

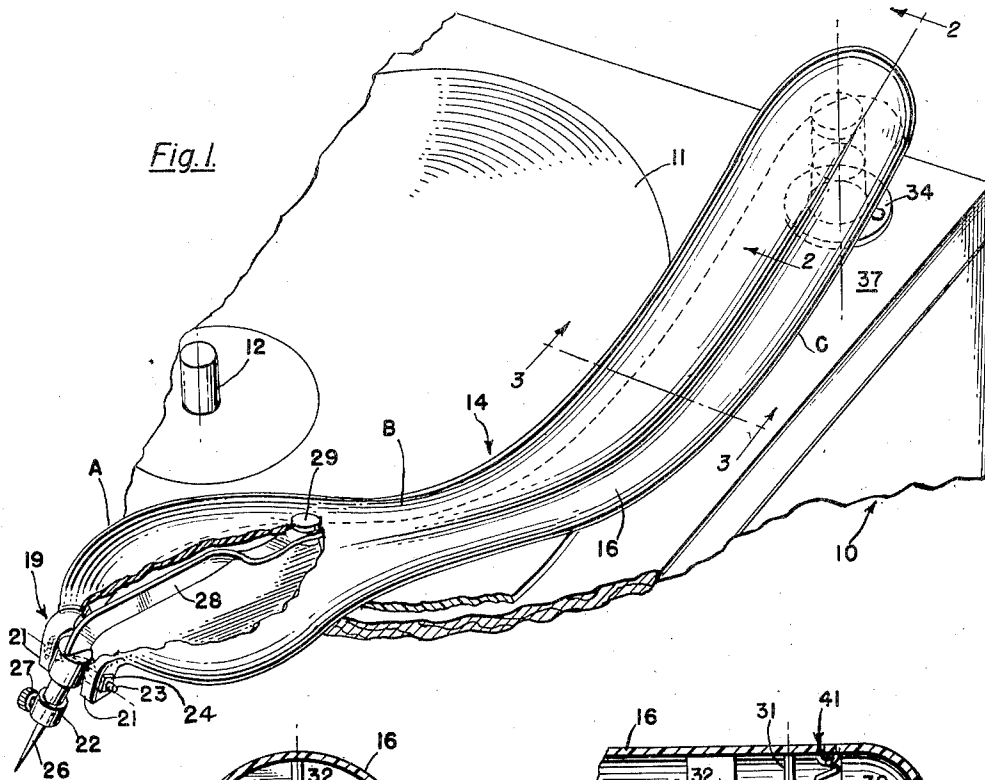
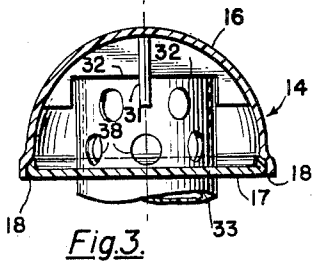
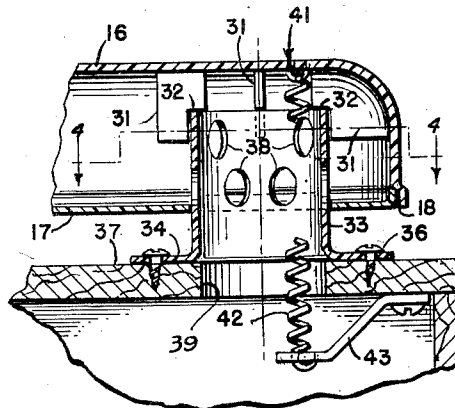
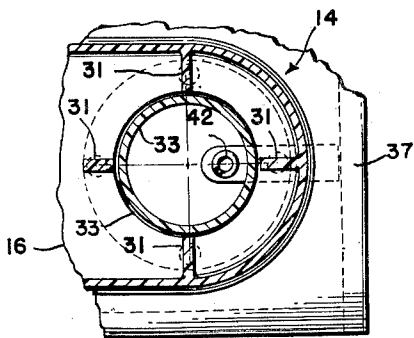
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2,819,088

TONE ARM CONSTRUCTIONS FOR PHONOGRAPHS

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2,819,088

TONE ARM CONSTRUCTIONS FOR PHONOGRAPHS

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4 Claims. (Cl. 274—23)

Our invention relates to improvements in tone arm constructions for phonographs.

One of the objects of our invention is the provision of an acoustic type tone arm for phonographs in which the use of a conventional diaphragm is avoided, the arm itself constituting a self amplifying diaphragm.

Another object of our invention is the provision of a phonograph tone arm constructed and supported so as to provide proper needle pressure while on a record and when off the record being retained against inadvertently striking the phonograph case.

A further object of our invention is the provision of a phonograph tone arm which may be constructed more economically than similar devices heretofore used and which is highly efficient in operation.

Other and further objects and advantages of our invention will become apparent from the following description when considered in connection with the accompanying drawings in which

Fig. 1 is a perspective view of a phonograph tone arm in accordance with our invention.

Fig. 2 is a cross sectional view taken substantially on line 2—2 of Fig. 1.

Fig. 3 is a cross sectional view taken substantially on line 3—3 of Fig. 1, and

Fig. 4 is a cross sectional view taken substantially on line 4—4 of Fig. 2.

Referring particularly to Fig. 1 there is illustrated a phonograph case 10 which includes a turn table 11 mounted on a spindle 12, the same being driven by a suitable spring driven or electric motor not shown, which is disposed below the turn table within the carrying case. The foregoing is conventional construction and forms no part of the present invention. Our invention is specifically directed to the tone arm assembly indicated generally by the numeral 14. The tone arm consists of two relatively thin walled complementary molded plastic sections 16 and 17, the upper section 16 being shaped substantially as illustrated in Fig. 1 and having a cross section substantially as illustrated in Fig. 3. The lower section 17 comprises a flat member which is received in longitudinal recesses 18 provided along the lower marginal edges of the upper section and cemented thereto to form an acoustic passageway which includes an enlarged head portion A tapering to a somewhat restricted neck portion B immediately adjacent thereto and a body portion C which progressively increases in cross sectional area proceeding from the neck portion B to the rear of the body portion. Thus, the tone arm rearwardly of the head portion has an expanding passageway which is substantially semi-circular in cross section.

The head portion A of the tone arm terminates in an inverted substantially U-shaped portion 19 between the legs 21 of which is disposed the needle holder 22. The said U-shaped portion is of substantial thickness and the legs 21 thereof are threaded to receive pointed pins 23 which are screwed into the legs from opposite sides and engage with the needle holder 22 to provide a fulcrum

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therefor. Lock nuts 24 are provided for locking the pins 23 in positions of adjustment.

The needle holder 22 is shaped substantially as illustrated in Fig. 1 and is provided with a socket at one end thereof to receive a needle 26, the said needle being retained in position by a set screw 27. The needle holder 22 is fulcrumed near the top thereof and suitably connected thereto as by soldering or brazing is a metal stylus arm 28 which is riveted to the head A substantially as shown. As will be apparent by reference to Fig. 1, the stylus arm 28 for the greater portion of its length is disposed in a vertical plane in common with that of the needle 26, while the rearward portion thereof is twisted 90 degrees to permit attachment, as by a rivet 29, to the head of the tone arm in the manner shown. It will be apparent that as the stylus arm 28 is caused to vibrate as a result of engagement of the needle within the spiral groove of a record, the amplitude of movement of the stylus arm 28 rearwardly of the point of fulcrum will be in direct proportion to the ratio of the lengths of the arm portions on opposite sides of the fulcrum.

The rearward portion of the tone arm is provided with a plurality of vanes or fins 31 formed preferably integrally with the wall structure of the tone arm, the fins being recessed as illustrated in Figs. 2 and 3 to provide shoulders 32 constituting bearing supports for the tone arm.

The tone arm is supported for movement about a vertical axis on a mounting which comprises a cylindrical member 33 having a flange 34, the said flange being perforated to permit the passage of the screws 36 therethrough whereby the said mounting may be attached to the top plate 37 of a phonograph case. The member 33 passes through a suitable aperture in the bottom section 17 of the tone arm and is provided with a plurality of perforations 38 which afford communication between the interior of the tone arm and the case 10, the member 33 being disposed in registration with a suitable aperture 39 provided in the top plate of the case. Arranged rearwardly of the vertical axis of the member 33 as illustrated in Fig. 2 is a perforated ear 41 which may be integrally formed with the upper section 16 and to which is connected one end of a tension spring 42, the other end of the said spring being connected to a bracket 43 which is mounted on the underside of the top plate of the case. The tension of the spring 42 is such that the tone arm is held to its mounting against inadvertent separation while yet permitting free swinging movement about a vertical axis whereby the needle 26 may freely follow the grooves in a record. The spring additionally serves as a counterbalancing means for the tone arm so that proper needle pressure is applied by the needle when on a record. Further, the tension of the spring provides a certain degree of friction between the arm and its mounting as also a retentive force which serves to hold the arm against swinging so that the arm will not strike any part of the case when the needle is off the record.

Various changes coming within the spirit of our invention may suggest themselves to those skilled in the art. Hence we do not wish to be limited to the specific embodiments described or uses mentioned, but intend the same to be merely exemplary, the scope of our invention being limited only by the appended claims.

We claim:

1. An acoustic type phonograph tone arm comprising a relatively thin-walled generally tubular body and integral head portion both constituting a resonating body, said arm being elongated and generally semi-circular in cross-section throughout its length, said head portion having at its forward end a pair of spaced depending legs, a needle and needle holder disposed between said legs, means carried on said legs affording a fulcrum support for said needle holder, a stylus arm having its forward portion

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connected to the upper end of said needle holder, said stylus arm being formed of strip material with the forward portion substantially coplanar with said needle and the rearward portion twisted to a plane substantially at a right angle thereto and secured to the upper wall of said head portion, said stylus arm for the major portion of its length being contained within said head portion.

2. An acoustic type phonograph tone arm comprising a relatively thin-walled generally tubular body and integral head portion both constituting a resonating body, means associated with the forward end of said head portion affording a fulcrum support, a needle holder carried by said fulcrum support, a needle received coaxially within said holder, a stylus arm formed of strip material with the forward portion arranged substantially coplanar with said needle and the rearward portion twisted to a plane substantially at a right angle and secured to the upper wall of said head portion, said stylus arm for the major portion of its length being contained within said head portion.

3. An acoustic type phonograph tone arm comprising a relatively thin-walled generally tubular body and integral head portion constituting a resonating body, a needle holder fulcrumed at the forward end of said head portion, a needle received coaxially within said holder, a stylus

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arm formed of strip material with the forward portion arranged substantially coplanar with said needle and the rearward portion twisted to a plane substantially at a right angle and secured to the upper wall of said head portion, said stylus arm for the major portion of its length being contained within said head portion.

4. In combination, an acoustic type phonograph tone arm comprising a relatively thin-walled generally tubular body and integral head portion both constituting a resonating body, a needle holder carrying a needle and fulcrumed at the forward end of said head portion, a stylus arm connected to said needle holder and received within said head portion with the rearward end of said stylus arm being secured to the upper wall of said head portion.

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