

Sept. 28, 1937.

E. K. MADAN

2,094,075

DIAL

Filed April 7, 1937

2 Sheets-Sheet 1

Fig. 1

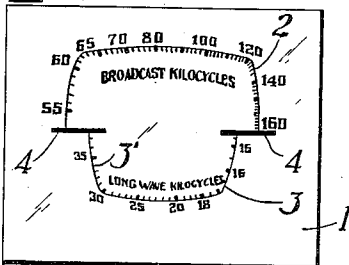


Fig. 2

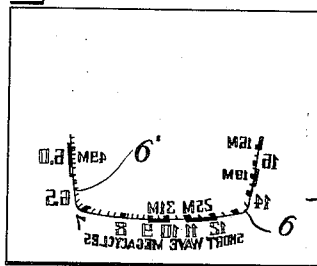


Fig. 4

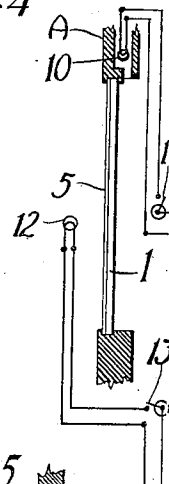


Fig. 3

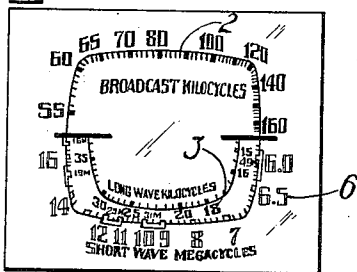


Fig. 7

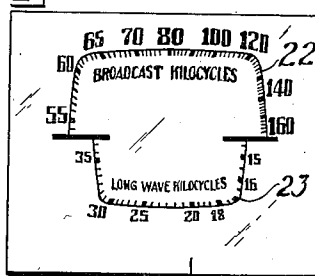


Fig. 5

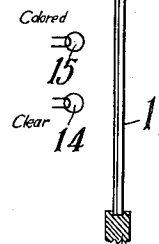


Fig. 8

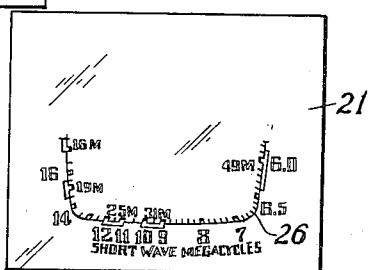


Fig. 6

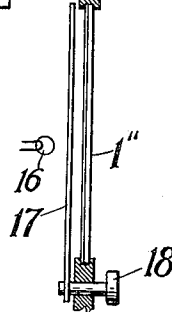


Fig. 9

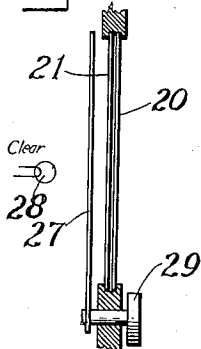


Fig. 10

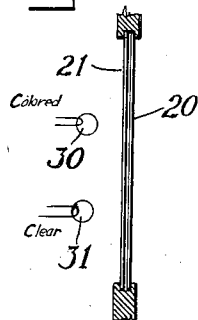
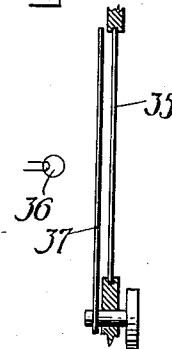


Fig. 11



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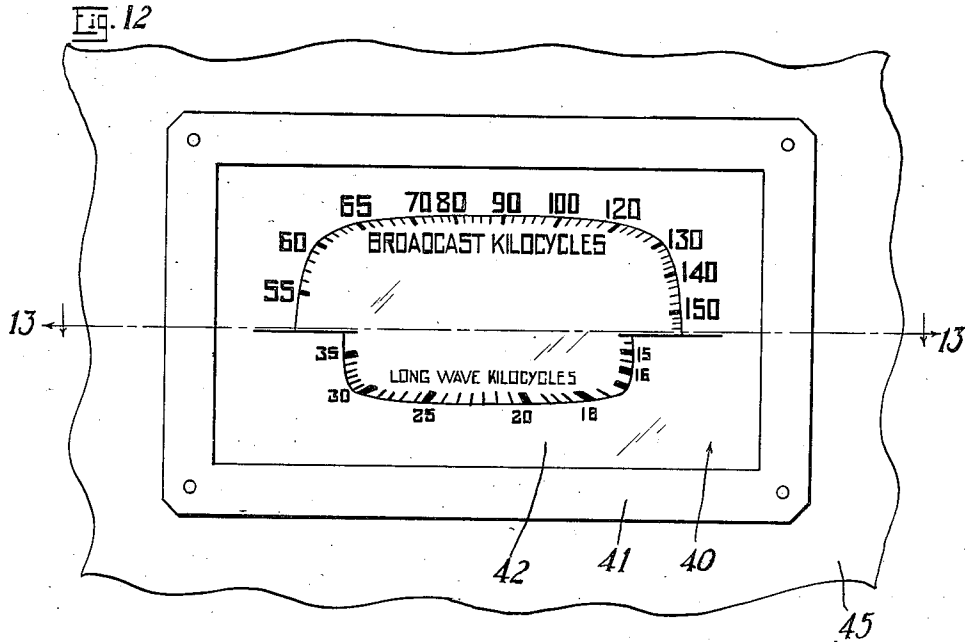
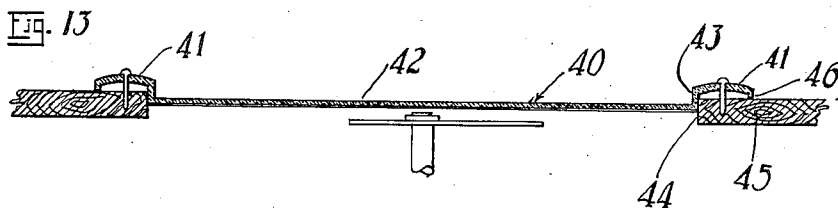
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2 Sheets-Sheet 2



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2,094,075

DIAL

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Application April 7, 1937, Serial No. 135,407

7 Claims. (Cl. 116—124.1)

This invention relates to dials, and more particularly to dials for use in radio receiving sets, of the type known as all-wave sets, that is, those which are capable of receiving on broadcasting kilocycles, long wave kilocycles, and short wave kilocycles. The dial carries sets or series of numbers or suitable indicia to facilitate the regulating of the radio receiving set to receive the broadcasting subject matter from the desired broadcasting or sending station.

In radio receiving sets of the all-wave receiving type the receiving action or properties of the set are shifted from one wave band to another by some mechanical means, usually manually operated, and it has been the practice to provide illuminated indicators or to shift the base of illumination on the dial of the receiving set in any one of a number of different manners to display most prominently the dial carrying indicia relating to the wave band on which the set is receiving.

It is an object of the present invention to provide a dial for radio receiving sets of the all-wave type which carries the various sets or series of indicia for the respective wave bands, but which dial is so constructed and arranged that at certain times certain of the indicia is invisible. The invisible indicia is brought into display or sight when the respective wave band receiving mechanism of the radio set is tuned in or brought into operation.

Another object of the present invention is to provide a dial as specified, which is attractive in appearance, neat, relatively small, comparatively inexpensive to manufacture, is capable of differing color combinations, and is in the form of a flat sheet so as to readily lend itself symmetrically to the design and construction of radio receiving sets without requiring special construction and/or design thereof to accommodate the dial.

A further object and novel feature of the present invention is the provision of a dial as specified, utilizing a transparent sheet or body, which may be clear or of any desired color. The body has one side coated with a translucent lacquer of any suitable color, such as gold, silver, or the like, and has suitable indicia printed thereon in a novel manner. Under certain lighting conditions, the dial or body appears opaque and of one color, with certain indicia thereon prominently displayed, while under other lighting conditions, presents a different color and displays other indicia.

With these and other objects in view, as may appear from the accompanying specification, the

invention consists of various features of construction and combination of parts, which will be first described in connection with the accompanying drawings, showing a dial embodying the invention, and the features forming the invention will be specifically pointed out in the claims.

In the drawings:

Figure 1 is a face view of the front of the improved dial under normal lighting conditions.

Figure 2 is a face view of the back of the dial under normal lighting conditions.

Figure 3 is a face view of the front of the dial under lighting conditions to bring into display the normally invisible indicia.

Figure 4 is a fragmentary section through a part of a radio cabinet showing the dial in edge elevation and showing one form of lighting system in diagram.

Figure 5 is an edge elevation of the dial showing a different form of lighting system, in diagram, associated therewith.

Figure 6 is an edge elevation of the improved dial showing a still further arrangement of lighting and light control associated therewith.

Figure 7 is a front view of a body sheet of a modified form of the dial.

Figure 8 is a front view of the second or back sheet used in connection with the sheet or body shown in Figure 7, in the modified form of dial.

Figure 9 is an assembled view in edge elevation of the modified form of dial illustrating one method of light control associated therewith.

Figure 10 is an assembled view in edge elevation of the modified form of dial showing another system of light control, in diagram, associated therewith.

Figure 11 is an edge elevation of a still further modified form of the dial.

Figure 12 is a front elevation of a further modified form of the dial.

Figure 13 is a cross section taken on the line 13—13 of Figure 12.

Referring particularly to the form of dial shown in Figures 1 to 6 inclusive of the drawings, the dial proper comprises a sheet 1 of transparent material, preferably celluloid or the like, which may be either clear or of any desired color. The body 1 has printed on the face thereof two series of indicia, such as the series 2 which is labeled broadcast kilocycles, and since this is the wave band most universally used, this series of indicia for the broadcast kilocycles are most prominently displayed. The second set of indicia 3 which is printed on the face of the body 1 is labelled long wave kilocycles and it is less prominently displayed.

played than the series 2 of indicia and is separated therefrom by distinct lines of demarcation indicated at 4. It will be noted that the series 3 of indicia and their accompanying graduations 3' are smaller than the series 2, leaving a space outside of the outermost parts of the series of indicia 3 and within the limits of the outermost parts of the series 2 of indicia.

The back or surface of the transparent body 1 opposite to the one on which the series of indicia 2 and 3 are printed, is coated, as indicated at 5, with a coating of semi-transparent or translucent lacquer or other coloring material. Preferably gold or silver is used, which in the case that the body 1 is clear, presents a gold or silver dial under normal lighting conditions, having the appearance, under such conditions, of being opaque. When colored material is used for the body 1, the backing of gold or silver slightly changes and enhances the coloring of the body 1, providing a brilliant, beautiful, opaque-appearing color effect of the dial under normal lighting conditions.

A red series of indicia, indicated at 6, is printed on the back of the body 1 and on the outside of the coating 5. This series of indicia is printed backwards, as shown in Figure 2 of the drawings, and is printed with a semi-transparent ink, preferably of a color different from the color of the opaque ink used for printing the series 2 and 3 of indicia. The semi-transparency of the body 1 of the dial caused by the semi-transparency of the coating 5 hides the series 6 of indicia under normal lighting effects and/or under the lighting effects provided for prominently displaying the series 2 and 3 of indicia. There are several ways in which the lighting control may be provided for rendering the series of indicia invisible and/or visible. The series 6 of indicia, together with its graduations 6' are of such size that they symmetrically fit and/or cooperate with the series 2 and 3 of indicia so that when this series 6 of indicia is visible, a symmetrical pleasant-appearing effect is provided as shown in Figure 3 of the drawings. The series 6 of indicia is of such size and is arranged so that it fits within the space about the series 3 of indicia which is confined within the outermost margins of the series 2. By printing the indicia of the series 6 backwards on the back of the body 1 of the dial, the indicia appears properly when viewed through the dial.

In Figure 4 of the drawings, one system of lighting control is shown. In this form, edge-lighting of the dial is provided by a light bulb 10 which may be suitably placed for illuminating the front or face of the dial, as for instance, embedded in the cabinet, part of which is shown at A. The light bulb 10 may be controlled in any suitable manner such as by the switch indicated at 11, as is the usual manner in radio sets, so that when the current is turned on to the radio set, the light bulb 10 will be energized. With the light distributed or delivered to and against the front or face of the body 1 without any light behind the dial only the indicia in the series 2 and 3 will be visible and the dial will appear in its normal color. That is, if the body 1 is clear and the coating 5 is gold, then the dial will appear as a gold dial.

A second light bulb 12 is positioned behind the dial and energizing of this light bulb is controlled by a switch 13. This switch 13 may be operated by the mechanism employed for setting the radio set to receive on short wave megacycles, the indicia for which is provided in the normally invisible series 6 of indicia. This is the usual construction in all-wave radio sets, and is

not illustrated in the drawings hereof since it is well-known and forms no part of the present invention. When the light bulb 12 is energized, the light rays will pass through the semi-transparent coating 5 and through the body 1, bringing the series 6 of indicia into view so that the operator of the radio set may adjust the set with the aid of the series 6 of indicia to receive from any desired short wave broadcasting or sending station. When the body 1 is clear and the back coating 5 is gold, the energizing of the light 12 will cause the dial to appear as a gray dial, with all three of the series of indicia exposed. If the backing is silver and the body 1 clear, the dial will, when the light 12 is lit, also appear gray, but of less density than the gray when the dial is gold-backed. If the body 1 is made of red material with a gold back, the dial appears under normal light and with the light 10 lit as a metallic rose-colored dial, and when the light 12 is lit, it appears as an orchid dial. A light red material used for the body 1 with a back coating 5 of silver provides a dial of a beautiful metallic pink under normal lighting and face lighting by means of the light 10. When the light 12 is lit, this dial also appears as an orchid dial, but of less intensity than the orchid of the gold-backed red body. Thus it will be seen that by the use of various colored transparent material for the body 1 together with different types of backing such as either gold or silver, various attractive and artistic effects of the radio dial may be provided which distinctly change colors when the sheet is shifted from broadcasting or long wave kilocycles setting to short wave setting, thereby not only providing attractive and interesting effects in the dial, but providing distinctive indicating means by which the person operating the set can unmistakably know whether the set is adjusted to receive on a short wave, long wave, or normal wave band.

In Figure 5 of the drawings, a different type of lighting or illuminating control is provided for use in connection with the improved dial. The dial 1' shown in Figure 5 is identically the same as the dial shown in Figures 1 to 4 above referred to. Behind the dial is placed two light bulbs 14 and 15, one of which is a clear bulb, and the other a colored bulb. When this type of lighting control is provided, the indicia of the series 6 are printed with a semi-transparent ink of the same color as the light rays diffused by the bulb 15, so that when the bulb 15 is lighted, the indicia of the series 6 will be invisible and only the indicia of the series 2 and 3 visible. When the light 15 is extinguished and the clear light 14 lit, the indicia of the series 6 will be visible through the dial.

Figure 6 of the drawings shows a still further arrangement of illuminating the dial and controlling the visibility of the indicia of the series 6. The dial 1'' is identical with the dial described and shown in Figures 1 to 4 inclusive, and the indicia of the series 6 is printed with a semi-transparent ink of a predetermined color. A clear light 16 is placed behind the dial 1'' and a sheet 17 of transparent material of the same color as the color of ink used for printing the indicia in the series 6 is movably placed between the dial 1'' and the light 16. When this sheet 17 is moved between the light 16 and the dial 1'', the light rays being the same color as the ink of the indicia of the series 6 will render this indicia invisible, and only the indicia of the series 2 and 3 will be displayed. When the sheet

17 is moved from between the light bulb 16 and the dial 1'', the light rays being of the normal color will bring the indicia in the series 6 into view through the dial. In Figure 6 the sheet 17 is shown as having a button 11 connected there-
 5 for moving it into and out of position behind the dial 1''. This button may readily be the usual button in a radio receiving set which shifts the setting of the set from the normal broadcast kilocycles band to the short wave band.

In Figures 7 to 10 inclusive of the drawings a modified construction of the dial is shown. This modified form of the dial includes a front body sheet 20 and a rear body sheet 21 which,
 15 in the assembled dial are placed in parallelism one directly behind the other as shown in Figures 9 and 10. The sheet 20 which is the front sheet may be of any desired color, or clear, and if it is so desired, it may have a back coating of gold, silver, or any semi-transparent material. The front sheet 20 has two series of indicia 22 and 23 printed thereon which correspond to the series 2 and 3 of indicia.

The back sheet 21 is transparent and it may
 25 be clear or of any desired color, so as to provide any desired color effect of the dial as a whole, with its cooperation with the front sheet 20. The back sheet 21 has a series of indicia 26 printed thereon with semi-transparent ink, which series of indicia corresponds to the series 6. The ink with which the indicia of the series 26 is printed may be of any suitable color, as for instance red. If the indicia of the series 26 are red, then the color control sheet 27 shown in Figure 9 of the
 35 drawings, which is movable into position between the light bulb 28 and the sheet 21 is also red, so that when the light 28 is lit the light rays passing through the red control sheet 27, will counteract the red of the indicia in the series 26 and render them invisible, permitting only the indicia of the series 22 and 23 to be visible at the front of the dial. When the control sheet 27 is moved from between the light 28 and the sheet 21, the light being of normal color, will bring the indicia in the series 26 into view. The control sheet 27 is shown as having a button 29 connected thereto for moving it into and out of controlling position, and like the button 18, this may well be the button of a radio receiving set which
 45 adjusts the set to receive on a short wave band.

In Figure 10 of the drawings, a lighting system is shown used in connection with the modified form of dial similar to the lighting system shown in Figure 5 of the drawings, that is, two
 55 light bulbs 30 and 31 are placed behind the dial, and by controlling the lighting of these respective light bulbs, one of which is colored and the other perfectly clear, the indicia in the series 26 may be rendered either visible or invisible. It is rendered invisible because the light 30 is colored to counteract or absorb the color of the indicia in the series 26, as for instance if the indicia are printed with red semi-transparent ink, then the light bulb 30 will be red.

Figure 11 of the drawings shows a still further modified construction of the dial. In this modification the dial comprises a single body or sheet 35, which is preferably transparent, and may be of any desired color. It is printed with the series of indicia in the same manner in which the dial shown in Figures 1 to 3 is printed, that is, with one or two series of indicia on the front surface of the sheet and another series of indicia on the back of the sheet. The indicia on the back of the sheet is printed with a semi-transparent ink

of any desired color. A light bulb 36 is placed behind the single transparent sheet 25 and a control sheet 37 is placed between the sheet 35 and the light 36. The light 36 will be lit all the time that the radio with which the dial 35 is used is turned on, and when the radio is adjusted to receive broadcasts over the wave bands represented by the indicia printed on the front of the dial, the control sheet 37 will be in place behind the sheet 35. The color of the control sheet is the same or any suitable color to absorb the color of the indicia printed on the back of the sheet 35, so that when the control sheet 37 is in position between the light 36 and the dial 35, the back indicia will be invisible but when the control sheet 37 is moved from between the dial 35 and the light 36, the back indicia will be visible.

In Figures 12 and 13 of the drawings, a further modified form of the dial is shown in which the flat body 40 of the dial is of the same construction and arrangement of indicia as the dial shown in Figures 1 to 4 inclusive of the drawings. This modified form of dial differs from the dial structure shown in Figures 1 to 4 of the drawings in that it has an offset annular border 41 formed integrally thereon. The border 41 is connected to the main body 42 of the dial 40 by a right angularly extending annular connection 43, the outer side of which fits against the edge 44 of the opening in the cabinet 45 with which the dial is employed. The laterally offset annular border 41 may be decorated in any suitable manner and as shown in Figure 13 it may be bowed outwardly and have an annular flange 46 about its outer edge so that when attached it will stand out from the outer face of the cabinet 45.

It will be noted, that in all of the various forms of the dial shown, the front indicia is always visible and the back indicia, whether it be printed on the back of a single sheet or body forming the dial, or whether it be printed on the back or second sheet is, under certain conditions, visible, and under other conditions, invisible. It will also be apparent from the foregoing that various color effects changeable at times, may be provided with a dial constructed in accordance with this invention.

It will be understood that the invention is not to be limited to the specific construction or arrangement of parts shown but that they may be widely modified within the invention defined by the claims.

What is claimed is:

1. As a new article of manufacture, a dial having a series of front indicia and a series of back indicia, said front indicia being always visible, said back indicia being printed with semi-transparent ink of a predetermined color, whereby under certain lighting conditions, it will be rendered invisible.

2. As a new article of manufacture, a dial comprising a body having a predetermined front color and a different back color, said dial having a series of front indicia and a series of back indicia, said front indicia being always visible, said back indicia being printed with semi-transparent ink of a predetermined color, whereby under certain lighting conditions it will be rendered invisible and under certain other light conditions, the visible coloring of the body will be changed and the back indicia rendered visible.

3. As a new article of manufacture, a dial comprising a body of transparent material, a series of indicia printed on said body, one side of said body covered with a semi-transparent color

lacquer, a second series of indicia printed on said body and normally invisible at the face of the dial, said second series of indicia being printed with a semi-transparent ink of a predetermined color, different from the color of the first series of indicia, the color of said second series of indicia and the color and density of said lacquer co-operating whereby under certain lighting conditions the second series of indicia will be invisible at the face of the dial and under certain other light conditions the second series of indicia will be visible at the face of the dial.

4. As a new article of manufacture, a dial comprising a body sheet of colored transparent material, a coating of semi-transparent lacquer on the back of said body sheet and showing through the colored sheet, said semi-transparent coat being of such density that when light is directed at or over the front of the sheet it appears opaque and when light is directed through the sheet, it appears translucent and of a color different than the color appearing when the sheet appears opaque, a series of indicia on the front of said sheet, a second series of indicia on the back of said sheet, said second series of indicia being visible at the front of the dial only when light is directed through said body sheet.

5. As a new article of manufacture, a dial comprising a body sheet of colored transparent material, a coating of semi-transparent lacquer on the back of said body sheet and showing through the colored sheet, said semi-transparent coat being of such density that when light is directed at or over the front of the sheet it appears opaque and when light is directed through the sheet, it appears translucent and of a color dif-

ferent than the color appearing when the sheet appears opaque, a series of indicia on the front of said sheet, a second series of indicia on the back of said sheet, said front series of indicia being always visible and said second series of indicia being printed with semi-transparent ink of a predetermined color whereby under certain lighting conditions it will be invisible and will be visible under certain other lighting conditions.

6. As a new article of manufacture, a dial including a flat body having a series of front indicia and a series of back indicia, said front indicia being always visible, said back indicia being printed with semi-transparent ink of a predetermined color, whereby under certain lighting conditions it will be rendered invisible, and a laterally offset annular border formed on said dial.

7. As a new article of manufacture, a dial comprising a body of transparent material, a series of indicia printed on said body, one side of said body covered with a semi-transparent color lacquer, a second series of indicia on said body and normally invisible at the face of the dial, said second series of indicia being printed with a semi-transparent ink of a predetermined color different from the color of the first series of indicia, the color of said second series of indicia and the color and density of said lacquer co-operating whereby under certain lighting conditions the second series of indicia will be invisible at the face of the dial and under certain other light conditions the second series of indicia will be visible at the face of the dial, and a laterally offset annular border formed on said dial.

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