

H. K. SANDELL.  
 DEVICE FOR FORMING GROOVES IN SOUND RECORDS.  
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Fig. 1.

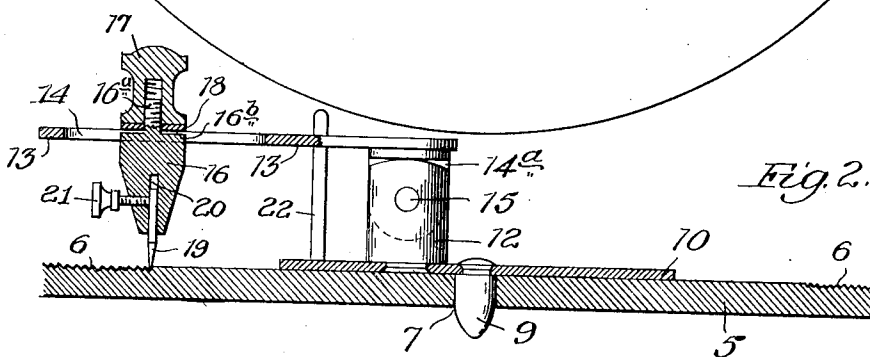
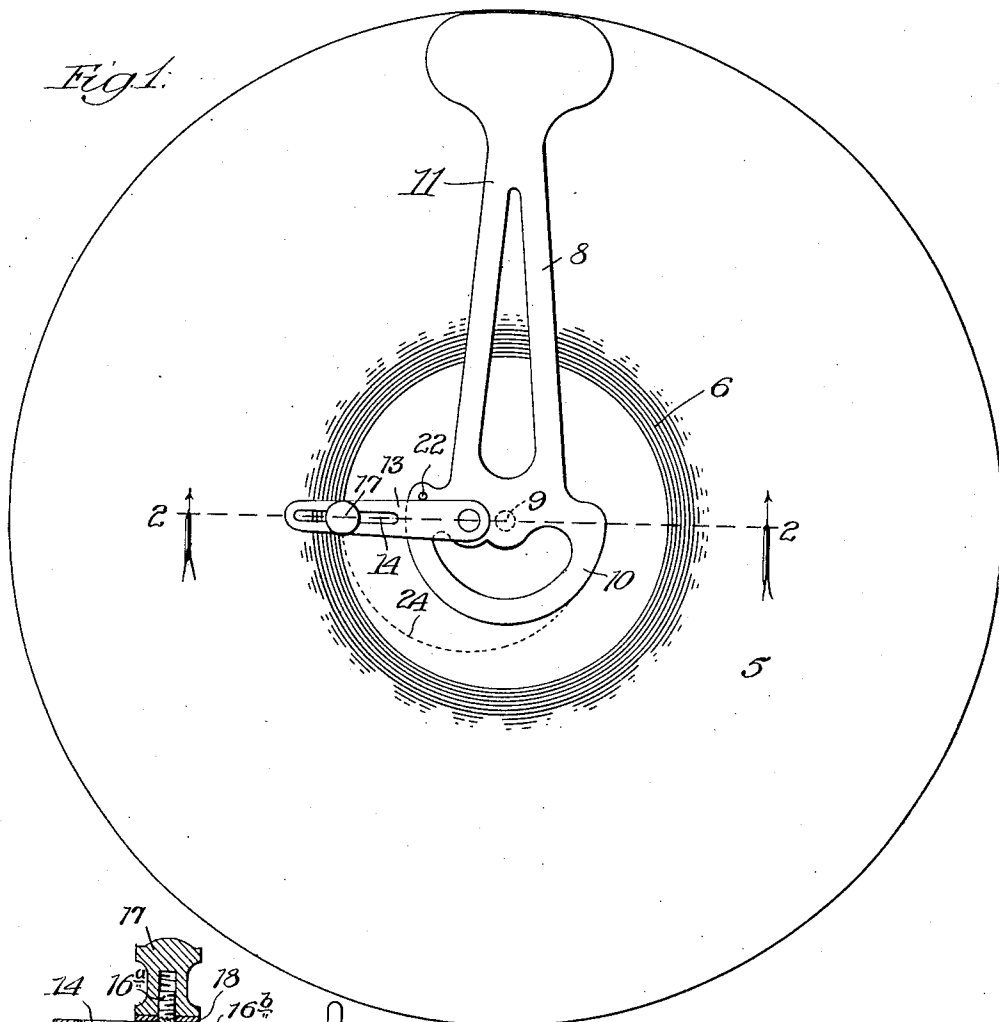


Fig. 2.

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# UNITED STATES PATENT OFFICE.

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DEVICE FOR FORMING GROOVES IN SOUND-RECORDS.

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Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, HENRY K. SANDELL, a citizen of the United States, residing at 221 South Green street, Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Devices for Forming Grooves in Sound-Records, of which the following is a specification.

This invention relates to groove forming devices, and more particularly to devices having as their object the ready and convenient formation of a groove in a disk record for sound reproducing machines, by means of which the tone arm of said machine, carrying a stylus traveling in a spiral sound recording groove, in such a record, may be rapidly brought toward the center of the record after having completed its passage through the sound recording groove. It relates also to records provided with such a groove.

My invention is fully and clearly described in the following specification and a preferred embodiment thereof is illustrated in the accompanying drawings, wherein—

Figure 1 is a plan view of the device, shown in position for use upon a sound record, and

Fig. 2 is a sectional view of the device on the line 2—2 of Fig. 1, likewise shown in operative position upon a sound record.

As illustrated in the drawings, 5 represents a sound record, in which is formed, in the usual manner, a spiral sound recording groove 6, either of the hill and dale or lateral wave type. This record 5 is provided, in the usual manner, with a central opening or aperture 7, intended to receive the drive spindle of the motor of the machine to which the record is applied.

The auxiliary groove forming device, which forms the subject of the present invention, in the embodiment illustrated comprises a base plate 8 having a flat under surface, adapted to lie upon the surface of the sound record. This base plate is provided, preferably near one end, with a rigid pin 9, of a size suitable to adapt it to enter the central opening 7 of the sound record to which the device is applied. The outline of the base plate 8 is such as to form at least a semi-circle about the pin 9, this semi-circular portion 10 having a radius corresponding to the distance from the central point of

the record which is to be regarded as the innermost limit of the movement of the needle of the tone arm in use of the record upon a suitable sound reproducing machine. The remainder of the outline of the base plate 8 may suitably consist of a relatively narrow portion extending radially from the central pin 9 and adapted for convenience in handling of the device, and extended sufficiently to give a broad surface for engagement with the record to which the device is applied and thereby avoid too great a pressure upon any particular point thereof.

Eccentrically of the semi-circular portion 10 of the base plate 8 is pivotally mounted an upright post 12, to the top of which is attached a substantially horizontally extending arm 13. This arm 13 is attached to the post 12 by means of a downwardly extending lug 14<sup>a</sup> and a horizontal pivot 15, the top of said post being suitably curved in order to permit movement of the arm 13 in a vertical plane about the pivot 15. The arm 13 is provided with a slot 14, extending in a straight line from the center of pivotal movement of the post 12. Within this slot 14 is slidably mounted a groove cutting device, which comprises a depending holder for the groove cutting tool, said holder 16 having a tongue or raised portion 16<sup>b</sup> entering the slot and preventing rotative movement of the holder relative thereto, and a screw 16<sup>a</sup> extending upwardly through the slot and upon which is screwed a headed nut 17. A washer 18 may be interposed between the nut 17 and the arm 13. It is readily apparent that on unloosening the nut 17, the cutter holding member 16 may be readily moved along the slot 14 to any desired position and fastened there by screwing down nut 17. In the embodiment illustrated, the groove cutting device is shown as a needle 19 clamped in a suitable bore 20 formed in the member 16, by means of set screw 21.

At one side of the substantially semi-circular portion 10 of the base plate 8 an upright post or standard 22 is provided, serving as a stop for the movement of the arm 13 in one direction. The position of this stop 22 is so selected that when the arm 13 engages therewith, the central pin 15 of the base plate, the pivotal center of the post 12 and the slot 14 in the arm 13 will be in a straight line.

In operation the base plate 8 is placed upon the record 5 with the depending pin 8 passing through the central opening of the record. The radial arm 13 is then brought into position against the stop 22, in which position the cutter holder is slidably moved along slot 14 until the cutter comes into position in the innermost of the sound recording grooves on the record. The cutter holder is then fixed in this position on the arm 13 and the arm is moved about its pivot 12 with the cutter holder 16 pressed against the record so that the cutter 19 forms a groove in the record surface. As the arm 13 is pivoted eccentrically of the circular portion 10 of the base plate 8, in its movement it will describe a curve which rapidly approaches the center of the record, terminating when the cutter or the cutter holder comes into engagement with the semi-circular edge of the base plate portion 10. This semi-circular portion 10 thus determines the radial distance from the center of the record at which the groove cut in this manner shall terminate.

In playing a record provided in this manner with a groove which, as respects the central point of the record itself, is substantially a spiral with a steep pitch, by means of a freely moving tone arm provided with a needle which travels through the spiral sound recording groove upon the record, the needle, after having traversed the sound recording groove, will enter the steep spiral curve formed at its end and, in traveling therethrough, will be rapidly drawn toward the center of the record. The tone arm will likewise move toward the center of the record, being drawn in that direction by the movement of the needle. It is readily apparent that with a device of this sort any desired stopping means, actuated by the arrival of the tone arm at a definite position relative to the center of the record, may be utilized without the necessity of setting or adjusting the stopping position of the tone arm for each record in accordance with the point at which the sound record grooves therein terminate. With a record grooved in the manner described a fixed stopping point may be provided, which, when reached by the tone arm, will stop the rotation of the sound record. Each record used may readily be provided with a groove of the character described, and thus all necessity of setting the stopping mechanism for each record will be obviated.

In the present embodiment of my invention I have illustrated the record 5 as having a spiral sound recording groove 6 of slight pitch, which is continued as a spiral guiding curve 24, shown in dotted lines, of relatively steep pitch. It is obvious, however, that for the purpose described the spe-

cific form of the guiding curve 24 is not material to the present invention, as it may be of any suitable form which will carry the needle rapidly from the end of the sound recording groove to or beyond the point at a determined distance from the center of the record.

Although I have described one embodiment of my invention in detail, I do not intend my invention to be limited to such details as are set forth, except in so far as such limitations may be included in the accompanying claims.

What I claim as new and desire to secure by Letters Patent, is:

1. In a device of the class described, supporting means capable of resting upon the surface of a sound record provided with a sound recording groove, and cutting means attached to said supporting means and movable in an arcuate path to form a surface groove in the record and connecting with the groove thereof.

2. In a device for cutting grooves in sound records provided with a sound recording groove, the combination of a support having an arcuate portion adapted to be disposed concentrically on a record, and cutting means adapted to engage said record and movable in an arcuate path relatively to said support to engage the arcuate portion of said record and thereby limit its movement whereby a groove connecting with the record groove is formed.

3. In a device for cutting grooves in sound records, a support adapted to rest on the surface of a record and having an arcuate portion adapted to be disposed concentrically with said record, a movable arm pivoted eccentrically thereto, and a cutter mounted on said arm and adapted to engage the surface of the record and to intersect the arcuate portion of the support in its movement.

4. In a device for cutting grooves in sound records, a support adapted to rest on the surface of a record and having an arcuate portion adapted to be disposed concentrically with said record, a movable arm pivoted eccentrically thereto, and a cutter slidably mounted on said arm and adapted to engage the surface of the record and to intersect the arcuate portion of the support in its movement.

5. In a device for cutting grooves in sound records, a support adapted to rest on the surface of a record and having an arcuate portion adapted to be disposed concentrically with said record, a movable arm pivoted eccentrically thereto, a cutter mounted on said arm, and a stop positioned on the support in such manner as to limit the movement of the arm in one direction.

HENRY K. SANDELL.