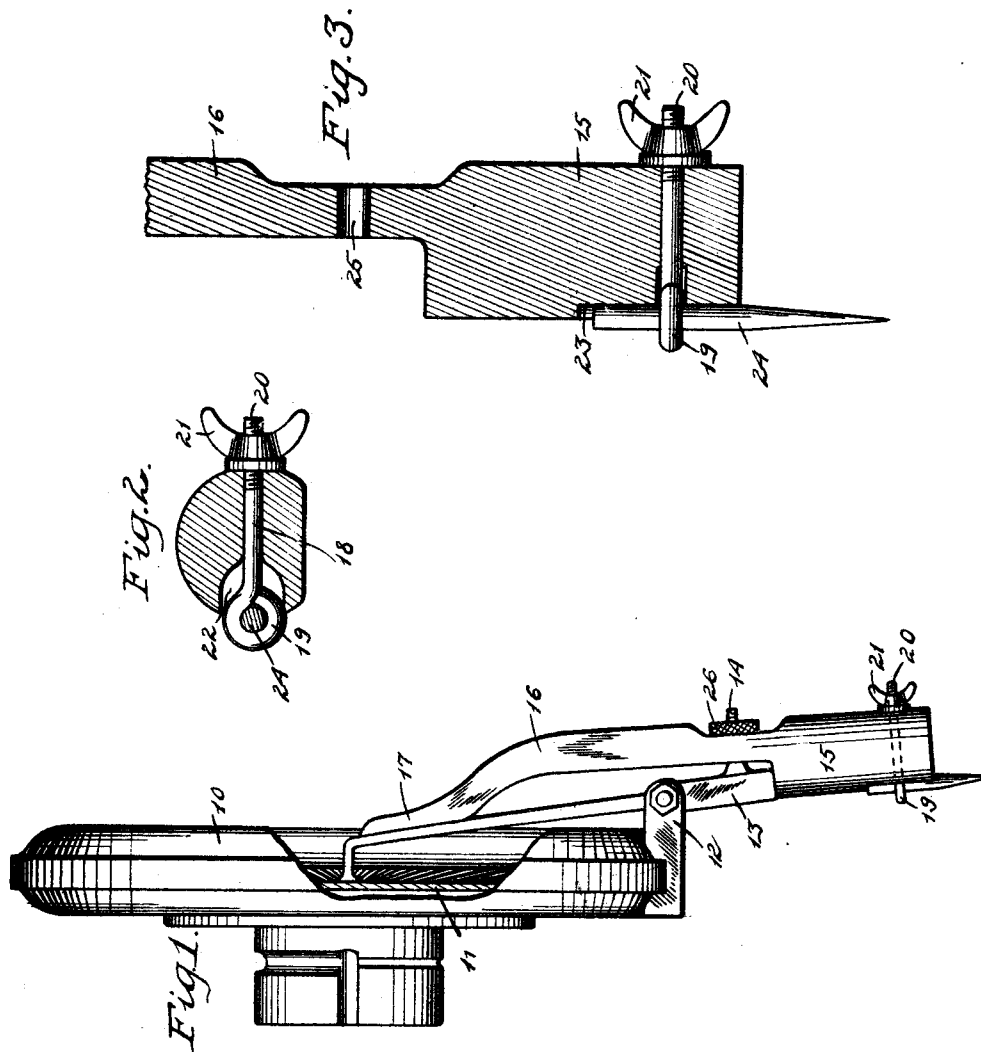


W. H. COOK.
TONE MODIFYING DEVICE.
APPLICATION FILED MAY 28, 1912.

1,062,224.

Patented May 20, 1913.



Witnesses.
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UNITED STATES PATENT OFFICE.

WILLIAM H. COOK, OF WEBSTER CITY, IOWA.

TONE-MODIFYING DEVICE.

1,032,224.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM H. COOK, a citizen of the United States, residing at Webster City, in the county of Hamilton and State of Iowa, have invented a certain new and useful Tone-Modifying Device, of which the following is a specification.

The object of my invention is to provide a stylus supporting lever to be connected with a diaphragm and so arranged as to prevent or modify the harsh grating metallic sounds ordinarily produced in phonographs on account of the use of wholly metallic material between the stylus and the diaphragm.

More specifically it is my object to provide a stylus supporting device for transmitting vibrations to the diaphragm in which the stylus may be readily and easily removed or replaced and in which the tension or the amount of frictional engagement between the wooden and metallic members of the stylus arm may be adjusted to suit the requirements and to produce the best results in modifying the tone of the instrument.

My invention consists in the construction, arrangement and combination of the parts of the stylus arm, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawings, in which:

Figure 1 shows a side elevation of a part of a phonographic reproducer and a stylus arm embodying my invention applied thereto. A part of the casing is broken away to show the connection between the stylus arm and the diaphragm. Fig. 2 shows a transverse, sectional view of the lower part of the stylus arm, and Fig. 3 shows an enlarged, detail, longitudinal, sectional view of the lower part of the stylus arm.

Referring to the accompanying drawings, I have used the reference numeral 10 to indicate the frame of the reproducer having therein a diaphragm 11 of ordinary construction. At the bottom of the casing 10 is a bracket 12 in which is pivotally supported a metallic reproducer arm 13 of ordinary construction, which arm is connected at its upper end to the center of the dia-

phragm 11. The lower end of the arm 13 is provided with a screw threaded extension 14 for purposes hereinafter made clear.

My improved stylus arm is formed of two parts, one part being a metallic member 13 and the other being a wooden member which comprises a body portion 15, an arched extension 16 and an upper end portion 17, the latter being designed to engage the arm 13 near the point where it is attached to the diaphragm. The body portion 15 is preferably arranged below the end of the metallic member 13 and is provided with a bolt 18 extended transversely through it and said bolt has on one end a loop 19 and its other end is screw threaded at 20 to receive a winged nut 21. The wooden body portion 15 is provided with a recess at 22 into which the loop 19 may be extended. It is also provided at a point adjacent to the recess 22 with a longitudinally arranged depression 23. The stylus proper is indicated by the numeral 24 and is of the ordinary construction. It may be connected with the body portion 15 by inserting it through the loop 19 and into the groove 23 and when thus inserted the winged nut 21 may be tightened to hold the stylus firmly against the wooden body portion 15 and in the groove 23. To detach the stylus it is only necessary to loosen the winged nut and push the bolt 18 so that the loop 19 moves away from the recess 22, whereupon the stylus may be readily removed and a new one inserted. The arched portion 16 of the wooden stylus arm member is provided near the body portion 15 with an opening 25 through which the screw threaded extension 14 is projected, and a nut 26 is placed on said screw threaded extension to rest against the outer surface of the arched portion 16, as shown in Fig. 1.

In practical use, and assuming that the stylus is being vibrated in accordance with the undulations of a phonographic record, the vibrations will be transmitted first from the metal stylus to the large wooden body portion 15. These vibrations will then be transmitted through both the metallic member 13 and the wooden member 16 and 17 to the diaphragm.

I have demonstrated by experiment that by having the stylus arranged in contact

only with the wooden member of the arm, and that by having an arm composed of a metallic member and a wooden member held in engagement both at the lower ends and upper ends thereof, the tone of the instrument is modified and the harsh grating and metallic sounds ordinarily produced when a wholly metallic stylus arm is employed are eliminated or modified to a considerable extent.

I am aware that heretofore stylus arms have been made wholly of metal and that stylus arms have been made wholly of wood, and also that stylus arms made of metal have been provided with some sort of a cushioning device between the metallic arm and the stylus. None of these devices will successfully accomplish the purposes for which my invention is intended. In cases where a metal stylus arm is employed and a cushion of a material such, for instance, as rubber, is placed between the stylus and the stylus arm, then the tone is modified but many of the lesser vibrations are eliminated entirely and all of the vibrations are weakened so that the sounds reproduced by the instrument are relatively weak and are not clear.

In cases where the entire stylus arm is made of wood, I have discovered that the vibrations will not be transmitted so faithfully as with a metallic arm. Hence the tone, while eliminating the harsh and metallic sounds, does not reproduce all of the sound vibrations in a clear and satisfactory manner. By means of my improvement, the metallic member of the arm tends to faithfully reproduce the sound vibrations in a clear and loud manner while the wooden member being held in firm contact with the metal member near the diaphragm tends to eliminate or modify the harsh metallic sounds that are ordinarily produced by the use of a wholly metallic arm.

I have obtained the best results and believe it to be advantageous to make a wooden member having a large body portion at its lower end to which the stylus is attached and which is relatively inflexible.

I have also found it advantageous to provide in the wooden member an arched portion spaced apart from the adjacent part of the metal arm member but held in contact with the metal member near the diaphragm.

I have found that by adjusting the nut 26 to vary the tension between the wooden and metallic arm members difference in the sounds produced by the instrument are noticeable. The operator may, by a manipulation of the nut 26 adjust it so as to cause the instrument to reproduce sounds in a loud and clear manner and without the harsh, metallic and grating sounds usually occurring in instruments of this kind.

The stylus arm, as illustrated and de-

scribed, is composed of a metallic and a non-metallic member. For the non-metallic member I preferably employ wood of a kind having a comparatively close grain such, for instance, as walnut. I however have employed wood and paper fibers of various kinds and have demonstrated that various non-metallic substances improved the tone of the instrument, although I have obtained the best results by the use of close grained wood as the non-metallic member.

I do not desire to be understood as limiting my invention to the employment of wood as the non-metallic member of the stylus arm.

I claim as my invention:

1. In a tone modifying device for phonographs, the combination of a pivotally supported metallic stylus arm member, a non-metallic stylus arm member in engagement with the metallic member on both sides of its pivotal support, and a stylus carried by the non-metallic member.

2. In a tone modifying device for phonographs, the combination of a pivotally supported stylus arm member, a non-metallic stylus arm member spaced apart from the metallic member at its pivotal point and in engagement with the metallic member at opposite sides of said pivotal point, and a stylus carried by the non-metallic member.

3. In a tone modifying device for phonographs, the combination of a pivotally supported stylus arm member, a non-metallic stylus arm member spaced apart from the metallic member at its pivotal point and in engagement with the metallic member at opposite sides of said pivotal point, a stylus carried by the non-metallic member, and means for adjustably holding the non-metallic member in engagement with the metallic member.

4. In a device of the class described, the combination of a diaphragm, a stylus arm comprising a metallic member connected to the diaphragm, means for pivotally supporting the metallic member, a non-metallic member comprising a relatively large body portion, means connected thereto for supporting a stylus, said non-metallic member also comprising an arched portion extending past the pivotal support of the metallic member and engaging the metallic member adjacent to the diaphragm, and means for holding the non-metallic member firmly in engagement with the metallic member on both sides of the pivotal center of the metallic member.

5. In a device of the class described, the combination of a diaphragm, a stylus arm comprising a metallic member connected to the diaphragm, means for pivotally supporting the metallic member, a non-metallic member comprising a relatively large body portion, means connected thereto for sup-

5 porting a stylus, said non-metallic member also comprising an arched portion extending past the pivotal support of the metallic member and engaging the metallic member adjacent to the diaphragm, and adjustable means for holding the non-metallic member firmly in engagement with the metallic mem-

ber on both sides of the pivotal center of the metallic member.

Des Moines, Iowa, January 12, 1912.

W. H. COOK.

Witnesses:

W. B. ROOD,

J. A. BOEYE.