

Feb. 5, 1952

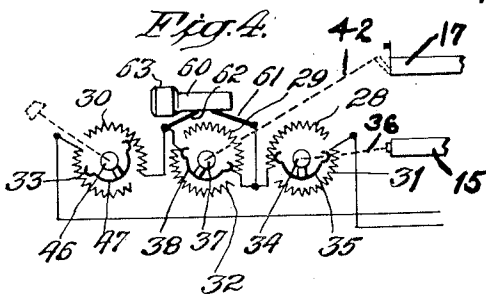
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2,584,155

FADER FOR RADIO RECEIVING OR OTHER APPARATUS

Filed Aug. 18, 1948

2 SHEETS—SHEET 1



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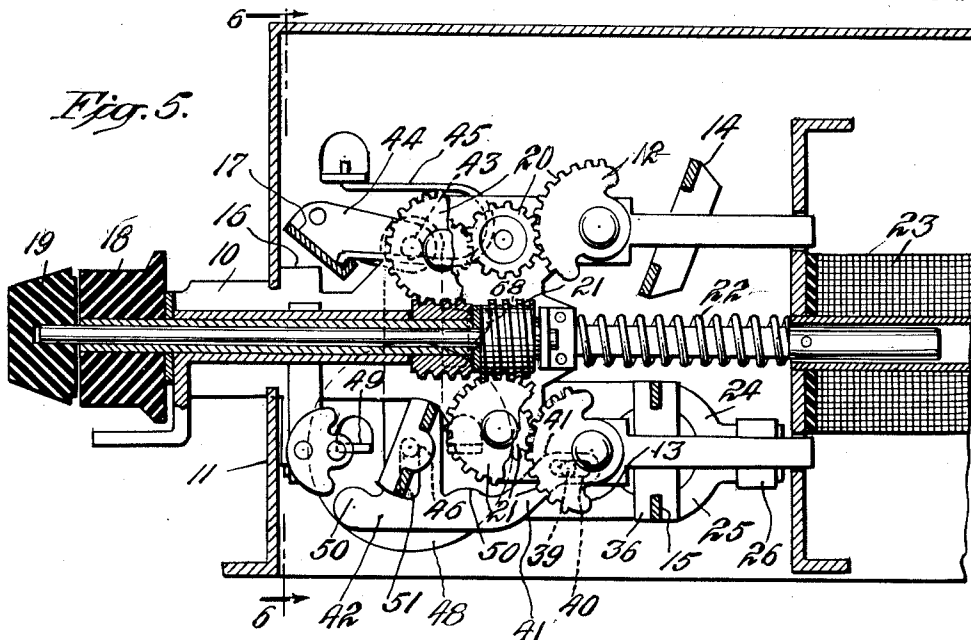
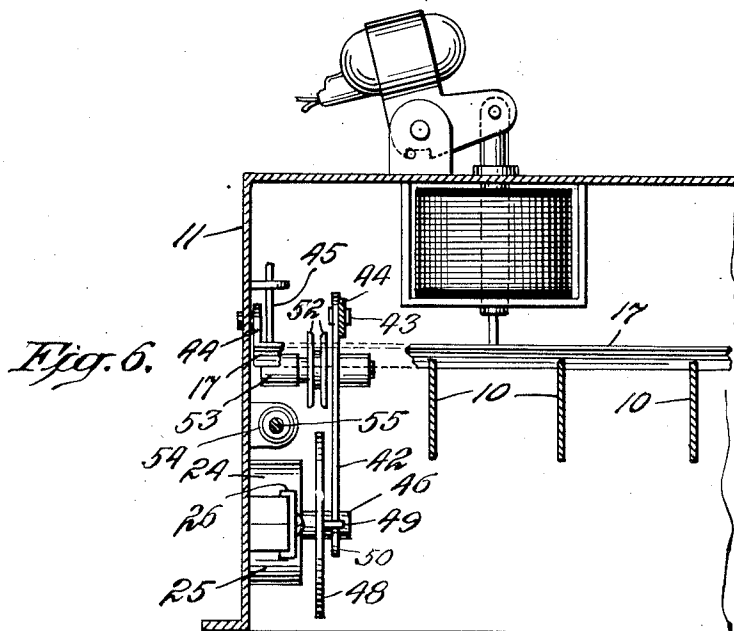
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2 SHEETS—SHEET 2



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2,584,155

FADER FOR RADIO RECEIVING OR OTHER APPARATUS

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Application August 18, 1948, Serial No. 44,853

7 Claims. (Cl. 250—20)

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The invention here disclosed relates to faders for radio receiving or other apparatus and particularly to receivers of the type disclosed in copending patent applications Serial No. 540,292 filed June 14, 1944, Patent 2,513,353 of July 4, 1950, and Serial No. 604,364 filed July 11, 1945, Patent 2,452,067 of October 26, 1948, of which this is a continuation in part.

In the patent applications referred to, the selection of different radio stations is effected by the actuation of slides each arranged to bring in a desired station at a previously determined sound level.

Special objects of the present invention are to effect an automatic fading out of one station and the fading in of a new station as the slides change the reception from one station to another.

Special objects also are to enable the automatic fader to be cut out of action when a slide is being set up for bringing in a particular station and at which time the fader otherwise might interfere with setting the parts for proper volume, and additionally to provide that the fader will be automatically returned to operating condition after such tuning and volume control adjustments have been made.

Further important objects of the invention are to accomplish the foregoing and other useful results with a simple, entirely practical structure which will take up but small space and which can be produced at reasonably low cost.

Other desirable objects attained by the invention are set forth or will appear in the course of the following specification.

The drawings accompanying and forming part of the specification illustrate a present practical embodiment of the invention. Actual structure and arrangement, however, may be modified and changed in various ways, all within the true intent and broad scope of the invention as herein-after defined and claimed.

Fig. 1 in the drawings is a broken cross sectional view illustrating the station selecting slide and related parts of a radio receiver having the present invention applied thereto and showing the slide in outward or normal receiving position and with the fader inactive;

Fig. 2 is a similar view showing the slide in inward position and the fader turned to cut in the volume fading resistance;

Fig. 3 is a sectional detail of the volume control and fader unit;

Fig. 4 is a partial wiring diagram.

Fig. 5 is a broken sectional view similar to Fig. 1, showing the station selecting slide in the outer, normal position;

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Fig. 6 is a broken vertical sectional view of the parts appearing as on substantially the plane of line 6—6 of Fig. 5, but with the slide in the inward position indicated in Fig. 2.

The parts of the receiver shown are similar to those present in the basic cases identified, involving operating members 10 mounted to slide in a chassis structure 11 and carrying cams 12 and 13 for setting tuning and volume control rockers 14, 15, and cam shoulders 16 for lifting the "on" switch actuating rocker 17.

These slides may carry tuning and volume control knobs 18, 19, at the outer ends connected by gearing 20, 21, to adjust the tuning and volume control rockers.

Figs. 1 and 5 show the normal position of the slides, pressed outward by springs 22 and adapted to be shifted inward for tuning, volume control, switch operation and in some instances, wave band selection, either by direct pressure applied to the exposed adjusting knobs or by the pull of a solenoid coil 23.

The volume control and fader unit is made up as shown in Fig. 3, of two complementary insulating sections 24, 25, held together at the ends by clamps or yokes 26 through which the mounting screws 27 are passed to fasten this insulating casing on the end wall of the chassis.

The insulating casing contains three circular cavities 28, 29, 30, for the critical volume control winding 31, the fader winding 32 and the master volume control winding 33.

The shaft or spindle 34 of the critical volume control carries a brush 35 cooperative with the winding 31 and has at the side of the case an exposed yoke piece 36 connected with the end of the volume control rocker 15.

The spindle 37 for the fader carries a brush 38 and is equipped with an external crank pin 39 engaged in a horizontal slot 40 in the laterally projecting arm 41 of a link 42 pivotally suspended at 43 from a lever arm 44 on the switch operating rocker 17.

Consequently each time the operating slide is shifted inwardly and the rocker 17 is lifted by shoulder 16, the link 42 will be raised to turn the fader in a resistance increasing direction.

Conversely, as the slide is returned to its normal outer position by spring 22 and the switch rocker 17 is rocked downwardly by its spring 45, the fader will be turned back in a resistance reducing direction to its normal position, where it may offer no resistance to the volume of reception.

The master volume control, as in copending patent application Serial No. 44,851 filed August

18, 1948, is shown as having a spindle 46 for operating the brush 47 and carrying an external disc 48 having lugs 49 at opposite sides of its center engageable by dual cams 50 to return the master volume control to a normal factory-set position each time an operating slide is forced inward. This, as disclosed in the patent application identified, is to assure that the master volume control will be in its neutral or factory-adjusted position each time a slide is operated to bring in a station at the volume for which the critical volume control has been set for that station and to leave the master volume control free, when the slide returns to its normal outer position to be operated then to suit the desire of any individual listener.

The cam carrying link 42 is shown as guided for vertical movement by having a slot 51 operating over the spindle 46 of the master volume control and this cooperative engagement holds the link in line against the angular drag of the laterally projecting crank arm portion 41 of the link.

The link 42 additionally carries a pair of friction discs 52 for gripping engagement with the rim of the master volume control disc 43 and a helical gear 53 for meshing engagement with a companion gear 54 on the inner end of the shaft 55 of the master volume control knob 56.

The master volume control shaft 55 is shown in Figs. 1 and 2 as of tubular construction to pass the stem 57 of the fader control knob 58 disposed over the end of the master volume control knob. At the inner end the knob stem 57 is slidably guided through a bracket 59 and carries a metal sleeve 60 for connecting the terminal strips 61, 62, of the fader resistance 32.

The fader knob 58 normally lies flat against the end of the master control knob 56 and in this position the insulated sleeve or collar 63 on the switch stem 57 engages contact 62 and holds it out of engagement with the movable switch contact 60, thus leaving the fader in circuit. When pulled out, as shown in Fig. 2, the insulated shoulder 63 leaves the contact 62, permitting that to engage the movable switch element 60 which then serves to connect the relatively stationary switch contacts 61, 62, to short the fader out of service.

The knob or button 58 is resorted to for thus cutting the fader out of action when one of the slides is pushed in and held in for setting the critical volume control 31, 35, at the particular sound level desired for the station controlled by that special slide.

The friction of the contact springs 61, 62, on the movable switch member 60, 63, is sufficient to hold the knob and this switch mechanism in either the "out" or the "in" position.

The sectional view, Fig. 3, shows how the spring switch strips 61, 62, may be held in notches 64, 65, formed for the purpose in the duplicate members 24, 25, of the insulating casing.

Fig. 4 shows diagrammatically how the fader winding is connected at opposite sides at 66 and 67 with the critical and master volume control windings and how it may be shorted out when volume control adjustments are being made by means of the shorting switch directly connected therewith.

To automatically return the fader knob 58 to its normal, inward position shown in Fig. 1, the cam link 42 is shown as having a downwardly faced inclined shoulder 38 which, as this link is lowered from the Fig. 2 to the Fig. 1 position, will

engage the shouldered portion 63 of the switch and thrust it inward to the switch open position shown in Figs. 1 and 3.

In addition to showing the wiring connections, Fig. 4 indicates how the fader is actuated first in one direction and then in the opposite direction by the link 42 connected with the "on" switch operating rocker 17, first to fade out or render inaudible one station and then to fade in or render audible the same or a newly selected station and how the critical volume control 31 is adjusted to the preselected setting by the connections at 36 with the volume control rocker 15.

What is claimed is:

1. In apparatus of the character disclosed, the combination with station selecting members separately shiftable in one direction for effecting station selecting operations and returnable in the opposite direction to positions of rest and critical volume control means operable by said members to different extents to establish the sound levels desired for the station selecting operations effected by different station selecting members, of fading volume control means inoperative in the positions of rest of said station selecting members and means operated by said members in the station selecting movements of the same for adjusting said fading volume control means in the volume decreasing direction and for adjusting the same in the volume increasing direction in the return movement of said members to the positions of rest.

2. In apparatus of the character disclosed, the combination with station selecting members separately shiftable in one direction for effecting station selecting operations and returnable in the opposite direction to positions of rest and critical volume control means operable by said members to different extents to establish the sound levels desired for the station selecting operations effected by different station selecting members, of fading volume control means inoperative in the positions of rest of said station selecting members and means operated by said members in the station selecting movement of the same for adjusting said fading volume control means in the volume decreasing direction and for adjusting the same in the volume increasing direction in the return movement of said members to the positions of rest and including a link mounted for reciprocatory movement and arranged for operation by any one of said station selecting members, said link having engagement with said fading volume control for shifting the same in opposite directions in the reciprocatory movements of said link.

3. In apparatus of the character disclosed, the combination with station selecting members separately shiftable in one direction for effecting station selecting operations and returnable in the opposite direction to positions of rest and critical volume control means operable by said members to different extents to establish the sound levels desired for the station selecting operations effected by different station selecting members, of fading volume control means inoperative in the positions of rest of said station selecting members and means operated by said members in the station selecting movements of the same for adjusting said fading volume control means in the volume decreasing direction and for adjusting the same in the volume increasing direction in the return movement of said members to the positions of rest, said station selecting members having means operative

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in the station selecting positions of said members for adjusting said critical volume control means to the sound levels desired for the respective members and a switch for rendering said fading volume control means inoperative in said station selecting positions of said members so that critical volume adjustments for stations selected may be effected entirely apart from the action of the fading volume control means.

4. In apparatus of the character disclosed, the combination with station selecting members separately shiftable in one direction for effecting station selecting operations and returnable in the opposite direction to positions of rest and critical volume control means operable by said members to different extents to establish the sound levels desired for the station selecting operations effected by different station selecting members, of fading volume control means inoperative in the positions of rest of said station selecting members and means operated by said members in the station selecting movements of the same for adjusting said fading volume control means in the volume decreasing direction and for adjusting the same in the volume increasing direction in the return movement of said members to the positions of rest, said station selecting members having means operative in the station selecting positions of said members for adjusting said critical volume control means to the sound levels desired for the respective members, a switch for rendering said fading volume control means inoperative in said station selecting positions of said members and means for automatically returning said switch to inoperative position on return movement of said members to the positions of rest whereby said fading volume control means will be effective on the operation of the next station selecting member

5. In apparatus of the character disclosed, the combination with station selecting members separately shiftable in one direction for effecting station selecting operations and returnable in the opposite direction to positions of rest and critical volume control means operable by said members to different extents to establish the sound levels desired for the station selecting operations effected by different station selecting members, of fading volume control means inoperative in the positions of rest of said station selecting members and means operated by said members in the station selecting movements of the same for adjusting said fading volume control means in the volume decreasing direction and for adjusting the same in the volume increasing direction in the return movement of said members to the positions of rest, master volume control means for arbitrarily adjusting volume independently of the setting of said critical volume control means and said means for adjusting said fading volume control means including connections for returning said master volume control means to a predetermined position in said volume increasing movement of said fading volume control means.

6. In apparatus of the character disclosed, the combination with station selecting members separately shiftable in one direction for effecting station selecting operations and returnable in the opposite direction to positions of rest and

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critical volume control means operable by said members to different extents to establish the sound levels desired for the station selecting operations effected by different station selecting members, of fading volume control means inoperative in the positions of rest of said station selecting members and means operated by said members in the station selecting movements of the same for adjusting said fading volume control means in the volume decreasing direction and for adjusting the same in the volume increasing direction in the return movement of said members to the positions of rest, master volume control means for arbitrarily adjusting volume independently of the setting of said critical volume control means and said means for adjusting said fading volume control means including connections for returning said master volume control means to a predetermined position in said volume increasing movement of said fading volume control means, said means for returning said fading volume control means and master volume control means including a reciprocating link having camming engagement with said master volume control means and provided with an arm extension for actuating said fading volume control means.

7. In apparatus of the character disclosed, the combination with station selecting members separately shiftable in one direction for effecting station selecting operations and returnable in the opposite direction to positions of rest and critical volume control means operable by said members to different extents to establish the sound levels desired for the station selecting operations effected by different station selecting members, of fading volume control means inoperative in the positions of rest of said station selecting members and means operated by said members in the station selecting movements of the same for adjusting said fading volume control means in the volume decreasing direction and for adjusting the same in the volume increasing direction in the return movement of said members to the positions of rest, master volume control means, the several control means aforesaid including an insulating support having three cavities, a critical volume control winding in one cavity, a fading volume control winding in a second cavity and a master volume control winding in the third cavity, adjustable contacts cooperable with the respective windings and said means for adjusting said fading volume control means including a link having connection with the adjustable contacts for said fading volume control winding and said master volume control winding.

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