Jan. 8, 1935. J. E. GRIMM 1,986,892

CONTROL UNIT

Filed June 26, 1931 2 Sheets-Sheet 1

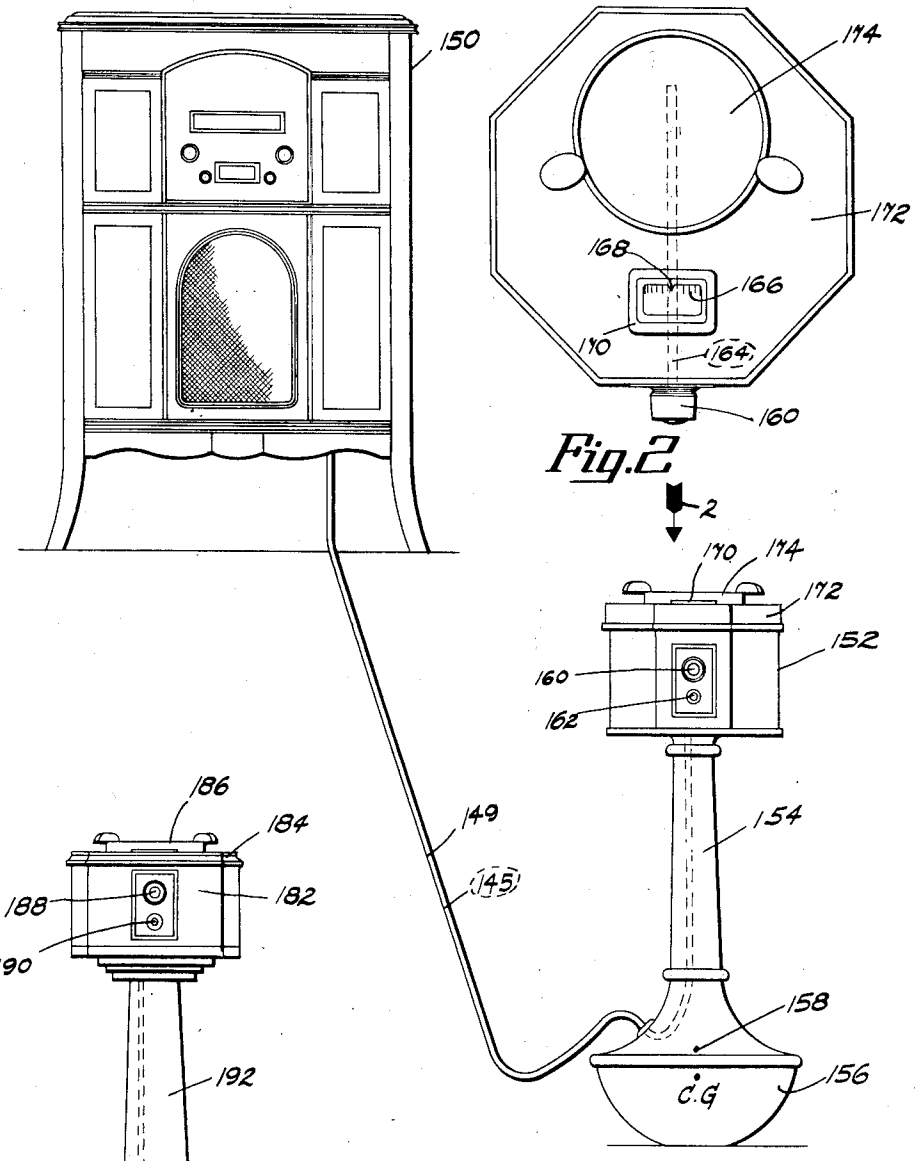


Fig. 1

Fig. 3

Inventor

JOHN E. GRIMM

By Spencer, Hardman & Fehr

his Attorneys

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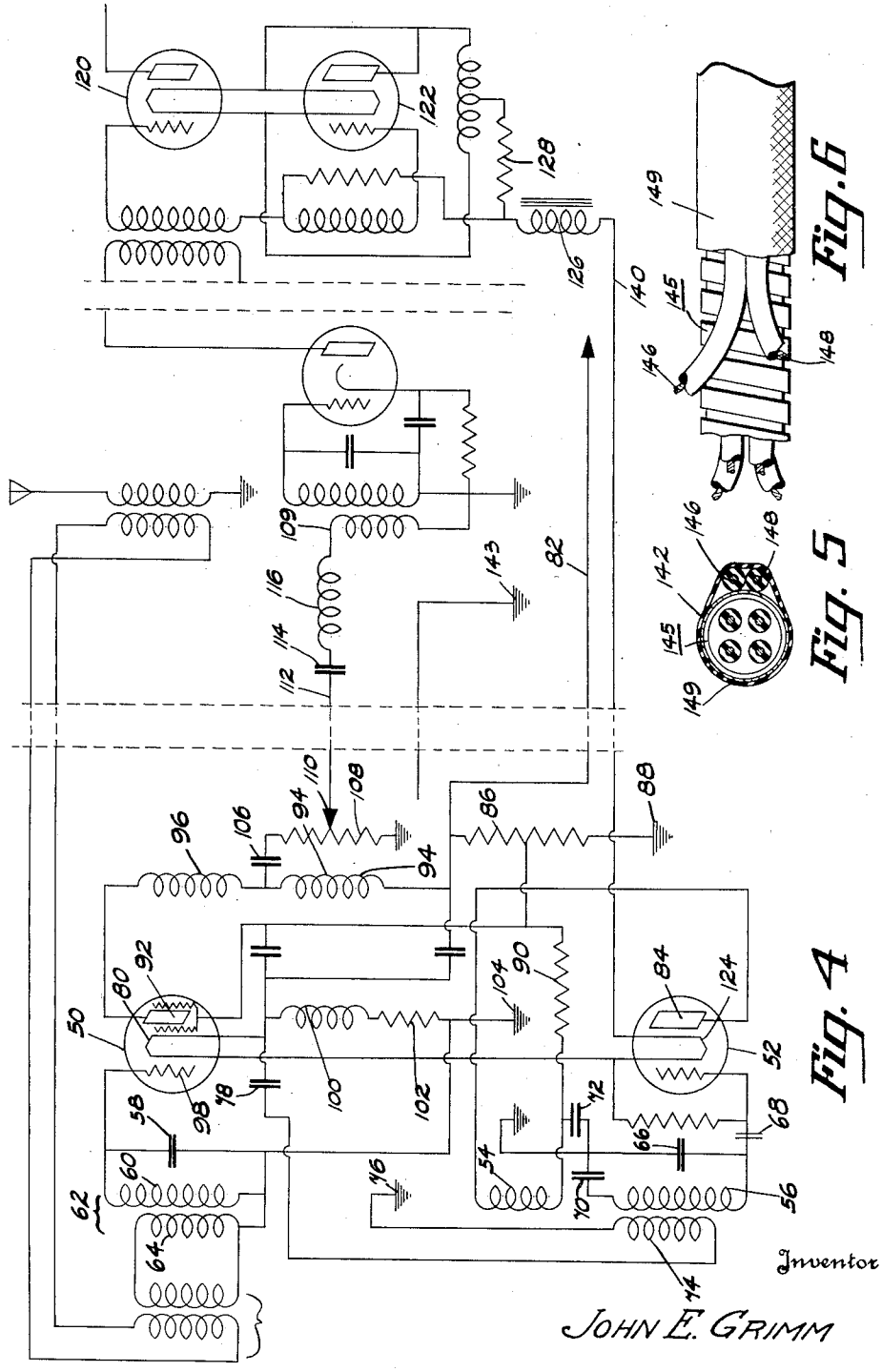


Fig. 4

Fig. 6

Fig. 5

Inventor

JOHN E. GRIMM

By Spencer, Hardman & Fehr

Attorneys

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UNITED STATES PATENT OFFICE

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CONTROL UNIT

John Edward Grimm, Dayton, Ohio, assignor, by mesne assignments, to Radio Corporation of America, New York, N. Y., a corporation of Delaware

Application June 26, 1931, Serial No. 546,993

1 Claim. (Cl. 250—14)

This invention relates to a radio receiver and in more particular to a remote control thereof. In the present-day receivers that are usually mounted in cabinets, the controls are mounted on the outside of the cabinet. With such an arrangement it is necessary for the operator of the receiver to be in the immediate vicinity of the receiver every time that it is desired to tune in on another station or to change the volume output of the receiver. This is objectional in that it is often necessary for the operator to either remain near the receiver or to go to the receiver at frequent intervals to manipulate the controls for satisfactory reproduction.

An object of this invention is to provide a remote control for the radio receiver that is efficient, dependable, easily constructed, that requires few parts and that improves upon the performance of the modern radio receiver. This has been accomplished by providing an oscillator and a detector supported in a suitable casing and attached to the radio receiver by a cable.

Another object of this invention is to provide a support for the remote control. This has been accomplished by combining the remote control apparatus with a suitable stand such as a tobacco stand.

Another object of this invention is to provide a stand that is so constructed and arranged that if it is upset it will upright itself, thereby protecting the apparatus, such as the tubes, mounted in the remote control unit. This has been accomplished by providing a pedestal for the stand that has a loaded semi-spherical base having the center of gravity below the center of curvature. Such an apparatus upon being upset will upright itself.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein a preferred embodiment of one form of the present invention is clearly shown.

In the drawings:

Figure 1 represents a conventional radio receiver provided with a remote control;

Figure 2 discloses a plan view of the remote control unit;

Figure 3 shows a modification of the stand for the remote control unit;

Figure 4 discloses a schematic wiring diagram of a portion of the circuit of the radio receiver and the circuit of the remote control.

Figure 5 discloses an end view of the cable extending from the radio receiver to the remote control unit;

Figure 6 discloses a side elevation of the cable with parts broken away so as to better illustrate the construction thereof.

The remote control unit may be used with practically any modern radio receiver such as a tuned radio frequency receiver, a superheterodyne receiver, a super-regenerative receiver or the like. When the remote control unit is used in connection with a receiver, the tuning device on the receiver is set in some predetermined position, as for example to a wave length just a little longer than the longest wave length found in the usual broadcast range.

The remote control unit contains a tuning device or station selector, an oscillator, and a detector. Either a separate or a single tube oscillator and detector may be used so that beat frequency is produced by combining the desired incoming signal with locally generated oscillations to produce a beat frequency equal to the frequency for which the receiver is set. The incoming signals may be signals within the usual broadcast range or signals outside of the usual broadcast range usually referred to as short wave signals. The remote control unit could, of course, be provided with removable coils so as to change its range from the broadcast range to the short wave range and vice versa.

In the preferred embodiment as best seen by the schematic wiring diagram of Figure 4, the receiving system includes the remote control unit, the intermediate amplifier, the cable connecting the remote control unit to the intermediate amplifier and an audio amplifier. Intermediate, as here used, designates the stages of amplification in the receiver that amplifies all signals above audio frequency whether it is a tuned radio frequency, a superheterodyne receiver or other receivers.

In the remote control unit is found the detector 50 and the oscillator tube 52. The oscillator as is well known to those skilled in this art includes the anode circuit which has an inductance 54 coupled to an inductance 56 found in the grid circuit. The frequency of the locally generated oscillations may be adjusted by changing the resonant circuit including the inductance 56 and the condenser 66.

A uni-control has been provided for actuating the condenser 58 in the tuned frequency stage which includes the secondary 60 of the transformer 62 having the primary 64 in the input circuit and for actuating the condenser 66 which is arranged to control at a certain predetermined frequency and at substantially constant frequency difference the oscillator circuit comprising the capacities 68, 70 and 72 and the inductance 56. The inductance 56 is coupled to an inductance 74 having one terminal grounded at 76 and the other terminal connected through a condenser 78 to the cathode 80 of the detector 50.

A suitable B-voltage is supplied to the plate 84 from the B-source in the radio receiver through a conductor 82 through a voltage di-

vider 86 having one terminal grounded at 88 and through a resistance 90. The B-voltage is supplied to the plate 92 of the detector 50 from the same source through the conductor 82, the choke 94 and the coil 96.

A direct current grid bias is supplied to the grid 98 through a high reactance coil 100 and a resistance 102 that are connected in series between the cathode 80 and ground 104. The inductance 100 offers a very high impedance for the oscillator voltage, and a high resistance for a direct component of the plate current. The resistance 102 may be omitted by increasing the impedance of the reactance coil 100.

The output of the detector is connected to the input 109 of the radio receiver through a condenser 106 having one terminal connected intermediate the coils 94 and 96 and the other terminal connected to a suitable grounded resistance 108 that is provided with a suitable tap 110 connected to a lead 112, a blocking condenser 114 and a loading coil 116.

The inductance 116 has been introduced into the line so as to counteract the capacity effect existing between the several leads. The size of the inductance 116 is dependent upon the length of the cable and its dimensions and upon the frequency at which the particular receiver is set. The intermediate stage or stages are set to a frequency preferably at one end of the range where it remains regardless of the station selected by the remote control unit. After the signal is amplified through the intermediate stages it is then detected and again amplified through the audio frequency stage, which in this particular modification includes the push pull tubes 120 and 122.

The current in the push-pull amplifier is used to energize the filament or cathode 80 and the filament or cathode 124 of the detector and of the oscillating tube respectively, in the remote control unit. If this plate circuit does not furnish the requisite current for the filament in the tubes in the remote control, these filaments may be energized from any suitable source of current, as for example from a voltage divider, in case an alternate current is used to energize the receiver. A choke 126 has been inserted in the lead 140 connecting the plates of the push-pull amplifier to the filaments in the remote control unit so as to isolate the high frequency signal current, the local generator oscillations and the beat frequency from the audio circuit. Grid bias for the push-pull amplifiers 120 and 122 is supplied through the voltage drop across the resistance 128.

The cable connecting the remote control unit to the radio receiver includes the leads 82, 112 and 140, enclosed within an armoured shield 142, grounded at 143. The leads 146 and 148 for the antenna is carried outside of the armour so as to eliminate any heterodyning effect between the incoming signal and the signal transmitted from the remote control to the intermediate stage. The armoured cable 145 and the antenna lead-ins 146 and 148 may be covered by a suitable covering 149 so as to hold the parts together and so as to improve the appearance of the cable. The above circuits per se do not form the subject matter of the present application, but are used to illustrate the present invention.

In the modification disclosed in Figures 1 and 2 the radio receiver is housed within the cabinet 150 and the remote control unit is housed within the case 152 carried on a suitable pedestal 154, provided with a curved base 156 that has the center of gravity CG located below the center of curvature 158. The cable 145 connects the radio receiver circuit to the remote control circuit housed within the casing 152. The casing 152 which is preferably made from a suitable metal is provided with a pair of knobs 160 and 162, the former controlling the condenser 58 and the condenser 66, and the latter adjusting the tap 110 on the potentiometer 108 so as to change the volume output. A shaft 164 which connects the knob 160 to the condensers 58 and 66 carries a dial 166 that cooperates with the indicants 168 integral with escutcheon plate 170 carried by the cover 172 of the casing 152. The cover 172 is also provided with an ash tray 174 so that this stand for the remote control also serves the function of a tobacco stand so as to reduce the number of pieces of furniture.

In the modification disclosed in Figure 3 a casing 182 provided with a cover 184 carrying an ash tray 186 and having the control knobs 188 and 190 encloses the remote control unit. The arrangement of the dial and escutcheon plate is the same as in the modification in Figures 1 and 2.

The casing 182 is supported upon a pedestal 192 provided with a suitable base structure 194. In the modification disclosed in Figure 3, the base is much broader as it is not provided with a curved base that automatically uprights.

While the form of embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claim which follows.

What is claimed is as follows:

In combination with a radio receiving system having its input adjusted so as to be resonant to a frequency at one end of the broadcast range, a power supply circuit for energizing the system and means adapted for connecting the input of the receiving system to a broadcast signal collector, a control device for said radio receiver, comprising a case normally disposed at a point remote from the receiver, a frequency changer circuit disposed within said case for converting selected signals of said broadcast range to the frequency to which the receiving system resonant input circuit is tuned, a broadcast signal selector in said case connected with the frequency changer circuit, means connecting the said receiver collector connection means to said selector, additional means connecting the output of the frequency changer circuit to said receiver input, said additional means including a variable device disposed within said case and adapted to be operated at said remote point for controlling the amount of energy transferred from the frequency changer circuit to the receiver input, means for connecting said power supply circuit to the frequency changer circuit to energize the latter and a cable housing all of said connecting means said cable being provided with a shielding tubing arranged so as to shield the means for connecting the receiver controller connection means to the selector from the other connecting means of said cable.

JOHN EDWARD GRIMM.