

D. H. HAYWOOD.
RECORD FOR SOUND REPRODUCING MACHINES.
APPLICATION FILED AUG. 23, 1909.

948,137.

Patented Feb. 1, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

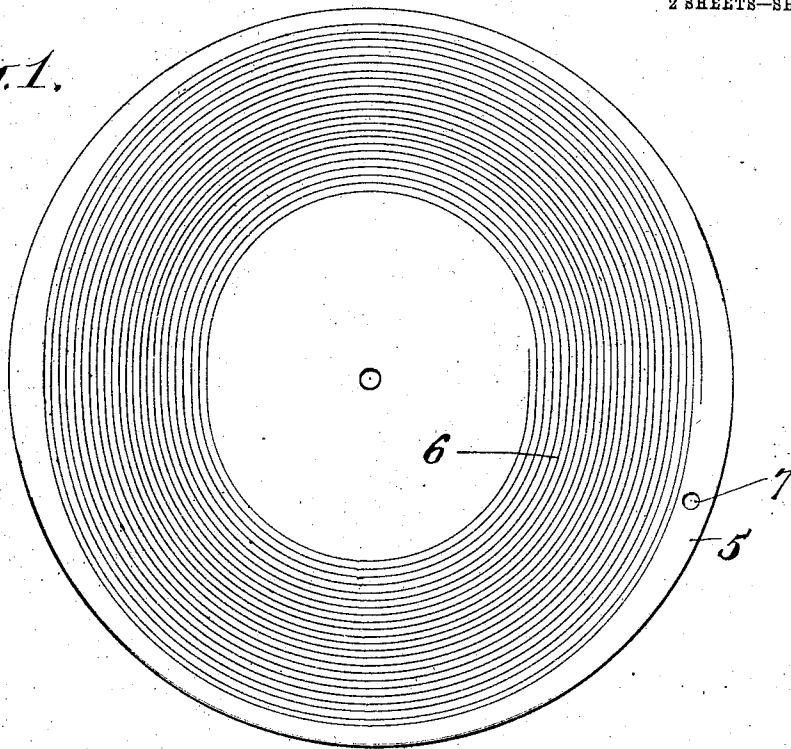
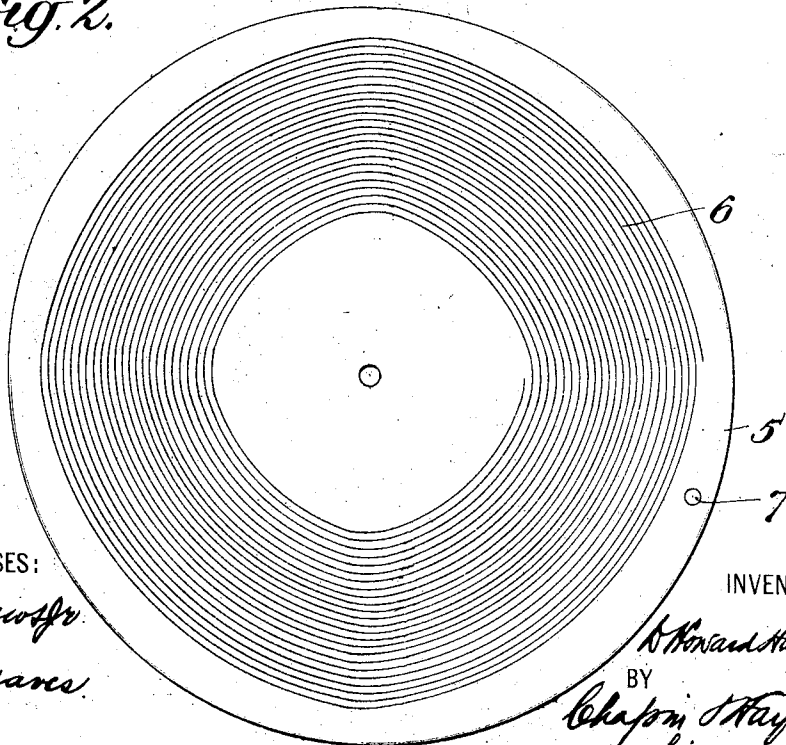


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

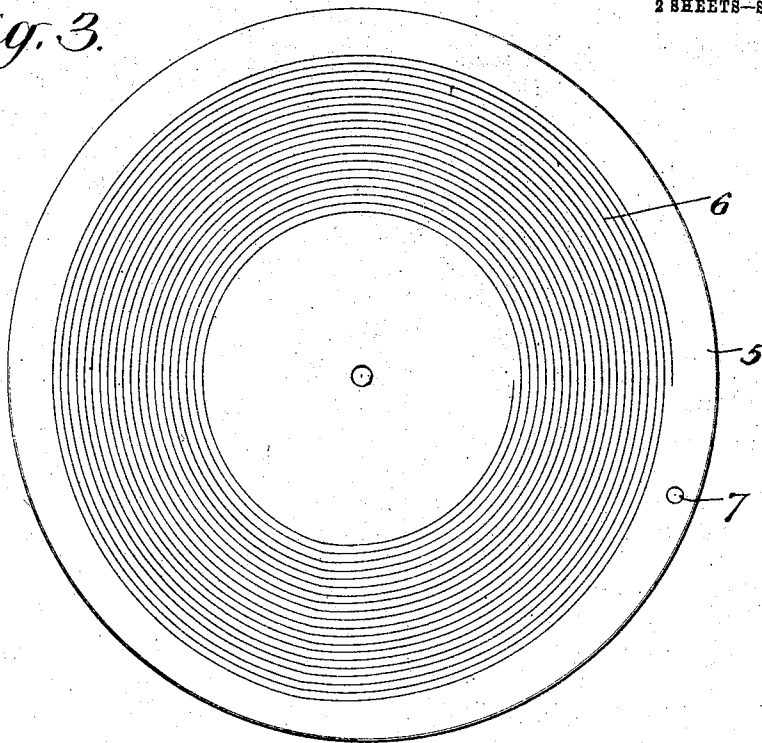
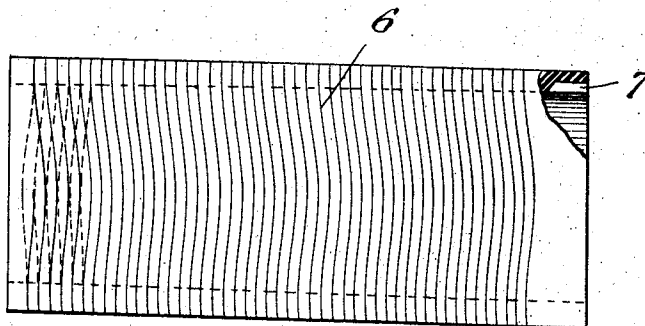


Fig. 4.



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UNITED STATES PATENT OFFICE.

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RECORD FOR SOUND-REPRODUCING MACHINES.

948,137.

Specification of Letters Patent.

Patented Feb. 1, 1910.

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To all whom it may concern:

Be it known that I, DANIEL HOWARD HAYWOOD, a citizen of the United States of America, and a resident of New York, county of New York, and State of New York, have invented certain new and useful Improvements in Records for Sound-Reproducing Machines, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The sound grooves of sound reproducing machine records commonly advance, independently of their sound producing undulations, in the form of a regular spiral or helix, so that the stylus employed in connection therewith has a regular and uniform transverse feeding movement as the record rotates.

The object of my present invention is to provide for an irregular transverse feeding movement of the stylus, and to this end I construct the record with a sound groove which, independently of its sound producing undulations, advances irregularly. The preferred form of feeding movement I desire to impart to the stylus is a to and fro movement, (the total movements in one direction being, of course, in excess of the total movements in the other, whereby the stylus is gradually, though irregularly, advanced) and to effect this I provide the record with a sound groove which advances and recedes as the record rotates. I also preferably provide the record with a positioning recess so that the record may be properly positioned upon its support in the machine with respect to the feeding mechanism. Included among the advantages of this form of feed are, first, that the stylus carrying arm has thereby a free swinging movement; second, the normal pressure upon the sound box diaphragm is thereby more uniformly distributed; *i. e.* such pressure is applied first upon one side of the diaphragm, and then upon the other; third, there is a greater tendency toward centralizing the stylus in the sound groove; and fourth, the records so constructed are adapted only for use in the specific form of machine for which they are designed, or which is designed to receive them. This latter is a feature of great commercial importance in that it tends to largely reduce the unauthorized copying of records, and the unauthorized use of records in machines for which they were not intended.

In order that my invention may be fully understood, I have illustrated several forms of records, constituting embodiments thereof, in the accompanying drawings which I will now proceed to explain, and will thereafter point out the novel features in claims.

In the drawings: Figure 1 is a face view of a record of the flat disk type, constructed according to my invention. Figs. 2 and 3 are similar views, illustrating different forms of the sound groove. Fig. 4 is a view in side elevation of a record of the cylinder type, constructed in accordance with my invention.

In Fig. 1, the record comprises a flat disk of any suitable material in the face of which appears the sound groove. The sound groove, so far as its sound producing undulations are concerned, may be of any desired character, the preferable form in this type of record being that in which the depth of the groove is uniform, and the undulations are lateral. The undulations are not illustrated herein, however, first because they are exceedingly minute at best and hence difficult to show, and second because an attempt to show them might readily obscure the illustration of the general direction of the groove which it is most desired to make clear. The general direction of this groove will be seen to be coincident with a curved line generated by the to and fro movement of a point in a line radial of the disk which rotates in one direction in the plane of the face of the disk about the axis thereof. If such an expression be permissible this curved line might be termed an oblong spiral. The groove may readily be formed by giving the cutting stylus in forming the record, a lateral to and fro movement as a part of the general lateral feeding movement thereof as the record rotates, or imparting a constant to and fro movement to the stylus and a feeding movement to the disk as well as a movement of rotation to the disk, or a uniform lateral feeding movement to the stylus and a constant to and fro lateral movement to the disk while simultaneously rotating it.

One form of machine for producing a record of the character disclosed herein is shown in a copending application Serial No. 534,834, filed December 24th, 1909.

It will of course be understood that the form of the groove, considered in relation to

its direction, is in no way limited to that shown in Fig. 1, as it is obvious from what has been set forth above that many varieties may be employed. In Fig. 2 I have shown a form in which there are twice as many to and fro movements in the general direction of the groove as there are in the form shown in Fig. 1, and the changes are more abrupt at some points than at others, while in Fig. 3, the groove lies in a series of concentric semicircles upon one side of a diametric line through the disk, while upon the other side of such line it advances and recedes in the manner illustrated in Fig. 1 and described in connection therewith.

In Fig. 4 in which the cylinder form of record is illustrated, I have shown a groove which advances and recedes with respect to a transverse line (parallel with the axis of rotation of the record) as the record revolves; the groove, however, having made a total advance at each revolution of the record. The general direction of this groove is similar to that shown in Fig. 1, but adapted to the cylinder form of record.

In order that the record may be properly positioned upon its carrier in the sound reproducing machine, I preferably provide the same with an eccentrically disposed positioning recess, such recess being shown at 7 in Figs. 1, 2, 3, and 4. This compels the proper angular relationship between the record and the feed mechanism, and is im-

portant where a positive feed is employed in the reproducing machine.

What I claim is:

1. A record element for sound reproducing machines, having in the face thereof a sound groove which in its general direction advances and recedes transversely as the element is revolved. 35
2. A record element for sound reproducing machines, having in the face thereof a continuous sound groove which, independently of its sound producing undulations, advances irregularly throughout its length. 40
3. A record disk having in the face thereof a sound groove the direction of which, independently of its sound producing undulations, follows a path produced by a point which advances and recedes along a line, radial with respect to the disk, to which a movement of revolution in one direction is given about the axis of the disk in the plane of the face thereof. 50
4. A record element for sound reproducing machines, having in the face thereof a sound groove which in its general direction advances and recedes transversely as the element is revolved, the said element having therein an eccentrically disposed positioning recess. 55

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