

E. WALKER.
COMPOSITE SOUND PRODUCER.
APPLICATION FILED SEPT. 14, 1904.

2 SHEETS—SHEET 1.

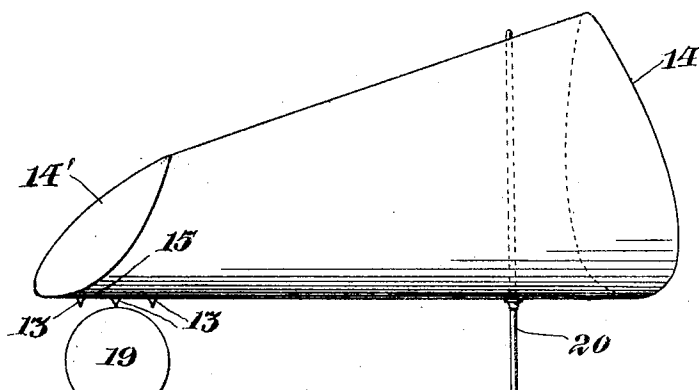


Fig. 1.

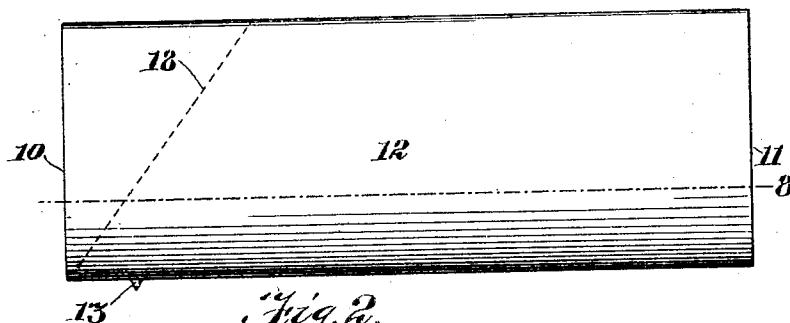


Fig. 2.

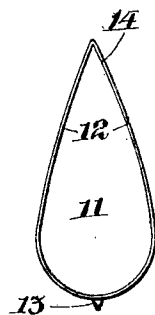


Fig. 3.

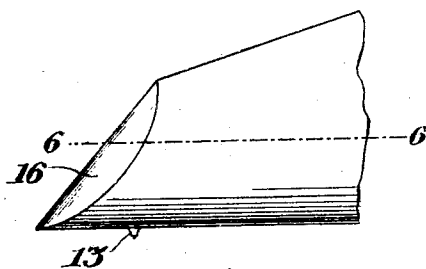


Fig. 4.

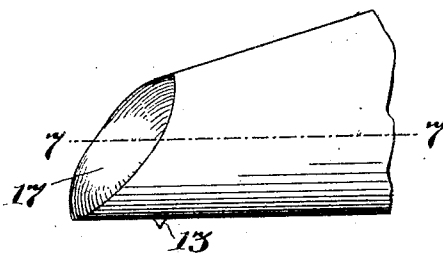


Fig. 5.

WITNESSES:

Robert Head
V. E. Nichols.

INVENTOR

Edwin Walker,

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Griffin Bernhard Cavanagh,
ATTORNEYS.

No. 805,600.

PATENTED NOV. 28, 1905.

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2 SHEETS—SHEET 2.

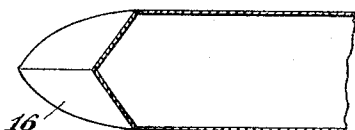


Fig. 6.

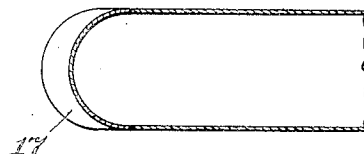


Fig. 7.

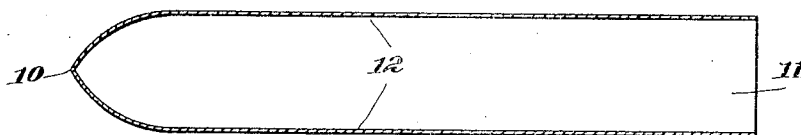


Fig. 8.

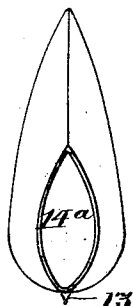


Fig. 9.

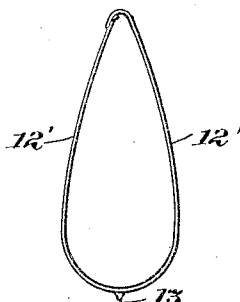


Fig. 10.

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UNITED STATES PATENT OFFICE.

EDWIN WALKER, OF ERIE, PENNSYLVANIA.

COMPOSITE SOUND-PRODUCER.

No. 805,600.

Specification of Letters Patent.

Patented Nov. 28, 1905.

Application filed September 14, 1904. Serial No. 224,466.

To all whom it may concern:

Be it known that I, EDWIN WALKER, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Composite Sound - Producers, of which the following is a specification.

The ordinary phonograph, as is well known, comprises as essential elements thereof a record, a sound-reproducer for receiving vibrations from the record and creating sound-waves, and a horn or trumpet for collecting and disseminating the sound-waves thus produced.

The object of my invention is the production of an instrument embodying therein or capable of performing the joint functions of the sound-reproducer and horn of such a phonograph. In other words, I produce a single instrument which serves the dual purpose of the reproducer and horn. I am enabled thereby to not only dispense with the costly reproducer now employed, but to produce a much simpler and more economical machine, and yet one giving excellent results.

In accomplishing the object of my invention I employ what might well be termed a "vibrating horn"—that is, one composed of flexible material—and attach thereto a stylus, the material of both the horn and stylus being preferably non-metallic, whereby I am enabled to eliminate the metallic sound usually present in phonographs.

The invention will be more fully understood from the following detailed description thereof, taken in conjunction with the accompanying drawings, wherein—

Figure 1 is a perspective view of my invention. Fig. 2 is a modified form thereof in side elevation; Fig. 3, an end view of Fig. 2 in the direction of the arrow; Figs. 4 and 5, further modifications with parts of the horn broken away; Fig. 6, a section on line 6 6 of Fig. 4; Fig. 7, a section on line 7 7 of Fig. 5; Fig. 8, a section on line 8 8, Fig. 2; Fig. 9, a detail view showing the horn of Fig. 1 with an open end, and Fig. 10 a detail view showing a horn with its upper edge formed with a lapped joint.

The simplest type of my invention is shown in Figs. 2 and 3 and is made by folding any suitable material into substantially envelop form, closing one end thereof 10, leaving the other end 11 open, and preferably slightly compressing the side walls 12 12, so

as to produce a horn having substantially the cross-sectional shape illustrated in Fig. 3, this being approximately egg-shaped, although this particular shape is not material.

In Fig. 10 I have shown a horn with a slightly-rounded upper surface made by lapping the edge of one wall 12' over the edge of the other wall 12'.

Near the closed end 10 and preferably from one to three inches from the end I attach thereto a stylus 13, preferably of non-metallic material, such as glass. The particular manner of attaching the stylus to the horn forms no part of this invention; but such attachment may be accomplished manifestly in various ways, such as by cementing or riveting the stylus to the material of the horn.

In the construction shown in Fig. 1 the upper and lower edges of the horn diverge so as to produce an enlarged end 14. The plane of the other end 14' in my preferred form is inclined at an acute angle 15 to the bottom edge of the horn, and this end may be closed by a flat covering or piece, as shown in Fig. 1, by an angular piece, as shown in Figs. 4 and 6, or by a curved surface, as shown in Figs. 5 and 7. One function of this closure is to assist in holding the horn in the desired cross-sectional form.

The form of horn shown in Fig. 2 may have its end inclined also, as indicated by the dotted line 18, which end may be provided with any type of closure heretofore described. While I prefer to have the end near the stylus closed, as described, I can get very good results by allowing it to remain open, as shown by 14' in Fig. 9. Further, while I prefer to have the end remote from the stylus open, yet, if it is desired to soften the tone of the instrument, this result may be accomplished by closing said end.

In Fig. 1 I have indicated the phonograph-record at 18 and the rod for supporting the end of the horn at 19. In Fig. 1 I have illustrated a plurality of styluses applied to the horn, and in practice I find it advantageous to place the first one about an inch from the end, the second one about an inch and a quarter from the first, and the third about an inch and a quarter from the second. I find that the volume and pitch of the sound varies according to the shape of the horn and the location of the stylus, the stylus nearest the end of the horn generally producing the loudest tones. Experience has shown that with

some records the best results are secured by utilizing the first stylus, while other records work better with one of the other styluses. It will be obvious that the several styluses may be so positioned that each will produce a pitch of a separate or different octave.

The horn may be made of any flexible material, preferably non-metallic, as stiff paper, celluloid, &c., but I have obtained very superior results by employing a quality of paper known in the trade as "press-board." If desired, the closure at the stylus end of the horn may be made of thinner material from that composing the body of the horn.

15 An instrument constructed as described is not only economical and simple, but produces clear, smooth, full, and well-rounded tones in contradistinction to the cramped, rasping, and metallic tones emanating from the ordinary phonograph. Furthermore, my instrument sends out its tones in all directions, whereas in the present machines the sound is emitted mainly from the open mouth of the horn and along lines substantially parallel with the axis thereof.

As another important commercial advantage of my invention I may state that a flexible horn of the shape specified is easily packed for shipment, and this is an item of very considerable importance, as the metallic horn usually employed must be packed with great care to prevent injury thereto.

While I have described the best form of my invention, it will be understood that many changes and additions may be made therein both as to shape and material without departing from the spirit thereof, and I reserve the right to make any and all of such variations.

40 Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A composite sound-producer having a horn of flexible material, the cross-sectional form of said horn, substantially throughout its entire length having a base of greater curvature than its top and a stylus attached to the base of the horn.

2. A composite sound-producer having a flexible horn approximately egg-shaped in cross-section throughout its entire length, one end of said horn being closed, and a stylus attached to the under side of the horn and near the closed end thereof.

55 3. A composite sound-producer having a horn of flexible material, said horn being approximately egg-shaped in cross-section for substantially its entire length and having one end thereof larger than the other, and a stylus attached to said horn, intermediate the ends thereof.

4. In a composite sound-producer a horn, the plane of one of the ends of which is inclined at an angle to the plane of the other end, and a stylus connected with said horn.

5. A horn having one of its ends in a plane inclined at an angle to the longitudinal axis of the horn, and a stylus connected with said horn.

6. A horn having one of its ends in a plane inclined at an angle to the longitudinal axis of the horn, and a closure for said inclined end.

7. A horn having one of its ends in a plane inclined at an angle to the longitudinal axis of the horn, and a flexible closure for said inclined end.

8. A horn having one of its ends in a plane inclined at an angle to the longitudinal axis of the horn, and a flexible closure for said inclined end, parts of which closure occupy different planes.

9. A composite sound-producer having a horn composed of flexible material and one of the ends of which is in a plane inclined to the longitudinal axis of the horn and a stylus intermediate the ends of the horn.

10. A composite sound-producer having a horn composed of flexible material, and a plurality of styluses attached to said horn and in substantially the same longitudinal plane.

11. A composite sound-producer having a horn composed of flexible material and a plurality of styluses intermediate the ends of the horn attached thereto and in substantially the same longitudinal plane.

12. A composite sound-producer having a horn composed of flexible material, said horn having a less area in cross-section above the horizontal plane of its longitudinal axis than the area below said plane for substantially the entire length of the horn, said horn being closed at one end.

13. A composite sound-producer having a horn composed of flexible material, said horn having a less area above the horizontal plane passing through its axis than below said plane, said horn being closed at one end and having a stylus attached to said horn.

14. A composite sound-producer comprising a horn, the body of which is made of thin press-board, one end of said horn being in a plane inclined at an angle to a horizontal plane passing through the axis of the horn, and a stylus attached to the horn near said inclined end.

15. A sound-reproducer provided with a plurality of styluses in substantially the same plane.

16. A sound-reproducer adapted for endwise movement, and provided with a plurality of styluses in substantially the same plane.

17. A sound-reproducer composed of flexible material and provided with a plurality of styluses, the latter being attached to said flexible material.

18. A flexible sound-reproducer having a plurality of styluses located at different points longitudinally of the reproducer.

19. A composite sound-producer consisting of a flexible horn having a plurality of styluses, located in different positions intermediate its ends.

5 20. A composite sound-producer comprising a flexible horn, having a plurality of styluses located at different positions longitudinally of the horn.

10 21. A composite sound-producer comprising a horn composed of flexible material and having a less area above the horizontal plane passing through its axis than below said plane, the material of the horn being lapped at the upper edge thereof.

22. A composite sound-producer comprising 15
a horn composed of flexible material and having a less area above the horizontal plane passing through its axis than below said plane, the sides of the horn being arched in cross-section from the upper edge to the base 20
thereof.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWIN WALKER.

Witnesses:

JAS. H. GRIFFIN,
H. I. BERNHARD.