Oct. 26, 1937. E. L. BARRETT 2,096,953

REMOTE CONTROL DEVICE FOR RADIO RECEIVING SETS

Original Filed July 1, 1932

Fig. 1.

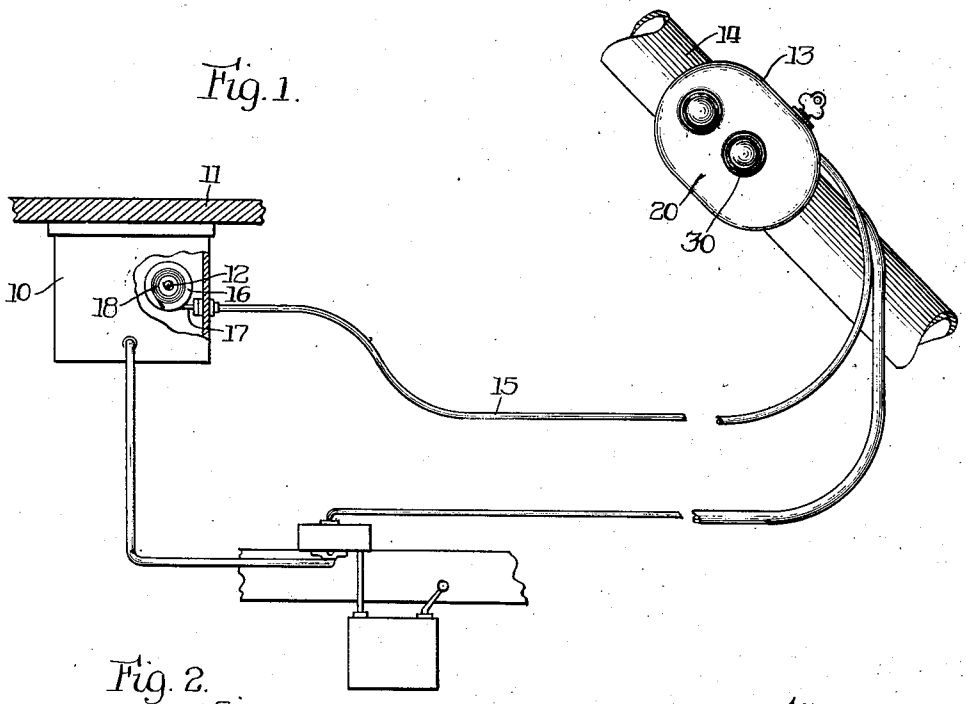


Fig. 2.

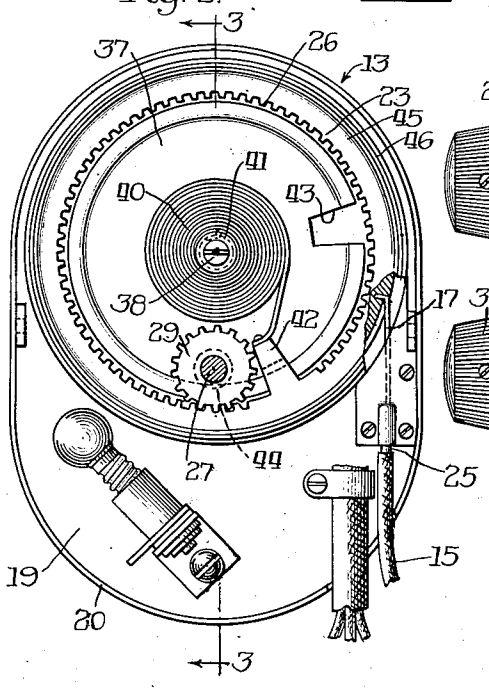
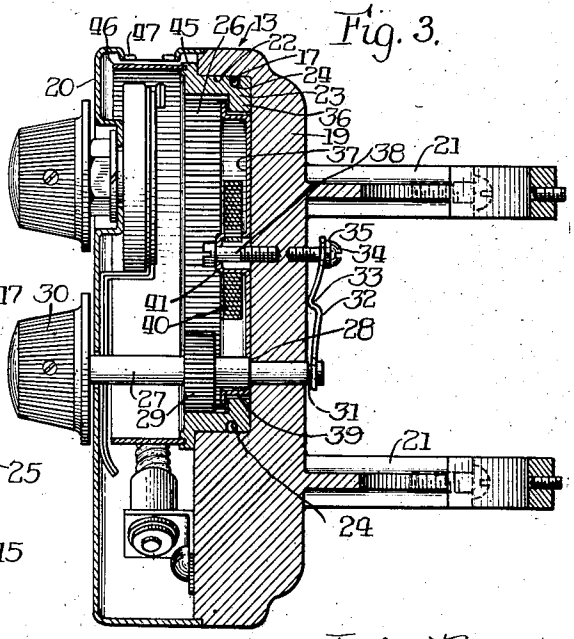


Fig. 3.



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REMOTE CONTROL DEVICE FOR RADIO RECEIVING SETS

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Application July 1, 1932, Serial No. 620,316
Renewed March 26, 1937

3 Claims. (Cl. 250—40)

The invention relates to improvements in remote control devices for radio receiving sets and more particularly to devices of the type disclosed in my copending application Serial No. 554,394, filed August 1, 1931, now issued as Patent No. 1,926,256, granted September 12, 1933.

A general aim of the invention resides in the provision of an improved control device which embodies a simple and compact arrangement of parts whereby adjustment of the device for proper operation is facilitated and the ease and efficiency of actual operation of the device is materially enhanced.

An object is to provide a new and improved means for controlling the tuning adjustment of a receiving set through an elongated flexible element which is pulled in one direction by resilient means at the set end of the cable and in the other direction by a manually rotatable member at the remote control box and which has a second resilient member in the control box intimately connected with the rotatable member for opposing the force exerted upon the flexible element by the first mentioned resilient means.

Another object is to provide in such a device an improved means for frictionally opposing the force exerted by the resilient means at the set end of the flexible element.

A further object resides in the provision of a remote control box having an improved arrangement of parts whereby an indicator in the remote control box has the same direction of rotation as the manipulating member by which the operator actuates the device, whereby the possibility of confusion to the operator in tuning the set is eliminated.

Other objects and advantages will become apparent in the following description and from the accompanying drawing, in which:

Figure 1 is a somewhat diagrammatic view showing a device embodying the features of the invention and the assembled relationship thereof.

Fig. 2 is a plan view of the remote control box with the cover removed.

Fig. 3 is a longitudinal section through the box taken along the line 3—3 of Fig. 2.

The general organization of the present device is illustrated in Fig. 1 of the drawing wherein 10 designates a radio receiving set of any suitable construction which is shown as being rigidly secured to a rigid part 11 of the automobile. The location of the receiving set may be at any number of positions on the automobile, as for example under the floor boards of the body or under either the front or rear seats. The radio receiving set embodies the usual condenser shaft 12, rotation of which, in the customary manner, is effective to adjust the set to different positions of reception. The condenser shaft 12 is operated from any position which is convenient to the operator of the automobile or to one of the passengers thereof by means of mechanism housed in a control box generally designated 13 and, in the present embodiment, is shown as being rigidly secured to the steering column 14 of the vehicle. A flexible mechanical connection 15 extends from the control box 13 to the receiver for transmitting control movements from one to the other.

As is more particularly described in my aforementioned copending application, the condenser shaft carries a circular, pulley-like member 16 to which a flexible element or cable 17 of the mechanical connection 15 is secured. The arrangement is such that a pull on the cable 17 rotates the condenser shaft 12 in one direction. A resilient member or coil spring 18 is arranged to exert its force between a stationary part and the shaft 12 or pulley 16 in such manner that the spring rotates the condenser shaft 12 in a direction opposite to that imparted to the condenser shaft by a pull on the cable 17.

Referring particularly to Figs. 2 and 3, the control box 13 is divided into sections comprising a relatively heavy base 19 and cover 20. The base 19 carries suitable brackets 21 for securing the control box to the steering post 14. Within the box the base 19 is provided with a circular recess 22 adapted to receive a rotatable control member 23. The rotatable member has a snug running fit within the recess 22 and is fashioned substantially in the form of a pulley by providing a peripheral groove 24 in the outer surface thereof in opposition to the annular wall of the recess 22. The groove 24 receives the remote end of the flexible cable 17 and this end is secured to the member 23. The cable is fed tangentially into the groove through an enclosed recess in the base provided substantially in the manner set forth in my copending application.

By this construction, if the rotatable member 23 is driven in one direction, the cable is pulled into the remote control box thereby turning the condenser shaft 12 against the force of the spring 18. Similarly, if the member 23 is rotated in an opposite direction, the cable is pushed out of the remote control box to allow the spring 18 to rotate the condenser shaft 12 in an opposite direction. By virtue of the close interfitting relationship between the rotatable member 23 and the recess 22,

the cable 17 is confined within the groove 24 against movement in any other than a longitudinal direction. The cable is similarly confined after it passes from the remote control box, it being understood that the flexible connection 15 embodies a relatively rigid tube 25 (Fig. 2) which closely embraces the cable 17 throughout the length thereof between the remote control box 13 and receiving set 10.

In the present embodiment, the rotatable member is shown as being in the form of a ring-like member which is provided with an annular series of gear teeth 26 arranged to face radially inwardly of the member. A manipulating shaft 27 is journaled in the base 19 on an axis which parallels the axis of the rotatable member 23 and is disposed in opposition to the gear teeth 26 within the periphery of the rotatable member. The shaft 27 has a shoulder 28 arranged to abut the inner side of the base 19 to limit axial movement of the shaft in that direction. The shaft carries a gear 29 rigidly affixed thereto and meshing with the gear teeth 26. Thus, rotation of the shaft in one direction or the other causes the rotatable member 23 to move in a corresponding direction. One end of the shaft extends through the cover 20 and carries a finger piece or knob 30 by which the shaft may be manually operated.

Means is provided for imposing a frictional resistance to turning on the shaft 27 so that the rotatable member 23 will be positively held in any position of adjustment to which it is turned. To this end, the end of the shaft opposite the finger piece 30 extends through the base 19 and the outer end thereof is provided with an annular groove 31. Engaging this groove is the forked end of an elongated arm 32 which is intermediately offset as at 33 for engagement with the outer side of the base 19, whereby to provide a pivot or fulcrum about which the arm may swing. The arm 32 thus constitutes a lever. The outer end of the arm is apertured to receive a screw 34 engaging the base 19 and such means as a lock nut 35 is preferably interposed between the arm 32 and the head of the screw. By adjustment of the screw 34, the arm 32 may be swung to draw the shoulder 28 on the shaft 27 against the base and thereby impose on the shaft a frictional resistance to turning. It will be evident that the force exerted on the shaft by the arm may be varied by minute increments whereby an exceedingly accurate adjustment is obtainable.

While it is contemplated that the rotatable member 23 might be held in position by the flexible element 17, it will generally be desirable to provide means for holding the rotatable member seated in the recess. To this end, the member 23 is provided with an inwardly extending radial flange 36 which abuts the base of the recess 22. A disk-like holding member 37 is rigidly secured by means of a screw 38 to the base and is peripherally provided with an outstanding and then laterally extending flange 39 which overlies the flange 36 to hold the rotatable member 23 in the recess.

Inasmuch as the present remote control device is particularly adapted for use in connection with radio receiving sets which are mounted in vehicles, the parts are of course subjected to considerable vibration. This vibration might have the effect of disturbing the set adjustment if the parts are not assembled with considerable accuracy. It may be desirable, therefore, to provide at the remote control box resilient means which exerts a force on the cable 17 in opposition to the spring 18 at the receiving set end of the cable. Thus, a coil spring 40 which is preferably concealed within the control box is arranged to exert a force between a stationary part and the rotatable member 23, whereby the force of the spring is exerted on the rotatable member 23 in such direction that there is a tendency for the cable 17 to be drawn into the control box against the force exerted on the cable by the spring 18. For suitably mounting the spring 40 in position, a central portion of the holding disk 37 may be struck outwardly to provide a boss 41 to which one end of the spring is anchored. The other end of the spring is connected with a lug 42 (Fig. 2) on the rotatable member 23.

While the tendency of the set to be moved out of a selected position of adjustment by the effect of vibration may be overcome either by the spring or by the friction imposing means, it is preferred to employ both of these arrangements as illustrated. By providing a spring 40 which is of slightly less strength than the spring 18, the friction imposing means may be easily and quickly adjusted accurately to provide a counterbalance for the spring 18. Under such conditions, vibration of the vehicle will have no effect whatever upon the set adjustment.

Referring to Fig. 2, it should be noted that the holding disk 37 is notched, as at 43, and apertured, as at 44, to allow the holding member 37 respectively to slip past the lug 42 and receive the shaft 27. Engagement of the aperture 44 with the shaft 27 will prevent the rotation of the holding member 37 by the force exerted thereon by the spring 40.

The side of the rotatable member 23, which is remote from the base of the recess 22, has an outwardly extending flange 45 arranged to overlie the surface of the base adjacent to the recess. This flange carries an indicating drum 46 fashioned of some suitable semi-transparent material and carrying the usual tuning indicia. The indicia are visible to the operator through a window aperture 47 provided in the end of the control box 13 which faces the operator when the device is installed on a vehicle.

One of the features of the present invention resides in the advantageous arrangement of parts by which the rotatable member 23 is caused to move in the same direction of rotation as that of the manipulating shaft 27. Since the indicator 46 is carried by the rotatable member 23, it will have the same direction of rotation and consequently the operator, in turning the knob 30, causes the drum to move in the same direction. Confusion of the operator in tuning the set is thus avoided.

While the invention is susceptible of various modifications and alternative constructions, I have shown in the drawing and have herein described in detail the preferred embodiment, but it is to be understood that I do not thereby intend to limit the invention to the specific form disclosed, but intend to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

I claim as my invention:

1. In a remote control device for radio receiving sets the combination of a rotatable tuning member, means for rotating said member including resilient means for rotating the member

in one direction and a flexible element for rotating the member in the opposite direction against the force of said resilient means, a remote control box to which said flexible element extends, a rotatable member journalled in said box, a manipulating member operatively connected with said rotatable member including a shaft extending externally of the box, a lever arm having one end in engagement with the external end of said shaft, and adjustable means connected with the other end of said lever arm for moving said shaft variably to impose a frictional resistance to movement upon the shaft.

2. A control box for a remote control device for radio receiving apparatus comprising, in combination, a housing adapted to be secured at a point remote from said apparatus, a control element extending from said housing for operative connection with an adjustable part of said apparatus, and means within said housing for manipulating said element including a rotatable member having a frictional engagement with a part of said housing, a shaft supporting said rotatable member and extending externally of said housing, and an adjustable lever engaging the external end of said shaft for moving said shaft endwise to vary the frictional resistance to movement offered by said frictional engagement.

3. A control box for a remote control device for radio receiving apparatus, comprising in combination, a housing adapted to be secured at a point remote from said apparatus, a control element extending from said housing for operative connection with an adjustable part of said apparatus, means within said housing for manipulating said element including a rotatable member having frictional engagement with a part of said housing, a shaft having an operating connection with said rotatable member and extending externally of said housing, and an adjustable lever engaging the external end of said shaft for moving said shaft endwise to vary the frictional resistance to movement offered by said frictional engagement.

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