Dec. 22, 1942. C. S. PRICE 2,305,991

INSTRUMENT, DIAL, AND SHEET MATERIAL

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Fig. 1.

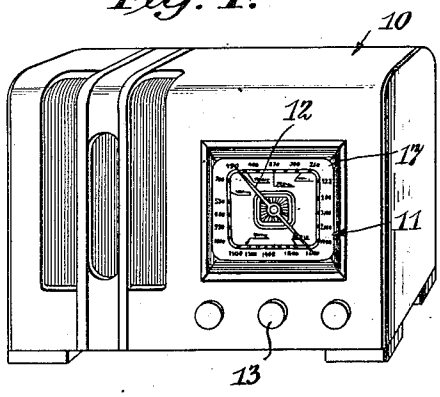


Fig. 2.

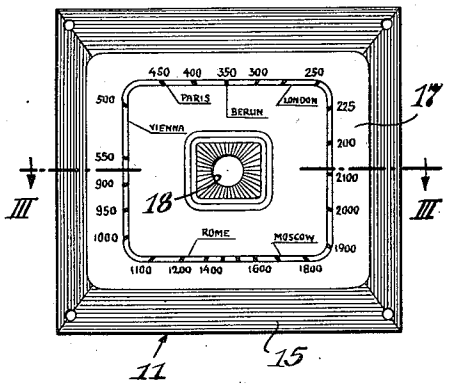


Fig. 3.

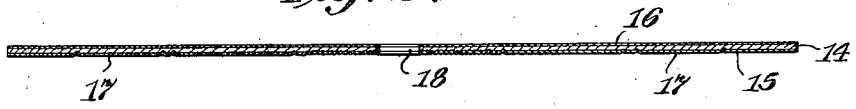


Fig. 5.

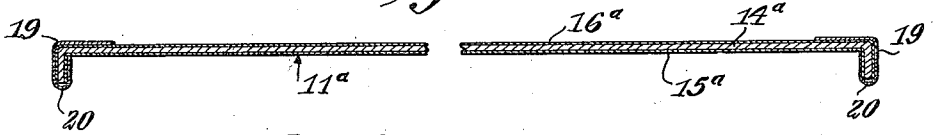


Fig. 4.

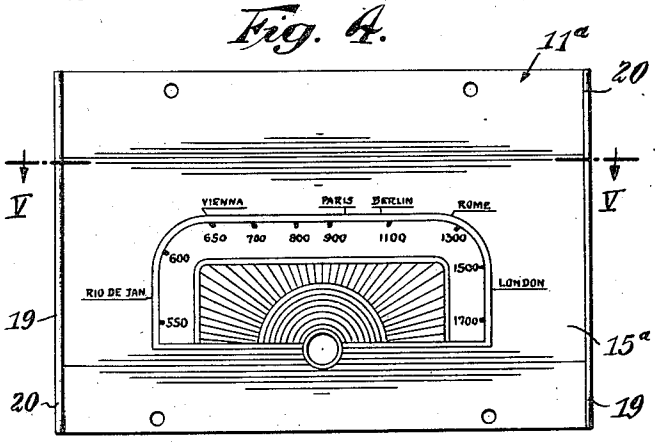
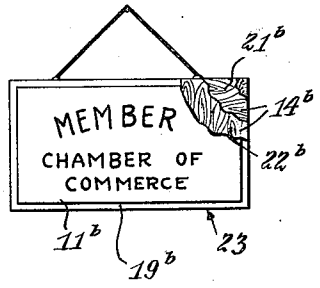


Fig. 7.



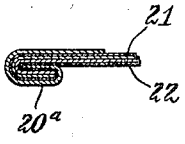


Fig. 6.

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INSTRUMENT, DIAL, AND SHEET MATERIAL

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Fig. 8.

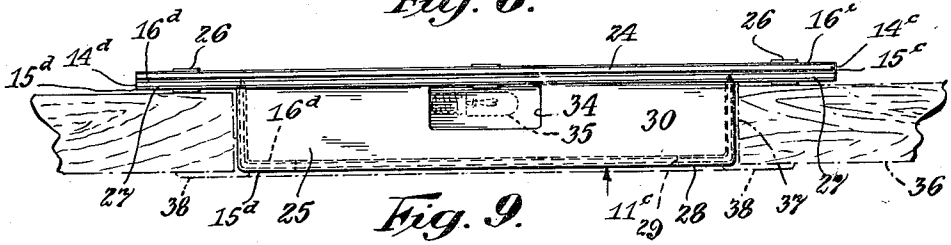


Fig. 9.

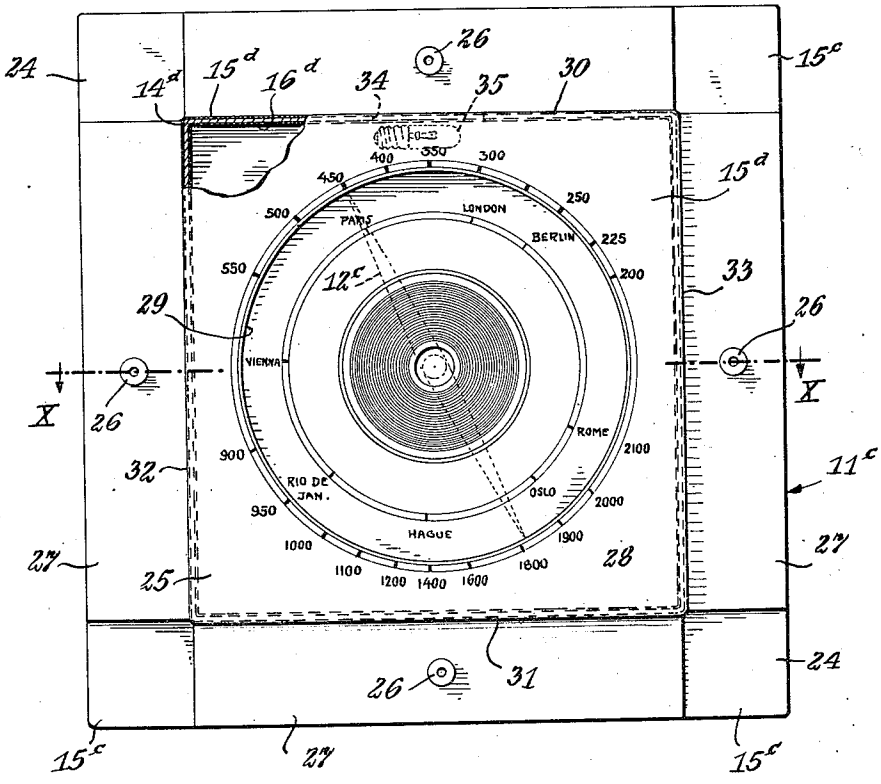
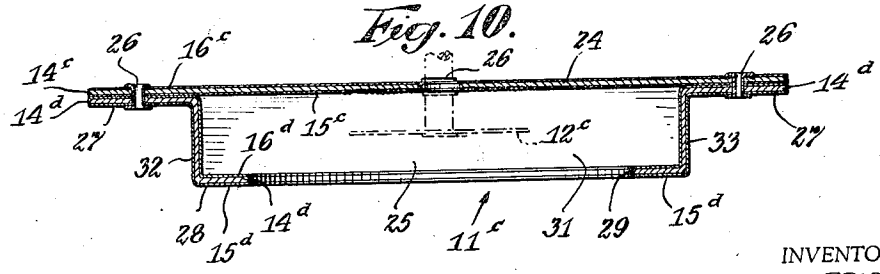


Fig. 10.



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UNITED STATES PATENT OFFICE

2,305,991

INSTRUMENT, DIAL, AND SHEET MATERIAL

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Application July 7, 1938, Serial No. 217,881

10 Claims. (Cl. 116—129)

This invention relates to radio receiving sets, other instruments, dials for said instruments and sheet material adaptable for making such dials, as well as other articles made from such material.

In the past, dials have been made consisting of a sheet of cardboard or other fibrous material, to one side of which was secured thin metallic foil. The dial was printed and embossed on the metallic side of this composite material, which was then cut to the required shape. Dials made of such material have been found to be subject to warpage and distortion, and would not remain perfectly flat.

In accordance with my invention, I make dials and other articles of composite material, consisting of paper, cardboard or other fibrous material, single or duplex, to both sides of which are secured sheets of foil or thin metal, thereby producing a balanced construction, in order to avoid subsequent distortion. The adhesive used for securing the metal to the fibre is preferably a heat softening glue, film or other adhesive, causing an even and secure union between the parts. The reverse or rear side of the composite sheet is desirably bright, in order to reflect heat developed in the instrument away from said sheet, and thereby prevent possible distortion.

It is, therefore, an object of my invention to produce a composite material which has metallic faces and a core, or inner sheet or sheets of paper, cardboard or other fibrous material, whereby the necessary stiffness is obtained, accompanied by lightness and low cost.

Another object of my invention is the provision of a composite material which may be used like thin metal or cardboard, for making dials for radio receiving sets and other instruments, as well as for the production of display signs and the like which may be provided with easel backs, chain hangers, loop hangers or other supporting means, but which has the appearance and durability of relatively heavy metal, accompanied with approximately the lightness and low cost of cardboard or other fibrous material.

A further object of my invention is the provision of instrument dials, signs or the like, formed of composite fibrous material and metal, a portion or all of the periphery of which is stiffened by preferably metallic edging crimped or secured therealong or around.

Other objects and advantages of the invention, relating to the particular arrangement and construction of the various parts, will become apparent as the description proceeds.

Referring to the drawings illustrating my invention:

Fig. 1 is a front elevational view of a radio receiving set embodying my invention.

Fig. 2 is a front face view of the dial for the set of Fig. 1, shown on a larger scale.

Fig. 3 is a sectional view on the line III—III of Fig. 2, in the direction of the arrows.

Fig. 4 is a view corresponding to Fig. 2, but showing another embodiment of my invention.

Fig. 5 is a sectional view on the line V—V of Fig. 4, in the direction of the arrows.

Fig. 6 is a fragmentary sectional view corresponding to Fig. 5, but showing a modification.

Fig. 7 is an elevational view of a sign embodying my invention.

Fig. 8 is a plan view of another form of radio receiving set dial embodying my invention, shown in place in a fragmentary portion of the front wall of a radio receiving set.

Fig. 9 is a front elevational view of the dial of the embodiment of Fig. 8, detached from the set.

Fig. 10 is a horizontal sectional view, on the line X—X of Fig. 9, in the direction of the arrows.

Referring to the drawings in detail, like parts being designated by like reference characters, and first considering the embodiment of my invention illustrated in Figs. 1, 2 and 3, there is shown a radio receiving set 10, having a dial 11 and a pointer or station selector 12, movable thereover by a knob or handle 13. The details of the dial are shown in Figs. 2 and 3, the sectional view, indicating that said dial comprises an inner core of fibrous material 14, such as cardboard, paper, wood like that for veneer, or the like, faced and backed by sheets of thin metal or foil 15 and 16. The core 14 is desirably duplex or formed of two sheets of fibrous material, desirably rag content bristol board secured together with the grain of one desirably running at an angle of 90° to that of the other, thereby preventing warping. A waterproof glue or casein latex adhesive is desirably employed for uniting the engaged faces of the sheets.

The facing sheet 15 is desirably ornamented and supplied with letters and other characters, as illustrated in Fig. 2, as is usual in dials for receiving sets. In the embodiment illustrated, the face of the foil 15 has a golden color and a band 17 of white, cream, or other light color printed thereon as a background for the numbers, indicating wave-lengths, which may be black. Inside of this band on the gold background are shown names indicating different sta-

tions. The central portion of the dial is apertured, as indicated at 18, to receive the stem or spindle of the station selector or pointer 12.

The rear sheet 16 desirably presents a bright reflecting surface, in order to minimize absorption of heat and other radiations from the receiving set by reflecting them away from the dial. For that purpose the sheet 16 may be plain and polished and formed of a light colored or silvery metal, such as aluminum or tin.

By virtue of the composite sheet having a fibrous core, it is possible to emboss characters, for ornamental or informative purposes, thereon without difficulty. In other words, the composite sheet, constructed in accordance with my invention, is better adapted for embossing characters therein than a sheet of corresponding thickness, but constructed entirely of metal. At the same time the composite sheet can be used for many purposes as if it were constructed entirely of metal, as it has substantially the same durability for the desired purposes here described, at the same time being lighter than metal of a corresponding thickness.

Referring now to the embodiment of my invention illustrated in Figs. 4 and 5, there is shown another type of receiving set dial 11^a, consisting, as heretofore, of a singular or duplex core or inner fibrous sheet 14^a, which may be like the core 14 of the preceding embodiment, a front printed and decorated foil or metal facing sheet 15^a and a rear, preferably plain and reflecting metal backing sheet 16^a. As in the preceding embodiment, the facing sheet 15^a has the appropriate numbers indicating wave-lengths and/or frequencies, printed thereon, as well as some of the more prominent stations indicated by name. The dial is also desirably decorated by embossing as well as by printing, which the composite sheet is especially adapted for.

In order to further stiffen the sheet, I may apply to one or more edge portions thereof, metal strips 19, which are desirably bent over an edge, or as many edges as desired, of the composite sheet 11^a, and an edge portion and the edging member or members, then bent at right angles as shown in Fig. 5, to provide an outstanding flange or flanges 20, which greatly rigidifies the construction and provides a stiff medium for the dial.

Fig. 6 shows an embodiment like that of Figs. 4 and 5, except that the flange portion 20^a, formed like the flange 20, is bent over flat against the front or rear face of the sheet, and the sheets 21 and 22 secured face to face with their grain or fibres crossing, are illustrated.

Referring now to the embodiment of my invention illustrated in Fig. 7, there is shown a sign 23, comprising a composite sheet of material 11^b, consisting of an inner duplex sheet or core 14^b of paper, wood, or other fibrous material faced and backed by sheets of thin metal or foil, as in the preceding embodiments. The core 14^b is shown as formed of a sheet 21^b of wood veneer running horizontally and another sheet 22^b of wood veneer running vertically, although other fibrous material may be used instead. The edges of the sign 23 are shown rigidified by metallic edging 19^b extending around all four sides, said edging being applied as shown in detail in either Fig. 5 or Fig. 6. Such a sign may be used for any desired purpose, including other than that indicated.

Referring now to the embodiment of my invention illustrated in Figs. 8, 9, and 10, there is shown another type of receiving set dial 11^c. Said dial, as contra-distinguished from those of the preceding embodiments, may be for a radio set of a larger type, and comprise a base sheet 24, which may be formed as heretofore, of a single or duplex core or inner fibrous sheet 14^c, which may be like the core 14 of the first embodiment, a front embossed, printed and/or decorated foil or metal facing sheet 15^c, and a rear preferably plain and reflecting metal backing sheet 16^c.

As in the first embodiment, the facing sheet 15^c has appropriate characters or numbers indicating stations or wave-lengths, printed thereon. However, in the present embodiment, I have shown only certain of the more prominent stations indicated by name on the backing sheet 24, the numbers representing wave-lengths and/or frequencies being applied to the front face of a box-like extension 25 secured to the front face of the base sheet 24, in any desired manner, as by means of rivets 26, extending through the base sheet 24 and the outstanding flange or edge portion 27 of the box-like extension 25.

The box-like extension 25 is desirably formed of material like the base sheet 24, that is it has a single or duplex core or inner fibrous sheet 14^d, a front embossed, printed and/or decorated foil or metal facing sheet 15^d and a rear or inner preferably plain and reflecting metal backing sheet 16^d. The front wall 28 of the member 25, is desirably apertured, as indicated at 29 to make the stations or other indicia on the backing sheet 24 visible from the front.

Top, bottom and side flanges 30, 31, 32 and 33 extend rearwardly from the edges of the front portion 28 and bend outwardly forming the flanges 27 which engage the front face of the backing sheet 24. The top flange 30 of the box portion 25 is desirably apertured as indicated at 34, to allow for the placement of a lamp 35 which serves to illuminate the characters on the backing sheet 24 and make them stand out in pleasing contrast with the characters on the front wall 28 of the box portion 25. The rear or inner surface of the box portion 25 being plain or adapted to efficiently reflect light, serves to assist in the illumination of the characters on said backing plate.

The pointer or station selector 12^c may stand out from the rear or backing plate 24 so as to be close to the numbers around the periphery of the apertured portion of the front wall 28, or lie lose to the backing plate 24, as desired. As an alternative, the numbers indicating wavelengths and/or frequencies may be applied on the backing plate 24, as they appear on the dials of the preceding embodiments, the front wall of the box portion 25 then being plain or carrying only arbitrary figures assisting in the use of the selector 12^c.

Fig. 8 shows the manner in which the dial may be applied to the front wall 36 of a radio receiving set as by insertion, from the rear of said wall, of the box-like projection 25 through the receiving aperture 37. An escutcheon 38 may be used to cover the space between the edge of the projection 25 and the receiving aperture 37.

In view of the foregoing disclosure, it will be seen that I have invented articles made of composite material, comprising an inner sheet of paper or other fibrous material, faced by a decorated and/or printed sheet of foil or sheet metal and backed by a preferably plain reflecting sheet of foil or sheet metal. The edges of the articles

may be reinforced by metal strips, crimped thereabout for rigidifying purposes.

Although preferred embodiments of my invention have been disclosed, it will be understood that modifications may be made within the spirit and scope of the appended claims:

I claim:

1. In an instrument, a source of radiations, a dial covering said source and comprising a generally flat sheet of non-metallic material, sheets of foil secured to opposite faces of said sheet of non-metallic material, one of said sheets of foil being bright, to reflect such radiations from said dial, and the other sheet of foil embossed and/or printed with the desired characters, to complete the dial.

2. In a radio receiving set, a source of radiations, a dial in the path of said radiations, facing away from said source, and comprising a sheet of fibrous material disposed in a single plane, a golden colored sheet of embossed and/or printed metal secured to the face of said fibrous material, and a plain reflecting sheet of thin silvery metal secured to the back of said fibrous material for minimizing the absorption of such radiations from the set.

3. In an instrument, a source of heat, a dial comprising a flat sheet of non-metallic material, sheets of foil secured to opposite faces of said sheet of fibrous material, the outer surface of one of said sheets of foil being bright to reflect heat received thereon from said source, and the outer surface of the other sheet of foil being embossed and/or printed with desired characters, and metal strips crimped to an edge or edge portions of said dial and reinforcing the peripheral portion thereof.

4. A dial comprising a sheet of fibrous material lying only in one plane, sheets of thin metal secured to opposite faces of said sheet of fibrous material, one of said sheets of metal presenting a bright, heat-reflecting face, and the other presenting a face embossed and/or printed with desired characters to complete the dial, the central portion of said dial being apertured to receive the stem of a pointer.

5. A dial adapted for use on a radio receiving set, comprising a flat sheet of non-metallic material, a sheet of metal or foil embossed and/or printed with the desired characters and covering the outer face of said sheet of non-metallic material, and a sheet of plain bright metal covering the inner face of said sheet of fibrous material to minimize the absorption of radiations from said set, the central portion of said dial being apertured for the passage of the stem of a station selector.

6. A dial comprising a core formed of a plurality of flat sheets of fibrous material secured together, with the fibers of one sheet extending at approximately right angles to those of another, sheets of thin metal secured to opposite faces of said core, one metal sheet presenting a bright face to reflect radiations therefrom, and the other embossed and/or printed with desired characters to complete the dial.

7. In combination, a dial adapted for use on a radio receiving set, comprising a backing sheet and a box-like structure comprising an outer wall and outstanding top, bottom and side flanges overlying peripheral portions of said backing sheet, means intersecting said flanges for securing them to said backing sheet, forming a compartment between said backing sheet and outer wall, and a station selector movable in said compartment and spaced outwardly from said backing sheet so as to be close to said outer wall, said outer wall being opaque, provided with characters relevant to radio stations, and apertured to permit only a portion of the front face of the backing sheet to be viewed therethrough, said visible portion of said backing sheet being provided with characters different from those on said outer wall, but also relevant to said radio stations, to supplement those on said outer wall and complete the dial.

8. In combination, a dial comprising a backing sheet carrying indicia to aid in station selection and adapted to be secured to a radio receiving set, a box-like structure secured to the front face of said backing sheet and apertured to allow a portion only of the front face of the backing sheet to be visible, the inner surface of said structure being formed of bright metal, the outer surface of said structure carrying indicia supplementing that on said backing sheet to also aid in station selection, a station selector movable in said structure, spaced from the backing sheet and disposed close to said outer surface for accurate registry with the indicia thereon, and a lamp mounted in said box-like structure for illuminating the front face of said backing sheet.

9. In an instrument, a source of visible radiations, a dial comprising a flat backing sheet, a box-like member with a front opening and secured to the front face thereof and enclosing said source of radiations, said backing sheet and the material forming said box-like member each comprising non-metallic sheet material and sheets of metal foil secured to opposite faces of said non-metallic material, the back one of said sheets of foil being bright to reflect radiations impinging thereon from said source and the other provided with desired characters, with those on the box-like member supplementing those on the backing sheet visible through said opening to complete the dial, and a pointer movable in the space between said backing sheet and box-like member and spaced outwardly from the former so as to be close to the latter for reading the characters thereagainst.

10. A dial comprising a flat backing sheet, a box-like structure with a front opening and secured to the front face thereof, said backing sheet and structure being each formed from composite material comprising a fibrous core and sheets of thin metal secured to opposite faces thereof, the back one of said sheets of metal presenting a bright face to reflect radiations therefrom and the other provided with characters, with those on the box-like member supplementing those on the backing sheet visible through said opening to complete the dial, and a pointer movable in the space between said backing sheet and box-like structure and spaced outwardly from the former so as to be close to the latter for reading the characters thereagainst.

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