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1,449,530

F. E. MILLER
SOUND AMPLIFIER

Filed Apr. 14, 1922.

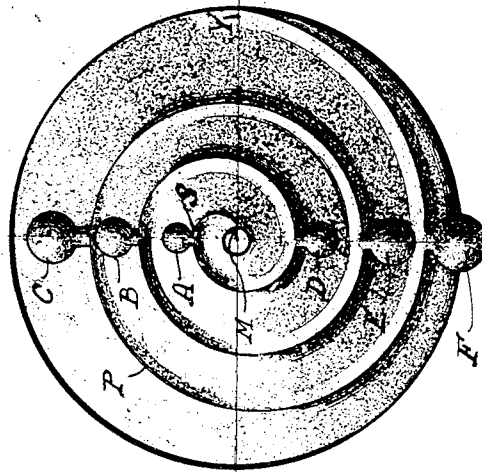


Fig. 2.

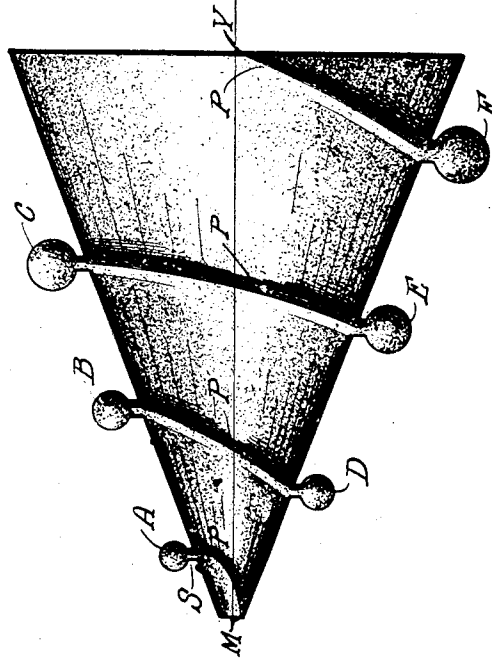


Fig. 1.

Frank E. Miller

INVENTOR BY

Stewart Gattis

AS HIS ATTORNEY

UNITED STATES PATENT OFFICE.

FRANK E. MILLER, OF NEW YORK, N. Y.

SOUND AMPLIFIER.

Application filed April 14, 1922. Serial No. 552,502.

To all whom it may concern:

Be it known that I, FRANK E. MILLER, a citizen of the United States, and a resident of the city of New York, county of New York, and State of New York, have invented certain new and useful Improvements in Sound Amplifiers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention consists of the novel features hereinafter described, reference being had to the accompanying drawings which illustrate one of the embodiments of the invention selected by me for the purpose of illustration, and my said invention is fully disclosed in the following description and claims.

The object of my invention is to create an amplifying device or sound amplifier, which will amplify the sound waves impressed thereon in a better manner than heretofore possible, especially the sound waves of the human voice, by eliminating certain inherent periodicity due to its molecular structure in said amplifier by means of an auxiliary spiral path disposed thereon; and by accentuating the desirable overtones of the impressed sound waves at the proper points in the amplifying path by means of auxiliary resonators attached thereto.

The further object of my invention is to provide a sound amplifier of such shape and construction that by reason of the continuous spiral paths disposed thereon, constructed to simulate the paths of the air columns in the production of voice initiating at the diaphragm as I have found them to be, it will be incapable of interfering inherent periodicity due to its molecular structure throughout its body.

A further object of my invention is to provide a sound amplifier and resonators adapted thereto in such manner and fashion that the first auxiliary resonator adjacent to the incoming sound wave will be substantially equivalent in volume to the volume of the amplifier up to the point of adaptation of said resonator and the remaining resonators of that series or side will be in relation of 3, 4 and 5 to such first resonator. My invention will better be understood by refer-

ence to the following specification which is directed to the several figures of the accompanying drawings which form part thereof.

Figure 1 is the side illustration of the sound amplifier embodying my invention which I use for the purpose of illustrating the invention.

Figure 2 is a front view of the same looking at the exterior of the main portion. Like letters refer to like parts of the several figures.

In Figure 1, "A" shows the first resonator attached to the sound amplifier and opening into the interior thereof which I have shown in the form of a conical horn although other shapes may be used. "B", "C", "D", "E", and "F", are the other resonators respectively attached to said horn or sound amplifier.

In Figure 2, "M" shows the starting point of the spiral path "P" preferably constructed as a ridge projecting inside and outside of the wall of the main portion of the amplifier, and "Y" shows the outer end thereof. This path substantially resembles the paths of the air columns in the production of voice from the point of its initiation at the diaphragm to the lips, and accentuated by its reacting with the other elements of voice anatomy as I have found in my study thereof, and I have found that this construction overcomes the periodicity or natural frequency due to its design and/or molecular structure of the main portion of the amplifier.

I preferably construct the resonators "A" to "F" of brass or some other metallic substance but they may readily be constructed from other substances and the body of the sound amplifier itself may likewise be constructed of several substances depending on the characteristics and frequencies of the sound waves to be amplified, and the conditions governing the reception thereof; that is, whether for phonograph, ear trumpet, loud speaker, or other use. I also prefer to make my resonators of spherical shape but other shapes may be used. It will be noticed that I have adapted resonators to the main body of the amplifier beginning at the quarter points of the turn in the spiral path, and thereafter at each half turn, and I have likewise constructed the resonators in relation one to the other by volume as 3, 4, and 5, since this is the rela-

relationship which exists between the laryngeal cavity, the nasal cavity, and the mouth cavity in the human voice anatomy as heretofore explained in my Patent No. 1, 190,787 for voice and sound recording machine issued July 11, 1916, as I find the best results possible with this design and arrangement. I also prefer to make the volume of my smallest resonator approximately equivalent to the volume of the portion of the main sound amplifier from the bottom "M" thereof to the point "S" where said resonator is connected therewith. In this explanation of the preferred embodiment of my invention, it is to be understood that I do not cover all of the adaptations thereof as contemplated by the claims.

What I claim and desire to secure by United States Letters Patent is:—

1. A sound amplifier containing auxiliary resonators connected to said amplifier so that the first point of attachment of said resonators approximates one-quarter of the turn of a conical spiral of three complete turns and the other attachments at each half-turn thereafter, all substantially as and for the purposes hereinbefore set forth.
2. A sound amplifier containing auxiliary resonators connected to said amplifier so that the first point of attachment of said resonators approximates one-quarter of a turn of a conical spiral of three complete turns, and the other attachments at each half-turn thereafter, said resonators being by volume in the relation 3, 4 and 5, and the smallest of said resonators being attached to the main body of said amplifier at a point nearest the initiation of the sound waves in the amplifier and at one-quarter of a turn of said spiral from said point, all substantially as and for the purposes hereinbefore set forth.
3. A sound amplifier containing auxiliary resonators connected to said amplifier so that the first point of attachment of said resonators approximates one-quarter of a turn of a conical spiral of three complete turns, the other attachments at each one-half turn thereafter, said resonators being by volume in the relation 3, 4 and 5, the

smallest resonator volume being substantially equal to the volume of the portion of the main sound amplifier from the bottom thereof to the point where said resonator is connected therewith, all substantially as and for the purposes hereinbefore set forth.

4. A sound amplifier containing auxiliary spherical resonators connected to said amplifier so that the first point of attachment of said resonators approximates one-quarter of the turn of a conical spiral of three complete turns, and the other attachments at each half-turn thereafter; said resonators being by volume in the relation 3, 4 and 5, and the smallest of said resonators being attached to the main body of said amplifier at a point nearest the initiation of the sound waves in the amplifier, and at one-quarter of a turn of said spiral from said point, all substantially as and for the purposes hereinbefore set forth.

5. A sound amplifier containing auxiliary spherical resonators connected to said amplifier so that the first point of attachment of said resonators approximates one-quarter of a turn of a conical spiral of three complete turns, the other attachments at each half-turn thereafter; said resonators being by volume in the relation 3, 4 and 5, the smallest resonator volume being substantially equal to the volume of the portion of the main sound amplifier from the bottom thereof to the point where said resonator is connected therewith, all substantially as and for the purposes hereinbefore set forth.

6. A sound amplifier containing auxiliary resonators connected therewith, a conical spiral ridge projection inside and outside of the wall of the main portion of said amplifier, extending from end to end thereof; the first point of attachment of said resonators approximately one-quarter of the turn of said spiral of three complete turns, and the other attachments at each half turn thereafter, all substantially as and for the purposes hereinbefore set forth.

In testimony whereof, I have signed my name to these specifications this 27th day of March, 1922.

FRANK E. MILLER.