Oct. 17, 1933. J. E. SAMPSON ET AL 1,931,012

RADIO APPARATUS

Filed June 12, 1930

Fig. 1.

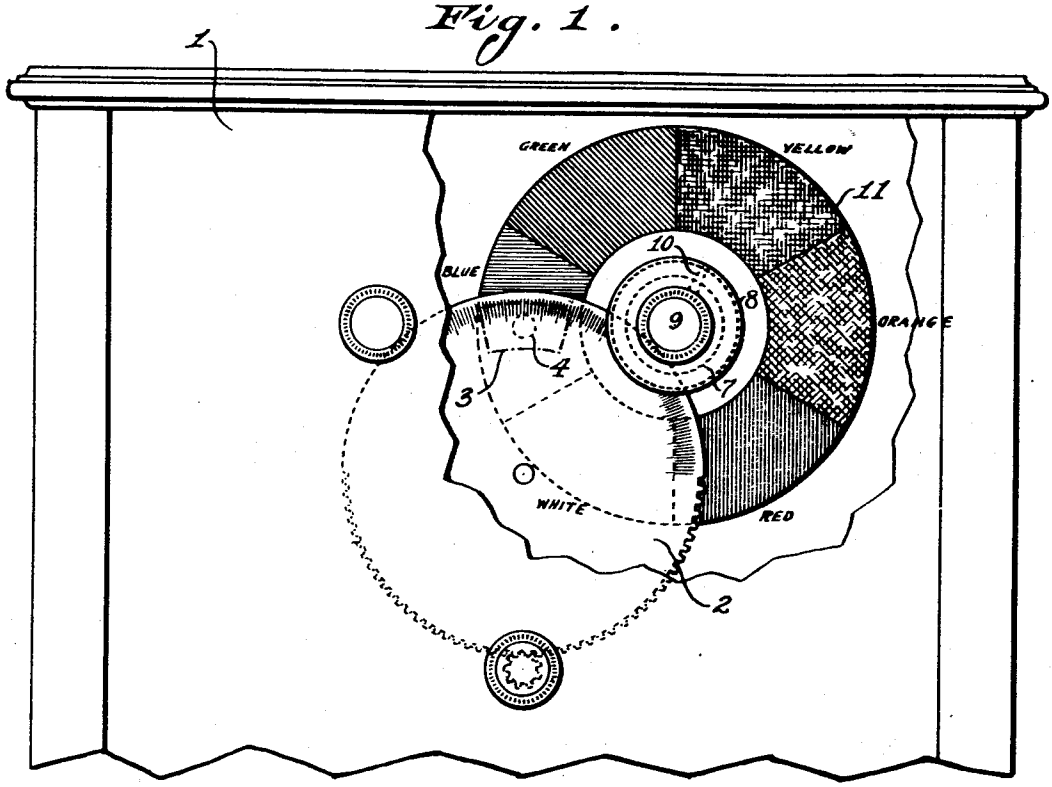


Fig. 2.

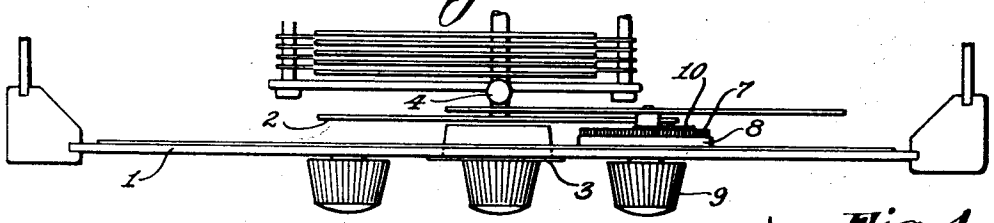


Fig. 4.

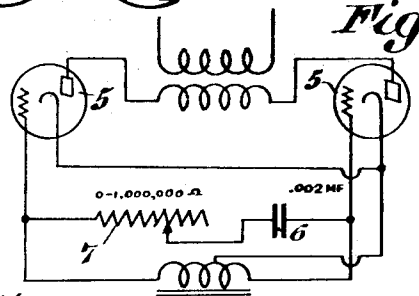


Fig. 3.

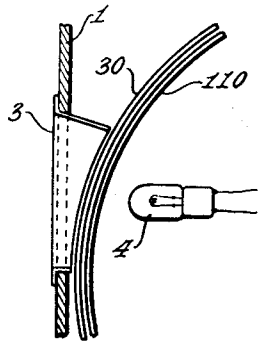
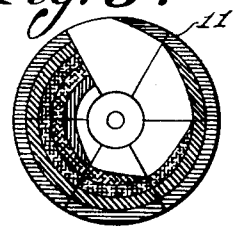


Fig. 5.



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RADIO APPARATUS

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Application June 12, 1930. Serial No. 460,638

5 Claims. (Cl. 250—20)

This invention pertains to radio apparatus and more particularly to means for indicating the adjustment of such apparatus.

Certain types of radio sets are equipped with means for adjusting the tone quality of the transmitted impulse. This adjustment is of such a nature as to vary the relative strength of the impulse in the base and treble regions thereof. This adjustment is usually made by means of a so-called push-pull connection, such connection including a variable adjustment which strengthens or weakens the impulses along the range from base to treble.

One of the objects of this invention is to provide a method and means for indicating this adjustment of tone quality visually on the set.

Another object is to make such indication by means of color display at an appropriate point in the set.

Another object is to provide means whereby the color display may be such as to provide an indication of the tone quality for which the set is adjusted.

Another object is to provide an indicating device in which colors are arranged in a manner suggesting range of tone qualities so that the indication may be such as to suggest by its color scheme a particular tone quality.

Another object is to provide such indicating means which will be of simple and inexpensive construction so as not to add appreciably to the cost of the set.

Further objects will appear from the following description taken in connection with the accompanying drawing; in which:—

Figure 1 is a front view of part of a radio set equipped in accordance with this invention shown with part of the front broken away so as to illustrate the underlying elements.

Figure 2 is a partial plan view of the set with the cover removed.

Figure 3 is a sectional fragmentary view of the front of a set illustrating another embodiment of this invention.

Figure 4 is a conventional diagram showing part of the connections of a radio set and illustrating the push-pull connection; and

Figure 5 is a face view of an indicating element showing another arrangement thereof.

The tone quality of a radio set depends upon the way in which the sound impulses in different parts of the audible range from base to treble are combined or blended and on the relative strengths of the impulses in different parts of that range. As some types of radio apparatus have a tendency to exaggerate the impulses in one part of the range as compared with those in another part such an adjustment is intended to equalize or balance the impulses over the entire range so as to improve the quality of the resulting tone. While the means for making such adjustment are well known and many sets are equipped therewith, it is desirable to provide simple and effective means for indicating the condition of such adjustment. It is further desirable to make the indication visual.

In accordance with the present invention the indication is made visual by displaying an appropriate color scheme for each adjustment of the regulating device. A sequence of different colors is arranged to be displayed successively in accordance with the progressive adjustment of the regulating device. This sequence of colors may be taken as that found in the solar spectrum, in which case the arrangement suggests a progressive change of quality such as may be obtained in such regulation of the radio set. Any othe sequence of colors may, however, be used, if found appropriate. The arrangement may be such as to display a single color at a time, the different colors coming into view successively according to the adjustment. Other arrangements may be made such, for instance, as to show successive groups of colors or different color blends.

In the accompanying drawing which shows several ways in which this invention may be put into effect, 1 indicates a radio set of any suitable type. This may be a receiving set of suitable construction having a tuning dial 2 which is usually visible thru a window in the front of the case as indicated at 3. The dial 2 is often constructed of transparent celluloid or similar material and may be illuminated by a lamp 4 usually placed behind the dial.

As shown in Fig. 4 certain tubes 5 of the set are shunted by a circuit including a condenser 6 and a variable resistance 7. The rheostat containing the resistance 7 is shown in Fig. 1 at 8. Such a rheostat is usually provided with a manipulating button 9 moving a contact arm 10 over the resistance 7 arranged in a circular coil. Any other suitable type of rheostat may, of course, be used.

The invention is not limited to any particular type of tone control circuit, and the arrangement in Fig. 4 is merely illustrative. The color system described hereafter is connected to button 9 controlling the variable resistance 7 so that when resistance 7 is entirely in the circuit and substantially none of the higher audio frequencies

are by-passed, one color appears at the sight window 3, whereas when a portion of resistance 7 is cut out and a portion of such higher frequencies by-passed, a different color appears at the sight window 3. If desired, when still more of the resistance 7 is cut out and still more of such higher frequencies by-passed so as to accentuate the base notes still further, still another color appears at the sight window 3.

In accordance with this invention, the color indication may be provided by an indicating element 11 which may be constructed in the form of a disc of celluloid or other transparent or translucent material. This disc may be mounted on the same shaft with the arm 10 so as to rotate therewith. Different proportions of the disc 11 may be of different colors as indicated in Figures 1 and 5. In Fig. 1 the colors are arranged in sectors. In Fig. 5 spiral bands of different colors are arranged on the disc. The disc 11 may be mounted so as to extend between the lamp 4 and the dial 2 so that the light of the lamp must traverse the disc 11 in order to illuminate the dial. Accordingly, the dial will be illuminated with different colored light according to the position of the disc 11 and, therefore, in accordance with the adjustment for tone quality.

In the arrangement of Fig. 1 the colors are displayed successively along the range of adjustment. For instance, the white sector may indicate the extreme adjustment in which the treble portion of the audible range is strongest. The colors are then displayed successively, for instance, in the order blue, green yellow, orange and red, the last color indicating the adjustment in which the base portion of the audible range is strongest. Thus the color indication provides an index of tone quality. In the arrangement of Fig. 5 the same six colors may be arranged in spiral blends in order to progress from the outer rim of the disc inwardly. It will be noted that in this arrangement the white indication for the treble is not eliminated entirely but is simply reduced in extent as the other colors are brought successively into the indicating field. The successive indications are made by adding colors to the group in the indicating field so that when the last adjustment is reached all of the colors are displayed. Any other scheme of color indication may, of course, be adapted.

In Fig. 3 is indicated an arrangement in which the dial 30 is cylindrical and the disc 11 is replaced by a suitable cylindrical screen 110.

It will be seen, therefore, that this invention provides for indicating the tone quality of a radio device in terms of colors. These colors are changed according to any suitable scheme with change in the tone quality regulation. While the order of colors in the solar spectrum provides a convenient arrangement and one which suggests a progressive variation of frequency or pitch, any other arrangement may, of course, be used.

While in the illustrated embodiment the colors are displayed by transmitting the light thru a varicolored screen, the display may, of course, be made by reflected light rather than by transmitted light. In the arrangement illustrated the illumination for indicating tone quality adjustment is displayed at the same window at which the tuning indication is given. The color display may, of course, be made separately from the tuning indication, if desired.

In accordance with the method of this invention the display of an appropriate color is used to indicate a tone quality for which the set is adjusted and the sequence of colors may be arranged to indicate a sequence of pitches.

Where a remote-control device is used for making adjustments of the set, the tone quality indication in accordance with this invention may be incorporated in the remote-control unit.

The tone quality indicating device of this invention may, of course, be constructed as a separate unit which may be applied to any existing radio set.

While this invention has been described and illustrated as applied to a unitary device, it will be understood that certain individual features and sub-combinations may be useful of themselves and the employment of such individual features or sub-combinations is contemplated by this invention and is within the scope of the appended claims.

It is obvious that various changes may be made in details of construction, within the scope of the appended claims, without departing from the spirit of this invention. It is, therefore, to be understood that this invention is not to be limited to the specific details shown and/or described.

Having thus described the invention, what is claimed is:

1. In a radio set having means for regulating the tone quality of the transmitted impulse, an illuminating device, means for varying the color of the illumination thereof in accordance with the variation in the tone quality, and a station dial arranged to be illuminated by said device.

2. In a radio set having means for regulating the tone quality of the transmitted impulse, a visual indicating element, and means for varying the indicating color of said element in accordance with the variation in tone quality, a lamp behind said element and a station dial illuminated by said lamp.

3. In a radio apparatus, tuning means, means for regulating the tone quality of the transmitted impulse, a window and means adapted to indicate simultaneously at said window the adjustments of said tuning means and said regulating means.

4. In a radio apparatus, tuning means, means for regulating the tone quality of the transmitted impulse, an indicator for said tuning means, means for illuminating said indicator, and a varicolored screen interposed between said illuminating means and said indicator and connected with said regulating means.

5. In the art of operating radio apparatus, the method comprising, regulating the tone quality of the transmitted impulse, and indicating a series of progressively varying tone qualities by a sequence of different colors.

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