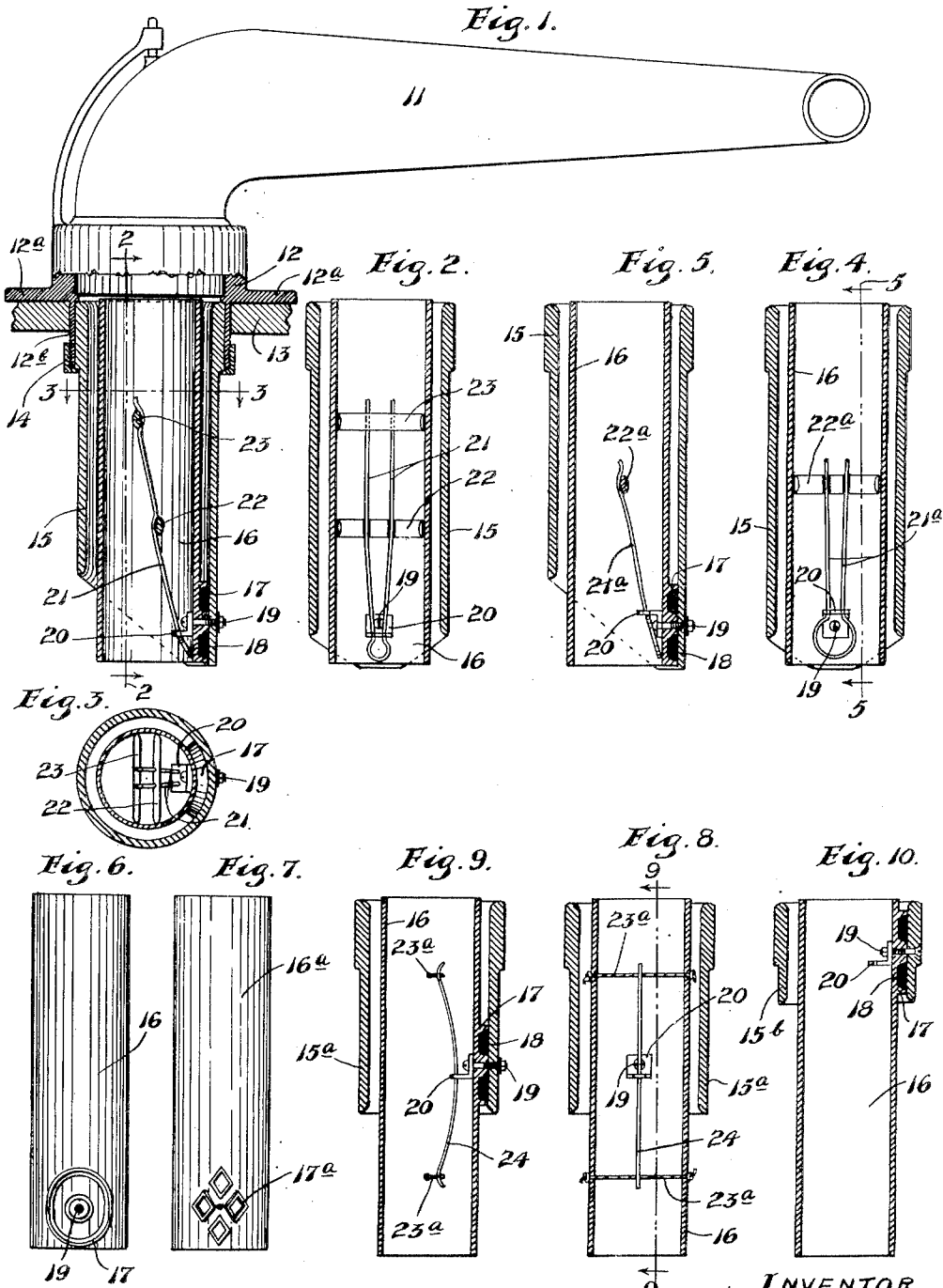


F. W. COOLEY.
TONE MODIFIER FOR TALKING MACHINES.
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1,349,604.

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TONE-MODIFIER FOR TALKING-MACHINES.

1,349,604.

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To all whom it may concern:

Be it known that I, FRED W. COOLEY, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Tone-Modifiers for Talking-Machines; 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 appertains to make and use the same.

My invention relates to phonographs or so-called talking machines and is directed to an improvement in the tone arms thereof, whereby a clearer, more resonant, more musical, and if desired, louder tone will be produced. Generally stated the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

In accordance with my invention I provide one or more, preferably two concentric resonant tubes and locate the same where the sound wave will pass therethrough as they emerge from the tone arm into the sound box. These resonant tubes should be made of wood thoroughly dried and having good resonant quality. Moreover, these wooden tubes should be made very thin so that they will readily vibrate. As an important feature of the invention, I provide a so-called tension or straining device which puts at least one of the resonant tubes under a normal stress so as to increase the resistance thereof.

The invention is illustrated in the accompanying drawings wherein like characters indicate like parts throughout the several views.

Referring to the drawings:

Figure 1 is a view chiefly in side elevation but with some parts in section showing the resonant tube attachment applied to a tone arm of a phonograph;

Fig. 2 is a vertical section taken actually through the resonant tube structure on the line 2—2 of Fig. 1;

Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 1;

Fig. 4 is a sectional view corresponding to Fig. 2 but illustrating a slightly modified construction;

Fig. 5 is a section on the line 5—5 of Fig. 4;

Fig. 6 is a side elevation of the inner tube shown in Figs. 1, 2 and 3;

Fig. 7 is a view corresponding to Fig. 6 but illustrating the slightly modified construction;

Fig. 8 is a view corresponding to Fig. 2 but illustrating a modified construction;

Fig. 9 is a section of the line 9—9 of Fig. 8; and

Fig. 10 is a view corresponding to Fig. 9 but illustrating a still further modified construction.

The tone arm 11 which is of the usual construction is, in the customary way, swiveled to a sleeve 12 which has a flange 12^a secured to the sound chamber 13 and is provided with a sleeve portion 12^b that projects through the top of the sound box and into the interior thereof. The sleeve 12^a, at its lower end, is externally threaded and provided with a flanged annular clamping nut or collar 14.

The numeral 15 indicates a wooden sleeve, the body of which is very thin, but the upper end of which is slightly increased in thickness so as to afford a shoulder adapted to be clamped by the flange of the nut 14, when the upper end of said sleeve tube 15 is telescoped into the flange 12^b as shown in Fig. 1.

The numeral 16 indicates the inner wooden resonant tube. This inner tube 16 is of a considerably smaller diameter than the outer tube 15 and it is concentrically spaced within the same but connected thereto at one point. In the construction illustrated in Figs. 1, 2, and 3 the connection between the two tubes 15 and 16 is made at the lower ends thereof, and by the flange ring 17 formed on the inner tube 16, by sealing wax or shoemakers' wax 18 and by a small nut equipped bolt 19. The wax 18 fills the space between the flange and the central hub and makes contact between the two tubes. The bolt 19 securely connects the two tubes at the one point and the wax prevents rattling or vibration at the joint between the two parts so that the resonance of the one tube will be transmitted to the other.

The bolt 19 also holds in position a small bracket 20, and this bracket holds, at the

lower end, a spring fork 21. The prongs of the fork 21 are sprung between and react upon two transverse sound parts or struts 22 and 23 that extend nearly but not quite diametrically through the inner tube 16, and at the ends are finally secured thereto. Preferably these so-called tone arms are of wood.

The construction shown in Figs. 4 and 5 is like that illustrated in Figs. 1, 2 and 3 except for the fact that one of the so-called tone struts or sounding posts 22^a is employed and the spring or fork 21^a presses only against this one strut 22^a.

In the construction shown in Figs. 8 and 9 the so-called sounding strut is in the form of cord or flexible tension members 23^a passing diametrically through the inner tube 16. In this arrangement, the outer tube 15^a is made shorter than in the other arrangement, before described, and the connection between the two tubes is at the lower portion of the outer tube and at the intermediate portions of the inner tube, as best shown in Fig. 9. The tension device here employed is a leaf spring or spring rod 24 the central portion of which is passed through a perforation in the bracket 20 and the end of which is pressed against the central portion of the strut 23^a.

In the arrangement shown in Fig. 10 the outer tube 15^b is made very short and the connections between this tube and this inner tube 16 is at the upper portion of the latter.

The inner tube 16^a shown in Fig. 7 is like a tube shown in Fig. 6 and the other views, but instead of having the single flange ring 17, it is shown as provided with several diamond shaped flanges 17^a that afford several pockets for containing the wax.

The device above described for improving the tone for phonographs or talking machines has been put into actual use and has been found very satisfactory for the purposes had in view. The tone produced when this device is applied, is not only louder, but is more resonant and musical and from all points of view, and a much better tone than that produced in that same machine without the resonator applied to the machine. The device may be more chiefly and easily applied to the machines now found on the market.

What I claim is:

1. The combination with a tone arm for talking machines, of a resonant tube spaced therefrom and located where the sound waves will pass therethrough on their way

from the tone arm into the sounding chamber, and a tension device putting said resonant tube normally under stress.

2. The combination with tone arm of a talking machine, of a resonant tube spaced from the inner end of said arm and located where the sound waves will pass therethrough on their way from said arm into the sound box, said resonant tube being supported at one spot located at one side thereof and free to vibrate throughout its main body portion.

3. The combination with a tone arm of a talking machine, of concentric resonant tubes spaced apart and located where the sound waves will pass therethrough on their way from said tone arm into the sound chamber, said resonant tubes being connected at one spot located at one side thereof and free to vibrate throughout their main body portions.

4. The combination with tone arm of a talking machine, of a resonant tube spaced from the inner end of said arm and located where the sound waves will pass therethrough on their way from said arm into the sound box, said resonant tube being supported at one spot only, and free to vibrate throughout its main body portion, a plurality of sounding posts or members extended through said resonant tubes, and a spring anchored to said tube and exerting spring forks against the intermediate portion of said sounding posts, thereby putting said tube under normal stress.

5. The combination with the tone arm of a talking machine, of concentric resonant tubes connected at one spot and spaced apart, said outer tube being anchored to the sound delivery end of said tone arm, and the two tubes being arranged so that the sound waves will pass therethrough.

6. The combination with the tone arm of a phonograph or talking machine, of concentric resonant tubes connected at one spot and spaced apart, said outer tube being anchored to the sound delivery end of said arm, and the two tubes being arranged so that the sound waves will pass therethrough, and a spring device anchored to said inner tube and exerting a normal tension thereon putting the same under stress.

In testimony whereof I affix my signature in presence of two witnesses.

FRED W. COOLEY.

Witnesses:

CLARA DEMAREST,
BERNICE G. BAUMANN.