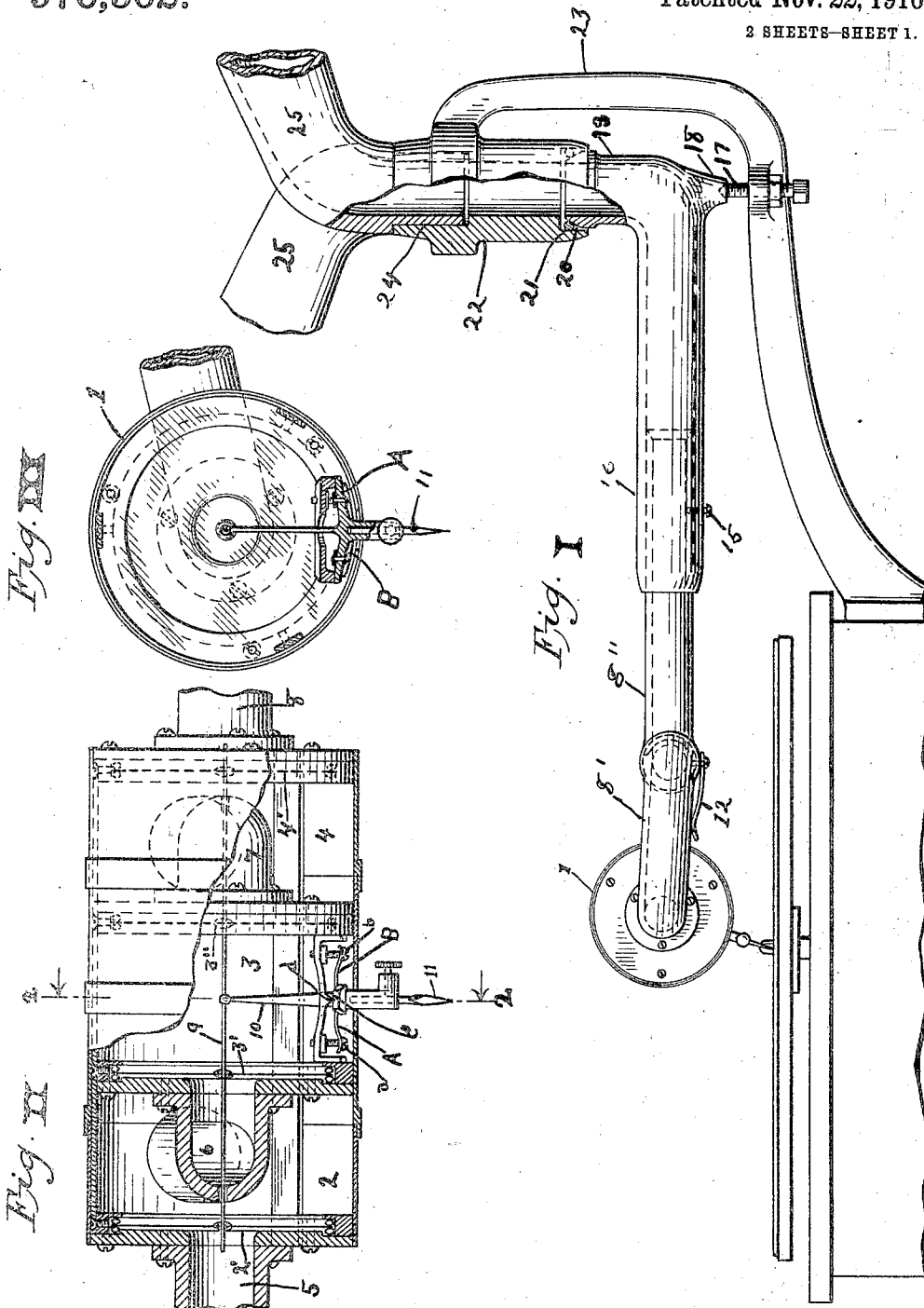


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 PHONOGRAPH SOUND BOX.  
 APPLICATION FILED JAN. 7, 1910.

976,502.

Patented Nov. 22, 1910.

2 SHEETS—SHEET 1.



Witnesses:

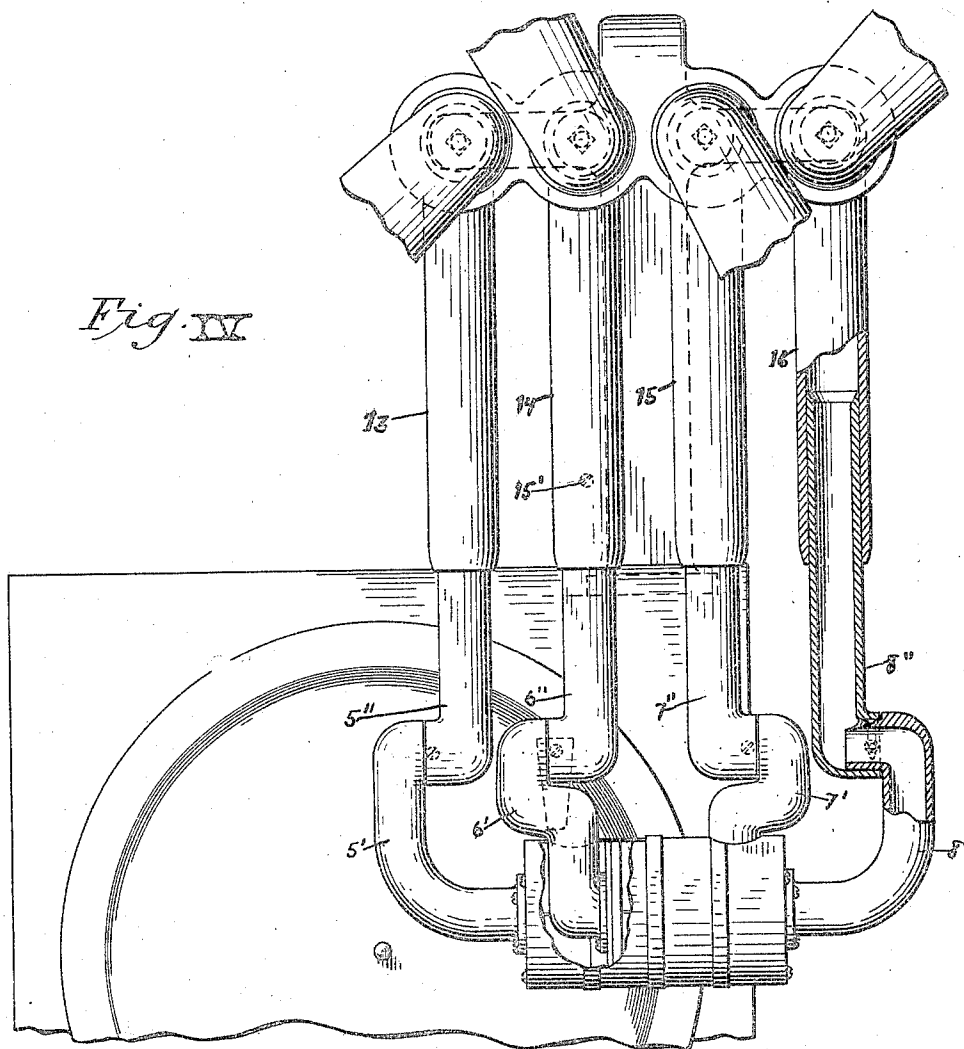
A. L. Lord.  
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 His Attorney.

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# UNITED STATES PATENT OFFICE.

ANTON F. SCHÖNWETTER, OF CLEVELAND, OHIO.

PHONOGRAPH SOUND-BOX.

976,502.

Specification of Letters Patent.

Patented Nov. 22, 1910.

Application filed January 7, 1910. Serial No. 536,794.

*To all whom it may concern:*

Be it known that I, ANTON F. SCHÖNWETTER, a citizen of Austria, and a subject of Kaiser Francis Joseph, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented some certain new and useful Improvements in Phonograph Sound-Boxes; 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 pertains to make and use the same.

This invention relates to phonographs of the type having a plurality of diaphragms and horns.

The object of this invention is to effect a duplication of the sound vibrations created by a single stylus or needle operated through a record, by causing the vibrations so created to act on a plurality,—in the case shown, four,—diaphragms, and vibrating them simultaneously in their respective sound chambers, and providing each individual sound chamber with a separate sound conducting tube.

My invention consists in a plurality of diaphragms mounted and operated in separate sound chambers connected together so as to vibrate in unison, and a single stylus mechanism so connected that it will operate to vibrate all of the diaphragms, and in providing a separate chamber for each diaphragm, which constitutes its sound box, and providing also means such as tubes leading from said sound boxes respectively, to which may be attached horns if found desirable.

My invention further consists in the construction of phonograph sound boxes, the manner of connecting them together and the construction of intercommunicating tubes, all of which will be hereinafter fully set forth and claimed.

In the drawings, Figure I, is a view in side elevation illustrating the construction of the sound carrying tubes and their relation to their frame and mountings, also showing the multiple sound box and the manner of mounting the same, and the ends of the tubes. Fig. II, is a view partly in section, showing the internal construction of my sound box with the several diaphragms mounted therein, the manner of connecting said diaphragms to each other and the connection of the stylus with said diaphragms. Fig. III, is a cross sectional view taken through lines 2, 2 Fig. II. Fig. IV, is a

plan view looking at the apparatus from the upper side, and illustrating the assemblage of the different tubes and the manner of operation of the device as a whole for the purpose of causing the stylus to follow the record without impairing in any way the vibrations.

1, represents the multiple sound box which in the case illustrated, is illustrated as of tubular construction. This multiple sound box is divided into separate chambers 2, 3 and 4, the chamber 2, having mounted therein a diaphragm 2', at one end and in close proximity to the sound tube 5. The chamber 3, at one end is also provided with a diaphragm 3', mounted in close proximity to the sound tube 6. At the opposite end of the chamber 3, opposed to the diaphragm 3' is mounted another diaphragm 3'', which is shown in dotted lines in Fig. II, of the drawings. This diaphragm 3'' is mounted in close proximity to the sound tube 7. The chamber 4 is also provided with a diaphragm 4' illustrated in dotted lines in Fig. II, which is mounted in close proximity to sound tube 8. It will thus be seen that each diaphragm 2', 3', 3'' and 4', are provided with respective sound conveying tubes 5, 6, 7 and 8, the mouths of which are in close proximity to said diaphragm. The diaphragms 2', 3', 3'' and 4' are connected together by means of a flexible connection 9, which in the case illustrated is preferably a wire, the same being cemented at the central portion of each diaphragm. Thus as said connection 9 is vibrated it causes the diaphragms to vibrate in unison.

Centrally located relative to the multiple sound box and connected to the flexible connection 9, is the stylus holder 10, which is mounted on two spring arms A, B, which forms part of said stylus holder 10, and are connected therewith, the same being supported by means of the screws a, b, for adjusting purposes. The stylus holder 10, is provided with a bearing surface c, which rests against the knife edge d. These bearings being adjusted and brought together through the medium of the screws a, b. Thus it will be seen that the mounting of the stylus holder is such that while it has a free vibratory action, it follows the characters on the record in consequence of which movements are imparted to it through the stylus, and all rattling, scratching or play movement are obviated. The metallic parts

that move in relation to each other are the knife edge *d* on the surface *c*. This obviates as it will be understood, all foreign sounds or scratching which would attend as a discord, and also provides means for imparting to the diaphragms the most minute variations or pitch of tones.

I now come to the manner of mounting the multiple sound box, which is as follows:  
 10 The several branches 5', 6', 7', and 8', of the tubes 5, 6, 7, and 8, are swiveled to the tubes 5'', 6'', 7'', and 8'', in such a manner that the sound box will raise and lower with the variations of the record surface, always tending by the partial weight of the sound box  
 15 to keep the stylus 11, in contact within the grooves of the record. However, in order that the sound box may partially be supported should it be too heavy so as to wear upon the record through the stylus 11, I have provided a spring 12, which may be made adjustable for supporting the sound box through one of its branches, in this case the branch tube 6'. This spring supports a  
 25 portion of the weight of the sound box, but at the same time allows of sufficient pressure for the proper reproduction from the record.

The sections 5'', 6'', 7'', 8'', are telescoped into tubes 13, 14, 15, and 16, in such  
 30 a manner that the sections 5'', 7'', and 8'', slide freely within the tubes 13, 14, 15 and 16. The section 6'' being held in predetermined adjustment in relation to its tube 14, by means of a screw 15, as the stylus with  
 35 its sound box travels along the face of the record, toward the center of the same, the section 5'', moves inward within tube 13, and the sections 7'', and 8'', slide outwardly. The fitting of these joints is such that no  
 40 appreciable sound or scratching results from the movement in relation to each other. In the movement of the stylus with its sound box toward the center of the record or from one side to the other of the record, it is of  
 45 course essential that the arms 13, 14, 15 and 16, have an oscillating movement or swinging movement in a horizontal plane, and for this purpose I have mounted the several sections 13, 14, 15 and 16 as illustrated in Fig.  
 50 I, of the drawings, by providing the same with an adjustable center screw 17, resting

in the step 18, and also by forming the upper end 19, of the several sections with a ball set  
 20, which engage antifriction balls 21, in a race-way formed in the under side of the  
 55 vertical journal 22, which in turn forms part of or is secured to arm 23. This allows of a free noiseless movement of the several sections 13, 14, 15, and 16 in a horizontal direction, and provides a convenient means  
 60 for assembling and taking apart the several portions of the machine. At the upper end of the journals 22 I provide sockets such as 24, for the reception of the receiving ends of the several horns 25, 25, allowing these horns  
 65 to be swiveled or turned in any desired direction in relation to each other, to the machine, and to the apartment in which said machine is operated, and hence the sound issuing from the several horns due to the  
 70 vibration of their independent diaphragms, is so distributed as to modify the pitch and harshness which is usually evidenced in phonographs, and to obtain a volume without unnecessary loudness. This is attained  
 75 by providing separate diaphragms in close relation to the sound conveying tubes of the independent horns connecting the said diaphragms together so that they will vibrate  
 80 in unison, and providing separate sound chambers for each individual sound conveying tube and horn.

What I claim is:

A reproducer for sound waves comprising a sound box having end and intermediate chambers separated by partitions, tubes  
 85 extending into the end chambers and connected to each partition and other tubes connected to the ends of the box, diaphragms located in the chambers, opposite the ends of  
 90 the tubes, a flexible connection between said diaphragms and extending through openings in the partitions, and a stylus operatively connected to said connections, in the intermediate chamber.  
 95

Signed at Cleveland in the county of Cuyahoga and State of Ohio, this 28th day of December 1909.

• ANTON F. SCHÖNWETTER.

Witnesses:

J. J. DONNELLY,  
 FRANK C. GREGG.