March 11, 1958 E. S. MILLER 2,826,260

HIGH-FIDELITY SOUND SYSTEM

Filed May 18, 1956

Fig. 1.

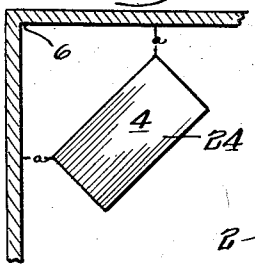


Fig. 2.

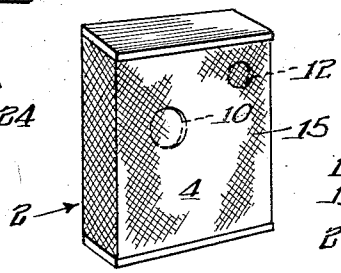


Fig. 6.

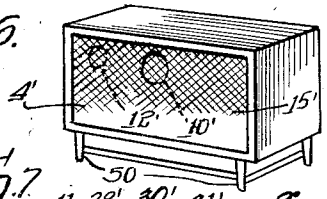


Fig. 7.

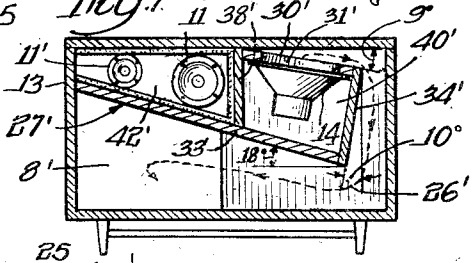


Fig. 3.

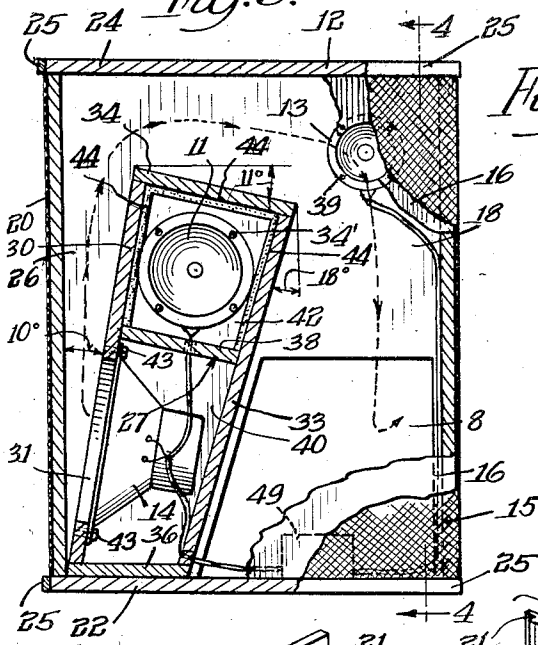


Fig. 4.

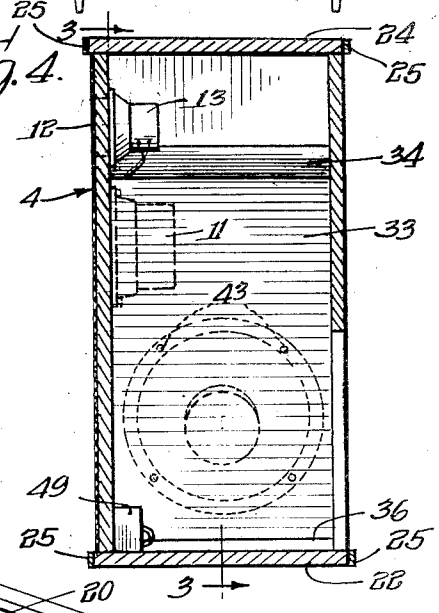
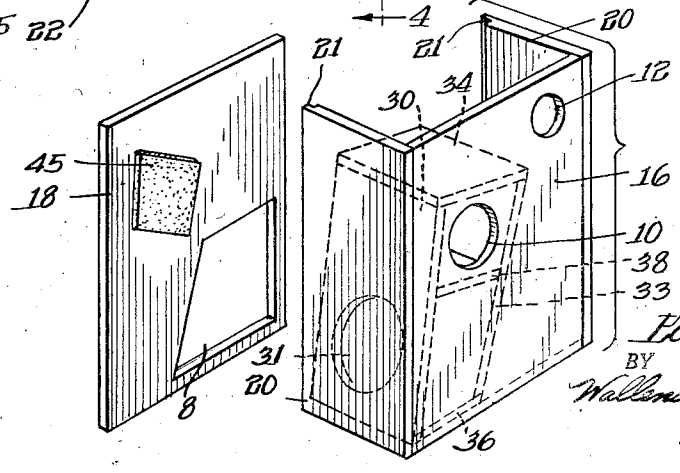


Fig. 5.



INVENTOR.
Edward Miller
BY
Wallenstein & Spangenberg
Attys

United States Patent Office 2,826,260
Patented Mar. 11, 1958

2,826,260

HIGH-FIDELITY SOUND SYSTEM

Edward S. Miller, Highland Park, Ill., assignor to Sherwood Electronic Laboratories, Inc., Chicago, Ill., a corporation of Illinois

Application May 18, 1956, Serial No. 585,861

9 Claims. (Cl. 181—31)

This invention relates to a high fidelity speaker system, more particularly it relates to a high fidelity speaker system which utilizes a cabinet having partition walls therein forming a low frequency folded horn speaker system.

Heretofore, in the interest of obtaining the best possible low frequency response, high fidelity speaker systems of the highest quality have required bulky, unattractive cabinets, and were so expensive that they could not be afforded by the average person.

It is accordingly one of the primary objects of the present invention to provide a speaker system of the general type above described which has frequency response and low distortion characteristics comparable to prior speaker systems costing many times more than the system constructed in accordance with the present invention.

In accordance with one aspect of the present invention the speaker cabinet, which is partitioned to form an equivalent low frequency range exponential folded horn, is arranged so that the horn folds around a generally horizontal axis extending between front and rear of the cabinet. In this way, a folded horn passage of appreciable length is obtained with a cabinet of relatively small depth. This makes for a relatively attractive cabinet design. Either or both the width and height of a cabinet is made substantially greater than the depth thereof to provide a horn passage of appreciable over-all length. To reduce the cost of the cabinet, the folded horn passage is preferably formed by flat panels extending between the vertical front and rear cabinet walls which panels are inclined to the contiguous side, bottom and top walls of the cabinet to form a folded horn passage whose cross sectional area progressively increases in a manner to approximate an ideal low frequency exponential horn. Although the cross-sectional area of the passage section formed between each panel and the contiguous cabinet wall increases linearly, an approximation to an exponential curve is preferably obtained by increasing the inclination of the panels at each corner or fold of the horn.

The various panels forming the folded horn passage are preferably constructed to form a rigid box-like structure to minimize undesired vibration and resultant loss of output. The box-like panel structure in the preferred form of the invention, has an intermediate partition which divides the interior of the box-like structure into two cavities. In the cavity nearest the throat of the horn passage, a woofer or low frequency range speaker is preferably mounted for driving the low frequency horn passage. This speaker is preferably designed to operate in the range of 30–300 cycles per second. In the other cavity is mounted preferably an intermediate range speaker which is mounted opposite an opening in the front wall of the cabinet through which it directs frequencies in an intermediate range. This range preferably extends from 300 to approximately 5,000 cycles per second. Also mounted opposite an opening in the front wall of the cabinet is the tweeter speaker which preferably operates in the range of from 5,000 to 18,000 cycles per

second. By using three spearate speakers to cover the range of from 30 to 18,000 cycles per second, intermodulation distortion is held to a minimum. Further, the arrangement of the various cavities and panels within the cabinet is such that access may be had to all speakers by removing the rear wall of the cabinet.

The cabinet is preferably designed to be used in the corner of a room so that the intersecting walls of the room act as a continuation of the folded horn passage. To this end, a large opening is provided in the rear wall of the cabinet through which opening the sound in the mouth of the folded horn passage leaves the cabinet.

The over-all shape of the cabinet is pleasing to the eye in that it is small relative to high quality, low frequency cabinets heretofore used and, because of the orientation of the folded horn passage, it has a shallow depth to provide a piece of furniture which is pleasingly proportioned. Further, the arrangement of the cabinet is such that space for all three speakers is provided; and all this is obtained for a cost which is a fraction of the cost of speaker systems of comparable quality heretofore made.

Other objects, advantages and features of the invention will become apparent upon making reference to the specification to follow, the claims, and the drawings wherein:

Fig. 1 is a horizontal section through the corner of a room showing the relationship of the speaker cabinet of the invention to the corner of the room;

Fig. 2 is a perspective view of the cabinet of Fig. 1;

Fig. 3 is an enlarged longitudinal vertical section through the cabinet of Fig. 2 taken along section line 3—3 in Fig. 4;

Fig. 4 is a vertical transverse section through the cabinet, taken along section line 4—4 of Fig. 3;

Fig. 5 is a perspective view of the cabinet shown in the previous figures with the top wall of the cabinet removed together with the various loud speakers used therein;

Fig. 6 is a perspective view of another form of cabinet of the present invention; and

Fig. 7 is a longitudinal vertical section through the cabinet of Fig. 6.

Referring now to the embodiment shown in Figs. 1 through 5, the speaker system there shown includes a rectangular cabinet 4 having a depth substantially less than the height and width of the cabinet to present an overall shape of attractive and practical proportions. The cabinet is designed to be mounted in the corner 6 of a room as shown in Fig. 1 wherein sound of the very lowest range of frequencies, for example from 30 to 300 cycles per second, are directed rearwardly of the cabinet through a large opening 8 in the rear wall thereof toward the corner 6 of the room. Sound is then reflected out into the room from between the sides of the cabinet and the walls of the room, the latter acting as a continuation of a low frequency horn passage located within the cabinet, as will be hereafter described.

The front of the cabinet is provided with a generally circular opening 10 behind which a cone type speaker 11 is mounted which is designed to direct frequencies in the intermediate range, for example, from 300 to 5,000 cycles per second, through the opening 10 forwardly into the room. A generally circular opening 12 is also provided in the front of the cabinet behind which opening is mounted a tweeter or high frequency speaker 13 preferably designed to operate in the range of from 5,000 to 18,000 cycles per second. This speaker directs high frequency sound through the opening 12 forwardly into the room. A band of grill cloth 15 covers the front and sides of the cabinet.

The caginet 4, as shown most clearly in Figs. 3 through

5, has a front wall 16 preferably made from ¾ inch plywood having the aforesaid circular holes 10 and 12 formed therein. Secured to the vertical side edges of the front wall 16 by gluing and nailing are a pair of shallow side walls 20—20. The side walls are similarly preferably made from ¾ inch plywood. The inner rear portion of the side walls are shown rabbeted at 21. The ends of the band of grill cloth 15 are folded around the rear edges of the side cabinet walls and nailed to the inner side surfaces thereof in the rabbeted edges 21—21. A rear cabinet wall 18 preferably made from ¾ inch plywood fits within the rabbeted portions of the side walls and is suitably removably secured thereto by screws or the like. The rear wall 18 has formed therein the aforementioned opening 8 which opens onto the mouth of the low frequency horn passage formed inside the cabinet. Bottom and top cabinet walls 22—24 more preferably of ¾ inch plywood are secured to the bottom and top edges of the cabinet side, front and rear walls as by screws or nails and glue. Since the top wall 24 is exposed it is preferably made of a veneer plywood. Molding pieces 25 are secured to the raw edges of the plywood walls.

The horn passage, which is generally indicated by the reference numeral 26, follows the path indicated by the arrowed dotted line in Fig. 3. It is formed by a lop-sided, box-like structure 27 secured within the cabinet 4. This structure includes side panels 30 and 33 which extend between the front and rear cabinet walls 16 and 18, upper and lower panels 34 and 36 which are secured between the ends of the side panels 30 and 33, and an intermediate partition panel 38 secured between an intermediate portion of the side panels 30 and 33 thereby forming an upper cavity or compartment 42 which receives the intermediate frequency range speaker 11, which may be secured to the front cabinet wall 16 by nuts and bolts 34', and a lower compartment 40 which receives the woofer or low frequency speaker 14.

The upper and side walls of the cavity 42 are lined with suitable sound insulating material 44 and a piece of similar insulating material 45 is secured to the rear cabinet wall 18 in a position where it will just fit within the confines of the cavity 42. The aforementioned panels forming the box-like structure 27 are all preferably made from ¾ inch plywood.

The side panel 30 nearest the left hand cabinet side wall 20 as viewed in Fig. 3 is inclined to the latter vertical wall preferably at an angle in the neighborhood of 10°, and together with the side wall 20 and the front and rear walls 16 and 18, form the throat portion of the folded horn passage 26. A circular opening 31 is formed in the lower portion of side panel 30 opposite the lower cavity or compartment 40 and a woofer speaker 14 is mounted behind the opening by suitable carriage bolts 43 passing through the panel 30 and the speaker rim.

The next section of the folded horn passage is formed between the upper panel 34 of the box-like structure 27 and the top wall 24 of the cabinet, and in a preferred form of the invention, the upper panel 34 may make an angle of approximately 11° with the horizontal.

The mouth portion of the horn passage is formed by the side panel 33 together with the front, rear and right-hand side walls of the cabinet. The side panel 33 preferably makes an angle of approximately 18° with the vertical.

The folded horn passage within the cabinet opens to the outside of the cabinet through the aforementioned opening 8 in the rear wall 18 of the cabinet. The cross sectional area of this hole preferably is in the neighborhood of the cross sectional area of the medial section of the mouth portion of the folded horn passage.

The tweeter or high frequency speaker 13, is mounted opposite the opening 12 of the front cabinet wall by suitable bolts and nuts 39. In the form of the invention illustrated in Figs. 1–5 this places the tweeter 13 in the region between the intermediate and mouth portion of the folded horn passage 26. This speaker is in a housing open only at the front to prevent intermodulating effects from other speakers.

A suitable cross-over network unit 49 may be secured to the front wall 16 of the cabinet near the bottom thereof, as shown in Fig. 4, and wires extend from the various speakers to terminals of the cross-over network. Where wires extend through an opening in the box-like structure 27, the hole is closed off using putty or other similar material. It is important to make each cavity and the horn passage air tight except at the openings behind which the speakers are mounted and the cabinet opening 8. Cross-over point between the intermediate frequency speaker 11 and the tweeter 13 is preferably made at 5,000 cycles per second at a 12 db/octave point on the response curve.

In one speaker system heretofore constructed the specifications were as follows:

Front cabinet wall 16—over-all dimensions were 23½ inches x 31 inches x ¾ inch; opening 10 was 7 inches in diameter; opening 12 was 4 3/16 inches.

Rear cabinet wall 18—over-all dimensions were 24 7/16 inches x 31 inches x ¾ inch; opening 8 was 14½ inches high, 14¾ inches across the bottom and 10¼ inches across the top.

Side walls 20—over-all dimensions 14¼ inches x 31 inches x ¾ inch; rabbeted along ¾ inch strip.

Top and bottom walls 22—24—over-all dimensions 14 5/16 inches x 25⅛ inches x ¾ inch.

Cabinet interior—over-all dimensions of space were 23½ inches x 31 inches x 12¾ inches (depth).

Cabinet exterior—over-all dimensions were 25 inches x 32½ inches x 14¼ inches.

Panel 30—over-all dimensions were 24 9/16 inches x 12¾ inches x ¾ inch; bevel at bottom was 10°; opening 31 was 10 inches in diameter.

Panel 33—over-all dimensions were 12¾ inches x 23½ inches x ¾ inch; bevel at bottom edge was 18° and bevel at top edge was 7°.

Panel 34—over-all dimensions were 12¾ inches x 10⅞ inches x ¾ inch.

Panel 38—over-all dimensions were 12¾ inches x 8⅛ inches x ¾ inch; bevel at right edge was 7°.

Panel 36—over-all dimensions were 12¾ inches x 8 inches x ¾ inch.

Speaker 14—12 inch cone speaker with 1 lb. magnet (30–300 C. P. S.).

Speaker 11—8 inch cone speaker with 14.6 ounce magnet (300–5,000 C. P. S.).

Speaker 13—5 inch cone speaker with 2.15 ounce magnet (5,000–18,000 C. P. S.).

The speaker cabinet is placed in the corner 6 of the room as shown in Fig. 1 so that the sound in the low frequency range is directed rearwardly into the corner through the rear cabinet opening 8. The rear corners of the cabinet are spaced from the walls so that the distances *a*—*a* are preferably in the neighborhood of from 4–9 inches.

Reference should now be made to the modified form of the invention as shown in Figs. 6 and 7. This embodiment of the invention provides an attractive cabinet 4' having a general over-all size of approximately 40 inches wide across the front of the cabinet, a height of 20 inches and a depth of approximately 14½ inches. The cabinet, which is supported upon a suitable attractive leg structure 50, is arranged similarly to the embodiment of the invention just described in that it has a folded horn passage 26' therein folded around a generally horizontally extending axis extending between the front and rear walls of the cabinet. The front and side walls of the cabinet are covered over with a suitable grill cloth 15' which covers openings 10' and 12' behind which are mounted the intermediate frequency range speakers 11

and 14, respectively. A box-like structure 27' is formed in the cabinet which structure forms the folded horn passage 26'. This box-like structure includes a panel 30' extending between the front and rear cabinet walls which inclines with respect to the top wall of the cabinet, making an angle preferably a little less than 10°, for example 9°, therewith, a generally upstanding panel 34' extending between the front and rear walls of the cabinet and secured to the end of the panel 30' and which makes an angle preferably of approximately 10° with a vertical, relatively long panel 33' extending between the front and rear walls of the cabinet and which inclines preferably approximately 16° with respect to a horizontal and a partition panel 38' which extends between the end of the panel 30' adjacent the upper cabinet wall and intermediate point of the long bottom panel 33'. The partition panel 38' forms a cavity 40' in which the woofer speaker 14 is mounted opposite an opening 31' formed in the upper panel 30'. A cavity 42' is also formed by the partition wall 38' in which cavity are mounted the intermediate frequency speaker 11 behind the opening 10' and the tweeter 13' behind the opening 12'.

The low frequency sounds emitted from the woofer speaker 14 leave the cabinet through an opening 8' formed in the rear cabinet wall which opening has a cross-sectional area approximately equal to the average cross-sectional area of the portion of the horn passage defined between the bottom panel 33' of the box-like structure and the outer cabinet walls.

The form of the invention shown in Figs. 6 and 7 has a somewhat shorter overall horn passage length than the embodiment of Figs. 1–5. In general, it has the same advantages mentioned in connection with the embodiment of Figs. 1–5.

It should be understood that numerous modifications may be made of the preferred forms of the invention above described without deviating from the broader aspects of the invention.

It is claimed as new and desired to be protected by Letters Patent of the United States:

1. A speaker system comprising: a cabinet to be placed in the corner of a room and including rear, front, top, bottom and side walls, one of said front and rear walls having an opening through which sound in the very lowest range of frequencies is to be emitted from the cabinet, and said front wall having an opening through which sound in an intermediate range of frequencies is to be emitted from the cabinet, wall means in said cabinet in the form of flat panels which extend between the front and rear cabinet walls and are inclined with respect to the side, top and bottom walls of the cabinet to form therewith a low frequency folded horn passageway, the mouth of said folded horn passageway opening onto said first-mentioned opening, partition wall means extending between said wall means and between said front and rear cabinet walls and forming a first compartment adjacent to the throat of said low frequency passageway and a second compartment opposite said opening in said front cabinet wall, said passageway-forming wall means having an opening opposite the throat of said folded horn passageway communicating with said first compartment, a low frequency driver mounted in said first compartment to direct low frequency sound into the throat of said folded horn passageway through said last-mentioned opening, and an intermediate frequency range speaker in said second compartment mounted to direct sound through said opening in said front cabinet wall.

2. A speaker system comprising: a cabinet to be placed in the corner of a room and including rear, front, top, bottom and side walls, one of front and rear walls having an opening through which sound in the very lowest range of frequencies is to be emitted from the cabinet, and said front wall having an opening through which sound in an intermediate range of frequencies is to be emitted from the cabinet, wall means in said cabinet which

are inclined with respect to the side, top and bottom walls of the cabinet to form a low frequency folded horn passageway, the mouth of said folded horn passageway opening onto said first-mentioned opening, partition wall means forming a first compartment adjacent to the throat of said low frequency passageway and a second compartment opposite said opening in said front cabinet wall, said passageway-forming wall means having an opening opposite the throat of said folded horn passageway communicating with said first compartment, a low frequency driver mounted in said first compartment to direct low frequency sound into the throat of said folded horn passageway through said last-mentioned opening, and an intermediate frequency range speaker in said second compartment mounted to direct sound through said opening in said front cabinet wall.

3. A speaker system comprising: a cabinet formed by front, rear, side, top and bottom walls, means forming a folded horn passageway in said cabinet comprising an open-sided box-like structure extending from one of the side, top and bottom walls thereof only part way across the cabinet interior to form a passageway extending around at least part of the outside of the box-like structure, the open sides of the box-like structure being closed-off by the front and rear cabinet walls, said box-like structure having exterior flat panels inclined with respect to the contiguous walls of the cabinet to form a low frequency range folded horn passageway, a partition panel in said box-like structure dividing the same into at least two cavities, the cavity nearest the throat of said folded horn passageway having a low frequency driver therein which is mounted to direct sound of the lowest frequency range into the throat of said passageway, the front wall of said cabinet having hole means therein opening onto said other cavity, speaker means in said other cavity for directing sound of a higher frequency range from the front of the cabinet, and one of said front and rear cabinet walls having a large opening therein communicating with the mouth of said folded horn passageway and through which the sound in the lowest frequency range is directed.

4. A speaker system comprising: a cabinet having vertical front, rear and side walls and horizontal top and bottom walls, a first pair of spaced, opposed, partition panels oriented at right angles to and extending between the front and rear cabinet walls, one of said panels extending part way across the cabinet interior from a point contiguous to a corner of the cabinet and inclined at a relatively small angle with a wall of the cabinet to form the throat portion of a folded horn passageway, said one panel having an opening near said cabinet corner, a low frequency speaker mounted between said panels behind said opening to drive said horn passageway, the other opposed panel extending a lesser distance across the cabinet interior from a point contiguous to a wall adjacent to said last-mentioned wall, said latter panel inclining in the same general direction as the former panel but at a greater angle to form with the wall which is opposite said last-mentioned wall the mouth portion of said folded horn passage, the cross-sectional area of the smaller end of said mouth portion being appreciably greater than the cross-sectional area of the large end of said throat portion, an end panel extending between and oriented at right angles to the front and rear walls of the cabinet, said end panel joining the ends of said opposed panels which are furthest from said cabinet corner, the end panel being inclined with respect to the contiguous wall of the cabinet, the location of the ends of said opposed panels being such that the end panel extending therebetween forms an intermediate horn passage portion which at its narrower end joins and is of a comparable size to the wide end of said throat portion of the folded horn passage, and at its wider end joins and is of comparable size to the narrow end of the mouth portion of said folded horn passage, and one of said front and

rear cabinet walls having a low frequency sound discharge opening opposite said mouth portion of the horn passage.

5. A speaker system comprising: a cabinet having vertical front, rear and side walls and horizontal top and bottom walls, the spacing between the side walls of the cabinet being appreciably less than the spacing between the top and bottom walls thereof and greater than the spacing between the front and rear walls thereof, a first pair of spaced, opposed, partition panels oriented at right angles to and extending between the front and rear cabinet walls, one of said opposed panels extending from one of said top and bottom walls part way across the cabinet interior and inclined at a given angle to a side wall of the cabinet, the other opposed panel extending a greater distance part way across the cabinet interior than said one opposed panel, said other opposed panel being closer to the latter side wall and extending from a point contiguous to a corner of the cabinet formed by said latter side wall and said one of said top and bottom walls and inclining with respect to said latter top wall at a substantially lesser angle than said given angle to form the throat portion of a folded horn passageway, said one opposed panel forming with the other of said side walls the mouth portion of the folded horn passageway, the cross-sectional area of the smaller end of said mouth portion of the folded horn passageway being appreciably greater than the cross-sectional area of the large end of the throat portion of said folded horn passageway, an end panel extending between and oriented at right angles to the front and rear walls of the cabinet, said end panel joining the distal ends of said opposed panels, the end panel being inclined with respect to the contiguous confronting wall of the cabinet, the location of the distal ends of said opposed panels being such that the end panel extending therebetween forms an intermediate horn passageway portion which at its narrow end joins and is of a comparable size to the wide end of said throat portion of said horn passageway, and at its wider end joins and is of comparable size to the narrow end of the mouth portion of said folded horn passageway, an intermediate partition panel extending between said front and rear cabinet walls and between intermediate portions of said opposed panels to thereby form adjacent compartments, and a low frequency speaker mounted in the compartment nearest the narrow end of the throat portion of said folded horn passageway, said other opposed panel having an opening through which sound from said low frequency speaker is directed into the throat portion of said folded horn passageway, speaker means mounted in the other of said compartments and operable in a higher frequency range, and said front cabinet wall having an opening opposite said latter compartment through which said speaker means therein directs said higher frequency sounds, and one of said front and rear cabinet walls having a large low frequency sound discharge opening opposite and communicating with said mouth portion of the folded horn passageway.

6. A speaker system comprising: a cabinet having vertical front, rear and side walls and horizontal top and bottom walls, the spacing between the side walls of the cabinet being appreciably less than the spacing between the top and bottom walls thereof and greater than the spacing between the front and rear walls thereof, a first pair of spaced, opposed, partition panels oriented at right angles to and extending between the front and rear cabinet walls, one of said opposed panels extending from one of said top and bottom walls part way across the cabinet interior and inclined at a given angle to a side wall of the cabinet, the other opposed panel extending a greater distance part way across the cabinet interior than said one opposed panel, said other opposed panel being closer to the latter side wall and extending from a point contiguous to a corner of the cabinet formed by said latter side wall and said one of said top and bottom walls and inclining with respect to said latter side wall at a substantially lesser angle than said given angle to form the throat portion of a folded horn passageway, said one opposed panel forming with the other of said side walls the mouth portion of the folded horn passageway, the cross-sectional area of the smaller end of said mouth portion of the folded horn passage being appreciably greater than the cross-sectional area of the large end of the throat portion of said folded horn passageway, an end panel extending between and oriented at right angles to the front and rear walls of the cabinet, said end panel joining the distal ends of said opposed panels, the end panel being inclined with respect to the contiguous confronting wall of the cabinet, the location of the distal ends of said opposed panels being such that the end panel extending therebetween forms an intermediate horn passageway portion which at its narrow end joins and is of a comparable size to the wide end of said throat portion of said folded horn passageway, a partition panel extending between said front and rear cabinet walls to form a low frequency speaker compartment, a low frequency speaker mounted in said compartment, said other opposed panel having an opening through which sound from said low frequency speaker is directed into the throat portion of said folded horn passageway, and one of said front and rear cabinet walls having a large low frequency sound discharge opening opposite and communicating with said mouth portion of the folded horn passageway.

7. A speaker system comprising: a cabinet having vertical front, rear and side walls and horizontal top and bottom walls, the spacing between the side walls of the cabinet being appreciably greater than the spacing between the top and bottom walls thereof and between the front and rear walls thereof, a first pair of spaced, opposed, partition panels oriented at right angles to and extending between the front and rear cabinet walls, one of said opposed panels extending from an intermediate portion of one of said top and bottom walls to a point partway across the cabinet interior and inclined at a given angle to said latter wall, the other opposed panel extending from one of said side walls in the same general direction as said one opposed panel extends and making a greater angle with respect to said one of said top and bottom walls, said other opposed panel terminating at a point spaced from the other one of said side walls a greater amount than the distal end of said one opposed panel, said one opposed panel defining a throat portion of a folded horn passageway and said other opposed panel defining the mouth portion of a folded horn passageway, the cross-sectional area of the smaller end of said mouth portion of the folded horn passageway being appreciably greater than the cross-sectional area of the large end of the throat portion of said folded horn passageway, an end panel extending between and oriented at right angles to the front and rear walls of the cabinet, said end panel joining the distal ends of said opposed panels and being inclined with respect to the contiguous confronting wall of the cabinet, the location of the distal ends of said opposed panels being such that the end panel extending therebetween forms an intermediate horn passageway portion which at its narrow end joins and is of a comparable size to the wide end of said throat portion of said horn passageway, and at its wider end joins and is of comparable size to the narrow end of the mouth portion of said folded horn passageway, a partition panel oriented at right angles and extending between said front and rear cabinet walls from an intermediate portion of said other opposed panel to form therewith adjacent compartments, around which said folded horn passageway extends, a low frequency speaker mounted in the compartment nearest the throat portion of said folded horn passageway, said one opposed panel having an opening through which sound from said low frequency speaker is directed into the

throat portion of said folded horn passageway, speaker means mounted in the other of said compartments and operable in a higher frequency range, and said front cabinet wall having an opening opposite said latter compartment through which said speaker means therein directs said higher frequency sounds, and one of said front and rear cabinet walls having a large low frequency sound discharge opening communicating with and opposite said mouth portion of the folded horn passageway.

8. A speaker system comprising: a cabinet having vertical front, rear and side walls and horizontal top and bottom walls, the spacing between the side walls of the cabinet being appreciably greater than the spacing between the top and bottom walls thereof and between the front and rear walls thereof, a first pair of spaced, opposed, partition panels oriented at right angles to and extending between the front and rear cabinet walls, one of said opposed panels extending from an intermediate portion of one of said top and bottom walls to a point partway across the cabinet interior and inclined at a given angle to said latter wall, the other opposed panel extending from one of said side walls in the same general direction as said one opposed panel terminating at a point spaced from the other one of said side walls a greater amount than the distal end of said one opposed panel, said one opposed panel defining a throat portion of a folded horn passageway and said other opposed panel defining the mouth portion of a folded horn passageway, the cross-sectional area of the smaller end of said mouth portion of the folded horn passageway being appreciably greater than the cross-sectional area of the large end of the throat portion of said folded horn passageway, an end panel extending between and oriented at right angles to the front and rear walls of the cabinet, said end panel joining the distal ends of said opposed panels and being inclined with respect to the contiguous confronting wall of the cabinet, the location of the distal ends of said opposed panels being such that the end panel extending therebetween forms an intermediate horn passageway portion which at its narrow end joins and is of a comparable size to the wide end of said throat portion of said folded horn passageway, and at its wider end joins and is of comparable size to the narrow end of the mouth portion of said folded horn passageway, a partition panel extending between said front and rear cabinet walls to form a low frequency speaker compartment, a low frequency speaker mounted in said compartment, said one opposed panel having an opening through which sound from said low frequency speaker is directed into the throat portion of said folded horn passageway, and one of said front and rear cabinet walls having a large low frequency sound discharge opening opposite and communicating with said mouth portion of the folded horn passageway.

9. The speaker system of claim 2 wherein said first-mentioned opening for sound in the low range of frequencies is formed in said rear cabinet wall.

References Cited in the file of this patent

Johnson, pub., Radio & Television News, September 1951, pp. 63 and 144.

Gassan, pub., Audio Eng'g., September 1953, pp. 22, 23, 63, 64.