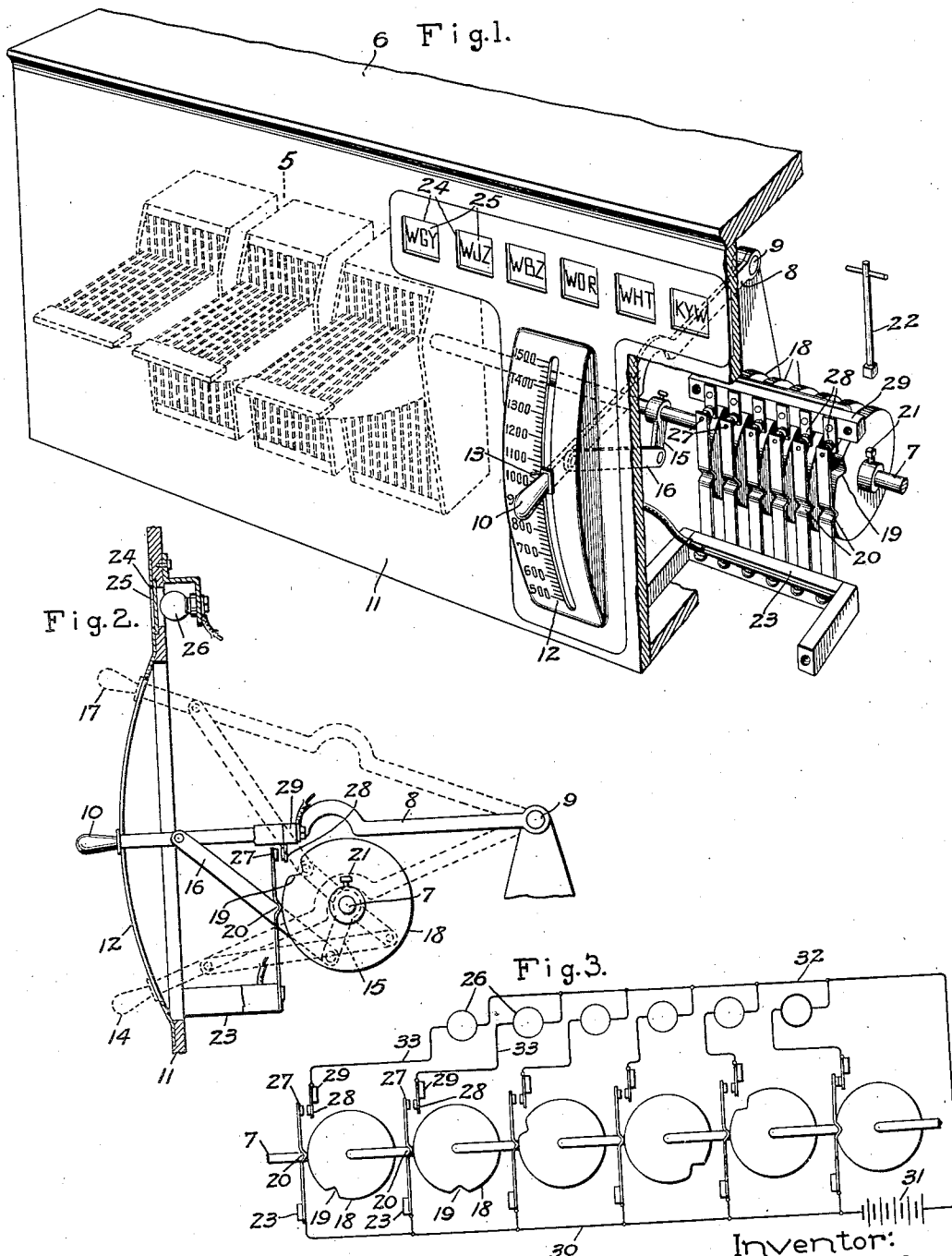


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INDICATING CONTROL MEANS
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INDICATING CONTROL MEANS

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4 Claims. (Cl. 74—10)

The present invention relates to an indicating control means for radio receiving apparatus and the like, and has for its primary object to provide an improved timing control means for apparatus of this character which may be adjusted to stop automatically, exactly in a plurality of predetermined tuning positions, and which is simple in construction and easily operable manually.

Another object of the invention is to provide an improved tuning control means arranged for simultaneously indicating the station being received or other tuning characteristic, for each position in which said control means is adjusted to stop whereby any one of a plurality of selected positions may be determined.

The invention will, however, be better understood from the following description when taken in connection with the accompanying drawing and its scope will be pointed out in the appended claims.

In the drawing, Fig. 1 is a view in perspective and partly in section showing an indicating control means embodying the invention and applied to a radio receiving apparatus; Fig. 2 is a cross-sectional view of the indicating control means of Fig. 1, on the same scale; and Fig. 3 is a schematic wiring diagram of the visual indicating means of the indicating control means of Figs. 1 and 2.

Referring to the drawing, 5 is a tuning control unit for a radio receiving apparatus 6. The tuning unit is provided with a rotatable tuning control shaft 7 which is connected for manual operation to a control lever 8 having a fixed fulcrum means 9 at one end and an operating handle 10 at the opposite end. The operating lever is arranged to move in a plane at a right angle to the shaft 7, and in the present example the fixed fulcrum is placed at the rear of the panel 11 of the apparatus with the operating handle projecting through a suitable indicating scale 12 arranged on the panel front and carrying an indicator or pointer 13, which moves over the scale 12. The latter is shown only by way of example as being a type of scale usually associated with the tuning control unit of a radio receiving apparatus and is graduated to represent the present broadcast receiving band of frequencies.

The control shaft 7 extends substantially parallel with the panel 11 at the rear thereof and the operating lever 8 is arranged in one position 14 to pass through the axis of the shaft. This is an extreme operating position and represents one end of the range of movement of the tuning unit

and of the control lever 8. The control shaft is provided with an operating lever 15, which is secured to the shaft so that it stands substantially at a right angle to the control lever 8 when the control lever is in the one position 14, above mentioned. The operating and control levers 15 and 8 are connected together through a movable link 16 which is connected between the free end of the operating lever and a point on the control lever between the handle 10 and the shaft 7.

As will be seen in Fig. 2, this arrangement provides for moving the control shaft 7 through a range of substantially 180 degrees as is required for the usual tuning unit of a radio receiver, the extreme positions of the lever and the connecting link being indicated in the general positions 17 and 14 of Fig. 2. It will be noted that the operating lever 15 is shorter than the control lever 8 whereby the latter lever is arranged to move through a relatively narrow angle of movement to control the tuning shaft 7, while the ratio represented by the length of the two levers provides a control system which is relatively easily movable by applying a light moving force to the control handle 10 of the lever 8.

An operating defect characteristic of the usual station selector or control means, such as that shown in the present example, is the lack of means for definitely locating the control at a desired point at which it is to be stopped for the reception of a desired signal channel or station. The tendency of an operator controlling such an apparatus is to move the control handle or other control device back and forth several times on either side of the position desired before becoming satisfied that the exact and correct setting of the tuning control means is obtained.

In connection with a full vision dial and movable arm or lever type of control such as that employed in the present example, it is particularly desirable that the tuning control shaft 7 be arranged to stop in definite predetermined positions whereby certain active or desirable signal channels or stations may be quickly and easily selected without undue adjustment of the control means to find the exact location of the tuning means. This obviates the necessity for and prevents the tendency to make several trial adjustments for each position as above mentioned.

Accordingly, in connection with the control shaft 7 there is provided a series of stop members 18 of substantially duplicate construction. These are in the form of discs which are freely rotatable upon the shaft in spaced relation to each other. The stop members or discs are all

of substantially the same diameter and each is provided with a notch or detent engaging means 19. The notches or detent engaging means are placed upon the peripheries of the discs.

5 The discs are adapted individually to be rotated upon the shaft and may be locked or secured to the shaft in such positions that the detent engaging means or notches 19 may each engage one of a series of spring pressed detents 20 in any
10 suitable order to stop the control shaft in a series of successive and preselected positions. The stop members are secured to the shaft 7 through the medium of suitable means such as set screws 21, as illustrated in Fig. 1. The set screws are
15 conveniently tightened or loosened through the medium of a suitable wrench 22 which is of such size that it may be applied to the set screws between the successive stop members or discs as indicated in Fig. 1.

20 The spring pressed detents 20 are in the form of short springs each provided with a bend intermediate its ends to provide the detent 20, and are carried by a fixed bar of insulating material 23, which in the present example is secured to the
25 panel 11 of the apparatus. The detents are held in a position to firmly engage and hold each stop member as it is moved by rotation of the shaft into a position wherein its notched or detent engaging means is presented to the detent.

30 From the foregoing description it will be seen that the control shaft 7 is provided with a series of stop members, associated with which is a corresponding series of detents, the latter being arranged to engage and stop said members as the shaft is rotated under control of lever 8.

35 By operating the control means or lever 8 to successively tune in a series of desired stations or signal channels and securing a stop member 18 to the shaft with its notch 19 in engagement
40 with one of the detents 20 for each station or signal channel tuned in, each of said stations or signal channels may again be selected automatically by moving the control lever 8 over the tuning range, since it will then be stopped suc-
45 cessively in the chosen position by the engagement of each of the stop members with one of the detents. Such an arrangement obviates the necessity for continued searching on either side of a particular signal channel or station to exactly
50 locate the tuning control at a desired accurate setting therefor.

It will be seen that as many stop members and detents may be arranged in connection with the control shaft 7 as there are numbers of desired
55 signal channels or stations which it is desired to accurately select. In the present example, six stop members and six detents are provided.

In addition to the adjustable means associated with the shaft for stopping the same at a plurality of predetermined points or positions as provided by the adjustable detents engaging stop members carried by the shaft, there may preferably
60 also be provided a means for the visual indication of the control shaft position or a condition of the apparatus as established by moving the shaft to a position determined by any one of the stop members. This is provided preferably by means
65 operative simultaneously with the stop means to provide such visual indication, and in the present example includes an indicating device for each stop member and means controlled by each detent for illuminating each device.

A preferred arrangement of such indicating means includes a series of indicators or windows 24 grouped in a row or in any suitable manner and

carried in a panel such as the front panel 11 of the receiving apparatus, and provided with screens 25 of translucent material which may be inscribed with a desired indicia such as station
80 call letters, as indicated. An electric lamp 26 associated with each window and screen in the rear of the panel is arranged to illuminate the screen, when the control shaft 7 is stopped by a
85 corresponding stop member 18. When the screen is illuminated by the lighting of the lamp, the indicia or other markings such as the station call letters carried by the screen is displayed to the view of an operator from the front of the panel.

For controlling each of the lamps a switch or switch means is provided in circuit therewith and is arranged to be actuated by one of the stop
90 means for the shaft 7. In the embodiment of the invention shown, a switch for each of the lamps is provided by a contact 27 carried by an extension of each of the spring pressed detents 20.
95 Each of the contacts 27 is associated with a fixed contact 28 carried by a fixed bar of insulating material 29. The contact or switching arrangement is such that the contacts 27 and 28 are maintained in an open position until the detent
100 carrying the contact 27 engages a notch 19 in its corresponding stop member whereupon the circuit is closed and the corresponding lamp is lighted as indicated in the diagram shown in Fig. 3.

Referring particularly to Fig. 3 it will be seen
105 that the movable contacts 27 which are carried by the spring pressed detents are connected with a common supply lead 30 from a source of current represented by a battery 31. The opposite
110 side of the source of operating current is connected with a common lead 32 to which are connected the lamps 26. An individual control lead from each lamp is connected with each of the
115 fixed contacts 28, as indicated at 33, whereby a series of individual operating circuits are provided for each of the lamps. With this arrangement it will be seen that as the detents
120 successively engage the notches 19 in the stop members 18, the lamps will successively be lighted to illuminate the indicating screens or windows in the panel front, whereby an operator of the
125 apparatus may at once determine the signal channel or station being received for each position in which the tuning control mechanism is automatically stopped.

The above-described control arrangement obviates the necessity for referring to a tuning control dial or scale when operating a device with
130 which it is provided since for the preselected positions of the control shaft, the shaft is automatically stopped in its rotation for each position selected and the individual position is at once indicated by the visual indication provided by the illuminated windows.

What I claim as new and desire to secure by
135 Letters Patent of the United States, is:

1. In a radio receiving apparatus, a tuning control shaft, manually operated means for rotating said shaft, and adjustable means associated with the shaft for accurately positioning the shaft
140 mechanically in a plurality of predetermined positions, said adjustable means including a plurality of members rotatable with the shaft and each corresponding to a different one of said shaft positions, each of said rotatable members
145 including a stop means rotatable therewith, said adjustable means further including a plurality of stop members each maintained continuously in position to engage automatically the stop means of a different one of said rotatable members, said
150

stop members being adapted to be released from engagement with said stop means only by rotation of said rotatable members, the rotation sufficient to effect the release of said stop members being through a relatively small arc, the engagement of any one of said stop members with the corresponding stop means as the shaft is turned by force applied thereto through said manually operated means indicating automatically that the shaft is in one of said predetermined positions, said given one of the stop members coacting with said corresponding stop means to maintain the corresponding rotatable member stationary, accurately in the position corresponding to said one of the predetermined shaft positions, when said turning force is discontinued upon the engagement of said given one of the stop members with the corresponding stop means.

2. In a radio receiving apparatus, a tuning control shaft, manually operated means for rotating said shaft, and adjustable means associated with the shaft for accurately positioning the shaft mechanically in a plurality of predetermined positions, said adjustable means including a plurality of discs each having a notch formed therein, said discs being rotatable with said shaft and each corresponding to a different one of said shaft positions, said adjustable means further including a plurality of spring-pressed detents each maintained continuously in position to engage the notch of a different one of said discs as the shaft is rotated, said detents being adapted to be released from engagement with said notches only by rotation of said discs, the rotation sufficient to effect the release of said detents being through a relatively small arc, the engagement of any one of said detents with the corresponding notch as the shaft is turned by force applied thereto through said manually controlled means indicating automatically that the shaft is in one of said predetermined positions, said given one of the detents coacting with said corresponding notch to maintain the corresponding disc stationary, accurately in the position corresponding to said one of the shaft positions, when said turning force is discontinued upon said engagement of the given one of the detents with the corresponding notch.

3. In a radio receiving apparatus, a tuning control shaft, manually operated means for rotating said shaft, means associated with said shaft and including a tuning dial for visually indicating a plurality of tuning positions of the shaft, and adjustable means associated with the shaft for accurately positioning the shaft mechanically in a plurality of predetermined tuning positions selected from the plurality of tuning positions indicated approximately by said visual indicating means, said adjustable means including a plurality of members rotatable with the shaft and each corresponding to a different one of said predetermined shaft positions, each of

said rotatable members including a stop means rotatable therewith, said adjustable means further including a plurality of stop members each maintained continuously in position to engage automatically the stop means of a different one of said rotatable members, said stop members being adapted to be released from engagement with said stop means only by rotation of said rotatable members, the rotation sufficient to effect the release of said stop members being through a relatively small arc, the engagement of any one of said stop members with the corresponding stop means as the shaft is turned by force applied thereto through said manually operated means indicating automatically that the shaft is accurately centered in one of said predetermined tuning positions, said given one of the stop members coacting with said corresponding stop means to maintain the corresponding rotatable member stationary, accurately in the position corresponding to said one of the predetermined shaft positions, when said turning force is discontinued upon said engagement of said given one of the stop members with the corresponding stop means.

4. In a radio receiving apparatus, a tuning control shaft, manually operated means for rotating said shaft, means associated with said shaft, and including a tuning dial for indicating a plurality of tuning positions of the shaft, and adjustable means associated with the shaft for accurately positioning the shaft mechanically in a plurality of predetermined tuning positions selected from the plurality of tuning positions indicated approximately by said indicating means, said adjustable means including a plurality of discs each having a notch formed therein, said discs being rotatable with said shaft and each corresponding to a different one of said predetermined shaft positions, said adjustable means further including a plurality of spring-pressed detents each maintained continuously in position to engage the notch of a different one of said discs as the shaft is rotated, said detents being adapted to be released from engagement with said notches only by rotation of said discs, the rotation sufficient to effect the release of said detents being through a relatively small arc, the engagement of any one of said detents with the corresponding notch as the shaft is turned by force applied thereto through said manually operated means indicating automatically that the shaft is accurately centered in one of said predetermined tuning positions, said given one of the detents coacting with said corresponding notch to maintain the corresponding disc stationary, accurately in the position corresponding to said one of the predetermined shaft positions, when said turning force is discontinued upon said engagement of the given one of the detents with the corresponding notch.

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