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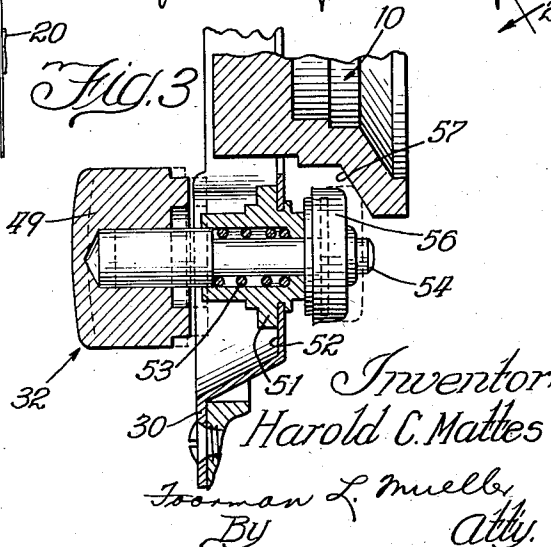
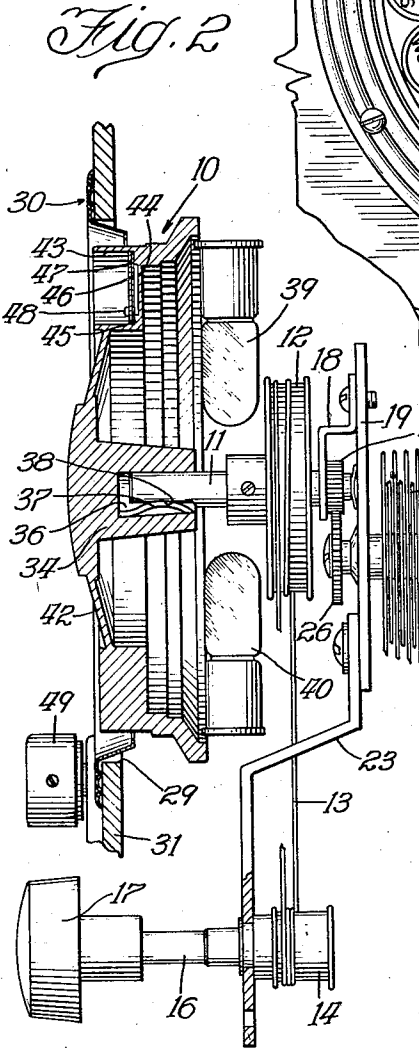
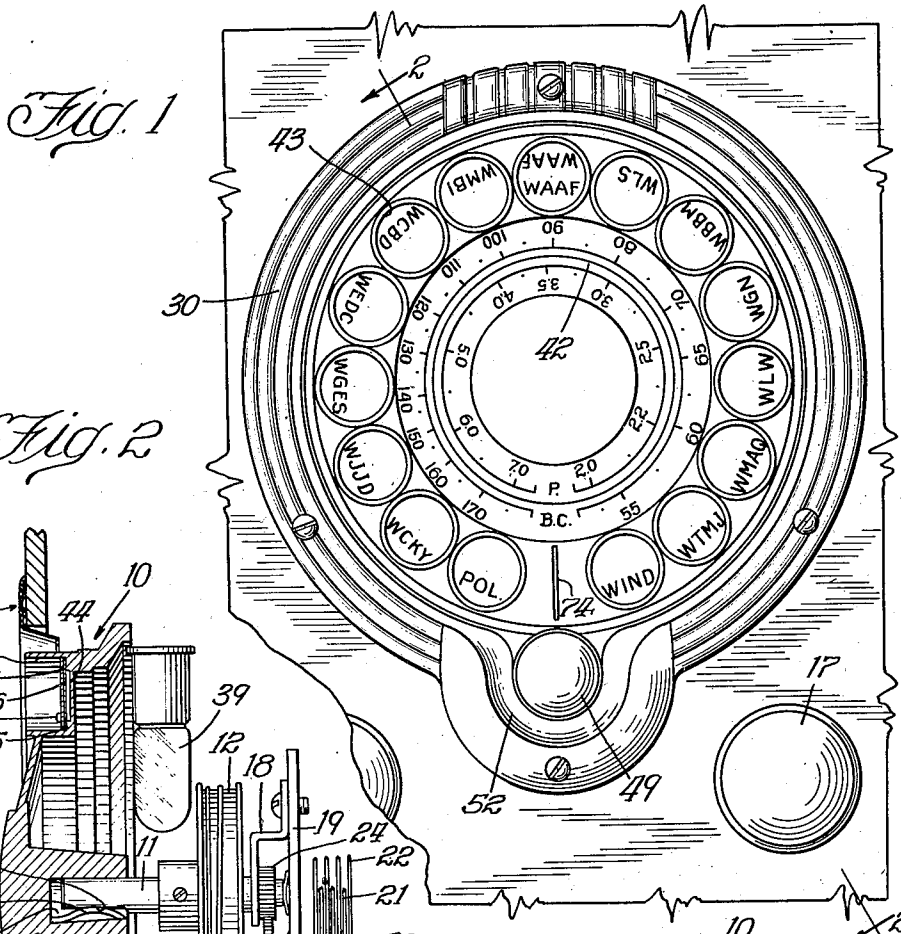
H. C. MATTES

2,106,152

INDICATING AND CONTROL APPARATUS

Filed July 19, 1937

2 Sheets-Sheet 1



Inventor:  
Harold C. Mattes  
By *Freeman L. Mueller*  
Att'y.

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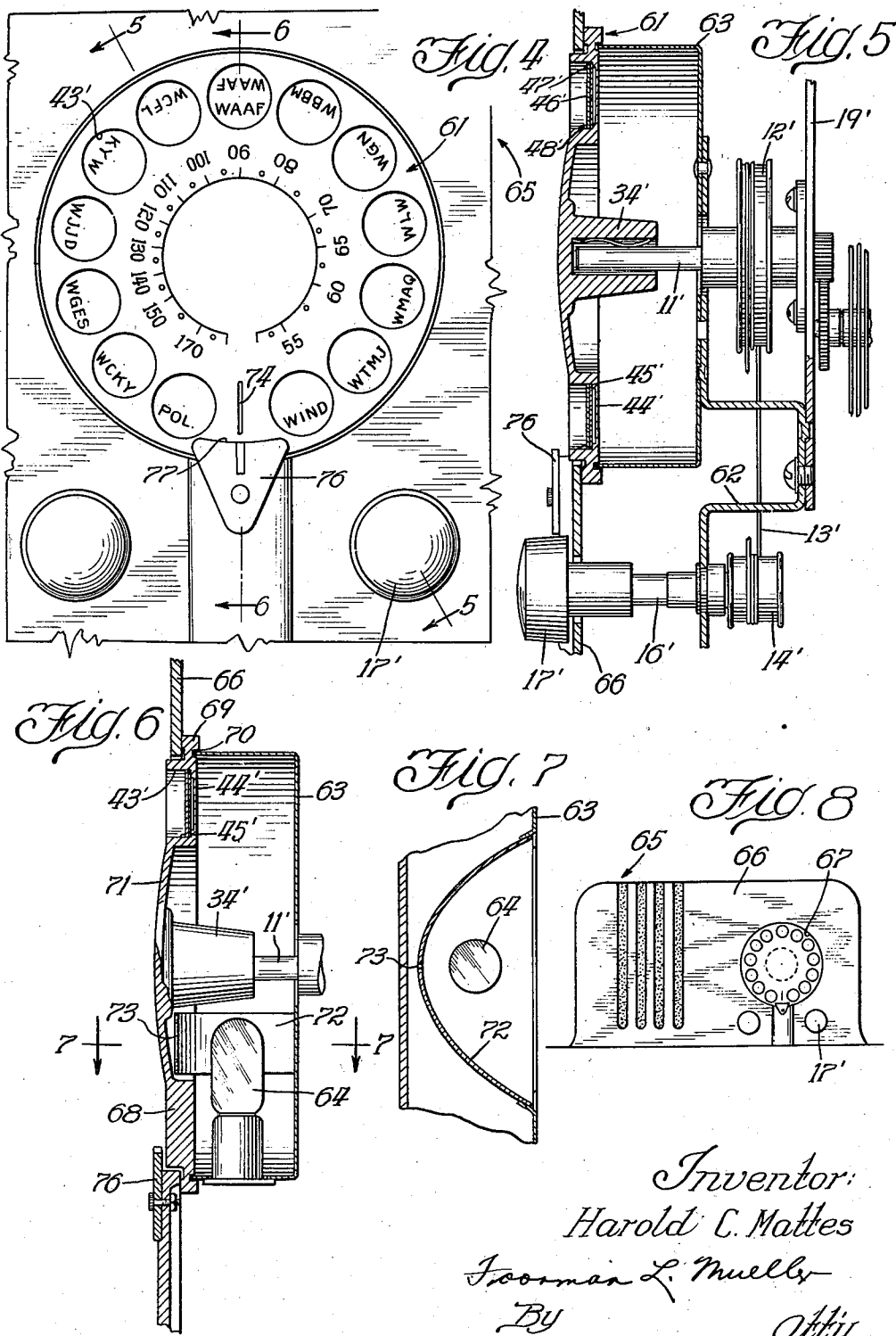
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# UNITED STATES PATENT OFFICE

2,106,152

## INDICATING AND CONTROL APPARATUS

Harold C. Mattes, Chicago, Ill., assignor to Belmont Radio Corporation, a corporation of Illinois

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14 Claims. (Cl. 116—124.4)

This invention relates in general to control and indicating apparatus, and particularly to tuning and station indicating apparatus for radio receivers.

5 In order to provide simple and rapid tuning for a radio receiver and also to provide a station log constantly available to a person operating a radio receiver, so-called automatic tuning has found extensive application in the radio industry. 10 The principal objection to automatic tuning devices, however, is the increased cost placed upon the receivers by virtue of the apparatus added thereto over the dial and control knob structure ordinarily employed because, of course, some scale 15 indication as well as knob control structure must of necessity be employed even with automatic tuning. This is true principally because there are many more stations available for radio reception than can be conveniently accommodated 20 on any of the ordinary automatic tuning devices now employed. The added costs for this equipment has practically eliminated it from low priced radio receivers.

It is an object of my invention to provide a 25 simplified improved mechanical tuning device in combination with a tuning scale and scale illumination for a radio receiver, which device is low in cost, yet novel and decorative in appearance, and having substantial utility.

30 One of the features of my invention is the provision of a one-piece rotatable combination dial and tuning device cooperating with positioning structure on the receiver cabinet to provide effective station finding characteristics.

35 Another feature is the provision of such a device in a molded product which is translucent over the dial portion and the finger engaging specific station indicating portions thereof to permit illumination at these portions, and is substantially opaque over the remaining portions of 40 the device to cause the illuminated portions to be particularly visible for effective tuning as well as to provide a pleasing decorative effect.

45 A still further feature of the invention is the provision of an inexpensive indicating and tuning device for original, rapid, substantially rough tuning to a predetermined station, operating in conjunction with the more usual tuning structure to readily accomplish final peak tuning on 50 that predetermined station.

Other objects and advantages of my invention will be apparent from the following description taken with the drawings in which:

55 Fig. 1 is a front elevation of one embodiment of my invention.

Fig. 2 is a fragmentary sectional view along the line 2—2 of Fig. 1.

Fig. 3 is an enlarged fragmentary illustration partly in section of the combination finger stop and friction tuning device for the rotatable element of Figs. 1 and 2.

Fig. 4 is a front elevation of a modification of the invention.

Fig. 5 is a sectional view along the line 5—5 of Fig. 4.

Fig. 6 is a sectional view along the line 6—6 of Fig. 4.

Fig. 7 is a plan view of the light and reflector along the line 7—7 of Fig. 6.

Fig. 8 is a miniature view of a front elevation 15 of the complete cabinet structure of Figs. 4 to 6.

In practicing my invention I provide a one-piece rotatable dial and station setting or tuning device in connection with a tuning condenser for a radio receiver, with the device formed of a molded plastic material having varying thicknesses of material over the body thereof to provide selected illumination over the device due to the translucency of the material at the relatively thin portions of the device, and the 25 opaqueness of the material at the thick portions. The dial portion of the device is translucent so as to be readily visible when a light is provided to the rear thereof. Similarly, the bottoms of the finger hold cavities spaced around the dial 30 for finger engagement to rotate the device and automatically tune the radio receiver to a predetermined station are translucent so that the station designation in each cavity is readily visible. The one-piece member, mechanically rotated by finger drive, cooperates with a finger locating member on the receiver housing. This may be somewhat rough, and to accomplish absolute peak tuning a knob control and appropriate drive means are provided in connection 40 with the station finding element to move the element in a vernier-like adjustment, and thus bring the tuning condenser to the desired position.

In the embodiment of Figs. 1 to 3, inclusive, 45 a one-piece dial and tuning member or control element 10 is mounted and keyed to a stub shaft 11, carrying a pulley 12 thereon, which is operated by a string or cable 13, encircling said pulley and a corresponding pulley 14 on a tuning shaft 50 16, having a tuning knob 17 on the end thereof. The stub shaft 11 is journaled in a bracket 18, which in turn is secured to the end of a variable condenser frame 19 having the usual stators 21, and having rotors 22 mounted on a shaft 20. 55

The tuning shaft 16 is similarly journaled in a bracket 23, likewise secured to the frame 19 of the tuning condenser and suitable reduction gearing is provided in the gear members 24 and 26 intermediate to the condenser shaft 20 and the control element shaft 11.

As will be more fully explained hereinafter, the shaft 11 may be rotated either by the element 10 or the tuning knob 17, operating the pulley 12 on such shaft.

The condenser frame 19 may be mounted upon a radio receiver chassis in any desired manner and the latter mounted in a radio cabinet with the dial 10 extending through an aperture 29 in the front wall 31 of the cabinet. An escutcheon plate 30 shown particularly in Figs. 1 and 2 is secured to the wall 31 so as to extend into the aperture 29 and form a frame for the element 10, and a combination finger positioning and friction tuning structure 32 (Fig. 3) is supported upon the escutcheon plate.

As to the control element 10, itself, this comprises a one-piece member preferably of a molded plastic product having a plurality of portions over the entire body thereof which are separated primarily by varying degrees of illumination due to the translucency and opaqueness of the various portions. The element is provided in a substantially cup-shaped form with a mounting stud 34 centrally thereof and having a deep cavity 36 therein for fitting over the stub shaft 11. The cavity 36 is irregular in shape and is frictionally connected to the shaft by means of a flat spring 37 non-rotatably retained in the cavity for engagement with a flat side 38 on the end portion of the shaft which connection in turn prevents the rotation of the control element 10 on the shaft 11. Due to the thickness of the material at the stud portion 34 this portion is opaque when viewed from the front with the lamps 39 and 40 lighted to the rear thereof, and projecting the light forwardly through the control element. The portion 42, having the two scales, one for police calls and the other for tuning in the broadcast band, imprinted thereon, is relatively thin and translucent as to the passage of light therethrough so that this portion is very satisfactorily illuminated for reading of the scale. It is understood that the number of scales may be varied, and likewise that scales for other wave bands may be substituted if desired.

Finger cavities 43 are provided around the control element 10 outside of the scale portion 42 for finger engagement to drive the control element 10 in the direction desired to accomplish tuning for the tuning condenser. Due to the thickness of the circular portion, as shown at the bottom of the element in Fig. 2, in which these cavities are provided, the portion is opaque to light except through the thin-walled bottom 44 of each cavity itself. The cavities are placed around the scales in the portion 42 in such a manner that they will correspond to the calibrations on the scale of an average number of transmitting stations in any particular locality, and to indicate the desired station for automatic tuning, a small tab or disc 46 with the station letters thereon is inserted in the cavity corresponding to the scale reading of a particular station. The single tab in the top cavity of Fig. 1 has the printing in both directions for ease of reading and it is understood that all other tabs are similarly printed. To readily adapt the control element on the receiver to any locality where some particular transmitting stations are more popular than

in another locality a sheet of tabs may be furnished with the receiver and the particular station lettering cut out and placed in the cavity by the operator. An annular shoulder 45 at the bottom of the cavity actually provides the major support for the tab 46, and if desired the thin bottom 44 may be omitted in the molding of the element. The bottom closes the cavity so that the receiver mechanism is not visible before insertion of the tab. A celluloid disc 47 is snapped into place over the tab 46 in each cavity and held therein by slight projections 48 formed on the wall thereof to protect the tabs against tearing and soiling. The tab is translucent and the disc is transparent so that no obstruction to the passage of light is encountered.

Although an operator with relatively careful manipulation may secure peak tuning by merely rotating the control element 10 in one direction until the finger in the desired station cavity is centered over the knob 49 of the friction tuning structure 32, a vernier adjustment of the control element and hence the tuning condenser may be accomplished either by means of the control knob 17 and connected mechanism as heretofore described, or by the friction drive connected to the control knob 49. The adjusting structure including the knob 49 comprises a bushing 51 secured to the escutcheon plate 30 in a recess 52 therein. A spring 53 fitting over the adjusting shaft 54 presses such shaft and knob 49 outwardly so as to maintain the friction disk 56 out of contact with the rim 57 of the member 10. To accomplish a vernier adjustment of the tuning condenser through the element 10 the control knob 49 may be pressed into a position shown by dotted lines in Fig. 3 so as to frictionally engage the rim 57. As the control knob is rotated the friction disc 56 similarly rotates the element 10.

A modification of the invention is illustrated in Figs. 4 to 8, inclusive. A one-piece station-finding and indicating device, or control element 61, similar to the element 10, is mounted by means of a stud 34' on a stub shaft 11' journaled in the frame plate 19' of a condenser in the same manner as that shown in Fig. 2. A pulley 12' may likewise be secured to said shaft with a cable or string 13' extending around a corresponding pulley 14' on a control shaft 16'. A knob 17' on the control shaft moves the pulleys and simultaneously therewith the control element 61 in the same manner as described for the embodiment of Figs. 1 to 3. A substantially U-shaped one-piece bracket 62 is rigidly secured to the condenser frame 19' and supports not only the control shaft 16' but also a cup-shaped metal member 63 completely enclosing the rear of the element 61 which acts somewhat as a reflector for the single dial lamp 64 mounted therein as shown in Fig. 6, but primarily as a light shield to prevent diffusion of the light from the lamp through the molded walls of the cabinet 65 which cabinet is substantially translucent as will be hereinafter described.

In this embodiment of the invention in commercial form the desirable characteristics of a molded device with wide possibilities in color and form variations have been taken advantage of in the one-piece molded housing 65 provided for the receiver chassis with the integral front wall 66 thereof having a circular aperture 67 provided therein to receive a projecting portion 68 of the element 61. An integral rim 69 on this element is positioned behind the front wall of the cabinet at the aperture 67 so as to close the view to the rear therethrough and thus eliminate the

necessity for an escutcheon plate as shown with the embodiment of Figs. 1 to 3, inclusive. A shallow groove 70 on the rear side of the rim 69 receives the circular edge of the member 63 to assist further in preventing light from spraying into the housing 65. With the molded housing provided in light colors, at least, the chassis and receiver mechanism show up through the cabinet as undesirable shadows on the outside thereof, due to the translucency of the material. Light will also be visible through the cloth covered speaker-grille in the cabinet in an undesirable manner, without this light shielding structure. Finger cavities 43' similar to the cavities of the first described embodiment are provided in a circular path around the raised portion 68, and due to the thin bottom wall 44' in the cavities, each cavity is translucent. A shoulder 46' is provided in the cavity and a station indicating tab, with a transparent protecting disc are provided in each cavity as heretofore described. The thin bottom wall 44' may be omitted, if desired, although this element 61 does present a more desirable appearance with the bottom wall. In this embodiment the central thin portion 71 of the element 61 is only wide enough for a single indicating scale but as heretofore stated the width of this portion and the number of scales thereon may be varied. As to both of these members it might be mentioned that the scales may be imprinted, or molded into the surface, or otherwise supplied in any desirable manner and then painted so that the letters will be plainly visible on the illuminated translucent background.

A shield or reflector 72 may be mounted in front of the lamp 64 with a slit 73, or an aperture therein so as to project a beam of light through the scale portion of the tuner element at the stopping position for such element to assist in rapid and accurate tuning with the device. This control element positioning means will show up clearly enough through the translucent scale portion of the element, to indicate the tuned position for the predetermined station, so that the finger positioning means as a control knob 49, and finger-hold 76, as will be hereinafter described, may be eliminated. The reflector throws the light back on to the cup-shaped reflector member from where there is substantially uniform light diffusion over the entire control element.

An imprinted, or molded mark or line 74 is provided near the outside edge of the control element 61 just as a similar line was provided in the embodiment of Figs. 1 to 3. This line is primarily decorative in its effect and is used to assist in lining up the control apparatus assembly in the original manufacture thereof.

Tuning of the receiver to a predetermined broadcasting station is accomplished with this embodiment of the invention in substantially the same manner as that previously described, with a finger drive for the element 61 acting to rotate the same. A satisfactory finger positioning device in combination with the finger driven control element includes a finger plate or finger-hold 76 secured to the front wall 66 of the cabinet on the vertical diameter of the control element 61. With the finger resting in the central depressed portion 77 of the top edge of the finger-hold 76 the radio receiver will normally be tuned to the desired predetermined station indicated in the cavity 43' in which the finger is inserted. The finger resting in the depressed portion 77 may be

rolled slightly thereon to in turn move the element 61 very slightly to accomplish peak tuning. However, the control knob 17' may be used to rotate the pulley 12' secured on the shaft 11', and the latter through a train of gears operates the tuning condenser for vernier adjustment if desired.

From the above description it is seen that I provide a simple and inexpensive apparatus for so-called automatic-tuning for a radio receiver, that is, for quickly adjusting a tuning condenser by mechanical means to a predetermined broadcasting station. In addition to combining the scale and the finger-engaging-operating-cavities in a one-piece member, the entire control and indicating apparatus is simplified over any comparable equipment previously employed.

Furthermore, illumination can be provided for the entire indicating, and automatic tuning structure from ordinary dial lamps to the rear thereof, and with opaque, and translucent portions in the structure selected illumination can be obtained therefor. There is utility in this function, and also decorative advantages, for this selected illumination in itself separates the various readable parts of the structure, and provides a novel appearance.

While I have shown and described but two embodiments of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made, which do not depart from the spirit and scope of the invention as described in the appended claims, and the invention is limited only by such claims.

I claim:

1. Indicating and control apparatus for a radio receiver including a one-piece combination tuner and dial member connected with the tuning condenser for the radio receiver, said one-piece member having finger cavities therein for tuning movement thereof, a dial portion on said member lighting means to the rear of said member, with said member translucent in portions and opaque in portions as to the passage of light therethrough from said lighting means whereby to provide selected illumination over the member to the eye of an observer in front of said radio receiver.

2. Indicating and control apparatus for a radio receiver as defined in claim 1 with said receiver having a housing therefor with an apertured front wall, and the combination tuner and dial member rotatably mounted at said aperture, positioning means on said wall at said aperture cooperating with said member to attain a desired predetermined station setting for the tuning condenser.

3. Indicating and control apparatus for a radio receiver including a one-piece combination tuner and dial member connected with the tuning condenser for the radio receiver, lighting means to the rear of said member, with said member having a tuning scale thereon and selected station indicators adjacent said scale, said member being translucent at the scale portion and station indicator portions and opaque over substantially the remainder thereof whereby to provide selected illumination in said member from said lighting means to the eye of an observer in front of said radio receiver.

4. Indicating and control apparatus for a radio receiver including a combination tuner and dial unit connected with the tuning condenser for the radio receiver, lighting means to the rear of said unit, said unit having a tuning scale thereon and

- finger-engaging tuning cavities with station indicators therein, with said unit being translucent to the passage of light from said lighting means at the scale portion and tuning cavity portions, and substantially opaque to the passage of light over the remainder of the unit visible to an operator in front of the radio receiver, whereby to provide visual separation of said portions over said unit.
5. In combination, a radio receiver housing having an enlarged aperture in the front wall thereof, and indicating and control apparatus for the radio receiver including a one-piece rotatable rimmed member in connection with tuning condenser of the radio receiver with the rim therefor extending beyond the aperture to the rear of said cabinet wall and having a raised portion within the outlines of the rim extending forwardly through the aperture, finger cavities with station indications therein in a circular path in said raised portion with said cavities themselves translucent to the passage of light from a source to the rear of said member to illuminate the station indications and the remaining material in said cavity path being relatively opaque to the passage of light, an opaque mounting stud for said member centrally and on the rear side thereof, with said member having a relatively thin translucent portion centrally thereof and intermediate the cavity path and stud portion with a tuning scale thereon providing tuning calibrations, finger positioning means on the cabinet at the front wall aperture to permit alignment therewith of the operator's driving finger in a finger cavity of said member whereby the tuning condenser is adjusted to a predetermined station setting corresponding to the station indication in the cavity carrying the finger.
6. In a combination controlled position finder and indicating device for controllable apparatus, a plurality of translucent finger cavities for finger engagement to move said device to a predetermined control position, and a translucent indicating scale portion adjacent said cavities adapted to be illuminated with said cavities to indicate the controlled position of the controllable apparatus.
7. Tuning and indicating apparatus for a radio receiver including a one-piece molded member having a plurality of finger cavities around the outer edge thereof and an indicating scale centrally of said member and inside the path of the cavities, illuminating means mounted to the rear of said member, with said member translucent at the cavity and scale portions for transmission of light to make said portions visible, and with the portions of said member intermediate said scale and said cavities opaque to accomplish visual separation of the lighted portions.
8. A control and indicating device for controllable apparatus including a one-piece member having portions of varying thicknesses over the body thereof, with relatively thin portions translucent to the passage of light and relatively thick portions opaque to such passage of light whereby to provide predetermined illumination over the body of the device as viewed from the side thereof opposite to the source of light, a position indicating scale at one of said relatively thin portions, and a plurality of predetermined controlled position indicating means at other of said relatively thin portions, with said scale and predetermined controlled position indicating means plainly visible to an operator of said controllable apparatus and a source of light to one side of said device for such illumination.
9. An indicating and control apparatus for a controllable device, a one-piece rotatable member having an indicating calibrated scale centrally thereof and a plurality of finger cavities disposed around said scale with each cavity corresponding to an adjacent scale calibration, with said member adapted to be rotated by finger engagement in a desired cavity to bring the controllable device to a desired predetermined position as indicated by the scale calibration adjacent the finger cavity.
10. Indicating and control apparatus for a radio receiver having a receiver chassis including a tuning condenser supported from said chassis having a rotatable shaft, a stub shaft geared to the condenser shaft, and alternate means for moving said stub shaft to move the condenser, said means including a pulley keyed to the stub shaft, a rotatably mounted control shaft spaced from said stub shaft and having a pulley thereon, a belt between the two pulleys whereby the stub shaft will rotate upon rotation of the control shaft, a tuning element having a tuning scale and station indicator thereon keyed to the stub shaft in front of the pulley thereon, said element having finger-hold cavities at the station indications for finger engagement to move said element to a predetermined station setting to simultaneously rotate the stub shaft, the control shaft and the tuning condenser therewith.
11. In a radio receiver in combination, a radio chassis having operating apparatus thereon, a relatively translucent molded housing of plastic material for said chassis having an aperture in the front wall thereof, a molded control and indicating member translucent in part and opaque in part rotatably mounted on said chassis and extending into said aperture, a light source to the rear of said member for projecting light forwardly to illuminate said member, and shielding means within said cabinet around said light source to direct the light over said control and indicating member, with said shielding means cooperating with said member to prevent the diffusion of light into said housing to illuminate the housing itself and cause undesirable shadows to be visible on the outside thereof.
12. In a radio receiver, in combination, a relatively translucent molded housing of plastic material having an aperture in one wall thereof, a one-piece molded control and indicating member translucent in part and rotatably mounted in said aperture, lighting means to the rear of said member within said housing to illuminate the translucent part of said member, and a cup-shaped shield and reflector around said lighting means to the rear thereof of substantially the same outside dimensions as said member mounted adjacent thereto to direct light over said member, and to substantially prevent diffusion of light into the relatively translucent housing to cause objectionable illumination over said housing.
13. A radio receiver including in combination, a cabinet having an enlarged aperture in the front wall thereof, and tuning and indicating means for said radio receiver at said aperture including a rotatable member having an annular rim on the outside thereof adjacent the back of the front wall of the cabinet at the aperture therein to close said aperture against a view of the inside of the cabinet, a raised portion extending forwardly from said rim to be positioned in said aperture, a tuning scale and tuning means

at said raised portion of said member visible and operable from the front of said cabinet, and means providing illumination in varied degrees of intensity over said raised portion.

5 14. A radio receiver including in combination a molded cabinet having an aperture in the front wall thereof, variable control apparatus for said receiver supported in said cabinet, means for operating said apparatus and indicating the po-

sition thereof, said means comprising a one-piece molded member at said aperture acting to close said aperture against a view to the inside of said cabinet and having a plurality of selectable finger means thereon and integral therewith 5 to permit engagement for movement of said member, with said member having a tuning scale on the front thereof.

HAROLD C. MATTES.