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1,934,932

SOUND AMPLIFIER

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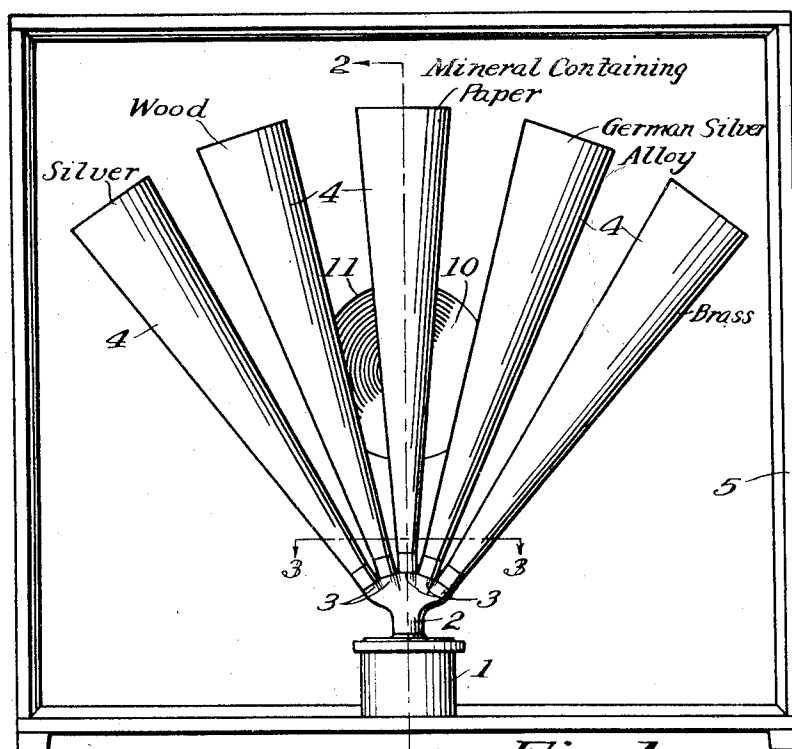


Fig. 1.

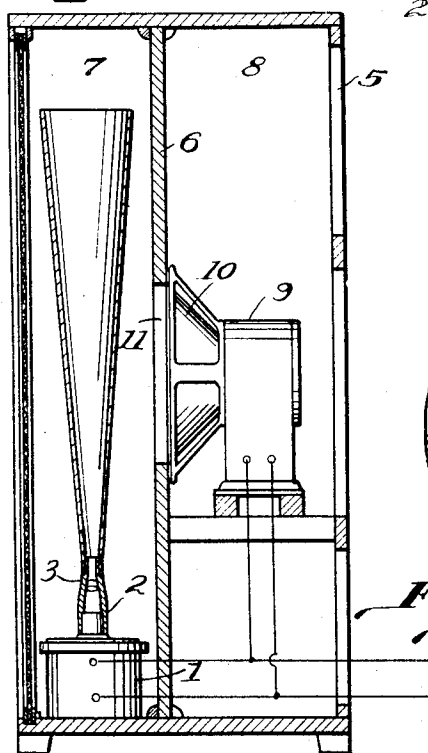


Fig. 2.

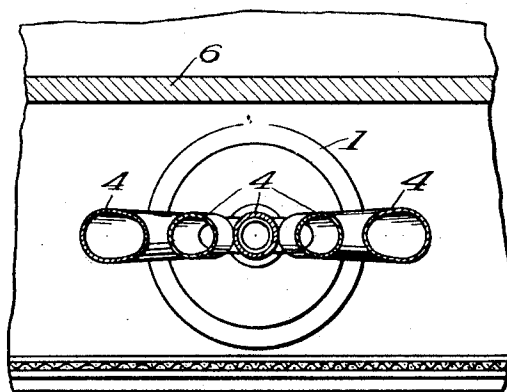


Fig. 3.

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SOUND AMPLIFIER

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5 Claims. (Cl. 181—27)

This invention relates to improvements in sound amplifiers for use in connection with sound reproducing instruments and apparatus and has to do particularly with an amplifier formed to comprise a plurality of spaced horns operated by a single reproducer and wherein the horns are formed from different resonating materials which respond sensitively to reproduce sound energy for the purpose of purifying and improving the reproduced tonal effects, whereby the blended and reproduced sound conforms faithfully to the original rendition.

Most sound amplifiers used in connection with the reproduction of sound by radio and sound record apparatus are formed to possess resonant walls of the same materials throughout their composition. Thus most amplifiers are formed from wood, metal or composition materials such as specially treated and prepared paper. I have found that such conventional amplifiers have certain definite tonal characteristics inherent in their construction which prevent such amplifiers from producing to the best advantage sounds of an all-inclusive nature. Certain amplifiers reproduce quite clearly, for example, the violin, and others, the metallic instruments, but very few of the amplifiers will reproduce with natural tone values the sounds of a piano or a high soprano voice. A pleasing melodious sound is composed of the fundamental tones and in addition those high frequency tones ordinarily referred to as harmonics or overtones, and it is the primary object of the present invention to provide a loud speaker or sound amplifier wherein I develop to an exceedingly high degree those minor high frequency vibrations which ordinarily cannot be acoustically produced in a sound amplifier or sound chamber having resonant walls formed from but a single material, my invention being characterized by the provision of a plurality of chambers or horns through which the sound energy is transmitted and wherein the walls of said horns are formed from widely different resonant materials having different periods of vibration, which sensitively respond to the sound waves developed by the diaphragm of a reproducer to produce in full value the fundamental and overtones above mentioned.

For a further understanding of the invention, reference is to be had to the following description and the accompanying drawing wherein:

Fig. 1 is a view in side elevation disclosing a sound amplifier constructed in accordance with the present invention;

Fig. 2 is a vertical transverse sectional view

taken through the amplifier on the plane indicated by the line 2—2 of Fig. 1;

Fig. 3 is a horizontal sectional view on the plane disclosed by the line 3—3 of Fig. 1.

Referring more particularly to the drawing, the numeral 1 designates a sound reproducer. This reproducer may be one of any conventional form now in accepted use in the reproduction of sound from talking machine or sound film records, radio receiving instruments and the like. Preferably the reproducer is of the electrically operated variety known generally by the term dynamic. It may however be of the so-called magnetic type, or in the other variations of the invention, the reproducer may be of the mechanically actuated variety, such as the type formerly used in the reproduction of sound from disc records. In all of these reproducers, however, a movable diaphragm is utilized in the reproduction of sound waves or energy and the reproducer of course includes such a diaphragm. Mounted above the diaphragm on the casing of the reproducer is a distributing connection 2 which includes a plurality of radiating extensions 3 and to these extensions there is suitably secured a plurality of radiating horns 4. These horns preferably are of the same length, being narrowest in diameter where connected with the extensions 3 and possessing maximum diameter at their upper or outlet ends. The horns are each constructed to include straight tapering walls, being devoid of the exponential curve characteristic of many amplifiers used in sound reproducing apparatus, since I have found the straight taper, as disclosed, to produce better reproduction. These horns are preferably formed from such materials as wood, metal, paper or compositions thereof. For instance, one of the horns may be formed from maple wood, a second from a paper containing a high percentage of mineral matter, a third from German silver, a fourth may be formed from a pure grade of silver and a fifth from sheet brass. Any number of these horns may be used as desired but in all amplifiers, a plurality of such horns will be employed composed principally of different materials.

By this construction and arrangement of spaced horns, I am enabled to reproduce sound with remarkable fidelity in comparison with the original. The quality of the reproduced sound is, I believe, mainly attributable to the high development of the high frequency sounds by which the overtones or harmonics are highly developed. The amplifier operates efficiently at high volume

and its tones do not shatter when subjected to such maximum amplification.

The amplifier is preferably mounted within a cabinet 5 in which is located a baffle board 6 formed from a non-resonant composition material and serves to divide the cabinet interiorly into front and rear compartments 7 and 8 respectively, the horns 4 being arranged in the front compartment. The rear compartment 8 is provided with one or more dynamic reproducer units 9 having a diaphragm 10 for each unit arranged in registration with a registering opening 11 formed in the baffle 6. It will be understood that the reproducers 1 and 9 are preferably simultaneously operated in the reproduction of sound, substantially after the disclosure set forth in my pending application, Serial No. 578,311, filed December 1, 1931, now Patent No. 1,902,250, dated March 21, 1933. In the amplifier comprising the present invention, however, the horns 4 are provided with a single reproducer unit instead of a plurality of such units.

What is claimed is:

1. A sound amplifier comprising a cabinet, a baffle arranged within said cabinet and provided with an opening, a reproducer unit arranged in said cabinet provided with a diaphragm disposed in registration with said opening, and a second reproducer arranged on the other side of said baffle and provided with a plurality of spaced tapering horns, the latter having their smaller ends united with the sound outlet connection of the second named reproducer.

2. A sound amplifier comprising a cabinet, a baffle arranged within said cabinet and provided with an opening, a reproducer unit arranged in said cabinet provided with a diaphragm disposed in registration with said opening, and a second reproducer arranged on the other side of said

baffle and provided with a plurality of spaced tapering horns, the latter having their smaller ends united with the sound outlet connection of the second named reproducer, said horns being formed from different resonating materials.

3. In sound reproducing apparatus, a cabinet provided with an opening in the front thereof, an electro-responsive reproducer of the dynamic cone type disposed in said cabinet to deliver sound developed thereby through the open front of the cabinet, a second electro-responsive reproducer arranged in said cabinet, and a plurality of horn type resonators projecting from said second reproducer, the sound energy developed by said reproducers and resonators being blended to produce composite tonal effects.

4. In sound reproducing apparatus, a cabinet provided with an opening in the front thereof, an electro-responsive reproducer of the dynamic cone type disposed in said cabinet to deliver sound developed thereby through the open front of the cabinet, a second electro-responsive reproducer arranged in said cabinet, and a plurality of horn type resonators of different materials projecting from said second reproducer, the sound energy developed by said reproducers and resonators being blended to produce composite tonal effects.

5. In sound reproducing apparatus, an electro-responsive reproducer of the dynamic cone type, a second electro-responsive reproducer disposed adjacent to said first-named reproducer and simultaneously operable in conjunction therewith by the same sound inducing circuit, and a plurality of horn type resonators projecting from said second reproducer, said resonators being formed from non-identical materials.

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