

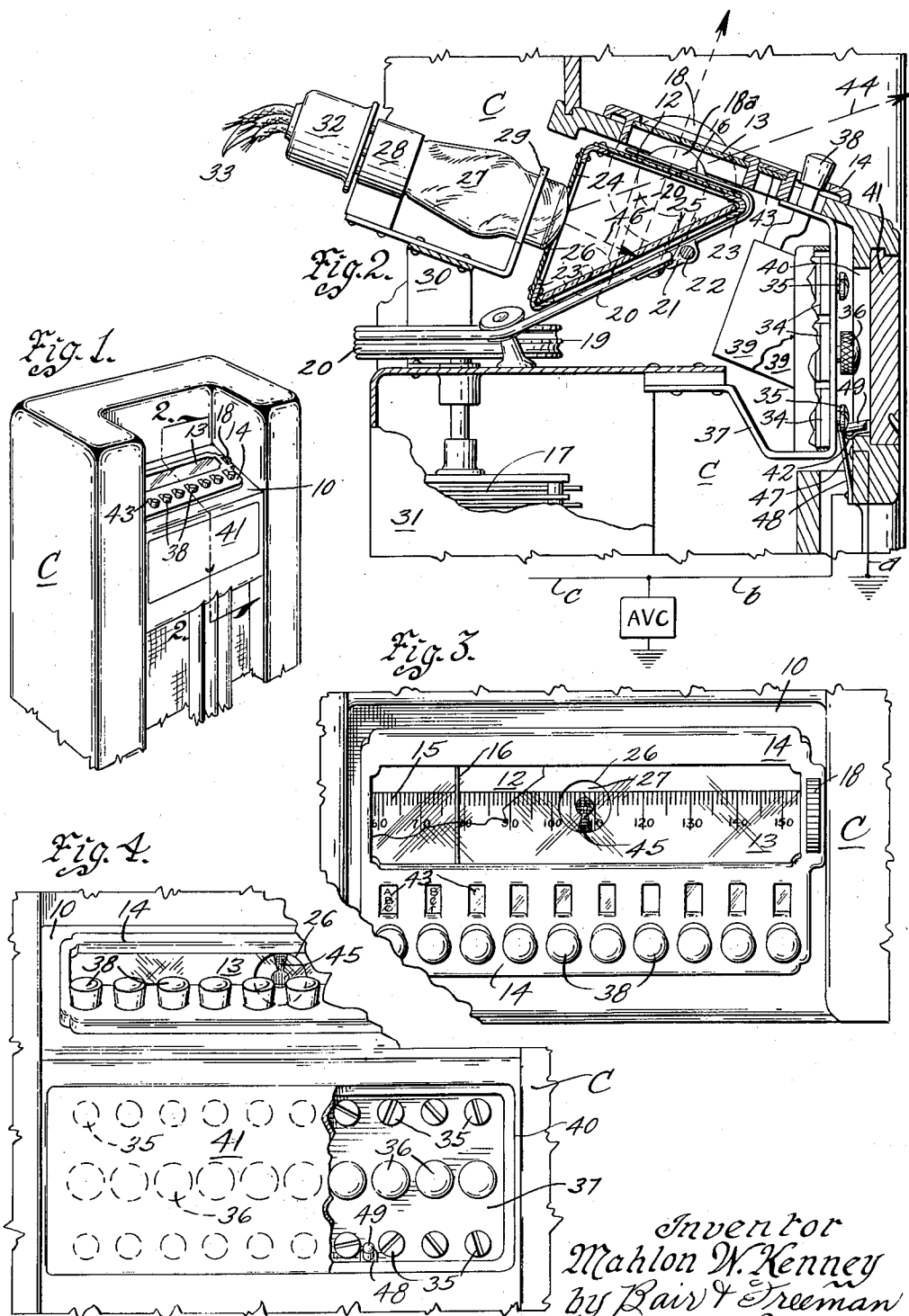
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RADIO APPARATUS

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RADIO APPARATUS

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An object of my invention is to provide radio apparatus in which a resonance indicator is included and to further provide novel means of inexpensive construction to facilitate use of the resonance indicator for effecting different distinct adjustments of the radio apparatus.

More particularly it is an important object of my invention to provide a resonance indicator and associated parts which facilitate the use of the indicator from either a position in front of a tuning dial or from a position convenient to a service man when he is adjusting the wave channel adjusting means of the radio apparatus.

A further object is to provide, in connection with a transparent tuning dial, a resonance indicator which can be seen through the dial while the dial is in use for manually tuning a radio, thus eliminating the necessity of the operator shifting his eyes from the dial when tuning the radio while at the same time observing the resonance indicator to aid him in the tuning operation.

Still another object is to provide a reflector so associated with a tuning dial and a resonance indicator that the indicator or its reflection can be seen from a plurality of distinct positions one of which may be the normal position for manual tuning and another of which may be an abnormal position as when adjusting the wave channel adjusting means of the radio.

Still another object is to provide in connection with a radio apparatus having automatic volume control mechanism, a means to retain the automatic volume control mechanism inoperative when adjusting the wave channel adjusting means so that the adjusting means can be properly adjusted in accordance with a resonance indicator.

With these and other objects in view, my present invention consists in an arrangement and combination of parts and in the construction of my radio apparatus whereby the foregoing objects and others which will become apparent as my description proceeds may be attained, as hereinafter pointed out in my claims, and illustrated in the accompanying drawing, in which:

Figure 1 is a perspective view of a radio apparatus including my invention.

Figure 2 is a vertical sectional view through a portion thereof as on the line 2—2 of Figure 1, the parts being shown on an enlarged scale.

Figure 3 is a plan view of the tuning dial and associated parts as normally seen when manually tuning the radio; and

Figure 4 is a front elevation of the radio showing a cover board for wave channel adjusting

means partially broken away, the radio being illustrated in this figure as seen by the service man when adjusting the channel adjusting means.

On the accompanying drawing I have used the reference character C to indicate a radio cabinet. The cabinet C has a control or key board 10 which is preferably arranged at an angle closer to the horizontal plane than to the vertical plane as shown in Figure 2. The purpose for arranging the key board at this angle is to facilitate the observance of a tuning dial 12 thereof whereas heretofore, tuning dials have usually been mounted in the horizontal front walls of radio cabinets.

The tuning dial 12 is preferably covered by a transparent cover 13 mounted in an escutcheon plate 14. A scale 15 is painted or otherwise impressed on the tuning dial 12 and the tuning dial is transparent for an important purpose which will hereinafter appear. The scale 15 may be suitably graduated as in kilocycles or the like and a pointer 16 is adapted to cooperate therewith to indicate the various radio stations as selected by the manipulation of a tuning condenser 17. By way of illustration, I show a disk like tuning knob 18 for the purpose of manipulating the tuning condenser 17.

As the condenser is adjusted to different frequencies, the pointer 16 may be made to transverse the scale 15 in any suitable manner. I show a double pulley 19 on the shaft of the condenser 17 and flexible cords 20 connected with a bracket 21 from which the pointer 16 extends. The bracket is slidable on a rod-like support 22, suitable pulleys being provided to direct the flexible cord 20 to the bracket 21 and to the drive pulley 18a on the shaft of the knob 18.

The transparent dial 12 is supported by a triangular frame 23 having a back wall 24 and a bottom wall 25. The wall 25 is a reflector, it being illustrated as a mirror or piece of glass with a silvered bottom face on the drawing. The back wall 24 is provided with an opening 26 into which the indicating end of a cathode ray resonance indicator or "tuning eye" 27 extends. The resonance indicator 27 may be suitably supported as in brackets 28 and 29 which in turn are supported by a bracket 30 on the chassis 31 of the radio apparatus. A socket 32 is illustrated for the necessary leads 33 extending to the radio apparatus (not shown) of the chassis 31.

In connection with the apparatus disclosed, there is a series of wave channel adjusting devices, each of which usually includes three nor-

mally fixed condensers 34 which however are capable of initial adjustment or setting. Adjusting screws 35 are provided for two of the condensers and an adjusting knob 36 is provided for the third one. The condensers 34 may be supported in any suitable manner as by a bracket plate 37. The condensers 34 are controlled by a series of push buttons 38 operating switches 39 which control the various banks of condenser 34. This is what is known as push button tuning and each button when depressed cuts its particular bank of condensers into the circuit of the radio as illustrated for instance in an application of Andrew H. Gedde, Serial No. 167,262, filed October 4, 1937 and which constitutes no part of my invention and is therefore not shown in detail in the drawing.

Access may be had to the adjusting screws 35 and the adjusting knobs 36 by a service man or the like through an opening 40 in the front wall of the radio cabinet. The opening 40 is normally closed by a cover board 41 retained in normal position as by a spring catch 42. When the cover board 41 is removed access may be had to the screws 35 and the knobs 36 for adjusting them and thus properly setting the various condensers 34 for the desired stations which are later to be tuned in automatically in response to depression of the appropriate push buttons 38. The various stations may be indicated on indicator elements 43 (see Figure 3).

Two of the adjusting screws (35) are adjustable by using a screw driver while the third one (36) is in the form of a knob to facilitate its adjustment inasmuch as in the usual superheterodyne type of radio having selected fixed condenser control, there is some tendency for the condensers 34 to drift from their initial setting. This drifting is most marked for only one of each bank of three condensers 34 and therefore, by providing the knob 36 for that particular condenser, adjustment thereof (in case the drift is too extreme) by the operator of the radio apparatus is facilitated.

In radio sets, it has heretofore been customary to have the wave channel adjusting screws 35 and 36 accessible from the back of the radio cabinet while the resonance indicator 27 is of course mounted on the front thereof so that it can be seen by the operator when tuning the radio apparatus. Accordingly when it is necessary for a service man to reset the condensers 34, since it is desirable to use the resonance indicator to aid in the setting operation, he must first change the setting slightly then go around to the front of the cabinet to see the result on the resonance indicator 27, then change the setting of the condenser another slight amount and repeat these cycles of operation which obviously would consume considerable time and be inconvenient and inaccurate besides.

I have provided an arrangement however, whereby the condensers 34 can be reset from the front of the cabinet and the resonance indicator 27 can be seen directly as indicated by the dash line arrow 44 while the service man is in front of the cabinet. As he sees the resonance indicator, he can at the same time adjust the screws 35 or the knobs 36 and thus bring their adjustment to a position where the "shadow" 45 of the "tuning eye" is narrowest in the usual manner. Also the resonance indicator 27 may be seen as a reflection indicated by the dotted arrow 46 when the radio apparatus is being manually tuned. During such operation, the pointer 16

would be observed in relation to the scale 15 of the tuning dial 12. Since the dial is transparent the tuning eye or rather its reflection can be seen back of the scale and this aids in convenient tuning of the radio since the kilocycle indicia, the pointer 16 and the tuning eye can all be observed at the time. This is a decided improvement over the mounting of a tuning eye at a position on the front panel of the radio spaced from the tuning dial and is an important feature of my invention.

I have provided a structure in which the resonance indicator 27 is useful and its use greatly facilitated whether manually tuning the radio apparatus or setting the wave channel adjusting device thereof. The arrangement of the reflector 25 also permits mounting of the resonance indicator 27 in a position where its length does not interfere with the other radio apparatus.

Where automatic volume control mechanism is included in the radio apparatus it is desirable to render it inoperable while adjusting the wave channel adjusting screws and knobs 35 and 36. This can be done by the use of a manual switch. It is desirable, however, to provide mechanism for rendering the automatic volume control apparatus inoperative whenever the wave channel adjusting means is being operated. This can be accomplished in different ways. By way of illustration, I show a switch contact 47 with which a leaf spring contact 48 normally engages due to its resiliency. The contact 47 is connected with a wire a while the spring 48 is connected with a wire b. From a wire c a circuit is established through the automatic volume control mechanism AVC when the contacts 47 and 48 are separated.

These contacts are normally held separated by the cover board 41 when in its normal position due to a plunger or extension 49 on the spring 47 being engaged by the cover board. When the cover board is removed, the contacts will engage thereby shorting the automatic volume control mechanism AVC out of the circuit. This will enable the resonance indicator 27 to then operate so that as long as the cover board is removed, the tuning eye can be utilized to indicate the proper adjustment of the condensers 34. With the mechanism just described, it is unnecessary to provide a manual switch for the purpose of rendering the automatic volume control mechanism inoperative and likewise unnecessary for the service man to bother with such a switch.

It is possible to make some changes in the construction and arrangement of the parts of my radio apparatus without departing from the real spirit and purpose of my invention. Therefore I intend to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim as my invention:

1. In apparatus of the character disclosed, a transparent tuning dial, a reflector back of said dial and a resonance indicator located with respect to said reflector and with respect to said dial so that its reflection can be seen through said dial from one angular position relative to the dial and the resonance indicator itself can be seen through the dial from another angular position relative thereto.

2. Radio apparatus comprising the combination of a transparent tuning dial, a reflector back of said dial and a resonance indicator located with respect to said reflector and said dial so that its

reflection can be seen through the dial from a position substantially at right angles thereto and the resonance indicator itself can be seen through the dial from an oblique angular position relative thereto.

3. In apparatus of the class described, a radio cabinet, a transparent element in one wall thereof, a resonance indicator within said cabinet and a reflector, said resonance indicator and said reflector being positioned relative to each other and relative to said transparent element whereby said tuning element can be seen through said transparent element from one angular position relative thereto and the reflection of the resonance indicator can be seen through the transparent element from another angular position relative thereto.

4. In radio apparatus of the character disclosed, the combination of a transparent tuning element on one wall of a radio cabinet, wave channel adjusting means accessible from another wall thereof, a reflector back of said tuning dial and a resonance indicator located with respect to said reflector so that its reflection or the resonance indicator itself can be seen through said dial from in front of said tuning dial or from in front of said wave channel adjusting means.

5. In radio apparatus of the character disclosed, the combination of a transparent tuning element on one wall of a radio cabinet, wave channel adjusting means accessible from another wall thereof, a reflector back of said tuning dial and a resonance indicator located with respect to said reflector so that its reflection can be seen from a position at substantially right angles to said tuning element and the resonance indicator itself can be seen through the tuning element from a position at an oblique angle thereto in front of said wave channel adjusting means.

6. In a radio apparatus, the combination of a transparent tuning dial on one wall of a radio cabinet, wave channel adjusting means accessible from another wall thereof, a reflector back of said tuning dial and a resonance indicator located with respect to said reflector and with respect to said dial so that its reflection can be seen through said dial when using the dial for tuning purposes and the resonance indicator itself can be seen through the dial from a position in front of said wave channel adjusting means when adjusting said means.

7. In apparatus of the class described, the combination of a radio cabinet, a transparent element on one wall thereof, a resonance indicator within said cabinet, a reflector therefor and wave channel adjusting means accessible from another wall of said radio cabinet, said resonance indicator and said reflector being in position relative to each other and relative to said transparent element and said wave channel adjusting means whereby said tuning element can be seen through said transparent element from a position in front of said wave channel adjusting means and the reflection of the resonance indicator itself can be seen through said transparent element from a position in front thereof.

8. Radio apparatus comprising in combination, a transparent dial, a reflector, a resonance indicator and wave channel adjusting means, the foregoing elements being arranged relative to each other whereby when either the tuning dial or the wave adjusting means is being operated, the resonance indicator itself or its reflection can be seen through said tuning dial.

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