

# UNITED STATES PATENT OFFICE

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## DEVICE TO MODIFY THE WAVE LENGTH RANGE IN RADIO SETS

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## 1 Claim. (Cl. 250-40)

The invention consists of a device to modify the wave length range in radio sets and particularly of receivers and transmitters and above all to facilitate the manufacturing of radio sets with an indefinite number of wave length ranges.

In the radio set wave length interchange is made through several switches through which the necessary inductances and additional capacities, for the different wave ranges, are introduced in the circuit of the relative amplification stages.

Often the change of frequencies is obtained through the turning of a coil, or by means of a variometer. The interchange of wave lengths is reached in different ways, mostly through a revolving switch, which is put in action by a knob situated outside the receiver's case.

A disadvantage of the usual switch for wave-lengths is that inductances and additional capacities are to be distributed around the switch, which frequently cause difficulties in the assembly, and limits the range of receivable frequencies, the relatively great residual capacity, which is usually placed in parallel with the tuning inductances, and causes some disadvantages, limiting the reception field and also lessening the amplification.

With the usual wave-length switches, there also appears an undesirable reaction between the different circuits.

To avoid the above mentioned disadvantages in some receivers one also employs tuning condensers with relatively high capacity, resulting in a diminished amplification and in complicating the means of locating the broadcasting stations.

The invention eliminates the use of a usual wave length switch, because the inductances and the trimmer capacities have been put together in a solid unit which constitutes a separate block. A special advantage of the invention consists in the fact that the tuning unit, which consists of inductances, trimmer capacities, and a scale or dial, is very easily removable and does not have any solid connection with the remaining part of the set.

The tuning unit can easily be interchanged with another, so that one can easily satisfy any desire relative to the receiving possibilities of the radio-set. The single tuning unit of the different wave lengths can be used independently of one another and only in relation to the tuning conditions arising in each corresponding wave field. The tuning unit can be connected with the tuning dial, and in this case a tuning unit corresponds only to a certain range on the dial.

The tuning units and the rest of the receiver

can be independently manufactured and standardized, so that the assembly consists only in adding the said tuning units to the rest of the set. This allows a simplified construction of the receiver (without the tuning unit) because there is no wave length switch required as this feature is built into the tuning unit. These units are easily assembled separate from the chassis and represent a unitary lay-out easily detached from the chassis in a manner to permit it to be readily manufactured.

The drawings represent an example of the type of construction disclosed in this invention and show a receiver of six wave bands but it is to be understood that the invention is not to be limited to the one construction shown in the drawings, in which

Figs. 1 and 2 show full assembled examples of the device as installed according to this invention.

Fig. 3 shows a diagrammatic view partly in section of the device shown in Fig. 2.

Fig. 4 is a perspective view showing details of the mechanical operation of the device.

As shown in the drawings the cylinder-like tuning unit consists of three disk like parts, 1, 1' and 1''; from these parts diverge radio contact plates 2 and 2', which on turning the cylinder are contacted with the fixed bimetallic contacts 4 situated on the supporting ledges (made of insulating material) which are set on base 22.

Associated with these contacts the soldered ends 4 are connected in a permanent manner with the remaining parts (not shown in the drawings) of the receiving set. The axle 8 of the cylinder is supported by the frame 5 while the metallic conductor of the frame 5 is fixed as shown at 19 to the base frame of the receiver 10. In the drawings the cylinder part, 1, 1' and 1'' is solidly fixed to another cylinder. This consists of Celluloid or other suitable materials on which is applied, as indicated at 7, the tuning scale corresponding to the relative wave ranges.

The names of the broad-casting stations can be illuminated by lamps which may be situated inside the cylinder.

A disk 9 enables one to turn by hand the two cylinders, but the regulation of the drum is effected by the use of a knob attached to a turning axle coupled directly or indirectly with disk 9 and thereby controlling the drums.

A second disk 9' which can be equipped with a micrometrical regulator is connected with the tuning condenser of said set. The turning of this disk and also of the tuning condenser is visible in

the usual way through an indicator moving correspondingly to the tuning scale 7.

The construction of the tuning unit designated with the different wave ranges, is shown in Fig. 3, which through the three diameters 11, 12, 13 is divided in six visible sections.

In each section of 60° there is on a base 14 an inductance 15 and a relative additional capacity 16, whose condenser blades are indicated by 18. Of the two screws relative to each section, shown in Fig. 1, the one indicated by 17, regulates condenser 16 while the second screw remains fixed to the base 14.

As shown in Fig. 4, the ring 9 controls the cylinders 1, 1' and 1'', which can be moved by the knob *a*, through conventional means such as bevel gearing *b* and a gear *c*, which engages teeth on the ring 9. The ring 9' controls the tuning, and can be operated by a knob *d* acting through a transmission cord *e*, or in other conventional manner.

While the invention has been described with reference to a preferred embodiment of the same, the invention is not limited to the embodiment

shown and described, but can be varied and modified in different ways without departing from the general principle thereof.

What I claim is:

An apparatus for changing the wave range in radio devices, especially in receiving sets, where the inductances and the capacities corresponding to the various ranges are composed of independent units mounted in such fashion that they can be rotated to bring them successively into cooperation with stationary external contact blocks, characterized by the feature that the units, each of which comprises the inductance and the capacity pertaining thereto, are associated together with an indicating drum so as to constitute a unitary layout adapted to be freely mounted in a readily demountable manner above the chassis, the said indicating drum comprising a scale corresponding to each of the wave ranges, so that upon rotation there will be presented to the operator the scale corresponding to the section which is placed in circuit.

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Feb. 27, 1940.

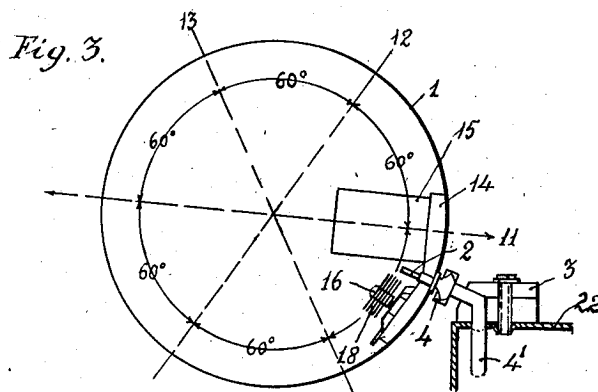
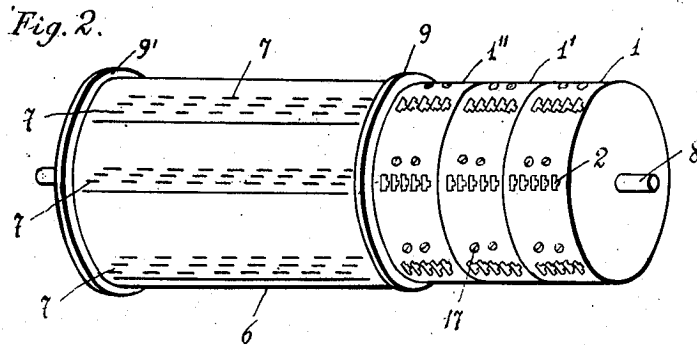
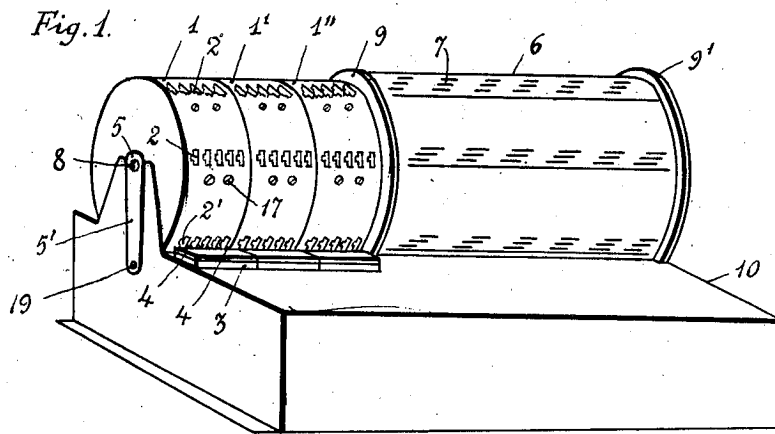
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DEVICE TO MODIFY THE WAVE LENGTH RANGE IN RADIO SETS

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2 Sheets-Sheet 1



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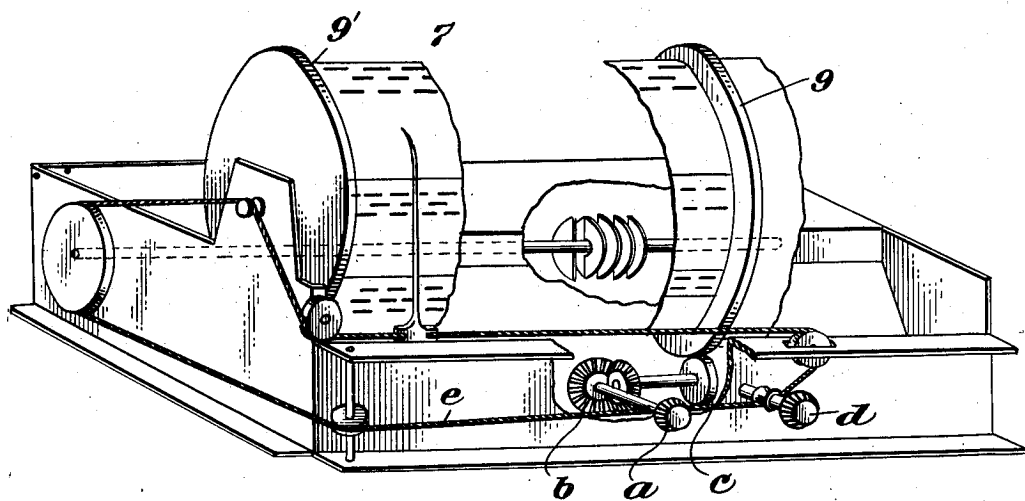
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DEVICE TO MODIFY THE WAVE LENGTH, RANGE IN RADIO SETS

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*Fig. 4.*

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