

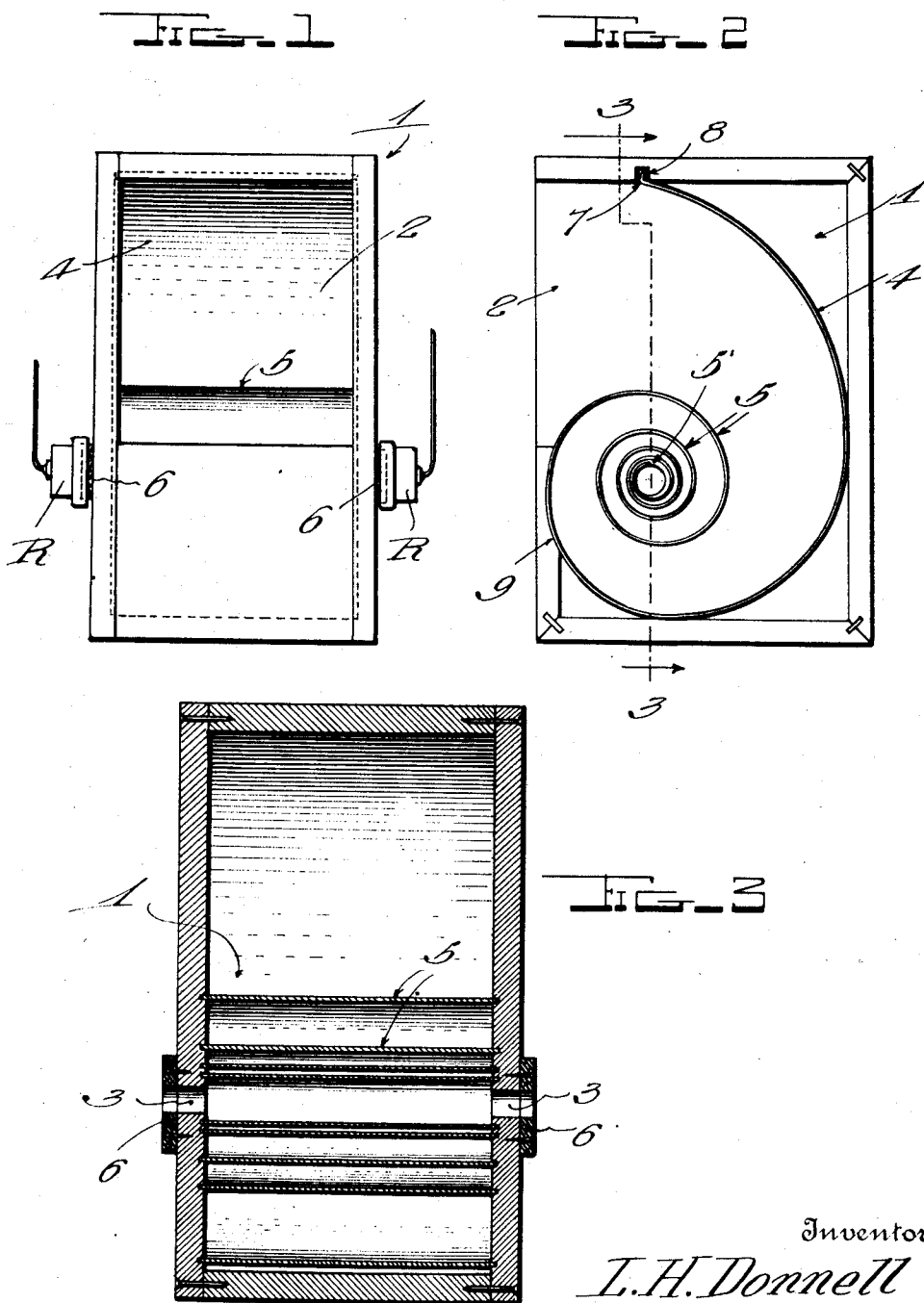
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L. H. DONNELL

SOUND AMPLIFIER

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SOUND AMPLIFIER.

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To all whom it may concern:

Be it known that I, LLOYD HAMILTON DONNELL, a citizen of the United States, residing at Ann Arbor, in the county of Washtenaw and State of Michigan, have invented certain new and useful Improvements in a Sound Amplifier, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to an improved amplifier to be used in connection with different types of sound producing apparatuses, the same being capable of practical use in connection with radio phones.

The principal object of the invention is to generally improve upon amplifiers of this class by providing one of extreme simplicity which is practical in construction and such that comparatively faint sounds can be converted into easily audible sounds.

More specifically speaking, it is another and important object of the invention to provide a sound amplifier or loud speaker for radiophones which embodies a chamber of suitable design in which a convolute passage is arranged, this passage being formed from a strip of sheet material coiled as shown and having its innermost coil disposed opposite one or more sound intake openings formed in the wall of the chamber.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same:

Figure 1 is a front elevation of a sound amplifier constructed in accordance with this invention.

Figure 2 is an elevation with one of its sides removed to disclose the construction of the tortuous passage more clearly.

Figure 3 is a vertical section taken substantially on the plane of the line 3—3 of Fig. 2.

Specifically described, the improved amplifier preferably comprises a substantially rectangular wooden box 1 formed at its front with a comparatively large discharge opening 2 for the sound waves and provided in its opposed sides adjacent its center with openings 3 through which the sound waves are introduced. Although two intake openings are shown, only one is necessary. As

before indicated, a peculiarly designed tortuous or convolute passage for the sound waves is arranged inside of this box and although this passage could be formed otherwise, it is preferably constructed from a single strip of flat sheet material 4 bent upon itself to provide a plurality of convolutions 5 which gradually increase in size toward the outer end of the passage. By providing a flat strip of metal for constructing such a passage, the walls of the convolutions are disposed in transverse parallelism and are uniformly spaced throughout their widths so as not to interfere with equal distribution of the effluent sound waves. As seen more clearly in Figure 3, the innermost and smallest convolution is arranged opposite the aforesaid intake openings 3, and the end of the strip forming this small convolution or coil is spaced from the adjacent coil to provide the opening 5' for permitting the sound waves to enter the discharge passage.

It may be conveniently stated here, as before indicated, that the amplifier is especially designed for use in connection with a radio telephone or the like, and in the drawings, I have shown conventional types of telephone receivers R which are connected with the felt washers 6 which are secured to the sides of the box around the aforesaid openings 3. These washers serve as simple and convenient means for connection of the telephone receivers to the box and to provide a sound-proof joint. In practice, the washers may be secured in place in any appropriate manner.

Particular attention is directed to the fact that in practice, the box will be composed of comparatively soft wood and, as more clearly seen in Figure 3, the space between the inner faces of the sides of the box is less than the width of the metal strip employed to form the convolutions or sound wave passage. When assembling the device, the metal strip is coiled to form the convolutions and the outer end of the strip is bent as shown at 7 and is received in the small groove 8 formed in the under-face of the top of the box. Then the sides of the boxes are forced on in a press, causing the edges of the strip to become embedded in the inner faces of the sides of the box. It is in this manner that the convolute metal strip is held in place. Although it is not essential, the front wall of the box may be

recessed on its inner face as indicated at 9 to accommodate that portion of the adjacent coil or convolution which bears against it.

5 In use, the means for conveying the sound waves into the sound amplifying box or chamber is associated with the aforesaid intake openings 3 and the sound is introduced into the innermost and smallest of the con-
10 volutions, and passes through the opening 5' and follows the tortuous path between the walls of the surrounding and the larger convolutions until it is discharged through the opening 2 in the box. In this way, compar-
15 atively faint sounds can be amplified to render them very distinct and audible at a considerable distance from the amplifier.

Hence, a small radio set can serve to amuse a number of persons by simply at-
20 taching one or both of the usual ear pieces as shown in the drawing. Constant use of the horn has actually demonstrated that the results sought can be effectively ac-
complished.

25 By carefully considering the description in connection with the drawings, persons familiar with devices of this class will doubt-
less be able to obtain a clear understanding of the invention. Therefore, a more lengthy
30 and detailed description is deemed unnecessary.

Since probably the best results may be obtained with the construction and arrange-
35 ment herein shown and described, this is taken as the preferred embodiment of the invention. However, it is to be understood that minor changes coming within the scope of the invention as claimed may be resorted to if desired.

I claim:

40 1. A sound amplifier for sound reproducing apparatuses comprising a flat strip of material coiled to form a convolute passage
45 between its coils, the innermost coil being comparatively small and the surrounding coils gradually increasing in size toward the outer coil to render the passage of gradually
50 increasing area from its inner toward its outer end, and a pair of spaced vertical plates engaging the edges of the coils and closing the passage at opposite sides to
55 compel the sound waves to travel from end to end, one of said plates having an opening formed therein opposite one end of the innermost coil to permit the reproduced waves to enter the passage for amplifi-
cation.

2. A sound amplifier for use in connec-
60 tion with sound producing apparatuses comprising a substantially rectangular box having a relatively large discharge opening in its front side and a comparatively small
65 sound intake opening at the center of one of its vertical sides, a flat strip of sheet material arranged inside of the box and having one end connected with the top wall
70 of the box, the opposite end of the strip being bent upon itself to provide a plurality of closely spaced convolutions, the inner one of which has its open end communi-
75 cating with the aforesaid opening, said strip of material being of a width greater than the distance between the walls of the box and having its edges embedded in the inner faces of said wall.

In testimony whereof I hereunto affix my signature.

LLOYD HAMILTON DONNELL.