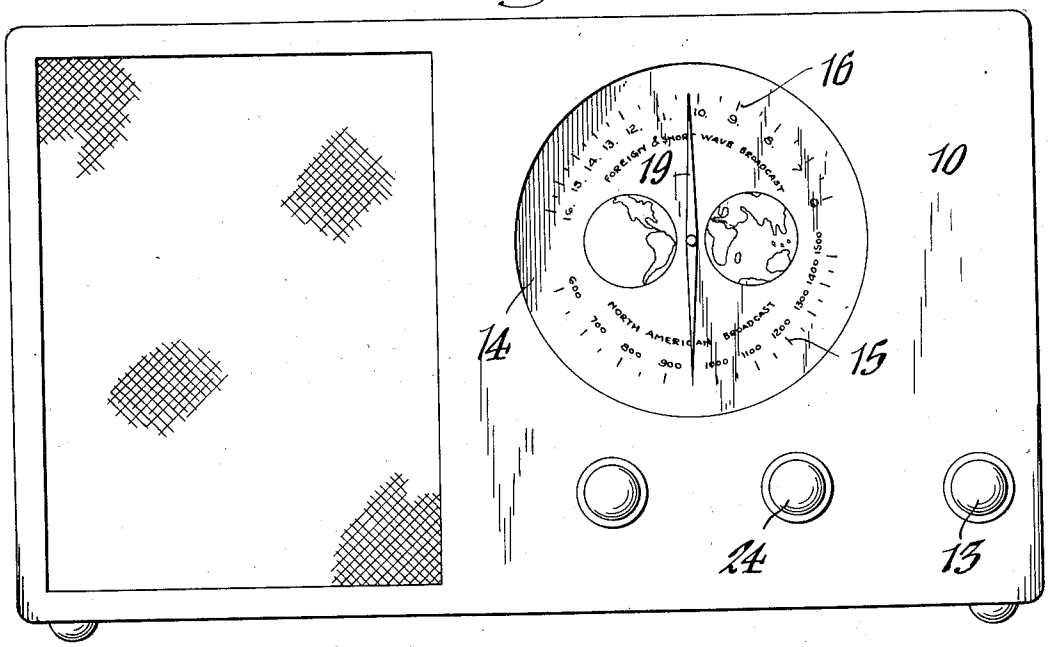
Nov. 19, 1935. E. P. WALLEY 2,021,843

AUTOMATIC TUNING CHANGER FOR RADIO RECEIVING SETS

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Fig. 1.



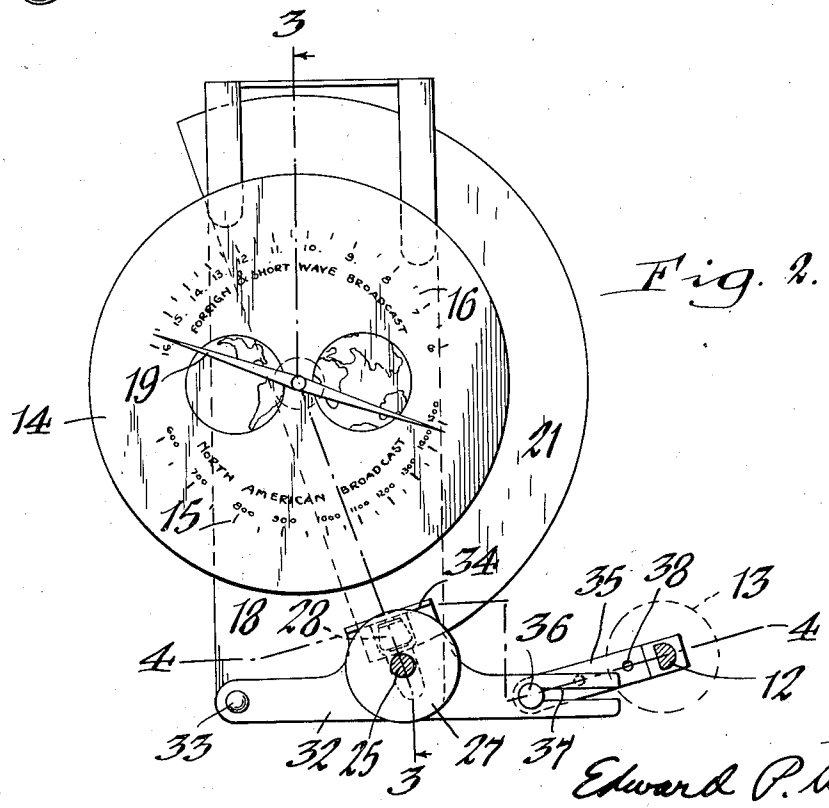


Fig. 2.

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Fig. 3.

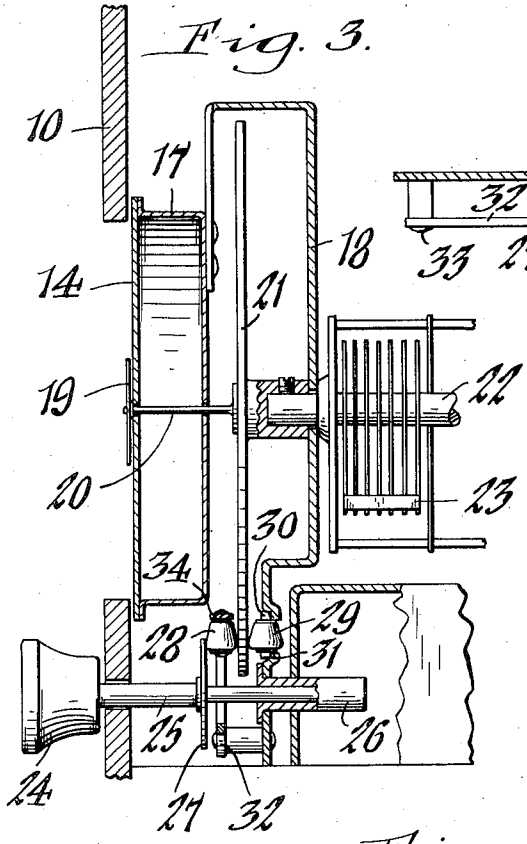


Fig. 4.

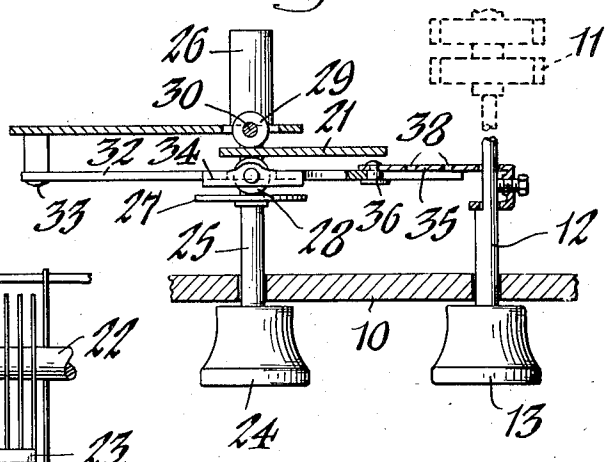
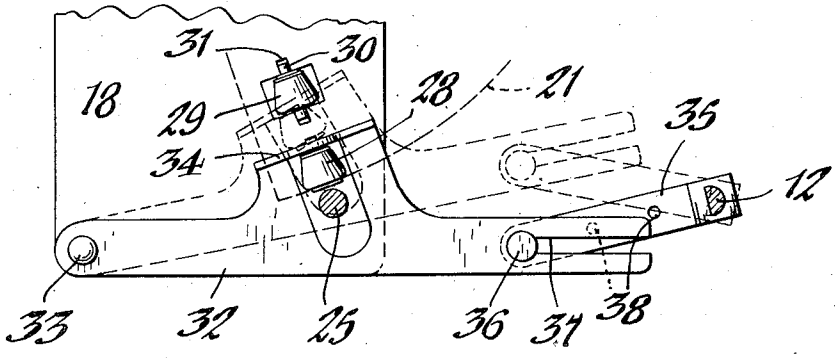


Fig. 5.



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UNITED STATES PATENT OFFICE

2,021,843

AUTOMATIC TUNING CHANGER FOR RADIO RECEIVING SETS

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Application May 17, 1934, Serial No. 726,032

10 Claims. (Cl. 250—40)

This invention relates generally to improvements in radio receiving sets having normal broadcast and short wave tuning ranges and more particularly to a tuning changer mechanism therefor.

It has for one of its objects to provide an automatic tuning changer for radio receiving sets which is simple and inexpensive in construction, and which is reliable and positive in operation and not liable to get out of order.

Another object of the invention is the provision of a tuning changer mechanism which is operatively associated with the wave-change switch of the receiver, and which is so designed as to automatically govern, when the switch is turned to selective positions for short wave reception and normal broadcast reception, respectively, the proper speed ratio of the tuning element of the receiver.

Other features of the invention reside in the construction and arrangement of parts hereinafter described and particularly pointed out in the appended claims.

In the accompanying drawings:—

Figure 1 is a face view of a radio receiving set equipped with my invention. Figure 2 is an enlarged front view, partly in section, of the dial and the associated tuning changer mechanism. Figure 3 is a transverse vertical section taken substantially in the plane of line 3—3, Figure 2. Figure 4 is a horizontal section taken on line 4—4, Figure 2. Figure 5 is an enlarged detail face view of the tuning changer mechanism.

Similar characters of reference indicate corresponding parts throughout the several views.

Referring now to the drawings, 10 indicates the cabinet of a radio receiving set of the type having normal broadcast and short wave reception, my invention being primarily directed to a means for automatically governing the tuning speed desired and operable in conjunction with the movement of the wave change switch or its actuating member to one or another of its selective positions, it being understood that for short wave reception a more critical tuning is required and a slow speed ratio necessary for the tuning elements of the set. This wave change switch, which of itself forms no part of the present invention, is indicated at 11, by dotted lines shown in Figure 4, and controls the selection of the broadcast bands of the receiver, the moving element of this switch being mounted on an actuating member preferably in the form of a shaft 12 having a knob or handle 13 at its front end.

The numeral 14 indicates the dial scale of the receiver which, in the example shown in the drawings, is provided on its face with the customary domestic or normal broadcast scale band 15 and with a short wave broadcast scale band 16, said bands being disposed substantially below and above the center of the dial scale, respectively. The latter is applied to a housing 17 which in turn is suspended from a mounting bracket 18 rising from the bottom of the cabinet 10, as shown in Figure 3. Traversing the dial scale is a two-pointed indicator 19, one end of which is associated with the normal broadcast band 15 while the other is associated with the short wave broadcast band 16. This indicator is mounted on a shaft 20 extending through the dial housing 17 and connected through the medium of an interposed driven disk or segment 21 to the shaft 22 of the tuning or variable condenser 23 of the radio receiving set. When motion is transmitted to this drive disk, the tuning condenser is actuated and the indicator 19 moves across the respective scale bands.

The driven disk 21, together with the parts it actuates, is adapted to be revolved at variable speeds according to the selected position of the wave change switch 11, a slower speed being transmitted to this disk for short wave tuning purposes than for normal broadcast tuning, and the motion-transmitting means for actuating the driven disk preferably includes a speed change mechanism which is automatically governed in accordance with the movement of the wave change switch to its different selective positions. Motion is transmitted to this driven disk for actuating the tuning elements of the set, including the indicator 19, through the medium of an actuating knob 24 preferably arranged alongside the wave change switch knob 13 and secured to the front end of a tuning shaft 25 journaled in a bearing sleeve 26 secured to the lower end of the bracket 18. Fixed on this shaft is a driving disk 27 whose rear face contacts the adjoining side of a shiftable friction wheel 28, the opposite side of such wheel frictionally engaging the opposing front face of the driven disk 21 and being adjustable toward and from the axis thereof to vary the speed of such disk 21. Frictionally contacting the opposite or rear face of the disk 21 is a thrust bearing or wheel 29 whose axle 30 is seated in bearing recesses 31 formed in the lower portion of the bracket 18, as shown in Figures 3 and 5. By this construction, the driven disk 21 is in frictional contact at all times with and between the friction wheels 28, 29 and upon turning the tuning shaft 25 its disk 27 frictionally

transmits motion to the disk 21 and its associated parts.

To effect a change of speed transmitted to the disk 21, it being understood that the tuning knob 24 is manually turned by the user at a given rate of speed whether he is tuning for normal broadcast or short wave reception, I provide a means governed by the movement of the change-switch controlling shaft 12 for shifting the friction wheel 28 radially inwardly or outwardly relative to the disk 21 to thereby automatically vary the speed of rotation of such disk when manipulating the tuning knob 24. This speed change mechanism preferably consists of a speed change lever 32 pivoted at 33 to the lower end of the bracket 18 to swing in a plane parallel to the disk 21 and adjacent the periphery thereof. The friction wheel 28 is supported on a flange 34 formed on this lever, so that upon moving the lever relative to the disk 21 its friction wheel is shifted radially inwardly or outwardly of such disk to accordingly vary the speed of rotation of the latter when the tuning knob 24 is actuated. The speed change lever 32 is actuated from the wave change switch controlling shaft 12 by means of a crank arm 35 fixed on said shaft and joined to the free end of the speed change lever by a pivot pin 36 engaging a longitudinal slot 37 in said lever, as seen in Figures 2 and 5. When short wave reception is desired, the wave change switch 11 is turned to that selective position with the result that the speed change lever 32 assumes the position shown by full lines in Figure 5 with the friction wheel 28 engaging the driven disk 21 at a point adjacent the periphery thereof, so that upon turning the tuning knob 24, said disk and the parts associated therewith are revolved at a comparatively slow speed which is desirable and necessary for the critical tuning required in short wave reception. When the wave change switch-shaft 12 is turned in a direction to shut off short wave reception and bring on normal broadcast reception, the speed change lever 32 is automatically shifted to the position shown by dotted lines in Figure 5, in which position the friction wheel 28 contacts the disk 21 at a point inwardly of its periphery, so that when the tuning knob 24 is turned the disk 21 and parts associated therewith will revolve at a faster speed which is possible when tuning for normal broadcast reception.

This automatic tuning changer is also readily adjustable to adapt it for use with a wave change switch having more than two positions and to a receiver having more than two wave bands on its dial. For so adapting it, the crank arm 35 may be provided with a plurality of openings 38 in one or another of which the pivot 36 may be located for varying the throw of the speed change lever 32 when the wave change switch shaft 12 is turned, and thereby automatically effect the proper speed ratio of the tuning dial indicator 19 in accordance with a given wave band.

I claim as my invention:—

1. In a radio receiving apparatus, a wave change switch control member, a tuning control element, a means for actuating said element, and means governed by said wave change switch control member for varying the speed ratio of said actuating means.

2. An actuating means for the tuning element of a radio receiving set, comprising an actuating shaft, variable speed, motion-transmitting means connecting said shaft with the tuning element, and a wave change switch actuating member operatively connected to said motion-transmitting means for governing the speed ratio of the tuning element in accordance with a given position assumed by said switch actuating member.

3. In a radio receiving apparatus for signal reception on a plurality of broadcast bands, a wave change switch-actuating member, a tuning control element, a variable speed, motion-transmitting means for actuating said element, and means operated by said wave change switch-actuating member for automatically governing the tuning speed of said element in accordance with a given position of the switch for signal reception on a corresponding broadcast band.

4. In a radio receiving apparatus for signal reception on a plurality of broadcast bands, a wave change switch-actuating member for governing the selection of said broadcast bands, a tuning control element, actuating means therefor including a speed change mechanism, and automatic means operatively connected to said wave change switch member for governing the speed change mechanism of the tuning control actuating means.

5. In a radio receiving apparatus for signal reception on a plurality of broadcast bands, a wave change switch-actuating member, a tuning control element, a motion-transmitting means for actuating said element including a shiftable member operable to vary the speed ratio of the tuning control element, and means actuated by said wave change switch member and operatively connected to said shiftable member.

6. In a radio receiving apparatus for signal reception on a plurality of broadcast bands, a wave change switch actuating member, a tuning control element, a variable speed motion-transmitting means for actuating said element and including a speed change shifting member, and means governed by said wave change switch-actuating member for automatically actuating said shifting member to a predetermined position corresponding to the broadcast band selection determined by the wave change switch.

7. In a radio receiving apparatus for signal reception on a plurality of broadcast bands, a wave change switch including an actuating shaft, a tuning control element, a variable speed, motion-transmitting means for actuating said tuning control element and including a speed change shifting member, and means connecting said wave change switch shaft with said shifting member to automatically vary the speed ratio of the tuning control element in accordance with a predetermined selective position of the wave change switch.

8. In a radio receiving apparatus for signal reception on a plurality of broadcast bands, a wave change switch including an actuating shaft, a tuning control element, a variable speed, motion-transmitting means for actuating said tuning control element and including a speed change shifting member, and a crank arm on said wave change switch shaft having an operative connection to said shifting member.

9. In a radio receiving apparatus for signal reception on a plurality of broadcast bands, a wave change switch-actuating member, a tuning control element, a variable speed, motion-transmitting means for actuating said element including a driven element and an actuating shaft having a shiftable drive connection to said driven element to vary the speed ratio of the tuning control element upon the operation of said actuating shaft, and an operative connection between said wave change switch-actuating member and said

shiftable drive connection for automatically controlling the latter in accordance with a predetermined selective position of the wave change switch.

10. In a radio receiving apparatus for signal reception on a plurality of broadcast bands, a wave change switch-actuating member, a tuning control element, a variable speed, motion-transmitting means for actuating said element including a driven disk, an actuating shaft, a speed change shifting lever, friction drive members on said shaft and said lever for transmitting motion to the driven disk upon actuating said shaft, and an operative connection between the wave change switch-actuating member and the shifting lever for governing the tuning speed of said element in accordance with a given position of the wave change switch-actuating member.

EDWARD P. WALLEY.