Dec. 10, 1929. C. A. AHLSTROM 1,739,201

PHONOGRAPH NEEDLE

Filed Jan. 31, 1928

Fig. 1.

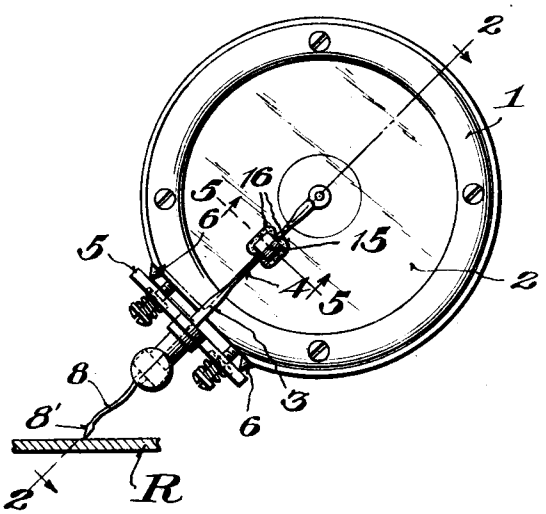


Fig. 2

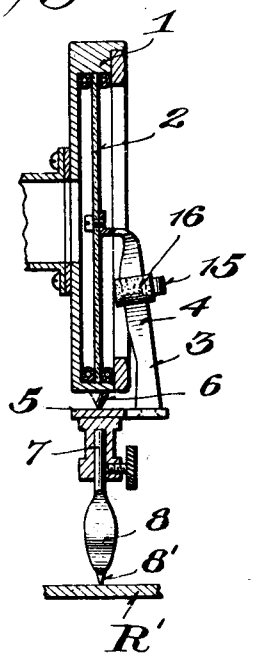


Fig. 3.

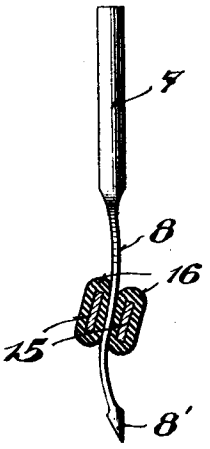


Fig. 4.

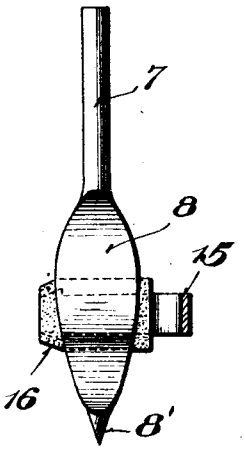
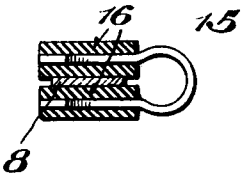


Fig. 5.



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UNITED STATES PATENT OFFICE

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PHONOGRAPH NEEDLE

Original application filed December 9, 1925, Serial No. 74,345. Divided and this application filed January 31, 1928. Serial No. 250,815.

This invention relates to certain new and useful improvements in phonograph needles, being a division of my application for patent filed December 9, 1925, Ser. No. 74,345, and the primary object thereof is to provide a needle which eliminates static and surfaces noises resultant from any of the metallic parts, or contact of the needle or stylus tip with the record, or disturbances of atmospheric, magnetic or mechanical origin.

A further object of the invention is to provide a needle which eliminates metallic vibrations and the static shock that effects distortion of the sound being reproduced and which also clarifies and isolates individual voices and accompaniment instruments.

Still further the invention aims to amplify or increase the sound to its natural volume and quality and to preserve the natural purity thereof.

The invention has still further and other objects which will be later set forth and manifested in the course of the following description.

In the drawings:—

Fig. 1 is a side elevation of a reproducer with the present invention applied thereto;

Fig. 2 is a section on line 2—2 of Fig. 1;

Fig. 3 is a side edge elevation of the needle, with a static shock and surface noise absorbing device in section;

Fig. 4 is a front elevation of Fig. 3 and

Fig. 5 is a section on line 5—5 of Fig. 1.

As disclosed in my aforesaid application, the sound box or reproducer 1 has the usual diaphragm 2 to which the stylus bar 3 is secured at its inner end. This stylus bar is thinned or flattened at its central portion as indicated at 4. The outer end of the stylus bar is secured to the stylus plate 5 that engages the pivot points 6.

The needle 7 as shown in Figs. 3 and 4 has a thinned and curved portion 8 so as to provide a flexible undulating shock absorbing tip, which bears upon the record R as depicted in Fig. 1 of the drawings, and wherein it will be noted that the concave side of the concavo-convex thinned part 8 directly faces the record so as to resiliently support the sound box from the record.

As depicted in Figs. 2, 3, 4 and 5, a static shock and surface noise absorbing device is provided consisting of a metal U-shaped clip or clamp 15 having tubular rubber pieces 16 covering the arms of the clamp. The shock and surface noise absorber is applied to the thinned central part 8 of the stylus bar and a similar device is applied to the curved and rounded needle tip, shown in Fig. 3.

The present invention therefore substitutes for the round, rigid needle, a flexible needle having a rounded sharp tip 8′ with its lower portion directly above the rounded point expanded and flattened very thin in a transverse parallel line with the face of the record, to create a flexibility when used for sound reproduction, the expanded flattened portion having an undulating form, with its rounded sharp tip 8′ curved slightly downward toward the record for engaging every minute indentation in the record, and for reproducing every inflection in the sound as perfectly and as naturally as it exists in the record.

The stylus bar and the rigid shank of the needle as depicted in Fig. 1, are disposed at approximately 45° to the plane of the record, while the record engaging tip of the needel is disposed at approximately 60° to the plane of the record, so that the said tip is approximately at 15° to the axis of the shank of the needle.

With the above construction, the needle is absolutely resistent to movement laterally of the groove, while still permitted to yield or flex in a plane which is at right angles to the plane of the record. With this confined movement, distortion of the sound resultant from the shock of the present day rigid needle is eliminated.

By virtue of applicant's structure of needle, wherein same can yield at right angles to the plane of the record, a quicker and truer response to the laterals is had. Otherwise expressed, the needle is free to respond to the laterals and follow the groove more perfectly, thus obtaining true reproduction.

From the foregoing it will be seen that the present invention involves a needle which has a straight and rigid shank, one end of the shank being thinned to provide a flexible part terminating in a record engaging tip, the thinned part having a compound curvature throughout its length so as to dispose the tip substantially more perpendicularly to the plane of the record. It is essential that the shank be rigid and straight so as to confine the flexibility to the end portion only of the needle. It is also essential in reproduction, according to the present invention, that the flexibility of the record engaging tip be in the direction of the groove and not laterally of the groove.

The stylus bar having a thin, expanded, central section counteracts the static shock and interfering sounds from being reproduced through the diaphragm, that have not been fully absorbed by the flexible undulating portion of the needle or stylus tip.

The static shock and surface noise absorbing clamp attached to the thin central section of the stylus bar and to the stylus tip absorbs and arrests static shocks and metallic vibrations and surface noise emanating from the needle tip in its travel in the groove of the record, and prevents such interfering sounds from being reproduced through the diaphragm.

To facilitate the adaptability of the needle to the various forms of reproducers to conform to any particular angle of the stylus bar with the plane of the second, the straight shank of the needle can be placed at any given angle to dispose the tip of the needle on the record at approximately 60° to the plane of the record.

What is claimed is:—

1. A needle for use with a stylus bar and phonograph record, composed of a straight rigid shank having a thinned end of approximately uniform thickness to provide a flexible part which latter terminates in an integral record engaging tip portion, said thinned part being of gradual compound curvature throughout its length and formed to extend toward the record and with the axis of the tip portion at substantially 60 degrees to the plane of the record.

2. A needle for use with a stylus bar and phonograph record, composed of a straight rigid shank having a thinned end of approximately uniform thickness to provide a flexible part which latter terminates in an integral record engaging tip portion, said thinned part being of gradual compound curvature throughout its length and formed to extend toward the record and having the axis of its said tip portion at approximately 15 degrees to the axis of the shank.

3. A needle for use with a stylus bar and phonograph record, composed of a straight rigid shank having a thinned end of approximately uniform thickness to provide a flexible part which latter terminates in an integral record engaging tip portion, said thinned part being of gradual compound curvature throughout its length, and means to support the shank from the stylus bar so as to dispose the axis of the tip portion at approximately 60 degrees to the plane of the record.

In testimony whereof I affix my signature.

CHARLES A. AHLSTROM.