March 28, 1950 G. J. KENNEDY 2,502,223

RADIO TUNING DEVICE

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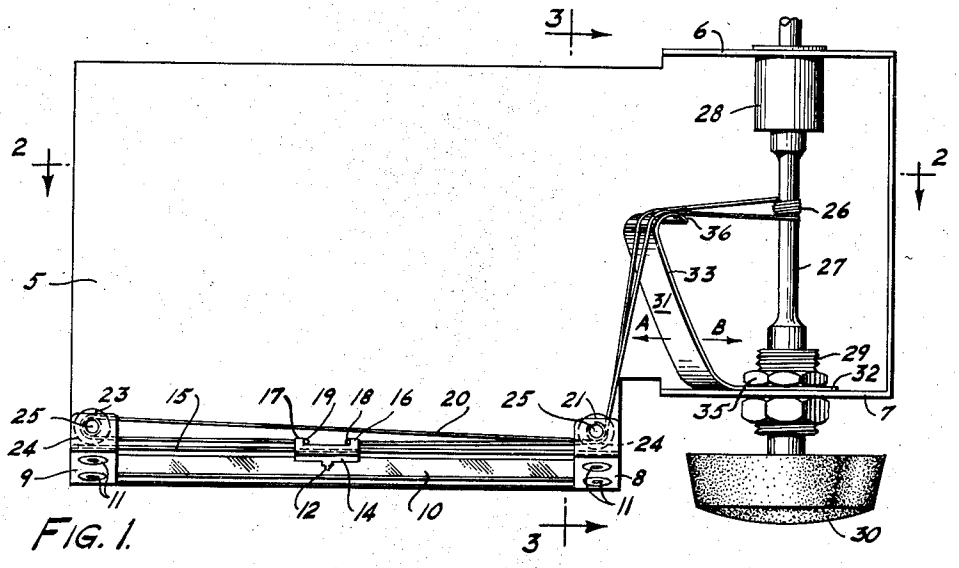


FIG. 1.

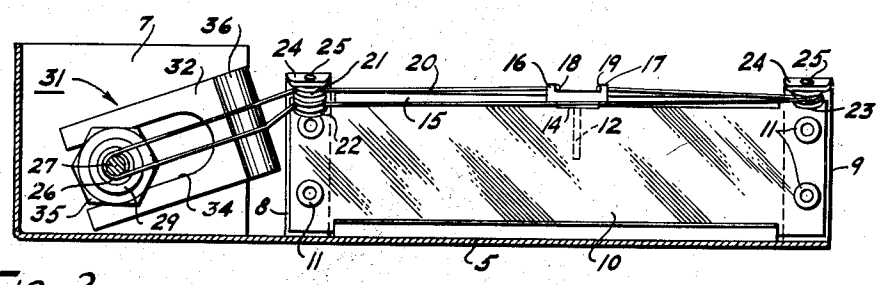


FIG. 2.

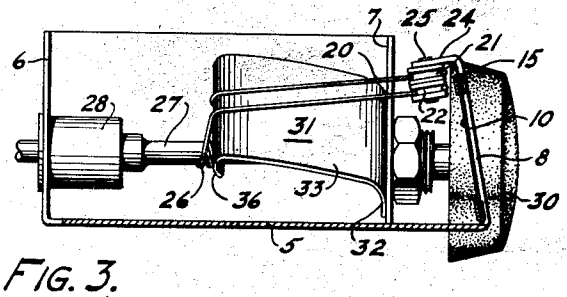


FIG. 3.

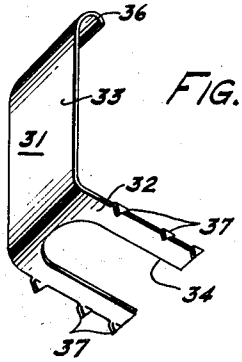


FIG. 4

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RADIO TUNING DEVICE

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4 Claims. (Cl. 116—124.1)

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The present invention relates to tuning devices for radio sets and, particularly, to tuning indicators included in such devices. More specifically, the invention has to do with improvements in the mechanism associated with and adapted to drive a pointer, or like element, which cooperates with a fixed scale for the purpose of giving visual indication of the tuning of a radio set to resonance with a desired station.

Certain types of mechanisms of the above-mentioned variety include a cord having its intermediate portion in engagement with a rotatable shaft with which the actuating knob is connected. The cord is connected with the pointer and passes over pulleys or other suitable means arranged to guide the cord in its movement in response to rotation of the shaft. The end portions of the cord are usually attached to the extremities of a coil spring which serves to maintain the cord in taut condition and, thereby, insures snug engagement of the cord with the shaft and with the pulleys so as to move the pointer. Arrangements of this kind are subject to certain constructional and operational difficulties. For instance, in addition to the pulleys needed to guide the cord so as to provide for displacement of the pointer in relation to the indicating scale, other pulleys must be employed to guide the cord to and from the rotatable shaft. The use of these additional pulleys not only represents an item of expense, but complicates the construction by making it necessary to calculate and to ascertain, precisely, the relative disposition of the pulleys so as to guide the cord at the required angles for the correct operation of the mechanism, and so as to prevent interference with free movement of the cord by the presence of the tension spring in the length of said cord. Moreover, the utilization of a spring, to which the opposite ends of the cord are attached, has the disadvantage that if the spring or the cord should unduly stretch under operational stress, the task of replacing the spring or the cord, or both, or of shortening the cord to overcome the defect, is difficult and tedious.

It is, therefore, the primary object of the invention to overcome the above-mentioned objections and difficulties by providing an improved mechanism of the aforesaid character. The improvide structure results in reducing the number of pulleys or like elements used in guiding the cord to and from the actuating shaft, in eliminating the use of a tension spring incorporated in the length of the cord, and in facilitating the adjustment of the tension of the cord to insure accurate operation of the mechanism.

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Another and more specific object of the invention resides in the provision of a radio tuning indicator which is particularly characterized by its simplicity of construction and its dependability of operation. According to this feature of the invention, the device requires, for accurate and dependable operation, but a small number of parts as compared to previous devices of the same general type. Moreover, the construction and relative disposition of the parts are such that the assembly and the adjustment of the device can be readily and quickly obtained. These advantages result from the fact that the invention makes it possible to utilize a single element to perform several functions which generally have required the use of separate elements. Particularly, the single element, according to the present invention, is capable of functioning to guide the indicator-operating cord and to adjust the operational tension of said cord. Moreover, the element is capable of providing for its own rigid mounting in adjusted position.

These and other objects, and the manner in which they are obtained, will more clearly appear from the following description based on the accompanying drawing which illustrates a preferred embodiment of the invention, and in which:

Figure 1 is a top plan view of a device, constructed in accordance with the invention;

Figure 2 is a longitudinal sectional view, looking in from the back of the device, in the general direction indicated by arrows 2—2 of Figure 1;

Figure 3 is a transversal sectional view, looking in from one side of the device, in the general direction indicated by arrows 3—3 of Figure 1; and

Figure 4 is a perspective view of the element employed, in accordance with the invention, to guide and to tension the cord.

Referring more particularly to the drawing, the device, as shown, includes a frame structure having a base 5 provided with an upright rear wall portion 6 and an upright front wall portion 7. The base is further provided with a pair of relatively spaced substantially parallel upstanding members 8 and 9. These members are disposed to extend in a generally upward direction from the base at the front thereof, and to one side of front wall portion 7, and serve to support an elongated scale 10 which has its end portions conveniently secured to said members by means of suitable fastening elements 11 (Figures 1 and 2). A pointer 12 (Figures 1 and 2) is provided on a

carriage 14 which is mounted in sliding engagement with the upper marginal edge portion 15 of the dial scale. Sliding movement of the carriage along said edge portion of the scale, linearly displaces the pointer across the face of said scale which bears suitable indicia (not shown). In accordance with this invention, sliding movement is imparted to the carriage by means of an improved cord-and-pulley system which will now be described.

As shown, particularly in Figures 1 and 2, the carriage 14 is provided with ears 16 and 17 to which the opposite ends 18 and 19 of a cord 20, are suitably attached. This cord rides over suitable guiding elements which, in the embodiment illustrated, are in the form of rotatable pulleys 21, 22 and 23. These pulleys are advantageously supported by the upstanding members 8 and 9. For that purpose, each of the members 8 and 9 has a rearwardly directed extension 24, provided with a depending stud 25. The stud on the extension of member 8, which member is nearest to the upright front wall portion 7, carries two of the pulleys (pulleys 24 and 25), and the stud on the extension of the other upstanding member 9 carries the remaining pulley (pulley 23). The intermediate portion of the cord is wrapped several times, as shown at 26, about a shaft 27 which is rotatably suspended above the base 5 and between the rear and front wall portions 6 and 7 of the frame structure. For that purpose, the shaft is supported in bearings 28 and 29 which are conveniently fixed on said rear and front wall portions, respectively. In practice, a manually operable knob 30, which serves to actuate the shaft 27, is mounted on one end portion of said shaft, and the usual tuning condenser (not shown) is suitably coupled with the other end portion of said shaft, to be operated by rotation of the latter.

In accordance with the present invention, the cord 20 is retained in snug engagement with the pulleys and with the shaft, and is guided in its movement to and from the shaft, by the function of a single element 31. This element is capable of adjusting and maintaining the tension of the cord, and of directing the cord as it travels between the shaft and pulleys 21 and 22.

As can be readily seen in Figure 4, element 31 has a generally L-shaped configuration, providing a foot portion 32 and a leg portion 33, the latter extending at a slightly obtuse angle with respect to the foot portion. The foot portion is bifurcated, as indicated at 34, so as to straddle (see Figure 2) the front bearing 29 and to contact (see Figures 1 and 3) the inside surface of front wall portion 7. In order to insure rigid and positive retention of the element 31 for the purpose of properly guiding and adequately tensioning the cord, the foot portion 32 of said element is provided with gripping means in the form of prongs 37 which are disposed to bite into the adjacent surface of front wall portion 7. In this manner, the element 31 may be effectively locked in adjusted position without requiring the use of locking washers or the like.

Contact of the foot portion with the adjacent surface of the front wall portion is assured by suitable means, such as nut 35 in screw-threaded engagement with bearing 29. The element 31 is so positioned that the free end of the leg portion 33 engages the cord at a point between pulleys 21 and 22 and the shaft 27. Thus, the portions of the cord, moving between said pulleys and shaft in response to rotation of the shaft,

ride over the mentioned end of leg portion 33, which end is curved, as shown at 36, to provide a smooth guiding surface for said portions of the cord. In practice, the element 31 is constructed of suitable yielding material, such as spring metal, so that said element may advantageously apply a resilient force to the cord and, thus, relieve the device from the stiffness of operation to which the cord might be subjected if the element were perfectly rigid. It is to be noted that the relative disposition of shaft 27 and of the scale and pulley carrying members is such that the latter extend in a plane substantially perpendicular to the shaft.

From the foregoing description and particularly with reference to Figure 1, it will be understood that rotatoin of shaft 27, in clockwise direction, winds the portion of the cord which runs from the shaft to the ear 16 of carriage 14, and unwinds the portion of the cord which runs from the shaft to ear 17 of said carriage. As a result, the carriage is caused to glide, to the right, along the upper edge portion 15 of scale 10, and the pointer 12 is accordingly moved to the right. Inversely, rotation of shaft 27, in counterclockwise direction, winds the portion of the cord which runs from said shaft to ear 17 of the carriage, and unwinds the portion of the cord which runs from the shaft to ear 16 of the carriage. As a result, the carriage is caused to glide, to the left, along said upper edge, and the pointer is accordingly moved to the left.

It will be especially appreciated that, in accordance with the invention, the winding and unwinding of the cord, and the guided movement of the cord to and from the shaft, are direct functions of element 31 which effectively takes up the slack in the cord, and which also insures proper engagement of the cord with pulleys 21, 22 and 23. Moreover, upon loosening the nut 35, element 31 may be readily moved in one direction, for instance, in the direction indicated by arrow A in Figure 1 to increase the tension of the cord, or in another direction, for instance, in the direction indicated by arrow B in Figure 1, to decrease the tension of the cord. Also, the presence of the gripping means on the foot portion of the mentioned element, provides for the effective locking of the element in adjusted position, upon tightening the nut 35. The use of a single element which, in accordance with this invention, guides the cord and adjusts its tension, and which further cooperates to effect its fixation in adjusted position, is especially advantageous since it does away with elements which would otherwise be needed to insure adequate operation of the device.

I claim:

1. A radio-tuning indicator comprising a frame structure having a base provided with wall portions, a shaft rotatably supported above said base by said wall portions, relatively spaced substantially paralleling members extending from said base and disposed in a plane substantially perpendicular to said shaft, each of said members having an extension, pulleys rotatably mounted on said extensions, an elongated scale attached to and extending between said members, a carriage and a pointer carried thereby, said carriage slidably engaging a marginal edge portion of the scale so as to move the pointer in relation to said scale, a cord having a portion wound about the shaft, the cord passing over said pulleys and having its ends attached to the carriage so as to slide the same in response to

winding and unwinding movements of the cord through rotation of the shaft, and an element adjustably retained on one of said wall portions and engaging the cord, between said shaft and pulleys, to adjust the tension of said cord and to guide the latter in its movements to and from the shaft, said element having means to effect locking thereof in adjusted position on said one wall portion.

2. A radio-tuning indicator comprising a frame structure, indicating means mounted on the frame structure and including an elongated scale and a pointer arranged for slidable reciprocating movement along the length of the scale, a shaft rotatably supported on the frame structure, a cord having an intermediate portion wound about the shaft and having two end portions leading from said wound portion and attached to the pointer, cord-orienting means carried by the frame structure at the opposite ends of the scale and engaging the cord at points between its wound portion and its attached portions so as to cause the pointer to reciprocate along the scale in response to winding and unwinding of the cord through rotation of the shaft, and a tensioning guide element mounted on the frame structure and provided with a resilient extension pressingly engaging said two portions of the cord between the shaft and cord-orienting means.

3. A radio-tuning indicator as set forth in claim 2, in which the tensioning guide element is mounted on the frame structure for adjustment in various positions between the shaft and cord-orienting means.

4. A radio-tuning indicator as set forth in claim 3, in which the tensioning guide element is provided with a mounting base having means grippingly engaging a portion of the frame structure to effect locking of said element in adjusted position between the shaft and cord-orienting means.

GILBERT J. KENNEDY.

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