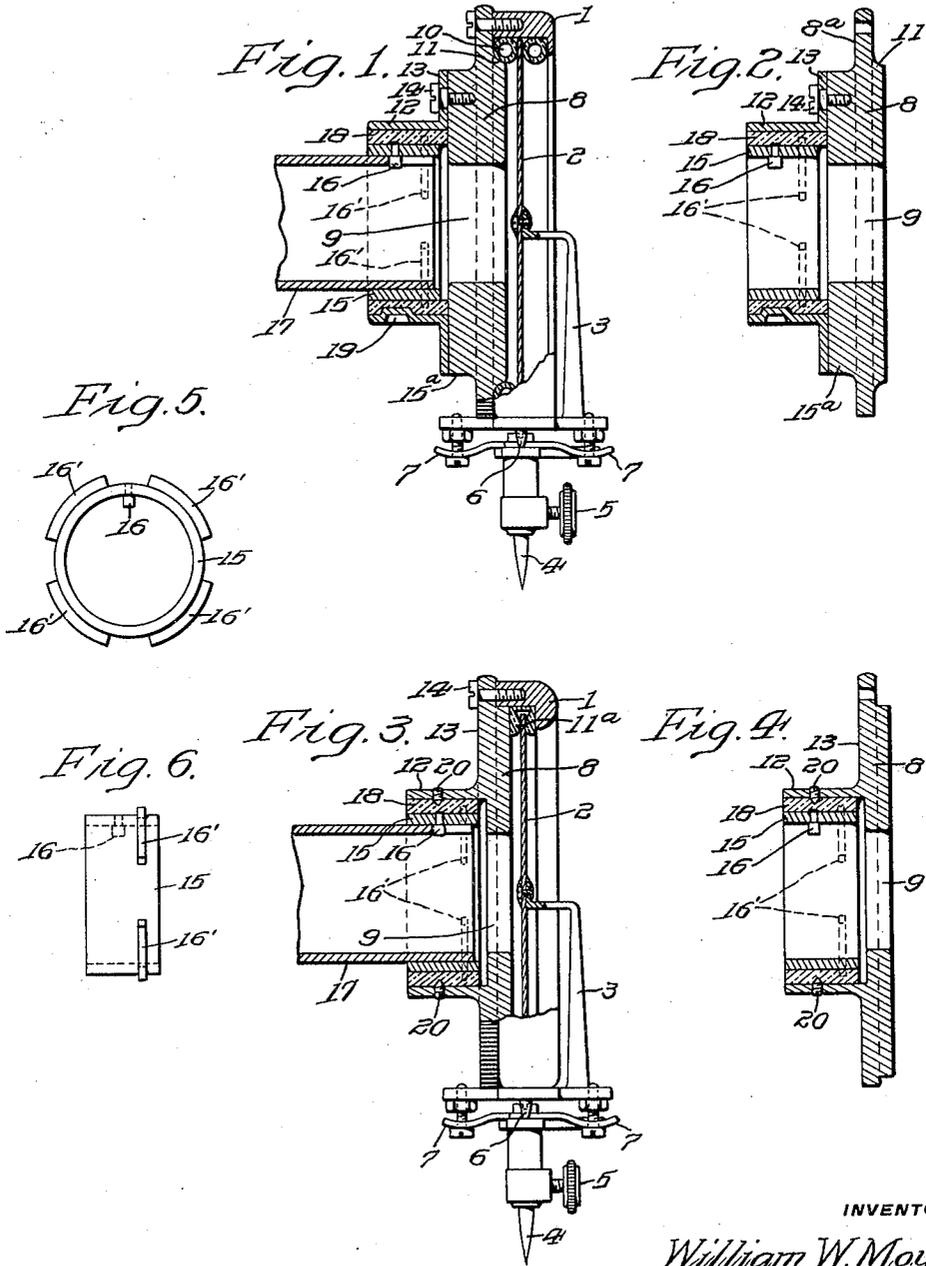


W. W. MOYER.  
 SOUND BOX FOR TALKING MACHINES.  
 APPLICATION FILED OCT. 18, 1917.

1,393,691.

Patented Oct. 11, 1921.

2 SHEETS—SHEET 1.



INVENTOR

*William W. Moyer*

*Sutton & Blount*

BY

ATTORNEYS

WITNESS

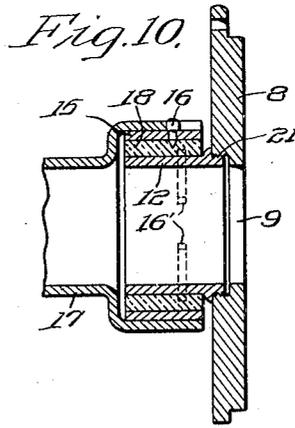
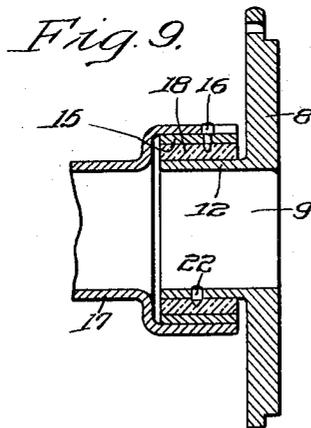
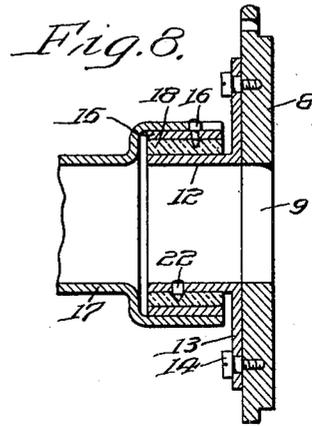
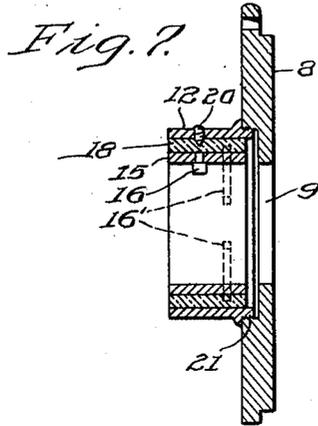
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2 SHEETS—SHEET 2.



WITNESS

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# UNITED STATES PATENT OFFICE.

WILLIAM W. MOYER, OF CAMDEN, NEW JERSEY, ASSIGNOR TO VICTOR TALKING MACHINE COMPANY, A CORPORATION OF NEW JERSEY.

## SOUND-BOX FOR TALKING-MACHINES.

1,393,691.

Specification of Letters Patent.

Patented Oct. 11, 1921.

Application filed October 18, 1917. Serial No. 197,224.

*To all whom it may concern:*

Be it known that I, WILLIAM W. MOYER, a citizen of the United States, residing in Camden, county of Camden, State of New Jersey, have invented a certain new and useful Improvement in Sound-Boxes for Talking-Machines, of which the following is a specification.

My invention relates to sound boxes for talking machines and more particularly to the provision of means arranged to be attached to or mounted upon a sound box casing for preventing vibrations from being transmitted from the sound box to the tone arm, sound conducting or other metal part upon which the sound box is mounted, by the metal itself, during the reproduction of sound. It relates to the provision of means for breaking or interrupting or preventing an all-metallic connection between the sound box and tone arm, sound conducting tube or other metal part upon which the sound box is carried.

Such acoustical insulation of the sound box from the metal parts connected thereto, has heretofore been accomplished by providing the back of the sound box with an exposed heavy backing of rubber or other yielding material, such rubber backing being provided with a metallic ferrule or tube inclosed therein arranged to engage to fit over the end of a metallic sound conducting tube or tone arm, but such means for acoustically insulating the sound box has been open to a number of objections, among which are the relatively large mass of rubber employed; the large exposed surface thereof which occasions a relatively rapid deterioration due to exposure to the atmosphere and by the necessary contact thereof with the hands or fingers of the operator of the talking machine; and its somewhat bulky and unattractive appearance.

The object of this invention is to overcome the objectionable features above referred to without sacrificing any of the efficiency of such a rubber back as a sound insulator of the sound box from the tone arm or other metallic part upon which it is mounted.

Further objects of this invention are to provide a construction in which the rubber or other yielding material is substantially inclosed and protected from the atmosphere

and from contact of the hands of the operator; to reduce the cost of making such sound insulating connections; and to provide a more attractive and less obtrusive connecting means or coupling.

Other objects of my invention will appear in the specification and claims below.

My invention specifically comprises a sound insulating connection between a sound box of a talking machine and the sound conveying tube or tone arm upon which the same is mounted, said connection comprising two relatively short light metallic tubes arranged substantially coaxially, one within the other, with yielding sound insulating means interposed between the adjacent surfaces of said tubes and fixedly secured thereto, one of said tubes being adapted to be rigidly secured to the sound box casing and the other arranged or adapted to form a detachable connection with the tone arm or sound conducting tube cooperating with the sound box.

Referring now to the drawings forming a part of this specification and in which the same reference characters are employed throughout the various views to designate the same parts, Figure 1 is a sectional view, partly in side elevation, of a common form of sound box, with my invention mounted thereon;

Fig. 2 is a similar sectional view showing merely the back plate of the sound box casing with my improved sound insulating coupling attached thereto;

Fig. 3 illustrates a modified form of construction in which one of the tubular members of my improved coupling device is made integral with the sound box casing or, more particularly, integral with the back plate of the sound box;

Fig. 4 is a view similar to Fig. 2 and showing the construction illustrated in Fig. 3 mounted on and secured to the back of the sound box;

Fig. 5 is an end view of the inner tube or ferrule detached from the other parts;

Fig. 6 is a side elevational view of the same;

Figs. 7, 8, 9 and 10 illustrate further different modified forms or embodiments of my invention, the same being shown as attached to the back plate of a sound box casing.

Referring now to the construction illus-

trated in Figs. 1 and 2, the sound box casing 1, the diaphragm 2, the stylus bar 3 and the stylus 4, held in the socket of the stylus bar by the thumb screw 5, the pivot pin 6 on which the stylus oscillates, the tension springs 7, the back or back plate 8 provided with a centrally arranged aperture 9, and the resilient gaskets 10 interposed between the back plate 8 and the front of the casing 1 and between which the annular edge of the diaphragm 2 is mounted, are or may be of any well known usual construction.

In Figs. 1 and 2, the back plate 8 is provided with a recess forming a seat for the inner rubber gasket.

The embodiment of my invention illustrated particularly in Figs. 1 and 2, consists in a metallic tubular member 12 provided with a transversely disposed annular flange 13 whereby it is fastened, as by screws 14, to the back plate 8 of the sound box casing. Within said tubular member and coaxially therewith, is a second metallic tubular member 15 provided on its inner surface with an inwardly projecting stud or pin 16 to engage with a slot in the end of the tone arm or sound conveying tube 17 and on its outer surface with a rib or a series of ribs 16'. The space between the inner surface of the tubular member 12 and the outer surface of the tubular member 15, is filled with a ring or tube 18 of a yieldable, flexible, or resilient non-metallic sound insulating material, preferably of rubber, (although cork, leather, felt or similar resilient material may be also used for the purpose), which, in addition to having the ribs 16' forced therein to produce a permanent connection or union between the tube 15 and the insulating ring 18, may be and preferably is vulcanized thereon. The metallic tubular member 15 is preferably shorter in length than the cooperating tubular member 12 so that the inner end thereof is spaced from and is out of contact with the back plate 8 of the sound box and the yielding rubber ring or tube 18 is preferably a little longer than the metallic tubular member 15 so that its inner end may even bear against the metallic back plate 8 of the sound box. This latter feature of construction is, however, not essential as will be referred to again in connection with other embodiments of my invention referred to below. The outer tubular member 12 may be permanently secured to the yielding tube or ring 18 by a projection 19 extending inwardly from the inner surface of the member 12 by depressing or bending inwardly a portion of the tube 12.

Referring now more particularly to Figs. 3 and 4, the construction therein illustrated is in general like that above referred to and described in connection with Figs. 1 and 2, except that the metallic tubular member 12

is integral with the back plate 8 of the sound box instead of being connected thereto by a flange and screws as shown in Figs. 1 and 2, and the tubular member 12 is permanently secured or fastened to the yielding ring or tube 18 by a screw or stud 20 forced into the interior of the intermediate yielding tube 18. As in the construction above described, the metallic tubular member 15 is shorter than the interior surface of the outer tubular member 12, so that its inner end is spaced from the back plate 8, and, if desired, the ring or tube 18 of rubber or similar material, may be either of the same length as that of the inner member 15, or long enough to abut against the back plate 8, as shown in Figs. 1 and 2.

In Fig. 7, is illustrated a further modification of my invention in which the metallic tubular member 12 is secured to the back 8 of the sound box casing by screw threads 21 instead of being secured thereto by a flange and screws as shown in Figs. 1 and 2 or made integral with the backing 8 as illustrated in Figs. 3 and 4. In other respects the construction is substantially identical with that previously described.

In Fig. 8 is shown a further modified form of my invention in which the metallic tubular member 12, connected to the sound box, constitutes the inner tube of the connection or coupling and the metallic tubular member 15, adapted to be attached to the tone arm or conveyer, is outside of and surrounds the tubular member 12, a ring or tube of yielding sound insulating material 18 being interposed between said tubes as before described. For permanently securing the tube or member 12 to the yielding ring or tube 18, a pin or stud 22 may project from the outer surface of the member 12 into the said resilient tube 18 and the metallic tubular member 15 may be secured to the resilient tube 18 by the pin or stud 22 which projects into said tube 18 and the head of which on the outside of the tubular member 18 may provide the usual stud for locking or fastening the same and the sound box to the end of the sound conveyer or tone arm.

Fig. 9 illustrates a further modified form of my invention, the same being similar to that shown in Figs. 3 and 4 in that the tube 12 is integral with the back plate 8 of the sound box casing and also similar to the embodiment of my invention shown in Fig. 8 in that the tubular member 12 is within instead of on the outside of the yielding ring or tube 18.

Fig. 10 illustrates a still further modified form of my invention in which the member 12 is secured to the back plate 8 by screw threads in the same way as it is attached to the back plate in the form of my invention shown in Fig 7, but in this form, the tube 12

is inside of the yielding ring or tube 18 instead of outside of it.

From the foregoing, it will be apparent that I have provided a coupling or connection by means of which a sound box or reproducer may be detachably or permanently mounted on the end of a sound conveyer or tone arm and at the same time acoustically insulated therefrom by a resilient non-metallic member fixedly interposed between two coaxially arranged metallic tubes, whereby there is no direct or continuous metallic connection between the casing and the tone arm or similar part. It will also be apparent that one of the tubular parts of this coupling or connection may be made integral with or separable from the sound box without departing from the spirit and scope of the invention, and in either case when the parts are assembled, the tubular member connected to the back plate constitutes a tubular projecting portion of the sound box.

When one of the metallic parts forming the connection or coupling is provided with a flange, that flange may be utilized for securing the coupling or connection to the back plate of the sound box, or said flange may be made large enough to constitute the back or back plate of the sound box casing.

While I have described several ways of uniting the metallic tubular members to the intermediate ring or tube of yielding material this invention is not to be construed as limited to any of said methods of uniting the parts. The tube or ring 18 may be made of raw rubber forced or stretched on over the inner member, and it may then be put into a press and vulcanized to make the outer surface of the resilient rubber tube 18 either slightly tapering or slightly larger than the interior diameter of the outer tubular member, and the inner member, with the yielding tube 18 secured thereto, may then be forced into the outer tubular member thus compressing the material of the resilient rubber tube between the rigid tubular members. After having been so forced together the resilient rubber ring may be retained or secured in place by any suitable means as by indentations 19, screws 20, or studs such as the stud 16'. Or a tube or ring of raw rubber may be placed over the inner tube and both forced into the outer tube after which both parts may be vulcanized together permanently, or the adjacent surfaces of the inner and outer tubular members may be suitably roughened and the ring of rubber or the material 18 may be cemented and forced into the space between said metallic tubular members in any suitable manner.

The advantages of this construction will now be apparent. The sound box and the sound conveying tube are acoustically in-

ulated from each other by the construction above described, but the amount of rubber or any other suitable non-metallic relatively resilient material employed is very small; resilient material is substantially encased between the tubular members so that it is not substantially subjected to the hardening or oxidizing action of the atmosphere, nor to deterioration due to handling; the entire rear exterior of the sound box may be polished uniformly with the front thereof; and the whole device is more attractive because it does not present the bulky appearance present in prior devices to which reference has been made.

It is to be further observed that either one of the tubular members may be rigidly secured to the back of the sound box and that the other tubular member may be designed to fit into or over the end of the tone arm or sound conveyer. Which of the parts will be attached to the sound box and which to the tone arm, will depend upon the particular construction of the sound box and of the tone arm to which the invention is to be applied.

The foregoing specification is a continuation of my prior application, Serial No. 92,663, filed April 21, 1916, and for which it is intended to be substituted.

Having thus described my invention, what I claim and desire to protect by Letters Patent of the United States is:

1. In a sound box, the combination of a sound box casing provided with a tubular member rigid therewith, a second rigid tubular member out of contact with said casing and with said first-mentioned tubular member, and adapted to be secured to a sound conveyer, and resilient sound insulating material of substantially tubular form in the space between said tubular members, said resilient material being substantially incased by and between the adjacent surfaces of said rigid tubular members.

2. In a sound box, the combination of a sound box casing provided with a tubular member rigid therewith, a second rigid tubular member out of contact with said casing and said first-mentioned tubular member, adapted to be secured to a sound conveyer and arranged substantially within said first-mentioned tubular member, and resilient sound insulating material compressed by and between the adjacent surfaces of said rigid tubular members.

3. A union or coupling for attaching a sound box casing to a sound conveying tube, comprising the combination of two rigid tubular members arranged one within the other and out of contact with each other, and resilient sound insulating material fitting between and substantially incased by said tubular members, one of said rigid tubular members being arranged to be rigidly se-

cured to a sound box casing, and the other of said rigid tubular members being arranged to be detachably secured to a sound conveying tube.

5 4. A union or coupling for attaching a sound box casing to a sound conveying tube, comprising the combination of two rigid tubular members coaxially arranged one within the other and out of contact with each other, resilient sound insulating material substantially filling the space between and substantially incased by said tubular members, one of said rigid tubular members being arranged to be rigidly secured to a sound box casing, and the other of said rigid tubular members being arranged to be secured to a sound conveying tube, and means to prevent relative displacement of said rigid tubular members with respect to said insulating material or each other.

10 5. A union or coupling for attaching a sound box casing to a sound conveying tube, comprising the combination of two rigid tubular members substantially arranged one within the other, resilient sound insulating means tightly fitted between the adjacent surfaces of said members, means to attach one of said tubular members to a sound box casing, and means to detachably secure the

other of said tubular members to a sound conveyer. 30

6. In a sound box, the combination of a sound box casing provided with a rigid tubular member, a second rigid tubular member adapted to be secured to a sound conveyer, one of said tubular members being arranged within the other of said tubular members but out of contact therewith, and resilient sound insulating material fitting within the space between said members. 35 40

7. A union or coupling for attaching a sound box casing to a sound conveying tube, comprising the combination of two tubular members arranged one within the other and out of contact with each other, resilient sound insulating material between and substantially incased by said tubular members, one of said tubular members being arranged to be rigidly secured to a sound box casing, and the other of said tubular members being arranged to be secured to a sound conveying tube, and means to prevent relative displacement of said tubular members with respect to each other and said insulating material. 45 50 55

In witness whereof I hereunto set my hand this 17th day of October, 1917.

WILLIAM W. MOYER.