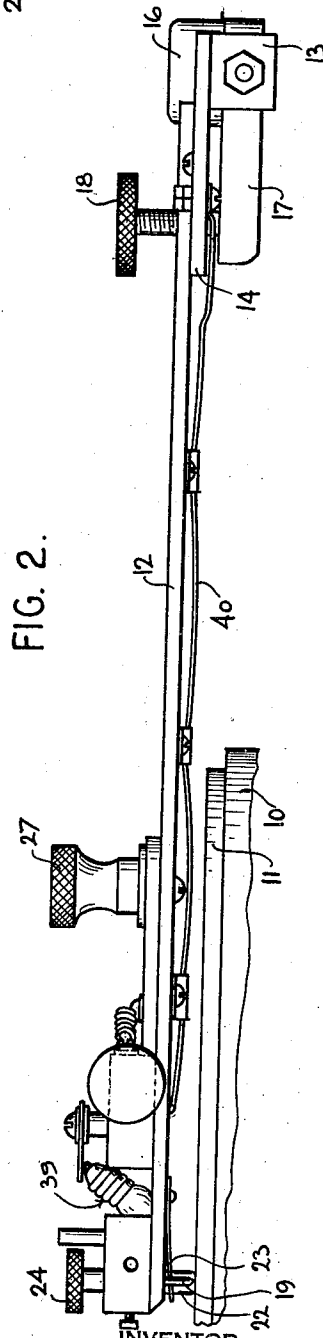
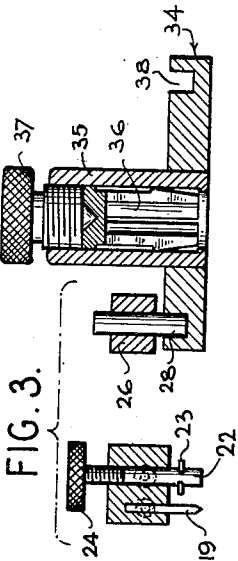
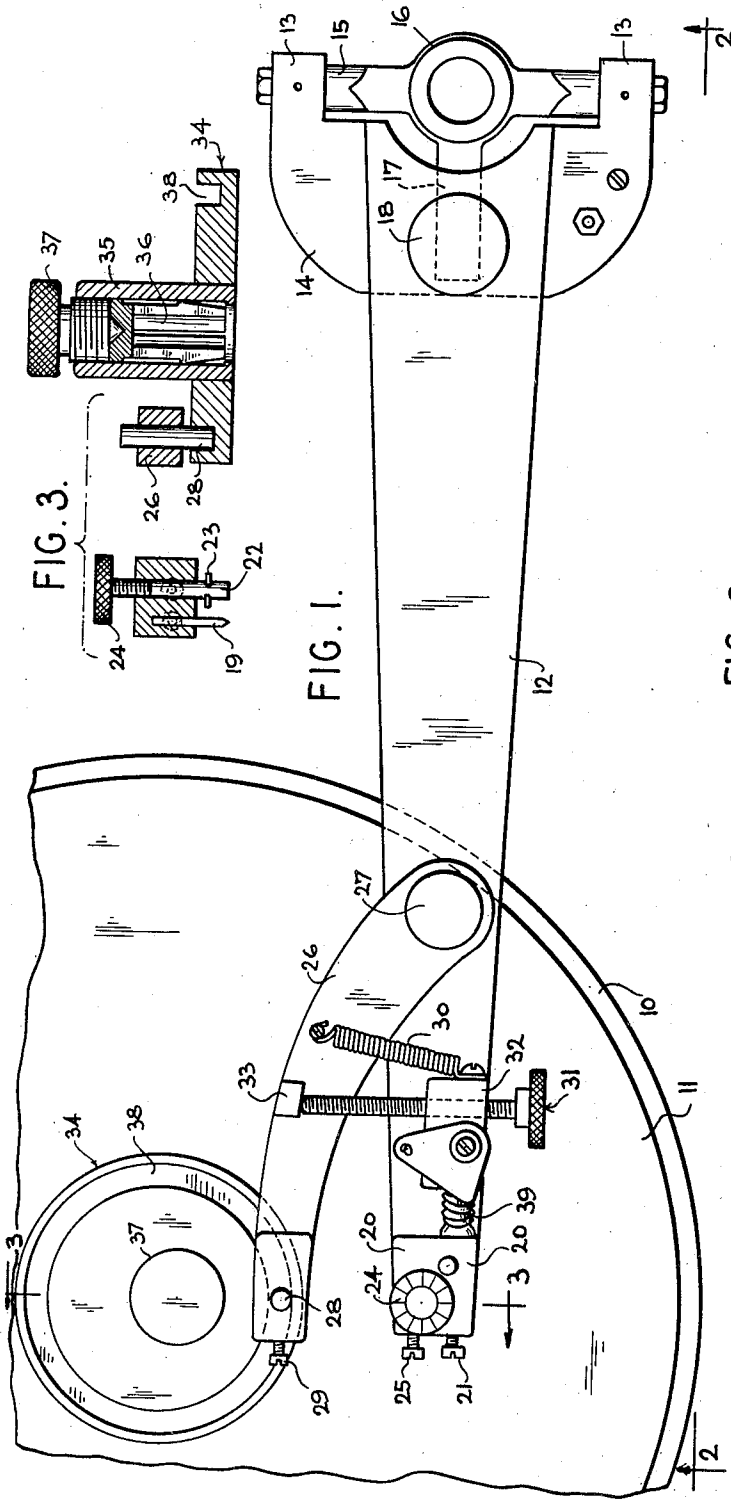


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 DEVICE FOR CUTTING THE TERMINAL ECCENTRIC  
 RUN-OUT GROOVE ON PHONOGRAPH RECORDS  
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## DEVICE FOR CUTTING THE TERMINAL ECCENTRIC RUN-OUT GROOVE ON PHONOGRAPH RECORDS

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This invention relates to sound recording equipment, and more particularly to a device for use in conjunction with such equipment for cutting a terminal, eccentric run-out groove on a record, the run-out groove being a continuation of the sound-track groove of the record.

The desirability of providing a terminal eccentric run-out groove on a record for swinging the pick-up arm inwardly toward the center of the record after the needle has traversed the sound track groove is well known. Better-grade modern phonographs are usually equipped with an automatic stopping mechanism which is actuated during the inward swing of the pick-up arm along the eccentric run-out groove. Furthermore the automatic record-changing mechanisms of phonographs are also actuated during the inward movement of the pick-up arm toward the center of the record along the run-out groove.

Accordingly, it is an object of the invention to provide an improved device for use in sound recording apparatus for rapidly and efficiently cutting a terminal eccentric run-out groove on a record.

A further object of the invention is the provision of a groove-cutting device of the character indicated which is designed and constructed in such a manner that the cutting needle may be easily adjusted at the end of the sound track groove prior to the formation of the eccentric run-off groove so that the run-off groove will invariably form a continuation of the sound track groove.

Another object of the invention is the provision of a groove-cutting device capable of being easily adjusted, prior to the formation of the eccentric run-off groove, at the end of the sound track groove despite the particular length of a given sound track groove and the location of the end of the sound track with respect to the center of the record.

The foregoing objects as well as additional objects and advantages of the invention will be readily understood in the course of the following detailed description taken in connection with the accompanying drawing, which illustrates a preferred embodiment of the invention, and wherein:

Fig. 1 is a plan view of a device embodying the features of the invention operatively connected to a recording apparatus, only a fragmentary portion of the turntable being shown.

Fig. 2 is an elevational view taken substantially along line 2—2 of Fig. 1.

Fig. 3 is a sectional view taken substantially along line 3—3 of Fig. 1.

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Referring now to the drawing in detail, it will be understood that the groove-cutting device of the invention may be used in conjunction with any conventional type of recording apparatus including a turntable 10 having a centering pin (not shown) for mounting a record disc 11 thereupon. The device comprises an arm 12 adapted to be swung toward and away from the turntable 10 in both a horizontal plane and in a vertical plane. It will be understood that arm 12 in its operative position is swingable on a substantially vertical axis. This purpose may be achieved by providing the outer end of the arm with a pair of bearings 13 formed on a bearing yoke 14, each of the bearings 13 being pivoted on a lateral horizontal extension 15 of a horizontally rotatable bearing 16, the bearing 16 being fixedly mounted on the frame or plate supporting the turntable 10. Bearing 16 may also be provided with a forward extension 17 for receiving the end of an adjusting screw 18 carried by arm 12 in order to limit the downward motion of said arm about the horizontal pivots 15.

The free inner end of arm 12 carries a cutting needle 19 which may be inserted within a mount or block 20 and secured by means of a set screw 21. In order to control the depth of the cut, a movable pin 22 may be supported within the mount or block 20 by means of a leaf spring 23 fixed at one end to arm 12 and having a recess at its other end engaging a pair of slots or depressions formed in said pin, as clearly shown in Figs. 2 and 3. A thumb screw 24 may be used to extend or retract pin 22 to any desired point above the end of needle 19 thereby controlling the depth of the run-out groove to be formed on the record disc 11. A set screw 25 is also provided for retaining the pin 22 in adjusted position.

A lever 26 is pivoted as at 27 to the inner arm 12, said lever carrying at its free end a pin or follower 28, which may be secured by means of a set screw 29, for a purpose to be fully described hereinbelow. A tension spring 30 normally urges lever 26 toward arm 12 but the distance between the pin or follower 28 of lever 26 and cutting needle 19 may be varied by means of an adjusting screw 31 carried by a block 32 fixed to arm 12. The free end of adjusting screw 31 engages against a fixed projection 33 of lever 26 so that by retracting or advancing said screw the lever will move toward or away from the arm 12 about pivot 27. Pivot 27 is preferably shaped as a plug or knob having a knurled head, as shown in Fig. 2, to facilitate the manipulation of arm 12 toward

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and away from turntable 10 during the operation of the device.

The device also comprises as a separate element an eccentric disc 34 which cooperates with lever 26 of arm 12 to form a terminal eccentric run-out groove on the record in a manner now to be described. Eccentric disc 34 is constructed to fit over the centering pin of turntable 10 and to rotate therewith, it being understood that the record 11 is placed upon the turntable before mounting the removably securable eccentric 34 in position. In order to mount the disc 34, said disc may be provided with an elongated off-center hub 35 carrying a chuck 36 therewithin, the chuck being operated by a control knob 37, as clearly shown in Fig. 3. An annular groove 38 is formed in eccentric disc 34 adjacent the periphery thereof for the reception of the follower or pin 28 of the lever 26.

In actual operation the arm 12 is swung inwardly toward the turntable 10 carrying the record 11 after first securing the eccentric disc 34 over the centering pin of the turntable, the follower or pin 28 being then engaged within the groove 38 (see Figs. 1 and 3). It will be understood of course that the sound track groove has previously been cut in the record by conventional apparatus not illustrated in the drawing. The cutting needle 19 is then adjusted to lie within the end of the sound track groove (not shown) by manipulating adjusting screw 31 to obtain the proper distance between the follower 28 resting within annular groove 38 and the cutting needle 19. This latter operation may be facilitated by preadjusting the screw 18 adjacent bearing 16 to elevate the arm 12 so that the tip of the needle 19 will be raised slightly above the surface of the record. Then, after the proper setting of adjusting screw 31 has been obtained, the screw 18 may be retracted to allow the needle to seat itself within the groove at the end of the sound track and to permit free operation of the arm 12 thereafter. Then as the turntable revolves the cutting needle 19 will move inwardly to form the eccentric run-out groove as follower 28 moves within annular groove 38 of eccentric disc 34. It will of course be understood that the high point or major dimension of the disc 34 will face toward the cutting needle 19 at the start of the groove cutting operation so that subsequent synchronous rotation of the disc with the turntable 10 and record 11 will move the cutting needle 19 inwardly to form the eccentric run-out groove.

If desired, arm 12 may be provided with an electric bulb 39 and wire 40 for illuminating the record in the vicinity of the cutting needle as the run-out groove is cut.

Since certain modifications may be made in the device of the invention without departing from the scope thereof, it is intended that all matter contained in the foregoing description and shown in the accompanying drawing be interpreted merely as illustrative and not in a limiting sense.

What is claimed is:

1. A device for cutting terminal, eccentric run-out grooves in records having previously cut sound tracks, said device comprising a turntable having a centering pin, an eccentric disc removably securable to said centering pin and rotatable therewith, said disc having a peripheral annular groove, an arm pivotally mounted at its outer end on a substantially vertical axis, a cutting needle carried at the inner end of said arm, a lever pivoted to said arm and carrying a follower at its free end engageable within said annular

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groove, and adjustable means for locating said follower a predetermined distance from said cutting needle at the end of the record sound track, whereby rotation of said turntable and eccentric disc will provide an eccentric run-out groove continuous with the sound track of the record.

2. A device for cutting terminal, eccentric run-out grooves in records having previously cut sound tracks, said device comprising a turntable having a centering pin, an eccentric disc removably securable to said centering pin and rotatable therewith, said disc having a peripheral annular groove, an arm pivotally mounted at its other end on a substantially vertical axis, a cutting needle carried at the inner end of said arm, a movable pin carried by said arm adjacent said cutting needle and adjustable to a predetermined level above the end of said needle for varying the depth of the cut groove, a lever pivoted to said arm and carrying a follower at its free end engageable within said annular groove, and adjustable means for locating said follower a predetermined distance from said cutting needle at the end of the record sound track, whereby rotation of said turntable and eccentric disc will provide an eccentric run-out groove continuous with the sound track of the record.

3. A device in accordance with claim 1, said eccentric disc having an elongated, off-center hub, a chuck within said hub and a control knob for locking said chuck upon said centering pin.

4. A device in accordance with claim 2, said eccentric disc having an elongated, off-center hub, a chuck within said hub and a control knob for locking said chuck upon said centering pin.

5. A device for cutting terminal, eccentric run-out grooves in records having previously cut sound tracks, said device comprising a turntable having a centering pin, an eccentric disc removably securable to said centering pin and rotatable therewith, said disc having a peripheral annular groove, an arm pivotally mounted at its outer end on a substantially vertical axis, a cutting needle carried at the inner end of said arm, a lever pivoted to said arm and carrying a follower at its free end engageable within said annular groove, a tension spring interconnecting said lever and said arm for normally urging said follower toward said cutting needle and an adjusting screw carried by said arm and engaging said lever for locating said follower a predetermined distance from said cutting needle at the end of the record sound track, whereby rotation of said turntable and eccentric disc will provide an eccentric run-out groove continuous with the sound track of the record.

6. A device for cutting terminal, eccentric run-out grooves in records having previously cut sound tracks, said device comprising a turntable having a centering pin, an eccentric disc removably securable to said centering pin and rotatable therewith, said disc having a peripheral annular groove, an arm pivotally mounted at its outer end on a substantially vertical axis, a cutting needle carried at the inner end of said arm, a movable pin carried by said arm adjacent said cutting needle and adjustable to a predetermined level above the end of said needle for varying the depth of the cut groove, a lever pivoted to said arm and carrying a follower at its free end engageable within said annular groove, a tension spring interconnecting said lever and said arm for normally urging said follower toward said cutting needle and an adjusting screw carried by said arm and engaging said lever for locating said fol-

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lower a predetermined distance from said cutting needle at the end of the record sound track, whereby rotation of said turntable and eccentric disc will provide an eccentric run-out groove continuous with the sound track of the record.

7. A device in accordance with claim 5, said eccentric disc having an elongated, off-center hub, a chuck within said hub and a control knob for locking said chuck upon said centering pin.

8. A device in accordance with claim 6, said eccentric disc having an elongated, off-center hub, a chuck within said hub and a control knob for locking said chuck upon said centering pin.

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