Dec. 1, 1942. R. B. DAVIS 2,303,619

ADJUSTABLE PICKUP HEAD FOR SOUND REPRODUCING APPARATUS

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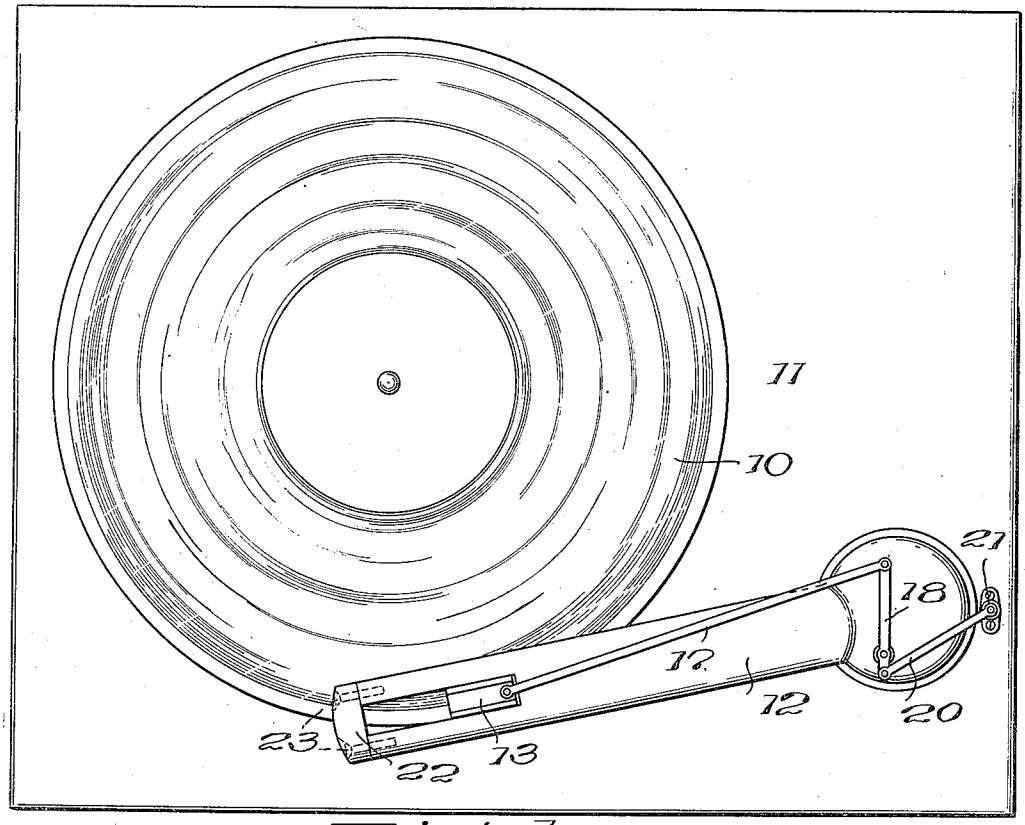
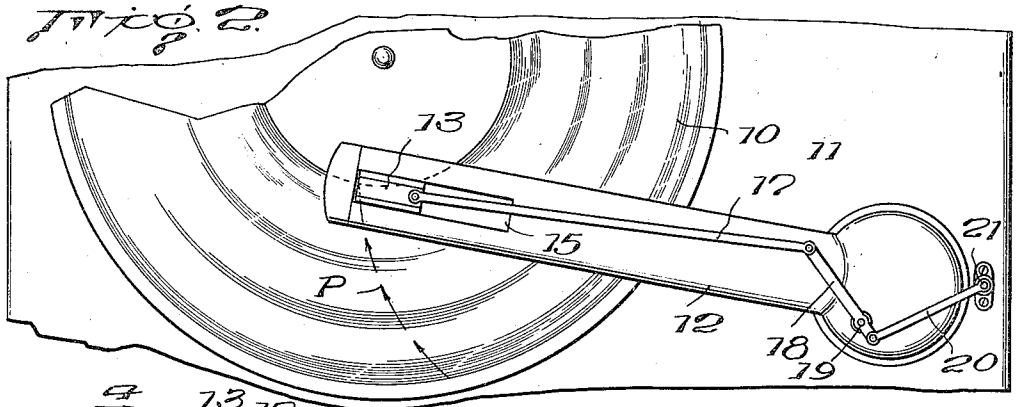


Fig. 1.

Fig. 2.



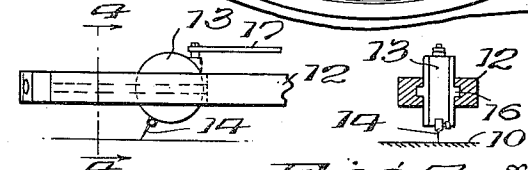


Fig. 3.

Fig. 4.

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UNITED STATES PATENT OFFICE

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ADJUSTABLE PICKUP HEAD FOR SOUND REPRODUCING APPARATUS

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4 Claims. (Cl. 274—9)

This invention relates to improvements in sound reproducing apparatus and particularly to the manner of mounting the pick-up head and its needle in the arm by which it is permitted to travel inwardly toward the center of the record disc in the usual phonograph.

The primary object of the invention is to provide means for moving the pick-up head and needle longitudinally of the arm in which they are carried, as the arm and head swing inwardly of the disc, whereby the relationship of the needle and disc will remain substantially unchanged during the playing of the record.

More specifically, the invention contemplates an arrangement wherein the pick-up head and its needle are slidably supported in the swingable arm and the head is connected by a link to lever pivoted on the arm eccentrically of the latter, said lever being also connected by a second link to a fixed point, whereby, as the arm swings during the playing of a record, the lever will rock on its pivotal center and cause the pick-up head and needle to move longitudinally of the arm.

With these and other objects in view, the invention consists in certain details of construction and combinations and arrangements of parts, all as will hereinafter be more fully described and the novel features thereof particularly pointed out in the appended claims.

In the accompanying drawing:

Figure 1 is a top plan view illustrating a record disc on the turntable of a phonograph and the pick-up head and arm in the relative positions they occupy when they are located adjacent the edge of the disc;

Fig. 2 is a similar view illustrating the movement of the pick-up head with respect to the disc and arm as the latter swings toward the center of the disc;

Fig. 3 is a side elevation showing the arm and pick-up head more or less diagrammatically; and

Fig. 4 is a sectional view on the line 4—4 of Fig. 3.

A record disc 10 is shown on the turntable of the phonograph in Fig. 1, the turntable being located somewhat above the upper surface 11 of the phonograph cabinet, as is well understood. Likewise, the arm 12, carrying the pick-up head 13 and needle 14, is pivoted at a suitable point on the surface 11, the arm being free to swing about its pivotal center toward the center of the disc 10 as the needle travels inwardly of the disc by reason of its engagement in the sound groove of said disc.

With the arm 12 pivoted to swing around a center fixed with respect to the record disc, the relationship of the needle and the surfaces of the sound groove would be changing constantly in the absence of means for adjusting the relationship between the needle and arm, depending upon the location of the arm during the playing of a record. To eliminate this varying relationship of the needle and sound groove, and the resultant effect on the sound reproduction, the present invention provides a comparatively simple arrangement wherein the pick-up is caused to slide lengthwise of arm 12 as the latter swings inwardly over the record. For instance, the arm may be provided with an elongated vertical opening 15, with ways formed in the side walls of said opening for reception of ribs 16 on the pick-up head, whereby the head can slide longitudinally of the arm. One end of a link 17 is pivotally attached to the head and its opposite end is similarly attached to a lever 18 pivoted at 19. Also pivotally attached to said lever is one end of a second link 20, whose opposite end is pivotally secured on a pin 21 mounted on the upper surface of the cabinet in such fashion as to permit the arm to be raised sufficiently to disengage the needle from the sound groove, as is necessary at times. Preferably, the lever 18 is actually pivoted on the arm 12.

By comparing the illustrations of Figs. 1 and 2, it will be seen that the swinging movement of arm 12 inwardly over the record will cause the links 17 and 20 and lever 18 to tend to assume positions in a straight line, thus causing the pick-up head to be moved longitudinally of the arm, away from the pin 21 and the pivotal center of the arm. The path of the needle, during the playing of the record, as affected by this movement of the head longitudinally of the arm, is indicated at P in Fig. 2. Thus, the needle is maintained in substantially the same relationship with respect to the sound groove from the outer end to the inner end of that groove. That is, the needle is moved along the arm in a line which intersects the pivotal center of the arm and which is tangent to the point at which the needle engages the sound groove in the record, and, as the needle moves across the record, the sliding movement of the pick-up head in the arm will always maintain the line of movement of the pick-up head coincident with lines tangential to the sound groove at the successive points of engagement of the needle in said groove. In this way, both sides of the sound groove exert the same pressure on the needle because there is no tendency on the

part of the needle arm to pull the needle across the groove.

To facilitate assembly of the head in arm 12 in the specific form of mounting illustrated, the end 22 of the arm may be made removable, being detachably secured in place on the arm by any suitable means, for instance, screws 23.

What I claim is:

1. In a sound reproducing system comprising a pivoted swingable arm, a pick-up head carried by said arm, and a sound groove engaging needle in said head, said head being slidable longitudinally of the arm in a line intersecting the pivotal center of the arm and tangent to the point at which said needle engages said groove, and means responsive to the swinging movement of the arm for effecting a sliding movement of said head in said line.

2. In a sound reproducing system comprising a swingable arm, a support on which said arm is pivoted, a pick-up head carried by said arm, and a sound track engaging needle in said head, said head being slidable in a line intersecting the pivotal center of the arm and tangent to the point at which said needle engages said track, a lever, a link connecting said head and lever, and means for rocking said lever upon swinging motion of said arm to slide said head along said line.

3. In a sound reproducing system comprising a swingable arm, a support on which said arm is pivoted, a pick-up head carried by said arm, and a sound track engaging needle in said head, said head being slidable longitudinally of the arm in a line tangent to the point at which said needle engages the sound track and intersecting the pivotal center of the arm, a lever pivoted on said arm, the pivotal center of said lever being arranged eccentrically of the pivotal center of the arm, means responsive to the swinging motion of the arm for rocking said lever, and a link pivotally attached to said lever and pick-up head whereby said head is moved along said line by the swinging movement of the arm.

4. In a sound reproducing system comprising a pivoted swingable arm, a pick-up head, and a sound track engaging needle in said head, said head being slidably mounted in said arm for movement longitudinally of the arm in a line intersecting the pivotal center of the arm and tangent to the point at which said needle engages said sound track, a lever carried by the arm on a pivot arranged eccentrically of the pivotal center of the arm, a link pivotally connected to said head and one end of said lever, a support, and a second line pivotally attached to said support and the opposite end of said lever, whereby said lever will rock and slide said pick-up along said line as the arm swings on its pivotal center.

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