

R. M. HUNTER.
 RECORD FOR SOUND REPRODUCING MACHINES.
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937,680.

Patented Oct. 19, 1909.

Fig. 1

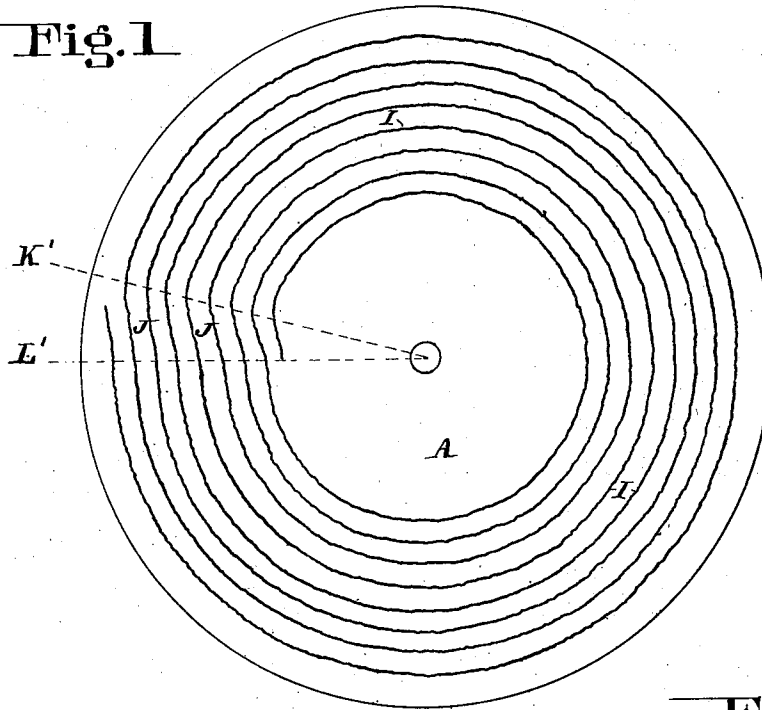


Fig. 2

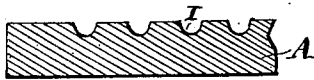


Fig. 3

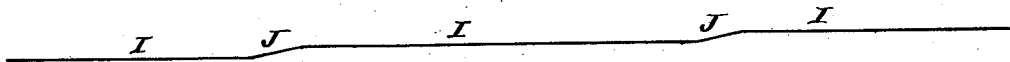
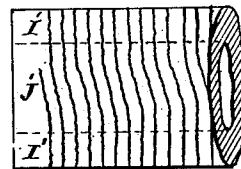


Fig. 4

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RECORD FOR SOUND-REPRODUCING MACHINES.

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To all whom it may concern:

Be it known that I, RUDOLPH M. HUNTER, of the city and county of Philadelphia and State of Pennsylvania, have invented an Improvement in Records for Sound-Reproducing Machines, of which the following is a specification.

My invention has reference to records for sound reproducing machines and consists of certain improvements which are fully set forth in the following specification and shown in the accompanying drawings which form a part thereof.

The object of my invention is to provide a construction of sound record tablet which, when operating in conjunction with the sound box and stylus, will, during the greater part of the time, cause a reproduction of the sounds without any feeding or propelling action upon the sound box and stylus or upon the record relatively to the sound box so that for about 95 per cent. of the time required to reproduce any piece, the stylus simply responds to the reproducing of sound and is not influenced by lateral feeding across the record tablet.

The result of the above described method of reproducing sound is that less scratchy tones result and the reproduction is more accurate, because there are no continuous lateral strains caused by the transverse feeding or propelling of the stylus by the groove and hence the lateral vibrations of the stylus are equally free in both directions.

My invention more especially resides in the sound record tablet, and this comprises the operating surface whether in disk or cylindrical form in which the groove over the greater part of its length is so formed that there is no requirement for a transverse feeding of the stylus and sound box, said feeding taking place only at widely separated intervals along the length of the groove and then only for very short periods of time.

More specifically, my invention is applied in its preferred form to what is known as the disk record such as employed in the ordinary gramophone, but the groove instead of being spiral is formed with a series of concentric circular parts connected by short diagonal grooved portions for feeding the stylus from the termination of one concentric groove to the beginning of the next adjacent concentric groove, the construction being such that there is no feeding action upon the

stylus across the record tablet during the travel of the concentric portions of the groove under the stylus and only during the time the short diagonal portions are operating upon the stylus.

My invention also comprehends details of construction which, together with the features above specified, will be better understood by reference to the drawings, in which:

Figure 1 is a plan view of a disk record embodying my invention; Fig. 2 is a cross-section of a portion of the same but on a larger scale; Fig. 3 is an elevation of a portion of a cylindrical record tablet embodying my invention; and Fig. 4 is a diagram illustrating the arrangement of the grooves when stretched out.

A is the body of the record and is provided with a series of concentric circular record grooves I. These concentric grooves have a common center with the center of the disk and hence with the turn-table of the ordinary sound reproducing machine when the disk is applied thereto. The concentric grooves I are not complete circles but for a short space are open as to themselves, but the termination of the outer groove is connected with the beginning of the next adjacent groove by a short diagonal groove J and so on with each successive concentric groove, as clearly indicated. The beginning and termination of each of these concentric grooves I are separated between the radial dotted lines K and L, and the surface constitutes a very small portion of the surface of the entire record disk, and consequently the grooved portions J likewise constitute a very small portion of the total length of the grooves of the record disk. In Fig. 1, the grooves I I are shown relatively far apart for clearness, and consequently the portions J have considerable obliquity, but in actual practice, the concentric grooves I I are approximately 1/100 of an inch apart, and therefore the obliquity of the connecting grooved portions J is hardly perceptible and produces no undue effect upon the stylus with regard to the reproduction of sound because it passes under the stylus so quickly and at such long intervals that any difference which might result would not be detected by the ear before it has occurred and passed. During the operation of the major part of the length of the combined grooves on the stylus there is no disturbing action

affecting the reproduction of sound due to the feeding action of the groove upon the stylus and sound box, which feeding action has heretofore required a greater pressure on one side of the groove than on the other by the stylus, and which, to that extent, has modified the purity of the tone which was reproduced by the instrument.

In Fig. 3, I have shown a portion of a cylindrical record, and in this case, the grooves I' lie in planes at right angles to the axis of rotation of the record tablet, and these portions are connected by the diagonal portions J' on the same general principle as specified in connection with Fig. 2. In this form of record tablet, the same advantage is secured where the record tablet is required to also feed the stylus, but because of the smaller diameter of the cylinder, there are relatively more of the diagonal grooved portions J', relatively to the length of the concentric portions I', than is the case in the disk form in Fig. 2.

If the grooves of Fig. 1 were stretched out, they would be as diagrammatically illustrated in Fig. 4, from which it will be seen that the only feeding action would be at the short diagonal portions J', and then only for very short durations of the total time it is required for the grooved portions to pass under the stylus. From this it will be seen that such defects as are introduced into the music or reproduction of sound, by the feeding action of the groove upon the stylus, is confined to a very small portion of the time which is required to reproduce the entire composition and then too, at widely separated intervals of time, so that the ear would not be alert enough to detect any difference before the cause for any such difference in the reproduction of sound has passed.

It will, of course, be understood that the general arrangement of the grooves illustrated in the drawings are more or less modified in their smoothness by the lateral sinuosities which are given to them under the sound vibrations through the recording stylus and which are totally independent of the position of the grooves which are defined by the device employed to relatively feed the recording surface under the engraving stylus when recording the sound record.

I do not limit myself to the arrangement of all of the portions J in the same radial position with respect to the surface of the record tablet as it is evident that they may be disposed in any other manner, regular or irregular as may be desired, the essential feature of the invention residing in the fact that the record tablet is so formed that a portion of the length of the groove therein is required to perform no function excepting that of reproducing sound, whereas the remaining and preferably very limited portion of its length is made to reproduce sound

and propel or feed the stylus transversely across the record tablet.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A flat sound record tablet having a series of laterally undulating sound record grooves of even depth in concentric circular arrangement but each forming less than a full circle and having the terminations of each circular groove connected by sound record grooves respectively with the beginning of sound record grooves of next smaller circumference.

2. A flat sound record tablet having a series of laterally undulating sound record grooves in concentric circular arrangement but each forming less than a full circle and having the terminations of each circular groove connected by diagonally arranged sound record grooves respectively with the beginning of sound record grooves of next smaller circumference.

3. A sound record tablet having its surface provided with a series of sound record grooves of substantially uniform cross section and of successively shorter length connected in series by a series of short sections of sound record grooves arranged diagonally to the first mentioned sound record grooves.

4. A sound record tablet having its surface provided with a series of concentrically arranged sound record grooves of successively shorter length connected in series by a series of parallel short sections of sound record grooves arranged diagonally to the first mentioned sound record grooves.

5. A sound record tablet having a series of parallel laterally undulating sound record grooves each of circular form and less than a full circle and connecting sound record grooves diagonally arranged with respect to the first mentioned grooves and connecting them in series.

6. A record tablet for sound producing machines which consists of a surface having a laterally undulating sound record groove formed therein and in which the said groove is made up of a series of circular parts the beginning and end of each of which parts are in alinement and a series of connecting parts arranged diagonally and connecting the series of circular parts in series to form one continuous groove which has its alinement changed only at long intervals in its length.

7. A record tablet having a laterally undulating sound record groove consisting of a series of grooved portions of circular arrangement but out of alinement connected in series by a series of diagonally arranged connecting grooves.

8. A record tablet having a laterally undulating sound record therein consisting of a series of sound record portions out of

alinement with each other and connected in series by a series of diagonally arranged connecting sound record portions.

5 9. A sound record tablet having a record groove in which a series of portions thereof are each constructed to have all portions lie in the same plane across the axis of the tablet and also at the same distance from the axis and said portions being connected in

series by a series of diagonal record groove 10 portions.

In testimony of which invention I have hereunto set my hand.

R. M. HUNTER.

Witnesses:

R. M. KELLY,

M. F. DRISCOLL.