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F. RIEBER

2,293,219

PHONOGRAPH

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Fig. 1

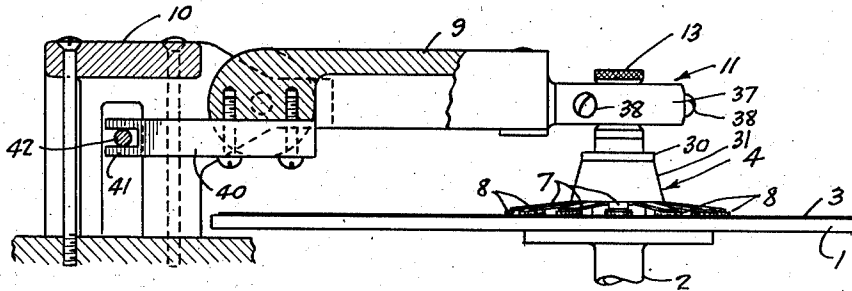


Fig. 2

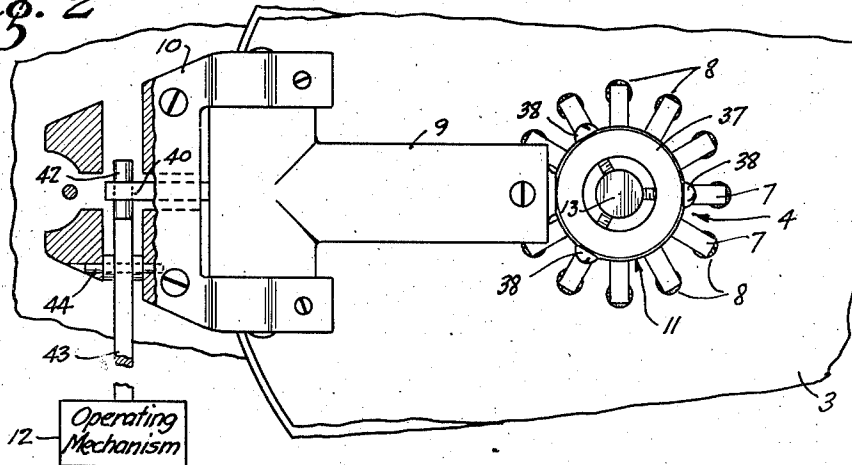


Fig. 4

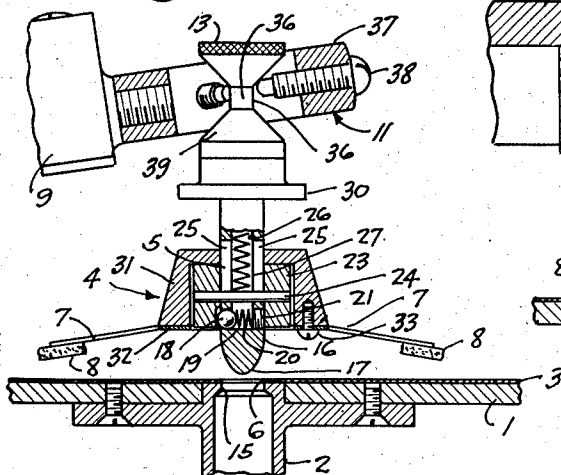
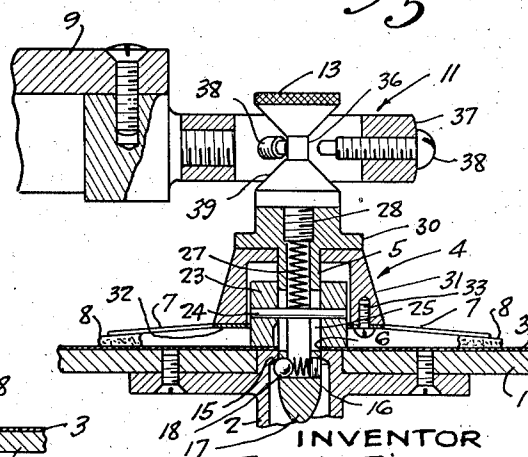


Fig. 3



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PHONOGRAPH

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12 Claims. (Cl. 274—39)

This invention relates to phonographs, and more particularly to a device for securing a record disc against slippage on its supporting and driving turntable.

In utilizing a phonograph record disc in connection with either a recording or reproducing head, it is of great importance that the speed of the disc be maintained against irregularities. By appropriate design of the turntable and the driving mechanism therefor, the speed of the turntable is held constant within narrow limits. However, due to the drag of the cooperating stylus on the record surface, or possibly other causes, the disc may slip on the turntable. In the case of recording where the stylus is positively caused to traverse the record surface in accordance with the speed of the turntable, any slippage of the disc will result in irregularities in the helical groove being formed by the stylus. Such irregularities will seriously impair the reproduction obtainable from the record or may even render the record useless.

When the record disc is very thin, as for example of that type disclosed in a copending application entitled "Sound record carrier," Serial No. 295,612, filed September 19, 1939, such slippage is particularly apt to occur.

Accordingly it is an object of this invention to make it possible to drive a record disc by a turntable in a manner to prevent slippage therebetween.

It is known to provide one or more pins spaced from the center of the turntable or a non-circular center pin to engage suitable openings in the record disc for driving it. However, such arrangements are not altogether satisfactory, particularly with a very thin disc.

It is thus another object of the invention to provide a device for frictionally securing a record disc to a turntable.

It is another object of the invention to provide such a device which is simple and may be attached or detached readily from the phonograph turntable to permit removal or replacement of a record.

It is still another object of the invention to provide such a device which may be operated either manually or mechanically, such mechanical operation being in conjunction with the control of various functions of the phonograph.

This invention possesses many other advantages, and has other objects which may be made more easily apparent from a consideration of one embodiment of the invention. For this purpose there is shown a form in the drawing ac-

companied and forming part of the present specification. This form will now be described in detail, illustrating the general principles of the invention; but it is to be understood that this detailed description is not to be taken in a limiting sense, since the scope of this invention is best defined by the appended claims.

In the drawing:

Figure 1 is an elevation of the clamping device and operating means therefor, the latter being partly in section;

Fig. 2 is a plan view of the structure of Fig. 1 also partly in section;

Fig. 3 is a transverse section, on an enlarged scale, of the clamp in use; and

Fig. 4 is a similar view, but showing the clamp disengaged.

Referring to the drawing, a phonograph turntable indicated by 1 is mounted on a rotatable spindle 2, and carries a record disc 3. This disc is shown as being very thin, and may have a thickness in the neighborhood of .015 inch. Record 3 is centered on the turntable and frictionally secured against rotation relative thereto by the clamping device generally indicated by 4.

This device 4, as best shown in Fig. 3, includes a stem 5 adapted to pass through a suitable aperture 6 in record 3 and be releasably secured in spindle 2. Device 4 also carries a plurality of spring fingers 7, having suitable pads 8 at their outer or free ends for contacting the disc 3. The parts are so proportioned that when clamp 4 is secured in spindle 2, fingers 7 are flexed upwardly by the disc 3, and accordingly urge disc 3 against the turntable 1, so that the frictional engagement between them is materially increased.

The head 13 of stem 5 forms a handle by which the clamp may be manipulated manually to or from operative engagement with the turntable.

If desired mechanical means may be provided for so manipulating the clamp. This means may comprise an arm 9 pivotally supported in a bracket 10. A lost motion connection 11 is provided between the arm 9 and clamp 4 to permit the clamp to rotate freely with the turntable 1. Appropriate operating mechanism 12 (Fig. 2) may be provided for manipulating arm 9.

Referring in more detail to the construction of the clamp, as best shown in Figs. 3 and 4, spindle 2 is hollow, at least in its upper portion, and has an inwardly extending flange 15 at its top forming an annular shoulder. The lower portion 16 of spindle 5 is of suitable size to be easily in-

serted into spindle 2 and at the same time accurately center record disc 3 by passing through aperture 5 therein. Thus stem 5 terminates in a generally conical portion 17, which serves to guide the stem through the record and into the spindle. A ball 18 is carried in diametral bore 19 in stem 5, being urged outwardly by spring 20, confined in bore 19 between the ball 18 and a plug 21. Ball 18 forms a detent cooperating with shoulder 15, to releasably retain the stem in position in the spindle.

A sleeve 23 is slidable over stem 5, being retained thereon by a pin 24, passing through suitable slots 25 in stem 5. Stem 5 has an axial bore 26, a compression spring 27 being confined therein between a closure 28 in the upper end of the bore and pin 24. Thus, when clamp 4 is lifted free of the record and turntable, sleeve 23 is supported by pin 24 resting on the lower ends of slots 25 as shown in Fig. 4.

When the device is lowered into operative or clamping position, ball 18 is forced inwardly against spring 20 to permit the ball to pass shoulder 15, the ball then being forced outwardly by the spring to engage the under side of shoulder 15. Also, the lower surface of sleeve 23 engages the disc 3 which forces the sleeve 23 upwardly against spring 27. The reaction of spring 27 forces stem 5 upwardly, maintaining detent 18 against shoulder 15.

The upper portion of stem 5 has a flange 30, an inverted cup 31 being freely slidable on the stem between this flange and the upper surface of sleeve 23. A circular member 32 of resilient material such as spring steel is attached to the lower end of cup 31, as by screws 33, and has the plurality of radially extending, angularly spaced resilient arms or fingers 7 heretofore mentioned. When free these fingers may have a slight downward inclination (Fig. 4). The small pad 8, attached to the ends of fingers 7, may be of suitable material for frictionally engaging the record disc. Such a material is sponge rubber.

When the stem 5 is in place on the spindle, as shown in Fig. 3, the spring fingers 7 are flexed and cause the pads 8 to urge the record disc 3 against the turntable 1. It will be obvious that the retentive force exerted by detent 18 on stem 5 must exceed the upward force exerted by the spring fingers 7.

The head 13 of the stem 5 is of enlarged diameter to form a convenient hand grip, as previously mentioned, and is attached by means of the threaded boss 28 which engages bore 26 and serves as a closure for the upper end thereof.

Head 13 has a neck 36 of reduced diameter adapted to form one element of lost motion connection 11. Secured to the free end of lever 10 is a ring 37, substantially coaxial with spindle 2 when the clamp is in the engaged position of Fig. 3. Ring 37 carries a plurality of screws 38 which project radially inward and closely approach neck 36, forming the other element of connection 11. With arm 9 in its normal operating position and clamp 4 in record clamping position on the turntable, screws 38 clear head 13 and neck 36; so that clamp may rotate freely with the turntable.

When it is desired to release the record disc so as to permit its removal, arm 9 is swung upwardly to the position of Fig. 4, one or more of the screws 38, contacting the enlarged part of head 13 above neck 36 and raising the clamp 4. The amount of such movement must be sufficient

to raise stem 5 clear of the top of the turntable 1.

When it is desired to secure the record disc 3, arm 9 is swung downwardly, stem 5 entering the bore of spindle 2, the conical extremity 17 serving to properly guide it. Ball 18, by its engagement with the upper side of shoulder 15, supports the stem 5 and connected parts out of operative position with respect to arm 9. Further, sleeve 23 by resting on the record may also cause spring 27 to assist in maintaining the parts in the upright position. Thus it is necessary to exert some downward force on stem 5 to cause it to assume the position of Fig. 3. Lever 9 is accordingly arranged to swing downwardly so that one or more of screws 38 engage the shoulder 39 below neck 36, forcing stem 5 into proper engagement with spindle 2. The lever 9 is then returned to its neutral position, when it clears head 13.

As previously pointed out, the clamping device can be manipulated by hand by grasping the head 13, lever 9 being entirely dispensed with, or lever 9 can be manipulated manually or automatically in accordance with the operation of the phonograph. Thus, lever 9 may have an extension 40, with a forked end 41 engaged by one end 42 of an operating lever 43. Lever 43 is pivotally mounted at 44 in support 10, being moved about this pivot in a suitable manner by operating mechanism 12. Movements of lever 43 are transmitted to lever 9 by fork 41 and extension 40.

What is claimed is:

1. In combination with a phonograph turntable for supporting a record disc thereon, said turntable and said disc each having an axial aperture, means to secure the disc on the table in coaxial relationship therewith, comprising a stem for insertion through the disc aperture into the aperture in the turntable for aligning the apertures, and means securing the stem in position on the turntable.

2. In combination with a phonograph turntable for supporting a record disc thereon, means to secure the disc against slippage comprising a stem adapted to be detachably secured to the table, and a plurality of spring fingers carried by the stem, the free ends of said fingers being adapted to engage the disc and urge it against the turntable.

3. In combination with a phonograph turntable for supporting a record disc thereon, said turntable and said disc each having an axial aperture, means to secure the disc on the table in coaxial relationship therewith, comprising a stem for insertion through the disc aperture into the aperture in the turntable for aligning the apertures, means securing the stem in position on the turntable, and means carried by the stem for urging the disc against the turntable.

4. In combination with a phonograph turntable for supporting a record disc thereon, said turntable and said disc each having an axial aperture, means to secure the disc on the table in coaxial relationship therewith, comprising a stem for insertion through the disc aperture into the aperture in the turntable for aligning the apertures, means releasably securing said stem against axial movement with respect to the turntable, and a member or resilient material carried by the stem, said member comprising a plurality of radial fingers, the free ends of which are adapted to engage the disc and urge it against the table.

5. In combination with a phonograph turntable for supporting a record disc thereon, said

turntable and said disc each having an axial aperture, means to secure the disc on the table in axial alinement therewith, comprising a stem adapted for insertion through the disc aperture into the turntable aperture for alining the apertures, means releasably securing the stem in position on the turntable including means forming a shoulder on the turntable, a detent on the stem, a sleeve slidable on the stem for engaging the disc, and means urging the stem upward through the sleeve, whereby said detent is urged into engagement with the shoulder.

6. In combination with a phonograph turntable for supporting a record disc thereon, said turntable and said disc each having an axial aperture, means to secure the disc on the table in axial alinement therewith, comprising a stem adapted for insertion through the disc aperture into the turntable aperture for alining the apertures, means releasably securing the stem in position on the turntable including means forming a shoulder on the turntable, a detent on the stem, a sleeve slidable on the stem for engaging the disc, means urging the stem upward through the sleeve, whereby said detent is urged into engagement with the shoulder, and means carried by the stem urging the disc against the table.

7. In combination with a phonograph turntable for supporting a record disc thereon, said turntable and said disc each having an axial aperture, means to secure the disc on the table in axial alinement therewith, comprising a stem adapted for insertion through the disc aperture into the turntable aperture for alining the apertures, means releasably securing the stem against axial movement with respect to the table, including means forming a shoulder on the turntable, a detent on the stem, and means carried by the stem urging the disc against the table and said detent against said shoulder.

8. In combination with a phonograph turntable for supporting a record disc thereon, said turntable and said disc each having an axial aperture, means to secure the disc on the table in axial alinement therewith, comprising a stem adapted for insertion through the disc aperture into the turntable aperture for alining the apertures, means releasably securing the stem against axial movement with respect to the table, including means forming a shoulder on the turntable, a detent on the stem, means carried by the stem urging the disc against the table and said detent against said shoulder, an arm for moving the stem

axially of the table, and a lost motion connection between the arm and the stem.

9. In combination with a phonograph having a turntable for supporting a record disc thereon, said turntable and said disc each having an axial aperture, means to secure the disc on the table in axial alinement therewith, comprising a stem adapted for insertion through the disc aperture into the turntable aperture for alining the apertures, means releasably securing the stem against axial movement with respect to the table, including means forming a shoulder on the turntable, a detent on the stem, means carried by the stem urging the disc against the table and said detent against said shoulder, an arm for moving the stem axially of the table, means forming a connection between the arm and the stem, a pivotal support for the arm, and means for moving the arm about its pivot as a function of the operation of the phonograph.

10. A clamp for a record disc comprising a stem adapted to be secured in axial alinement with a phonograph turntable, means slidable on said stem including spring fingers extending from the stem, and a stop on the stem for said means, said fingers being adapted to press on the record and urge said means against said stop.

11. In a phonograph apparatus, a turntable adapted to support a record disc, and means for holding the disc firmly against the turntable, comprising a yielding member adapted to engage the disc at the area surrounding the axis of the turntable, and means associated with said member adapted to pass through an axial aperture in the record and cooperate with an axial aperture in the turntable for releasably locking said yielding member in engaging position.

12. In a phonograph apparatus, a turntable adapted to support a record disc, a spindle for supporting the turntable, said spindle and turntable presenting a flush record disc supporting surface, said turntable and said disc each having an axial aperture, means to secure the disc resiliently on the table in coaxial relationship therewith, comprising a yielding member adapted to engage the disc at an axial area, means supporting said member including a stem adapted for insertion through the disc aperture into the spindle aperture for alining the apertures, and means for releasably locking the stem in the spindle aperture.

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