T. FLETCHER.

PHONOGRAPH NEEDLE.

APPLICATION FILED JUNE 5, 1919.

1,391,884.

Patented Sept. 27, 1921.

Fig. 1.

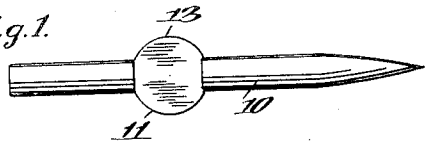


Fig. 2.

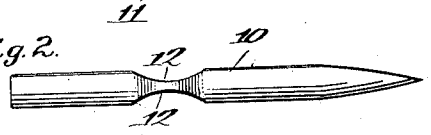


Fig. 3.

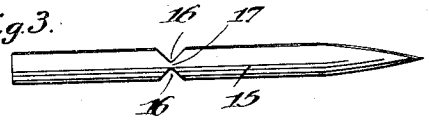


Fig. 4.

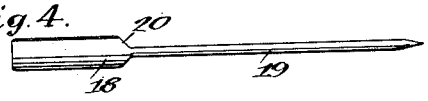


Fig. 5.

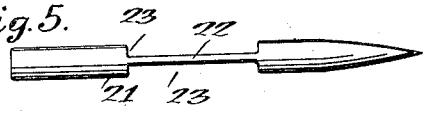


Fig. 6.

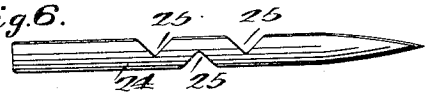


Fig. 7.

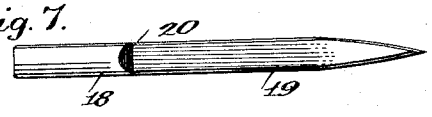


Fig. 9.

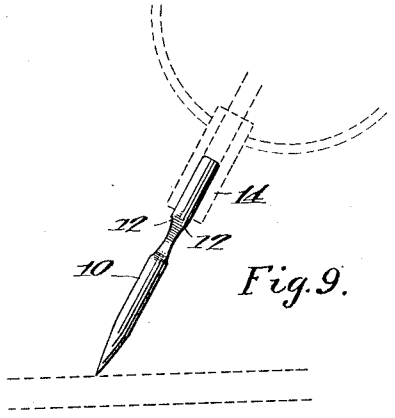
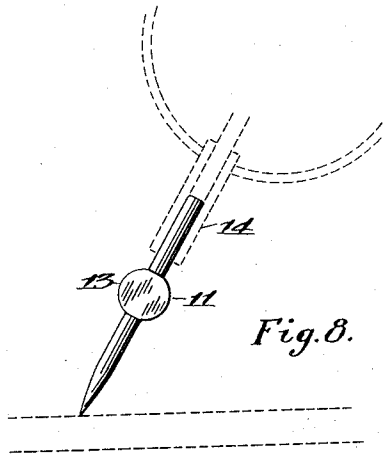


Fig. 8.



WITNESSES

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UNITED STATES PATENT OFFICE.

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PHONOGRAPH-NEEDLE.

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To all whom it may concern:

Be it known that I, THEODORE FLETCHER, a subject of the King of Great Britain, residing at San Antonio, in the county of Bexar and State of Texas, have invented certain new and useful Improvements in Phonograph-Needles, of which the following is a specification.

My invention relates to improvements in needles for phonographs.

An important object of the invention is to provide a needle of the above-mentioned character, which by being turned upon its longitudinal axis, will function as a soft, medium, or loud needle.

A further object of the invention is to provide a needle of the above-mentioned character which is simple in construction, inexpensive to manufacture, and may be used in connection with phonograph records of different types.

Another object is that by making the shank of the needle more flexible in one position than it is in another it is capable of absorbing most of the strong vibrations communicated to it from the record and by so doing cut them out from reaching the diaphragm and so play softly, at the same time preserving the overtones which add so much to the rendition of the music, but which are often lost in reproduction.

Another object is to confine the improvement to the shank of the needle, so that the same principle can be employed with needles having a "tungsten" or "jewel" point, besides the solid steel one, so that all makes of records can be played with needles having my improvement, with various volumes of sound, as desired.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same—

Figure 1 is a side elevation of a needle embodying my invention;

Fig. 2 is a similar view, with the needle turned at substantially a right angle to Fig. 1;

Fig. 3 is a side elevation of a second form of needle embodying my invention;

Fig. 4 is a side elevation of a third form of needle embodying my invention;

Fig. 5 is a similar view of a fourth form of needle embodying the invention;

Fig. 6 is a similar view of a fifth form of needle embodying the invention;

Fig. 7 is a side elevation, taken at a right angle to Fig. 4, of the needle shown in Fig. 4;

Fig. 8 is a side elevation of the needle shown in Fig. 1, showing the same in use, and playing as a soft needle; and

Fig. 9 is a similar view showing the needle turned at a right angle, and playing as a hard needle.

In the drawing, wherein for the purpose of illustration is shown a preferred embodiment of my invention, attention being first called to Figs. 1 and 2, the numeral 10 designates the body portion of the needle, which is preferably circular in cross-section, throughout the greater portion of its length. The needle is shown as tapered at its forward end. The numeral 11 designates a thin or flattened portion formed in the body portion 10 of the needle. This thin or flattened portion provides concave recesses 12 upon the opposite sides thereof. The thin or flattened portion 11 is disposed in the central longitudinal axis of the needle, and projects beyond its periphery, as shown in Fig. 1. This thin or flattened portion has preferably curved edges 13. Particular attention is called to the fact that the thin or flattened portion 11 is not arranged near the forward or tapered end of the needle, but is disposed at a point remote from such forward end, or near its rear end. This thin or flattened portion is adapted to be disposed adjacent the socket 14 of the vibratory stylus or lever, connected with the flexible diaphragm of the phonograph, as is well known. The function of the thin or flattened portion 11 is to impart an increased flexibility to the needle when desired, and by locating this portion at or near the rear end of the needle, or the socket 14, the same result is obtained as if the needle were rendered flexible through its entire length.

In Fig. 3, the numeral 15 designates the body portion of a different form of needle embodying my invention. This body portion is provided at a point remote from its forward end and near its rear end, with V-shaped recesses 16, forming a flexible portion 17, which is thin or flattened with respect to the body portion 10 in one direction

but has the same diameter in a direction at right angles to the first direction. The body portion 15 is preferably tapered at its forward end, as shown.

In Figs. 4 and 7, I have shown a different form of needle, having a body portion 18. This body portion is provided with a flattened portion 19, which extends from the forward tapering end thereof to a point 20, arranged near its rear end, whereby the needle may be rendered flexible in playing, throughout its entire operating length, As shown in Fig. 7, when the needle is turned at a right angle to Fig. 4, the flattened portion 19 has the same diameter as the body portion of the needle.

In Fig. 5, the numeral 21 designates the body portion of a needle similar to that shown in Figs. 4 and 7. This body portion is provided with a flattened portion 22, forming recesses 23. This flattened portion starts from a point spaced a substantial distance from the forward tapered end of the body portion and extends to a point near its rear end. The portion 22 is flattened in one direction only, and at a right angle to the flattened portion which has the same diameter as the body portion 21.

In Fig. 6, the numeral 24 designates a needle, provided with a plurality of V-shaped openings or notches 25, formed therein, and arranged in the same plane. These notches are disposed at a point remote from the forward tapered end of the needle, and imparts flexibility to the needle in one direction only.

From the foregoing description, it will be seen that the invention is principally concerned with rendering the body portion of the needle flexible in one direction only, and that the needle may be equipped at its forward end with a suitable point for playing any desired type of record such as the Edison, Pathé, Victor, Columbia, etc.

The needle may be made of steel, brass, or other suitable metal, or may be made of the combination of various metals, as a steel or brass body with a tungsten or jewel point.

In Figs. 8 and 9, the needle shown in Figs. 1 and 2 is illustrated in operation. In Fig. 8, the needle is employed to function as a soft needle, and it is therefore rotated upon its longitudinal axis so that the thin or flexible portion 11 is at right angles to the record. In Fig. 9, the needle is shown turned at an angle of 90° from the position occupied in Fig. 8, whereby the thin or flattened portion will render the needle rigid through its entire length with respect to its function, and the needle will then function as a hard needle. By turning the needle upon its longitudinal axis to different positions between these extreme points, it will be made to play with the desired degree of softness or hardness.

It is to be noted that when the needle is placed in the holder of the reproducer in such a manner that the thin or flexible section of the needle is in the same plane as the diaphragm when playing the zig-zag or hill-and-dale style of record, then its rendition is soft; and when the thin portion is at right angles, then it is at its loudest. That is, when playing the zig-zag record, if the thin section is in a vertical position, then it plays softly, for the vibrations are transverse, so act on the thin part, but with the hill-and-dale record, the vibrations are vertical, and therefore the position of the needle when playing them softly would be at right angles to the position of the zig-zag records, because of the fact that the position of the diaphragm is also changed.

By making the thinnest section of the needle some distance (the greater the better), from the point, the more strong vibrations it absorbs and is so enabled to play more softly when desired.

It is to be understood that the forms of my invention herewith shown and described are to be taken as preferred examples of the same, and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claim.

I claim:

A phonograph needle, having V portions, produced by removing sufficient parts from alternately opposite sides of the body.

THEODORE FLETCHER.