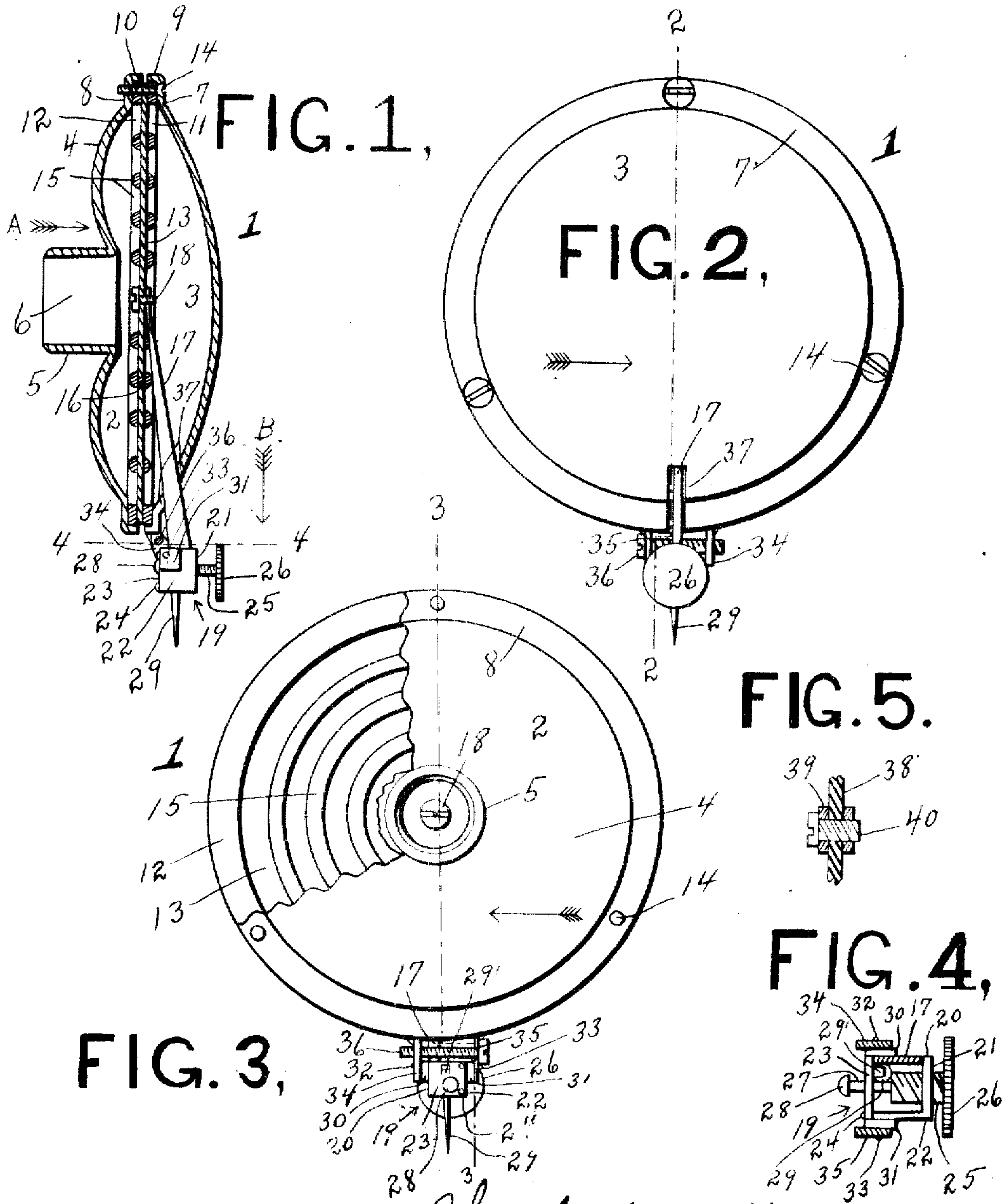


1,166,953.

Patented Jan. 4, 1916.



WITNESSES:
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Fred E. Johnson

Charles W. Waller INVENTOR.

UNITED STATES PATENT OFFICE.

CHARLES W. WALLER, OF CHICAGO, ILLINOIS.

PHONOGRAPH SOUND-BOX.

1,166,953.

Specification of Letters Patent.

Patented Jan. 4, 1916.

Application filed April 30, 1915. Serial No. 24,859.

To all whom it may concern:

Be it known that I, CHARLES W. WALLER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Phonograph Sound-Boxes, of which the following is a specification.

This invention relates to sound reproducing boxes for use in connection with sound-recording and reproducing machines, and it is to be understood that the invention is adapted for any purposes for which it is found applicable, and the object thereof is to provide a sound box for phonographs, graphophones or the like, whereby an improved character of sound is produced and in which the vibrations of great frequency will be absorbed or eliminated to remove the objectionable squeaks and similar metallic or foreign sounds.

Another object of the invention is to provide a sound box which shall be simple in construction and inexpensive to manufacture, and in which the diaphragm and most of the stylus-arm may be entirely inclosed.

A further object of the invention is to provide a sound box in which the body, stylus head and etc. may be constructed of sheet metal, and the diaphragm of cork, or the like, if desired.

A still further object is to provide a sound box which will prevent the sound waves from escaping into the air from the outside or inoperative side of the diaphragm.

With the foregoing and other objects in view, the invention consists of the novel construction, combination and arrangement of parts hereinafter more specifically described and illustrated in the accompanying drawings, wherein is shown the preferred embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

Referring to the drawings, wherein like reference numerals indicate similar parts in the several views, Figure 1 is a vertical sectional view of a sound box in accordance with this invention, taken on lines 2—2 and 3—3 of Figs. 2 and 3 respectively, looking in the direction of the arrows; Fig. 2 is a front view of Fig. 1; Fig. 3 is a rear view

of the same, showing a portion cut away for the purpose of a clearer illustration of the parts, and looking in the direction of arrow A in Fig. 1; Fig. 4 is a top view, partly in section, of the stylus head and support therefor, taken on line 4—4 of Fig. 1 and looking in the direction of arrow B; and Fig. 5 is a vertical sectional view of a section of a modified form of diaphragm.

Referring to the drawings, the body portion of the sound box 1 is formed of two oppositely disposed sections, 2, 3, the latter being preferably concavo-convex shaped, and the former being preferably formed into a concavo-convex ring 4 provided with a central neck 5, the said neck having a sound passage 6. The peripheries of the said sections 2, 3 are provided with flat circular portions 7, 8, the outer edge of which is preferably bent inwardly to form flanges 9, 10 respectively. The inside of these flat portions and flanges serve to hold in place elastic or flexible washers or gaskets 11, 12 between which a diaphragm 13, preferably of cork or the like, is held in place, the screws 14 serving to retain the several parts in place and to regulate the degree of pressure between the washers 11 and 12 and the diaphragm.

The employment of the cork diaphragm will eliminate the objectionable squeaks and similar metallic or foreign sounds and will make it possible to construct sound boxes of large dimensions, and it is to be understood that when a cork diaphragm is employed, the washers 11 and 12 may, if desired, be entirely eliminated.

To improve the character of sound, absorb or eliminate the vibrations of great frequency, and to remove the objectionable squeaks and similar metallic or foreign sounds, when a diaphragm of other suitable material is employed, such as, for instance, mica, the diaphragm is preferably provided with one or more weights, in the present instance in the form of twin rings 15, of any suitable material, preferably a non-resilient or non-sound-conducting material, such as, for instance, lead or solder. These rings may be joined together and fastened to the diaphragm by means of pins or bolts 16 passing through the diaphragm.

I have made practical tests with a sound box provided with a cork diaphragm and

have found that all objectionable squeaks and similar metallic or foreign sounds have been eliminated entirely by the use of the said cork diaphragm, and that the tones are clear and natural, producing a rich mellow tone, also that the soft tones or sound colors are clearly and naturally brought out. Many of these soft tones or sound colors have heretofore been completely drowned out or obliterated by the use of diaphragms of mica or other materials, since such diaphragms produce, more or less, objectionable squeaks and similar metallic or foreign sounds, whereas a cork diaphragm will produce none of these objectionable sounds, for the reason that no metallic or foreign sounds will emanate from cork, and for the reason that cork is not as hard as mica. Also, cork is capable of vibrating only as it is forced to vibrate by the lateral movement of the stylus arm, thereby causing only such sounds as the record will give out through the stylus.

A stylus arm 17, preferably of sheet metal, has its upper end twisted at a right angle and secured to the diaphragm by means of a small screw 18, the lower end of said stylus arm being bent to form a stylus head 19, the said stylus head having four sides or walls 20, 21, 22 and 23, the wall 22 being provided with rivets 24 which pass through holes or openings in the end of the wall 23, thus forming a strong combined stylus head and arm of sheet metal. The said stylus head is also provided with a threaded opening in the wall 21 through which a screw 25 on the thumb-disk 26 is passed. A pin or bolt 27 provided with a head 28 is passed through a smooth opening in the wall 23, the said bolt being joined to the screw 25, thus providing means for holding the stylus 29 securely in place, the head 28 on the bolt 27 preventing the screw 25 from being turned completely out of the stylus head and thereby probably lost.

In order to prevent the stylus from moving too far upwardly in the stylus head, a small portion of the wall 23 is bent inwardly so as to form a stop 29', against which the top end of the stylus 29 abuts. The said stylus head 19 is also provided with elastic members 30 and 31, preferably of rubber or felt, located next to the walls 20 and 22 respectively, through which pass fingers 32 and 33 respectively, the said members acting to assist in regulating the degree of pressure between the end portions 34 and 35 and the stylus head.

The sound box section 3 is provided at its lower edge with the pair of downwardly and outwardly extending end portions 34 and 35, through which pass the fingers 32 and 33, forming in effect a hinge and movably connecting the said section with the said stylus arm and head, thereby allowing lat-

eral movement of the said stylus, stylus arm and head to vibrate the diaphragm. In order to regulate and adjust the lateral movement of the said stylus, stylus head and arm, the said end portions 34 and 35 are provided with threaded and unthreaded openings, respectively, through which is screwed and passed, respectively, a screw 36.

To allow the section 3 to be put into place and to allow lateral movement of the stylus arm 17, a vertical elongated opening or slot 37 is provided in the lower portion of the said section 3, and this opening may, if desired to absolutely inclose all sounds between the section 3 and the diaphragm, be entirely covered or closed by any suitable flexible or yieldable material, not shown.

If desired, the modified form of twin rings shown in Fig. 5 may be employed, instead of the form shown in Figs. 1 and 3, in which 38 is the diaphragm, 39 the twin rings of any suitable material, preferably a non-resilient or non-sound-conducting material, such as, for instance, lead or solder. The said diaphragm and twin rings are fastened together by means of screws 40.

I wish it understood that any suitable material may be employed in the manufacture of the said invention, but I prefer to employ a non-resilient or non-sound-conducting material in the manufacture of the sections 2 and 3 and the twin rings 15 or 39, as the case may be. I also wish it understood that the diaphragm 13 or 38, as the case may be, may be, if desired, made or molded in one piece, of any suitable material, or made of cork or the like, instead of as shown and described, and that the twin rings may, if desired, be eliminated entirely.

What I claim is—

1. In a sound box, the combination of a diaphragm, a covering for the outside or inoperative side of the diaphragm, the lower portion being provided with an opening, a stylus arm passing through said opening, and a yieldable pastelike or jellylike material closing said opening between said covering and stylus arm, whereby the sounds from the outside or inoperative side of the diaphragm will be prevented from reaching the outside air.

2. In a sound box, a casing, a pair of downwardly extending end portions formed on said casing, a stylus arm and head, a piece of flexible material between each of said end portions and stylus head, said stylus head having fingers passing through openings in said end portions, and a screw passing through said end portions, whereby the degree of pressure may be regulated between said stylus head, flexible material and end portions.

3. In a sound box, a stylus head having a front, rear, and side walls, said front wall having a threaded opening, said rear wall

having a smooth opening, and a thumb screw provided with a threaded and unthreaded portion, said threaded and unthreaded portions being inserted in said
5 threaded and smooth openings, respectively, and said unthreaded portion having its end provided with a head.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CHARLES W. WALLER.

Witnesses:

JENNIE V. BERGLAND,
C. A. WALLER.

It is hereby certified that in Letters Patent No. 1,166,953, granted January 4, 1916, upon the application of Charles W. Waller, of Chicago, Illinois, for an improvement in "Phonograph Sound-Boxes," errors appear in the printed specification requiring correction as follows: Page 2, line 47, for the word "for" read *for*; same page, line 124, claim 2, for the word "portioins" read *portions*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 25th day of January, A. D., 1916.

[SEAL.]

R. F. WHITEHEAD.

Acting Commissioner of Patents.

Cl. 181—11.