May 24, 1932. L. G. LARSEN 1,860,104

PHONOGRAPH ATTACHMENT

Filed July 15, 1930

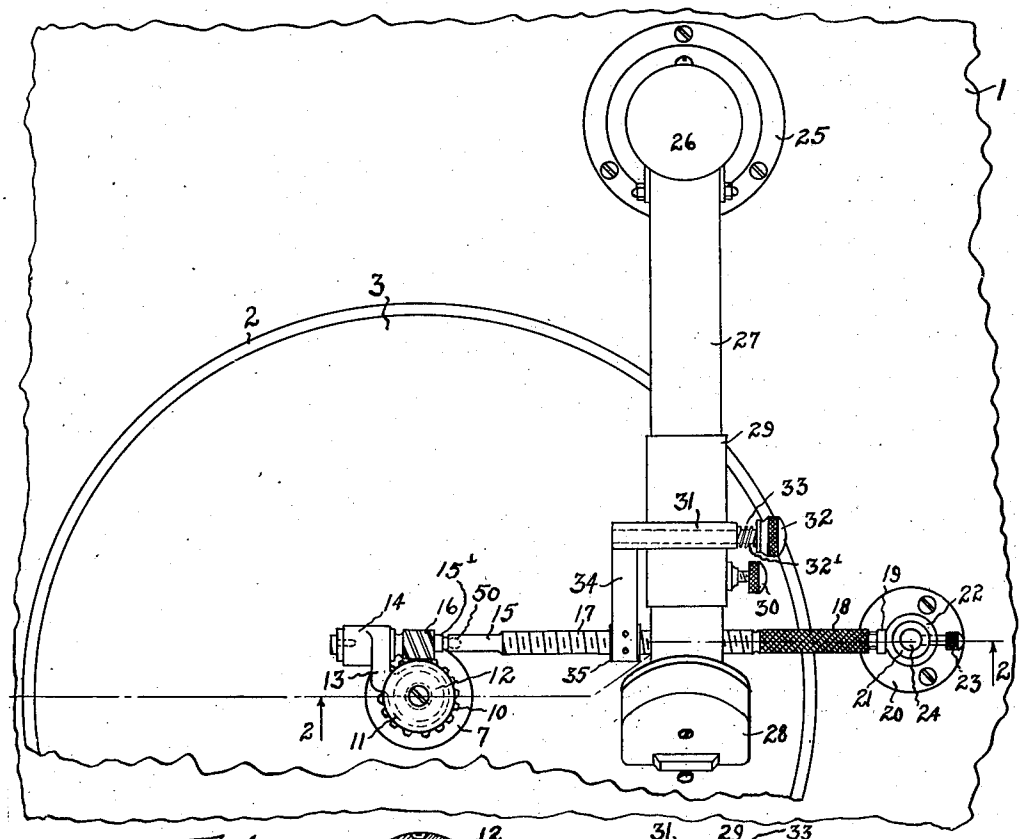


Fig. 1.

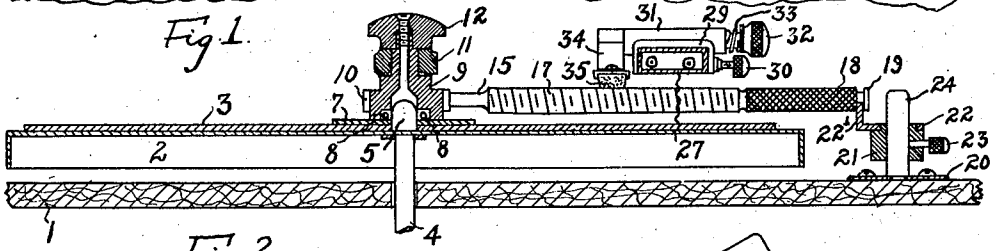


Fig. 2.

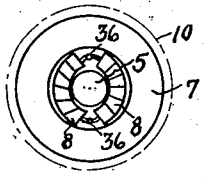


Fig. 3.

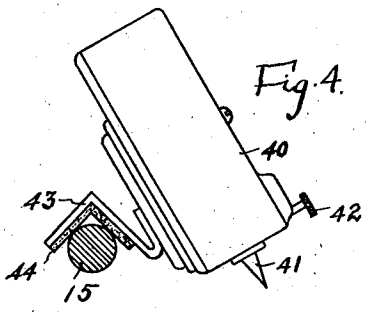


Fig. 4.

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UNITED STATES PATENT OFFICE

LOUIS G. LARSEN, OF JERSEY CITY, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO PRESTO MACHINE PRODUCTS COMPANY, INC., A CORPORATION OF NEW YORK, AND PRESTO CORPORATION OF AMERICA, A CORPORATION OF DELAWARE

PHONOGRAPH ATTACHMENT

Application filed July 15, 1930. Serial No. 468,107.

This invention relates to improvements in devices for cutting records on plates or discs.

One of the objects of this invention is the provision of apparatus by means of which sounds such as speech and music may be permanently recorded upon plates or discs such as the type used on phonographs.

A further object of this invention is the provision of means of this type in the form of an attachment which may be readily applied to existing phonographs (normally used for reproducing) for use in recording.

Another object of this invention is the provision of driving means in the form of an attachment for a phonograph for guiding the recording mechanism across the disc as it records.

A still further object of this invention is the provision of mechanism in the form of an attachment which may be applied to phonographs and to the tone-arm thereof in order that the reproducing unit may be used for recording.

All of these objects are particularly carried out in connection with electric phonographs in which the reproducing unit is of the electrically operated type.

A still further object of this invention is the provision of a simplified form of mechanism comprising an attachment of a recording unit driven thereby by means of which sounds may be permanently recorded.

These and other objects as will appear from the following disclosure are secured by means of this invention.

This invention resides substantially in the combination, construction, arrangement and relative location of parts all as will be described in detail hereinafter.

Referring to the drawings:

Figure 1 is a plan view with some parts broken away of the device of this invention;

Fig. 2 is a cross-sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is an enlarged underside view of the portion of the attachment which is applied to the turntable spindle; and

Fig. 4 is a side view of a modified form of the invention.

The general object of this invention is to provide a mechanism in the form of an attachment which may be applied to existing electric phonographs which are normally used for reproducing so that recording can be effected. The device comprises means driven by the turntable spindle for guiding the tone-arm and its electric reproducing unit across the face of a disc to cut a record thereon by supplying electric currents representing sound waves to the reproducing unit to make it a recording unit. Since, of course, an uncut disc has no grooves on it, it is necessary to guide the recording unit smoothly and evenly over the face of the disc as the record is cut to form a uniform, continuous spiral cut.

The invention can be best understood by direct reference to the drawings.

At 1 is the top of the phonograph cabinet or other support through which the driving shaft 4 for the turntable 2 projects. The shaft 4 is, of course, driven in any suitable manner to give the turntable a slow, uniform rotation. It may be well to point out here that this invention is in no sense directed to the form of driving means for the turntable since it may be applied to any type of phonograph having a driven turntable. At 3 is the plate or disc on which the record is to be cut. This disc may be made of any suitable material and is provided with a central hole which fits over the projecting spindle 5. The attachment includes a central hub like member attached to a small disc 7 having a central opening. The member 9 has a small worm wheel or gear 10 cut on the outer surface thereof. This member 9 is centrally recessed as shown and has secured therein by means of pins 36 to coiled springs 8. These springs 8 are so arranged that they slip down over the spindle 5 to effect frictional engagement therewith. The member 9 is provided with several cylindrical reduced portions arranged in alignment as shown. On one of these portions is mounted a collar 11 and on the other reduced portion is provided a cap 12 which is held in place by means of a threaded screw which engages the member 9. Collar 11 is provided with an arm 13 having a bearing 14 at the end thereof. At 15 is a

shaft which is journaled at one end in the bearing 14 and provided near that bearing with a worm 16 which engages with the worm wheel 10. Shaft 15 is provided with a threaded portion 17, a knurled portion 18 and a head portion 19 provided by an annular recess. The outer end of shaft 15 is supported by means of a bracket comprising a plate 20 to be secured to the support 1. Projecting vertically upward from plate 20 is a short standard 24 on which is adjustably secured by means of the screw 23 a collar 21. Attached to this collar is a ring 22 having an integral extending arm 22'. The upper end of this arm is cut out so as to rotatably support shaft 15 at the recessed end. Secured to the support 1 is the usual turret for the tone-arm comprising a supporting member 25 and a rotatable head 26. Secured to the rotatable head 26 is the supporting arm 27 which has secured to its free end an electric recording or reproducing unit. At 29 is a U-shaped channel member cut so as to slidably fit over the arm 27. This supporting member 29 may be adjustably secured at any desired point along arm 29 by means of the screw 30. Secured to the member 29 is a bearing bracket 31 through which extends the shaft 32' provided with an adjusting head 32. The shaft 32' is secured to the arm 34 at one end and near the other end is encircled by a friction spring 33 which lies between the head 32 and the bracket 31. By means of this arrangement the arm 34 may be rotated as desired and held in any position by means of the friction spring. The outer end of arm 34 is provided with a block of resilient material such as rubber, felt and the like, which engages with the threaded portion 17 of shaft 15. An important feature of this invention comprises the flexible shaft or universal joint connection shown at 50. In the form shown in the drawings the driving shaft is divided into two portions 15 and 15' which are connected by the universal joint 50. The universal joint connection may be of any well known type such as, for example, the ball and socket type as has been illustrated.

In the operation of this apparatus the attachment is applied to the phonograph by forcing the central head down over the spindle 5 so that springs 8 engage the spindle. The right-hand end of shaft 15 is mounted in bracket 22' and this bracket is adjusted vertically to the proper position by loosening screw 23 and sliding collar 21 up and down on the standard 24. The electric reproducing head 28 which, of course, has a needle in it is mounted on the disc at the desired point and then arm 34 is rotated downwardly by head 32 so that the resilient pad 35 engages the threads 17. The recording unit 28 is, of course, connected by wires to the output of an amplifier of any suitable type, which amplifier is fed by sound currents through the agency of a microphone. The turntable is started so that it revolves at the proper speed. As a result the member 9 having the worm wheel on its outer surface is caused to revolve with the turntable 2, disc 3, plate 7, springs 8 and cap 12, these parts all revolving as a unit. Collar 11 is freely enough supported on member 9 between it and the cap 12 so that all of these parts with the exception of collar 11 may revolve with the turntable. By reason of the engagement of worm wheel 12 with worm 16, shaft 15' is caused to revolve as well as shaft 15 through the universal connection 50. The rotation of the shaft 15 and its threads 17 causes the movement of arm 27 and the recording unit 28 across the face of the disc by reason of the engagement of the resilient pad 35 with threads 17. The knurled portion 18 of shaft 15 is provided so that the shaft 15 may be revolved by hand to adjust the needle to the exact desired position. The universal connection 50 is provided to smooth out any irregularities in movement of the parts and to permit the operator to easily place the free end of shaft 15 in the supporting bracket 22'. It is apparent that this attachment may be applied to an electric phonograph having a reproducing unit since such an electric reproducing unit, although not particularly adapted for recording, may be used nevertheless, for useful recording. Likewise, a special recording unit may be applied to the end of arm 27 when the best results are sought.

In the modified arrangement shown in Fig. 4 the parts are the same with the exception that the supporting turret and arm as well as the attached parts may be removed and a special recording unit shown at 40 may be employed. This recording unit is, of course, of the electric type and is provided with a cutting needle or stylus 41 which is held in place by means of the screw 42. On the back of the recording unit is a supporting bracket 43 which is lined with felt or any other suitable material 44. This unit may be directly applied to the threaded portion 17 of the shaft 15 and it will be guided in its movement across the face of the record in the same manner as is the recording unit in the arrangement of Figs. 1 and 2. In both cases the threaded portion 17 of shaft 15 provides a feeding mechanism for moving the recording unit at a uniform rate across the face of the disc either towards or away from the centre, depending upon either the direction of rotation of shaft 15 or the direction of advance of the threads 17.

From the foregoing disclosure it will be apparent that I have devised an invention employing certain principles of construction and operation which may be embodied in other physical forms than those shown for purposes of illustration and I do not, therefore, desire to be strictly limited to the dis-

closure as given for purposes of illustration but rather to the scope of the appended claims.

What I seek to secure by United States Letters Patent is:

1. In a recording apparatus of the type described, the combination with a turntable having a central spindle, and an electric recording unit, of a rotatably supported threaded shaft, a driving head detachably secured to said spindle, a flexible connection between the driving head and said rotatable shaft, and means secured to said recording unit and engaging the threads of said shaft for moving the recording unit across the turntable.

2. A detachable mechanism for a phonograph having a driven spindle comprising a detachable head to engage the spindle, said head including a gear, a rotatably supported shaft having a gear at one end for engagement with said first gear, and means driven by said shaft and adapted to be detachably secured to a recording unit to effect movement thereof.

3. A detachable driving unit of the type described, comprising a spring clutch adaptable for attachment to the spindle of a phonograph turntable, a threaded shaft rotatably connected to the clutch by a universal joint and a vertically adjustable bearing support for the other end of the shaft by means of which it is rotatably supported.

4. A recording apparatus of the type described, comprising the combination with a record turntable having a central spindle and a spring clutch for attachment to the spindle, a gear formed on said clutch for rotation, a second gear, a threaded shaft, a universal joint connecting the second gear and the shaft, means for rotatably supporting the shaft at its other end, a recording head, means for supporting the recording head for oscillation, and means for connecting said means with the threaded shaft to effect its oscillation as the shaft revolves.

5. In a recording apparatus of the type described, the combination with a turntable having a central spindle and an electric recording unit of a threaded shaft, universal joint means for connecting the threaded shaft to said spindle to effect its rotation, vertically adjustable means for rotatably supporting the outer end of the shaft and longitudinally and rotatably adjustable means for connecting the recording unit with the threaded rotatable shaft.

6. A detachable mechanism for a phonograph having a driving spindle comprising a detachable head having spring means for connecting it with the spindle, a gear formed on said head, a threaded shaft, a second gear connecting the first gear and having a universal connection with the threaded shaft, and vertically adjustable supporting means for the outer end of the shaft comprising a bearing in which the shaft is supported and from which it may be moved, said universal joint permitting vertical adjustment of the threaded shaft by said supporting means.

7. The combination with a movable recording unit and a supporting arm therefor of a rotatably supported threaded shaft, and means longitudinally adjustable on said supporting arm and rotatably movable in a vertical plane for connecting the supporting arm with the threaded rod to effect oscillation of the arm.

8. A device as described, comprising a phonograph turntable and spindle, a threaded shaft supported for rotation, means for connecting the shaft to the spindle to effect rotation of the shaft, a recording head for impressing a record in a blank record when supported on the turntable, and means for connecting the recording head to the shaft to effect longitudinal movement of the head including a pad engaging a plurality of the threads on said shaft.

9. A device as described, comprising a phonograph turntable and spindle, a threaded shaft supported for rotation, means for connecting the shaft to the spindle to effect rotation of the shaft, a recording head for impressing a record in a blank record when supported on the turntable, and means for connecting the recording head to the shaft to effect longitudinal movement of the head including a soft member for engaging the shaft threads and having substantial contact area longitudinally of the shaft.

10. A device as described, comprising a phonograph turntable and spindle, a threaded shaft supported for rotation, means for connecting the shaft to the spindle to effect rotation of the shaft, a recording head for impressing a record in a blank record when supported on the turntable, and means for connecting the recording head to the shaft to effect longitudinal movement of the head including a recessed member lined with a soft material for engaging the threads of the shaft.

In testimony whereof I have hereunto set my hand on this 9th day of July A. D. 1930.

LOUIS G. LARSEN.