Feb. 5, 1935. H. E. REPPERT 1,989,771

REMOTE CONTROL DEVICE

Filed July 25, 1932

FIG. 1

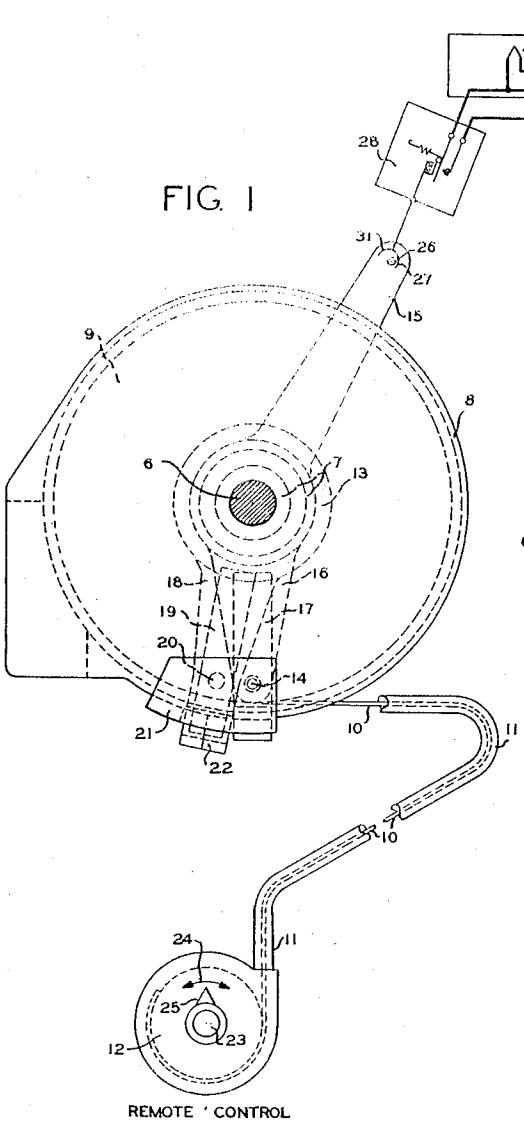
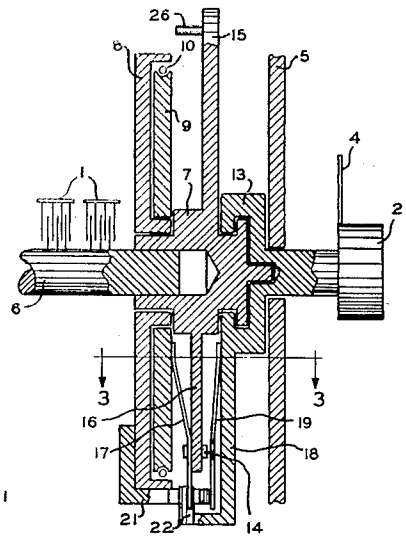


FIG. 2



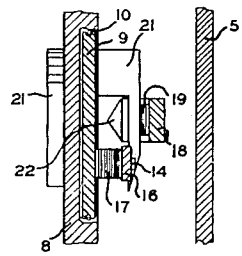


FIG. 3

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REMOTE CONTROL DEVICE

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18 Claims. (Cl. 250—40)

This invention relates to remote control devices, and particularly to devices for the remote control of a radio receiver. By remote control is meant control from any point other than the set itself. For example, the remote point may be a favorite armchair only a few feet removed from the set, or the radio may be put in a closet or cellar and the remote point be a considerable distance away.

In co-pending application, Serial No. 400,575, filed October 18, 1929 by Wm. J. Gillule, a remote control for a radio receiver is shown in which a pulley is keyed to the shaft on which a plurality of ganged condensers are mounted, to control the tuning of the set. The pulley is rotated by a wire or other tractile element enclosed in a sheath. The tractile element is wound around a drum at the remote point, which drum is turned by a suitable mechanism, in this specific case, a worm drive. A spiral spring at the radio set resists the motion of the tractile element when it is operated to wind on the drum at the remote point. The spring, of course, assists the operation of tuning the set in the reverse direction, that is, the direction for which the wire unwinds from the drum at the remote point and winds on the pulley at the set. Means are also provided, in the Gillule application, for turning the set on and off at the remote point and for controlling the volume of the received signal from the remote point. Also, a dial light is provided to illuminate the dial at the remote point when the set is operated.

When a radio set is provided with means for controlling its operation from a remote point, it is desirable that it shall also be possible to control the set locally, that is, by means of dials and switches at the set itself. With apparatus such as that disclosed in the Gillule application, no provision is made for this dual control, as the knob which turns the condensers locally will not operate against the pull of the wire in the sheath and the gears at the remote point, and the knob which turns the drum at the remote point will not operate against the friction of the local tuning knob and gearing.

An object of this invention is to provide means for alternatively controlling a radio receiver, or other device, from the receiver itself or from a remote point.

A feature of the invention is the provision of means for discontinuing the operative connection of the remote control means with the tuning condensers when it is desired to tune the set locally, and vice versa.

It is also desirable to be able to turn the set on and off from the point at which the set is being tuned at any particular time.

Another object of this invention is to provide means for accomplishing this.

In the drawing,

Fig. 1 is a schematic showing of the device of the invention, showing remote control, local control, and means for operating either control at will;

Fig. 2 is a side elevation, partly in section, of the remotely and locally controlled driving elements and the means for disconnecting one or the other; and

Fig. 3 is a section along line 3—3 of Fig. 2, looking downward.

Similar numbers refer to similar parts in all the figures.

A radio receiver having a plurality of ganged condensers 1 for tuning, may be located at any convenient place, while the remote control device may be located within a few feet of it or a considerable distance away. It has the usual tuning knob 2 with pointer 4 for indicating the condenser setting, mounted in front of a panel 5, behind which the set is located. The movable elements of the tuning condensers 1 are connected to a shaft 6 to which is keyed a driven element 7. Loosely mounted on a flange of the driven element 7, but fixed with relation to the panel and the radio receiver, is a mounting 8 within which a pulley 9 is encased. A wire or other tractile element 10 is secured at one end to the pulley and the other end extends from the radio set through a sheath 11 to the remote control point from which the set may be operated, where it is wound around a drum 12 and one end secured thereto. Loosely mounted on another flange of the driven element 7 is a hub to which the tuning knob 2 is secured. The driven element 7 has an upper arm 15 and a lower arm 16. The lower arm 16 has a pin 14 which projects from both sides thereof, as shown in Fig. 2. The pulley 9 has a spring driving arm 17 having a hole therein adapted to engage the pin 14. When this driving arm engages the pin and the pulley 9 is rotated, the condenser settings will be changed accordingly. Hub 13, to which the local tuning knob 2 is connected, has an arm 18 to which is attached a second spring driving arm 19 with a hole 20 therein adapted to engage pin 14, in order to drive the condensers from the local end. Attached to the mounting 8 is a cam element 21, the shape of which may be better seen from Fig. 3. Driving arm 18 likewise has a cam surface 22. It will be noted that the driving arm 17 attached to pulley 9 moves with the pulley, while the cam 21 remains in a fixed position; and that the driving arm 19 attached to arm 18 which is controlled locally moves with this arm and that the cam 22 moves along with the driving arm.

Assume that the dials at the set and at the remote end are marked from zero to 100. The position of the controls shown in all figures of

the drawing will be at the zero position for the dial settings. At this setting the driving arm 17 engages the pin 14 so that if the pulley 9 is rotated by means of the drum 12 at the remote point, the driven element 7 will be rotated and consequently shaft 6 and the rotors of the condensers 1 will be rotated. In the remote unit a knob 23 is suitably geared to the drum so that the drum may be turned to rotate the condensers 1 through 180°. A dial 24 and pointer 25 indicate the condenser setting at the remote point. The set may, therefore, be controlled through its entire range of operation by means of the remote control.

If it is desired to control the set locally, assuming that it has again been returned to zero condenser setting, the knob 2 is turned. This turns the arms 18 and 19. As the driving arm 19 approaches the pin 14, the cam surface 22 will raise the driving arm 17 from its connection with the pin 14 so that the remotely controlled pulley is released from its operative connection with the condensers. As the arms 18 and 19 pass beyond the cam 21, driving arm 19 will engage pin 14 and further movement of the arms 18 and 19 by means of the knob 2 will, therefore, turn the driven element 7 and the rotors of the condensers. They may be controlled through the entire 180° of their movement. When the condensers are returned to zero setting, by means of knob 2, as they approach the position shown in the figures the driving arm 19 will engage cam 21 and will, therefore, be released from engagement with pin 14. The driven element 7 will therefore stop at this position, due to friction, while the driving arms 18 and 19 will move on into the position which is better illustrated in Figs. 1 and 3. As these arms move through the zero position for the pulley, the driving arm 17 will ride over cam 22 and again drop into engagement with pin 14.

Assume now that the set has been tuned by means of the remote control to a setting of 50, and that it is now desired to change the tuning by means of the control at the set itself. It is simply necessary to turn the knob 2 up to 50 at which point the cam 22 will lift the driving arm 17 from engagement with pin 14 while the driving arm 19 will slip into engagement with the pin 14, and the set may therefore be tuned to any point in the entire range or turned back to zero by means of the local tuning control. When the set has been operated from the remote point and it is desired to assume control from the set, it is therefore not necessary to perform any operation whatsoever at the remote point.

It is obvious that the positions of the cams 21 and 22 could be reversed so that, if the set had been tuned to any point from the local control, control of the tuning operation might be obtained at the remote point by simply turning the knob 23 at that point to the position for which the set had last been tuned by means of the local control.

The arm 15 of the driven element 7 is provided with a pin 26 which engages one of the prongs 27 of a toggle switch 28, when the condensers are turned to the zero position. This toggle switch is provided to turn the set on and off. In Fig. 1 a battery 29 is shown in the switch circuit, and filaments 30 of the tubes of a radio receiver are in parallel therewith. When the condensers are moved away from the zero position by means of either the remote or local control, the set will, of course, be turned on by engagement of pin 26 with the other prong 31 of the toggle switch. It is, therefore, possible to turn the set off from either the remote point or from the set itself, by simply tuning it to zero.

Suitable means is, of course, provided at the remote point and at the set for controlling the volume of the received signal. This may be done in the manner shown in the Gillule application, heretofore referred to.

What is claimed is:

1. A radio receiver, means for tuning said receiver, means for operating said tuning means locally, means for operating said tuning means from a remote point, and means alternately operable under control of said second and said third mentioned means for releasing driving engagement between said tuning means and one of said operating means and for permitting the establishment of driving engagement between said tuning means and the other of said operating means whereby said remote and said local operating means are alternately rendered effective to control said tuning.

2. A device to be controlled, a driven element attached to said device, a first driving element operated from a remote point, a second driving element operated locally, a stationary element, and means controlled by said driving elements and co-operating with said stationary element for alternatively engaging either driving element with said driven element.

3. A device to be controlled, a driven element for operating said device, a remotely controlled driving element engaging said driven element, a locally controlled driving element disengaged from but adapted to engage said driven element, and means carried by said locally controlled driving element for releasing the engagement of said remotely controlled driving element with said driven element and permitting the establishment of a driving engagement between said locally controlled driving element and said driven element.

4. A device to be controlled, a driven element for operating said device, a locally controlled driving element engaging said driven element, a remotely controlled driving element adapted to engage said driven element, and means comprising a stationary cam engageable by said locally controlled driving element upon movement thereof for releasing the engagement of said locally controlled driving element with said driven element and permitting the engagement of said remotely controlled driving element therewith.

5. A device to be controlled, a driven element for operating said device, a remotely controlled driving element engaging said driven element, a locally controlled driving element disengaged from but adapted to engage said driven element, and locally operable means controlled by said locally controlled driving element for releasing the engagement of said remotely controlled driving element with said driven element and permitting the establishment of a driving engagement between locally controlled driving element and said driven element.

6. A radio receiver, means for tuning said receiver, a driven element to operate said tuning means, a driving element controlled from a remote point adapted to engage said driven element, a driving element controlled locally adapted to engage said driven element, and differential means comprising a stationary cam co-operating with one of the driving elements and a mov-

able cam co-operating with the other driving element for alternatively controlling the engagement of said driving elements with said driven element.

7. A radio receiver, means for tuning said receiver, a driven element to operate said tuning means, a locally controlled driving element adapted to engage said driven element, a remotely controlled driving element adapted to engage said driven element, and differential means comprising a stationary cam co-operable with one of the driving elements and a cam carried by the said one driving element and co-operable with the other driving element for alternatively controlling the engagement of said driving elements with said driven element.

8. In a radio receiver having means for tuning said receiver, the combination of a driven element to operate said tuning means, a driving element controlled from a remote point, a member carried by said driving element movable into and out of locking engagement with said driven element, a driving element controlled locally, a member carried by said second mentioned driving element movable into and out of engagement with said driven element, and means controlled by said driving elements for preventing locking engagement of one of said members with said driven element while the other is in locking engagement therewith.

9. The combination according to claim 8, characterized in this, that said last mentioned means comprises a stationary cam engageable by one of said members and a cam carried by one of said driving elements and engageable with the said other member.

10. The combination according to claim 8, characterized in this, that said last mentioned means comprises a stationary cam engageable by the member carried by the locally controlled driving element to interrupt locking engagement thereof with said driven element, and a cam carried by the locally controlled driving element and engageable with the member carried by the remotely controlled driving element to control the locking engagement thereof with the driven element.

11. A device to be controlled, a driven element for operating said device, a remotely controlled driving element engaging said driven element, a locally controlled driving element for engaging said driven element, and locally operable means controlled by said locally controlled driving element for releasing said remotely controlled driving element from engagement with said driven element and thereafter permitting the engagement of said locally controlled driving element therewith, the driving engagement between said remotely controlled driving element and said driven element being independent of said locally operable means.

12. A device to be controlled, a driven element for operating said device, a remotely controlled driving element engaging the said driven element, a locally controlled driving element for engagement with said driven element, locally operable means controlled by said locally controlled driving element for releasing said remotely controlled driving element from engagement with said driven element, and means rendered effective by operation of said locally operable means for causing said locally controlled driving element to engage said driven element following the disengagement of said remotely controlled driven element therefrom.

13. A radio receiver, means including a rotatable member for tuning said receiver, remotely controlled means for rotating said member, locally controlled means for rotating said member, and differentially operating means controlled by each of said remotely controlled and locally controlled means for causing the alternative engagement thereof with said rotatable member.

14. In a radio receiver having a tunable element, means including a rotatable shaft for tuning said element, means thereat controlled from two different points for driving said shaft and including a driving member controlled from one point and a driving member controlled from the other point, a controller at each said point operatively connected to the respective driving members, means for coupling either driving member to said shaft, and means controlled by each driving member for preventing simultaneous coupling of both driving members to said shaft.

15. In a radio receiver having a tunable element, means including a rotatable shaft for tuning said element, a plurality of driving members for said shaft each controlled from a separate point, means for coupling one of the said driving members to said shaft, and means controlled from one of said points for disengaging said coupling and for connecting another of said driving members in driving engagement with said shaft.

16. A device to be controlled, a driven element attached to said device, two driving elements, one remotely controlled and the other locally controlled and each connectible with said driven element for establishing driving engagement therewith, means operable to connect either driving element into driving engagement with said driven element and to prevent simultaneous coupling of the other driving element therewith, and an actuator carried by each driving element and moved thereby into engagement with said means thereby to operate said means.

17. A device to be controlled, a driven element attached to said device, two driving elements, each independently controlled and connectible with said driven element for establishing driving engagement therewith, an actuator carried by each driving element, and means engaged by either actuator during movement of its driving element to effect driving engagement between one of said driving elements and the driven element and to prevent simultaneous coupling of the other driving element therewith.

18. A radio receiver, means for tuning said receiver, a driven element for controlling said tuning means, a first driving element controlled from a remote point adapted to engage said driven element, a second driving element controlled locally adapted to engage said driven element, differential means for alternatively controlling the engagement of said driving elements with said driven element, and means controlled by said second driving element for operating said differential means to release said first driving element and permit said second driving element to control said driven element through the entire frequency range of said receiver.

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