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# Cabinet

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April 23, 1929.

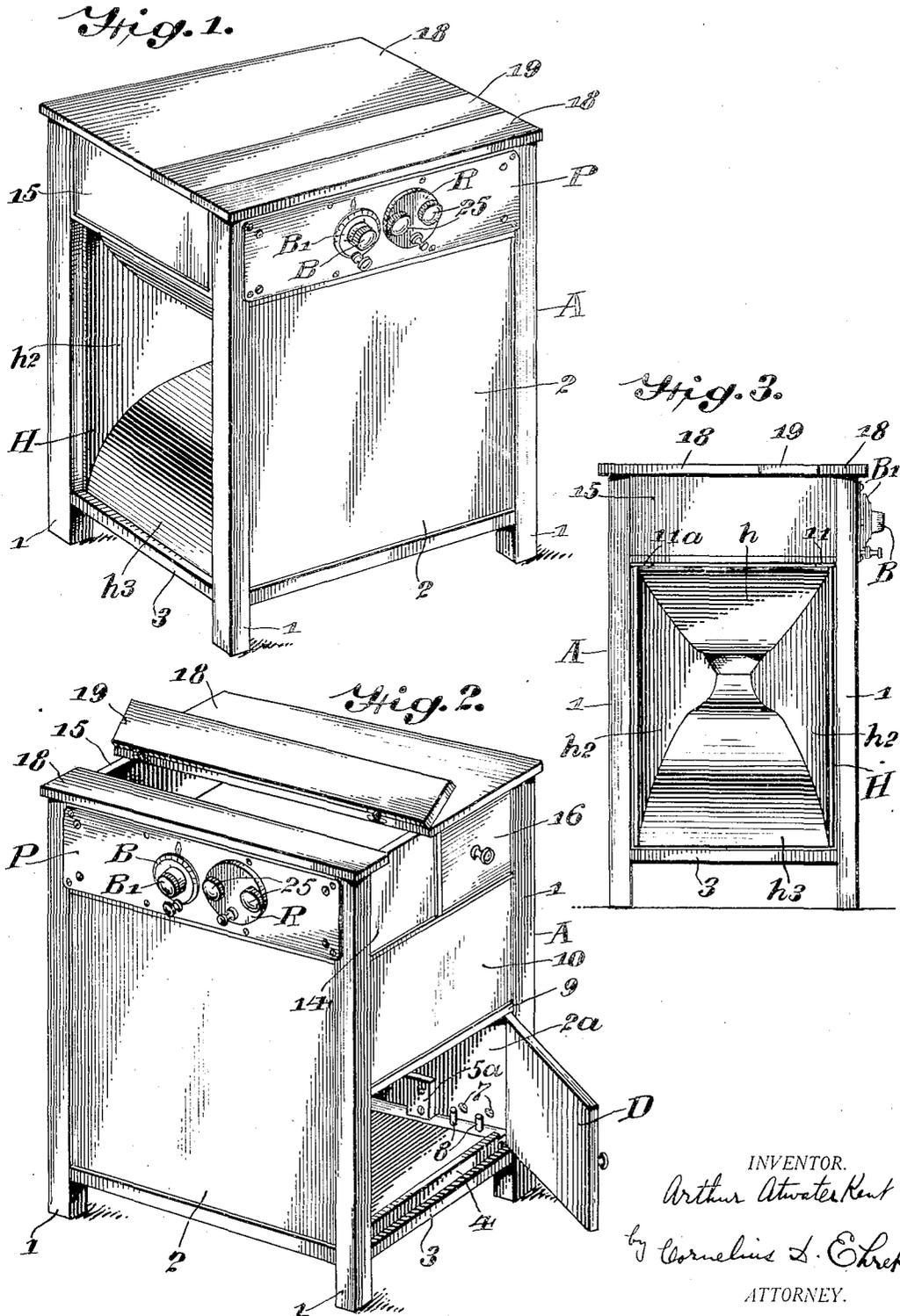
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1,710,482

CABINET

Filed March 27, 1926

3 Sheets-Sheet 1



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April 23, 1929.

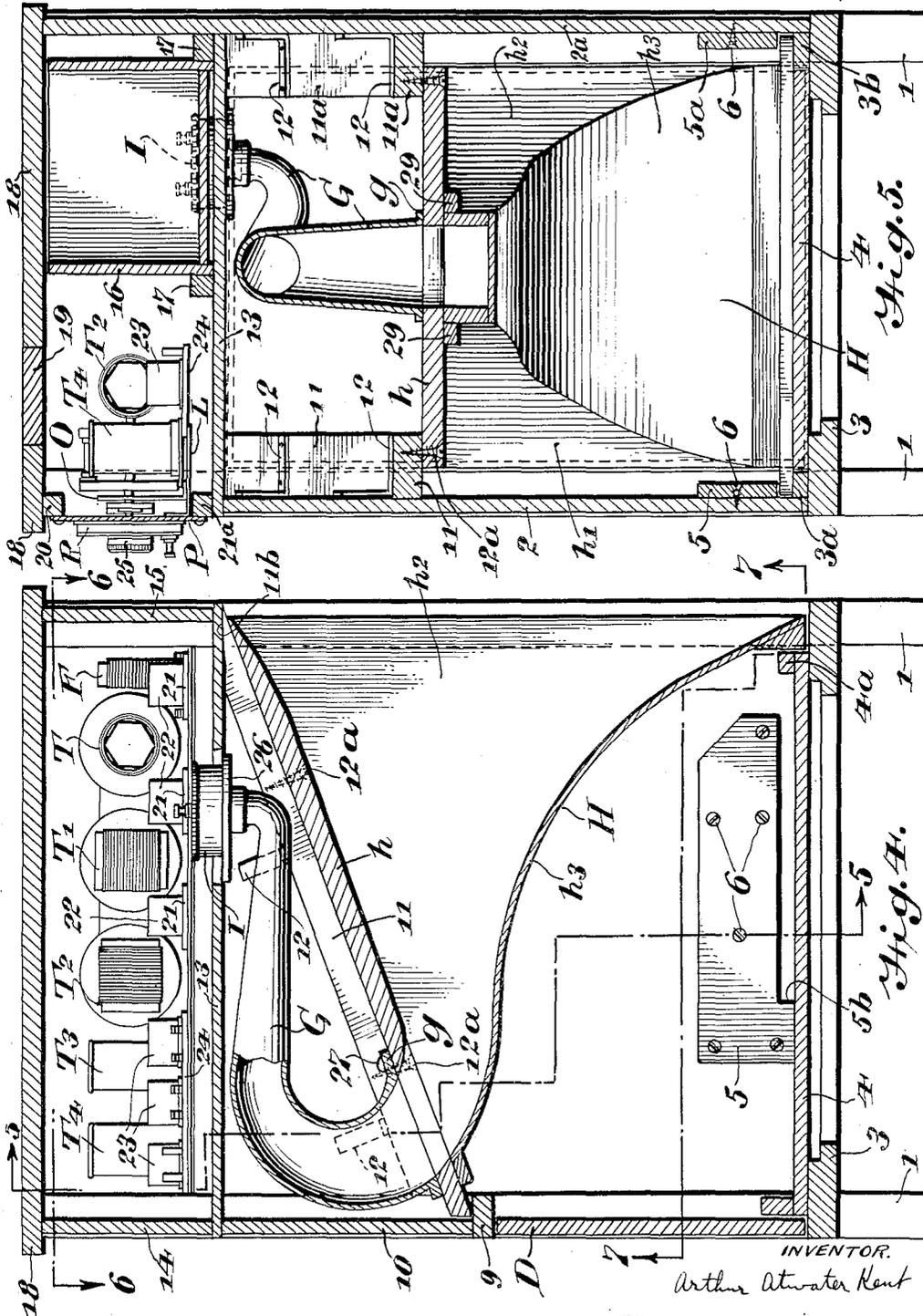
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3 Sheets-Sheet 3

Fig. 6.

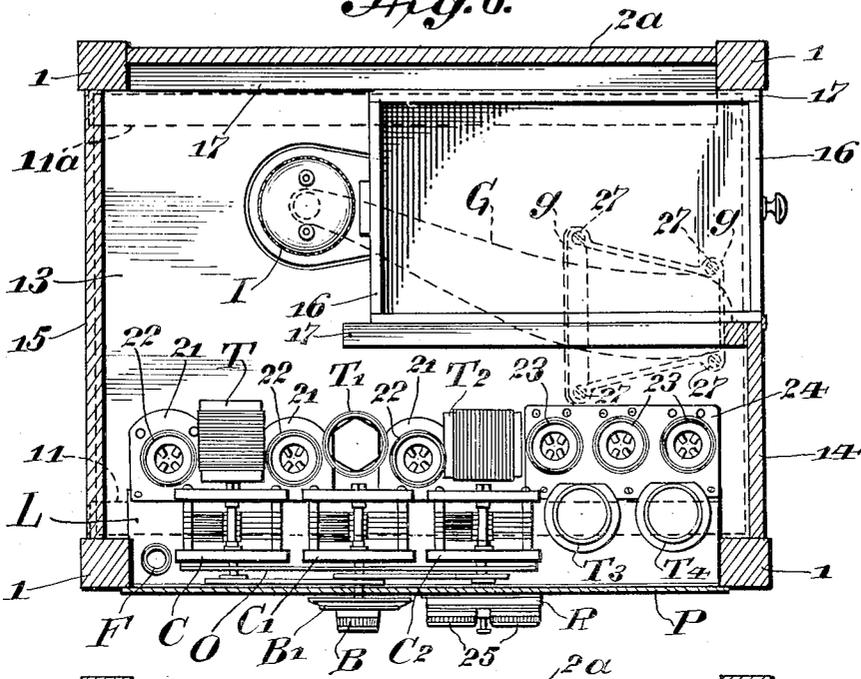


Fig. 7.

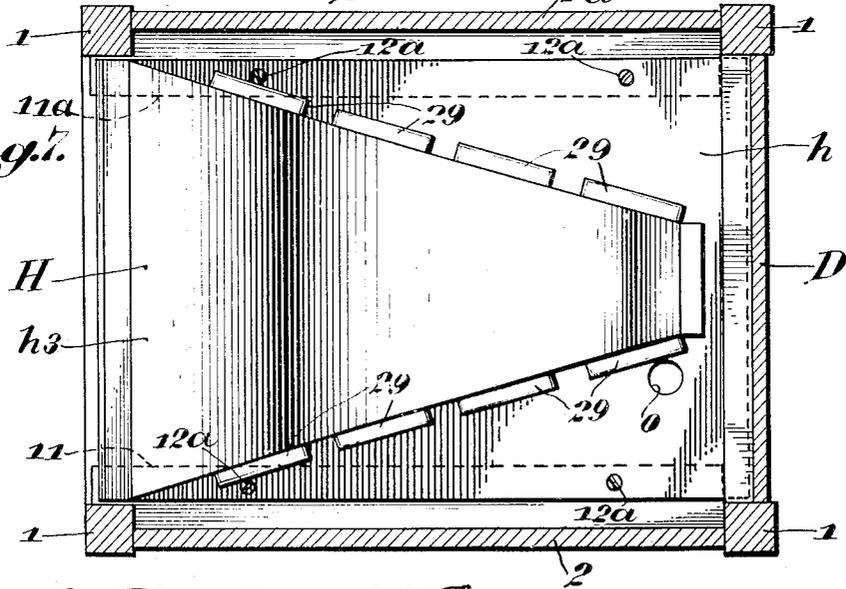
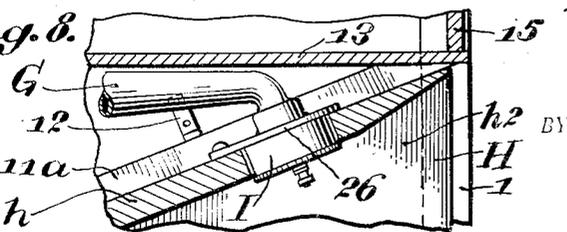


Fig. 8.



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# UNITED STATES PATENT OFFICE.

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## CABINET.

Application filed March 27, 1926. Serial No. 97,986.

My invention relates to closure structure, as a cabinet confining and supporting a sound amplifying horn or the like in such manner that the wall structure of the horn is not  
5 damped by the cabinet walls, or other cabinet structure and hence may vibrate freely under the influence of sound or signal waves passing therethrough without substantial trans-  
10 fer or vibratory impulses to said cabinet walls or other cabinet structures, and, more particularly, the amplifying horn aforesaid is so supported within the cabinet as to be readily removable as a unitary structure.

Further in accordance with my invention,  
15 there is provided a sound amplifying horn or radio speaker which is simple in construction, easy to assemble and cheap to manufacture, and which, preferably, is constructed of wood in sheet form, as veneer, which may  
20 be readily caused to assume the desired contour.

In accordance with my invention, a substantial portion of the wall structure of an amplifying horn is supported within a cabinet  
25 solely by a member forming another portion of said wall structure, and, more particularly, the wall structure last mentioned comprises a member preferably of greater thickness than the wall structure first mentioned extending transversely of the cabinet  
30 and preferably inclined with respect to the cabinet base.

Further in accordance with my invention,  
35 a member forming part of the wall structure of an amplifying horn and suitably secured transversely of a cabinet or the like forms the sole support for another part of the horn wall structure and has secured thereto a sound-conveying conduit or gooseneck one end of  
40 which is in registering relation with the throat of the horn and to whose other end is connected a signal-transmitting instrument or the like.

Further in accordance with my invention,  
45 the wall structure of an amplifying horn suitably supported within a cabinet or closure structure forms with the bottom thereof a chamber utilizable for any desired purpose, as for the reception of the storage, plate or  
50 other batteries of a radio receiving set.

Further in accordance with my invention,  
there is provided a compact cabinet within which is received a radio receiving set and a radio speaker or sound amplifying horn so  
55 constructed and arranged that a non-inter-

rupted flare is presented for the amplification of the music, speech or other sound waves passing therethrough, and, more particularly, the cabinet comprises one or more  
60 compartments or chambers utilizable for any desired purpose, as for the reception of storage or other batteries, accessories or the like.

My invention resides in features and details of construction of the character hereinafter described and claimed. 65

For an illustration of some of the forms that my invention may take, reference is to be had to the accompanying drawing, in which:

Figs. 1 and 2 are perspective views of a  
70 cabinet constructed in accordance with my invention.

Fig. 3 is an end view of the cabinet shown in Figs. 1 and 2.

Fig. 4 is a vertical sectional view taken  
75 transversely of my cabinet structure and looking toward the front thereof.

Fig. 5 is a vertical sectional view taken on the line 5—5 of Fig. 4 looking in the direction of the arrows. 80

Fig. 6 is a horizontal sectional view taken on the line 6—6 of Fig. 4 looking in the direction of the arrows.

Fig. 7 is a horizontal sectional view taken on the line 7—7 of Fig. 4 looking in the direction of the arrows. 85

Fig. 8 is a vertical sectional view illustrating a modified manner of supporting a signal-transmitting instrument.

Referring to the drawings, there is illustrated a cabinet A preferably of generally  
90 rectangular shape, herein shown as comprising the vertically extending legs or standards 1 to which are suitably secured the front and rear side walls 2 and 2<sup>a</sup>, Fig. 7, the  
95 former terminating short of the tops of a pair of the legs 1 to provide a rectangular opening closed by a panel P, as hereinafter more fully described.

A base 3 secured to the legs 1 constitutes  
100 a support for a pair of guides 3<sup>a</sup> and 3<sup>b</sup> or the like between which slides a member 4 utilizable for any desired purpose, for example, as a support for one or more plate batteries and a storage battery together with the tray  
105 usually associated therewith. Member 4 may be provided with an upstanding flanged portion 4<sup>a</sup> of a length slightly less than the distance between front and rear side walls 2 and 2<sup>a</sup>. Upon withdrawal of said member 4 from  
110

within the cabinet, flanged portion 4<sup>a</sup> thereof slides beneath stop members 5 and 5<sup>a</sup> suitably secured to the front and rear side walls of the cabinet, as by the screws 6. Complete withdrawal of member 4 is prevented by engagement of portion 4<sup>a</sup> thereof with the vertical portions 5<sup>b</sup> of stop members 5 and 5<sup>a</sup>, Fig. 4. However, should it be desired to remove member 4 from the cabinet, the flanged portion 4<sup>a</sup> thereof is elevated above stop members 5 and 5<sup>a</sup> and, while so held, member 4 is moved toward the left, Fig. 4. Since the width of member 4 is less than the distance between stop members 5 and 5<sup>a</sup>, this operation may be readily effected. It shall also be understood that a suitable stop or abutment, not shown, may be provided for so limiting movement of member 4 toward the right, Fig. 4, as to avoid contact thereof with the horn structure hereinafter described.

One of the side walls of the cabinet, as wall 2<sup>a</sup>, may be provided with a plurality of perforations 7 through which pass conductors connected to a signal system of desired character, as the antenna and earth or counter-capacity of a radio receiving system. Interiorly of cabinet A, the conductors aforesaid may be attached to terminals or binding posts 8, preferably secured to the guide 3<sup>b</sup>, Fig. 2.

A door D hinged to one of the legs 1 permits access to the interior of the cabinet and, when open, the member 4 may be readily withdrawn therefrom to the extent permitted by stop members 5 and 5<sup>a</sup> or entirely by elevating flanged portion 4<sup>a</sup> as indicated above.

A horizontal strip 9 extends between and is secured at each end to a leg 1 above the door D. Rising from horizontal strip 9 to a height substantially the same as the front side wall 2 is the intermediate section 10 of the wall structure for one end of the cabinet.

Supporting members or cleats 11 and 11<sup>a</sup> suitably secured, respectively, to the front and rear side walls 2 and 2<sup>a</sup> of the cabinet as by the angle irons 12, or other means, Figs. 5 and 7 support the heavy top section *h* of bell H, as hereinafter more particularly described, said top section *h* at one end thereof resting upon the horizontal strip 9 and extending across the cabinet forwardly and upwardly at an angle with respect to the cabinet base and having an opening *o* through which pass current-carrying conductors. Each supporting member 11 and 11<sup>a</sup> likewise extends forwardly and upwardly across the cabinet and terminates preferably in a beveled surface 11<sup>b</sup>, Fig. 4.

A dividing wall or floor 13 preferably secured to the legs 1 and engaging the beveled surfaces 11<sup>b</sup> of supporting members 11 and 11<sup>a</sup> occupies a substantially horizontal position and divides the cabinet into an upper and a lower compartment. Rising from wall 13 at either end of the cabinet are the top sections

14 and 15 of the wall structure at each end of the cabinet. If desired, top wall section 14 may be cut away to form a rectangular opening for the reception of a drawer 16 sliding between and guided by the ribs 17, Figs. 5 and 6.

The top of cabinet A may be closed or covered in any suitable manner, preferably, however, by utilizing a pair of plane horizontally extending members 18 separated by a third plane member 19 hinged to one of said members 18, which, when in the position indicated in Fig. 2 permits access to the interior of the upper compartment of the cabinet adjacent the front thereof.

In accordance with my invention, the primary function of the upper compartment of cabinet A is that of enclosing or housing suitable apparatus, for example, of a character suitable for detecting and amplifying radiant energy. Such apparatus may assume any desired form and for purposes of illustration is herein shown as conforming generally with apparatus of that character described and illustrated in my Patent No. 1,668,115, May 1, 1928.

Briefly, apparatus of the character aforesaid comprises the plate or panel P suitably secured to a pair of spaced strips 20 and 21<sup>a</sup>, Fig. 5, parallel one with the other and secured to the legs of the cabinet at the front thereof. Panel P may be of any suitable insulating or conducting material, but preferably of iron, steel, aluminum or brass, and secured thereto interiorly of the upper compartment of the cabinet is the shelf or ledge member L, preferably of sheet metal, having a flange integral therewith spot-welded or otherwise secured to said panel.

Spaced from and disposed substantially parallel with panel P is the rear plate or panel O, Fig. 5, preferably carried by or secured to said panel P.

Upon the rear panel O are mounted several variable adjustable tuning devices, such as variable inductances, or, and preferably, as indicated, variable tuning condensers for tuning two or more circuits of the receiving set.

In the example illustrated, three variable condensers C, C<sup>1</sup> and C<sup>2</sup> are mounted upon the rear panel O and have their rotors or adjustable elements mechanically coupled for simultaneous adjustment in unison by a single knob or handle on the outer side of the front wall or panel P.

Each of the rotor shafts of the variable condensers extend freely through apertures in the rear panel O, the shafts of the condensers C and C<sup>2</sup> terminating in the space between the panels O and P, while the shaft of the condenser C<sup>1</sup> extends freely through an aperture in the panel P to the front side thereof where there is attached thereto the operating knob or handle B, with which may be associated a dial B<sup>1</sup> bearing suitable graduations co-

acting with a marker or index on the front face of panel P.

As clearly described in my co-pending application aforesaid, the rotor shafts of the variable condensers C and C<sup>2</sup> are provided with individual drums or pulleys each in alignment with a pulley or drum on the rotor shaft of the variable condenser C<sup>1</sup>, a belt or band passing from the pulley on the rotor shaft of condenser C to one pulley on the rotor shaft of condenser C<sup>1</sup> and a second belt or band passing from the pulley on the rotor shaft of condenser C<sup>2</sup> to the other pulley on the rotor shaft of condenser C<sup>1</sup>.

Disposed upon the ledge L are the insulating bases or brackets 21 each carrying a tube socket 22 for a radio frequency amplifier of the audion type. A radio frequency auto-transformer F has its primary connected in series between the antenna or other absorption path and ground or counter-capacity and its secondary connected to the grid and cathode of the first tube of the series traversed by the incoming signal wave.

Radio frequency step-up transformers T, T<sup>1</sup>, and T<sup>2</sup> are connected in the proper circuit relation with the electrodes or terminals of the tubes in the sockets 22.

The tube sockets 23 for the remaining tubes of the apparatus are carried upon the member 24 of insulating material secured upon the ledge L at its inner edge. The audio frequency transformers T<sup>3</sup> and T<sup>4</sup> are likewise carried by said member 24.

On the front of the panel P is secured a structure R comprising two rheostats, not shown, adjustable by the knobs or handles 25 for controlling the current delivered to the filaments of the tubes in the sockets 22 and 23.

In accordance with my invention, the dividing wall 13 is cut away or provided with an opening preferably to the rear of the drawer 16, Fig. 6, in which is inserted a signal-transmitting instrument I, such as a loud speaker unit, telephone, or the like connected in the output circuit of the last tube in the audio frequency series. Preferably, instrument I is of the character disclosed in the patent to Kingsford, No. 1,672,493, June 5, 1928, wherein telephone structure for converting sound-representing current into sound waves is used in connection with horns and like amplifiers. Sound or signals reproduced in instrument I having a flange member 26 pass through a sound conveying conduit, as the gooseneck G, and are emitted through the sound amplifying horn H or the like of novel construction and supported in a novel manner in the cabinet A.

Gooseneck G is mounted in the upper part of said lower compartment and may be constructed from any one or more of a variety of materials but preferably is a metallic casting terminating in a flanged portion g, Figs. 4 and 6, suitably secured, as by screws 27 to

the top portion or section h of horn H in registering relation with an opening of suitable configuration in said section h.

Referring to Figs. 4 and 5, the upper portion of section h of horn H is shown in inclined position secured along either edge thereof to the cleats 11 and 11<sup>a</sup> in any suitable manner, as by the screws 12<sup>a</sup>. Horn H, in addition to top section h, comprises the side sections h<sup>1</sup> and h<sup>2</sup> and the bottom section h<sup>3</sup>, Fig. 5. The bottom and side sections aforesaid may be integrally formed and then suitably united with top section h or the latter and the side and bottom sections may be formed as an integral unit. All or any of the bottom and side horn sections may be constructed of any suitable material, preferably, however, of wood, as veneer, which may be readily caused to assume any desired form or contour. Preferably, and as herein shown, the top section h comprises throughout the greater part of its length substantially a flat plane member of materially greater thickness than the side and bottom sections. By preference, the side sections h<sup>1</sup> and h<sup>2</sup> are likewise flat, plane sections to which the bottom section h<sup>3</sup> is secured in suitable manner after said last-mentioned section has been properly formed, as by steaming, pressing and shaping into a member having the configuration indicated in Fig. 5. Ordinarily, the side sections h<sup>1</sup> and h<sup>2</sup> and bottom section h<sup>3</sup> are initially formed as a unitary structure and then secured to top section h in any suitable manner, as by the cleats or blocks 29, Figs. 5 and 7.

Referring particularly to Fig. 5, it will be observed that the horn side sections h<sup>1</sup> and h<sup>2</sup> are spaced from and removed from contact with the adjacent cabinet legs 1 or other cabinet structure and that the bottom horn section h<sup>3</sup> is likewise spaced from and removed from contacting engagement with the base 3 of the cabinet. It will also be observed that the section h in addition to forming the top of the horn also comprises parts or portions extending to either side thereof and that only the edges of these portions are secured to the cleats or members 11 and 11<sup>a</sup>, Fig. 7. Section h, then, while constituting the top of the horn also has the function of supporting the horn structure as a whole. It results, therefore, that although the horn H as a whole and particularly that part thereof comprising the bottom and side sections, necessarily partakes of vibratory movement due to the issuing sound waves, but little of such vibratory movement is damped by the cabinet whereby there is little or no distortion of the sound waves passing through said horn, nor are sound waves transmitted in any substantial amount through the cabinet to the radio set to interfere with the proper operation thereof. This is true despite the fact that the top section of the horn is supported on the portion

9 of the cabinet and is connected thereto by the cleats 11 and 11<sup>a</sup> in the manner indicated above, for the reason that the thickness of section *h* is such as to limit vibratory movement thereof and also because contact with the cabinet is effected in regions removed from the region traversed by sound waves passing through the horn.

Referring to Fig. 8, there is illustrated a modification of my invention wherein the signal-transmitting instrument I is mounted in an opening or aperture suitably located in the top section *h* of horn H rather than in the dividing wall 13.

When assembling the structure described above, the horn side sections *h*<sup>2</sup> should be united with the bottom section *h*<sup>3</sup> whereupon by utilizing the cleats 29, or equivalent, the now combined side and bottom sections may be secured to top section *h*. Then, after sound-translating instrument I has been secured to gooseneck G, the latter may be attached in proper relation to section *h* by means of screws 27. The combined structure aforesaid may then be moved within the lower cabinet compartment, the end of the top horn section *h* assuming a position on horizontal strip 9 and instrument I entering its aperture in dividing wall 13, when the latter is used. The edges of section *h* will now have assumed a position along and beneath the cleats 11 and 11<sup>a</sup> and said section may be secured thereto by the screws 12<sup>a</sup>, the workman gaining access to the interior of the cabinet through the opening closed by door D.

Although, in the upper compartment of cabinet A I have illustrated a particular type of radio receiving apparatus, it shall be understood that other types of radio apparatus may be employed, as desired. Further, it shall be understood that wall 13 may be utilized as the top surface of the cabinet in which case a portable radio set may be placed thereon.

It shall also be understood that when a radio set is positioned at the top of the cabinet as shown herein, it may be desirable to eliminate the dividing wall 13 or a large portion thereof in which case the drawer 16 would probably be omitted.

What I claim is:

1. In a cabinet, an amplifying horn, an inclined transverse member having a portion serving as a part of the wall structure of said amplifying horn, means for securing said member to the interior of the cabinet side exteriorly of said portion, and another portion of the wall structure of said horn supported solely by said member said horn presenting an unobstructed passage for the transmission of sound waves.

2. In a cabinet, a sound amplifying horn, a member having appreciable mass forming a portion of the wall structure of said amplifying horn, said horn having an unobstruct-

ed passage therethrough, means for supporting said member within said cabinet, said member shaped as a continuous part of the horn and another portion of the wall structure of said horn comprising a thin curved section less massive than said member and supported solely thereby.

3. In a cabinet, a sound amplifying horn, a member forming a portion of the wall structure of an amplifying horn, means for supporting said member entirely within said cabinet, another portion of the wall structure of said horn on one side of said member joined to and supported solely thereby, a goose neck supported by the other side of said member in registering relation with the throat of said horn, and a signal transmitting instrument mounted on the other end of said gooseneck.

4. In a cabinet, a dividing wall forming upper and lower compartments, said upper compartment adapted to house radio receiving apparatus, a sound amplifying horn having a wall dividing the lower compartment into an upper and a lower chamber, and a sound transmitting conduit in said upper chamber having an end in registering relation with the throat of said horn and a portion extending toward said upper compartment.

5. In a cabinet, a dividing wall forming upper and lower compartments, said upper compartment adapted to house radio receiving apparatus, a sound amplifying horn having an unobstructed passage therethrough and having a wall dividing the lower compartment into an upper and a lower chamber, the remainder of said horn being supported solely by said wall, a sound transmitting conduit in said upper chamber having an end in registering relation with the throat of said horn and a portion extending toward said upper compartment, another portion of the wall structure of said amplifying horn and the bottom of the cabinet forming an inclosed accessible space, and a removable supporting member in said space.

6. In a cabinet, a sound amplifying horn, a member forming a portion of the wall structure of said amplifying horn, said horn having an unobstructed passage therethrough, means for supporting said member within said cabinet, the remaining wall structure joined to and supported solely thereby, a sound transmitting conduit, and a signal transmitting instrument connected to said conduit and mounted in the wall of said member.

7. In a cabinet, a sound amplifying horn, a member forming a portion of the wall structure of said amplifying horn, said horn having an unobstructed passage for the transmission of sound waves, another portion of the wall structure of said horn on one side of said member joined to and supported sole-

ly thereby, a sound transmitting conduit mounted upon the other side of said member, and a signal transmitting instrument connected to said conduit and mounted in the wall structure of said member.

8. In a cabinet, an amplifying horn, a member forming a portion of the wall structure of said horn, said horn having an unobstructed passage therethrough, a sound transmitting conduit connected to said horn at one end, and a signal transmitting instrument connected to said conduit at the other end thereof and mounted in the wall structure of said member.

9. In a cabinet, a sound amplifying horn presenting an unobstructed passage for the transmission of sound waves comprising a member forming part of the wall structure of said horn secured within said cabinet, and horn structure comprising the remaining wall sections of said amplifying horn secured to and supported solely by said member, said member having appreciable mass such that vibrations set up in the cabinet structure are not transmitted to an appreciable extent to the amplifying horn to injure the tone qualities thereof.

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