March 6, 1934. J. R. HAVILAND 1,950,143

REMOTE CONTROL DEVICE

Filed Oct. 21, 1929

FIG. 2.

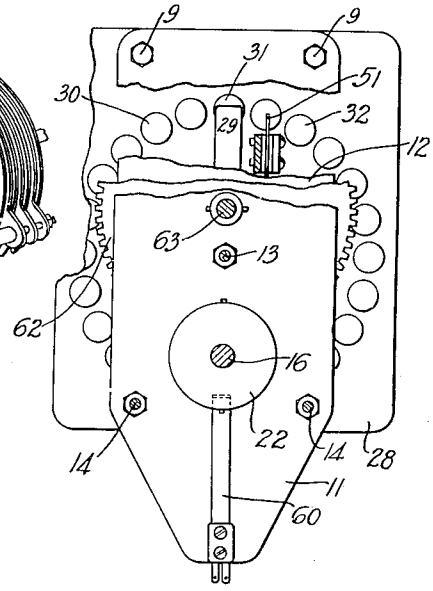


FIG. 3.

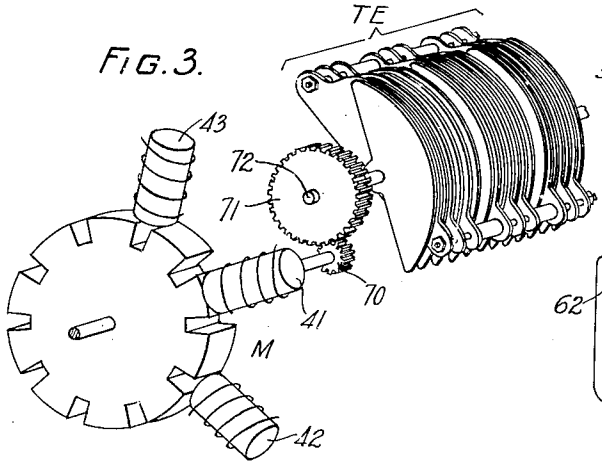


FIG. 1.

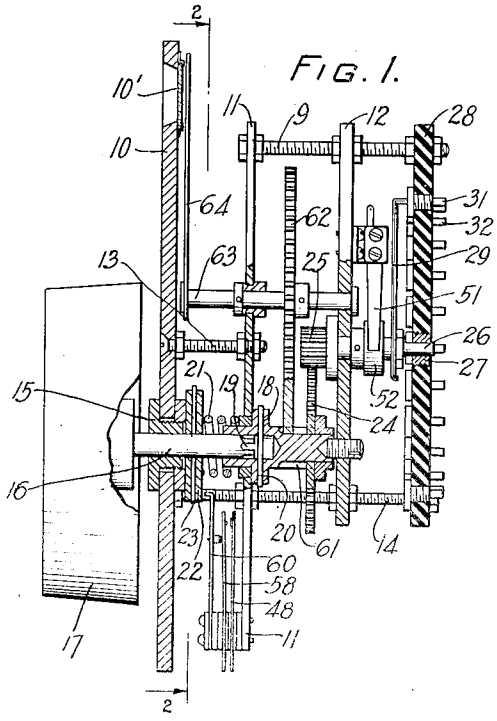
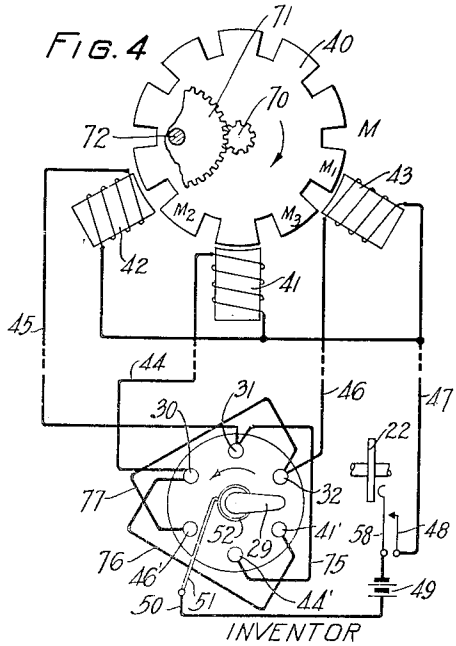


FIG. 4



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Patented Mar. 6, 1934

1,950,143

UNITED STATES PATENT OFFICE

1,950,143

REMOTE CONTROL DEVICE

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Application October 21, 1929, Serial No. 401,334

1 Claim. (Cl. 200—11)

This invention relates to remote control devices.

In radio receiving and transmitting apparatus of the type used in airplanes, for example, where the set is placed at a considerable distance from the operator, a remote control mechanism actuated by the operator is provided for moving the tuning element of the set in adjusted position with respect to marks on a dial which indicate the wave length at which it is desired to receive or send signals.

The object of this invention is to provide a remote control arrangement of this character which will be efficient in operation, cheap to manufacture and wherein the tuning element is moved in adjusted position in a simple and positive manner.

According to this invention, the operation of a gearing mechanism through the movement of a manual operating knob is effective to move a wiper on a row of associated contacts for controlling the operation of a motor placed at the remote end of the control. In this motor the successive energization of a series of electromagnets is effective to cause the rotation of an armature wheel to which the tuning element of the set is operatively connected. Means is provided for automatically disconnecting the operating knob from the gear actuating mechanism and for simultaneously breaking the motor's operating circuit upon the release of the knob when the tuning element of the set reaches its adjusted position, and a dial movable under control of the actuating mechanism indicates the wave length to which the radio set is tuned.

Fig. 1 is a side view of the controlling mechanism showing a number of operating parts in section;

Fig. 2 is a sectional view taken approximately on line 2—2 of Fig. 1; and

Fig. 3 is a perspective view of the tuning element showing the motor geared to the condenser shaft;

Fig. 4 is a diagrammatical view of the motor and its operating circuit.

In Figs. 1 and 2, 10 indicates a panel on which the plates 11 and 12 are secured by a number of studs such as 13 and 14, the studs 14 cooperating with studs 9 for supporting a plate 28 provided for a purpose that will be hereinafter described in detail. In the plate 10 there is mounted a bushing 15 in which the shaft 16 is mounted. This shaft carries at one end an actuating knob 17 and the other end engages a sleeve 18 journaled in the plates 11 and 12. The shaft 16 is provided at its inner end with a clutch portion 19 for engagement with a pin 20 extending across the sleeve 18 upon an axial movement of shaft 16 against the resistance of a spring 21 having one end abutting against a collar 22 and the other end against the shoulder portion of sleeve 18, collar 22 being secured on the shaft 16 by a pin 23.

The sleeve 18 carries a gear 24 which meshes with a pinion 25 mounted on one end of a shaft 26 journaled in plate 12 and in a bearing 27 in the insulating plate 28. On this shaft is mounted a slip ring 52 which is engaged by a brush 51 mounted on the plate 12. The shaft 26 carries a wiper 29 arranged to successively engage a circular row of associated contact members, such as 30, 31, 32, etc. shown in Figs. 1, 2 and 4 provided for a purpose that will be hereinafter described in detail.

As shown in Figs. 3 and 4 the motor M which is placed at a remote point from the control consists of a toothed armature wheel 40 arranged to be energized by a series of staggered magnets 41, 42 and 43. These magnets are connected to the contact members 30, 31 and 32 through the line wires 44, 45 and 46 and through wiper 29, the slip ring 52, brush 51 and the lead 50 to one side of battery 49, the other side of the magnet circuit extending through a common line wire 47, the springs 48 and 58 to the other side of battery 49.

The armature wheel 40 carries a pinion 70 which meshes with a gear 71 keyed on shaft 72 to which the tuning element TE of the radio set is operatively connected.

The springs 48 and 58 are mounted in a pile-up arrangement with a contact actuating member 60 on the lower end of plate 11, as shown in Figs. 1 and 2. Member 60 extends in operable relation with the collar 22 on shaft 16, the axial movement of this shaft being effective to engage the springs 48 and 58 and simultaneously engage the clutch portion 19 with the pin 20 for operatively connecting the wiper 29 with knob 17.

The sleeve 18 has a gear toothed portion 61 engaging a gear 62 keyed on a shaft 63. This shaft is journaled in plates 11 and 12 and carries at one end a dial 64 which cooperates with a hair line marked on a glass window 10' mounted on the panel 10 for translating the movement of the tuning element TE into the wave length of the radio signals.

In this device in order to decrease the number of turns of knob 17 with respect to the movement of armature wheel 40, the line wires 44, 45 and 46 are multipled by conductors such as

76, 75 and 77 to a number of contacts 41', 44' and 46', as shown in Fig. 4.

In operation, the axial movement of knob 17 against the resistance of spring 21 is effective to engage the contact springs 48 and 58 for closing the motor's operating circuit and to engage the clutch portion 19 on shaft 16 with the pin 20 for operatively connecting the wiper 29 with knob 17. The movement of wiper 29 in the direction indicated by the arrow in Fig. 4 will first cause the energization of magnet 43 through a circuit extending from one side of battery 49, conductor 50, the brush 51, the slip ring 52, the wiper 29, contact 32, the line wire 46, the winding of magnet 43, the common line wire 47, the springs 48 and 58 closed to the other side of battery 49. The energization of this magnet is effective to rotate the armature wheel 40 in a clockwise direction until the tooth M_1 coincides with the magnet 43. The movement of wiper 29 on contact 31 is effective to energize magnet 42 which causes the continued movement of wheel 40 until the tooth M_2 coincides with the position of this magnet, which movement will position the tooth M_3 in position to be attracted by magnet 41 upon the passing of the wiper 29 on contact 30, the continued movement of wiper 29 on contacts 46', 44' and 41' being effective to cause the successive energization of these magnets in the order above mentioned through the loop wires 77, 75 and 76.

Similarly the movement of wiper 29 in the direction opposite to that indicated by the arrow is effective to cause the movement of the armature wheel 40 in a counterclockwise direction, which permits the adjustment of the tuning element TE in either direction.

What is claimed is:

In a switch for the control of an electric motor, said switch comprising a circular row of stationary contacts, a slip ring, a stationary wiper engaging said slip ring, a wiper movable for successively engaging said contacts, a speed-up driving mechanism for said slip ring and said wiper, a normally ineffective manually operable member for actuating said mechanism, a clutch device to render said member effective upon the axial movement of one element of said device for operating said mechanism, and means for automatically disengaging said clutch device upon the release of said operable member to render it ineffective with respect to said mechanism.

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