocating operating member.

5. In an automatic control for radio receiving sets having a tuning member, the combination of a reciprocating operating member for operating said tuning member, a carriage member, a series of interchangeable stop means mounted on said carriage member and adapted to variably limit the return movement of said reciprocating operating member, means operated by said reciprocating operating member in its forward movement to uniformly and progressively move said carriage member step by step in advance of the return movement of said operating member and to variably limit the movement of said tuning member in one direction in advance of the variable return movement limited by said interchangeable stop means and means for intermittently causing a single reciprocation of said reciprocating operating member.

6. In an automatic control for radio receiving sets having an oscillating tuning member, the combination of a movable selector member, a series of stop means interchangeably carried by said selector member, a step by step operating means for progressively advancing said selector member, a reciprocating operating member for oscillating said tuning member during each reciprocation thereof and operating said step by step operating means during its forward movement to cause said selector member to advance one of said interchangeable stop means and oscillate said tuning member to a fixed position in one direction and limit the return movement of said operating member to a predetermined movement in the opposite direction and means for intermittently causing a single reciprocation of said reciprocating operating member.

7. In an automatic control for radio receiving sets having an oscillating tuning member, the combination of a swinging arm for oscillating said tuning member, an armature connected to said arm, a solenoid for moving said armature to swing said arm in one direction and spring means for swinging said arm in the opposite direction, a link operated by said armature to move to a fixed position on the movement of the armature by said solenoid over a variable distance, a selector member operated by said link to move a uniform distance on the variable movement of said armature, an interchangeable stop means carried by said selector member to cause a variable return movement of said arm by said spring means.

FRANCIS J. DWYER.