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E. M. GRILLEY ET AL

STYLUS FOR LATERAL CUT PHONOGRAPH RECORDS

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Fig. 1.

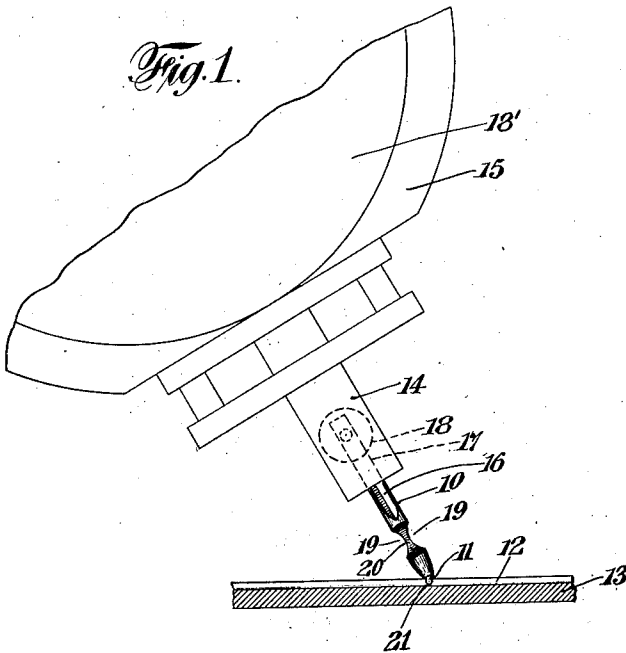


Fig. 2.

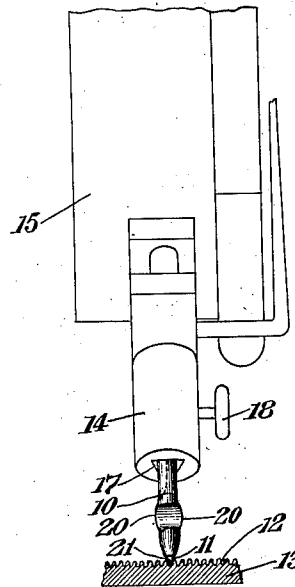


Fig. 3.

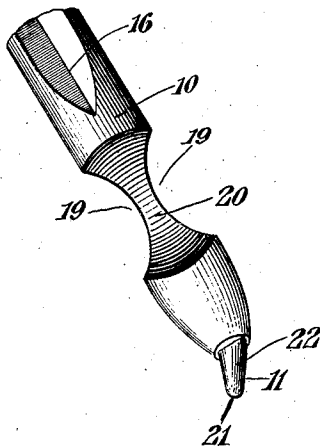
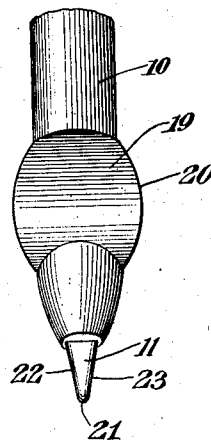


Fig. 4.



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STYLUS FOR LATERAL-CUT PHONOGRAPH RECORDS.

Application filed January 24, 1921. Serial No. 439,454.

To all whom it may concern:

Be it known that we, ERNEST M. GRILLEY and FRANKLIN G. NEUBERTH, citizens of the United States, and residents of Waterbury and Ansonia, respectively, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Styli for Lateral-Cut Phonographic Records, of which the following is a specification.

The invention relates to a stylus for playing lateral-cut phonographic records.

It has for its object to provide a construction for styli of this type which will allow of the use of a stylus not abraded to any appreciable degree by the material composing the record. A stylus of this character will, therefore, be permanent or substantially permanent, that is to say, of such a nature as to allow of the playing of a great number of records before the point becomes so worn as to be no longer suitable for playing purposes. A further object of the invention consists in providing a stylus having a hard, highly polished working surface whereby the same will burnish the record indentations rather than cut same as is the case with the present type of steel and similar needles generally employed, thereby preventing wearing of the record. A still further object of the invention consists in the feature of so shaping the operating point as to give maximum strength and to reduce lateral vibration, also in maintaining the shape of the working surface to insure proper contact in traveling thru the grooves of the record, thereby greatly reducing record noises and scratching and rendering possible the reproduction of difficult high notes, which may not be attempted by the use of steel and other known needles now generally employed for playing lateral-cut records and rapidly worn by the record material.

The nature of the invention will best be understood when described in connection with the accompanying drawings, in which—

Figs. 1 and 2 are respectively a side and front elevation of the improved stylus in playing position.

Figs. 3 and 4 are detail side and front elevations of the improved stylus.

Similar characters of reference designate

corresponding parts thruout the several views.

Referring to the drawings, 10 designates a cylindrical shank or mounting member designed to have set therein an operating point 11 adapted to fit the grooves 12 of a phonographic record 13 of the lateral-cut type. The member 10 is designed to be received and retained in the usual manner within a stylus holder 14 carried by the sound box 15. It is preferred, however, in order to insure location of the working surfaces of the stylus point 11 with reference to the grooves 12, to provide the mounting member or shank 10 with a triangular or like groove 16, Fig. 3. The groove 16 is formed in the upper end of the shank 10 which fits within the socket 17 of the holder 14; and it is designed to receive the usual set screw 18 whose axis is generally located at right angles to the diaphragm 18' of the sound box. In this manner, the correct playing position of the stylus point 11 in the groove 12 is assured, namely with its wider portion parallel to the sides of the groove and to the diaphragm. Furthermore, it is preferred to weaken the shank 10 in its plane of travel, as by providing indentations or depressions 19 transversely of same. This may be effected by milling out the shank; but it is preferred to swage the same, the surplus material 20 therefrom then extending over the intermediate portions. By this expedient, surface noises are further reduced in that the stylus may have a vibration in the plane of its travel.

The operating point 11 may be set or mounted within the member 10 in any well-known or special manner; and, in accordance with the invention, is so constituted and shaped in a novel manner as to secure exceptionally long life of the stylus and better reproduction thru lesser friction in traveling the grooves. Record noises and scratching are thereby greatly reduced and it is possible, also, to render the reproduction of difficult high notes. To this end, the portion 11, constituting the operating point projecting beyond the mounting member 10, is secured in position to be substantially perpendicular to the record; and, to insure maximum strength may be made relatively narrow as compared to its thickness, being about one-half of the same. It

is this narrow portion which rides in the grooves 12 of the record, the surfaces of the wider sides contacting with the indentations in the sides of the grooves for reproduction of the sound. The one edge 21, adapted to ride in the lower portion of a groove, is rounded, being preferably made circular with a radius equal to substantially one-half the width of the point which is tapered thereto. Furthermore, the lower end of the point is also rounded at right angles with a radius of curvature approximately one-half of the radius of curvature in the other direction and tapered thereto, thus affording a more or less flattened tapering point with rounded edges. The bounding and playing surfaces 22 and 23, moreover, are formed of conoidal contour from these edges, being of a radius of curvature approximately seven times the smaller of the two said radii and thereby providing surfaces which will smoothly and readily follow the indentations 12 of the record. By thus also rounding the sides of the playing point there is no danger of a double reproduction thru the said point engaging portions of the grooves not diametrically opposed to each other when the needle assumes a slight twist during its travel over the record.

As a suitable material for the point, we have found precious and semi-precious stones, for example diamond, sapphire, ruby, garnet, agate and like substances particularly satisfactory, especially such materials as exceed (6) in the scale of hardness. For most purposes, we have found sapphire to be most excellent; but we do not desire to restrict ourselves to the use of the particular substances set forth, as other materials which will not have an appreciable abrasive action on the record may be employed. It is desirable, also, to give the

working surfaces of the point a high polish; and it has been found that this polish will be maintained during use in that the extremely slight abrasive action thereon of the record serves to polish the same rather than to cut the point as is the case with the steel needle generally employed for lateral-cut records. Moreover, we have found that if the shank in which this point material is set be of tool steel, an improvement in the reproduction is obtained by the use of such combination in playing a lateral-cut record.

We claim:—

1. Permanent stylus for playing lateral-cut phonographic records, comprising a suitable mounting member and a flattened operating point set therein whose lower end is of a thickness substantially one-half of the width of the point and the side faces being conoidal.

2. Permanent stylus for playing lateral-cut phonographic records, comprising a suitable mounting member and a flattened operating point set therein and the side faces being conoidal and of a radius of curvature in excess of the width of said point.

3. Permanent stylus for playing lateral-cut phonographic records, comprising a suitable mounting member and a flattened operating point set therein whose lower end is of a thickness substantially one-half its width and having its bottom edge rounded in directions at right angles to each other, the radius of curvature of the narrow portion being substantially twice that of the radius of curvature at right angles thereto and the side faces being conoidal.

Signed at Thomaston, in the county of Litchfield and State of Connecticut, this 20th day of January A. D. 1921.

ERNEST M. GRILLEY.

FRANKLIN G. NEUBERTH.