Sept. 3, 1940. J. S. ROBB 2,213,849

MECHANICAL TUNING MECHANISM FOR A RADIO SET

Filed June 17, 1939 2 Sheets-Sheet 1

Fig. 1

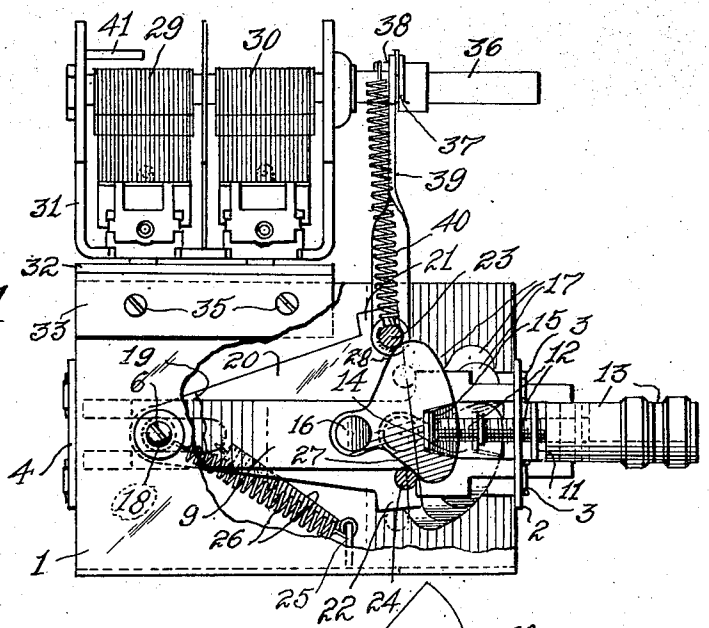
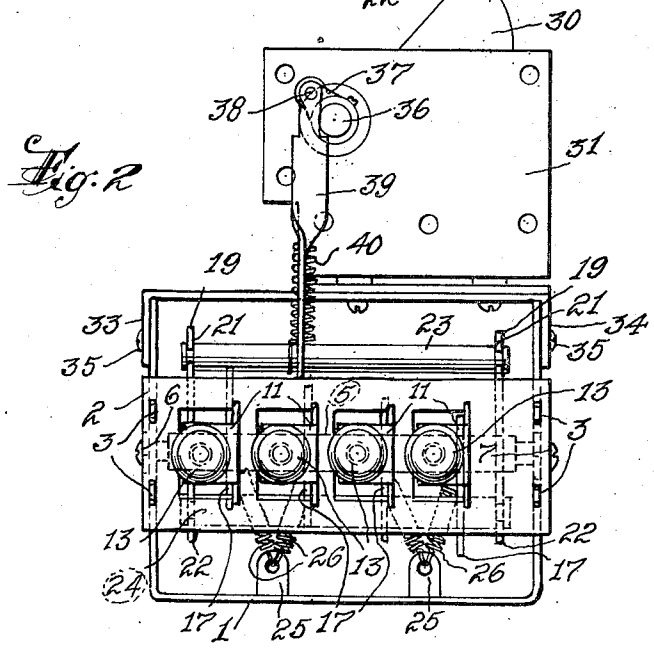


Fig. 2



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Fig. 3

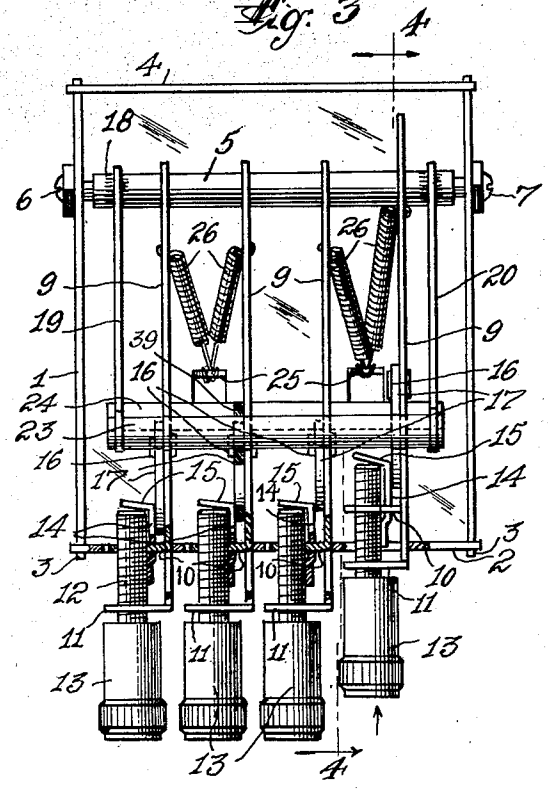
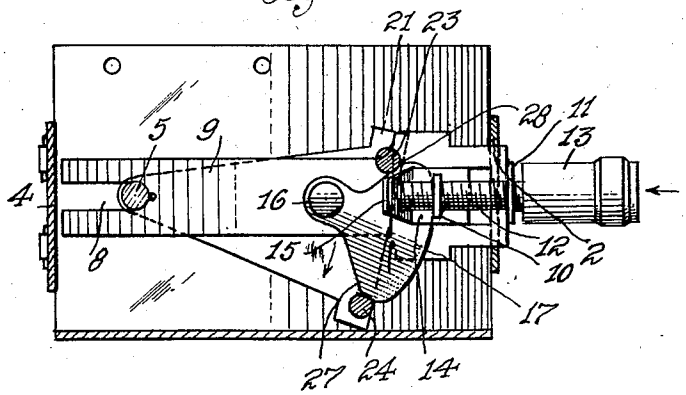


Fig. 4



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MECHANICAL TUNING MECHANISM FOR A RADIO SET

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Application June 17, 1939, Serial No. 279,692

10 Claims. (Cl. 74—10)

This invention relates to a unitary tuning structure for a radio receiving set in which the tuning device or devices, such as condensers, may or may not form part of the complete apparatus which includes mechanical setting devices, one for each radio station that is desired to be tuned in.

It has become quite common now to use these mechanical tuners which are usually operated by push-buttons which also act as means for adjusting various units so that any desired station may be set to respond to merely the operation of pushing in one of the buttons which corresponds to the chosen station.

It is the object of my present invention to provide a tuning apparatus which is relatively simple and inexpensive as compared with a number of devices of a similar nature which have been suggested for this general purpose.

Another object of my invention is to provide a mechanical tuning apparatus which may be built and sold as a unit, or one which may be readily combined with the tuning device such as a condenser.

These and other objects will be clear from reading the specification taken in connection with the annexed drawings, wherein:

Figure 1 is a side elevation of a combined unit; that is to say, the tuning apparatus and tuning condenser, a part of the side of the framework being broken away to show some of the interior parts, and one of the push-buttons, corresponding to the left-hand one of Figure 3, being shown in actuating or tuning position.

Figure 2 is a front view of Figure 1.

Figure 3 is a plan view of the tuning apparatus shown in Figure 1, with the condenser removed and the right-hand button being moved to tuning position.

Figure 4 is a view on the line 4—4 of Figure 3.

In the drawings, wherein like numbers refer to corresponding parts in the various views, 1 is a U-shaped framework of suitable metal provided with a front support member 2 which is held in place by the upset lugs 3 on the sides of the frame member 1. A similar frame member 4 may be used at the rear. Also mounted between the side members of the frame 1, at the rear portion, is a rear support member 5 in the form of a shaft which may be provided with adjustable pivotal mountings 6 and 7. The shaft 5 has annular grooves intermediate its ends to receive the slotted ends 8 of sliding bars 9, four of which are shown, the forward or front ends of which are supported in the front support member 2. Each bar has, at its forward end, a pair of lugs 10 and 11 preferably formed integral therewith, and these lugs have holes which are screw-threaded to receive a threaded member 12, on the outer end of which is mounted a button 13 preferably of insulating material. The lug 10 also supports a member 14 which acts as a clamp and has a slot that passes over the lug 10. The inner end of the member 14 has its end 15 bent forwardly over the path of movement of the threaded member 12.

Each bar 9 also has pivoted thereto, as by the pivot pin 16, a setting device 17 which is shaped somewhat like a fan, the small end of the same being fastened by the pivot pin 16 to the bar 9. The enlarged portion of the setting device 17 extends forwardly toward the frame member 2 and passes between the slide bar 9 and the member 14 which overlaps the enlarged portion of the setting device 17 so that when the end of the threaded member engages the inturned end 15 of the setting device, the same is caused to tilt about its axis on the lug 10 and to come into engagement with the setting device and clamp it against the side of the bar 9.

Securely fastened to the ends of the shaft 5 as by means of the knurls 18 are two arms 19 and 20. The forward ends of these arms are provided with enlargements or ears 21 and 22 which are slotted to receive rods 23 and 24 which have annular grooves forced into the somewhat narrower slots in the ears 21 and 22, thereby securely anchoring the rods 23 and 24 to the arms 19 and 20. This construction provides what may be termed a rocker unit which is rotatable carried by the shaft 5. From the various figures it will be seen that the sliding bars 9 pass between the rocker rods 23 and 24.

The bottom part of the framework has upwardly thrown lugs 25 to which are attached springs 26, the other ends of which are attached to the bars 9. These springs act to return the bars 9 to normal position after the tuning operation has been performed through the medium of the setting device 17 which has curved surfaces 28 and 27 adapted to successively engage the rods 23 and 24 as the buttons 13 are pushed inwardly. It will be understood of course that a given station has been tuned in by one of the buttons and if, sometime later, the same station is desired, the surfaces 28 and 27 will then of course simultaneously contact with the rods, assuming that the device has not been moved since the prior setting.

To adjust the setting device for a given sta-

tion, all that is required is to unscrew the threaded member 12 to loosen the member 14 and then push in on the button which will cause the setting device 17 to turn about its pivot 16 until the two engagement surfaces 28 and 27 come in contact with the rods 23 and 24 which will move the rocker to a position as determined by these surfaces, after which no further movement will be possible; and then, with the sliding bar held in this position, the knob 13 is turned so that the threaded member 12 engages the member 14 and forces it to grip the setting device in the adjusted position, all as heretofore described.

As shown in Figures 1 and 2, the tuning device, in the form of a two-gang condenser the units of which are represented by the numbers 29 and 30, is mounted above the mechanical tuners heretofore described. As shown in Figures 1 and 2, the condenser has a separate frame 31 fastened to a cross-member 32 which in turn is attached to the side members of the framework 1 by downwardly turned sides 33 and 34, screws 35 being used to make the attachment. The rotor of the condenser has a shaft 36 provided with a rocker arm 37 having a pin 38 to which is attached a link 39, the lower end of which is fastened to a member such as the rod 23 of the rocker. A spring 40 is also connected between the same parts in parallel with the link 39 so as to provide a take-up for any lost motion that may exist between these parts.

While I have shown the condenser units as mounted on a separate frame, the entire framework, including that for the condenser, may be made from one piece as will be apparent from the drawing, in which case the apparatus becomes, in every sense of the word, an integral, unitary structure. It may be mentioned in passing that the condenser used in this combination is of what may be termed the ninety-degree type; that is to say, one in which the full engagement of the rotor plates is made with the stator plates through an arcuate movement of ninety degrees or somewhat less, a stop pin 41 being provided to limit the outward movement of the rotor when the condenser is operated manually, as may be done through a suitable knob or other attachment to the shaft 36.

It will be understood that certain changes in the mechanical details may be made without departing from the spirit of my invention or the scope of the appended claims.

What I claim is:

1. A tuning apparatus for a radio receiving set including a framework, tuning elements carried by a portion of the framework, one of said elements being movable, said framework having front and rear support members, the rear member being rotatable, a pair of arms fastened, one each, to said rear rotatable member adjacent the sides of the framework and extending toward the front support member, a pair of rods attached in spaced relation to the forward ends of said arms, a plurality of bars slidably mounted on said front and rear support members and passing between said rods, each bar having a setting device pivoted thereon, the setting device having curved surfaces adapted to successively engage said rods to rock said arms and rods in a direction as defined by the position of the setting device, clamping means for clamping the setting device in adjusted position against its bar, means carried on the bar for operating the clamping means as well as moving the bar and operating means connected between at least one of said rods and the movable tuning element.

2. A tuning apparatus for a radio receiving set including a framework, tuning elements carried by a portion of the framework, one of said elements being movable, said framework having front and rear support members, the rear member being rotatable, a pair of arms fastened, one each, to said rear rotatable member adjacent the sides of the framework and extending toward the front support member, a pair of rods attached in spaced relation to the forward ends of said arms, a plurality of bars slidably mounted on said front and rear support members and passing between said rods, each bar having a fan-shaped setting device pivoted at the small end to its bar and extending toward the front support member and having curved surfaces adapted to successively engage said rods to rock said arms in a direction as defined by the position of the setting device, a clamping device for clamping the setting device in adjusted position against its bar, a pair of lugs on said bar, one of said lugs positioning said clamping device, a screw-threaded member carried by said lugs and adapted to actuate said clamping device, means carried by said screw-threaded device for actuating the bar, and operating means connected between the arm and rod structure and the movable tuning element.

3. A tuning apparatus for a radio receiving set including a framework, tuning elements carried by a portion of the framework, one of said elements being movable, said framework having front and rear support members, the rear member being rotatable, a rocker having a pair of spaced arms fastened one each to said rear rotatable member and extending toward the front support member, a pair of spaced transverse rods fastened to the free ends of said arms, a plurality of bars slidably mounted on said front and rear support members and passing between said rods, each bar having a setting device pivoted thereon, said device having curved surfaces adapted to successively engage said rocker rods in accordance with the adjustment of said device, means for clamping the setting device in adjusted position, and means for actuating the clamping means, means for actuating the sliding bar, and operating means connected between the rocker and the moving tuning element.

4. A tuning apparatus for a radio receiving set including a framework, tuning elements carried by a portion of the framework, one of said elements being movable, said framework having front and rear support members, the rear member being rotatable, a rocker having a pair of spaced arms fastened one each to said rear rotatable member and extending toward the front support member, a pair of spaced transverse rods fastened to the free ends of said arms, a plurality of bars slidably mounted on said front and rear support members and passing between said rods, each bar having a setting device adjustably carried thereon, said device having surfaces adapted to successively engage said rocker rods in accordance with the adjustment of said device, means for clamping the setting device in adjusted position and means for actuating the clamping means, means for actuating the sliding bar and operating means connected between the rocker and the moving tuning element.

5. A tuning apparatus for a radio receiving set including a framework having a front support member and a rotatable member mounted within the framework at the rear thereof, a rocker com-

prising two spaced arms fastened one each to said rotatable member and extending on the same side of said rotatable member toward the front support member and spaced rods connecting the free ends of said arms, a plurality of bars slidably mounted on said front support member and rear rotatable member and passing between said rods, each bar having a setting device adjustably carried thereon, said device having surfaces adapted to successively engage said rocker rods in accordance with the adjustment of said device, means for clamping the setting device in adjusted position and means for actuating the sliding bar, and means connected to the rocker for operating a tuning element of the set.

6. A tuning apparatus for a radio receiving set including a framework having a front support member and a rotatable member mounted within the framework at the rear thereof, a rocker comprising two spaced arms fastened one each to said rotatable member and extending on the same side of said rotatable member toward the front support member and spaced rods connecting the free ends of said arms, a plurality of bars slidably mounted on said front support member and rear rotatable member and passing between said rods, each bar having a setting device adjustably carried thereon, said device having surfaces adapted to successively engage said rocker rods in accordance with the adjustment of said device, means for clamping the setting device in adjusted position and means for actuating the clamping means, means for actuating the sliding bar, a condenser carried in an operative position by the framework and having a rotor including a shaft, and a link connected between said shaft and the rocker.

7. Means for operating the movable element of a tuning device for a radio receiving set including a framework having a front support member and a rearwardly positioned rotatable shaft, a rocker carried by said shaft, said rocker having two spaced arms fastened to the shaft and extending from the same side of the shaft and having their free ends connected by spaced rods, a plurality of bars slidably carried by the front frame support member and said rotatable shaft and extending between said rocker rods, each bar having a setting device adjustably carried thereon, means including said spaced rods for adjusting and clamping said setting device, a part of said adjusting and clamping means serving also to actuate the bar, and means connected to the rocker and the movable element of the tuning device for moving said element as the rocker is moved by said setting devices and their respective sliding bars.

8. Means for operating the movable element of a tuning device for a radio receiving set including a framework having a front support member and a rearwardly positioned rotatable shaft, a rocker carried by said shaft, said rocker having two spaced arms fastened to the shaft and extending from the same side of the shaft and having their free ends connected by spaced rods, a plurality of bars slidably carried between said rocker rods, each bar having a setting device adjustably carried thereon, the operating surfaces being normally forward of the plane of said rods, means including said spaced rods for adjusting and clamping said setting device, a part of said adjusting and clamping means serving also to actuate the bar, and means connected to the rocker and the movable element of the tuning device for moving said element as the rocker is moved by said setting devices and their respective sliding bars.

9. A tuning apparatus for a radio receiving set including a framework having a front support member and a rotatable member mounted within the framework at the rear thereof, a rocker comprising two spaced arms fastened one each to said rotatable member and extending on the same side of said rotatable member toward the front support member and spaced rods connecting the free ends of said arms, a plurality of bars slidably mounted on said front support member and rear rotatable member, each bar having a setting device and means carried on said bar in cooperation with said rods for adjusting said setting device and for locking the setting device in adjusted position, and means for making an operative connection between the rocker and a movable element of a tuning device.

10. A tuning apparatus for a radio receiving set including a framework having a front support member and a rotatable member mounted within the framework at the rear thereof, a rocker comprising two spaced arms fastened one each to said rotatable member and extending on the same side of said rotatable member toward the front support member and spaced rods connecting the free ends of said arms, a plurality of bars slidably mounted in the frame and passing between said rods, each bar having a setting device with oppositely disposed engaging surfaces to engage said rods, and means carried on said bar in cooperation with said rods for adjusting said setting device and for locking the setting device in adjusted position, and means for making an operative connection between the rocker and a movable element of a tuning device.

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