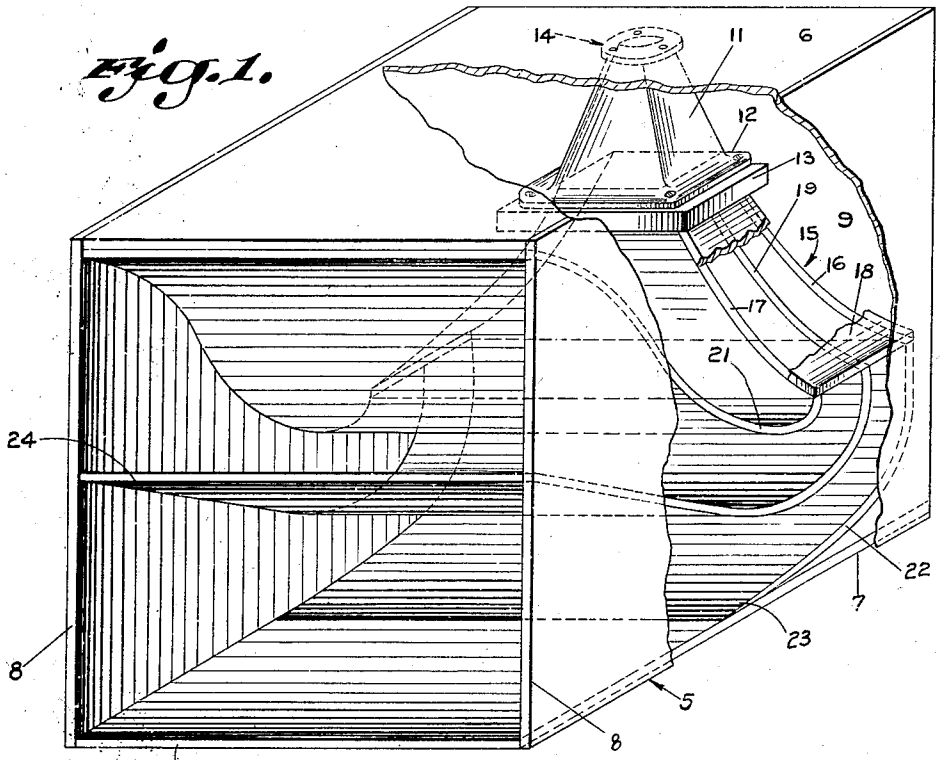
April 15, 1930. F. C. HINCKLEY 1,754,425

SOUND AMPLIFIER

Filed May 28, 1926

Fig. 1.



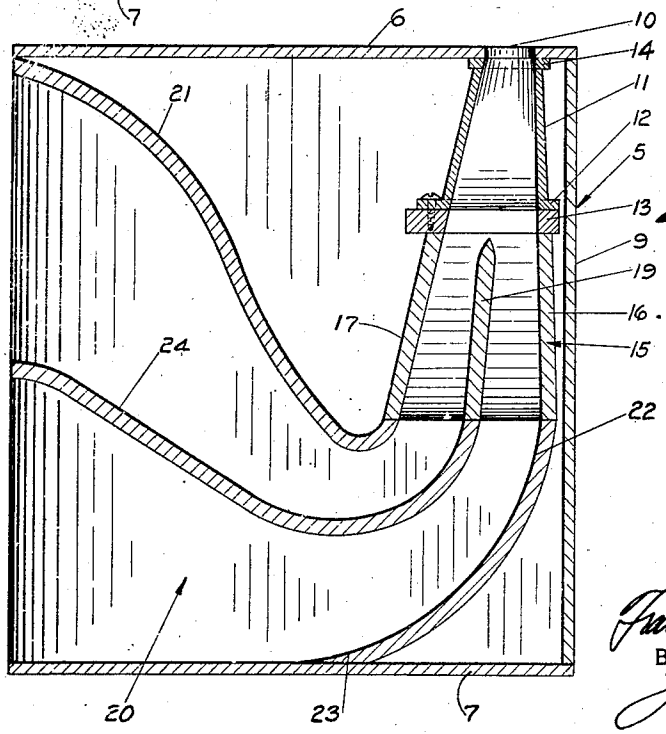


Fig. 2.

INVENTOR
Frank C. Hinckley
BY
John A. Keenahan
ATTORNEY

Patented Apr. 15, 1930 1,754,425

UNITED STATES PATENT OFFICE

FRANK C. HINCKLEY, OF STRATFORD, CONNECTICUT, ASSIGNOR TO COLUMBIA PHONOGRAPH COMPANY, INC., OF BRIDGEPORT, CONNECTICUT, A CORPORATION OF NEW YORK

SOUND AMPLIFIER

Application filed May 28, 1926. Serial No. 112,259.

This invention relates to new and useful improvements in sound amplifiers of general application, and has particular reference to that type of amplifier used in reproducing phonographs or talking machines.

An object of the invention is to produce an amplifier including as an element thereof, a resonance chamber into the small end of which the horn delivers the amplified sound which is mellowed therein and emitted through the larger end thereof.

A further object is to provide an amplifier of the type indicated which may be constructed with a phonograph cabinet to form a part thereof, or which may be constructed separate therefrom, and secured therein, and in either case to provide for the maximum expansion of sound in a relatively short amplifier.

An additional object is to provide an amplifier of simplified construction having all of the characteristics above enumerated, and which in addition comprises the minimum number of parts and amount of material, and which may be readily and easily constructed, and at a low cost.

Other objects and advantages will become apparent from a consideration of the following description taken in connection with the accompanying drawing:

Wherein Fig. 1 is a perspective view of the amplifier, parts being broken away to disclose details of construction; and

Fig. 2 is a vertical central sectional view of the same.

Referring in detail to the drawings, 5 indicates in its entirety an enclosure or cabinet comprising a top and a bottom wall 6 and 7 respectively, which with the sides 8, and back 9, form the enclosure or cabinet. In the embodiment shown, the enclosure 5 is adapted to be slid into a phonograph cabinet in a position below the motor and secured by any suitable means. An opening 10 is formed in the top 6, and through this opening the tone-arm of the phonograph has communication with a rigid iron coupling 11; this coupling, as shown, tapers outwardly on all sides towards its lower end, at which it is provided with a flange 12 through which screws or other fastening means are passed to connect it with a heavy supporting piece 13. A flange 14 is also provided at the upper end of the coupling 11 and this flange serves as a means for connecting the coupling either with the top of the enclosure or with a flange of a tone-arm base or the like. In addition to its coupling function, the part 11 is the anvil for making heavy sound.

A section 15 communicates with the lower end of the coupling 11 and receives the partially amplified sound therefrom. This section 15 with the coupling provides a horn. Section 15 comprises front and rear boards 16 and 17 which are arranged in diverting relationship so as to have the distance between them increase from the upper to the lower end of the section. Further, as shown, the edges of the boards incline outwardly and downwardly from their upper to their lower ends so that the section 15 increases in area transversely of the cabinet to a very material extent. As is readily observable from an inspection of Fig. 1, these boards are relatively narrower at their upper end where they join the piece 13, but are the complete width of the enclosure 5 at their lower ends.

Side pieces 18 close the space between the outer edges of boards 16 and 17, and in connection therewith, complete the section 15. A partition 19 is disposed in the section midway between the boards 16 and 17 so as to divide the section into two equal compartments. In Fig. 2, it will be observed that the partition stops just short of the heavy supporting piece 13 which rests on section 15.

At its lower end, section 15 connects with and communicates with a further amplifying section which is a resonance chamber, and which receives the sound at its rear end and emits it from the enclosure at the forward end thereof. Sides 8 of the enclosure also form the sides of this resonance chamber 20. The upper side of the resonance chamber is closed by a reversely curved board or section 21, and the lower side of said chamber is formed by inserting segment 22 in the rear of the cabinet with its upper edge in air-tight contact with the lower edge of the board 16, and with its lower edge fish-tailed or bevelled

as indicated at 23, so as to make a smooth connection with the bottom 7, the forward portion of which forms the remainder of the bottom enclosure of the resonance chamber. A reversely curved partition 24 at its rear end has an air-tight contact with the lower edge of partition 19 and its forward edge is in line with the forward edge of the part 21.

As will be readily noted, the degree of curvature in partition 24 is not at all the same as the degree of curvature of part 21, the curvature of the respective parts being such that the distance between the partition 24 and part 21 at their forward edges is the same as the distance between the forward edge of partition 24 and the forward edge of bottom 7. In this way, the outlets for the sound are of substantially the same area. In addition, the resonance chamber flares suddenly towards its forward end so that the sound just prior to being emitted from the cabinet is permitted to expand rapidly in a vertical direction, it having already rapidly expanded in a horizontal direction as it passed through the section 15.

It will be readily apparent that I have provided an amplifier of simplified construction, and comprising a relatively few parts.

While passing through the resonance chamber, the sound expands to a very considerable degree and is amplified in this chamber in addition to having already been amplified while passing through the coupling 11 and the section 15. Owing to the high degree of curvature of the part 21, sound passing through the resonance chamber is suddenly permitted to expand vertically. This sudden expansion of the sound takes place during the time the sound is travelling a distance slightly greater than half the length of the cabinet and in that distance the sound expands vertically a distance equal to two-thirds of the height of the cabinet, the height of the cabinet being greater than its length.

While I have shown and described preferred and satisfactory embodiments of the invention, it will be understood that the disclosure is entirely by way of illustration and is not for the purpose of limitation. Various modifications of the invention, within the scope of the appended claims, will readily suggest themselves to those skilled in the art. Therefore, the invention not being limited to the disclosure, reference must be had to the appended claims for a definition of the limitations of the invention.

Having thus described the invention, what I claim is:

1. In an amplifier, an enclosure including side portions and a bottom portion, a horn-like structure arranged vertically in the rear of said enclosure and having an inlet and an outlet the outlet being disposed toward the bottom of the enclosure, said horn-like structure including a front, a back and a partition arranged between said front and back, a curved board abutting the lower edge of said back and contacting with said bottom portion rearwardly of the front edge thereof whereby said curved board with said bottom portion forms the bottom wall of a resonance chamber, a board abutting the lower edge of said front and extending to the forward upper edges of said side portions, said last-named board being reversely curved, curving downwardly and then upwardly and outwardly to form the top of the resonance chamber and a dividing board at its rear edge abutting the lower edge of said partition and extending forwardly to the forward edges of said side portions, said dividing board being reversely curved but to a degree different from that of the top of said chamber and dividing the chamber into substantially equal compartments.

2. In combination, an amplifier comprising an enclosure including side portions and a bottom portion, a horn-like structure at the entrance end of said enclosure, a resonance chamber communicating with the outlet end of said horn-like structure, said resonance chamber including a curved bottom section, a curved part forming the top of said resonance chamber, said top and bottom section contacting at their edges with the side portions of the enclosure whereby said side portions form the side walls of the resonance chamber, and said top contacting along its rear edge with the lower edge of one wall of said horn-like structure and curving for a slight distance downwardly and forwardly and then extending upwardly for a predetermined distance and then curving upwardly and forwardly on an arc struck on a large radius, whereby a bell-like mouth portion for the resonance chamber is produced.

3. A device as in claim 2, the same being provided with a partition in said resonance chamber, and said partition being reversely curved but to a degree different from that of that of the top of said chamber and dividing the chamber into two substantially equal compartments having exit openings of substantially equal area.

4. In combination, an amplifier comprising an enclosure including side portions and a bottom portion, a horn-like structure at the entrance end of said enclosure, a resonance chamber communicating with the outlet end of said horn-like structure, said resonance chamber including a curved bottom section, which with the bottom of the enclosure provides the lower limitation of the resonance chamber, a curved part forming the top of said resonance chamber, said top and bottom sections contacting at their edges with the side portions of the enclosure whereby said side portions form the side walls of the resonance chamber, and said top contacting along its rear edge with the lower edge of one wall

of said horn-like structure and curving for a slight distance downwardly and forwardly and then extending upwardly for a predetermined distance and then curving upwardly and forwardly on an arc struck on a large radius, whereby a bell-like mouth portion for the resonance chamber is produced, said resonance chamber being provided with a partition, and said partition being reversely curved but to a degree different from the curvature of the top of said chamber and dividing the chamber into two substantially equal compartments having exit openings of approximate equal area.

Signed at Bridgeport, in the county of Fairfield, and State of Connecticut, this 25th day of May, A. D. 1926.

FRANK C. HINCKLEY.